

UNITED STATES SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549
FORM 20-F

**ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d)
OF THE SECURITIES EXCHANGE ACT OF 1934**

for the fiscal year ended December 31, 2018
Commission File Number 0-99

PETRÓLEOS MEXICANOS

(Exact name of registrant as specified in its charter)

Mexican Petroleum
(Translation of registrant's name into English)

United Mexican States
(Jurisdiction of incorporation or organization)

**Avenida Marina Nacional No. 329
Colonia Verónica Anzures**

11300 Ciudad de México, México
(Address of principal executive offices)

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11300 Ciudad de México, México**

(Name, telephone, e-mail and/or facsimile number
and address of company contact person)

Securities registered or to be registered pursuant to Section 12(b) of the Act. None
Securities registered or to be registered pursuant to Section 12(g) of the Act. None
Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act.
Title of Each Class

8.00% Guaranteed Notes due 2019	3.500% Notes due 2020
6.000% Notes due 2020	6.375% Notes due 2021
5.50% Notes due 2021	4.875% Notes due 2022
5.375% Notes due 2022	Floating Rate Notes due 2022
8.625% Bonds due 2022	3.500% Notes due 2023
4.625% Notes due 2023	8.625% Guaranteed Bonds due 2023
4.875% Notes due 2024	4.250% Notes due 2025
4.500% Notes due 2026	6.875% Notes due 2026
9.50% Guaranteed Bonds due 2027	9.50% Global Guaranteed Bonds due 2027
6.500% Notes due 2027	5.350% Notes due 2028
6.500% Notes due 2029	6.625% Guaranteed Bonds due 2035
6.625% Guaranteed Bonds due 2038	6.500% Bonds due 2041
5.50% Bonds due 2044	6.375% Bonds due 2045
5.625% Bonds due 2046	6.750% Bonds due 2047
6.350% Bonds due 2048	

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

Yes No

If this report is an annual or transition report, indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934.

Yes No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).

Yes No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or an emerging growth company. See definitions of "large accelerated filer," "accelerated filer," and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer Accelerated filer Non-accelerated filer Emerging growth company

If an emerging growth company that prepares its financial statements in accordance with U.S. GAAP, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

†The term "new or revised financial accounting standard" refers to any update issued by the Financial Accounting Standards Board to its Accounting Standards Codification after April 5, 2012.

Indicate by check mark which basis of accounting the registrant has used to prepare the financial statements included in this filing:

U.S. GAAP IFRS as issued by the IASB Other

If "Other" has been checked in response to the previous question, indicate by check mark which financial statement item the registrant has elected to follow.

Item 17 Item 18

If this is an annual report, indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).

Yes No

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Petróleos Mexicanos and its six subsidiary entities, which we refer to as the subsidiary entities, *Pemex Exploración y Producción* (Pemex Exploration and Production), *Pemex Transformación Industrial* (Pemex Industrial Transformation), *Pemex Perforación y Servicios* (Pemex Drilling and Services), *Pemex Logística* (Pemex Logistics), *Pemex Fertilizantes* (Pemex Fertilizers) and *Pemex Etileno* (Pemex Ethylene), comprise the state oil and gas company of the United Mexican States, which we refer to as Mexico. Petróleos Mexicanos is a productive state-owned company of the Federal Government of Mexico, which we refer to as the Mexican Government, and each of the subsidiary entities is a productive state-owned subsidiary of Mexico. Each of Petróleos Mexicanos and the subsidiary entities is a legal entity empowered to own property and carry on business in its own name. In addition, a number of subsidiary companies that are defined in Note 1 and listed in Note 5 to our consolidated financial statements incorporated in Item 18, which we refer to as our subsidiary companies, are incorporated into the consolidated financial statements; these subsidiary companies are also identified with their corresponding ownership percentages in “—Consolidated Structure of PEMEX” on page 4. Petróleos Mexicanos, the subsidiary entities and the subsidiary companies are collectively referred to as “PEMEX” or “we.” See “Item 4—Information on the Company—History and Development—Corporate Structure” for more details.

References herein to “U.S. \$,” “\$,” “U.S. dollars” or “dollars” are to United States dollars. References herein to “pesos” or “Ps.” are to the legal currency of Mexico. References herein to “euros” or “€” are to the legal currency of the European Economic and Monetary Union. References herein to “pounds” or “£” are to the legal currency of the United Kingdom. References herein to “Swiss francs” are to the legal currency of the Swiss Confederation. References herein to “Japanese yen” or “¥” are to the legal currency of Japan. References herein to “Australian dollars” are to the legal currency of Australia. The term “billion” as used herein means one thousand million.

Our consolidated financial statements included in this annual report were prepared in accordance with International Financial Reporting Standards as issued by the International Accounting Standards Board. We refer in this report to “International Financial Reporting Standards as issued by the International Accounting Standards Board” as IFRS. In addition, these financial statements were audited in accordance with the International Standards on Auditing, as required by the *Ley del Mercado de Valores* (Securities Market Law) and the *Disposiciones de carácter general aplicables a las emisoras de valores y a otros participantes del mercado de valores* (General Provisions applicable to issuers of securities and other participants in the securities market) in each case, of Mexico, for purposes of filing with the *Comisión Nacional Bancaria y de Valores* (National Banking and Securities Commission, or the CNBV) and the *Bolsa Mexicana de Valores, S.A.B. de C.V.* (Mexican Stock Exchange), and in accordance with the standards of the Public Company Accounting Oversight Board (United States), or PCAOB, for purposes of filings with the U.S. Securities and Exchange Commission, or the SEC.

The regulations of the SEC do not require foreign private issuers that prepare their financial statements on the basis of IFRS to reconcile such financial statements to United States Generally Accepted Accounting Principles, which we refer to as U.S. GAAP. Accordingly, while we have in the past reconciled our consolidated financial statements prepared in accordance with *Normas de Información Financiera Mexicanas* (Mexican Financial Reporting Standards) to U.S. GAAP, those reconciliations are no longer presented in our filings with the SEC. We do, however, continue to provide the disclosure required under the U.S. Financial Accounting Standards Board Accounting Standards Codification (ASC) Topic 932 “Extractive Activities—Oil and Gas” (which we refer to as ASC Topic 932), as this is required regardless of the basis of accounting on which we prepare our financial statements.

We maintain our consolidated financial statements and accounting records in pesos. Unless otherwise indicated, we have translated all peso amounts to U.S. dollars in this Form 20-F, including all convenience translations of our consolidated financial statements included herein, at an exchange rate of Ps. 19.6829 = U.S. \$1.00, which is the exchange rate that the *Secretaría de Hacienda y Crédito Público* (Ministry of Finance and Public Credit) instructed us to use on December 31, 2018. You should not construe these translations from pesos into dollars as actually representing such U.S. dollar amounts or meaning that you could convert such amounts into U.S. dollars at the rates indicated. Mexico has a free market for foreign exchange, and the Mexican Government allows the peso to float freely against the U.S. dollar. There can be no assurance that the Mexican Government will maintain its current policies with regard to the peso or that the peso will not depreciate or appreciate significantly in the future. Due to the volatility of the peso/U.S. dollar exchange rate, the exchange rate on any date subsequent to the date hereof could be materially different from the rate indicated above.

PRESENTATION OF INFORMATION CONCERNING RESERVES

The proved hydrocarbon reserves included in this report for the year ended December 31, 2018 are those that we have the right to extract and sell based on assignments granted to us by the Mexican Government.

The estimates of our proved reserves of crude oil and natural gas for the five years ended December 31, 2018 included in this report have been calculated according to the technical definitions required by the SEC. DeGolyer and MacNaughton, Netherland, Sewell International, S. de R.L. de C.V. (which we refer to as Netherland Sewell) and GLJ Petroleum Consultants LTD. (which we refer to as GLJ) conducted reserves audits of our estimates of our proved hydrocarbon reserves as of December 31, 2018 or January 1, 2019, as applicable. All reserves estimates involve some degree of uncertainty. For a description of the risks relating to reserves and reserves estimates, see “Item 3—Key Information—Risk Factors—Risk Factors Related to our Relationship with the Mexican Government— Information on Mexico’s hydrocarbon reserves is based on estimates, which are uncertain and subject to revisions,” “—We must make significant capital expenditures to maintain our current production levels, and to maintain, as well as increase, the proved hydrocarbon reserves assigned to us by the Mexican Government. Reductions in our income, adjustments to our capital expenditures budget and our inability to obtain financing may limit our ability to make capital investments” and “—The Mexican nation, not us, owns the hydrocarbon reserves located in the subsoil in Mexico and our right to continue to extract these reserves is subject to the approval of the Ministry of Energy.”

FORWARD-LOOKING STATEMENTS

This Form 20-F contains words, such as “believe,” “expect,” “anticipate” and similar expressions that identify forward-looking statements, which reflect our views about future events and financial performance. We have made forward-looking statements that address, among other things, our:

- exploration and production activities, including drilling;
- activities relating to import, export, refining, transportation, storage and distribution of petrochemicals, petroleum, natural gas and oil products;
- activities relating to our lines of business;
- projected and targeted capital expenditures and other costs;
- trends in international and Mexican crude oil and natural gas prices;
- liquidity and sources of funding, including our ability to continue operating as a going concern;
- farm-outs, joint ventures and strategic alliances with other companies; and
- the monetization of certain of our assets.

Actual results could differ materially from those projected in such forward-looking statements as a result of various factors that may be beyond our control. These factors include, but are not limited to:

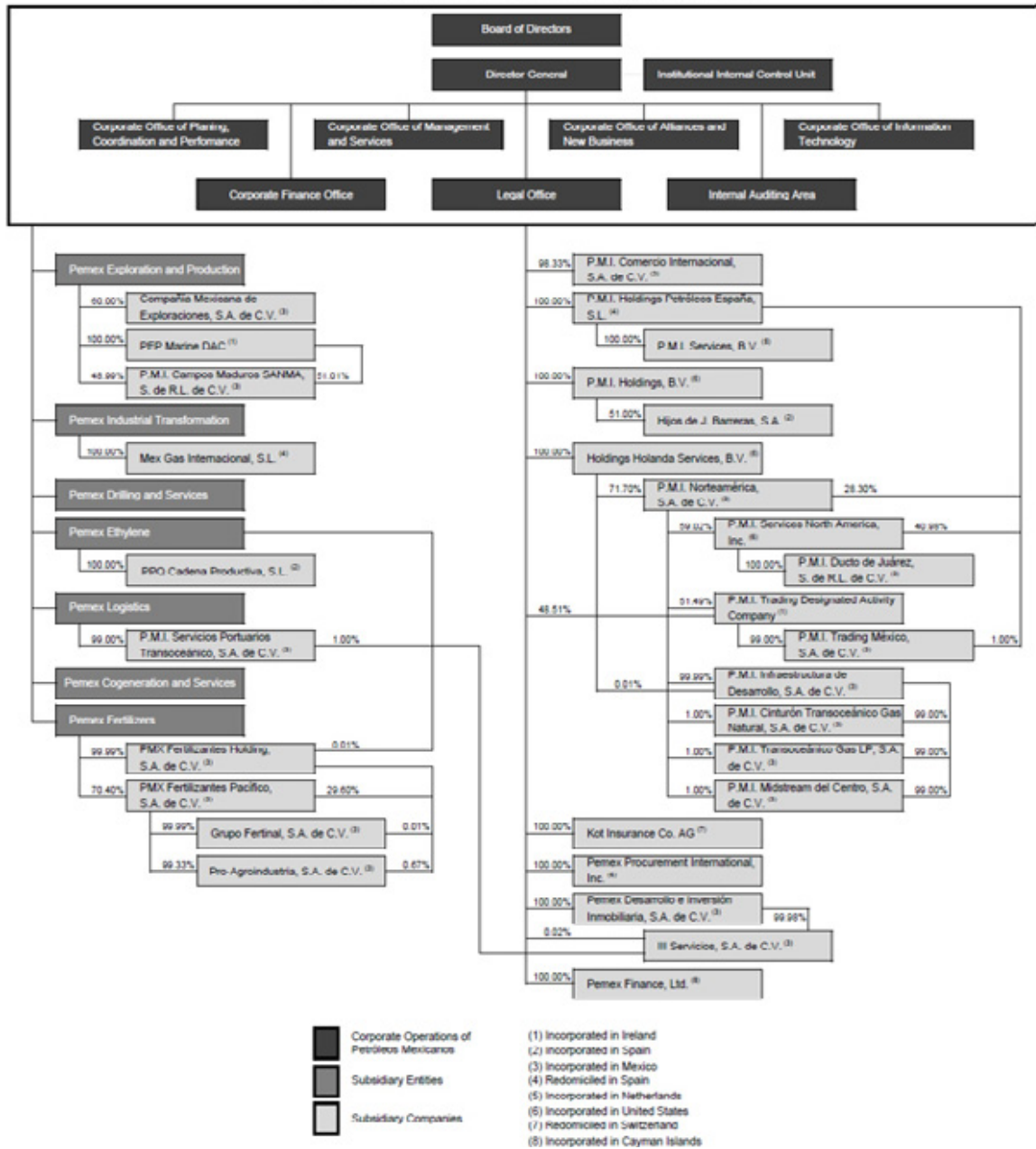
- general economic and business conditions, including changes in international and Mexican crude oil and natural gas prices, refining margins and prevailing exchange rates;
- credit ratings and limitations on our access to sources of financing on competitive terms;
- our ability to find, acquire or gain access to additional reserves and to develop, either on our own or with our strategic partners, the reserves that we obtain successfully;
- the level of financial and other support we receive from the Mexican Government;
- effects on us from competition, including on our ability to hire and retain skilled personnel;
- uncertainties inherent in making estimates of oil and gas reserves, including recently discovered oil and gas reserves;
- technical difficulties;
- significant developments in the global economy;

- significant economic or political developments in Mexico and the United States;
- developments affecting the energy sector;
- changes in, or failure to comply with, our legal regime or regulatory environment, including with respect to tax, environmental regulations, fraudulent activity, corruption and bribery;
- receipt of governmental approvals, permits and licenses;
- natural disasters, accidents, blockades and acts of sabotage or terrorism;
- the cost and availability of adequate insurance coverage; and
- the effectiveness of our risk management policies and procedures.

Accordingly, you should not place undue reliance on these forward-looking statements. In any event, these statements speak only as of their dates, and we undertake no obligation to update or revise any of them, whether as a result of new information, future events or otherwise.

For a discussion of important factors that could cause actual results to differ materially from those contained in any forward-looking statement, see “Item 3—Key Information—Risk Factors.”

CONSOLIDATED STRUCTURE OF PEMEX



Corporate Operations of Petróleos Mexicanos
 Subsidiary Entities
 Subsidiary Companies

(1) Incorporated in Ireland
 (2) incorporated in Spain
 (3) Incorporated in Mexico
 (4) Redomiciled in Spain
 (5) Incorporated in Netherlands
 (6) Incorporated in United States
 (7) Redomiciled in Switzerland
 (8) Incorporated in Cayman Islands

PART I

Item 1. Identity of Directors, Senior Management and Advisers

Not applicable.

Item 2. Offer Statistics and Expected Timetable

Not applicable.

Item 3. Key Information

SELECTED FINANCIAL DATA

The selected statement of comprehensive income (loss), statement of financial position and cash flows data set forth below as of and for the five years ended December 31, 2018 have been derived from, and should be read in conjunction with, our consolidated financial statements as of December 31, 2017 and 2018 and for the years ended December 31, 2016, 2017 and 2018, which are included in Item 18 of this report. Our consolidated financial statements for each of the fiscal years ended December 31, 2014, 2015, 2016 and 2017 were audited by Castillo Miranda y Compañía, S.C. (which we refer to as BDO Mexico), an independent registered public accounting firm. Our consolidated financial statements for the fiscal year ended December 31, 2018 were audited by KPMG Cárdenas Dosal, S.C. (which we refer to as KPMG Mexico), an independent registered public accounting firm. Certain amounts in the consolidated financial statements for the years ended December 31, 2014, 2015, 2016 and 2017 have been reclassified to conform the presentation of the amounts in the consolidated financial statements for the year ended December 31, 2018. These reclassifications are not significant to the consolidated financial statements and had no impact on our consolidated net income (loss).

As detailed below, for the years ended December 31, 2016, 2017 and 2018, we recognized a net loss of Ps. 191.1 billion, Ps. 280.9 billion and Ps. 180.4 billion, respectively. In addition, we had negative equity as of December 31, 2017 and 2018 of Ps. 1,502.4 billion and Ps. 1,459.4 billion, respectively, which resulted in a negative working capital of Ps. 25.6 billion and Ps. 54.7 billion, respectively; and cash flows from operating activities of Ps. 141.8 billion for the year ended December 31, 2018. This has led us to state in our consolidated financial statements that there exists substantial doubt about our ability to continue as a going concern. However, we have concluded that we continue to operate as a going concern. Accordingly, we have prepared our consolidated financial statements on a going concern basis, which assumes that we can meet our payment obligations. For more information on the actions that we are taking to face these negative trends, see “Item 5—Operating and Financial Review and Prospects—Overview” and “Item 5 — Operating and Financial Review and Prospects —Liquidity and Capital Resources.”

Selected Financial Data of PEMEX

	Year ended December 31, ⁽¹⁾					2018 ⁽²⁾ (in millions of U.S. dollars)
	2014	2015	2016	2017	2018	
(in millions of pesos, except ratios)						
Statement of Comprehensive Income (Loss)						
Data						
Net sales	Ps. 1,586,728	Ps. 1,161,760	Ps. 1,074,093	Ps. 1,397,030	Ps. 1,681,119	U.S.\$ 85,410
Operating income	615,480	(154,387)	424,350	104,725	367,400	18,666
Financing income	3,014	14,991	13,749	16,166	31,557	1,603
Financing cost	(51,559)	(67,774)	(98,844)	(117,645)	(120,727)	(6,134)
Derivative financial instruments (cost) income—Net	(9,439)	(21,450)	(14,000)	25,338	(22,259)	(1,131)
Exchange (loss) gain—Net	(76,999)	(154,766)	(254,012)	23,184	23,659	1,202
Net (loss) income for the period	(265,543)	(712,567)	(191,144)	(280,851)	(180,420)	(9,166)
Statement of Financial Position Data (end of period)						
Cash and cash equivalents	117,989	109,369	163,532	97,852	81,912	4,162
Total assets	2,128,368	1,775,654	2,329,886	2,132,002	2,075,197	105,431
Long-term debt	997,384	1,300,873	1,807,004	1,880,666	1,890,490	96,047
Total long-term liabilities	2,561,930	2,663,922	3,136,704	3,245,227	3,086,826	156,828
Total equity (deficit)	(767,721)	(1,331,676)	(1,233,008)	(1,502,352)	(1,459,405)	(74,146)
Statement of Cash Flows						
Depreciation and amortization	143,075	167,951	150,439	156,705	153,382	7,793
Acquisition of wells, pipelines, properties, plant and equipment ⁽³⁾	230,679	253,514	151,408	91,859	(94,004)	(4,776)

(1) Includes Petróleos Mexicanos, the subsidiary entities and the subsidiary companies listed in Note 5 to our consolidated financial statements included herein.

(2) Translations into U.S. dollars of amounts in pesos have been made at the exchange rate established by the Ministry of Finance and Public Credit for accounting purposes of Ps. 19.6829 = U.S. \$1.00 at December 31, 2018. Such translations should not be construed as a representation that the peso amounts have been or could be converted into U.S. dollar amounts at the foregoing or any other rate.

(3) Includes capitalized financing cost. See Note 15 to our consolidated financial statements included herein and “Item 5—Operating and Financial Review and Prospects—Liquidity and Capital Resources.”

Source: PEMEX's consolidated financial statements, prepared in accordance with IFRS, as it relates to the selected statements of comprehensive income, statement of financial position and statement of cash flows data; and Petróleos Mexicanos, as it relates to other financial data.

RISK FACTORS

Risk Factors Related to Our Operations

We have a substantial amount of indebtedness and other liabilities and are exposed to liquidity constraints, which could make it difficult for us to obtain financing on favorable terms and could adversely affect our financial condition, results of operations and ability to repay our debt and, ultimately, our ability to operate as a going concern.

We have a substantial amount of debt. Due to our heavy tax burden, our cash flow from operations in recent years has not been sufficient to fund our capital expenditures and other expenses and, accordingly, our debt has significantly increased and our working capital has deteriorated. Relatively low oil prices and declining production have also had a negative impact on our ability to generate positive cash flows, which, together with our heavy tax burden, has further exacerbated our ability to fund our capital expenditures and other expenses. Therefore, in order to develop our hydrocarbon reserves and amortize scheduled debt maturities, we will need to obtain funds from a broad range of sources, in addition to implementing the efficiency and cost-cutting initiatives described in this annual report.

As of December 31, 2018, our total indebtedness, including accrued interest, was Ps. 2,082.3 billion (U.S. \$105.8 billion), which represented a 2.2% increase compared to our total indebtedness, including accrued interest, of Ps. 2,037.9 billion (U.S. \$103.5 billion) as of December 31, 2017. 27.2% of our existing debt as of December 31, 2018, or Ps. 566.1 billion (U.S. \$28.8 billion), is scheduled to mature in the next three years, including Ps. 191.8 billion (U.S. \$9.7 billion) scheduled to mature in 2019. As of December 31, 2018, we had a negative working capital of Ps. 54.7 billion (U.S. \$2.8 billion). Our level of debt may increase further in the short or medium term as a result of new financing activities or depreciation of the peso as compared to the U.S. dollar, and may have an adverse effect on our financial condition, results of operations and liquidity position. To service our debt, we have relied and may continue to rely on a combination of cash flows provided by our operations, drawdowns under our available credit facilities and the incurrence of additional indebtedness. See “Item 5 — Operating and Financial Review and Prospects — Liquidity and Capital Resources — Overview—Changes to Our Business Plan.”

If we were unable to obtain financing on favorable terms, this could hamper our ability to obtain further financing, invest in projects financed through debt and meet our principal and interest payment obligations with our creditors. As a result, we may be exposed to liquidity constraints and may not be able to service our debt or make the capital expenditures required to maintain our current production levels and to maintain, and increase, the proved hydrocarbon reserves assigned to us by the Mexican Government, which may adversely affect our financial condition and results of operations. See “—Risk Factors Related to our Relationship with the Mexican Government—We must make significant capital expenditures to maintain our current production levels, and to maintain, as well as increase, the proved hydrocarbon reserves assigned to us by the Mexican Government. Reductions in our income, adjustments to our capital expenditures budget and our inability to obtain financing may limit our ability to make capital investments” below.

If such constraints occur at a time when our cash flow from operations is less than the resources necessary to meet our debt service obligations, in order to provide additional liquidity to our operations, we could be forced to further reduce our planned capital expenditures, implement further austerity measures and/or sell additional non-strategic assets in order to raise funds. A reduction in our capital expenditure program could adversely affect our financial condition and results of operations. Additionally, such measures may not be sufficient to permit us to meet our obligations.

Our consolidated financial statements have been prepared under the assumption that we will continue as a going concern. However, there exists substantial doubt about our ability to continue as a going concern. Our consolidated financial statements do not include any adjustments that might result from the outcome of that uncertainty. If the actions we are taking to improve our financial condition, which are described in detail under “Item 5 — Operating and Financial Review and Prospects — Liquidity and Capital Resources — Overview—Changes to Our Business Plan,” are not successful, we may not be able to continue operating as a going concern.

Downgrades in our credit ratings could negatively impact our access to the financial markets and cost of financing.

We rely on access to the financial markets to finance the capital expenditures needed to carry out our capital investment projects. Accordingly, maintaining investment grade credit ratings is important to our business and financial condition, as credit ratings affect the cost and other terms upon which we are able to obtain funding. Certain rating agencies have expressed concerns regarding: (1) our heavy tax burden; (2) the total amount of our debt and the ratio of our debt to our proven reserves; (3) the significant increase in our indebtedness over the last several years; (4) our negative free cash flow; (5) the natural decline of certain of our oil fields and lower quality of crude oil; (6) our substantial unfunded reserve for retirement pensions and seniority premiums, which was equal to Ps. 1,080.5 billion (U.S. \$54.9 billion) as of December 31, 2018; (7) the persistence of our operating expenses notwithstanding declines in oil prices; (8) the possibility that our budget for capital expenditures will be insufficient to maintain and exploit reserves; and (9) the involvement of the Mexican Government in our strategy, financing and management.

On April 12, 2018, Moody's Investors Service announced the revision of its outlook for our credit ratings from negative to stable and affirmed our global foreign currency rating as Baa3 and our global local currency credit rating as Aa3. On January 29, 2019, Fitch Ratings lowered our credit rating from BBB+ to BBB- in both global local and global foreign currency and affirmed the outlook for our credit ratings as negative. On March 4, 2019, Standard and Poor's announced the revision of the outlook for our credit ratings from stable to negative and affirmed our global foreign currency credit rating as BBB+ and our global local currency rating as A-.

Any further lowering of our credit ratings, particularly below investment grade, may have material adverse consequences on our ability to access the financial markets and/or our cost of financing. In turn, this could significantly harm our ability to meet our existing obligations, financial condition and results of operations. Credit rating downgrades could also negatively impact the prices of our debt securities. There can be no assurance that we will be able to maintain our current credit ratings or outlooks.

Crude oil and natural gas prices are volatile and low crude oil and natural gas prices adversely affect our income and cash flows and the amount of hydrocarbon reserves that we have the right to extract and sell.

International crude oil and natural gas prices are subject to global supply and demand and fluctuate due to many factors beyond our control. These factors include competition within the oil and natural gas industry, the prices and availability of alternative sources of energy, international economic trends, exchange rate fluctuations, expectations of inflation, domestic and foreign laws and government regulations, political and other events in major oil and natural gas producing and consuming nations and actions taken by oil exporting countries, trading activity in oil and natural gas and transactions in derivative financial instruments (which we refer to as DFIs) related to oil and gas.

When international crude oil, petroleum product and/or natural gas prices are low, we generally earn less revenue and, therefore, generate lower cash flows and earn less income before taxes and duties because our costs remain roughly constant. Conversely, when crude oil, petroleum product and natural gas prices are high, we earn more revenue and our income before taxes and duties increases. Crude oil export prices, which had generally traded above U.S. \$75.00 per barrel since October 2009 and traded above U.S. \$100.00 per barrel as of July 30, 2014, began to fall in August 2014. The weighted average Mexican crude oil export price fell further in subsequent years, reaching U.S. \$18.90 per barrel on January 20, 2016. Crude oil export prices have since stabilized, with the Mexican crude oil export price averaging of U.S. \$62.29 per barrel in 2018. However, prices remain significantly below 2014 levels and fluctuated greatly in 2018.

Any future decline in international crude oil and natural gas prices will likely have a negative impact on our results of operations and financial condition. In addition, significant fluctuations may affect estimates of the amount of Mexico's hydrocarbon reserves that we have the right to extract and sell, which could affect our future production levels. See "—Risk Factors Related to our Relationship with the Mexican Government—Information on Mexico's hydrocarbon reserves is based on estimates, which are uncertain and subject to revisions" below and "Item 11—Quantitative and Qualitative Disclosures About Market Risk—Changes in Exposure to Main Risks—Market Risk—Hydrocarbon Price Risk."

We are an integrated oil and gas company and are exposed to production, equipment and transportation risks, criminal acts, blockades to our facilities, cyber-attacks, failure in our information technology system and deliberate acts of terror that could adversely affect our business, results of operations and financial condition.

We are subject to several risks that are common among oil and gas companies. These risks include production risks (fluctuations in production due to operational hazards, natural disasters or weather, accidents, etc.), equipment risks (relating to the adequacy and condition of our facilities and equipment) and transportation risks (relating to the condition and vulnerability of pipelines and other modes of transportation). More specifically, our business is subject to the risks of explosions in pipelines, refineries, plants, drilling wells and other facilities, oil spills, hurricanes in the Gulf of Mexico and other natural or geological disasters and accidents, fires and mechanical failures.

Our operations are also subject to the risk of criminal acts to divert our crude oil, natural gas or refined products from our pipeline network, including the theft, and tampering with the quality, of our products. We have experienced an increase in the illegal trade in the fuels that we produce and in the illegal "tapping" of our pipelines, which has resulted in explosions, property and environmental damage, injuries and loss of life, as well as loss of revenue from the stolen product.

In 2018, we discovered 14,910 illegal pipeline taps. We are also subject to the risk that some of our employees may, or may be perceived to, be participating in the illicit market in fuels. In addition, our facilities are subject to the risk of sabotage, terrorism and blockades. For example, in early 2017 we experienced widespread demonstrations, including blockades, as a result of the Mexican Government's increase in fuel prices during 2017, which prevented us from accessing certain of our supply terminals and caused gasoline shortages at several retail service stations in Mexico. The occurrence of incidents such as these related to the production, processing and transportation of oil and gas products could result in personal injuries, loss of life, environmental damage from the subsequent containment, clean-up and repair expenses, equipment damage and damage to our facilities, which in turn could adversely affect our business, results of operations and financial condition.

Our operations depend on our information technology systems and therefore cybersecurity plays a key role in protecting our operations. Cyber-threats and cyber-attacks are becoming increasingly sophisticated, coordinated and costly, and could be targeted at our operations. Although we have established an information security program that helps us to prevent, detect and correct vulnerabilities, and we have not yet suffered a significant cyber-attack, if the integrity of our information technology system were to be compromised due to a cyber-attack, or due to the negligence or misconduct of our employees, our business operations could be disrupted or even paralyzed and our proprietary information could be lost or stolen. As a result of these risks, we could face, among other things, regulatory action, legal liability, damage to our reputation, a significant reduction in revenues, an increase in costs, a shutdown of operations, or loss of our investments in areas affected by such cyber-attacks, which in turn could have a material adverse effect on our reputation, results of operations and financial condition.

We purchase comprehensive insurance policies covering most of these risks; however, these policies may not cover all liabilities, and insurance may not be available for some of the consequential risks. There can be no assurance that significant incidents will not occur in the future, that insurance will adequately cover the entire scope or extent of our losses or that we will not be held responsible for such incidents. The occurrence of a significant incident or unforeseen liability for which we are not fully insured or for which insurance recovery is significantly delayed could have a material adverse effect on our results of operations and financial condition. See "Item 4—Information on the Company—Business Overview—PEMEX Corporate Matters—Insurance."

A continued decline in our proved hydrocarbon reserves and production could adversely affect our operating results and financial condition.

Some of our existing oil and gas producing fields are mature and, as a result, our reserves and production may decline as reserves are depleted. In recent years the replacement rate for our proved hydrocarbon reserves has been insufficient to prevent a decline in our proved reserves. During 2018, our total proved reserves decreased by 683.7 million barrels of crude oil equivalent, or 8.9%, after accounting for discoveries, extensions, revisions, and delimitations, from 7,694.7 million barrels of crude oil equivalent as of December 31, 2017 to 7,010.3 million barrels of crude oil equivalent as of December 31, 2018. See "Item 4—Information on the Company—Business Overview—Exploration and Production—Reserves" for more information about the factors leading to this decline. Our reserve-replacement ratio, or RRR, in 2018 was 34.7%, as compared to our RRR of 17.5% in 2017. In addition, our crude oil production decreased by 5.0% in 2016, by 9.5% in 2017 and by 6.4% in 2018, primarily as a result of the decline of the Cantarell, Yaxché-Xanab, Crudo Ligero Marino, El Golpe-Puerto Ceiba, Bellota-Chinchorro, Antonio J. Bermúdez, Cactus-Sitio Grande, Ixtal-Manik, Chuc, Costero Terreste and Tsimín-Xux projects. There can be no assurance that we will be able to stop or reverse the decline in our proved reserves and production, which could have an adverse effect on our business, results of operations and financial condition.

Developments in the oil and gas industry and other factors may result in substantial write-downs of the carrying amount of certain of our assets, which could adversely affect our operating results and financial condition.

We evaluate on an annual basis, or more frequently where the circumstances require, the carrying amount of our assets for possible impairment. Our impairment tests are performed by a comparison of the carrying amount of an individual asset or a cash-generating unit with its recoverable amount. Whenever the recoverable amount of an individual asset or cash-generating unit is less than its carrying amount, an impairment loss is recognized to reduce the carrying amount to the recoverable amount.

Changes in the economic, regulatory, business or political environment in Mexico or other markets where we operate, such as the liberalization of fuel prices or a significant decline in international crude oil and gas prices, among other factors, may result in the recognition of impairment charges in certain of our assets. Due to the decline in oil prices, we have performed impairment tests of our non-financial assets (other than inventories and deferred taxes) at the end of each quarter. As of December 31, 2016 and 2017, we recognized a net reversal of impairment of Ps. 331,314 million and an impairment charge of Ps. 151,444 million, respectively. As of December 31, 2018, we recognized a net reversal of impairment in the amount of Ps. 21,419 million. See Note 15 to our consolidated financial statements for further information about the impairment of certain of our assets. Future developments in the economic environment, in the oil and gas industry and other factors could result in further substantial impairment charges, adversely affecting our operating results and financial condition.

Increased competition in the energy sector could adversely affect our business and financial performance.

The *Constitución Política de los Estados Unidos Mexicanos* (Political Constitution of the United Mexican States or the “Mexican Constitution”) was amended in 2013 and the *Ley de Hidrocarburos* (Hydrocarbons Law) was enacted in 2014 in order to allow other oil and gas companies, in addition to us, to carry out certain activities related to the energy sector in Mexico, including exploration and production activities, and the import and sale of gasoline. As a result, we face competition for the right to explore and develop new oil and gas reserves in Mexico. We also face competition in connection with certain refining, transportation and processing activities. Increased competition could make it difficult for us to hire and retain skilled personnel. While we have not yet experienced significant adverse effects from increased competition, there can be no assurances that we will not experience such adverse effects in the future. If we are unable to compete successfully with other oil and gas companies in the energy sector in Mexico, our results of operations and financial condition may be adversely affected.

We participate in strategic alliances, joint ventures and other joint arrangements. These arrangements may not perform as expected, which could harm our reputation and have an adverse effect on our business, results of operations and financial condition.

We have entered into and may in the future enter into strategic alliances, joint ventures and other joint arrangements. These arrangements are intended to reduce risks in exploration and production, refining, transportation and processing activities. Our partners in such arrangements may, as a result of financial or other difficulties, be unable or unwilling to fulfill their financial or other obligations under our agreements, threatening the viability of the relevant project. In addition, our partners may have inconsistent or opposing economic or business interests and take action contrary to our policies or objectives, which could be to our overall detriment. If our strategic alliances, joint ventures and other joint arrangements do not perform as expected, our reputation may be harmed and our business, financial condition and results of operations could be adversely affected.

We are subject to Mexican and international anti-corruption, anti-bribery and anti-money laundering laws. Our failure to comply with these laws could result in penalties, which could harm our reputation and have an adverse effect on our business, results of operations and financial condition.

We are subject to Mexican and international anti-corruption, anti-bribery and anti-money laundering laws. See “Item 4—Information on the Company—General Regulatory Framework.” Although we maintain policies and processes intended to comply with these laws, including the review of our internal control over financial reporting, we are subject to the risk that our employees, contractors or any person doing business with us may engage in fraudulent activity, corruption or bribery, circumvent or override our internal controls and procedures or misappropriate or manipulate our assets for their personal or business advantage to our detriment. We have in place a number of systems for identifying, monitoring and mitigating these risks, but our systems may not be effective and we cannot ensure that these compliance policies and processes will prevent intentional, reckless or negligent acts committed by our officers or employees. Any failure—real or perceived—by our officers or employees to comply with applicable governance or regulatory obligations could harm our reputation, limit our ability to obtain financing and otherwise have a material adverse effect on our business, financial condition and results of operations.

If we fail to comply with any applicable anti-corruption, anti-bribery or anti-money laundering laws, we and our officers and employees may be subject to criminal, administrative or civil penalties and other measures, which could have material adverse effects on our reputation, business, financial condition and results of operations. Any investigation of potential violations of anti-corruption, anti-bribery or anti-money laundering laws by governmental authorities in Mexico or other jurisdictions could result in an inability to prepare our consolidated financial statements in a timely manner and could adversely impact our reputation, ability to access financial markets and ability to obtain contracts, assignments, permits and other government authorizations necessary to participate in our industry, which, in turn, could have adverse effects on our business, results of operations and financial condition.

Our management has identified material weaknesses in our internal control over financial reporting for each of the last four years and has concluded that our internal control over financial reporting was not effective at December 31, 2018, which may have a material adverse result on our results of operation and financial condition.

Our management identified two material weaknesses in our internal control over financial reporting in 2018. For further information on the material weaknesses identified by our management in 2018, see “Item 15—Controls and Procedures—Management’s Annual Report on Internal Control over Financial Reporting.” In light of the identified material weaknesses, our management concluded that our internal control over financial reporting was not effective at December 31, 2018. Although we have developed and implemented several measures to remedy these material weaknesses, we cannot be certain that there will be no other material weaknesses in our internal control over financial reporting in the future.

In addition, our management identified material weaknesses in our internal control over financial reporting in connection with the preparation of our consolidated financial statements as of and for each of the years ended December 31, 2015, 2016 and 2017. We disclosed the circumstances giving rise to these material weaknesses—which were generally different from one year to the next—in our annual reports on Form 20-F for the years 2015, 2016 and 2017, respectively. As of the date of this annual report, we believe that each of these material weaknesses has been remediated.

If our efforts to remediate the material weaknesses identified in 2018 are not successful, we may be unable to report our results of operations for future periods accurately and in a timely manner and make our required filings with government authorities, including the SEC. There is also a risk that there could be accounting errors in our financial reporting, and we cannot be certain that in the future additional material weaknesses will not exist or otherwise be discovered. Any of these occurrences could adversely affect our results of operation and financial condition.

Our compliance with environmental regulations in Mexico, including in connection with efforts to address climate change, could result in material adverse effects on our results of operations.

A wide range of general and industry-specific Mexican federal and state environmental laws and regulations apply to our operations; these laws and regulations are often difficult and costly to comply with and carry substantial penalties for non-compliance. This regulatory burden increases our costs because it requires us to make significant capital expenditures and limits our ability to extract hydrocarbons, resulting in lower revenues. For an estimate of our accrued environmental liabilities, see “Item 4—Information on the Company—Environmental Regulation—Environmental Liabilities.” Growing international concern over greenhouse gas emissions and climate change could result in new laws and regulations that could adversely affect our results of operations and financial condition. International agreements, including the Paris Agreement approved by the Mexican Government, contemplate coordinated efforts to combat climate change. We may become subject to market changes, including carbon taxes, efficiency standards, cap-and-trade and emission allowances and credits. These measures could increase our operating and maintenance costs, increase the price of our hydrocarbon products and possibly shift consumer demand to lower-carbon sources. See “Item 4 — Environmental Regulation —Climate Change” for more information on the Mexican Government’s current legal and regulatory framework for combatting climate change.

Risk Factors Related to Mexico

Economic conditions and government policies in Mexico and elsewhere may have a material impact on our operations.

A deterioration in Mexico’s economic condition, social instability, political unrest or other adverse social developments in Mexico could adversely affect our business and financial condition. Those events could also lead to increased volatility in the foreign exchange and financial markets, thereby affecting our ability to obtain new financing and service our debt. Additionally, the Mexican Government in the past has announced budget cuts in response to declines in international crude oil prices, and, while the Mexican Government did not reduce our budget in 2017 and announced a budget increase in December 2018, it may reduce our budget in the future. See “—Risk Factors Related to our Relationship with the Mexican Government—The Mexican Government controls us and it could limit our ability to satisfy our external debt obligations or could reorganize or transfer us or our assets” below. Any new budget cuts could adversely affect the Mexican economy and, consequently, our business, financial condition, operating results and prospects.

In the past, Mexico has experienced several periods of slow or negative economic growth, high inflation, high interest rates, currency devaluation and other economic problems. These problems may worsen or reemerge, as applicable, in the future and could adversely affect our business and ability to service our debt. A deterioration in international financial or economic conditions, such as a slowdown in growth or recessionary conditions in Mexico’s trading partners, including the United States, or the emergence of a new financial crisis, could have adverse effects on the Mexican economy, our financial condition and our ability to service our debt.

Changes in Mexico's exchange control laws may hamper our ability to service our foreign currency debt.

The Mexican Government does not currently restrict the ability of Mexican companies or individuals to convert pesos into other currencies. However, we cannot provide assurances that the Mexican Government will maintain its current policies with regard to the peso. In the future, the Mexican Government could impose a restrictive exchange control policy, as it has done in the past. Mexican Government policies preventing us from exchanging pesos into U.S. dollars could hamper our ability to service our foreign currency obligations, including our debt, the majority of which is denominated in currencies other than pesos.

Mexico has experienced a period of increasing criminal activity, which could affect our operations.

In recent years, Mexico has experienced a period of increasing criminal activity, primarily due to the activities of drug cartels and related criminal organizations. In addition, the development of the illicit market in fuels in Mexico has led to increases in theft and illegal trade in the fuels that we produce. In response, the Mexican Government has implemented various security measures and has strengthened its military and police forces, and we have also established various strategic measures aimed at decreasing incidents of theft and other criminal activity directed at our facilities and products. See "Item 8—Financial Information—Legal Proceedings—Actions Against the Illicit Market in Fuels." Despite these efforts, criminal activity continues to exist in Mexico, some of which may target our facilities and products. These activities, their possible escalation and the violence associated with them, in an extreme case, may have a negative impact on our financial condition and results of operations.

Economic and political developments in Mexico and the United States may adversely affect Mexican economic policy and, in turn, PEMEX's operations.

Political events in Mexico may significantly affect Mexican economic policy and, consequently, our operations. Presidential and federal congressional elections in Mexico were held on July 1, 2018. Mr. Andrés Manuel López Obrador, a member of the *Movimiento Regeneración Nacional* (National Regeneration Movement, or Morena), was elected President of Mexico and took office on December 1, 2018, replacing Mr. Enrique Peña Nieto, a member of the *Partido Revolucionario Institucional* (Institutional Revolutionary Party, or PRI). The new President's term will expire on September 30, 2024. The newly-elected members of the Mexican Congress took office on September 1, 2018. As of the date of this annual report, the National Regeneration Movement holds an absolute majority in the Chamber of Deputies.

The new administration and the Mexican Congress are discussing a number of reforms that could affect economic conditions or the oil and gas industry in Mexico. Until any reform has been adopted and implemented, we cannot predict how these policies could impact our results of operation and financial position. We cannot provide any assurances that political developments in Mexico will not have an adverse effect on the Mexican economy or oil and gas industry and, in turn, our business, results of operations and financial condition, including our ability to repay our debt.

Economic conditions in Mexico are highly correlated with economic conditions in the United States due to the physical proximity and the high degree of economic activity between the two countries generally, including the trade facilitated by the North American Free Trade Agreement, or NAFTA. As a result, political developments in the United States, including changes in the administration and governmental policies, can also have an impact on the exchange rate between the U.S. dollar and the Mexican peso, economic conditions in Mexico and the global capital markets.

Since 2003, exports of petrochemical products from Mexico to the United States have enjoyed a zero-tariff rate under NAFTA and, subject to limited exceptions, exports of crude oil and petroleum products have also been free or exempt from tariffs. During 2018, our export sales to the United States amounted to Ps. 434.8 billion, representing 25.9% of total sales and 62.8% of export sales for the year. On November 30, 2018, the presidents of Mexico, the United States and Canada signed the United States-Mexico-Canada Agreement, or the USMCA, which, if ratified by the legislatures of the three countries, would replace NAFTA. As of the date of this annual report, there is uncertainty about whether the USMCA will be ratified, as well as the timing thereof, and the potential for further re-negotiation, or even termination, of NAFTA. Any increase of import tariffs resulting from the implementation of the USMCA or the re-negotiation or termination of NAFTA could make it economically unsustainable for U.S. companies to import our petrochemical, crude oil and petroleum products if they are unable to transfer those additional costs onto consumers, which would increase our expenses and decrease our revenues, even if domestic and international prices for our products remain constant. Higher tariffs on products that we export to the United States could also require us to renegotiate our contracts or lose business, resulting in a material adverse impact on our business and results of operations.

In addition, because the Mexican economy is heavily influenced by the U.S. economy, policies that may be adopted by the U.S. government may adversely affect economic conditions in Mexico. These developments could in turn have an adverse effect on our financial condition, results of operations and ability to repay our debt.

Risk Factors Related to our Relationship with the Mexican Government

The Mexican Government controls us and it could limit our ability to satisfy our external debt obligations or could reorganize or transfer us or our assets.

We are controlled by the Mexican Government and our annual budget may be adjusted by the Mexican Government in certain respects. Pursuant to the *Petróleos Mexicanos* Law, *Petróleos Mexicanos* was transformed from a decentralized public entity to a productive state-owned company on October 7, 2014. The *Petróleos Mexicanos* Law establishes a special regime governing, among other things, our budget, debt levels, administrative liabilities, acquisitions, leases, services and public works. This special regime provides *Petróleos Mexicanos* with additional technical and managerial autonomy and, subject to certain restrictions, with additional autonomy with respect to our budget. Notwithstanding this increased autonomy, the Mexican Government still controls us and has the power to adjust our financial balance goal, which represents our targeted net cash flow for the fiscal year based on our projected revenues and expenses, and our annual wage and salary expenditures, subject to the approval of the *Cámara de Diputados* (Chamber of Deputies).

The adjustments to our annual budget mentioned above may compromise our ability to develop the reserves assigned to us by the Mexican Government and to successfully compete with other oil and gas companies that may enter the Mexican energy sector. See “Item 4—General Regulatory Framework” for more information about the Mexican Government’s authority with respect to our budget. In addition, the Mexican Government’s control over us could adversely affect our ability to make payments under any securities issued by *Petróleos Mexicanos*.

The Mexican Government’s agreements with international creditors may affect our external debt obligations. In certain past debt restructurings of the Mexican Government, *Petróleos Mexicanos*’ external indebtedness was treated on the same terms as the debt of the Mexican Government and other public-sector entities, and it may be treated on similar terms in any future debt restructuring. In addition, Mexico has entered into agreements with official bilateral creditors to reschedule public-sector external debt. Mexico has not requested restructuring of bonds or debt owed to multilateral agencies.

The Mexican Government has the power, if the Mexican Constitution and federal law were amended, to reorganize our corporate structure, including a transfer of all or a portion of our assets to an entity not controlled, directly or indirectly, by the Mexican Government. See “—Risk Factors Related to Mexico” above.

Our financing obligations are not guaranteed by the Mexican Government.

Although *Petróleos Mexicanos* is wholly owned by the Mexican Government, our financing obligations do not constitute obligations of and are not guaranteed by the Mexican Government. As a result, the Mexican Government would have no legal obligation to make principal or interest payments on our debt if we were unable to satisfy our financial obligations.

We pay significant taxes and duties to the Mexican Government, and, if certain conditions are met, we may be required to pay a state dividend, which may limit our capacity to expand our investment program or negatively impact our financial condition generally.

We are required to make significant payments to the Mexican Government, including in the form of taxes and duties, which may limit our ability to make capital investments. In 2018, we paid Ps. 570.3 billion to the Mexican Government in the form of taxes and duties, which constituted a substantial portion of the Mexican Government’s revenues.

In addition, we are generally required, subject to the conditions set forth in the *Petróleos Mexicanos* Law, to pay a state dividend to the Mexican Government. We were not required to pay a state dividend in 2016, 2017 and 2018 and we will not be required to pay a state dividend in 2019. See “Item 8—Financial Information—Dividends” for more information. Although the Mexican Government has on occasion indicated a willing to reduce its reliance on payments made by us, we cannot provide assurances that we will not be required to continue to pay a large proportion of our sales revenue to the Mexican Government. See “Item 4—Information on the Company—Taxes, Duties and Other Payments to the Mexican Government—Fiscal Regime.” In addition, the Mexican Government may change the applicable rules in the future.

The Mexican nation, not us, owns the hydrocarbon reserves located in the subsoil in Mexico and our right to continue to extract these reserves is subject to the approval of the Ministry of Energy.

The Mexican Constitution provides that the Mexican nation, not us, owns all petroleum and other hydrocarbon reserves located in the subsoil in Mexico. Article 27 of the Mexican Constitution provides that the Mexican Government will carry out exploration and production activities through agreements with third parties and through assignments to and agreements with us. The Secondary Legislation allows us and other oil and gas companies to explore and extract the petroleum and other hydrocarbon reserves located in Mexico, subject to assignment of rights by the Ministry of Energy and entry into agreements pursuant to a competitive bidding process.

Access to crude oil and natural gas reserves is essential to an oil and gas company's sustained production and generation of income, and our ability to generate income would be materially and adversely affected if the Mexican Government were to restrict or prevent us from exploring or extracting any of the crude oil and natural gas reserves that it has assigned to us or if we are unable to compete effectively with other oil and gas companies in potential future bidding rounds for additional exploration and production rights in Mexico. For more information, see "—We must make significant capital expenditures to maintain our current production levels, and to maintain, as well as increase, the proved hydrocarbon reserves assigned to us by the Mexican Government. Reductions in our income, adjustments to our capital expenditures budget and our inability to obtain financing may limit our ability to make capital investments" below.

Information on Mexico's hydrocarbon reserves is based on estimates, which are uncertain and subject to revisions.

The information on oil, gas and other reserves set forth in this annual report is based on estimates. Reserves valuation is a subjective process of estimating underground accumulations of crude oil and natural gas that cannot be measured in an exact manner; the accuracy of any reserves estimate depends on the quality and reliability of available data, engineering and geological interpretation and subjective judgment. Additionally, estimates may be revised based on subsequent results of drilling, testing and production. These estimates are also subject to certain adjustments based on changes in variables, including crude oil prices. Therefore, proved reserves estimates may differ materially from the ultimately recoverable quantities of crude oil and natural gas. Downward revisions in our reserve estimates could lead to lower future production, which could have an adverse effect on our results of operations and financial condition. See "—Risk Factors Related to Our Operations—Crude oil and natural gas prices are volatile and low crude oil and natural gas prices adversely affect our income and cash flows and the amount of hydrocarbon reserves that we have the right to extract and sell" above. We revise annually our estimates of hydrocarbon reserves that we are entitled to extract and sell, which may result in material revisions to these estimates. Our ability to maintain our long-term growth objectives for oil production depends on our ability to successfully develop our reserves, and failure to do so could prevent us from achieving our long-term goals for growth in production.

The *Comisión Nacional de Hidrocarburos* (National Hydrocarbon Commission, or CNH) has the authority to review and approve our estimated hydrocarbon reserves estimates and may require us to make adjustments to these estimates. A request to adjust these reserves estimates could result in our inability to prepare our consolidated financial statements in a timely manner. This could adversely impact our ability to access financial markets, obtain contracts, assignments, permits and other government authorizations necessary to participate in the crude oil and natural gas industry, which, in turn, could have an adverse effect on our business, results of operations and financial condition.

We must make significant capital expenditures to maintain our current production levels, and to maintain, as well as increase, the proved hydrocarbon reserves assigned to us by the Mexican Government. Reductions in our income, adjustments to our capital expenditures budget and our inability to obtain financing may limit our ability to make capital investments.

Because our ability to maintain, as well as increase, our oil production levels is highly dependent upon our ability to successfully develop existing hydrocarbon reserves and, in the long term, upon our ability to obtain the right to develop additional reserves, we continually invest capital to enhance our hydrocarbon recovery ratio and improve the reliability and productivity of our infrastructure.

The development of the reserves that were assigned to us by the Mexican Government will demand significant capital investments and will pose significant operational challenges. Our right to develop the reserves assigned to us is conditioned on our ability to develop such reserves in accordance with our development plans, which were based on our technical, financial and operational capabilities at the time. We cannot provide assurances that we will have or will be able to obtain, in the time frame that we expect, sufficient resources or the technical capacity necessary to explore and extract the reserves that the Mexican Government assigned to us, or that it may grant to us in the future. In the past, we have reduced our capital expenditures in response to declining oil prices, and unless we are able to increase our capital expenditures, we may not be able to develop the reserves assigned to us in accordance with our development plans. We would lose the right to continue to extract these reserves if we fail to develop them in accordance with our development plans, which could adversely affect our operating results and financial condition. In addition, increased competition in the oil and gas sector in Mexico may increase the costs of obtaining additional acreage in potential future bidding rounds for the rights to new reserves.

Our ability to make capital expenditures is limited by the substantial taxes and duties that we pay to the Mexican Government, the ability of the Mexican Government to adjust certain aspects of our annual budget, cyclical decreases in our revenues primarily related to lower oil prices and any constraints on our liquidity. The availability of financing may limit our ability to make capital investments that are necessary to maintain current production levels and decrease the proved hydrocarbon reserves that we are entitled to extract. For more information on the liquidity constraints we are exposed to, see “—We have a substantial amount of indebtedness and other liabilities and are exposed to liquidity constraints, which could make it difficult for us to obtain financing on favorable terms and could adversely affect our financial condition, results of operations and ability to repay our debt and, ultimately, our ability to operate as a going concern” above.

In addition, we have entered into strategic alliances, joint ventures and other joint arrangements with third parties in order to develop our reserves. If our partners were to significantly default on their obligations to us, we may be unable to maintain production levels or extract from our reserves. Moreover, we cannot assure you that these strategic alliances, joint ventures and other joint arrangements will be successful or reduce our capital commitments. For more information, see “—Risk Factors Related to Pemex’s Operations—We participate in strategic alliances, joint ventures and other joint arrangements. These types of arrangements may not perform as expected, which could harm our reputation and have an adverse effect on our business, results of operations and financial condition” above and “Item 4—Information on the Company—History and Development—Capital Expenditures.”

The Mexican Government has historically imposed price controls in the domestic market on our products.

The Mexican Government has from time to time imposed price controls on the sales of natural gas, liquefied petroleum gas, gasoline, diesel, gas oil intended for domestic use, fuel oil and other products. As a result of these price controls, we have not been able to pass on all of the increases in the prices of our product purchases to our customers in the domestic market when the peso depreciates in relation to the U.S. dollar. A depreciation of the peso increases our cost of imported oil and gas products, without a corresponding increase in our revenues unless we are able to increase the price at which we sell products in Mexico.

In accordance with the *Ley de Ingresos de la Federación para el Ejercicio Fiscal de 2017* (2017 Federal Revenue Law), during 2017 the Mexican Government gradually removed price controls on gasoline and diesel as part of the liberalization of fuel prices in Mexico. As of the date of this annual report, sales prices of gasoline and diesel have been fully liberalized and are determined by the free market. For more information, see “Item 4—Information on the Company—Business Overview—Industrial Transformation.” However, we do not control the Mexican Government’s domestic policies and the Mexican Government could impose additional price controls on the domestic market in the future. The imposition of such price controls would adversely affect our results of operations. For more information, see “Item 4—Information on the Company—Business Overview—Refining—Pricing Decrees” and “Item 4—Information on the Company—Business Overview—Gas and Aromatics—Pricing Decrees.”

We may claim some immunities under the Foreign Sovereign Immunities Act and Mexican law, and your ability to sue or recover may be limited.

We are public-sector entities of the Mexican Government. Accordingly, you may not be able to obtain a judgment in a U.S. court against us unless the U.S. court determines that we are not entitled to sovereign immunity with respect to that action. Under certain circumstances, Mexican law may limit your ability to enforce judgments against us in the courts of Mexico. We also do not know whether Mexican courts would enforce judgments of U.S. courts based on the civil liability provisions of the U.S. federal securities laws. Therefore, even if you were able to obtain a U.S. judgment against us, you might not be able to obtain a judgment in Mexico that is based on that U.S. judgment. Moreover, you may not be able to enforce a judgment against our property in the United States except under the limited circumstances specified in the Foreign Sovereign Immunities Act of 1976, as amended. Finally, if you were to bring an action in Mexico seeking to enforce our obligations under any securities issued by Petróleos Mexicanos, satisfaction of those obligations may be made in pesos, pursuant to the laws of Mexico.

Our directors and officers, as well as some of the experts named in this annual report, reside outside the United States. Substantially all of our assets and those of most of our directors, officers and experts are located outside the United States. As a result, investors may not be able to effect service of process on our directors or officers or those experts within the United States.

Item 4. Information on the Company

HISTORY AND DEVELOPMENT

We are the largest company in Mexico according to the July 2018 edition of *Expansión* magazine, and according to the November 19, 2018 issue of *Petroleum Intelligence Weekly*, we were the tenth largest crude oil producer and the nineteenth largest oil and gas company in the world based on data from the year 2017.

Our executive offices are located at Avenida Marina Nacional No. 329, Colonia Verónica Anzures, 11300, Alcañía Miguel Hidalgo, Ciudad de México, México. Our telephone number is (52-55) 9126-8700.

In March 1938, President Lázaro Cárdenas del Río nationalized the foreign-owned oil companies that were then operating in Mexico, and the Mexican Congress established *Petróleos Mexicanos* through the *Decreto que crea la Institución Petróleos Mexicanos* (Decree that creates the entity *Petróleos Mexicanos*), which was published in the Official Gazette of the Federation and took effect on July 20, 1938.

Legal Regime

On December 21, 2013, amendments to Articles 25, 27 and 28 of the Mexican Constitution took effect, including transitional articles setting forth the general framework and timeline for implementing legislation relating to the energy sector.

On August 11, 2014, this implementing legislation was published in the Official Gazette of the Federation. The implementing legislation includes nine new laws, of which the following are most relevant to our operations:

- The *Petróleos Mexicanos* Law, which took effect, with the exception of certain provisions, on October 7, 2014;
- Hydrocarbons Law, which took effect on August 12, 2014; and
- *Ley de Ingresos sobre Hidrocarburos* (Hydrocarbons Revenue Law).

Together, the Hydrocarbons Law and the Hydrocarbons Revenue Law establish the legal framework for the exploration and production of oil and gas through assignments and contracts, as well as the fiscal regime through which the Mexican Government collects revenues from participants in the Mexican oil and gas industry. The Hydrocarbons Law empowers the Ministry of Energy to determine the appropriate contract model for each area that is subject to a competitive bidding process, while the Ministry of Finance and Public Credit is responsible for determining the economic and fiscal terms of each contract. See “—Taxes, Duties and Other Payments to the Mexican Government—Fiscal Regime” below in this Item 4. The following arrangements comprise the contractual regime established by the current legal framework for upstream activities:

- licenses, pursuant to which a license holder is entitled to the oil and gas that are extracted from the subsoil;
- production-sharing contracts, pursuant to which a contractor is entitled to receive a percentage of production;
- profit-sharing contracts, pursuant to which a contractor is entitled to receive a percentage of the profit from the sale of the extracted oil and gas;
- service contracts, pursuant to which a contractor would receive cash payments for services performed; and
- service contracts, together with licenses, production-sharing contracts and profit-sharing contracts are known as the contracts for the exploration and production of oil and gas, collectively referred to as contracts for exploration and production.

For midstream and downstream activities, including oil refining and natural gas processing, the Hydrocarbons Law establishes a permit regime that is granted by the Ministry of Energy and the *Comisión Reguladora de Energía* (Energy Regulatory Commission, or CRE), as applicable. The Hydrocarbons Law also sets forth the process by which entities may apply for these permits. The CRE has issued permits for the retail sale of gasoline and diesel fuel since 2016.

Under the *Petróleos Mexicanos* Law, *Petróleos Mexicanos* is a productive state-owned company, wholly owned by the Mexican Government, and has the corporate purpose of generating economic value and increasing the income of the Mexican nation while adhering to principles of equity, as well as social and environmental responsibility.

On December 2, 2014, the special regime provided for in the *Petróleos Mexicanos* Law, which governs *Petróleos Mexicanos*' activities relating to productive state-owned subsidiaries, affiliates, compensation, assets, administrative liabilities, budget, debt levels and the state dividend, took effect. On June 10, 2015, the *Disposiciones Generales de Contratación para Petróleos Mexicanos y Sus Empresas Productivas Subsidiarias* (General Provisions for Contracting for *Petróleos Mexicanos* and its Productive State-Owned Subsidiaries) were published in the Official Gazette of the Federation, and on June 11, 2015, the special regime for acquisitions, leases, services and public works became effective.

Corporate Structure

The principal lines of business of the productive state-owned subsidiaries are as follows:

- Pemex Exploration and Production, formed on June 1, 2015 as a successor to *Pemex-Exploración y Producción* (Pemex-Exploration and Production), explores for, extracts, transports, stores and markets crude oil and natural gas;
- Pemex Drilling and Services, formed on August 1, 2015, performs drilling and well repair services;
- Pemex Fertilizers, formed on August 1, 2015, integrates the ammonia production chain up to the point of sale of fertilizers;
- Pemex Ethylene, formed on August 1, 2015, separates the ethylene business from our petrochemicals segment in order to take advantage of the integration of the ethylene production chain and distributes and trades other gases, including methane and propylene;
- Pemex Logistics, formed on October 1, 2015, provides land, maritime and pipeline transportation, storage and distribution to us and third parties; and
- Pemex Industrial Transformation, formed on November 1, 2015 as a successor of *Pemex-Refinación* (Pemex-Refining), *Pemex-Gas y Petroquímica Básica* (Pemex-Gas and Basic Petrochemicals) and *Pemex-Petroquímica* (Pemex-Petrochemicals), refines petroleum products and derivatives; processes natural gas, natural gas liquids, artificial gas and derivatives; engages in industrial petrochemical processes and generates, supplies and trades electric and thermal energy.

Each of these productive state-owned subsidiaries is a legal entity empowered to own property and carry on business in its own name and has technical and operational autonomy, subject to the central coordination and strategic direction of *Petróleos Mexicanos*.

Prior to July 27, 2018, *Pemex Cogeneración y Servicios* (Pemex Cogeneration and Services) operated as an additional productive state-owned subsidiary. On July 13, 2018, the Board of Directors of *Petróleos Mexicanos* issued the *Declaratoria de Liquidación y Extinción de Pemex Cogeneración y Servicios* (Declaration of Liquidation and Extinction of Pemex Cogeneration and Services), which was published in the Official Gazette of the Federation and became effective on July 27, 2018. As of July 27, 2018, all of the assets, liabilities, rights and obligations of Pemex Cogeneration and Services were automatically assumed by, and transferred to, Pemex Industrial Transformation, and Pemex Industrial Transformation became, as a matter of Mexican law, the successor to Pemex Cogeneration and Services. Pemex Cogeneration and Services was in turn dissolved effective as of July 27, 2018.

On March 26, 2019, the Board of Directors of *Petróleos Mexicanos* requested that our management bring forth proposals for the merger of Pemex Ethylene into Pemex Industrial Transformation and of Pemex Drilling and Services into Pemex Exploration and Production. As of the date of this annual report, the Board of Directors has not yet approved resolutions in respect of the proposed mergers.

Capital Expenditures

The following table shows our capital expenditures, excluding non-capitalizable maintenance, for each of the three years ended December 31, 2018, as well as the budget for these expenditures for 2019. Capital expenditure amounts are derived from our budgetary records, which are prepared on a cash basis. Accordingly, these capital expenditure amounts do not correspond to capital expenditure amounts included in our consolidated financial statements prepared in accordance with IFRS. The following table presents our capital expenditures made or expected to be made by productive state-owned subsidiary.

Capital Expenditures and Budget by Subsidiary

	Year ended December 31,			Budget 2019 ⁽¹⁾
	2016	2017	2018	
	(in millions of pesos) ⁽²⁾			
Pemex Exploration and Production	Ps. 137,242	Ps. 85,491	Ps. 71,107	Ps. 98,226
Pemex Industrial Transformation	33,947	18,576	17,026	57,500
Pemex Logistics	7,015	4,917	5,042	1,200
Pemex Drilling and Services	2,688	1,550	1,388	1,295
Pemex Ethylene	746	618	975	300
Pemex Fertilizers	379	264	331	500
Petróleos Mexicanos	1,004	1,609	893	107
Total capital expenditures	Ps. 183,021	Ps. 113,025	Ps. 96,762	Ps. 159,128

Note: Numbers may not total due to rounding.

n.a. Not available.

(1) Original budget published in the Official Gazette of the Federation on January 17, 2019.

(2) Figures are stated in nominal pesos.

Source: *Petróleos Mexicanos*.

The following table shows our capital expenditures, excluding non-capitalizable maintenance, by segment for the years ended December 31, 2017 and 2018 and the budget for these expenditures in 2019.

Capital Expenditures by Segment

	Year ended December 31,		Budget 2019 ⁽¹⁾
	2017	2018	
	(millions of pesos)		
Exploration and Production	Ps. 85,491	Ps. 71,107	Ps. 98,226
Industrial Transformation			
Refining	15,988	14,119	57,500
Gas and Aromatics	2,587	2,907	—
Total	18,576	17,026	57,500
Logistics	4,917	5,042	1,200
Drilling and Services	1,550	1,388	1,295
Ethylene	618	975	300
Fertilizers	264	331	500
Corporate and other Subsidiaries	1,609	893	107
Total Capital Expenditures	Ps. 113,025	Ps. 96,762	Ps. 159,128

Note: Numbers may not total due to rounding.

(1) Original budget published in the Official Gazette of the Federation on January 17, 2019.

Source: *Petróleos Mexicanos*.

Capital Expenditures Budget

Capital expenditures and budget by project are described under each segment below in this Item 4.

Since mid-2014, the international reference prices of crude oil have fluctuated significantly and prices remain significantly below 2014 levels. The weighted average Mexican crude oil export price for 2018 was U.S. \$56.19 per barrel. Based on its estimate that the weighted average Mexican crude oil export price would be U.S. \$55.00 per barrel, the Mexican Congress approved a 2019 budget of Ps. 464.6 billion, including operational expenses and a financial balance goal (which we define as sales after deducting costs and expenses, capital expenditures, taxes and duties, and cost of debt) of Ps. 65.4 billion. With this budget, our management expects that we will be able to maintain our medium- and long-term growth plans without

the need to incur more indebtedness than the amount included in our approved financing program for 2019 of Ps. 112.8 billion. The budget was based on the guiding principles of: stabilizing our crude oil and gas production levels in the medium and long-term; maintaining the industrial safety and reliability of our facilities; taking advantage of our ongoing contracts with third parties; and meeting our labor and financial obligations.

Our budget for 2019 includes a total of Ps. 273.1 billion for capital expenditures, including non-capitalizable maintenance. Our capital expenditures budget net of non-capitalizable maintenance is Ps. 159.1 billion. We expect to direct Ps. 98.2 billion (or 61.7% of our total capital expenditures net of non-capitalizable maintenance) to exploration and production programs in 2019. This investment in exploration and production activities reflects our focus on maximizing the potential of our hydrocarbon reserves and our most productive projects. In addition, in 2019 we expect to direct Ps. 57.5 billion (or 36.1% of our total capital expenditures net of non-capitalizable maintenance) to our industrial transformation segment, in particular to the construction of our new Dos Bocas refinery. We continuously review our capital expenditures portfolio in accordance with our current and future business plans.

Our main objectives for upstream investment are to maximize our long-term economic value, and to increase and improve the quality of the oil and gas reserves assigned to us, enhance Pemex Exploration and Production's reserves recovery ratio, improve the reliability of its production and transportation infrastructure for crude oil and natural gas operations and continue to emphasize industrial safety and compliance with environmental regulations. Our 2019 budget objectives include maintaining crude oil production at levels sufficient to satisfy domestic demand and have a surplus available for export and maintaining natural gas production levels.

Our downstream investment program seeks to increase our refining capacity, to improve the quality of our product selection and the reliability of our logistics and distribution services, to achieve a level of efficiency similar to that of our international competitors and to continue to emphasize industrial safety and environmental compliance.

BUSINESS OVERVIEW

Overview by Business Segment

Exploration and Production

Our exploration and production segment operates through the productive state-owned subsidiary Pemex Exploration and Production and explores for and produces crude oil and natural gas, primarily in the northeastern and southeastern regions of Mexico and offshore in the Gulf of Mexico. In nominal peso terms, our capital expenditures in exploration and production activities decreased by 16.8% in 2018. As a result of our investments in previous years, our total hydrocarbon production reached a level of approximately 929.6 million barrels of oil equivalent in 2018. Despite these investments, our crude oil production decreased by 6.4% from 2017 to 2018, averaging 1,823 thousand barrels per day in 2018, primarily as a result of the decline of the Cantarell, Yaxché-Xanab, Crudo Ligerero Marino, El Golpe-Puerto Ceiba, Bellota-Chinchorro, Antonio J. Bermúdez, Cactus-Sitio Grande, Ixtal-Manik, Chuc, Costero Terrestre, Tsimin-Xux projects, which was partially offset by development of the Integral Tekel project's Ayatsil field and by repairs, improvements and diversification of artificial systems at our onshore fields that helped maintain production levels.

Our natural gas production (excluding natural gas liquids) decreased by 5.2% from 2017 to 2018, averaging 4,803 million cubic feet per day in 2018. This decrease in natural gas production resulted primarily from the decreased volumes in the Burgos, Crudo Ligerero Marino, Ixtal-Manik, Integral Veracruz Basin, Cactus-Sitio Grande, Integral Macuspana Basin and Ogarrio-Sánchez Magallanes projects. Exploration drilling activity decreased by 20.8% from 2017 to 2018, from 24 exploratory wells completed in 2017 to 19 exploratory wells completed in 2018. Development drilling activity nearly tripled from 2017 to 2018, from 55 development wells completed in 2017 to 143 development wells completed in 2018. In 2018, we completed the drilling of 162 wells in total. Our drilling activity in 2018 was focused on increasing the production of crude oil and associated gas in the Ayatsil-Tekel, Chuc, Crudo Ligerero Marino, El Golpe-Puerto Ceiba, Ku-Maloob-Zaap, Antonio J. Bermúdez, Aceite Terciario del Golfo and Ogarrio-Sánchez Magallanes projects.

Our primary objectives in 2019 include: (i) maximizing profitability to ensure the sustainability of the company; (ii) stopping, or even reversing, the decline in our proved reserves and production; (iii) accelerating the development of discovered fields; and (iv) improving our performance in industrial safety and environmental protection. We aim to meet these objectives through the following strategies: (1) accelerating the incorporation of reserves by prioritizing our exploration activities onshore, in conventional shallow waters and in blocks adjacent to our production fields; (2) increasing our recovery factor by focusing on areas where we have greater experience and a higher historical success rate, such as secondary and tertiary recovery system; (3) reducing exploration and production costs by improving operational efficiency and cost control; (4) focusing on maintenance to improve the safety and reliability of our operations; and (5) increasing our gas production and reducing gas flaring and venting.

Our production goals for 2019 include producing crude oil at a level of approximately 1,773 thousand barrels per day and maintaining natural gas production above 4,654 million cubic feet per day. We aim to meet these production goals through exploration and development activities, increasing inventory reserves through new discoveries and reclassifications and managing the decline in field production by focusing our exploration and production activities in areas where we have greater experience and higher historical success rates, such as secondary and tertiary recovery systems. In addition, we intend to re-allocate resources away from deep-water projects, which tend to be expensive and long-term activities, and towards shallow-water and onshore projects, which have the potential for near-term results. We plan to develop 20 new fields in 2019, 16 of which will be in shallow waters and four of which will be onshore. We expect that these 20 new fields will be able to produce an aggregate of up to 73 thousand barrels of crude oil per day during 2019.

Industrial Transformation

Our industrial transformation segment is comprised of two principal activities: (i) refining and (ii) gas and aromatics:

Refining

Pemex Industrial Transformation converts crude oil into gasoline, jet fuel, diesel, fuel oil, asphalts and lubricants. We also distribute and market most of these products throughout Mexico. During 2018, atmospheric distillation refining capacity increased to 1,640.0 thousand barrels per day, which represents an increase of 0.8% as compared to 1,627.0 thousand barrels per day during 2017. In 2018, we produced 628.5 thousand barrels per day of refined products as compared to 786.2 thousand barrels per day of refined products in 2017. This decrease in refined products production was mainly due to operational problems relating to the performance and reliability of our refineries. As a result of these operational problems, processing of crude oil by the National Refining System decreased 20.2%, from 767.0 thousand barrels per day in 2017 to 611.9 thousand barrels per day in 2018.

Our primary goal for 2019 is to improve our efficiency and performance by focusing on the repair and maintenance of our six existing refineries in order to stabilize operations and increase our capacity. In addition, we intend to begin development of a new refinery located in Dos Bocas, Tabasco, in order to further expand our production capacity.

Gas and Aromatics

Our gas and aromatics business processes wet natural gas to produce dry natural gas, ethane, liquefied petroleum gas (LPG) and other natural gas liquids, along with aromatic derivatives chain products such as toluene, benzene and xylene. In 2018, our total sour natural gas processing capacity remained at 2017 levels of 4,523.0 cubic feet per day. We processed 2,952.0 million cubic feet of wet natural gas per day in 2018, an 8.8% decrease from the 3,237.0 million cubic feet per day of wet natural gas processed in 2017. We produced 240.0 thousand barrels per day of natural gas liquids in 2018, a 14.3% decrease from the 280.0 thousand barrels per day of natural gas liquids produced in 2017. We also produced 2,422.0 million cubic feet of dry gas (which is natural gas with a methane content of more than 90.0%) per day in 2018, 9.2% less than the 2,667.0 million cubic feet of dry gas per day produced in 2017. We produced 570.0 thousand tons of aromatics and derivatives, a 8.4% decrease from the 622.0 thousand tons of aromatics and derivatives we produced in 2017. The decreases in our gas and liquid gas production were mainly due to a decrease in the supply of wet gas and condensates from Pemex Exploration and Production. Additionally, the decreases in our gas and aromatics production were caused mainly because our naptha reforming plant (CCR) operated only intermittently due to equipment failure, and we experienced shortages in auxiliary services and the supply of raw materials from our Minatitlán refinery.

In 2019, we intend to continue processing wet gas with the goal of achieving improved operating performance and efficiency in the recovery of liquids. We also expect to have a lower supply of natural gas from our fields in 2019, which would require us to import higher volumes of natural gas to satisfy domestic demand.

Fertilizers

Our fertilizers segment operates through the productive state-owned subsidiary Pemex Fertilizers and integrates the ammonia production chain up to the point of sale of fertilizers, including agricultural and industrial nitrates, phosphate fertilizers and acids (produced by Grupo Fertinal, S.A. de C.V. (Fertinal)). We also expect that our subsidiary Pro-Agroindustria, S.A. de C.V. (or Pro-Agroindustria) will be able to begin producing urea at our Pajaritos petrochemical complex in the second half of 2019.

In 2019, we intend to focus our strategy on: (1) increasing the national production of fertilizers at competitive prices; (2) increasing the economic value of our segment by generating diverse investment opportunities in the agricultural sector in Mexico; (3) ensuring a reliable supply of natural gas for the operation of our plants; and 4) continuing to make capital expenditure investments to improve the operational reliability of our four ammonia plants.

Ethylene

Our ethylene segment operates through the productive state-owned subsidiary Pemex Ethylene and takes advantage of the integration of the ethylene production chain. In 2018, we produced a total of 1,830.3 thousand tons of petrochemical products, a 2.9% decrease from the 1,884.0 thousand tons of petrochemical products produced in 2017.

The primary goals for our ethylene segment in 2019 are to streamline our operations, improve our operational reliability and secure a steady and reliable supply of raw materials, which will allow us to improve margins and achieve profitability.

Drilling and Services

Our drilling and services segment operates through the productive state-owned subsidiary Pemex Drilling and Services and provides drilling, completion, work-over and other services for wells in offshore and onshore fields. In 2018, this segment mainly provided completion, work-over and other drilling services to Pemex Exploration and Production, but also provided services to external clients such as *Comisión Nacional del Agua* (the National Water Commission or CONAGUA), *Marinsa de México S.A. de C.V.* (Marinsa), *Gobierno de la Ciudad de México* (Government of Mexico City), *Weatherford de Mexico, S. de R.L. de C.V.*, *Fieldwood Energy LLC* (Fieldwood) and *Key Energy Services* (Key Energy).

Our well drilling activities during 2018 led to onshore and offshore discoveries. Our main discoveries were of crude oil reserves located in the Southeastern and Veracruz basins, specifically in the Northern and Southern regions. Exploration activity in the Northern region also led to the discovery of additional non-associated gas reserves in the Burgos basin. We are currently working on development plans for these new reserves.

Logistics

Our logistics segment operates through the productive state-owned subsidiary Pemex Logistics and provides land, maritime and pipeline transportation, storage and distribution services to some of our subsidiary entities and other companies, including the *Comisión Federal de Electricidad* (Federal Electricity Commission or CFE), *Aeropuertos y Servicios Auxiliares*, CENAGAS, local gas stations and distributors.

During 2018, we injected approximately 1,581.5 thousand barrels per day of crude oil and petroleum products into our pipelines, representing a 16.2% decrease as compared to 2017 when we injected approximately 1,887 thousand barrels per day, mainly due to a reduction in crude oil processed in the National Refining System and the illicit market in fuels that caused temporary closures of certain pipelines. Of the total amount of crude oil and petroleum products that we injected in 2018, 74.5% was transported by pipeline, 7.5% by tanker and the remaining 18.0% by land transport.

During 2018, we injected 139.1 thousand barrels per day of LPG, representing a 0.7% increase as compared to the 138.1 thousand barrels per day injected in 2017. In addition, we injected 2.4 thousand barrels per day of petrochemicals, an increase of 4.3% as compared to the 2.3 thousand barrels per day we injected in 2017. These increases were mainly due to an increase in imports of isobutane by Pemex Industrial Transformation.

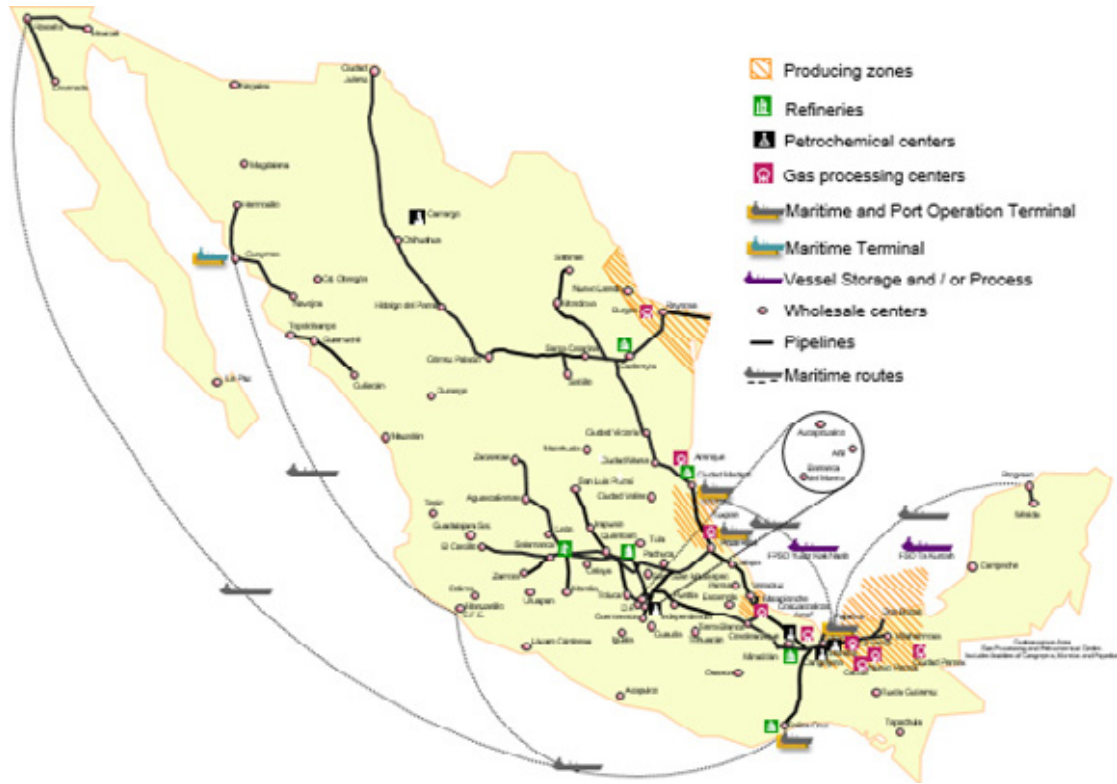
As of 2016, natural gas transportation is carried out by CENAGAS, with the support of Pemex Logistics through an operation and maintenance contract. During 2018, we transported approximately 5,070.9 million cubic feet per day of natural gas, a 2.4% decrease compared to the 5,195.1 million cubic feet per day we transported in 2017, mainly due to a decrease in natural gas transported to CFE and Pemex Industrial Transformation.

International Trading

The international trading segment provides us with international trading, distribution, risk management, insurance and transportation services. This segment operates through P.M.I. Comercio Internacional, S.A. de C.V. (which we refer to as PMI), P.M.I. Trading Designated Activity Company (formerly P.M.I. Trading, Ltd., which we refer to as P.M.I. Trading), P.M.I. Norteamérica, S.A. de C.V., (which we refer to as PMI-NASA, and, together with PMI and P.M.I. Trading, we collectively refer to as the PMI Subsidiaries) and Mex Gas International, S.L. (which, together with the PMI Subsidiaries, we collectively refer to as the Trading Companies). Certain of the Trading Companies sell, buy and transport crude oil, refined products and petrochemicals in world markets, and provide related risk management, insurance, transportation and storage services. The Trading Companies have offices in Mexico City, Houston, Amsterdam, Singapore and Madrid. Export sales are made through PMI to approximately 30 major customers in various foreign markets.

In 2018, our crude oil exports increased in volume by 0.9%, from 1,173.9 thousand barrels per day in 2017 to 1,184.1 thousand barrels per day in 2018. Natural gas imports decreased by 25.5% in 2018, from 1,766.0 million cubic feet per day in 2017 to 1,316.5 million cubic feet per day in 2018. In 2018, exports of petrochemical products decreased by 4.5%, from 60.5 thousand metric tons in 2017 to 57.8 thousand metric tons in 2018, while imports of petrochemical products increased 150.0%, from 332.8 thousand metric tons in 2017 to 831.8 thousand metric tons in 2018. In 2018, exports of other petroleum products decreased 16.0%, from 158.0 thousand barrels per day in 2017 to 132.8 thousand barrels per day in 2018, while imports of other petroleum products and liquefied petroleum gas increased 4.3%, from 936.2 thousand barrels per day in 2017 to 976.7 thousand barrels per day in 2018. As a major supplier of crude oil to the United States, our international trading segment's crude oil exports to the United States totaled Ps. 434.8 billion in 2018, an increase of Ps. 131.7 billion from 2017. In 2018, we also imported 3.8 thousand barrels per day of light crude oil for processing in the National Refining System, which represented the first time we imported crude oil.

Infrastructure of PEMEX



Exploration and Production

Following our 2015 corporate reorganization, certain business units and assets that were operated by our exploration and production segment were transferred to our drilling and services segment upon the formation of Pemex Drilling and Services on August 1, 2015. For the year ended December 31, 2015, we have not presented separately the operating results of our drilling and services segment in this Item 4 and, accordingly, the results of our exploration and production segment include the results of that segment for this period. Operating results for both the exploration and production and drilling and services segments are presented separately for periods beginning January 1, 2016. For a detailed description of the financial results of each segment, see our consolidated financial statements included herein.

Exploration and Drilling

We seek to identify new oil reservoirs through our exploration program in order to increase the future replacement rate of proved reserves. From 1990 to 2018, we completed 13,391 exploration and development wells. During 2018, our average success rate for exploratory wells was 38.9%, a 37.8% decrease as compared to 2017 and our average success rate for development wells was 95.8%, a 3.1% increase as compared to 2017. From 2014 to 2018, we discovered 12 new crude oil fields and four new natural gas fields, bringing the total number of our crude oil and natural gas producing fields to 356 at the end of 2018.

Our 2018 exploration program was comprised of exploration in both onshore and offshore regions, including the deep waters of the Gulf of Mexico. These exploratory activities yielded 287 million barrels of oil equivalent of proved reserves resulting from the discovery of four crude oil producing fields, as well as from the drilling of two appraisal wells in two existing fields. We continued our main seismic data acquisition activities, in particular, those related to three-dimensional seismic data. In 2018, we acquired 1,085 square kilometers of three-dimensional seismic data in deep and shallow waters.

The following table summarizes our drilling activity for the five years ended December 31, 2018, all of which occurred in Mexican territory.

	Year ended December 31,				
	2014	2015	2016	2017	2018
Wells initiated ⁽¹⁾	474	274	93	70	149
Exploratory wells initiated ⁽¹⁾	20	22	23	22	28
Development wells initiated ⁽¹⁾	454	252	70	48	121
Wells drilled ⁽²⁾	535	312	149	79	162
Exploratory wells	24	26	21	24	19
Productive exploratory wells ⁽³⁾	8	13	6	10	5
Dry exploratory wells	16	13	15	14	14
Success rate %	33	50	29	42	26
Development wells	510	286	128	54	143
Productive development wells	484	266	110	50	137
Dry development wells	26	20	18	4	6
Success rate % ⁽⁴⁾	95	93	86	93	96
Producing wells (annual averages)	9,558	9,363	8,749	6,699	6,771
Marine region	581	544	539	443	519
Southern region	1,420	1,403	1,244	931	129
Northern region	7,557	7,416	6,966	5,325	6,123
Producing wells (at year end) ⁽⁵⁾	9,077	8,826	8,073	8,194	6,946
Crude oil	5,598	5,374	4,912	4,956	4,321
Natural gas	3,479	3,452	3,161	3,238	2,625
Producing fields	428	434	405	398	356
Marine region	45	41	43	43	43
Southern region	97	97	88	91	83
Northern region	286	296	274	264	230
Drilling rigs	136	113	110	83	84
Kilometers drilled	1,413	815	330	280	455
Average depth by well (meters)	2,738	3,038	3,655	3,639	2,808
Discovered fields ⁽⁶⁾	2	6	1	3	4
Crude oil	—	6	1	1	4
Natural gas	2	—	—	2	—
Crude oil and natural gas output by well (barrels of oil equivalent per day)	370	349	348	291	329
Total developed acreage (km²)⁽⁷⁾	8,339	8,654	7,017⁽⁸⁾	6,886⁽⁸⁾	6,923⁽⁸⁾
Total undeveloped acreage (km²)⁽⁷⁾	1,278	1,000	712⁽⁸⁾	620⁽⁸⁾	607⁽⁸⁾

Note: Numbers may not total due to rounding.

- (1) “Wells initiated” refers to the number of wells the drilling of which commenced in a given year, regardless of when the well was or will be completed.
- (2) “Wells drilled” refers to the number of wells the drilling of which was completed in a given year, regardless of when the drilling of the well commenced.
- (3) Excludes non-commercial productive wells.
- (4) Excludes injector wells.
- (5) For the years ended December 31, 2014 and 2015, all productive wells, and all other wells referred to in this table, are “net,” because we did not grant others any fractional working interests in any wells that we owned no acquired any fractional working interest in wells owned by others. Figures for the years ended December 31, 2016, 2017 and 2018 include fractional interests obtained pursuant to joint ventures and associations.
- (6) Includes only fields with proved reserves.
- (7) For the years ended December 31, 2014 and 2015, all acreage is net because we neither granted others fractional interests nor entered into other types of production sharing arrangements. Figures for the years ended December 31, 2016, 2017 and 2018 include fractional interests obtained pursuant to joint ventures and associations.
- (8) These values relate only to our current assignments.

Source: *Pemex Exploration and Production*.

Extensions and Discoveries

During 2018, our exploratory activity in the shallow waters of the Gulf of Mexico and onshore regions resulted in the discovery of four fields: the two onshore Chocol and Cibix crude oil fields, the offshore Mulach crude oil field and the offshore Manik NW crude oil field. In addition, extension activities in our Doctus and Ixachi fields led to the incorporation of additional reserves. Together, these extensions and discoveries led to the incorporation of approximately 287 million barrels of oil equivalent.

Reserves

Under the Mexican Constitution, all oil and other hydrocarbon reserves located in the subsoil of Mexico are owned by the Mexican nation and not by us. Pemex Exploration and Production has the right to extract, but not own, the reserves granted to us by the Mexican Government and to sell the resulting production. As of the date of this report, the exploration and development activities of Petróleos Mexicanos and the subsidiary entities are limited to reserves located in Mexico.

Proved oil and natural gas reserves are those estimated quantities of crude oil, natural gas and natural gas liquids which geological and engineering data demonstrate with reasonable certainty to be economically producible from a given date forward, from known reservoirs and under existing economic conditions, operating methods and government regulations.

Proved reserves estimates as of December 31, 2018 were prepared by our exploration and production segment and were reviewed by the Independent Engineering Firms (as defined below), which audit its estimates of our oil and gas reserves. In addition, pursuant to the *Reglamento de la Ley de Hidrocarburos* (Regulations under the Hydrocarbons Law), the CNH reviewed the proved reserves reports estimates as of December 31, 2018 and approved them on April 12, 2019. See “Item 3—Key Information—Risk Factors—Risk Factors Related to our Relationship with the Mexican Government—Information on Mexico’s hydrocarbon reserves is based on estimates, which are uncertain and subject to revisions.”

We estimate reserves based on generally accepted petroleum engineering and evaluation methods and procedures, which are based primarily on applicable SEC regulations and, as necessary, the Society of Petroleum Engineers’ (which we refer to as the SPE) publication entitled Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserves Information, dated February 19, 2007 and other SPE publications, including the SPE’s publication entitled Petroleum Resources Management System, as well as other technical sources, including Estimation and Classification of Reserves of Crude Oil, Natural Gas, and Condensate, by Chapman Cronquist, and Determination of Oil and Gas Reserves, Petroleum Society Monograph Number 1, published by the Canadian Institute of Mining and Metallurgy & Petroleum. The choice of method or combination of methods employed in the analysis of each reservoir is determined by:

- experience in the area;
- stage of development;
- quality and completeness of basic data; and
- production and pressure histories.

Reserves data set forth herein represent only estimates. Reserves valuation is a subjective process of estimating underground accumulations of crude oil and natural gas that cannot be measured in an exact manner. The accuracy of any reserves estimate depends on the quality of available data, engineering and geological interpretation and professional judgment. As a result, estimates of different engineers may vary. In addition, the results of drilling, testing and producing subsequent to the date of an estimate may lead to the revision of an estimate.

During 2018, we did not record any material increase in our proved oil and gas reserves as a result of the use of new technologies.

In order to ensure the reliability of our reserves estimation efforts, we have undertaken the internal certification of our estimates of reserves since 1996. We have established certain internal controls in connection with the preparation of our proved reserves estimates. Initially, teams of geoscientists from our exploration and production business units (with each of these units covering several projects) prepare the reserves estimates, using distinct estimation processes for valuations relating to new discoveries and developed fields, respectively. Subsequently, the regional reserves offices collect these reserves estimates from the units and request that the Gerencia de Recursos y Certificación de Reservas (Office of Resources and Certification of Reserves), the central hydrocarbon reserves management body of Pemex Exploration and Production, review and certify such valuations and the booking of the related reserves. This internal certification process is undertaken in accordance with internal guidelines for estimating and classifying proved reserves, which are based on the SEC’s rules and definitions. The Office of Resources and Certification of Reserves, which additionally oversees and conducts an internal audit of the process described above, consists entirely of professionals with geological, geophysical, petrophysical and reservoir engineering backgrounds. Additionally, the engineers who participate in our reserves estimation process are experienced in: reservoir numerical simulation; well drilling and completion; pressure, volume and temperature (PVT) and analytical tools used in forecasting the performance of the various elements comprising the production system; and design strategies in petroleum field development. Furthermore, all of our personnel have been certified by the Secretaría de Educación Pública (Ministry of Public Education), most have earned master’s degrees in areas of study such as petroleum engineering, geology and geophysical engineering and they possess an average of over fifteen years of professional experience.

In addition to this internal review process, our exploration and production segment's final reserves estimates are audited by independent engineering firms. Three independent engineering firms audited our estimates of proved reserves as of December 31, 2018: Netherland Sewell, DeGolyer and MacNaughton and GLJ (we refer to these firms together as the Independent Engineering Firms). The reserves estimates reviewed by the Independent Engineering Firms totaled 98.0% of our estimated proved reserves. The remaining 2.0% of our estimated proved reserves consisted of reserves located in certain areas that have been shared with third parties. Netherland Sewell audited the reserves in the Cantarell, Ku-Malooob-Zaap, Cinco Presidentes and Macuspana-Muspac business units, DeGolyer and MacNaughton audited the reserves in the Aceite Terciario de Golfo, Poza Rica-Altamira, Abkatún-Pol-Chuc and Litoral de Tabasco business units and GLJ audited the reserves in the Burgos, Veracruz, Bellota-Jujo and Samaria-Luna business units. The audits conducted by the Independent Engineering Firms consisted primarily of: (1) analysis of historical static and dynamic reservoir data that we have provided; (2) construction or updating of the Independent Engineering Firms' own static and dynamic reservoir characterization models of some of our fields; (3) economic analysis of fields; and (4) review of our production forecasts and reserves estimates.

Since reserves estimates are, by definition, only estimates, they cannot be reviewed for the purpose of verifying exactness. Instead, the Independent Engineering Firms conducted a detailed review of our reserves estimates so that they could express an opinion as to whether, in the aggregate, the reserves estimates we furnished were reasonable and had been estimated and presented in conformity with generally accepted petroleum engineering and evaluation methods and procedures.

All questions, including any suggested modifications to proved reserves estimates, that arose during the Independent Engineering Firms' review process were resolved by our exploration and production segment to the satisfaction of the Independent Engineering Firms. The Independent Engineering Firms have concluded that our estimated total proved oil and natural gas reserve volumes set forth in this report are, in the aggregate, reasonable and have been prepared in accordance with Rule 4-10(a) of Regulation S-X of the SEC, as amended (which we refer to as Rule 4-10(a)), are consistent with international reserves reporting practice and are in accordance with the revised oil and gas reserves disclosure provisions of ASC Topic 932.

Our total proved developed and undeveloped reserves of crude oil, condensates and liquefiable hydrocarbons recoverable from field processing plants decreased by 10.0% in 2018, from 6,427 million barrels at December 31, 2017 to 5,787 million barrels at December 31, 2018. Our proved developed reserves of crude oil, condensates and liquefiable hydrocarbons recoverable from processing plants decreased by 13.9% in 2018, from 4,166 million barrels at December 31, 2017 to 3,588 million barrels at December 31, 2018. These decreases were principally due to a decrease in oil production in 2018, a decrease in field development, the natural decline of fields and, following bidding rounds conducted by the Mexican Government, the transfer to third parties of rights to certain fields included in our 2017 reserves. The amount of crude oil, condensate and liquefiable hydrocarbon reserves added in 2018 was insufficient to offset the level of production in 2018, which amounted to 743 million barrels of crude oil, condensates and liquefiable hydrocarbons.

Our total proved developed and undeveloped dry gas reserves decreased by 3.4% in 2018, from 6,593 billion cubic feet at December 31, 2017 to 6,370 billion cubic feet at December 31, 2018. Our proved developed dry gas reserves decreased by 16.0% in 2018, from 4,026 billion cubic feet at December 31, 2017 to 3,380 billion cubic feet at December 31, 2018. These decreases were principally due to a decrease in oil production in 2018, a decrease in field development, the natural decline of fields and, following bidding rounds conducted by the Mexican Government, the transfer to third parties of rights to certain fields included in our 2017 reserves. The amount of dry gas reserves added in 2018 was insufficient to offset the level of production in 2018, which amounted to 887 billion cubic feet of dry gas. Our proved undeveloped dry gas reserves increased by 16.5% in 2018, from 2,567 billion cubic feet at December 31, 2017 to 2,990 billion cubic feet at December 31, 2018. This increase was primarily due to new discoveries.

During 2018, our exploratory activity in the shallow waters of the Gulf of Mexico and onshore regions resulted in the discovery of four new fields: the two onshore Chocol and Cibix crude oil fields, the offshore Mulach crude oil field, and the offshore Malik NW crude oil field. In addition, extension activities in our Doctus and Ixachi fields led to the incorporation of additional reserves. Together, these extensions and discoveries led to the incorporation of approximately 287 million barrels of oil equivalent.

In 2018, our proved reserves increased by 317 million barrels of oil equivalent due to reclassifications, development, revisions and discoveries.

The following three tables of crude oil and dry gas reserves set forth our estimates of our proved reserves determined in accordance with Rule 4-10(a).

**Summary of Oil and Gas⁽¹⁾ Proved Reserves as of December 31, 2018
Based on Average Fiscal Year Prices**

	<u>Crude Oil and Condensates⁽²⁾</u> (in millions of barrels)	<u>Dry Gas⁽³⁾</u> (in billions of cubic feet)
Proved developed and undeveloped reserves		
Proved developed reserves	3,588	3,380
Proved undeveloped reserves	2,198	2,990
Total proved reserves	<u>5,786</u>	<u>6,370</u>

Note: Numbers may not total due to rounding.

(1) We do not currently produce synthetic oil or synthetic gas, or other natural resources from which synthetic oil or synthetic gas can be produced.

(2) Crude oil and condensate reserves include the fraction of liquefiable hydrocarbons recoverable in natural gas processing plants located at fields.

(3) Reserve volumes reported in this table are volumes of dry gas, although natural gas production reported in other tables refers to sour wet gas. There is a shrinkage in volume when natural gas liquids and impurities are extracted to obtain dry gas. Therefore, reported natural gas volumes are greater than dry gas volumes.

Source: Pemex Exploration and Production.

**Crude Oil and Condensate Reserves
(including natural gas liquids)⁽¹⁾**

	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>
Proved developed and undeveloped reserves	(in millions of barrels)				
At January 1	11,079	10,292	7,977	7,219	6,427
Revisions ⁽²⁾	95	(1,491)	189	(95)	22
Extensions and discoveries	119	111	(55)	147	140
Production	(1,001)	(935)	(891)	(805)	(743)
Farm-outs and transfer of fields due to CNH bidding process	—	—	—	(38)	(59)
At December 31	<u>10,292</u>	<u>7,977</u>	<u>7,220</u>	<u>6,428</u>	<u>5,786</u>
Proved developed reserves at December 31	7,141	5,725	4,886	4,166	3,588
Proved undeveloped reserves at December 31	3,151	2,252	2,333	2,261	2,198

Note: Numbers may not total due to rounding.

(1) Crude oil and condensate reserves include the fraction of liquefiable hydrocarbons recoverable in natural gas processing plants located at fields.

(2) Revisions include positive and negative changes due to new data from well drilling, revisions made when actual reservoir performance differs from expected performance and the effect of changes in hydrocarbon prices.

Source: Pemex Exploration and Production.

Dry Gas Reserves

	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>
Proved developed and undeveloped reserves	(in billions of cubic feet)				
At January 1	12,273	10,859	8,610	6,984	6,593
Revisions ⁽¹⁾	4	(955)	(183)	169	3
Extensions and discoveries	93	47	(308)	468	809
Production ⁽²⁾	(1,511)	(1,341)	(1,134)	(999)	(887)
Farm-outs and transfer of fields due to CNH bidding process	—	—	—	(29)	(148)
At December 31	<u>10,859</u>	<u>8,610</u>	<u>6,984</u>	<u>6,593</u>	<u>6,370</u>
Proved developed reserves at December 31	6,740	6,012	4,513	4,026	3,380
Proved undeveloped reserves at December 31	4,119	2,598	2,471	2,567	2,990

Note: Numbers may not total due to rounding.

(1) Revisions include positive and negative changes due to new data from well drilling, revisions made when actual reservoir performance differs from expected performance and the effect of changes in hydrocarbon prices.

(2) Production refers here to dry gas, although natural gas production reported in other tables refers to sour wet gas. There is a shrinkage in volume when natural gas liquids and impurities are extracted to obtain dry gas. Therefore, reported natural gas volumes are greater than dry gas volumes.

Source: Pemex Exploration and Production.

The following table sets forth, as of December 31, 2018, the volumes of proved developed and undeveloped reserves, the number of producing wells and the number of proved undeveloped locations for the fields that contained 95.3% of our proved reserves.

Field	Reserves			Number of Producing Wells	Number of Undeveloped Locations ⁽²⁾
	Proved ⁽¹⁾	Developed ⁽¹⁾	Undeveloped ⁽¹⁾		
	(in millions of barrels of oil equivalent)				
Ku-Maloob-Zaap	1,858.0	1,515.7	342.2	178	33
Akal	669.0	669.0	—	83	26
Ayatsil	604.7	202.0	402.7	11	27
Aceite Terciario del Golfo ⁽³⁾	579.1	109.4	469.6	1,943	3,403
Ixachi	364.6	32.3	332.2	1	26
Jujo-Tecominoacán	172.7	83.9	88.8	31	18
Antonio J. Bermudez ⁽⁴⁾	157.3	96.0	61.4	236	38
Xikin	143.9	—	143.9	—	5
Balam	133.5	112.4	21.1	10	2
Onel	119.3	88.3	31.0	9	4
Ek	76.5	12.1	64.3	12	7
Santuario	66.7	19.1	47.6	30	—
Lakach	63.5	—	63.5	—	3
Tekel	59.7	—	59.7	—	8
Pokche	56.9	—	56.9	—	6
Xux	56.7	35.4	21.3	13	3
Tamaulipas Constituciones	51.8	22.9	29.0	251	126
Teotleco	46.3	27.3	19.0	10	2
Sihil	42.9	26.5	16.4	16	—
Utsil	42.0	—	42.0	—	8
Arenque	41.6	34.5	7.0	14	2
Poza Rica	41.0	30.7	10.3	187	32
Ayín	39.0	—	39.0	—	3
Homol	38.9	27.7	11.2	10	—
Tsimín	35.1	35.1	—	13	—
Suuk	35.1	—	35.1	—	3
Puerto Ceiba	34.6	23.4	11.1	14	5
Gasífero	33.3	29.5	3.9	24	7
Giraldas	32.5	24.1	8.3	9	1
Ixtal	32.4	32.4	—	10	—
Kambesah	31.0	31.0	—	4	—
Cuitláhuac	27.4	16.7	10.7	178	52
Costero	27.4	18.3	9.2	10	—
Tizón	26.0	22.0	4.0	10	1
Terra	25.2	25.2	—	12	—
Rabasa	24.7	24.7	—	34	—
Etkal	23.1	8.7	14.4	1	2
Kax	22.3	22.3	—	2	—
Bellota	22.0	16.0	6.0	6	2
Cárdenas-Mora	21.8	15.0	6.8	12	—
Tupilco	21.5	13.9	7.6	24	5
Ogarrio	20.4	6.0	14.4	72	10
Caparroso-Pijije-Escuintle	20.3	14.1	6.2	16	1
Valeriana	20.2	10.1	10.2	—	1
Lum	19.6	16.2	3.4	4	3
May	19.5	19.5	—	10	—
Sen	18.9	11.6	7.3	12	1

Reserves

Field	Proved ⁽¹⁾	Developed ⁽¹⁾	Undeveloped ⁽¹⁾	Number of Producing Wells	Number of Undeveloped Locations ⁽²⁾
Chinchorro	18.8	16.1	2.7	4	1
Jaatsul	18.7	—	18.7	—	3
Abkatún	18.6	18.6	—	12	—
Yaxché	18.4	7.1	11.2	7	4
Madrefil	17.9	17.9	—	6	—
Eltreinta	17.7	13.6	4.1	13	5
Bedel	17.2	10.7	6.5	7	5
Cuervito	16.8	5.3	11.5	86	48
Kuil	16.5	5.4	11.1	8	1
Nejo	15.8	15.7	0.1	169	1
Ébano Chapacao	15.5	11.6	3.9	162	38
Paredón	15.3	15.3	—	2	—
Cinco Presidentes	15.2	14.6	0.6	34	4
Takín	15.2	15.2	—	4	—
Sunuapa	15.0	11.7	3.4	11	2
Ixtoc	14.7	14.7	—	10	—
Chuc	14.0	14.0	—	10	—
Esah	13.9	—	13.9	—	1
Bolontikú	13.2	13.2	—	4	1
Uchbal	13.3	—	13.3	—	4
Los Soldados	13.0	11.8	1.2	21	3
Mulach	12.9	—	12.9	—	2
Edén-Jolote	12.8	8.7	4.1	6	2
Sini	12.7	8.4	4.3	6	1
Kab	12.5	10.9	1.6	6	2
Cacalilao	12.2	4.8	7.4	90	99
Manik	12.0	9.4	2.6	3	1
Jacinto	11.2	11.2	—	3	—
Blasillo	11.2	6.8	4.5	21	6
San Ramón	10.3	9.2	1.2	41	4
Pánuco	10.2	2.9	7.3	57	121
Xanab	9.7	9.7	—	9	—
Och	9.3	9.3	—	5	—
Nohoch	9.2	9.2	—	7	—
Ayocote	9.0	8.6	0.4	11	1
Rodador	8.7	8.7	—	22	—
Tetl	8.6	—	8.6	—	4
Tintal	7.8	7.8	—	6	—
Batsil	7.3	—	7.3	—	—
Kanaab	7.1	7.1	—	3	—
Pareto	7.1	7.1	—	2	—
Cheek	7.0	—	7.0	—	—
Magallanes-Tucán-Pajonal	6.9	5.6	1.3	35	3
Bacab	6.6	6.6	—	6	—
Cauchy	6.4	6.4	—	15	—
Total	6,683.3	3,971.9	2,711.4	4,446	4,243
Our proved reserves	7,010.3	4,236.9	2,773.4		
Percentage	95.3%	93.7%	97.7%		

Note: Numbers may not total due to rounding.

(1) Proved reserves, developed reserves and undeveloped reserves are expressed in millions of barrels of oil equivalent. To convert dry gas to barrels of oil equivalent, a factor of 5.201 thousand cubic feet of dry gas per barrel of oil equivalent is used.

(2) Undeveloped Locations refers to the number of geographic sites or locations where a well will be drilled to produce undeveloped proved reserves.

(3) Includes extraction assignments and temporary assignments.

(4) Includes the Cunduacán, Iride, Oxiacaque, Platanal and Samaria fields.

Source: Pemex Exploration and Production.

Our reserve-replacement ratio, or RRR, for a given period is calculated by dividing the sum of proved reserves additions due to discoveries, developments, delineations and revisions by that period's total production. During 2018, we obtained 317 million barrels of oil equivalent of proved reserves, which represents an RRR of 34.7%, as compared to our RRR of 17.5% in 2017. We expect continued improvements in our RRR in subsequent years.

Our reserves production ratio, which is presented in terms of years, is calculated by dividing the estimated remaining reserves at the end of the relevant year by the total production of hydrocarbons for that year. As of December 31, 2018, this ratio stayed constant with 2017 levels and was equal to 7.7 years for proved reserves. For more information, see Note 33 to our consolidated financial statements included herein.

Sales Prices and Production Costs

The following table sets forth our average sales price per unit of oil and gas produced and our average production cost per unit of production, in the aggregate and for each field containing 10% or more of our proved reserves.

Unit Sales Prices and Production Costs⁽¹⁾

	<u>Ku-Maloob-Zaap</u>	<u>Akal</u>	<u>Other Fields</u>	<u>All Fields</u>
	<u>(in U.S. dollars)</u>			
Year ended December 31, 2018				
Average sales prices				
Crude oil, per barrel	U.S.\$ 58.71	U.S.\$ 61.41	U.S.\$ 66.34	U.S.\$ 66.13
Natural gas, per thousand cubic feet	4.37	1.62	4.21	4.21
Average production costs, per barrel of oil equivalent	10.03	38.94	14.78	13.73
Year ended December 31, 2017				
Average sales prices				
Crude oil, per barrel	41.70	48.75	52.90	48.71
Natural gas, per thousand cubic feet	5.07	4.25	4.12	4.32
Average production costs, per barrel of oil equivalent	7.53	23.25	11.53	10.90
Year ended December 31, 2016				
Average sales prices				
Crude oil, per barrel	30.11	36.67	40.21	36.55
Natural gas, per thousand cubic feet	3.40	2.86	3.16	3.01
Average production costs, per barrel of oil equivalent	5.34	16.53	8.08	7.78

(1) Average of sales prices as of the last day of each month of the year.

Source: *Pemex Exploration and Production*.

In 2018, our average production cost was U.S. \$13.73 per barrel of oil equivalent, which represented an increase of 26.0%, as compared to our average production cost of U.S. \$10.90 per barrel in 2017. This increase resulted primarily from an increase in expenses for the maintenance of wells, equipment and production facilities and payments of non-income related taxes and duties.

We calculate and disclose our production costs pursuant to international practices, which are based on U.S. GAAP under ASC Topic 932. In accordance with ASC Topic 932, the production cost per barrel of oil equivalent is calculated by dividing total production expenses (in U.S. dollars) by total production of oil and gas (in barrels of oil equivalent) for the relevant period.

Our total production cost consists of all direct and indirect costs incurred to produce crude oil and gas, including costs associated with the operation and maintenance of wells and related equipment and facilities. In addition, it includes costs of labor to operate the wells and facilities, the costs of materials, supplies and fuel consumed, including gas used for gas lifting, nitrogen and other chemicals, repair and non-capitalized maintenance costs, and other costs, such as fees for general services, a labor fund for active personnel, corporate services, indirect overhead and applicable taxes and duties. However, it excludes non-cash expenses such as amortization of capitalized well expenses, the depreciation of fixed assets, expenses associated with the distribution and handling of oil and gas and other expenses that are related to exploration and drilling activities.

Crude Oil and Natural Gas Production

In 2018, we produced an average of 1,822.5 thousand barrels per day of crude oil, 6.5% less than our average production in 2017 of 1,948.3 thousand barrels per day of crude oil. The decrease in 2018 resulted primarily from the decrease of production in the Cantarell, Yaxché-Xanab, Crudo Ligerero Marino, El Golpe-Puerto Ceiba, Bellota-Chinchorro, Complejo Antonio J. Bermúdez, Cactus-Sitio Grande, Ixtal-Manik, Chuc, Costero Terrestre and Tsimin-Xux projects. Notwithstanding this overall decrease, our average production of heavy crude oil increased by 22.2 thousand barrels per day, or 2.1% more than the average daily production in 2017, primarily due to an increase in our drilling activities and a deceleration in the decline in field production, primarily in the Ku-Maloob-Zaap and Ayatsil-Tekel projects. In 2018, the average production of light crude oil decreased by 147.8 thousand barrels per day, or 16.4%, as compared to 2017. This decrease occurred mainly due to a natural decline in production in the Chuhuk, Caan, and Ixtal fields of the Abkatún-Pol-Chuc business unit; the Xanab, Tsimín, Sinán, Bolontikú and Yaxché fields of the Litoral de Tabasco business unit; the Costero, Sitio Grande, Teotleco fields of the Macuspana-Muspac business unit; and the Samaria, Íride, Cunduacán and Sini fields of the Samaria-Luna business unit.

Crude oil can be classified by its sulfur content. “Sour” or heavy crude oil contains 3.4% or greater sulfur content by weight and “sweet” or light crude oil contains less than 1.0% sulfur content by weight. Most of our production is classified as sour or heavy crude oil.

Our exploration and production segment primarily produces four types of crude oil:

- Altamira, a heavy crude oil;
- Maya, a heavy crude oil;
- Isthmus, a light crude oil; and
- Olmeca, an extra-light crude oil.

Most of our production consists of Isthmus and Maya crude oil. In 2018, 58.8% of our total production of crude oil consisted of heavy crude oil and 41.2% consisted of light and extra-light crude oil. The Marine regions yield mostly heavy crude oil (65.9% of these regions’ production in 2018), although significant volumes of light crude oil are also produced there (34.1% of these regions’ production in 2018). The Southern region yields mainly light and extra-light crude oil (together, 88.2% of this region’s production in 2018), and the Northern region yields both light and extra-light crude oil (46.6% of this region’s production in 2018) and heavy crude oil (53.4% of this region’s production in 2018).

The most productive crude oil and natural gas fields in the Gulf of Mexico are located in the Ku-Maloob-Zaap, Litoral de Tabasco, Abkatún-Pol-Chuc and Cantarell business units in the Marine regions and the Sarmaria Luna and Bellota-Jujo business units in the Southern region. In particular, the Ku-Maloob-Zaap business unit was the most important crude oil producer in 2018, producing an average of 874.7 thousand barrels of crude oil per day in 2018, or 48.0% of our total crude oil production for the year, and 693.5 million cubic feet per day of natural gas, or 14.4% of our total natural gas production for the year. Our second most important crude oil producer was Litoral de Tabasco which produced an average of 291.1 thousand barrels of crude oil per day in 2018, or 16.0% of our total crude oil production for the year, and an average of 798.0 million cubic feet per day of natural gas, or 16.6 % of our total natural gas production for the year.

The following table sets forth our annual crude oil production rates by type of oil for the five years ended December 31, 2018.

Crude Oil Production

	Year ended December 31,					2018 vs. 2017 (%)
	2014	2015	2016	2017	2018	
	(in thousands of barrels per day)					
Marine regions						
Heavy crude oil	1,160.1	1,054.9	1,018.3	978.0	996.1	1.9
Light crude oil ⁽¹⁾	691.3	705.4	682.7	605.6	514.8	(15.0)
Total	1,851.4	1,760.3	1,700.9	1,583.6	1,510.9	(4.6)
Southern region						
Heavy crude oil	35.0	31.7	22.3	16.9	25.8	52.7
Light crude oil ⁽¹⁾	417.4	362.1	321.8	249.8	193.6	(22.5)
Total	452.4	393.8	344.1	266.7	219.4	(17.7)
Northern region						
Heavy crude oil	70.4	65.7	62.0	54.2	49.3	(9.0)
Light crude oil ⁽¹⁾	54.6	47.0	46.5	43.8	43.0	(1.8)
Total	125.0	112.7	108.5	97.9	92.3	(5.7)
Total heavy crude oil	1,265.5	1,152.3	1,102.6	1,049.1	1,071.2	2.1
Total light crude oil ⁽¹⁾	1,163.3	1,114.5	1,051.0	899.2	751.4	(16.4)
Total crude oil	2,428.8	2,266.8	2,153.6	1,948.3	1,822.5	(6.5)

Note: Numbers may not total due to rounding.

(1) Includes extra-light crude oil.

Source: Pemex Exploration and Production.

The following table sets forth our annual crude oil production by region and business unit for the five years ended December 31, 2018.

Crude Oil Production

	Year ended December 31,					2018 vs. 2017 (%)
	2014	2015	2016	2017	2018	
	(in thousands of barrels per day)					
Marine regions						
Ku-Maloob-Zaap	856.7	853.1	866.6	858.0	874.7	1.9
Cantarell	374.9	273.4	215.8	176.0	161.2	(8.4)
Litoral de Tabasco	320.4	347.2	359.9	345.8	291.1	(15.8)
Abkatún-Pol-Chuc	299.3	286.7	258.7	203.2	183.8	(9.5)
Total	1,851.4	1,760.4	1,700.9	1,583.6	1,510.9	(4.6)
Southern region						
Samaria-Luna	161.4	145.4	127.0	99.9	86.5	(13.4)
Bellota-Jujo	124.8	101.7	90.3	72.4	58.6	(19.1)
Cinco Presidentes	89.1	87.6	80.0	63.1	50.7	(19.7)
Macuspana-Muspac	77.0	59.0	46.8	31.3	23.6	(24.6)
Total	452.4	393.7	344.1	266.7	219.4	(17.7)
Northern region						
Aceite Terciario del Golfo	48.8	42.0	39.8	34.4	28.4	(17.4)
Poza Rica-Altamira	59.8	58.7	53.9	48.2	43.7	(9.3)
Burgos	5.0	—	—	—	2.6	100.0
Veracruz	11.4	12.1	14.8	15.3	17.6	15.0
Total	125.0	112.7	108.5	97.9	92.3	(5.7)
Total crude oil	2,428.8	2,266.9	2,153.6	1,948.3	1,822.5	(6.5)

Note: Numbers may not total due to rounding.

Source: Pemex Exploration and Production.

The Marine regions, which are comprised of the Northeastern Marine region and the Southwestern Marine region, are located on the continental shelf and its slope in the Gulf of Mexico. They cover a surface area of approximately 550,000 square kilometers, located entirely within Mexican territorial waters, along the coast of the states of Tabasco, Campeche, Yucatán, Quintana Roo and the southern coast of the state of Veracruz. In 2018, the average crude oil production from the 43 fields located in these regions was 1,510.8 thousand barrels per day.

The Southern region covers an area of approximately 392,000 square kilometers, including the states of Guerrero, Oaxaca, Chiapas, Tabasco, Yucatán, Quintana Roo, Campeche and Veracruz. In 2018, the average crude oil production from the 86 fields located in this region was 219.4 thousand barrels per day.

The Northern region, including its offshore area, is located on the continental shelf in the Gulf of Mexico along the coast of the state of Tamaulipas and the northern coast of the state of Veracruz. It covers an area of approximately 1.8 million square kilometers. Our production area in the onshore portion of this region is located in, among others, the states of Veracruz, Tamaulipas, Nuevo León, Coahuila, San Luis Potosí and Puebla; we also produce offshore on the continental shelf in the Gulf of Mexico. In 2018, the average crude oil and natural gas production in the Northern region totaled 92.3 thousand barrels of crude oil per day and 1,003.7 million cubic feet of natural gas per day, respectively, from the 263 oil and gas fields in this region.

The following table sets forth our annual natural gas production by region and business unit for the five years ended December 31, 2018.

Natural Gas Production

	Year ended December 31,					2018 vs. 2017 (%)
	2014	2015	2016	2017	2018	
	(in millions of cubic feet per day)					
Marine regions						
Cantarell	1,120.9	1,277.1	1,184.9	1,133.4	1,151.1	1.6
Litoral de Tabasco	842.6	993.5	950.0	882.3	798.0	(9.6)
Abkatún-Pol-Chuc	553.4	455.9	390.5	319.5	288.2	(9.8)
Ku-Maloob-Zaap	571.0	556.5	589.3	552.3	693.5	25.6
Total	3,087.9	3,283.0	3,114.6	2,887.6	2,930.8	1.5
Southern region						
Samaria-Luna	583.1	500.3	498.7	426.9	381.0	(10.8)
Macuspana-Muspac	490.5	455.3	382.2	291.6	249.2	(14.5)
Bellota-Jujo	288.9	264.5	231.5	183.3	147.4	(19.6)
Cinco Presidentes	152.8	160.1	137.7	109.1	90.9	(16.7)
Total	1,515.4	1,380.1	1,250.0	1,011.0	868.5	(14.1)
Northern region						
Burgos	1,221.0	1,099.0	864.6	699.2	603.9	(13.6)
Veracruz	455.3	392.2	322.8	263.5	217.3	(17.5)
Aceite Terciario del						
Golfo	149.5	145.2	142.5	118.5	92.2	(22.2)
Poza Rica-Altamira	102.8	101.5	97.9	88.2	90.3	2.4
Total	1,928.6	1,737.9	1,427.8	1,169.4	1,003.7	(14.2)
Total natural gas	6,531.8	6,401.1	5,792.5	5,068.0	4,803.0	(5.2)

Note: Numbers may not total due to rounding.

Source: Pemex Exploration and Production.

In 2018, the Marine regions produced 2,930.8 million cubic feet per day of natural gas, or 61.0% of our total natural gas production, an increase of 1.5% as compared to the regions' 2017 production of 2,887.6 million cubic feet per day. In 2018, the Southern region produced 868.5 million cubic feet per day of natural gas, or 18.1% of our total natural gas production, a decrease of 14.1% as compared to the region's 2017 production of 1,010.9 million cubic feet per day. In 2018, the Northern region produced 1,003.7 million cubic feet per day of natural gas, or 20.9% of our total natural gas production, a decrease of 14.1% as compared to the region's 2017 production of 1,169.4 million cubic feet per day.

Our average natural gas production decreased by 5.2% in 2018, from 5,067.8 million cubic feet per day in 2017 to 4,803.0 million cubic feet per day in 2018. Natural gas production associated with crude oil production accounted for 78.9% of total natural gas production in 2018, with the remainder of natural gas production consisting of extraction from fields holding natural gas reserves. As of December 31, 2018, 139 of our 394 gas producing fields, or 35.3%, produced non-associated gas. These non-associated gas fields accounted for 19.5% of all natural gas production in 2018.

Investments in Exploration and Production

In nominal peso terms, our capital expenditures for exploration and production were Ps. 71,107 million in 2018, as compared to Ps. 85,491 million in 2017, representing a decrease of 16.8% in nominal terms. Of our total capital expenditures, Ps. 10,879 million was directed to the Ku-Maloob-Zaap fields, Ps. 1,065 million was directed to the Tsimin-Xux project, Ps. 13,178 million was directed to the Chuc project, Ps. 2,228 million was directed to the Cantarell fields, Ps. 3,535 million was directed to the Crudo Ligero Marino project, Ps. 1,227 million was directed to the Ogarrio-Sánchez Magallanes project, Ps. 879 million was directed to the Delta del Gijalva fields, Ps. 1,448 million was directed to the Antonio J. Bermúdez fields, Ps. 162 million was used for development of the Burgos natural gas fields and Ps. 511 million was directed to the ATG project. During 2018, expenditures for these ten projects amounted to 49.0% of all our capital expenditures for exploration and production. The remaining 51.0% amounted to Ps. 36,295 million in nominal terms, which was directed to the 16 remaining projects, as well as to other exploratory projects, other development projects and administrative and technical support.

2019 Exploration and Production Capital Expenditures Budget

For 2019, our total capital expenditures budget is Ps. 98,226 million, as compared to Ps. 71,107 million of capital expenditures made in 2018, representing an increase of 38.1%, largely with a view of reaching our objectives of stopping and reversing the decline in our reserves and production, and accelerating the development of discovered fields. The 2019 budget includes all of the 26 ongoing strategic exploration and production projects and an additional Ps. 21,154 million to be allocated to other exploratory projects. Ps. 77,054 million, or 78.4% of our 2019 capital expenditures budget is to be allocated to projects relating to field development and pipelines. Ps. 21,172 million, or 21.6% of the total budget, will be allocated to exploration activities.

The 2019 exploration and production budget includes Ps. 17,162 million for investments in the Ku-Maloob-Zaap project, Ps. 5,150 million for the Integral Yaxché project, Ps. 12,194 million for the Chuc project, Ps. 1,112 million for the Tsimin-Xux project, Ps. 1,443 million for the Cantarell project, Ps. 1,569 million for the Delta del Grijalva project, Ps. 5,305 million for the Crudo Ligero Marino project, Ps. 2,130 million for the Antonio J. Bermúdez project, Ps. 1,406 million for the Ogarrio-Sánchez Magallanes project, Ps. 480 million for the Burgos project, Ps. 1,051 million for the Bellota Chinchorro project, and Ps. 49,224 million for the remaining projects, as well as for other exploratory and development projects and administrative and technical support.

Exploration and Production Investment Trends

In 2018, we invested Ps. 23,892 million in nominal terms, or 33.6% of the total capital expenditures of our exploration and production segment, in exploration activities, which represents a 16.9% decrease from the Ps. 28,753 million invested in exploration activities in 2017. In 2018, we invested Ps. 47,214 million in nominal terms, or 66.4% of our total capital expenditures in development activities, which represents a 16.8% decrease from the Ps. 56,741 million invested in development activities in 2017.

In 2019, we have budgeted Ps. 21,172 million, or 21.6% of total capital expenditures, for exploration activities of our exploration and production segment, which represents an 11.4% decrease in nominal terms from the amount invested in exploration activities in 2018. For development activities in 2019, we have budgeted Ps. 77,054 million, or 78.4% of total capital expenditures, which represents a 63.2% increase in nominal terms from the amount that we invested in development activities in 2018.

Our projected exploration and development capital expenditures correspond to the areas assigned to us through bidding rounds, which represent the areas in which we are exploring, operating or have an interest in developing based on our operational capabilities. The Ministry of Energy granted us the right to explore and develop these areas with the aim of maintaining our production levels in the short term, while providing us with sufficient exploration opportunities to increase our production in the future. Given that a significant number of exploration areas are reserved by the Mexican Government for potential future competitive bidding rounds, we intend to carry out our strategy of increasing production and improving our RRR over time by entering into strategic joint ventures with other oil and gas companies. Through these joint ventures, we hope to gain access

to new technology and international best practices, while sharing the costs associated with security, occupational health and environmental protection and minimizing our operational risks. Over time, the allocation of our capital expenditures budget may change due to a number of factors, including the results of potential subsequent bidding rounds in which we participate.

The capital expenditures of our exploration and production segment have constituted 73.5% or more of our total capital expenditures in each of the last three years. In 2019, the budgeted capital expenditures of our exploration and production segment constitute 61.7% of our total capital expenditures.

The following tables sets forth our capital expenditures, excluding non-capitalizable maintenance, related to exploration and development for each of the three years ended December 31, 2018, and the budget for 2019. Capital expenditure amounts are derived from our budgetary records, which are prepared on a cash basis. Accordingly, these capital expenditure amounts do not correspond to capital expenditure amounts included in our consolidated financial statements prepared in accordance with IFRS.

Exploration and Development Capital Expenditures

	Year ended December 31, ⁽¹⁾			Budget 2019 ⁽²⁾
	2016	2017	2018	
	(in millions of nominal pesos)			
Exploration	Ps. 32,441	Ps. 28,753	Ps. 23,892	Ps. 21,172
Development	104,801	56,738	47,214	77,054
Total	Ps. 137,242	Ps. 85,491	Ps. 71,107	Ps. 98,226

Note: Numbers may not total due to rounding.

(1) Amounts based on cash basis method of accounting.

(2) Original budget published in the Official Gazette of the Federation on January 17, 2019.

Source: Pemex Exploration and Production

Investments and Production by Project

We conduct exploration, production and development activities in fields throughout Mexico. Our main projects are Ku-Maloob-Zaap, Tsimin-Xux, ATG, Cantarell, Crudo Ligero Marino, Burgos, Chuc, Antonio J. Bermúdez, Ogarrio-Sánchez Magallanes and Delta del Grijalva. These projects are described below.

Exploration and Production's Capital Expenditures

	Year ended December 31, ⁽¹⁾			Budget
	2016	2017	2018	2019 ⁽²⁾
	(in millions of pesos) ⁽³⁾			
Exploration and Production				
Chuc	Ps. 10,024	Ps. 8,761	Ps. 13,178	Ps. 12,194
Ku-Maloob-Zaap	25,468	20,454	10,879	17,162
Integral Yaxché	10,116	7,984	3,686	5,150
Crudo Ligero Marino	4,931	1,026	3,535	5,305
CE Ek-Balam	—	—	2,820	9,920
Cantarell	8,179	3,119	2,228	1,443
Veracruz Basin	884	671	2,018	660
Ogarrio-Sánchez Magallanes	3,543	1,063	1,227	1,406
Bellota-Chinchorro	1,978	400	1,187	1,051
Antonio J. Bermúdez	2,562	1,306	1,148	2,130
Lakach	5,683	1,058	1,083	1,078
Tsimin-Xux	13,802	4,961	1,065	1,112
Delta del Grijalva	2,859	1,705	879	1,569
Ixtal-Manik	1,740	368	807	594
Aceite Terciario del Golfo	1,487	604	511	352
Jujo-Tecominoacán	997	565	492	823
Cactus-Sitio Grande	1,555	463	412	1,337
El Golpe-Puerto Ceiba	1,375	286	365	832
Tamaulipas-Constituciones	501	101	339	771
Integral Poza Rica	521	173	324	618
Burgos	2,032	606	162	480
Costero Terrestre	380	120	114	9
Ek-Balam	2,687	737	98	—
Ayín-Alux	443	1	—	—
Cuenca de Macspana	368	117	96	331
Lankahuasa	22	11	—	—
Arenque	16	6	61	—
Other Exploratory Projects	32,410	26,235	22,388	21,154
Other Development Projects	172	2,341	—	10,745
Administrative and Technical Support	507	249	5	—
Total	Ps. 137,242	Ps. 85,491	Ps. 71,107	Ps. 98,226

Notes: Numbers may not total due to rounding.

(1) Amounts based on cash basis method of accounting.

(2) Original budget published in the Official Gazette of the Federation on January 17, 2019.

(3) Figures are stated in nominal pesos.

Source: *Petróleos Mexicanos*.

Ku-Maloob-Zaap Project. The Ku-Maloob-Zaap project was our most important producer of heavy crude oil and plays an important part in the production of the Maya crude oil mix. It is the most important project in Mexico in terms of total proved hydrocarbon reserves and crude oil production. It is composed of the Ayatsil, Bacab, Lum, Ku Maloob, Tekel, Utsil and Zaap fields, and extends over an area of 305.7 square kilometers. As of December 31, 2018, there was a total of 278 wells completed, 192 of which were producing. The project produced an average of 874.7 thousand barrels of crude oil per day, 48.0% of our total production, and 693.5 million cubic feet of natural gas per day in 2018. As of December 31, 2018, cumulative production was 5.7 billion barrels of crude oil and 2.9 trillion cubic feet of natural gas. As of December 31, 2018, proved hydrocarbon reserves totaled 2.4 billion barrels of crude oil and 0.96 trillion cubic feet of natural gas. Total proved reserves were 2.6 billion barrels of oil equivalent, of which 1.7 billion barrels of oil equivalent were proved developed reserves.

In nominal peso terms, our exploration and production segment's capital expenditures for this project were Ps. 25,468 million in 2016, Ps. 20,454 million in 2017 and Ps. 10,879 million in 2018. For 2019, we anticipate that our capital expenditures will be Ps. 17,162 million and that total accumulated capital expenditures for this project will reach approximately U.S. \$25.8 billion. In 2018, we paid approximately U.S. \$38.3 million to acquire approximately 104.6 billion cubic feet of nitrogen for the pressure maintenance project in the fifth module of the Cantarell nitrogen cryogenic plant. In 2019, we expect to spend approximately U.S. \$39.1 million to acquire approximately 103.9 billion cubic feet of nitrogen for injection into the Ku-Maloob-Zaap fields.

Tsimin-Xux Project. This project consists of the Tsimin and Xux fields, which include volatile oil and gas condensate reservoirs in the shallow waters of the Gulf of Mexico. The Tsimin field is located 62 kilometers from the Dos Bocas Marine Terminal in Paraíso, Tabasco, while the Xux field is located on the continental shelf of the Gulf of Mexico, approximately ten kilometers off the coast of Tabasco. During 2018, no new wells were completed at the Xux or Tsimin fields. During 2018, average daily production at the Tsimin-Xux project totaled 89.2 thousand barrels of crude oil and 458.6 million cubic feet of natural gas. During 2018, the sales prices of the light and extra-light crude oil produced at these fields averaged approximately U.S. \$71.58 per barrel, making this one of our most important projects in terms of revenue generation.

As of December 31, 2018, cumulative production totaled 0.1 billion barrels of crude oil and 0.9 trillion cubic feet of natural gas. Proved oil and gas reserves totaled 45.6 million barrels of crude oil and 228.8 billion cubic feet of natural gas. Total proved reserves were 91.9 million barrels of oil equivalent, of which 70.5 million barrels of oil equivalent were proved developed reserves.

In nominal peso terms, our exploration and production segment's capital expenditures for the Tsimin-Xux project were Ps. 4,961 million in 2017 and Ps. 1,065 million in 2018. In 2019, we expect capital expenditures for this project to total Ps. 1,112 million and that by the end of 2019 our total accumulated capital expenditures for this project will reach approximately U.S. \$185.0 million.

Chuc Project. The Chuc project is the second largest producer of light crude oil in the Southwestern Marine region, and includes the operation and maintenance of the Pol-A facility and water injection complexes. This project covers an area of 213 square kilometers. The fields of this project are located on the continental shelf of the Gulf of Mexico, off the coast of the states of Tabasco and Campeche, at a depth of between the 20- and 100-meter isobaths, approximately 132 kilometers from the Dos Bocas Marine Terminal in Paraíso, Tabasco, and 79 kilometers northeast of Ciudad del Carmen, Campeche. The fields in the project include Abkatún, Batab, Caan, Ché, Chuc, Chuhuk, Etkal, Homol, Kanaab, Kuil, Onel, Pol, Taratunich and Tumul. As of December 31, 2018, 120 wells had been completed, of which 73 were producing. During 2018, average production totaled 174.7 thousand barrels per day of crude oil and 254.0 million cubic feet per day of natural gas. As of December 31, 2018, cumulative production totaled 5.9 billion barrels of crude oil and 6.8 trillion cubic feet of natural gas. As of December 31, 2018, proved hydrocarbon reserves totaled 175.3 million barrels of oil and 363.2 billion cubic feet of natural gas, or 257.9 million barrels of oil equivalent. As of December 31, 2018, total proved developed reserves were 190.2 million barrels of oil equivalent.

In nominal peso terms, our exploration and production segment's capital expenditures for the Chuc project were Ps. 10,024 million in 2016, Ps. 8,761 million in 2017 and Ps. 13,178 million in 2018. In 2019, we expect our capital expenditures to be Ps. 12,194 million and anticipate that our total accumulated capital expenditures for this project will reach approximately U.S. \$7.2 billion.

Cantarell Project. The Cantarell project is located on the continental shelf of the Gulf of Mexico. It consists of the Akal, Chac, Ixtoc, Kambesah, Kutz, Nohoch, Sihil and Takin fields, which extend over an area of 294.4 square kilometers. As of December 31, 2018, there was a total of 564 wells drilled in the Cantarell project, 131 of which were producing. During 2018, the Cantarell business unit, of which the Cantarell project is part, was the fourth most important producer of crude oil in Mexico, averaging 161.2 thousand barrels per day of crude oil. This was 8.4% less than 2017 production, which was 176.6 thousand barrels per day, as a result of the decline of crude oil reserves remaining in these fields. Natural gas production from the Cantarell business unit during 2018 averaged 1,151.1 million cubic feet per day. This was 1.6% more than the 2017 average natural gas production, which was 1,133.4 million cubic feet per day.

As of December 31, 2018, cumulative production of the Cantarell project was 14.3 billion barrels of crude oil and 10.1 trillion cubic feet of natural gas. As of December 31, 2018, proved oil and gas reserves of the Cantarell project totaled 646.1 million barrels of crude oil and 792.2 billion cubic feet of natural gas. As of December 31, 2018, total proved reserves were 789.4 million barrels of oil equivalent, of which 773.0 million barrels were proved developed reserves.

The Akal field, which is the most important field in the Cantarell project, averaged 49.8 thousand barrels per day of crude oil production during 2018. This was 9.5% less than the average production in 2017, which was 55.0 thousand barrels per day.

In nominal peso terms, our exploration and production segment's capital expenditures for the Cantarell project totaled Ps. 8,179 million in 2016, Ps. 3,119 million in 2017 and Ps. 2,228 million in 2018. For 2019, we budgeted Ps. 1,443 million for capital expenditures for the Cantarell project. By the end of 2019, we expect our total accumulated capital expenditures to be approximately U.S. \$41.5 billion for this project.

On October 10, 1997, we awarded a build-own-operate contract for a nitrogen cryogenic plant at the Cantarell project to a consortium formed by BOC Holdings, Linde, Marubeni, West Coast Energy and ICA Fluor Daniel. Under this contract, the consortium is responsible for the financing, design, construction and operation of the plant. The plant began operations in 2000 and cost Ps. 10,131 million. Pursuant to the terms of the agreement, Pemex Exploration and Production has the right to acquire the nitrogen plant in the case of a default by the consortium. Pemex Exploration and Production has the obligation to acquire the nitrogen plant if it defaults under the contract. Under the terms of the contract, Pemex Exploration and Production committed to purchasing 1.2 billion cubic feet per day of nitrogen from the consortium and to continue to supply service through June 2027.

During 2018, we paid U.S. \$194.5 million under this contract for an approximate total volume of 410.7 billion cubic feet of nitrogen, which was injected into the Cantarell fields. In 2019, our exploration and production segment expects to pay U.S. \$201.8 million under this contract for an approximate total volume of 417.6 billion cubic feet of nitrogen to be injected into the fields.

Crudo Ligerio Marino Project. In 2013, the Ministry of Finance and Public Credit approved the designation of the Crudo Ligerio Marino project as a stand-alone project, thereby separating it from the Strategic Gas Program of which it formed part from 2001 through 2012. In 2013, the Och-Uech-Kax project was integrated into this project. The main objectives for the Crudo Ligerio Marino project during the years 2019 to 2035 are to continue constructing one marine structure, in addition to the marine structure completed during 2014, drill additional wells, implement secondary recovery, as well as intervention, optimization and maintenance techniques to its facilities, particularly in the Sinan, Kab and Kax fields. As of December 31, 2018, a total of 101 wells had been completed at this project, of which 37 were producing. During 2018, average daily production totaled 65.5 thousand barrels of crude oil and 244.5 million cubic feet of natural gas. As of December 31, 2018, cumulative production was 898.1 million barrels of crude oil and 2,577.8 billion cubic feet of natural gas. Proved oil and gas reserves totaled 47.2 million barrels of crude oil and 168.7 billion cubic feet of natural gas. Total proved reserves were 88.6 million barrels of oil equivalent, of which 87.0 million barrels were proved developed reserves.

In nominal peso terms, our exploration and production segment's capital expenditures for the Crudo Ligerio Marino project totaled Ps. 3,535 million in 2018. For 2019, we anticipate our capital expenditures to total Ps. 5,305 million and that total accumulated capital expenditures for this project will reach approximately U.S. \$463.1 million.

Ogarrio-Sánchez Magallanes Project. The Ogarrio-Sánchez Magallanes project is composed of 21 crude oil and natural gas producing fields and forms part of the Cinco Presidentes business unit. This project is located between the state borders of Veracruz and Tabasco and covers an area of 10,820 square kilometers. From a geological standpoint, this project pertains to the Isthmus Saline basin, specifically the southeastern basins at the Tertiary level. The Ogarrio-Sánchez Magallanes project is geographically bounded by the Gulf of Mexico to the north, the geological folds of the Sierra Madre of Chiapas to the south, the Tertiary basin of Veracruz to the west and the Comalcalco Tertiary basin to the east. The primary objective of this project is to increase production levels through the drilling of development wells and infill wells, which are drilled between producing wells to more efficiently recover oil and gas reserves, the execution of workovers of wells and the implementation of secondary and enhanced oil recovery processes. In addition, we aim to optimize the infrastructure of this project in order to counteract the decreases in production levels that result from the natural depletion of its reservoirs.

As of December 31, 2018, the Ogarrio-Sánchez Magallanes project had 533 producing wells. Nine new wells were completed during 2018. Average daily production totaled 52.7 thousand barrels of crude oil and 97.5 million cubic feet of natural gas during 2018. As of December 31, 2018, cumulative production was 1.3 billion barrels of crude oil and 1.9 trillion cubic feet of natural gas. Proved hydrocarbon reserves totaled 105.6 million barrels of crude oil and 206.2 billion cubic feet of natural gas. Total proved reserves were 139.3 million barrels of oil equivalent, of which 112.6 million barrels were proved developed reserves.

In nominal peso terms, our capital expenditures for the Ogarrio-Sánchez Magallanes project were Ps. 1,227 million in 2018. For 2019, we anticipate that our capital expenditures will total Ps. 1,406 million and that by the end of 2019 total accumulated capital expenditures for this project will reach approximately U.S. \$144.8 million.

Delta del Grijalva Project. The Delta del Grijalva project is the most important project in the Southern region in terms of both oil and gas production. The project covers an area of 1,343 square kilometers. As of December 31, 2018, there was a total of 199 wells drilled, of which 60 were producing. During 2018, the project produced an average of 52.6 thousand barrels per day of crude oil and 211.5 million cubic feet per day of natural gas.

As of December 31, 2018, cumulative production in the Delta del Grijalva project was 0.8 billion barrels of crude oil and 3.1 trillion cubic feet of natural gas. Proved oil and gas reserves as of December 31, 2018 totaled 61.5 million barrels of crude oil and 273.9 billion cubic feet of natural gas. As of December 31, 2018, total proved reserves were 125.2 million barrels of oil equivalent, 93.3 million of which were proved developed reserves.

In nominal peso terms, our exploration and production segment's capital expenditures for the Delta del Grijalva project were Ps. 2,859 million in 2016, Ps. 1,705 million in 2017 and Ps. 879 million in 2018. In 2019, we expect our capital expenditures to be Ps. 1,569 million, bringing our total capital expenditures for the project to approximately U.S. \$4.0 billion.

Antonio J. Bermúdez Project. The Antonio J. Bermúdez project is designed to accelerate reserves recovery, as well as increase the recovery factor, by drilling additional wells and implementing a system of pressure maintenance through nitrogen injection. It consists of the Samaria, Cunduacán, Oxiacaque, Iride and Platanal fields, and covers an area of 163 square kilometers. As of December 31, 2018, a total of 852 wells had been completed, of which 236 were producing. During 2018, the project produced an average of 33.9 thousand barrels per day of crude oil and 169.5 million cubic feet per day of natural gas. As of December 31, 2018, cumulative production was 3.0 billion barrels of crude oil and 4.8 trillion cubic feet of natural gas. As of December 31, 2018, proved hydrocarbon reserves in these fields totaled 113.3 million barrels of crude oil and 185.2 billion cubic feet of natural gas. As of December 31, 2018, total proved reserves were 157.3 million barrels of oil equivalent, of which 96.0 million were proved developed reserves.

In nominal peso terms, our exploration and production segment's capital expenditures for the Antonio J. Bermúdez project were Ps. 2,562 million in 2016, Ps. 1,306 million in 2017 and Ps. 1,148 million in 2018. For 2019, we anticipate that our capital expenditures for this project will be Ps. 2,130 million and that our total accumulated investments in the project will reach approximately U.S. \$9.3 billion.

Burgos Project. The Burgos project is the largest producer of non-associated gas in Mexico. The purpose of the Burgos project is to enable us to meet increasing domestic demand for natural gas. The fields in Burgos accounted for 12.6% of our total natural gas production in 2018. The project is located in northeastern Mexico.

During 2018, the Burgos project produced an average of 603.9 billion cubic feet per day of natural gas. As of December 31, 2018, the drilling of 7,988 wells had been completed, 2,502 of which were producing. The most important fields are the Nejo, Arcabuz-Culebra, Cuitláhuac, Cuervito, Velero and Santa Anita fields, which together produced 52.7 % of the total production of the Burgos project in 2018.

**Main Fields of the Burgos Project
(as of December 31, 2018)**

	Nejo	Arcabuz- Culebra	Cuitláhuac	Velero	Cuervito	Santa Anita
Wells completed	428	970	445	221	138	81
Producing wells	191	437	167	142	85	50
2018 production of natural gas (million cubic feet per day)	107.5	81.9	50.7	32.7	18.8	26.9
Cumulative production of natural gas (billion cubic feet)	577.5	2,103.9	825.9	361.0	213.5	273.7
Proved reserves of natural gas (billion cubic feet)	156.8	89.3	86.6	59.6	41.2	36.0
Proved developed reserves	95.6	88.5	27.2	46.8	41.2	30.9
Proved undeveloped reserves	61.2	0.8	59.4	12.8	—	5.1

Source: Pemex Exploration and Production.

During 2018, proved reserves decreased by 12.4 million barrels of oil equivalent, from 182.6 million barrels of oil equivalent in 2017 to 170.2 million barrels of oil equivalent in 2018, primarily due to the natural decline of certain fields in the Burgos project.

In nominal peso terms, our exploration and production segment's capital expenditures (including capital expenditures made pursuant to FPWCs) for the Burgos project were Ps. 2,032 million in 2016, Ps. 606 million in 2017 and Ps. 162 million in 2018. For 2019, we anticipate that our capital expenditures for this project will amount to Ps. 480 million and that our total accumulated capital expenditures will reach approximately U.S. \$20.5 billion.

Aceite Terciario del Golfo Project (formerly Paleocanal de Chicontepec). The ATG project is located in the Northern region and covers an area of 4,243 square kilometers. This project comprises 29 fields, which are divided among eight sectors. As of December 31, 2018, there was a total of 4,646 wells completed, of which 1,656 were producing. The project produced an average of 28.4 thousand barrels of crude oil per day in 2018 as compared to 34.4 thousand barrels of crude oil per day in 2017, which represents a 17.4% decrease, and 92.2 million cubic feet of natural gas per day in 2018 as compared to 118.5 million cubic feet of natural gas per day in 2017, which represents a 22.2% decrease. The decrease in crude oil and natural gas production was primarily due to the decline in pressure in certain reservoirs. As of December 31, 2018, cumulative production was 324.8 million barrels of crude oil and 701.9 billion cubic feet of natural gas. As of December 31, 2018, proved reserves totaled 446.6 million barrels of crude oil and 880.8 billion cubic feet of natural gas. Total proved hydrocarbon reserves were 579.1 million barrels of oil equivalent, of which 109.4 million barrels of oil equivalent were proved developed reserves.

During 2018, field development activities at the project included the drilling of 56 new wells and the completion of 65 wells, 62 were classified as producing, reflecting a 95.4% success rate. As of December 31, 2018, 82.0% of the total producing wells were operating with artificial systems such as mechanical, pneumatic, hydraulic and electric pumping, while the remaining 18.0% were "flowing wells" that are classified accordingly because they did not require any means of artificial lift.

In nominal peso terms, our exploration and production segment's capital expenditures for the ATG project were Ps. 1,487 million in 2016, Ps. 604 million in 2017 and Ps. 511 million in 2018. For 2019, we anticipate that our capital expenditures for this project will be Ps. 352 million and that total accumulated investments in this project will be approximately U.S. \$13.2 billion.

Crude Oil Sales

During 2018, domestic consumption of crude oil amounted to approximately 606.4 thousand barrels per day, which represented 33.3% of our total crude oil production. Through PMI's activities, we sold the remainder of our crude oil production abroad. Maya crude oil accounted for 92.1% of exported crude oil volume sold by PMI in 2018. See "—Business Overview—International Trading" in this Item 4.

The following table sets forth crude oil distribution for the past five years.

Crude Oil Distribution

	At December 31,					2018 vs. 2017 (%)
	2014	2015	2016	2017	2018	
	(in thousands of barrels per day)					
Production	2,428.8	2,266.8	2,153.5	1,948.3	1,822.5	(6.5)
Distribution						
Refineries	1,161.1	1,064.0	935.0	769.0	606.4	(21.1)
Export terminals	1,148.6	1,177.7	1,198.7	1,167.8	1,186.9	1.6
Total	2,309.7	2,241.7	2,133.7	1,936.7	1,793.3	(7.4)
Statistical differences in stock measurements⁽¹⁾	119.1	25.2	19.8	11.6	29.2	274.4

Note: Numbers may not total due to rounding.

(1) Includes measurement inconsistencies, shrinkage and leakage, naphthas and condensates added to crude oil.

Source: Pemex Exploration and Production.

Differences between the volume of crude oil measured at the wellhead and the volume distributed reflect customary adjustments due to, among other things, shifting inventories, evaporation, shrinkage and product segregation. In the past, we identified increases in the difference between the volumes of crude oil production and distribution. Based on an analysis conducted in coordination with the CNH, we implemented various corrective measures to improve our measurement methodology and management system, including continuously monitoring our wells, calibrating our measurement equipment and installing additional crude oil dehydration systems. To this end, sediment tanks have also been installed at marine terminals in order to accelerate water evaporation and crude oil stabilization in accordance with industry standards. In addition, crude oil barrels undergo a stabilization process in preparation for export, which involves certification by us, the buyer and a third party to verify that the contents meet international standards and contain no more than 0.5% water.

Gas Flaring

The flaring of produced gas, which consists of the burning off of surplus combustible vapors from a well, usually occurs as a result of operational adjustments to carry out maintenance at production facilities, and in some cases is due to limitations in the ability to handle, process or transport natural gas. In addition, the flaring of produced gas is also used as a safety measure to relieve well pressure. Gas flaring is considered to be one of the most significant sources of air emissions from offshore oil and gas installations. In 2018, gas flaring represented 3.7 % of total natural gas production, as compared to 4.3% of total natural gas production in 2017. The decreased gas flaring in 2018 was primarily due to improvement in the use of gas compression equipment on offshore platforms. We continue to implement programs to reduce gas flaring and improve gas extraction efficiency, including strategies to optimize the exploitation of wells with high associated gas content at the Cantarell project. In addition, in March 2017, we agreed to certain programs with the CNH, including five projects for U.S. \$3.0 billion, which may allow us to improve our gas utilization rate to up to 98.0% at our Ku-Maloob-Zaap business unit by 2020. We began to take action steps under this program in 2017 and are continuing to work towards increasing our gas utilization rate.

Pipelines

The crude oil and natural gas pipeline network owned by our exploration and production segment connects crude oil and natural gas producing centers with refineries and petrochemical plants. At the end of 2018, this pipeline network consisted of approximately 37,501 kilometers of pipelines, of which 2,060 kilometers were located in the Northeast Marine region, 1,144 kilometers were located in the Southeast Marine region, 9,656 kilometers were located in the Southern region, 24,641 kilometers were located in the Northern region. For a description of products transported by the pipeline network, see “—Business Overview—Logistics” in this Item 4.

Integrated Exploration and Production Contracts and Financed Public Works Contracts

Our FPWC program, previously known as the Multiple Services Contracts program, was first announced in December 2001. The objective of the program was to provide a contractual framework that promotes efficient execution of public works in order to increase Mexico’s oil and gas production. The FPWC were public works contracts based on unit prices that aggregate a number of different services into a single contract. Under the FPWC framework, Pemex Exploration and Production retains the rights and title to all oil and gas produced and works performed under each FPWC.

Our Integrated E&P Contracts program was established as part of reforms to the Mexican energy sector enacted in 2008. The objective of these Integrated E&P Contracts was to increase our execution and production capabilities. The oil and gas reserves located in and extracted from the areas to which we have a legal right, continue to be owned exclusively by the Mexican Government. Under this program, payments to the contractors were made on a per-barrel basis, plus recovery costs, provided that the payments did not exceed our cash flow from the particular block.

We may amend our Integrated E&P Contracts and FPWCs in order to align these contracts with the contractual framework established under the Hydrocarbons Law and existing Integrated E&P Contracts or FPWCs may be migrated into a contract for exploration and production upon agreement by the contract parties to the technical guidelines established by the Ministry of Energy (after seeking our favorable opinion) and the financial terms determined by the Ministry of Finance and Public Credit. Upon approval by the contract parties, the existing Integrated E&P Contract or FPWC will terminate and be replaced by the new contract for exploration and production without the need for a bidding process. If the contract parties do not agree to the proposed technical guidelines and contractual and financial terms, the original Integrated E&P Contract or FPWC remain in effect.

As of the date of this annual report, we have migrated three Integrated E&P Contracts to contracts for exploration and production:

- On December 18, 2017, the Integrated E&P Contract governing the Santuario and El Golpe blocks was migrated;
- On August 3, 2018, the Integrated E&P Contract governing the Ebano block was migrated; and
- On November 21, 2018, the Integrated E&P Contract governing the Miquetla Block was migrated.

In addition, we migrated the FPWCs governing the Misión block and the Olmos block on March 2, 2018 and February 22, 2018, respectively, to different contractual frameworks permitted under the *Petróleos Mexicanos* Law. We have also requested migration of the FPWCs governing the Pánuco, Altamira, Pitepec, Miahuapan and Magallanes blocks, which requests are being evaluated by the Ministry of Energy. For more information on the migration of these Integrated E&P Contracts and FPWCs, see “—Other Exploration and Production Contracts” below.

Among the FPWC works during 2018, maintenance activities were carried out in the Burgos project under the FPWC program. The work carried out in 2018 represented an investment of U.S. \$110.2 million. In 2018, natural gas production in the existing FPWC blocks reached 140.0 million cubic feet per day and condensate production reached 3.0 thousand barrels per day.

During 2018, contractors expended U.S. \$336.6 million in connection with Integrated E&P Contracts. In 2018, production in the existing Integrated E&P blocks reached 23.4 thousand barrels per day of crude oil and 34.4 million cubic feet per day of natural gas, for a total of 30.3 thousand barrels of oil equivalent per day.

Farm-Outs

Over the last several years, we have pursued farm-outs and other partnerships in order to diversify and strengthen our exploration and production portfolio and to focus on the most profitable projects. Through farm-outs, we sell a partial interest in fields that have been granted to us and enter into agreements for the joint operation of such fields. This requires third parties to make financial contributions to the partnership and to provide field services, allowing us to recoup some of our previous investments in the fields and to share some of the risk associated with the further development of the fields, while maintaining an interest in the future profits.

The Mexican Government has announced its intention to suspend bidding rounds for new farm-outs for a period of three years to provide an opportunity to evaluate the performance of existing farm-outs. The existing farm-outs will continue to operate in accordance with the terms and conditions of their respective contracts. We understand the Mexican Government will use the results of such evaluation to determine whether to pursue farm-outs in the future.

Trión Farm-Out

On July 28, 2016, the CNH published the tender offer and bidding package to select a partner for Pemex Exploration and Production to carry out exploration and production activities in the Trión block field assignments located in the Perdido Fold Belt in the Gulf of Mexico. Since the Trión block has a depth greater than 2,500 meters, it requires a high level of technical expertise and financial investment to develop.

On December 5, 2016, the CNH announced that BHP Billiton *Petróleo Operaciones de México, S. de R.L. de C.V.*, or BHP Billiton Mexico, an affiliate of BHP Billiton Limited and BHP Billiton Plc, had been selected as the partner for Pemex Exploration and Production in the Trión block farm-out. Pursuant to the terms of its bid, BHP Billiton Mexico made a U.S. \$789.6 million contribution to the partnership in exchange for a 60% participating interest in the Trión Block. BHP Billiton Mexico will be the operator of the Trión block, and must invest U.S. \$1.9 billion in the Trión farm-out before we are required to invest in the project, which will likely be in at least five years. The corresponding exploration and production contract, joint operating agreement and other relevant agreements were executed on March 3, 2017. This farm-out is currently in the first stage of exploration following approval of the exploration plan by the CNH in February 2018.

Ogarrio, Cárdenas-Mora and Ayin-Batsil Farm-Outs

In addition to the Trión farm-out, on October 4, 2017, the CNH held a bidding round for farm-outs of the Ogarrio, Cárdenas-Mora and Ayin-Batsil blocks. No bids were received for the Ayin-Batsil block, which is located in the shallow waters of the Gulf of Mexico. However,

multiple bids were received for the Ogarrio block, which currently produces approximately 4,900 barrels of crude oil per day and 16 million cubic feet of natural gas per day, and the Cárdenas-Mora block, which currently produces approximately 5,500 barrels of crude oil per day and 15.9 million cubic feet of natural gas per day. The Ogarrio and Cárdenas-Mora blocks, both onshore fields located in the state of Tabasco, were ultimately awarded to the German company Deutsche Erdoel AG (DEA) and the Egyptian company Cheiron Holdings Limited (Cheiron), respectively. DEA's bid consisted of an initial cash payment of U.S. \$190.0 million, a royalty rate of 13% and an additional cash payment of U.S. \$213.9 million, which is the highest sign-up bonus submitted in a CNH bidding round as of the date of this annual report. Cheiron's bid consisted of an initial cash payment of U.S. \$ 125.0 million, a royalty rate of 13% and an additional cash payment of U.S. \$41.5 million. The corresponding contracts were signed on March 6, 2018 and have a term of 25 years. We retain a 50% interest in both blocks. The fields are in operation pending approval by the CNH of the respective development plans.

Other Exploration and Production Contracts

In addition to the farm-outs described above, we have also pursued other types of partnerships for the exploration and production of fields that were not already granted to us.

On December 5, 2016, we participated in the bidding process referred to as Round 1.4, through which we, as part of a consortium consisting of Pemex Exploration and Production, Chevron Energía de Mexico, S. de R.L. de C.V., or Chevron Energía, a subsidiary of Chevron Corporation, and INPEX Corporation, were awarded an exploration contract for a field located in the Perdido Fold Belt in the Gulf of Mexico. The field covers an area of approximately 1,686.9 square kilometers and is located approximately 117 kilometers off the coast of Mexico in water depths ranging between 500 meters and 1,700 meters. Chevron Energía will be the operator and holds a 33.3334% interest in the consortium, while Pemex Exploration and Production and INPEX Corporation each hold a 33.3333% interest. The corresponding exploration and production contract, joint operating agreement and other relevant agreements were executed on February 28, 2017. This project is currently in the exploration phase following approval of the exploration plan by the CNH in February of 2018.

On May 2, 2017, Pemex Exploration and Production entered into a contract for crude oil extraction with the CNH to upgrade the assignments under the shared shallow water production structure for the Ek and Balam project area located in Campeche Sound. Under the contract, which has a term of 22 years with two possible five-year extensions, the Mexican Government will retain 70.5% of the operating profits and will pay Pemex Exploration and Production the remaining 29.5%. Pemex Exploration and Production has provided a guarantee of U.S. \$5.0 billion. During 2018, we produced an average of 34.1 thousand barrels per day of crude oil and 6.8 million cubic feet per day of gas pursuant to this contract.

On June 19, 2017, we participated in another bidding round conducted by the CNH, referred to as Round 2.1. As a result of this bidding process, we won two blocks. We were awarded Block 2, which covers an area of 549 square kilometers and is located on the continental shelf of the Tampico-Misantla basin, to the west of the Gulf of Mexico, in partnership with DEA. We are the operating partner in this block and own a 70% interest. Additionally, we were awarded Block 8, which is located in the Southeastern Basins and covers an area of 586 square kilometers, in partnership with Colombia's Ecopetrol. In Block 8, we are also the operating partner and own a 50% interest. The corresponding contracts for the exploration and extraction of hydrocarbons with DEA and Ecopetrol were signed on September 25, 2017. Both blocks are in the exploration phase following approval of the exploration plans by the CNH in November and October of 2018, respectively.

On December 18, 2017, we executed contracts for an association with Petrofac México, S.A. de C.V., or Petrofac, under which we assigned to Petrofac the rights to certain fields that were part of the El Golpe-Puerto Ceiba project, including the onshore fields of Santuario, El Golpe and Caracolillo, located in the state of Tabasco. We have a 64% share in this project. During 2018, we had an average production of 7.2 thousand barrels per day of crude oil and 5.7 million cubic feet per day of gas. These fields are currently in the development stage following approval of the exploration plan by the CNH in December of 2018.

On March 2, 2018, we completed the first migration of an FPWC. The FPWC governing the Misión block was migrated to a shared production contract with Servicios Múltiples de Burgos, S.A. de C.V. and the CNH. The Misión block is located in the states of Nuevo León and Tamaulipas. We have a 51% interest in the contractual area and the average production under this contract in 2018 amounted to 59.8 million cubic feet per day of gas. The Misión block is currently in the development stage following approval of the development plan by the CNH in January of 2019.

On March 27, 2018, we successfully participated in the first call of bidding Round 3 of the CNH, and were awarded seven contractual areas in shallow waters, six of them as part of a consortium and one on an individual basis. Pemex Exploration and Production won four blocks in the Southeast Basins: two in consortium with Total S.A., one with Shell Oil Company and one individually, as well as three blocks corresponding to the province of Tampico-Misantla-Veracruz: two in partnership with Compañía Española de Petróleos and one in partnership with DEA.

On May 7, 2018, we signed four hydrocarbon exploration and extraction contracts covering several deep-water blocks in the Gulf of Mexico, the rights to which were auctioned off pursuant to the bidding round referred to as Round 2.4:

- Exploration and production contract for block 2 with Shell Exploración y Extracción de México, S.A. de C.V., as operator. We have a 50% interest in the contractual area, which spans 2,146 square kilometers and is located in the Plegado Perdido Belt.
- Exploration and production contract for block 22 with Chevron Energía de Mexico, S. de R.L. de C.V., as operator, and Inpex E&P México, S.A. de C.V. We have a 27.5% interest in the contractual area, which spans 2,879 square kilometers and is located in the Cuenca Salina region.
- Exploration and production contract for block 5. We are the operator of and have a 100% interest in the contractual area, which spans 2,733 square kilometers and is located in the Plegado Perdido Belt.
- Exploration and production contract for block 18. We are the operator of and have a 100% interest in the contractual area, which spans 2,917 square kilometers and is located in Cordilleras Mexicanas basin.

On August 3, 2018, we migrated the Integrated E&P Contract for the Ebano block to a shared production contract with DS Servicios Petroleros, S.A. de C.V. (DIAVAZ), as operator, and D&S Petroleum, S.A. de C.V. The Ebano block spans an area of 1,569.1 square kilometers and is located in the states of Veracruz, San Luis Potosí and Tamaulipas. As of December 31, 2018, average production under this contract was 7.2 thousand barrels per day of crude oil and 3.8 million cubic feet per day of gas. We and DIAVAZ contributed to a corporate guarantee delivered to the Mexican Government in accordance with our respective interests in the partnership. The corporate guarantee totaled U.S. \$500 million, 55% of which was contributed by us and 45% of which was contributed by DIAVAZ.

On September 20, 2018, we signed a pre-utilization agreement related to certain tracts of the Yaxché fields and the shared production contract for Block 7 with a consortium of Talos Energy, as operator, Sierra Oil and Gas and Premier Oil. Both areas are located in the offshore regions of Mexico's Southeast basin. This was the first pre-utilization agreement signed in Mexico. Such agreements are permissible under recent changes to the legal and regulatory framework under which we operate. This pre-utilization agreement is a two year contract that enables information sharing relating to the Zama discovery, which is located in Block 7, and potential expansion of the Zama discovery into a neighboring block assigned to us. The pre-utilization agreement also contemplates the signing of a unit agreement and unit operating agreement in the event that a shared reservoir is confirmed. As a result of the pre-utilization agreement, we will form a working group with the consortium with the objectives of maximizing operational and informational efficiencies, optimizing the collection of data for the area and reducing potential hazards. The working group will be comprised of legal and technical representatives of the member companies.

On November 21, 2018, we migrated the Integrated E&P Contract for the Miquetla block to a license contract with Operadora de Campos DWF, S.A. de C.V., as operator. The Miquetla block spans 139.7 square kilometers and is located in the states of Puebla and Veracruz. As of December 31, 2018, average production under this contract was 135.6 thousand barrels per day of crude oil and 255.6 million cubic feet per day of gas. We have a 49% interest in the contractual area and the contract has a term of 30 years.

Collaboration and Other Agreements

Pemex Exploration and Production, or its predecessor Pemex-Exploration and Production, have entered into non-commercial scientific and technology agreements with the following parties, which remain in effect as of the date of this annual report:

- Pan American Oil, Plc (PAO), during 2015;
- Hokchi Energy, S.A. de C.V., during 2016;
- Kinder Morgan Texas LLC, during 2016;

- ENI México, S. de R.L. de C.V., during 2016;
- Ministerio de Energía y Minas de Nicaragua, Pan American Oil, PLC and the Empresa Nicaragüense del Petróleo (Petronic), during 2017;
- 3M México, S.A. DE C.V., during 2017; and
- Sun God Energía de México, S.A. de C.V., during 2018.

On March 6, 2019, we signed a memorandum of understanding with the Japan Bank for International Cooperation with a view to pursue strategic opportunities in the energy sector. We believe this collaboration strengthens our relationship with the Japan Bank for International Cooperation and may provide us with further access to financing opportunities.

Through these agreements, we have sought to increase our technical and scientific knowledge in areas including deepwater subsalt exploration and drilling; enhanced oil recovery processes, such as air injection; and reservoir characterization of complex structures. These broad agreements of technological and scientific collaboration are strictly non-commercial, *i.e.*, there is no transfer of resources and they do not establish a binding relationship among the parties.

Industrial Transformation

Our industrial transformation segment is comprised of two principal activities: (i) refining and (ii) gas and aromatics.

Refining

Refining Processes and Capacity

Our refining production processes include the following:

- *Atmospheric distillation.* This process heats crude oil in a tube furnace at atmospheric pressure to distill refined products. The primary products produced are gasoline, jet fuel, diesel, atmospheric gas oil and atmospheric residual crude oil.
- *Vacuum distillation.* This process heats crude oil or other feedstock in a vacuum distillation column, which is operated at low pressures. The objective of this process is to maximize production of heavy vacuum gas oil, which is produced by boiling crude oil.
- *Cracking.* This process uses either heat and pressure or a catalytic agent to increase gasoline yields from crude oil.
- *Visbreaking.* This is a thermal cracking process, which uses a horizontal-tube heater fired to a high temperature. Visbreaking reduces flasher bottom viscosity and produces some heavy gas oil.
- *Reforming processes.* These processes use heat and catalysts to transform smaller or unstable hydrocarbon molecules into larger, more useful refining or blending products. For example, we use reforming processes to convert low octane gasoline into higher octane stocks that are suitable for blending into finished gasoline and to convert naphthas into more volatile, higher octane products.
- *Hydrotreatment or residual hydrocracking.* This process uses a catalyst and hydrogen at high temperature and pressure to remove sulfur, nitrogen and some aromatic compounds. Hydrotreatment also processes some lighter liquid product off-take.
- *Alkylation and isomerization.* This polymerization process unites olefins and isoparaffins. Butylenes and isobutanes are combined with sulfuric acid or hydrofluoric acid to rearrange straight-chain hydrocarbon molecules into branched-chain products. Pentanes and hexanes, which are difficult to reform, are isomerized through the use of aluminum chloride and other precious-metal catalysts. Normal butane may be isomerized to provide a portion of the isobutane feed needed for the alkylation process. The process produces a high octane, low sensitivity blending agent for gasoline.
- *Coking.* This process is a severe method of thermal cracking used to upgrade heavy residuals into lighter products or distillates. Coking produces straight-run gasoline (coker naphtha) and various middle-distillate fractions used as catalytic feedstock, thus generating a concentrated solid material.

These production processes together constitute our production capacity as set forth in the table below.

Refining Capacity by Production Process

Production Process	At December 31,				
	2014	2015	2016	2017	2018
	(in thousands of barrels per day)				
Atmospheric distillation	1,602.0	1,640.0	1,602.0	1,627.0	1,640.0
Vacuum distillation	767.5	772.4	767.5	772.2	772.2
Cracking	422.5	422.5	422.5	422.5	422.5
Visbreaking	91.0	91.0	91.0	91.0	91.0
Reforming	279.3	279.3	279.3	279.3	279.3
Hydrotreatment	1,067.5	1,099.9	1,230.0	1,230.0	1,230.0
Alkylation and isomerization	154.3	154.8	154.3	154.3	154.3
Coking	155.8	155.8	155.8	155.8	155.8

Source: Base de Datos Institucional (Pemex Institutional Database, or Pemex BDI).

As of December 31, 2018, we owned and operated six refineries: Cadereyta, Madero, Minatitlán, Salamanca, Salina Cruz and Tula. Our refineries consist of atmospheric and vacuum distillation units, where the bulk of crude oil input is processed. Secondary processing facilities include desulfurization units and facilities for catalytic cracking, reforming and hydrotreating.

During 2018, our refineries processed 611.9 thousand barrels per day of crude oil (118.0 thousand barrels per day at Cadereyta, 19.2 thousand barrels per day at Madero, 26.2 thousand barrels per day at Minatitlán, 140.5 thousand barrels per day at Salamanca, 165.2 thousand barrels per day at Salina Cruz and 142.8 thousand barrels per day at Tula), which in total consisted of 395.8 thousand barrels per day of Olmeca and Isthmus crude oil and 216.1 thousand barrels per day of Maya crude oil.

During 2018, we were affected by operational reliability problems in main equipments at our refineries. To address the operational difficulties and improve reliability in the National Refining System, we intend to allocate additional resources for the maintenance of our six existing refineries, with the goal of improving efficiency and increasing production. This increase in efficiency and production, in turn, would help meet the national demand for refined products and maintain prices at competitive levels. We have prepared evaluations of each plant as to determine the specific maintenance requirements and the allocation of budgetary resources among our six existing refineries. In addition, in 2019 we intend to begin development of a new refinery located in Dos Bocas, Tabasco, in order to expand our production capacity.

Since 1993, through our subsidiary company, PMI-NASA, we have participated in a limited partnership with Shell Oil Company in a refinery located in Deer Park, Texas, which has the capacity to process 340 thousand barrels per day of crude oil. Under the Deer Park Limited Partnership agreement, PMI-NASA and Shell Oil Company each provide 50% of the refinery's crude oil input and own 50% of the refinery's output. This agreement is limited to the specific purpose of operating the Deer Park refinery.

Production

We produce a wide range of products derived from crude oil and natural gas, including LPG, gasoline, jet fuel, diesel, fuel oil, asphalts, lubricants and other refined products. In 2018, we produced 628.5 thousand barrels per day of refined products (including dry gas by-products of the refining process), as compared to 786.2 thousand barrels per day in 2017, representing a decrease of 20.1%. This decrease in refined products production was mainly due to a decrease in crude oil production as a result of operational difficulties related to the reliability of our refineries. Our Tula refinery operated only intermittently from January through September due to a shortage of light crude oil, breakdowns of plant equipment and excessive inventories of fuel oil. Our Madero refinery also experienced lower processing levels and production of petroleum products as a result of decreased operational performance in the atmospheric distillation plant. At the Minatitlán refinery, operations were affected by a fire at the combined Mayan atmospheric distillation plant in October of 2018.

This decrease was partially offset by an increase in crude oil processing at our Salina Cruz refinery of 28.3 thousand barrels per day in 2018, as compared with 2017. This improved performance was mainly a result of the stabilization of our operations as of March 2018, following the emergency shutdowns in 2017 caused by natural disasters, such as the tropical storm “Calvin” and an earthquake.

The following table sets forth, by category, our production of petroleum products for the five years ended December 31, 2018.

Refining Production

	Year ended December 31,					2018 vs. 2017 (%)
	2014	2015	2016	2017	2018	
Refinery Crude Oil Runs	1,155.1	1,064.5	933.1	767.0	611.9	(20.2)
Refined Products	(in thousands of barrels per day)					
Liquefied petroleum gas	26.4	21.4	17.2	15.8	10.1	(36.1)
Gasoline						
Pemex Magna	290.9	272.5	150.6	11.0	8.8	(20.0)
Ultra-Low Sulfur Magna	99.1	88.4	165.5	238.7	196.4	(17.7)
Pemex Premium ⁽¹⁾	30.8	16.8	7.7	5.6	1.9	(66.1)
Base	0.8	3.6	1.6	1.8	—	(100.0)
Total	421.6	381.4	325.3	257.0	207.1	(19.4)
Kerosene (Jet fuel)	53.4	47.8	42.8	40.5	34.7	(14.3)
Diesel						
Pemex Diesel ⁽²⁾	186.9	191.5	130.1	87.4	67.8	(22.4)
Ultra-Low Sulfur Diesel	97.8	83.0	85.1	63.8	48.9	(23.4)
Others	1.9	0.2	1.0	2.4	0.1	(95.8)
Total	286.6	274.7	216.2	153.6	116.8	(24.0)
Fuel oil ⁽³⁾	259.2	237.4	228.1	217.3	185.1	(14.8)
Other refined products						
Asphalts	23.9	17.7	16.9	16.5	13.8	(16.4)
Lubricants	3.7	2.3	3.0	1.9	1.9	—
Paraffins	0.6	0.5	0.6	0.4	0.5	25.0
Still gas	63.9	62.2	61.9	47.9	34.8	(27.3)
Other refined products ⁽⁴⁾	66.7	68.9	65.3	35.5	23.7	(33.2)
Total	158.8	151.6	147.6	102.1	74.7	(26.8)
Total Refined Products	1,206.1	1,114.3	977.2	786.2	628.5	(20.1)

Note: Numbers may not total due to rounding.

(1) Pemex Premium is an ultra-low sulfur gasoline with 0.003% sulfur content.

(2) Pemex Diesel is sold in the northern border market with 0.003% sulfur content.

(3) Includes heavy fuel oil and intermediate 15.

(4) Includes mainly coke, along with other products such as aeroflex, furfural extract, and light cyclic oil.

Source: Pemex BDI.

In 2018, gasoline represented 33.0%, fuel oil represented 29.5% and diesel fuel represented 18.6% of total petroleum products production. Jet fuel represented 5.5% and LPG represented 1.6% of total production of petroleum products in 2018. The remainder, 11.8%, of our production consisted of a variety of other refined products.

Variable Refining Margin

During 2018, the National Refining System recorded a variable refining margin of U.S. \$0.96 per barrel, a decrease of U.S. \$4.47 per barrel as compared to U.S. \$5.43 in 2017, mainly due to low margins in the last quarter of the year as a result of flattening prices of refined products and crude oil, which were caused by decreased demand for gasoline and an increase in the market supply of crude oil.

The following table sets forth the variable refining margin for the five years ended December 31, 2018.

Variable Refining Margin

	Year ended December 31,					2018 vs. 2017 (%)
	2014	2015	2016	2017	2018	
Variable margin	1.76	3.35	4.48	5.43	0.96	(82.3)

Domestic Sales

We market a full range of refined products, including gasoline, jet fuel, diesel, fuel oil and petrochemicals. We are one of a few major producers of crude oil worldwide that experiences significant domestic demand for our refined products.

For the five years ended December 31, 2018, the value of our domestic sales of refined products and petrochemicals was as follows.

Value of Refining's Domestic Sales⁽¹⁾

Refined Products	Year ended December 31,					2018 vs. 2017 (%)
	2014	2015	2016	2017	2018	
	(in millions of pesos) ⁽²⁾					
Gasoline						
Pemex Magna	Ps. 347,952.4	Ps. 274,006.9	Ps. 248,595.2	Ps. 361,021.7	Ps. 428,838.0	18.8
Pemex Premium	80,058.9	81,813.5	87,422.8	82,028.7	83,837.1	2.2
Aviation fuels (Others)	387.5	339.8	342.4	371.1	433.1	16.7
Total	Ps. 428,398.8	Ps. 356,160.2	Ps. 336,360.4	Ps. 443,421.5	Ps. 513,108.2	15.7
Kerosene (Jet fuel)	36,449.3	27,077.2	28,945.2	39,024.5	56,793.9	45.5
Diesel						
Pemex Diesel	194,545.6	139,796.2	117,556.3	181,854.4	207,499.4	14.1
Others	31,156.7	22,930.4	19,236.4	28,195.1	26,669.3	(5.4)
Total	Ps. 225,702.4	Ps. 162,726.7	Ps. 136,792.7	Ps. 210,049.5	Ps. 234,168.6	11.5
Fuel oil						
Total	46,838.3	25,906.0	16,436.3	35,622.9	43,779.1	22.9
Other refined products						
Asphalts	10,788.0	7,575.5	5,468.7	5,895.8	7,062.0	19.8
Lubricants	2,618.9	1,297.5	1,473.0	1,061.4	1,277.4	20.4
Paraffins	319.2	257.9	267.0	230.9	291.4	26.2
Coke	763.3	669.5	501.9	421.1	200.5	(52.4)
Citroline	0.4	0.9	4.6	3.6	—	(100.0)
Gas oil for domestic use	432.2	587.4	424.2	—	—	—
Total	Ps. 14,921.9	Ps. 10,388.8	Ps. 8,139.4	Ps. 7,612.8	8,831.2	16.0
Total Refined Products	Ps. 752,310.8	Ps. 582,258.9	Ps. 526,673.9	Ps. 735,731.2	Ps. 856,681.0	16.4
Petrochemicals⁽³⁾	Ps. 7,582.2	Ps. 3,930.9	Ps. 3,118.0	Ps. 3,905.6	Ps. 3,795.6	(2.8)

Note: Numbers may not total due to rounding.

(1) Excludes IEPS tax and value added tax. See “—Taxes, Duties and Other Payments to the Mexican Government” in this Item 4.

(2) Figures are stated in nominal pesos. See “Item 3—Key Information—Selected Financial Data.”

(3) Petrochemical products produced at refineries operated by our industrial transformation segment (carbon black feedstocks and propylene).

Source: Pemex BDI.

In 2018, our domestic sales of refined products increased by Ps. 120,949.8 million, or 16.4% in value, as compared to 2017 levels (excluding IEPS tax and value added tax). This was primarily due to a 15.7% increase in the value of our gasolines sales, an increase of 11.5% in the value of diesel sales and a 22.9% increase in the value of fuel oil sales, in each case primarily as a result of higher average prices.

The volume of our domestic sales of refined products for the five-year period ended December 31, 2018 was distributed as follows.

Volume of Refining's Domestic Sales

	Year ended December 31,					2018 vs. 2017 (%)
	2014	2015	2016	2017	2018	
	(in thousands of barrels per day, except where otherwise indicated)					
Refined Products						
Gasoline						
Pemex Magna	639.1	638.0	637.5	660.5	646.2	(2.2)
Pemex Premium	137.1	154.8	185.1	136.6	117.5	(14.0)
Aviation fuels (Others)	0.5	0.5	0.5	0.5	0.5	—
Total	776.7	793.3	823.1	797.5	764.2	(4.2)
Kerosenes (jet fuel)	66.5	70.8	76.2	81.7	85.6	4.8
Diesel						
Pemex Diesel	336.4	330.6	335.5	317.6	292.8	(7.8)
Others	53.0	54.2	51.8	47.9	38.5	(19.6)
Total	389.4	384.7	387.2	365.5	331.3	(9.4)
Fuel oil						
Total	121.7	111.7	102.6	124.7	105.1	(15.7)
Other refined products						
Asphalts	21.7	15.9	15.9	15.4	12.9	(16.2)
Lubricants	4.0	2.6	3.1	2.0	2.0	—
Paraffins	0.6	0.6	0.6	0.4	0.5	25.0
Coke	46.0	45.9	36.3	21.3	13.2	(38.0)
Citroline	—	—	0.01	0.01	—	(100.0)
Gas oil for domestic use	0.9	1.2	0.9	—	—	—
Total	73.3	66.2	56.9	39.1	28.5	(27.1)
Total refined products	1,427.6	1,426.7	1,446.0	1,408.4	1,314.8	(6.6)
Petrochemicals⁽¹⁾⁽²⁾	703.8	620.9	543.5	464.5	411.1	(11.5)

Note: Numbers may not total due to rounding.

(1) In thousands of metric tons.

(2) Petrochemical products produced at refineries operated by our refining business (black feedstocks and propylene).

Source: Pemex BDI.

The volume of our domestic gasoline sales decreased by 4.2% in 2018, from 797.5 thousand barrels per day in 2017 to 764.2 thousand barrels per day in 2018. The volume of our diesel sales decreased by 9.4%, from 365.5 thousand barrels per day in 2017 to 331.3 thousand barrels per day in 2018. The decrease in the volume of our domestic gasoline and diesel sales is mainly explained by increased competition in the open market. The volume of our domestic sales of fuel oil decreased by 15.7%, from 124.7 thousand barrels per day in 2017 to 105.1 thousand barrels per day in 2018, primarily due to a decrease in CFE's demand for fuel oil.

Sales of Pemex Premium gasoline decreased 14.0% in 2018, while those of Pemex Magna decreased 2.2% from the previous year. This change in consumption patterns is due to the increased price differential between the two kinds of gasoline.

We have also made concerted efforts to build and enhance our brands. Pursuant to these efforts, on June 5, 2016, Pemex Industrial Transformation announced the establishment of a joint branding program between us and various entities that own and operate retail service stations in Mexico. The joint branding program allowed our franchisees to rename their retail service stations while continuing to sell our products under our brand. In addition, we continued to provide technical and operational assistance to such franchisees. We believe that this program has strengthened our relationship with entities that own and operate retail service stations in Mexico, and we intend to continue our commercial branding strategy.

On November 15, 2017, we relaunched the "Pemex Franchise" image program with a new business model that includes new products and a variety of association structures. The goal of this program, which consists of nearly 10,000 service stations throughout Mexico, is to provide better service to end users and to strengthen the PEMEX brand. On October 11, 2018, we launched the seventh generation of our high-end performance additive that blends with our Pemex Magna and Pemex Premium gasolines. This additive will be promoted as Pemex Aditec. We believe Pemex Aditec could be a competitive advantage for our Pemex Franchise program.

As part of the Pemex Franchise program, we operate three association structures: (i) PEMEX Franchise, (ii) sublicensing of branded products, and (iii) the sale of generic, unbranded products. We also have two options for wholesale distribution: (i) independent retailers of unbranded products, and (ii) associate distributors of PEMEX-branded gasoline and diesel. In order to strengthen the PEMEX brand, we have introduced an optional redesign for service stations. As of December 31, 2018, 52 service stations have been redesigned and more than 112 are in the process of being redesigned.

As of December 31, 2018, there were 9,930 retail service stations in Mexico, of which 9,884 were privately owned and operated as franchises, while the remaining 46 were owned by Pemex Industrial Transformation. This total number of retail service stations represents a decrease of 14.3% from the 11,586 service stations as of December 31, 2017. This decrease was caused by increased competition in the open market. As of December 31, 2018, Pemex Industrial Transformation was party to 934 medium-long-term contracts with our franchisees, representing approximately 5,560 of the Pemex Franchise service stations. These medium-long-term contracts include the 20 most important customers in volume nationwide. In addition, Pemex Industrial Transformation supplies oil products to 2,006 service stations outside the Pemex Franchise program. Of these service stations, 386 operate under a sublicense of PEMEX brands and 1,620 use third-party brands.

Pricing Decreases

As of December 31, 2017, fuel prices in Mexico are fully liberalized. However, the CRE reserves the right to intervene. Therefore, our sales prices continue to be subject to potential future regulations by the CRE, until the *Comisión Federal de Competencia Económica* (Federal Economic Competition Commission) determines that there is effective competition in the wholesale market.

Gasoline and Diesel

As of December 31, 2017, sale prices of gasoline and diesel have been fully liberalized and are determined by the free market. For more information, see “Item 5—Operating and Financial Review and Prospects—IEPS Tax, Hydrocarbon Duties and Other Taxes.”

On January 1, 2018, in accordance with reports issued by the CRE, average national magna retail gasoline prices increased by Ps. 0.54 per liter, as compared to December 31, 2017. Similarly, average national retail diesel prices increased by Ps. 0.54 per liter on January 1, 2018, as compared to December 31, 2017.

Discount

Since the early 1980s, the Mexican Government has also established a discount of 30% on the price at which we sell gas oil intended for domestic use to the state of Chihuahua during the months of January, February and December of each year. On January 1, 2014, pursuant to the IEPS Tax on Fossil Fuels, such gas oil became subject to a one-time price increase of 10.857 Mexican cents per liter. Gas oil became subject to a one-time price increase of 11.307 Mexican cents per liter in 2015, 11.558 Mexican cents per liter as of January 1, 2016, 11.94 Mexican cents per liter as of January 1, 2017, 12.73 Mexican cents per liter as of January 1, 2018 and 13.33 Mexican cents per liter as of January 1, 2019. Notably, the discount on the price of gas oil in the state of Chihuahua was suspended in December 2016. As of the date of this annual report, this discount remains suspended.

Fuel Oil

Since December 2008, the price at which we sell fuel oil to CFE has been linked to international market prices in accordance with a pricing methodology established by the Mexican Government. This methodology is based on the price of fuel oil in the U.S. Gulf of Mexico coastal region, and is then adjusted for quality as well as expenses related to distribution.

As of January 1, 2017, the IEPS Tax on Fossil Fuels was 14.78 Mexican cents per liter, as of January 1, 2018, the IEPS Tax on Fossil Fuels was 15.76 Mexican cents per liter, and as of January 1, 2019, the IEPS Tax on Fossil Fuels was 16.50 Mexican cents per liter.

As of November 3, 2017, the CRE authorized new formulas to determine the price for fuel oil. As of December 31, 2017, there are first-hand sale prices for sales at refineries and market prices for sales at storage and distribution terminals. These prices are calculated weekly and apply to all customers, including the CFE.

The Mexican Government could modify these price controls or impose additional price controls in the future. See “Item 3—Key Information—Risk Factors—Risk Factors Related to our Relationship with the Mexican Government—The Mexican Government has historically imposed price controls in the domestic market on our products.”

We withhold IEPS Tax. While it is included in the price to our customers, we pay this tax to the authorities upon collection of the sale of our products and it is not included in our revenues. For more information, see “Item 4—Taxes, Duties and Other Payments to the Mexican Government—Fiscal Regime for PEMEX.”

Investments

Over the past several years, we have focused our investment program on enhancing the quality of the gasoline and diesel we produce to meet Mexico's environmental standards. In 2019, we are shifting our focus to the maintenance of our existing refineries and expansion of our refinery system. Our aim continues to be to improve our ability to process heavy crude oil in order to optimize the crude oil blend in our refineries and to increase production of unleaded gasoline and diesel in order to supply growing demand at a lower cost.

Our refining business invested Ps. 14,119 million in capital expenditures in 2018 and has budgeted Ps. 57,500 million in capital expenditures for 2019.

This increase in our capital expenditures budget is principally related to the Ps. 50,000 million we intend to allocate to the construction of the new Dos Bocas refinery in 2019. We expect this new refinery will allow us to increase our production capacity, and we are currently in the process of conducting and evaluating the studies required to carry out this project. Construction of the Dos Bocas refinery is expected to commence towards the end of 2019. In addition, this project was announced by the Mexican Government together with our refineries rehabilitation program on December 9, 2018. Pursuant to this rehabilitation program, we have evaluated each of our six existing refineries and have identified the specific maintenance requirements for each plant. For 2019, Ps. 7,500 million in capital expenditures is budgeted to carry out this rehabilitation plan.

The following table sets forth our refining business' capital expenditures, excluding non-capitalizable maintenance, for each of the three years ended December 31, 2018, and the budget for 2019. Capital expenditure amounts are derived from our budgetary records, which are prepared on a cash basis. Accordingly, these capital expenditure amounts do not correspond to capital expenditure amounts included in our consolidated financial statements prepared in accordance with IFRS.

Refining's Capital Expenditures

	Year ended December 31, ⁽¹⁾			Budget 2019 ⁽²⁾
	2016	2017	2018	
	(in millions of pesos) ⁽³⁾			
Refining				
Fuel Quality Investments ⁽⁴⁾	Ps. 10,702	Ps. 5,196	Ps. 2,636	Ps. —
Tuxpan Pipeline and Storage and Distribution Terminals	15	67	342	—
Residual Use at the Miguel Hidalgo Refinery in Tula (formerly Reconfiguration of Miguel Hidalgo Refinery in Tula)	8,610	1,912	306	—
Residual Conversion from Salamanca Refinery Project Refinery in Tula ⁽⁵⁾	749	773	101	—
Minatitlán Refinery Energy Train	1,849	—	18	—
Cadereyta Refinery Energy Train	1,100	—	—	—
Rehabilitation of National Refining System	872	—	—	—
Dos Bocas Refinery Project	—	—	—	7,500
Others	—	—	—	50,000
	6,604	8,039	10,716	—
Total	Ps. 30,501	Ps. 15,988	Ps. 14,119	Ps. 57,500

Notes: Numbers may not total due to rounding.

(1) Amounts based on cash basis method of accounting.

(2) Original budget published in the Official Gazette of the Federation on January 17, 2019.

(3) Figures are stated in nominal pesos.

(4) Includes clean fuels investments for gasoline and diesel in our six refineries.

(5) Includes pre-investments studies, on-site preparation and other expenses related to this project. This project concluded in 2018.

Source: *Petróleos Mexicanos*.

In 2018, we imported approximately 599.9 thousand barrels per day of gasoline, which represented approximately 78.5% of total domestic demand for gasoline in that year. Our priority in 2019 is to increase our production of oil products by focusing on the maintenance of our existing refineries and the development of the new Dos Bocas refinery in order to increase our production capacity.

Additionally, we intend to seek private sector financing for some of our projects such as the reconfiguration of the Miguel Hidalgo Refinery in Tula and the residual conversion of the Salamanca Refinery.

Our projects are described in further detail below.

Fuel Quality Project, Gasolines Phase (ULSG)

This project consisted of the installation of ULSG post-treatment units in our refineries in order to improve the quality of our gasoline. As of the date of this annual report, all gasoline produced in Mexico meets international environmental standards and we are winding down this project.

Fuel Quality Project, Diesel Phase (ULSD)

This project consists of the construction of five ULSD facilities, five hydrogen plants, four sulfur recovery units, five sour water treatment plants and the reconfiguration of 17 existing units to produce ULSD. However, as of the date of this annual report, this project has been suspended and our capital expenditures budget is focused on other areas of priority. We intend to continue to evaluate alternative sources of funding for this project.

Residual Use at the Miguel Hidalgo Refinery in Tula (formerly Reconfiguration of the Miguel Hidalgo Refinery in Tula)

The Miguel Hidalgo refinery in Tula has been undergoing renovations since 2014. This project consists of the construction of nine plants. The main project we have yet to complete is the new coking plant, which has been under construction for several years. The new coking plant is intended to modernize the refinery and to increase the production of various types of gasoline, diesel and jet fuel, which we estimate would allow us to increase production of refined oil products from 315 thousand barrels per day to 340 thousand barrels per day. As of December 31, 2018, construction of the coking plant, which was 62% complete, has been suspended due to budgetary constraints. We are currently evaluating funding alternatives, including through the use of private sector financing, in order to complete construction.

Residual Conversion of the Salamanca Refinery

The reconfiguration of the “Ingeniero Antonio M. Amor” refinery in Salamanca, Guanajuato has focused on the conversion of low-value residuals into high-steam high-value distillates (without a need for increased crude oil processing), as well as the modernization of the lubricants train to produce lubricants of greater value and quality. As of December 31, 2018, however, this project was approximately 12.8 % complete and has been suspended due to budgetary constraints. We are currently evaluating funding alternatives in order to resume this reconfiguration.

Tuxpan Maritime Terminal

The Tuxpan Maritime Terminal project is intended to help meet the increasing demand for refined products in the metropolitan area of the Mexico Valley. The total cost of the project is Ps. 5,637.9 million, which includes the construction of a pipeline measuring 18-inches in diameter and 109 kilometers in length from Cima de Togo to Venta de Carpio, five storage tanks located at the Tuxpan Maritime Terminal with a capacity of 100,000 barrels each, a research study to determine the best option for the discharge of refined products from tankers and pipelines into these storage tanks and auxiliary and integration services.

As of April 2018, two of the three key phases of this project were complete: the pre-investment studies and construction of the Tuxpan-Mexico pipeline. The pipeline is currently operating. The third phase, the storage system, is 96.8% complete, down from 98.4% in 2017 due to adjustments in the cost and scope of the project. We have arranged an extension with the Ministry of Finance and Public Credit to allow for additional time in which this final phase may be completed. Four of the five storage tanks have been delivered to the Tuxpan Maritime Terminal and are in operation. The fifth and remaining tank is 99.9% complete. The Tuxpan Maritime Terminal project is expected to be fully completed by the end of 2019, contingent on budget availability.

Maintenance at the Francisco I. Madero Refinery

On August 23, 2017, we commenced a scheduled gradual shutdown of our Francisco I. Madero refinery, located in Ciudad Madero, Tamaulipas, in order to implement a comprehensive general maintenance program for the plants at this refinery. Operations at the plants were restarted in February 2018, but we experienced start-up and stabilization difficulties which caused our Madero refinery to be out of operation during the second half of 2018. In January 2019, we were able to restart our Mayan plant and U-901 reformer after performing maintenance at these plants, and we expect to allocate additional resources to the maintenance of our other plants at this refinery in 2019 through the plan for rehabilitation of the National Refining System. We expect that this program will lead to improved safety and reliability of our operating processes and, in turn, improved performance of this refinery.

Hydrogen Supply for Refineries

In order to permit us to specialize, maximize value, and focus on the processing of crude oil, in the past we have partnered with third parties for projects related to auxiliary services, such as the supply of hydrogen to our refineries.

On September 1, 2017, we entered into long-term agreements with Air Liquide for the supply of hydrogen to the Miguel Hidalgo refinery in Tula. Air Liquide will operate the existing hydrogen plant at the Miguel Hidalgo refinery. In February 2018, we executed the plant's performance and stabilization tests, which was an important milestone under the contract with Air Liquide. In addition, in April 2018 we entered into a long-term agreement with Linde AG for the supply of hydrogen to our Madero refinery. In July 2018, we signed several agreements related to the supply of hydrogen to our Cadereyta refinery. However, some of the conditions precedent required by these agreements were not met, and these agreements were subsequently terminated. In 2018, we continued to experience shortages in the supply of hydrogen to our refineries, which has contributed to our operational difficulties. We intend to address the operational difficulties in our refineries through our plan for the rehabilitation of the National Refining System.

Rehabilitation of National Refining System

As part of our efforts to stabilize the operations of our refineries, we are adopting a plan for the rehabilitation of the National Refining System. Pursuant to this plan, we will allocate additional resources for the repair and maintenance of our six existing refineries. The goal of this plan is to repair and maintain our refinery infrastructure so as to improve efficiency and stabilize our crude oil processing. Our budget for this rehabilitation of the National Refining System for 2019 is Ps. 7,500 million. We are currently evaluating the optimal allocation of resources based on evaluations of our existing refineries, and, as of the date of this annual report, we have not allocated definitive amounts to specific projects.

Dos Bocas Refinery

In 2019, we announced our plans for the construction of a new refinery in Dos Bocas in the state of Tabasco. Our 2019 budget includes Ps. 50,000 million for the construction of the Dos Bocas refinery, of which Ps. 1,800 million has been allocated to conduct pre-investment studies. The Dos Bocas refinery is intended to increase our production of gasoline and diesel by processing additional volumes of heavy crude oil. As of the date of this annual report, we are preparing the business case for construction of the Dos Bocas refinery, which will be presented to the Board of Directors of Petróleos Mexicanos once complete.

Gas and Aromatics

Natural Gas and Condensates

All wet natural gas production is directed to our gas processing facilities. At the end of 2018, we owned nine facilities.

The following facilities are located in the Southern region:

- *Nuevo Pemex*. This facility contains 13 plants that together in 2018 produced 643.0 million cubic feet per day of dry gas, 28.3 thousand barrels per day of ethane, 32.6 thousand barrels per day of liquefied gas, 13.5 thousand barrels per day of naphtha and 51.4 thousand tons of sulfur.
- *Cactus*. This facility contains 22 plants that together in 2018 produced 522.0 million cubic feet per day of dry gas, 24.1 thousand barrels per day of ethane, 29.9 thousand barrels per day of liquefied gas, 10.5 thousand barrels per day of naphtha and 139.0 thousand tons of sulfur.
- *Ciudad Pemex*. This facility contains eight plants that together in 2018 produced 600.4 million cubic feet per day of dry gas and 183.9 thousand tons of sulfur.
- *La Venta*. This facility contains one plant that in 2018 produced 138.8 million cubic feet of dry gas per day.

- *Matapionche*. This facility contains five plants that together in 2018 produced 12.5 million cubic feet per day of dry gas, 0.6 thousand barrels per day of liquefied gas, 0.2 thousand barrels per day of naphtha and 2.9 thousand tons of sulfur.
- The Morelos, Cangrejera and Pajaritos facilities form the Coatzacoalcos area gas processing complex (which we refer to as a GPC):
 - o *Morelos*. This facility contains one plant that in 2018 produced 16.4 thousand barrels per day of ethane, 18.3 thousand barrels per day of liquefied gas and 4.9 thousand barrels per day of naphtha.
 - o *Cangrejera*. This facility contains two plants that together in 2018 produced 16.0 thousand barrels per day of ethane, 18.3 thousand barrels per day of liquefied gas and 5.0 thousand barrels per day of naphtha.
 - o *Pajaritos*. This facility contains one plant, which was non-operational in 2018 due to a lack of auxiliary services, and it remains non-operational as of the date of this annual report.

The following facilities are located in the Northern region:

- *Burgos*. This facility contains nine plants that together in 2018 produced 377.7 million cubic feet per day of dry gas, 8.2 thousand barrels per day of liquefied gas and 8.3 thousand barrels per day of naphtha.
- *Poza Rica*. This facility contains five plants that together in 2018 produced 104.9 million cubic feet per day of dry gas, 2.3 thousand barrels per day of liquefied gas, 0.9 thousand barrels per day of naphtha and 2.2 thousand tons of sulfur.
- *Arenque*. This facility contains three plants that together in 2018 produced 18.9 million cubic feet per day of dry gas and 1.4 thousand tons of sulfur.

Petrochemical Complexes

In addition to our gas processing facilities, we also own the following two petrochemical complexes:

- *Independencia*. The Independencia petrochemical complex consists of three plants and is located in the Central region. In 2018, this complex produced 148.4 thousand tons of methanol and 3.0 thousand tons of petrochemical specialties.
- *Cangrejera*. The Cangrejera petrochemical complex consists of five plants and an aromatics line and is located in the Southern region. In 2018, this complex produced 569.5 thousand tons of aromatics and derivatives and 265.7 thousand tons of other petrochemical products (butanes, hexane, hydrogen, pentanes, BTX liquids, petroleum products, naphtha gas and heavy naphtha).

The following tables set forth our processing capacity, as well as our total natural gas processing and production, for the five years ended December 31, 2018.

Gas and Aromatics' Processing and Production Capacity⁽¹⁾

	Year ended December 31,				
	2014	2015	2016	2017	2018
	(in millions of cubic feet per day, except where otherwise indicated)				
Sweetening plants					
Sour condensates ⁽¹⁾	144	144	144	144	144
Sour natural gas ⁽²⁾	4,523	4,523	4,523	4,523	4,523
Natural gas liquids recovery plants					
Cryogenics	5,912	5,912	5,912	5,912	5,912
Natural gas liquids fractionating⁽²⁾⁽³⁾	569	569	569	569	569
Processing of hydrosulfuric acid	219	219	219	229	229
Aromatic compounds and derivatives (Cangrejera and Independencia) ⁽⁴⁾⁽⁵⁾⁽⁶⁾	—	1,694	1,694	1,734	1,734

(1) Production capacity refers to aromatic compounds and derivatives.

(2) In thousands of barrels per day.

(3) The figure for 2016 has been restated.

(4) Thousand tons per year.

(5) Since November 2015, the operation of the Methanol I and II plants, the CPQ Independencia petrochemical specialties plant and the CPQ Cangrejera aromatic compounds plants have been assigned to Pemex Industrial Transformation.

(6) The increase in the production capacity for aromatic compounds and derivatives beginning in 2017 was the result of updates to design values of 100% capacity of our CCR reforming plants.

Source: Pemex BDI.

Natural Gas, Condensates and Aromatics' Processing and Production⁽¹⁾

	Year ended December 31,					2018 vs. 2019 (%)
	2014	2015	2016	2017	2018	
	(in millions of cubic feet per day, except where otherwise indicated)					
Processing						
Wet gas	4,343	4,073	3,672	3,237	2,952	(8.8)
Sour gas	3,356	3,225	2,997	2,688	2,492	(7.3)
Sweet gas ⁽²⁾	986	847	675	550	459	(16.5)
Condensates ⁽³⁾⁽⁶⁾	49	45	41	32	27	(15.6)
Gas to natural gas						
liquids extraction	4,303	3,904	3,450	3,199	2,782	(13.0)
Wet gas	4,172	3,745	3,394	3,086	2,782	(9.9)
Reprocessing streams ⁽⁴⁾	131	159	56	113	—	(100.0)
Production						
Dry gas ⁽⁵⁾	3,699	3,454	3,074	2,667	2,422	(9.2)
Natural gas liquids ⁽⁶⁾⁽⁷⁾	364	327	308	280	240	(14.3)
Liquefied petroleum gas ⁽⁶⁾⁽⁸⁾	205	174	159	144	122	(15.3)
Ethane ⁽⁶⁾	110	107	106	101	85	(15.8)
Naphtha ⁽⁶⁾	77	69	62	52	43	(17.3)
Sulfur ⁽⁹⁾⁽¹¹⁾	962	858	673	551	443	(19.6)
Methanol ⁽⁹⁾	168	161	145	116	148	27.6
Aromatic compounds and derivatives ⁽⁹⁾⁽¹⁰⁾	1,017	1,022	940	622	570	(8.4)
Others ⁽⁹⁾⁽¹²⁾	899	535	507	302	269	(10.9)

Note: Numbers may not total due to rounding.

GPC= Gas Processing Complex

(1) Excludes operations of our exploration and production segment, which produced 4,803 million cubic feet per day in 2018.

(2) Includes sweet vapor from condensates.

(3) Includes internal streams.

(4) Reprocessing of pipeline dry gas at the Pajaritos cryogenic plant.

(5) Includes ethane reinjected into the natural gas stream.

(6) In thousands of barrels per day.

(7) Includes stabilized condensates, reprocessing streams from the Cangrejera petrochemical complex and other streams for fractionating.

(8) Includes production from GPC, refineries and transfers from Pemex Exploration and Production.

(9) In thousands of tons.

(10) Includes aromine 100, benzene, styrene, ethylbenzene, fluxoil, high octane hydrocarbon and xylenes.

(11) Production of gas processing GPCs and refineries.

(12) Includes butanes, petrochemical specialties, pentanes, hexane, hydrogen, BTX liquids, isopentanes and petroleum products, naphtha gas, petrol octane base and heavy naphtha.

Source: Pemex BDI.

We process sour and sweet condensates from our exploration and production segment in order to obtain stabilized natural gas liquids and also recover liquid hydrocarbons obtained from the processing of sweet natural gas. In addition, we obtain natural gas liquids from internal streams and liquid hydrocarbons condensed in sour wet gas pipelines. Our production of natural gas liquids, including stabilized condensates, reprocessing and other fractionating streams, decreased by 14.3% from 280 thousand barrels per day in 2017 to 240 thousand barrels per day in 2018.

We process sour condensates, which have a higher sulfur content, to produce stabilized sweet condensates. The volume of sour condensates we processed from our exploration and production segment and internal streams of our gas and aromatic compound sub-segment totaled 27.0 thousand barrels per day in 2018, a 15.6% decrease from the 32.0 thousand barrels per day processed in 2017. We also process sweet condensates at our Burgos facilities to produce light and heavy natural gasoline.

The production of aromatic compounds and derivatives decreased 8.4%, from 622.0 thousand tons in 2017 to 570.0 thousand tons in 2018, mainly because our naphtha reforming plant (CCR) operated only intermittently due to equipment failure, and we experienced shortages in auxiliary services and the supply of raw materials from our Minatitlán refinery.

Over the five years ended December 31, 2018, the value of our domestic sales was distributed as follows:

Value of Gas and Aromatics' Domestic Sales⁽¹⁾

	Year ended December 31,					2018 vs. 2017 (%)
	2014	2015	2016	2017	2018	
	(in millions of pesos) ⁽²⁾					
Natural gas	Ps. 78,666.4	Ps. 53,037.3	Ps. 67,536.5	Ps. 74,287.7	Ps. 62,355.4	(16.1)
Liquefied petroleum gas	78,258.9	78,194.0	50,179.8	49,137.3	52,053.6	5.9
Ethane ⁽³⁾	283.6	310.7	1,284.7	2,989.7	3,203.4	7.1
Heptane	39.1	1.0	—	0.9	9.5	955.6
Propane	92.4	57.6	73.8	111.6	148.2	32.8
Light naphtha	2.8	39.7	84.5	158.8	221.4	39.4
Heavy naphtha	15.7	191.0	404.8	429.3	708.6	65.1
Sulfur	795.9	926.1	585.7	540.2	766.0	41.8
Methanol	775.5	748.4	625.1	806.9	1,089.9	35.1
Aromatic compounds and derivatives ⁽⁴⁾	4,427.5	3,479.4	2,122.1	1,673.1	1,759.8	5.2
Others ⁽⁵⁾	619.8	399.1	261.4	308.5	296.1	(4.0)
Total	Ps.163,977.6	Ps.137,384.3	Ps.123,158.4	Ps. 130,444.0	Ps. 122,611.9	(6.0)

Note: Numbers may not total due to rounding.

(1) Excludes value added tax.

(2) Figures are stated in nominal pesos.

(3) In January 2016, we began the supply of ethane to Braskem IDESA.

(4) Includes aromine 100, benzene, styrene, toluene, xylene.

(5) Includes petrochemical specialties, hydrogen, isopropane, hexane, pentane and naphtha gas.

Source: Pemex BDI.

The volume of our domestic sales of gas and aromatics for the five-year period ended December 31, 2018 was distributed as follows:

Volume of Gas and Aromatics' Domestic Sales

	Year ended December 31,					2018 vs. 2017 (%)
	2014	2015	2016	2017	2018	
	(in thousands of barrels per day, except where otherwise indicated)					
Natural gas ⁽¹⁾	3,451.2	3,246.6	3,347.3	2,623.0	2,064.3	(21.3)
Liquefied petroleum gas ⁽²⁾	282.1	278.8	202.1	171.3	165.1	(3.6)
Ethane	5.8	8.8	30.5	57.7	48.9	(15.3)
Heptane	3.0	0.1	—	0.1	0.5	400.0
Propane	9.7	10.1	11.3	11.3	11.8	4.4
Heavy naphtha ⁽³⁾	1.5	29.9	64.3	56.2	69.5	23.7
Light naphtha ⁽³⁾	0.3	6.2	13.3	19.9	21.3	7.0
Sulfur ⁽³⁾	655.3	572.7	580.5	529.9	450.5	(15.0)
Methanol ⁽³⁾	110.9	112.0	111.3	100.8	106.0	5.2
Aromatic compounds and derivatives ⁽³⁾⁽⁴⁾	246.8	240.0	155.1	111.3	101.6	(8.7)
Others ⁽³⁾⁽⁵⁾	48.3	40.5	29.6	28.2	22.8	(19.1)

Note: Numbers may not total due to rounding.

(1) In millions of cubic feet per day.

(2) In thousands of barrels per day.

(3) In thousands of tons per year.

(4) Includes aromine 100, benzene, styrene, toluene, ethylbenzene, fluxoil and xylene.

(5) Includes petrochemical specialties, hydrogen, isopropane, hexane, pentane and naphtha gas.

Source: Pemex BDI.

In 2018, the value of our domestic sales in gas and aromatics decreased by 6.0% as compared to 2017, reaching Ps.122,611.9 million. This decrease was mainly a result of a reduction in the domestic sales volume of natural gas.

Domestic sales of natural gas decreased by 21.3%, as compared to 2017, from 2,623.0 million cubic feet per day in 2017 to 2,064.3 million cubic feet per day in 2018, mainly due to competition from third-party suppliers in the national market.

Domestic sales of LPG decreased by 3.6%, as compared to 2017, from 171.3 thousand per barrels per day in 2017 to 165.1 thousand barrels per day in 2018. This decrease was primarily due to competition from private companies importing foreign LPG.

Subsidiaries of Pemex Industrial Transformation

Pemex Industrial Transformation conducts certain management, real estate and distribution activities through its subsidiaries and through certain joint ventures. The following table lists its subsidiaries, their principal operating activities and Pemex Industrial Transformation's ownership interest as of December 31, 2018.

Subsidiaries of Pemex Industrial Transformation⁽¹⁾

Subsidiary	Principal Activity	Ownership Interest (%)
Mex Gas Internacional, S.L. ⁽²⁾	Holding company	100.00
Terrenos para Industrias, S.A.	Real estate holding company	100.00

(1) As of December 31, 2018.

(2) Mex Gas Internacional, S.L. is the only subsidiary of Pemex Industrial Transformation that is a consolidated subsidiary company. See Note 5 to our consolidated financial statements included herein.

Source: Pemex Industrial Transformation

Divestitures

On October 5, 2017, the Board of Directors of Petróleos Mexicanos authorized the divestiture of our 5% indirect participation in TAG Norte Holding, S. of R. L. de C. V. (TAG Norte Holding) for the Ramones II Norte project. The divestiture was subsequently carried out on August 31, 2018 for a total amount of U.S. \$43.0 million.

Pricing Decrees

As of December 31, 2017, fuel prices in Mexico are fully liberalized. However, the CRE reserves the right to intervene. Therefore, until the *Comisión Federal de Competencia Económica* (Federal Economic Competition Commission) determines that there is effective competition in the wholesale market, our sales prices continue to be subject to potential future regulations by the CRE.

As of July 1, 2017, the CRE permits third-party participants to enter the gasoline and diesel market and has authorized the permanent regime of first-hand sales of natural gas. This permanent regime allows us to sell natural gas under two separate pricing mechanisms: (1) the first hand sale price, wherein we may sell natural gas directly to customers without additional transportation or services and (2) the full marketing price, wherein we may charge a higher price that includes transportation and services costs associated with the commercialization of natural gas.

Since 2003, price control mechanisms for LPG have been implemented through governmental decrees.

Since January 1, 2017, we have sold natural gas in accordance with the methodology authorized by CRE for determining the first-hand sales price at the point of delivery, and all end user prices are freely determined by the market.

We withhold IEPS tax. For more information, see “Item 4—Taxes, Duties and Other Payments to the Mexican Government—Fiscal Regime for PEMEX.”

The Mexican Government could modify these price controls or impose additional price controls in the future. See “Item 3—Key Information—Risk Factors—Risk Factors Related to our Relationship with the Mexican Government—The Mexican Government has historically imposed price controls in the domestic market on our products.”

Natural Gas Hedging Operations

We offer, as a value-added service, various hedging contracts to our domestic customers to protect them against fluctuations in the prices of natural gas. For information on hedging contracts offered to natural gas domestic customers, see “Item 11—Quantitative and Qualitative Disclosures about Market Risk.”

Gas and Aromatics Capital Expenditures

Our gas and aromatics business invested Ps. 2,907 million in capital expenditures in 2018. Our budget for 2019 does not contain any capital expenditures for this segment. However, we contemplate that we may re-allocate certain resources during 2019 in order to meet potential capital expenditure requirements for this segment.

The following table sets forth our gas and aromatics business' capital expenditures, excluding non-capitalizable maintenance, for each of the three years ended December 31, 2018, and the budget for 2019. Capital expenditure amounts are derived from our budgetary records, which are prepared on a cash basis. Accordingly, these capital expenditure amounts do not correspond to capital expenditure amounts included in our consolidated financial statements prepared in accordance with IFRS.

Gas and Aromatics' Capital Expenditures

	Year ended December 31, ⁽¹⁾			Budget 2019 ⁽²⁾
	2016	2017	2018	
	(in millions of pesos) ⁽³⁾			
Gas and Aromatics				
Modernization of Transportation Areas of GPCs	Ps. 482	Ps. 239	Ps. 644	Ps. —
Modernization and Rehabilitation of Facilities of the Supply and Water Treatment System at Nuevo Pemex GPC	255	216	241	—
Adaptation of Fractionation Plants and Conversion of the Liquids Sweetener at Nuevo Pemex GPC	174	271	136	—
Conditioning of the Venting Systems at Cactus GPC	75	147	131	—
Integral Maintenance of Gas Sweetening Plants 1, 2, 3 and 12 at Cactus GPC	116	64	53	—
Conservation and Modernization of the Storage Area at Coatzacoalcos Area GPC	88	32	53	—
Security Requirements for Improvement of Operational Reliability of the GPCs	87	31	41	—
Modernization of Measuring, Control and Security Systems of GPCs	481	—	—	—
Refurbishment and Modernization of Natural Gas Turbocompressors of the Cryogenic Plants at Nuevo Pemex GPC	257	41	—	—
Integral Project of Electric Reliability at GPCs	177	22	—	—
Refurbishment of Refrigerating and Ethane Turbocompressors of Fractionating Plants at Nuevo Pemex GPC	119	—	—	—
Conservation of Processing Capacity at Nuevo Pemex GPC	70	—	—	—
Conservation of Operational Reliability at Ciudad Pemex GPC	31	6	—	—
Conditioning of Facilities for Ethane Supply at Cactus GPC	21	5	—	—
Integral Facilities Maintenance at Cactus GPC	21	—	—	—
Others	992	1,514	1,609	—
Total	Ps. 3,446	Ps. 2,587	Ps. 2,907	Ps. —

Notes: Numbers may not total due to rounding.

GPC= Gas Processing Complex.

PC= Petrochemical Complex.

(1) Amounts based on cash basis method of accounting.

(2) Original budget published in the Official Gazette of the Federation on January 17, 2019.

(3) Figures are stated in nominal pesos.

Source: *Petróleos Mexicanos*.

Ethane Supply Contract

On February 19, 2010, we entered into a contract to supply 66,000 barrels per day of ethane to the Etileno XXI project, a petrochemical complex in Nanchital, Veracruz that produces ethylene and polyethylene. The Etileno XXI project commenced operations on March 18, 2016. The Etileno XXI project is owned and operated by Braskem-IDES, a Brazilian-Mexican consortium. In order to meet the obligations of this contract, we made adjustments to the infrastructure of our gas processing plants in the Ciudad Pemex, Nuevo Pemex and Cactus. Additional ethane is transported from the gas processing plants located in Tabasco, in southeastern Mexico, to Coatzacoalcos, Veracruz. This contract provides for "take or pay—delivery or pay" obligations for the parties, and thus, in case of breach of our supply obligation, we are subject to the payment of liquidated damages. In the event of termination as a consequence of our material default under the ethane supply contract, we may be obligated to pay to the other parties involved in the project an amount equal to the termination value of this project (the value of which is determined pursuant to the contract and takes into consideration, among other factors, the outstanding debt of the project and the amount invested in the project at such time). As of December 31, 2016, construction of the pipeline to transport ethane from the gas processing plants located in Tabasco to Coatzacoalcos, Veracruz, was complete. During 2018, we supplied 804.5 million cubic meters of ethane for a total of Ps. 3,203.4 million under this contract.

Fertilizers

Our fertilizers segment operates through the productive state-owned subsidiary Pemex Fertilizers and integrates the ammonia production chain up to the point of sale of fertilizers, including agricultural and industrial nitrates, phosphate fertilizers and acids (produced by Fertinal). We also expect that our subsidiary Pro-Agroindustria will be able to begin producing urea at our Pajaritos petrochemical complex in the second half of 2019.

Our strategy focuses on: (1) increasing the national fertilizers production at competitive prices; (2) increasing the economic value of our segment by generating diverse investment opportunities in the agricultural sector in Mexico; (3) ensuring a reliable supply of natural gas for the operation of our plants; and (4) continuing to make capital expenditure investments to strengthen the operational reliability of our four ammonia plants.

We expect to have two ammonia plants in operating condition during the second half of 2019. Taking into account the product mix of fertilizers we are currently producing, our Fertinal segment is operating near full capacity, but we intend to improve our profit margins by increasing our sales in the domestic market.

In addition, as part of our strategy we intend to integrate our Fertinal segment into the production chain of natural gas to ammonia to fertilizers. We expect that this integration will help us offer a wide range of fertilizers, nitrogen and phosphates at competitive prices. In addition, we expect that establishing new commercial channels will allow us to bring the supply of ammonia and fertilizers closer to industrial and agricultural producers throughout the country.

Capacity

As of December 31, 2018, we owned four petrochemical plants, one of which was in operation, for the production of ammonia. Two of our plants are scheduled to undergo a major rehabilitation in March and September of 2019, respectively, and another plant will also require rehabilitation, which will be scheduled based on the availability of resources. We had a total production capacity of 1,440 thousand tons of ammonia per year in 2018.

The total production capacity of our operating plants for the last three years was distributed among our facilities as set forth below:

Fertilizers Segment's Total Capacity

Petrochemical Complexes	Year ended December 31,		
	2016	2017 (thousands of tons)	2018
Cosoleacaque (ammonia)	1,440	1,440	1,440

Source: Pemex Fertilizers.

Production

The following table summarizes the annual production of our fertilizers segment for the three years ended December 31, 2018.

Fertilizers Segment's Production

Methane Derivatives	Year ended December 31,			2018 vs. 2017 (%)
	2016	2017 (thousands of tons)	2018	
Ammonia	533	500	151	(69.8)
Carbon dioxide	786	844	372	(55.9)
Total	1,319	1,343	523	(61.1)

Note: Numbers may not total due to rounding.

Source: Pemex BDI.

Total annual production of methane derivatives in 2018 decreased 61.1% from 1,343 thousand tons in 2017 to 523 thousand tons in 2018. This decrease was mainly due to shortages in the supply of raw material that has kept our Cosoleacaque plant out of operation since mid-August of 2018 and unscheduled stoppages during the first half of 2018 due to equipment failure.

In 2018 we produced 151 thousand tons of ammonia, which represents a decrease of 69.8% as compared to 500 thousand tons produced in 2017. In 2018, we produced 372 thousand tons of carbon dioxide, a by-product of the production process, which represents a 55.9% decrease as compared to 2017.

Sales of Fertilizers

The following table sets forth the value of our domestic sales for the three years ended December 31, 2018.

Value of Fertilizers Segment's Domestic Sales⁽¹⁾

	Year ended December 31,			2018 vs. 2017 (%)
	2016	2017 (in millions of pesos) ⁽²⁾	2018	
Methane Derivatives				
Ammonia	Ps. 4,593.1	Ps. 4,676.5	Ps. 5,544.3	18.6
Carbon dioxide	90.2	109.1	56.8	(47.9)
Urea (resale)	6.9	—	—	—
Total	Ps. 4,690.1	Ps. 4,785.7	Ps. 5,601.1	17.0

Note: Numbers may not total due to rounding.

(1) Excludes value added tax.

(2) Figures are stated in nominal pesos.

Source: Pemex BDI.

In 2018 the value of domestic sales in our fertilizers segment increased by 17.0%, from Ps. 4,785.7 million in 2017 to Ps. 5,601.1 million in 2018, primarily due to an increase in the sales price of ammonia, and to a lesser extent due to the increase in sales volume of ammonia, as presented in more detail below.

Volume of sales

The following table sets forth the value of our domestic sales for the three years ended December 31, 2018.

Volume of Fertilizers Segment's Domestic Sales

	Year ended December 31,			2018 vs. 2017 (%)
	2016	2017 (thousands of tons)	2018	
Methane Derivatives				
Ammonia	752.8	760.4	771.7	1.5
Carbon dioxide	179.7	207.6	151.3	(27.1)
Urea (resale)	1.7	—	—	—
Total	934.3	968.0	923.0	(4.6)

Note: Numbers may not total due to rounding.

Source: Pemex BDI.

Fertilizers Capital Expenditures

Our fertilizers segment invested Ps. 331 million in capital expenditures in 2018 and has budgeted Ps. 500 million in capital expenditures for 2019. The following table sets forth our fertilizers segment's capital expenditures, excluding non-capitalizable maintenance, for each of the three years ended December 31, 2018, and the budget for 2019. Capital expenditure amounts are derived from our budgetary records, which are prepared on a cash basis. Accordingly, these capital expenditure amounts do not correspond to capital expenditure amounts included in our consolidated financial statements prepared in accordance with IFRS.

Fertilizers' Capital Expenditures

	Year ended December 31, ⁽¹⁾			Budget 2019 ⁽²⁾
	2016	2017	2018	
	(in millions of pesos) ⁽³⁾			
Fertilizers				
Rehabilitation of Primary Reformers and Auxiliary Ammonia Plant VI and VII of Cosoleacaque PC	Ps. —	Ps. 75	Ps. 138	Ps. 170
Efficiency in Storage and Distribution	45	38	72	—
Rehabilitation of the ammonia plant No. V, at Cosoleacaque PC	—	—	38	11
Maintenance of refrigeration and ammonia storage plant No. 2 of the Pajaritos Refrigerated Terminal	—	—	30	50
Maintaining the Production Capacity of Ammonia Plant VII and its Auxiliary Services at Cosoleacaque PC	18	5	22	—
Maintaining the Production Capacity of Ammonia Plant VI at Cosoleacaque PC	16	—	18	—
Rehabilitation of Ammonia Plant IV and Integration and Auxiliary Services for Cosoleacaque PC	295	102	11	—
Safety and Environmental Protection, Derived from Observations and Regulations II in Cosoleacaque PC	5	—	—	—
Maintenance of the Ammonia Refrigeration and Storage Plant No. 1 of the Pajaritos Refrigerated Terminal	—	—	—	157
Maintenance for transportation, storage and handling of Ammonia	—	—	—	112
Others	—	45	2	—
Total	Ps. 379	Ps. 264	Ps. 331	Ps. 500

Notes: Numbers may not total due to rounding.

PC = Petrochemical Complex.

(1) Amounts based on cash basis method of accounting.

(2) Original budget published in the Official Gazette of the Federation on January 17, 2019.

(3) Figures are stated in nominal pesos.

Source: *Petróleos Mexicanos*.

Pajaritos Petrochemical Complex

In 2014, we acquired a non-operating nitrogen fertilizer production facility located in Pajaritos, Veracruz. The rehabilitation of the facility involved the restoration of our rotating, static and mechanical equipment, the construction of a carbon dioxide compression station, as well as other auxiliary projects. The rehabilitation was completed in the second quarter of 2018. While tests were started at that time, production could not be stabilized due to the discontinuous operation of our Cosoleacaque petrochemical complex, which led to an insufficient supply of ammonia. We expect that we will be able to start operations at this facility in the second half of 2019, and, once the production stabilizes, we expect to have a production capacity of 90 thousand tons of urea per month.

Fertinal

Fertinal produces fertilizers, primarily phosphates, as well as acids and other agricultural and industrial nitrates, and operates an industrial complex located in Lázaro Cárdenas, Michoacán. Fertinal's total production capacity for the three years ended December 31, 2018 is as set forth below.

Fertinal Segment's Total Capacity

	Year ended December 31,		
	2016	2017	2018
	(thousands of tons)		
Nitrate and phosphates ⁽¹⁾	1,299	1,420	1,225

(1) During 2018, we produced Triple Superphosphate, which limits the production capacity for Diamonic Phosphate / Monoammonium phosphate, which, in turn, reduced our total production capacity.

Source: Fertinal Group

Fertinal's total production for the three years ended December 31, 2018 is set forth below.

Fertinal Segment's Production

	Year ended December 31,			2018 vs. 2017 %
	2016	2017	2018	
	(thousands of tons)			
Phosphates	682.0	763.9	880.7	15.3
Nitrate	187.3	220.8	225.1	1.9
Others	5.7	3.5	23.3	565.7
Total	875.0	988.2	1,129.1	14.3

Source: Fertinal Group

The following table sets forth the value of Fertinal's domestic sales for the three years ended December 31, 2018.

Value of Fertinal's Domestic Sales⁽¹⁾

	Year ended December 31,			2018 vs. 2017 %
	2016	2017	2018	
	(in millions in pesos) ⁽²⁾			
Phosphates	Ps. 1,430.9	Ps. 1,717.5	Ps. 1,576.1	(8.2)
Nitrates	1,154.3	1,099.1	1,316.9	19.8
Ammonia	33.5	108.6	1,168.2	975.7
Sulfur	—	11.1	158.7	1,329.7
Sulfuric Acid	7.5	4.5	2.5	(44.4)
Others	20.4	24.7	32.6	32.0
Total	Ps. 2,646.6	Ps. 2,965.5	Ps. 4,255.0	43.5

Note: Numbers may not total due to rounding.

(1) Excludes value added tax.

(2) Figures are stated in nominal pesos.

Source: Fertinal Group.

The increase in our sales in 2018 was mainly due to an increase in the production available for sale, better prices obtained in the market as compared to 2017 prices (an average price increase of approximately U.S. \$45.00 per ton), and an increase in sales of other products such as ammonia, sulfur and industrial use acids.

In 2018, we implemented a strategic plan to consolidate optimal production levels, continue to manage short-term cash flows and strengthen our financial position. As a result, in 2018 we operated at 90.3% of our total production capacity and produced 1,106.0 thousand tons of final product, which represents an increase of 12.3% as compared to 2017.

Ethylene

Our ethylene segment operates through the productive state-owned subsidiary Pemex Ethylene and takes advantage of the integration of the ethylene production chain by manufacturing various petrochemical products. Our ethylene segment manufactures various petrochemical products, including:

- ethane derivatives, such as ethylene, polyethylenes, ethylene oxide and glycols;
- propylene and derivatives; and

- others such as oxygen, nitrogen, hydrogen and butadiene, among other products.

Capacity

Total production capacity of our operating plants for the three years ended December 31, 2018 was distributed among our facilities as set forth below.

Ethylene Segment's Production Capacity

	Year ended December 31,		
	2016	2017	2018
	(in thousands of tons)		
Petrochemical Facility			
Cangrejera ⁽¹⁾	1,321.3	1,321.3	1,321.3
Morelos	<u>2,277.2</u>	<u>2,277.2</u>	<u>2,277.2</u>
Total	<u><u>3,598.5</u></u>	<u><u>3,598.5</u></u>	<u><u>3,598.5</u></u>

Notes: Numbers may not total due to rounding.

(1) Our ethylene segment's capacity in Cangrejera does not include products from the aromatics and derivatives chain. These products belong to Pemex Industrial Transformation.

Source: Pemex Ethylene.

Production

The following table sets forth our ethylene segment's production for the three years ended December 31, 2018.

Ethylene Segment's Production⁽¹⁾

	Year ended December 31,			2018 vs. 2017 (%)
	2016	2017 (in thousands of tons)	2018	
Ethane derivatives	1,690.7	1,274.1	1,304.8	2.4
Propylene and derivatives	42.8	12.9	16.5	27.9
Others	795.2	597.0	509.0	(14.7)
Total⁽¹⁾	2,528.7	1,884.0	1,830.3	(2.9)

Note: Numbers may not total due to rounding.

(1) Figures include petrochemical products used as raw material to produce other petrochemicals.

Source: Pemex BDI.

In 2018, our total production in the ethylene segment decreased 2.9%, from 1,884.0 thousand tons in 2017 to 1,830.3 thousand tons in 2018, primarily due to a decrease in the national supply of ethane, which impacts the production of ethylene and its derivatives, in particular linear low-density polyethylene.

During 2018, Pemex Ethylene reengineered its refrigerated terminal to provide ethane refrigeration rather than ethylene refrigeration, which allows us to import ethane, a raw material necessarily for our operations of which we have had a domestic shortage in recent years. We began to import ethane in January 2018. Our Cangrejera Low Density Polyethylene Plant experienced growth in production, with 2018 production volume increasing 30.0% as compared to 2017, which was primarily due to increased operative reliability and an increased supply of raw materials due to our new capacity to import ethane.

Domestic Sales

The following table sets forth our ethylene segment's domestic sales for the three years ended December 31, 2018.

Value of Ethylene Segment's Domestic Sales⁽¹⁾

	Year ended December 31,			2018 vs. 2017 (%)
	2016	2017 (in millions of pesos) ⁽²⁾	2018	
Ethane derivatives	Ps. 14,539.4	Ps. 12,252.7	Ps. 12,472.8	1.8
Propylene and derivatives	788.3	340.7	314.4	(7.7)
Others	64.8	28.3	45.9	62.2
Total	Ps. 15,392.5	Ps. 12,621.7	Ps. 12,833.2	1.7

Note: Numbers may not total due to rounding.

(1) Excludes value added tax.

(2) Figures are stated in nominal pesos.

Source: Pemex BDI.

In 2018, the value of our domestic sales increased by 1.7% from Ps. 12,621.7 million in 2017 to Ps. 12,833.2 million in 2018. This increase was primarily due to an increase in income from sales of glycols and low-density polyethylene. In 2018, the volume of our domestic sales decreased by 1.5% as compared to 2017 figures.

On June 27 2018, Pemex Ethylene successfully concluded its second auction to allocate the supply of ethylene oxide, which is a derivative of ethane. Eleven customers, including domestic ethoxylation companies and import brokers, participated in the auction, which resulted in 98.0 % of the available volume being placed at a fair market price.

Sales to other Subsidiary Entities

The following table sets forth the intercompany sales of petrochemical products for the three years ended December 31, 2018.

Ethylene Segment's Intercompany Sales⁽¹⁾

	Year ended December 31,			2018 vs. 2017 (%)
	2016	2017	2018	
		(in millions of pesos)⁽²⁾		
Ethane and derivatives	Ps. 109.8	Ps. 1.1	Ps. 2.5	127.3
Others	457.8	284.2	62.5	(78.2)
Total	Ps. 567.6	Ps. 285.3	Ps. 64.5	(77.4)

Note: Numbers may not total due to rounding.

(1) Excludes value added tax.

(2) Figures are stated in nominal pesos.

Source: Pemex Ethylene.

In 2018, our intercompany sales decreased by 77.4%, from Ps. 285.3 million in 2017 to Ps. 64.5 million in 2018. This decrease was primarily due to a reduction in the volume of intercompany sales of nitrogen, hydrogen and pyrolysis gasoline in 2018, as compared to 2017, mainly because Pemex Industrial Transformation did not purchase any pyrolysis gasoline in 2018. We addressed this change in intercompany demand by exporting our products.

Ethylene Capital Expenditures

Our ethylene segment invested Ps. 975 million in capital expenditures in 2018, and has budgeted Ps. 300 million for capital expenditures in 2019.

The following table sets forth our ethylene segment's capital expenditures, excluding non-capitalizable maintenance, for each of the three years ended December 31, 2018, and the budget for 2019. Capital expenditure amounts are derived from our budgetary records, which are prepared on a cash basis. Accordingly, these capital expenditure amounts do not correspond to capital expenditure amounts included in our consolidated financial statements prepared in accordance with IFRS.

Ethylene's Capital Expenditures

	Year ended December 31, ⁽¹⁾			Budget 2019 ⁽²⁾
	2016	2017	2018	
Ethylene⁽⁴⁾		(in millions of pesos) ⁽³⁾		
Modernization of Fire Protection Network at Cangrejera PC	Ps. 71	Ps. 68	Ps. 171	Ps. —
Modernization and Expansion of Production Capacity of Ethane Derivatives Chain I at Morelos PC	3	—	168	—
Maintaining the Production Capacity of the Swing Plant 2015-2017 at Morelos PC	6	16	78	—
Sustainability of the Production Capacity of the Ethylene Plant at Morelos PC	3	43	75	62
Acquisition of Catalysts for Pemex Ethylene Plants	—	—	72	56
Maintaining the Production Capacity of Ethylene Oxide Plant 2015-2017 at Morelos PC	23	49	69	23
Maintenance program of the Capacity of the Low Density Polyethylene plant at Cangrejera PC	—	64	48	—
Maintenance Program of the Ethylene Plant at Cangrejera PC	—	39	48	—
Rehabilitation of Maintenance Areas to Support Production at Cangrejera PC	20	82	47	—
Modernization and Optimization of Infrastructure and Auxiliary Services I at Cangrejera PC	105	74	43	—
Maintenance of the Production Capacity of the Asahi Plant 2015-2017 at Morelos PC	4	13	26	14
Maintenance program for the production capacity of the Ethylene Oxide plant at Cangrejera PC	—	2	20	49
Maintaining the Production Capacity of Auxiliary Services at Morelos PC	17	4	18	—
Maintaining the Production Capacity of the Mitsui plant 2015-2017 at Morelos PC	8	14	8	23
Maintenance of the Production Capacity of the Ethylene Oxide Plant at Cangrejera PC	103	38	3	—
Maintaining the Production Capacity of Ethylene Plant 2013-2015 at Morelos PC	122	—	—	—
Safety and Environmental Protection Based on Observations and Regulations IV at Morelos PC	43	1	—	—
Maintaining Production Capacity of the Low Density Polyethylene Plant	40	67	—	—
Maintaining the Production Capacity of Ethane Derivatives Chain II at Morelos PC	38	1	—	—
Maintaining the Production Capacity of Auxiliary Services II	27	16	—	—
Maintaining the Production Capacity of Auxiliary Services III	17	8	—	—
Maintaining the Production Capacity of the Ethane Derivatives Chain III at Morelos PC	8	1	—	—
Others	88	18	81	73
Total	Ps. 746	Ps. 618	Ps. 975	Ps. 300

Notes: Numbers may not total due to rounding.

PC = Petrochemical Complex.

(1) Amounts based on cash basis method of accounting.

(2) Original budget published in the Official Gazette of the Federation on January 17, 2019.

(3) Figures are stated in nominal pesos.

(4) Capital expenditures were made for certain projects in years following the original term indicated in the project title.

Source: *Petróleos Mexicanos*.

Joint Venture with Mexichem

Petroquímica Mexicana de Vinilo S.A. of C.V. (PMV) was a joint venture of the Vinyl Business Group of Mexichem, S.A.B. de C.V. (Mexichem) and PPQ Cadena Productiva S.L. (PPQ), a subsidiary of Pemex Ethylene. On December 20, 2017, Mexichem announced that the Board of Directors of PMV decided not to rebuild its Vinyl Monochloride (VCM) production capacity, as the plant was damaged in a 2016 explosion. Therefore, the joint venture's VCM production, and the assets and liabilities associated with ethylene production and auxiliary services associated with VCM and ethylene were classified as discontinued operations.

On November 30, 2018, we concluded the sale of our total 44.09% interest in PMV and total 44.09% interest in PMV Minera, S.A. de C.V. (PMV Minera) to Mexichem. These sales were recorded as investments in joint ventures and associates. The sale price for PMV was Ps. 3,198.6 million and the sale price for PMV Minera was Ps. 53.7 million. We recognized a gain of Ps. 689.3 million and Ps. 1.6 million, respectively.

Drilling and Services

Our drilling and services segment operates through the productive state-owned subsidiary Pemex Drilling and Services and provides drilling, completion, work-over and other services for wells in offshore and onshore fields. During 2018, this segment mainly provided drilling services to Pemex Exploration and Production, but also provided services to third-party clients.

During 2018, we drilled 115 wells, 75 onshore and 40 offshore; completed 91 wells, 55 onshore and 36 offshore; and made 542 work-overs, 446 onshore and 96 offshore. Of the wells completed, one was for CONAGUA. Those services were performed with an average of 78 drilling and work-over rigs, 46 terrestrial and 32 marine, including both owned and leased equipment. Moreover, we conducted 20,312 well services in 2018,

of which 50.2% were wireline operations, 29.0% were cementing jobs, 16.5% were logging operations and perforations and 4.4% were coiled tubing operations. In addition, we provided drilling and services to external customers such as CONAGUA, Marinsa, Latina, Fieldwood and Key Energy.

Given the slight recovery of the oil and gas industry, the demand for well drilling and services increased in 2018 by approximately 23.6% as compared to 2017. In 2019, we expect well interventions to increase by approximately 61.8% compared to 2018, and we expect to operate an average of 119 rigs—73 land and 46 marine—including both owned and leased equipment, which represents a 52.6% increase as compared to 2018. Of these, we expect that 48 land and 9 marine will be rigs we own, which is a 21.3% increase as compared to 2018.

In 2018, in accordance with our *Programa de Modernización de la Infraestructura de Perforación* (Drilling Infrastructure Modernization Program), we carried out the modernization of two drilling land rigs of 2,000 horsepower for an amount of Ps. \$803.6 million.

Drilling and Services Capital Expenditures

Our drilling and services segment invested Ps. 1,388 million on capital expenditures in 2018 and has budgeted Ps. 1,295 million for capital expenditures in 2019.

The following table sets forth our drilling and services segment's capital expenditures, excluding non-capitalizable maintenance, for each of the three years ended December 31, 2018, and the budget for 2019. Capital expenditure amounts are derived from our budgetary records, which are prepared on a cash basis. Accordingly, these capital expenditure amounts do not correspond to capital expenditure amounts included in our consolidated financial statements prepared in accordance with IFRS.

Drilling and Services' Capital Expenditures

	Year ended December 31,⁽¹⁾			Budget
	2016	2017	2018	2019⁽²⁾
	(in millions of pesos)⁽³⁾			
Drilling and Services				
Acquisition of Two Jack-Up Platforms	Ps. 772	Ps. 794	Ps. 804	Ps. 834
Acquisition of Nine Land-Based Drilling Rigs	340	352	353	386
Drilling Rig Equipment and Well Service Equipment Maintenance Program	74	96	83	49
Acquisition of Two Modular Drilling Rigs	—	3	2	—
Acquisition of Modernization Equipment for Drilling and Repair of Wells	—	—	—	25
Others	1,501	307	146	—
Total	Ps. 2,688	Ps. 1,550	Ps. 1,388	Ps. 1,295

Notes: Numbers may not total due to rounding.

(1) Amounts based on cash basis method of accounting.

(2) Original budget published in the Official Gazette of the Federation on January 17, 2019.

(3) Figures are stated in nominal pesos.

Source: *Petróleos Mexicanos*.

Logistics

Our logistics segment operates through the productive state-owned subsidiary Pemex Logistics and provides land, maritime and pipeline transportation, storage and distribution services to some of our subsidiary entities and to other companies, including CFE, *Aeropuertos y Servicios Auxiliares*, CENAGAS, local gas stations and distributors.

Transportation of Crude Oil and Refined Products

During 2018, we injected approximately 1,581.5 thousand barrels per day of crude oil and petroleum products into our pipelines, representing a 16.2% decrease as compared to 2017 when we injected 1,887 thousand barrels per day, mainly due to a reduction in the volume of crude oil processed in the National Refining System and the illicit market in fuels that caused temporary closures of certain pipelines. Of the total amount of crude oil and petroleum products that we injected in 2018, 74.5% was transported by pipeline, 7.5% by tanker and the remaining 18.0% by land transport.

During 2018, we injected 139.1 thousand barrels per day of LPG, representing a 0.7% increase as compared to the 138.1 thousand barrels per day we injected in 2017. In addition, we injected 2.4 thousand barrels per day of petrochemicals, an increase of 4.3% as compared to the 2.3 thousand barrels per day we injected in 2017. These increases were mainly due to an increase in imports of isobutane by Pemex Industrial Transformation.

As of 2016, natural gas transportation is carried out by CENAGAS, with the support of Pemex Logistics through an operation and maintenance contract. During 2018, we transported approximately 5,070.9 million cubic feet per day of natural gas, a 2.4% decrease compared to the 5,195.1 million cubic feet per day we transported in 2017, mainly due to a decrease in the volume of natural gas transported to the CFE and Pemex Industrial Transformation.

Treatment and Primary Logistic

We received an average of 1,315.2 thousand barrels per day of crude oil for treatment, which consists of dehydration and desalination, in 2018, compared to 1,421.2 thousand barrels per day in 2017, which represents a decrease of 7.5%, mainly due to lower crude oil production by Pemex Exploration and Production. During 2018, an average of 804.5 thousand barrels of crude oil per day were delivered to the National Refining System and 554.7 thousand barrels of crude oil per day were delivered to the export terminals.

During 2018, we transported an average of 3,096.9 million cubic feet per day of natural gas through the Altamira, Misión, Santuario and Gas Marino Mesozoico transportation systems, as compared to the 3,415.8 million cubic feet per day in 2017, which represents a 9.3% decrease, partially due to a decrease in natural gas production by Pemex Exploration and Production and Pemex Industrial Transformation having to reject a certain volume of wet sour gas due to its nitrogen content. In addition, we transported an average of 23.9 thousand barrels per day of condensate by the Misión and Condensado Terrestre Sur transportation systems compared to 27.9 thousand barrels per day in 2017, which represents a 14.3% decrease, partially due to a decrease in natural gas production by Pemex Exploration and Production.

During 2018, we had six leak and spill events, none of which were significant.

Open Season

During 2017, under the guidelines issued by the CRE, Pemex Logistics began participating in “Open Season” auctions, which are intended to be transparent and competitive auctions for access to our pipelines and storage infrastructure, wherein any participant can compete to offer its services.

On May 2, 2017, following the first Open Season auction, Andeavor (formerly Tesoro Corporation), a U.S. company, was awarded a three-year contract at the assigned capacity at rates above the minimums set by us. On July 18, 2017, we signed the contracts with Andeavor, allowing it to use the pipeline transport and storage system owned by us in the states of Sonora and Baja California. These contracts include access to the Rosarito-Mexicali, Rosarito-Ensenada, Guaymas-Hermosillo and Guaymas-Ciudad Obregón pipelines, as well as the Rosarito, Mexicali and Ensenada storage terminals in Baja California and the Guaymas, Ciudad Obregón, Hermosillo, Magdalena, Nogales and Navojoa in Sonora.

Also, in continuation of the Open Season auctions, on December 18, 2017, the CRE approved the auction procedures for the North Border Zone, Pacific Topolobampo Zone and North Zone Madero.

In March of 2018, we held an Open Season auction for the North Border Zone system, which consists of three terminals and two pipeline sections in the states of Coahuila and Tamaulipas. However, since no outside bids were received, the capacity for this system was assigned to Pemex Industrial Information. On July 24, 2018, following an Open Season auction for the Pacific Topolobampo Zone, Tesoro Mexico Supply & Marketing, S. de R.L. de C.V. (an affiliate of Andeavor) was awarded a three-year contract for the use of our storage terminals in Topolobampo, Culiacán, La Paz and Mazatlán.

In July 2018, we commenced an Open Season auction for the Pacific-Gulf zone, which consists of the Lázaro Cárdenas, Uruapan, Acapulco, Iguala, Oaxaca, Tapachula II, Tuxtla Gutiérrez and Villahermosa storage terminals. The period to submit bids for this Open Season auction ended on August 27, 2018. However, since no outside bids were received, the capacity for this system was assigned to Pemex Industrial Transformation.

Transport and distribution

Our pipelines connect crude oil and natural gas production centers with refineries and petrochemical plants, and our storage terminals with Mexico’s major cities. At the end of 2018, the pipeline network measured approximately 15,909.1 kilometers in length, of which 14,458.0 kilometers

are currently in operation and 1,451.1 kilometers are temporarily out of operation. These pipelines may be temporarily out of operation because of a decline in the production of a field where the pipeline is located or because the transportation service is irregular, which makes its operation unprofitable. Once such circumstances are more favorable, the pipelines may become operational again. As of the date of this annual report, we are analyzing the 1,451.1 kilometers of pipelines that are temporarily out of operation to determine if and how they may be used in the future.

As of December 31, 2018, the pipeline network of Pemex Logistics was distributed as follows:

Transported Product	Length (km)
Petroleum products	8,427.9
Crude Oil	5,216.5
LP Gas	1,394.6
Chemicals	392.2
Petrochemicals	246.0
Fuel Oil	142.6
Jet Fuel	81.2
Water	8.1
Total	15,909.1

We have implemented a pipeline integrity management plan, which requires us to keep detailed documentation on the condition of our pipelines in order to optimize our maintenance investments. The pipeline integrity management plan is based on NOM-027, as well as API RP 1160 for liquid hydrocarbons and ASME B31.8S standards for gas, and includes the following stages:

- collection of detailed records and the development of a pipeline database;
- categorization and identification of threats that could affect pipeline integrity, safety and operation;
- identification of critical points in the pipeline;
- risk assessment of pipeline reliability and integrity;
- maintenance and risk mitigation planning and programming; and
- ongoing monitoring throughout all stages.

We have made considerable progress towards satisfying the requirements of NOM-027 on risk assessment and pipeline integrity. Specifically, as of December 31, 2018, we have analyzed 100% of our overall logistics pipeline network. In addition, we have implemented several measures related to our pipeline integrity management plan, including by collecting information in order to create pipeline databases.

The results of our risk evaluation are as follows:

- High Risk: 0 kilometers
- Medium Risk: 4,230.3 kilometers
- Low Risk: 12,895.0 kilometers

Notwithstanding the implementation of our pipeline integrity management plan, we experienced 17 leaks and spills in 2018. The total number of incidents in 2018 represented a decrease of 10.5%, as compared to the 19 incidents we experienced in 2017. Of the 17 incidents in our transportation pipelines, seven were due to a failure in the mechanical integrity of the pipelines, seven were due to third-party incidents and three were due to other factors.

The transportation of crude oil, natural gas and other products through the pipeline network is subject to several risks, including risk of leakage and spills, explosions and the illicit market in fuels. In 2018, we spent a total of Ps. 1,075.1 million in expenditures for the rehabilitation and maintenance

of our pipeline network and we have budgeted Ps. 403.7 million for these expenditures in 2019. See “Item 3—Key Information—Risk Factors—Risk Factors Related to our Operations—We are an integrated oil and gas company and are exposed to production, equipment and transportation risks, blockades to our facilities and criminal acts and deliberate acts of terror” above.

Fleet Developments

In July of 2013, as part of a plan to modernize the fleet, we signed an agreement with the Secretaría de Marina - Armada de México (Mexican Navy), valued at Ps. 3,212.1 million (U.S.\$250.0 million), for the construction of 22 marine vessels for our refining segment. This agreement initially included construction of 16 tugboats, three multipurpose vessels and three barges, but was modified in 2016 to remove the construction of the three barges and to extend the final delivery date to December 31, 2018. This transaction is now valued at Ps. 4,705.0 million. As of December 31, 2018, the Mexican Navy has delivered eight tugboats. We are currently in the process of further extending the contract for delivery of the remaining 11 vessels, subject to budget availability.

As of December 31, 2018, we owned 16 refined product tankers and leased one. We also own 19 tugboats, 1,485 tank trucks and 511 train tank cars, as well as 76 storage and distribution terminals, ten liquefied gas terminals, five maritime terminals and ten dock operation and maintenance facilities. These facilities, together with our pipeline network, constitute the hydrocarbons transportation and distribution infrastructure.

Our current fleet includes 17 vessels, of which we own 16 and lease one, and altogether we have a transportation capacity of 5,071.3 thousand barrels. 68% of our vessels are located on the Pacific coast and 32% are in the Gulf of Mexico. Of the capacity of the vessels located on the Pacific coast, 75% is used to transport distillates and 25% is used to transport fuel oil and heavy diesel. Of the capacity of the vessels located in the Gulf of Mexico, 88% is used for distillates and 12% is used for fuel oil and heavy diesel.

Logistics Capital Expenditures

Our logistics segment invested Ps. 5,042 million in capital expenditures in 2018 and has budgeted Ps. 1,200 million in capital expenditures for 2019.

The following table sets forth our logistics segment’s capital expenditures, excluding non-capitalizable maintenance, for each of the three years ended December 31, 2018, and the budget for 2019. Capital expenditure amounts are derived from our budgetary records, which are prepared on a cash basis. Accordingly, these capital expenditure amounts do not correspond to capital expenditure amounts included in our consolidated financial statements prepared in accordance with IFRS.

Logistics' Capital Expenditures

	<u>Year ended December 31,⁽¹⁾</u>			<u>Budget</u>
	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019⁽²⁾</u>
	(in millions of pesos) ⁽³⁾			
Logistics				
Larger Fleet Modernization	Ps. 583	Ps. 645	Ps. 604	Ps. —
Acquisition of 5 Tankers Vessel by Cash and/or by leasing	427	431	435	—
Replacement of Vessel Tanks Nuevo Pemex I, II, III and IV by Acquisition and/or Leasing	326	332	334	—
Evaluation and Rehabilitation of the Mechanical Integrity of the Turbosine, Diesel, Gasoline and Fuel Oil Pipelines and Gas Pipelines in the Central Zone	109	80	204	—
Evaluation and Rehabilitation of the Mechanical Integrity of the Pipelines in Northern and Pacific Zones	251	316	105	20
Maintenance of Safety, Measurement, Control and Auto-mation Systems in Storage and Distribution Terminals	452	235	91	87
Renewal of Tugs, Chalanes and Multipurpose Vessels of the Smaller Fleet	495	258	68	—
Evaluation and Rehabilitation of the Mechanical Integrity of the Pipelines Nuevo Teapa-Madero-Cadereyta	193	88	65	—
Implementation of the SCADA System in 47 Pipeline Transportation Systems	270	78	45	72
Refurbishment, Modification and Modernization of Pumping and Compression Stations Nationwide	476	95	7	—
Modernization of the Instrumented Security and Basic Control Systems of the Pumping Stations and Product Receipt Northern Zone	110	6	7	—
Evaluation and Rehabilitation of the Mechanical Integrity of the Pipeline's Poza Rica-Salamanca and Nuevo Teapa- Tula-Salamanca	347	6	6	—
Integral Maintenance of Pipeline Systems for Natural Gas and LPG, Stage II	172	205	—	—
Natural Gas Transportation from Jáltipan to Salina Cruz Refinery	31	12	—	—
Maintenance of Marine Facilities	28	11	—	—
Others	2,745	2,120	3,072	1,021
Total	<u>Ps. 7,015</u>	<u>Ps. 4,917</u>	<u>Ps. 5,042</u>	<u>Ps. 1,200</u>

Notes: Numbers may not total due to rounding.

(1) Amounts based on cash basis method of accounting.

(2) Original budget published in the Official Gazette of the Federation on January 17, 2019.

(3) Figures are stated in nominal pesos.

Source: *Petróleos Mexicanos*.

CENAGAS

Pursuant to the Hydrocarbons Law, on August 11, 2014, CENAGAS was created as a decentralized public entity of the Mexican Government to act as the independent administrator of the Integrated Natural Gas System. This system interconnects the infrastructure for the storage and transportation of natural gas across the nation, with the aim of expanding coverage, strengthening security measures and improving the continuity, quality and efficiency in transportation service. As an integrated system of transportation systems owned by CENAGAS or other participating companies, the Integrated Natural Gas System functions as a primary transportation service supplier in Mexico with standardized fares. Within this system, the *Sistema Nacional de Gasoductos* (National Gas Pipelines System) acts as the commercial administrator for the total available capacity of the Integrated Natural Gas System. In order for a transportation system to become part of the Integrated Natural Gas System, its transport capacity must enhance the Integrated Natural Gas System's flow capacity and improve the overall transportation service provided to users.

On October 29, 2015, we signed a transfer agreement with CENAGAS for the transfer to CENAGAS of assets associated with the Integrated Natural Gas System and the distribution contract for the Naco-Hermosillo pipeline system. The National Gas Pipeline System has 87 pipelines with a total length of almost 9,000 kilometers and a transport capacity over 5,000 million cubic feet per day, while the Naco-Hermosillo system is a 300 kilometers long pipeline with a transport capacity of 90 million cubic feet per day. The approximate aggregate book value of these assets, which were transferred to CENAGAS on January 1, 2016, was Ps. 7,450 million as of December 31, 2018.

On December 29, 2016, we entered into two agreements with CENAGAS pursuant to which we continued to provide operation and maintenance services and commercial operation services to CENAGAS during 2018. Both agreements, which, as of December 31, 2018, have a total value of Ps. 3,045.0 million and Ps. 116.3 million, respectively, initially had a term of one year and are automatically renewed for one year unless either party gives advance notice to the contrary. The agreements for nine of the 21 pipeline subsystems have been terminated as a result of a new services bidding strategy implemented by CENAGAS. However, Pemex Logistics subsequently won bids for three of these nine pipeline subsystems with an estimated contract value of Ps. 78.8 million and, as a result, continues to provide services to CENAGAS for 15 of the 21 pipeline subsystems.

During 2018 we obtained Ps. 3,577.6 million from our services provided to CENAGAS.

International Trading

PMI and the PMI subsidiaries conduct international commercial activities for our crude oil, refined and petrochemical products, with the exception of natural gas, which is marketed directly by our industrial transformation segment. The PMI subsidiaries' main objectives are to assist in maximizing our profitability and optimizing our operations through international trade, facilitating our link with the international markets and pursuing new business opportunities marketing our products internationally. PMI and the PMI subsidiaries manage the international sales of our crude oil and petroleum products and acquire in the international markets crude oil and those petroleum products that we import to satisfy domestic demand. Sales of our crude oil are carried out through PMI. Sales and purchases of crude oil and petroleum products in the international markets are carried out through P.M.I. Trading, which also performs third-party trading, transportation and risk management activities.

Exports and Imports

PMI purchases crude oil from our exploration and production segment and then sells it to PMI's customers. PMI sold an average of 1,184.1 thousand barrels of crude oil per day in 2018, which represented 64.9% of our total crude oil production.

The following tables set forth the composition and average prices of our crude oil exports for the periods indicated.

	Year ended December 31,									
	2014		2015		2016		2017		2018	
	(tbpd)	(%)	(tbpd)	(%)	(tbpd)	(%)	(tbpd)	(%)	(tbpd)	(%)
Crude Oil Exports (by Volume)										
Olmeca ⁽¹⁾ (API gravity of 38°-39°)	91.2	8.0	124.2	10.6	108.0	9.0	18.9	1.6	—	—
Isthmus (API gravity of 32°-33°)	133.7	11.7	194.0	16.5	152.7	12.8	85.8	7.3	30.7	2.6
Maya (API gravity of 21°-22°)	887.1	77.7	743.4	63.4	864.9	72.4	1,053.9	89.8	1,090.1	92.1
Altamira (API gravity of 15.0°-16.5°)	27.2	2.4	27.7	2.4	23.6	2.0	15.3	1.3	19.9	1.7
Talam (API gravity of -15.8°)	3.0	0.3	83.1	7.1	45.2	3.8	—	—	43.5	3.7
Total	1,142.2	100.0	1,172.4	100.0	1,194.3	100.0	1,173.9	100.0	1,184.1	100.0

Notes: Numbers may not total due to rounding.

tbpd = thousand barrels per day.

API gravity refers to the specific gravity or density of liquid petroleum products, measured in degrees on the American Petroleum Institute (API) scale. On the API scale, oil with the lowest specific gravity has the highest API gravity. In addition, holding all other factors constant, the higher the API gravity, the greater the value of the crude oil.

(1) During 2018 we used Olmeca crude oil for processing in our refineries and did not export Olmeca crude oil.

Source: PMI operating statistics as of January 16, 2019.

	Year ended December 31,				
	2014	2015	2016	2017	2018
	(U.S. dollars per barrel)				
Crude Oil Prices					
Olmecca	U.S. \$93.54	U.S. \$51.46	U.S. \$39.71	U.S. \$51.79	U.S. \$—
Isthmus	93.39	49.28	37.72	50.75	64.54
Maya	83.75	41.12	35.30	46.48	61.41
Altamira	81.31	36.19	30.35	39.45	57.81
Talam	36.74	36.40	28.44	—	58.91
Weighted average realized price	U.S. \$85.48	U.S. \$43.12	U.S. \$35.65	U.S. \$46.79	U.S. \$61.34

Source: PMI operating statistics as of January 16, 2019.

Geographic Distribution of Export Sales

As of December 31, 2018, PMI had 30 customers in 11 countries. In 2018, 56.6% of our crude oil export sales were to customers in the United States and Canada, which represents a 17.6% decrease as compared to 2014. Since 2014, primarily as a result of increased availability of light crude oil in the United States and other developing trends in international demand for imported crude oil, we have expanded the scope of our geographic distribution and adapted our strategy to diversify and strengthen the position of Mexican crude oil in the international market.

The following table sets forth the geographic distribution of PMI's sales of crude oil exports for the five years ended December 31, 2018. The table also presents the distribution of exports among PMI's crude oil types for those years.

Composition and Geographic Distribution of Crude Oil Export Sales

	Year ended December 31,									
	2014		2015		2016		2017		2018	
	(tbpd)	(%)	(tbpd)	(%)	(tbpd)	(%)	(tbpd)	(%)	(tbpd)	(%)
PMI Crude Oil Export Sales to:										
United States and Canada	812.8	71.2	689.6	58.8	570.3	47.7	617.2	52.6	669.8	56.6
Europe	214.6	18.8	248.3	21.2	272.2	22.8	219.1	18.7	199.1	16.8
Asia	100.1	8.8	219.2	18.7	318.3	26.6	317.2	27.0	311.4	26.3
Central and South America	14.7	1.3	15.4	1.3	33.6	2.8	20.4	1.7	3.8	0.3
Total	<u>1,142.2</u>	<u>100</u>	<u>1,172.4</u>	<u>100</u>	<u>1,194.3</u>	<u>100</u>	<u>1,173.9</u>	<u>100</u>	<u>1,184</u>	<u>100</u>
Olmecca (API gravity of 38°-39°)										
United States and Canada	35.0	3.1	39.8	3.4	4.1	0.3	—	—	—	—
Others	56.2	4.9	84.4	7.2	103.9	8.7	18.9	1.6	—	—
Total	<u>91.2</u>	<u>8.0</u>	<u>124.2</u>	<u>10.6</u>	<u>108.0</u>	<u>9.0</u>	<u>18.9</u>	<u>1.6</u>	<u>—</u>	<u>—</u>
Isthmus (API gravity of 32°-33°)										
United States and Canada	88.8	7.8	78.1	6.7	3.2	0.3	4.7	0.4	—	—
Others	44.9	3.9	115.9	9.9	149.5	12.5	81.1	6.9	30.7	2.6
Total	<u>133.7</u>	<u>11.7</u>	<u>194.0</u>	<u>16.5</u>	<u>152.7</u>	<u>12.8</u>	<u>85.8</u>	<u>7.3</u>	<u>30.7</u>	<u>2.6</u>
Maya (API gravity of 21°-22°)										
United States and Canada	662.3	58.0	513.2	43.8	539.9	45.2	597.2	50.9	624.1	52.7
Others	224.8	19.7	230.2	19.6	325.0	27.2	456.7	38.9	466.1	39.4
Total	<u>887.1</u>	<u>77.7</u>	<u>743.4</u>	<u>63.4</u>	<u>864.9</u>	<u>72.4</u>	<u>1,053.9</u>	<u>89.8</u>	<u>1,090.1</u>	<u>92.1</u>
Altamira (API gravity of 15.0°-16.5°)										
United States and Canada	26.8	2.3	27.7	2.4	21.9	1.8	15.3	1.3	19.9	1.7
Others	0.4	0.04	—	—	1.8	0.1	—	—	—	—
Total	<u>27.2</u>	<u>2.4</u>	<u>27.7</u>	<u>2.4</u>	<u>23.62</u>	<u>1.8</u>	<u>15.3</u>	<u>1.3</u>	<u>19.9</u>	<u>1.7</u>
Talam (API gravity of 15.8°)										
United States and Canada	—	—	30.7	2.6	1.3	0.1	—	—	25.8	2.2
Others	3.0	0.3	52.4	4.5	43.9	3.7	—	—	17.6	1.5
Total	<u>3.0</u>	<u>0.3</u>	<u>83.1</u>	<u>7.1</u>	<u>45.17</u>	<u>3.8</u>	<u>—</u>	<u>—</u>	<u>43.5</u>	<u>3.7</u>

Notes: Numbers may not total due to rounding.

tbpd = thousand barrels per day.

API gravity refers to the specific gravity or density of liquid petroleum products, measured in degrees on the API scale. On the API scale, oil with the lowest specific gravity has the highest API gravity. In addition, holding all other factors constant, the higher the API gravity, the greater the value of the crude oil.

Source: PMI operating statistics as of January 16, 2019.

In total, we exported 1,184.1 thousand barrels of crude oil per day in 2018, and in 2019 we expect to export approximately 993.0 thousand barrels of crude oil per day. We sell the crude oil produced by Pemex Exploration and Production under a variety of contractual arrangements. Of the 993.0 thousand barrels of crude oil per day we expect to export in 2019, we are contractually committed to deliver approximately 900.0 thousand barrels per day pursuant to existing supply commitments. We believe that our proved developed and proved undeveloped reserves will be sufficient to allow us to fulfill our supply commitments.

The following table sets forth the average volume of our exports and imports of crude oil, natural gas and petroleum products for the five years ended December 31, 2018.

Volume of Exports and Imports

	Year ended December 31,					2018 vs. 2017 (%)
	2014	2015	2016	2017	2018	
Exports						
Crude Oil:						
Olmecca	91.2	124.2	108.0	18.9	—	(100.0)
Isthmus	133.7	194.0	152.7	85.8	30.7	(64.2)
Maya	887.1	743.4	864.9	1,053.9	1,090.1	(3.4)
Altamira	27.2	27.7	23.6	15.3	19.9	30.1
Talam	3.0	83.1	45.2	—	43.5	100.0
Total crude oil	1,142.2	1,172.4	1,194.3	1,173.9	1,184.1	0.9
Natural gas ⁽¹⁾	4.1	2.7	2.2	1.7	1.4	(17.6)
Gasoline	66.0	62.9	52.7	45.0	37.7	(16.2)
Other petroleum products	133.3	130.8	132.9	113.1	95.1	(15.9)
Petrochemical products ⁽²⁾⁽³⁾	406.1	333.8	124.7	60.5	57.8	(4.5)
Imports						
Natural gas ⁽¹⁾	1,357.8	1,415.8	1,933.9	1,766.0	1,316.5	(25.5)
Gasoline	389.7	440.1	510.8	582.5	599.9	3.0
Other petroleum products and LPG ⁽¹⁾⁽⁵⁾	248.7	299.7	289.6	353.6	376.7	6.5
Petrochemical products ⁽²⁾⁽⁴⁾	85.3	107.3	278.2	332.8	831.8	149.9

Note: Numbers subject to adjustment because crude oil exports may be adjusted to reflect the percentage of water in each shipment.

(1) Numbers expressed in millions of cubic feet per day.

(2) Thousands of metric tons.

(3) Includes propylene.

(4) Includes isobutane, butane and N-butane.

(5) Includes liquefied natural gas imported through the Manzanillo terminal.

Source: PMI operating statistics as of January 16, 2019, and Pemex Industrial Transformation.

Crude oil exports increased by 0.9% in 2018, from 1,173.9 thousand barrels per day in 2017 to 1,184.1 thousand barrels per day in 2018, mainly due to an increase of exports of 7.9% of heavy crude oil (Maya, Talam and Altamira crudes), which was partially offset by a 64.2% decrease in exports of Isthmus crude oil and a decrease of 100% in Olmecca crude oil export during 2018. We exported no Olmecca crude oil in 2018 due to a lack of availability of Olmecca crude oil for export.

In 2018, we imported 3.8 thousand barrels per day of light crude oil equivalent to U.S. \$93.8 million, for processing in the National Refining System, which represented the first time we imported crude oil.

We import dry gas, a variety of natural gas, to satisfy shortfalls in our production and to meet demand in areas of northern Mexico that, due to their distance from the fields, can be supplied more efficiently by importing natural gas from the United States. Domestic sales of dry gas decreased by 21.3%, as compared to 2017, from 2,623.0 million cubic feet per day in 2017 to 2,064.3 million cubic feet per day in 2018, mainly due to competition from third-party supply in the national market. Natural gas imports decreased by 25.5% in 2018, from 1,766.0 million cubic feet per day in 2017 to 1,316.5 million cubic feet per day in 2018. The total amount of natural gas imported per day in 2018 includes 17.4 million cubic feet per day of liquefied natural gas imported through the Manzanillo terminal. This decrease in natural gas imports was primarily due to decreased demand in the domestic market due to competition from third party suppliers.

P.M.I. Trading sells refined and petrochemical products on an *FOB, Delivered Ex-ship* and *Cost and Freight* basis and buys refined and petrochemical products and crude oil on an *FOB, Cost and Freight* and *Delivered Ex-ship, Delivery at Frontier* and *Delivered at Place* basis.

The following table sets forth the value of exports and imports of crude oil, natural gas and petroleum products for the five years ended December 31, 2018.

Value of Exports and Imports⁽¹⁾

	Year ended December 31,					2018 vs. 2017 (%)
	2014	2015	2016	2017	2018	
	(in millions of U.S. dollars)					
Exports						
Olmecca	U.S. \$3,114.7	U.S. \$2,333.1	U.S. \$1,569.3	U.S. \$358.1	U.S.\$ —	(100.0)
Isthmus	4,557.1	3,489.0	2,107.6	1,588.7	722.2	(54.5)
Altamira	806.7	366.6	262.4	219.8	419.6	90.9
Maya	27,119.4	11,158.9	11,172.6	17,880.6	24,435.7	36.7
Talam	40.4	1,103.6	470.1	—	934.6	100.0
Total crude oil ⁽²⁾	U.S. \$35,638.3	U.S. \$18,451.2	U.S. \$15,582.0	U.S. \$20,047.2	U.S. \$26,512.1	32.2
Natural gas	4.8	1.6	1.1	1.3	1.0	(23.1)
Gasoline	1,985.9	1,007.4	733.2	746.9	813.9	9.0
Other petroleum products	3,425.7	1,580.2	1,161.9	1,655.6	1,938.1	17.1
Petrochemical products	132.4	63.5	20.5	37.8	39.7	5.0
Total natural gas, petroleum and petrochemical products	U.S. \$5,548.8	U.S. \$2,652.7	U.S. \$1,916.7	U.S. \$2,441.5	U.S. \$2,792.8	14.4
Total exports	U.S. \$41,187.1	U.S. \$21,103.9	U.S. \$17,498.7	U.S. \$22,488.8	U.S. \$29,304.8	30.3
Imports						
Natural gas	U.S. \$2,819.3	U.S. \$1,673.7	U.S. \$2,097.9	U.S. \$2,484.1	U.S. \$2,043.2	(17.7)
Gasoline	16,691.2	12,805.2	11,994.8	15,380.1	18,867.5	22.7
Other petroleum products and LPG	8,738.7	6,178.6	5,699.9	8,446.3	11,103.3	31.5
Petrochemical products	168.1	196.3	85.5	122.5	588.8	380.7
Total imports	U.S. \$28,417.3	U.S. \$20,853.8	U.S. \$19,878.1	U.S. \$26,433.0	U.S. \$32,602.8	23.3
Net exports (imports)	U.S. \$12,769.8	U.S. \$250.1	U.S. \$(2,379.4)	U.S. \$(3,944.2)	U.S. \$(3,297.9)	(16.4)

Note: Numbers may not total due to rounding.

(1) Does not include crude oil, refined products and petrochemicals purchased by P.M.I. Trading, or PMI-NASA from third parties outside of Mexico and resold in the international markets. The figures expressed in this table differ from the amounts contained under the line item "Net Sales" in our financial statements because of differences in methodology associated with the calculation of the exchange rates and other minor adjustments.

(2) Crude oil exports are subject to adjustment to reflect the percentage of water in each shipment.

Source: PMI operating statistics as of January 16, 2019, which are based on information in bills of lading, and Pemex Industrial Transformation.

In 2018, imports of natural gas decreased in value by 17.7% as compared to 2017, primarily as a result of a decrease in the volume of natural gas imports. Imports of gasoline increased in value by 22.7% over the same period due to an increase in the volume of gasoline imports resulting from lower domestic production of gasoline and a higher average price of gasoline as compared to 2017.

The following table describes the composition of our exports and imports of selected refined products for the three years ended December 31, 2018.

Exports and Imports of Selected Petroleum Products

	Year ended December 31,					
	2016		2017		2018	
	(tbpd)	(%)	(tbpd)	(%)	(tbpd)	(%)
Exports						
Liquefied petroleum gas ⁽¹⁾	4.5	2.4	5.7	3.6	1.2	0.9
Fuel oil	113.3	61.0	103.5	65.5	89.8	67.6
Gasoline	52.7	28.4	45.0	28.4	37.7	28.4
Others	15.1	8.2	3.9	2.5	4.0	3.0
Total	185.5	100.0	158.0	100.0	132.8	100
Imports						
Gasoline ⁽³⁾	510.8	63.8	582.5	62.2	599.9	61.4
Fuel oil	10.7	1.3	24.4	2.6	16.5	1.7
Liquefied petroleum gas ⁽²⁾	50.6	6.3	42.6	4.5	61.8	6.3
Diesel	187.8	23.5	237.5	25.4	238.8	24.5
Others	40.4	5.1	49.1	5.2	59.6	6.1
Total	800.4	100.0	936.2	100.0	976.7	100

Notes: Numbers may not total due to rounding.

tbpd = thousand barrels per day.

(1) Includes butanes and propane.

(2) Includes methyl tert-butyl ether (MTBE).

(3) Includes premium gasoline, regular gasoline, premium components and naphthas

Source: Pemex BDI.

In 2018, exports of petroleum products decreased by 15.9%, from 158.0 thousand barrels per day in 2017 to 132.8 thousand barrels per day in 2018, mainly due to decreases in the export volumes of fuel oil and natural gas of 13.2% and 16.2%, respectively. Imports of petroleum products increased by 4.3% in 2018, from 936.2 thousand barrels per day in 2017 to 976.7 thousand barrels per day in 2018, primarily due to a decrease in domestic production of petroleum products.

Exports of petroleum products increased in value by 14.6% in 2018, primarily due to a 34.3% increase in the average price of fuel oil and increases in the average prices of other petroleum products. In 2018, imports of petroleum products increased in value, by 25.8%, primarily due to a 4.4% increase in volume of imports caused by lower domestic gasoline production and an increase in the average price of gasoline as compared to the previous year. Our net imports of petroleum products for 2018 totaled U.S. \$3,297.9 million, which represents a 16.4% decrease from our net imports of petroleum products of U.S.\$3,944.2 million in 2017.

The Secretary of Energy has entered into certain agreements to reduce or increase crude oil exports. See “Item 4—Information on the Company—Trade Regulation and Export Agreements” below in this Item 4.

Hedging Operations

P.M.I. Trading engages in hedging operations to cover its price exposure in the trading of petroleum products. The internal policies and procedures of P.M.I. Trading establish: (1) that DFIs are used exclusively to mitigate the volatility of oil and gas prices; (2) limits on the maximum amount of capital at risk and on the daily and accumulated annual losses for each business unit; and (3) the segregation of risk-taking and risk measurement. Capital at risk is calculated on a daily basis in order to compare the actual figures with the aforementioned limit. P.M.I. Trading has a risk management subcommittee that supervises risk and hedging operations. See “Item 11—Quantitative and Qualitative Disclosures about Market Risk—Changes in Exposure to Main Risks—Hydrocarbon Price Risk.”

Gas Stations in the United States

Between late 2015 and early 2016, we opened five gas stations in Houston, Texas that are owned and operated by franchisees. In 2018, we opened four additional gas stations, three of which are located in California and one of which is located in Texas. This is part of our strategy to expand our operations to the United States. Further, it has allowed us to measure the impact of our brand against others and identify business opportunities abroad and to generate institutional knowledge about operating in a competitive environment in the retail business. The gas stations’ fuel supply is derived from the United States wholesale market and selling prices are subject to local market conditions. As of December 31, 2018, we have a presence in the Texas and California markets with a combined number of nine locations. In 2018, we saw an increase in fuel consumption of 42% in our United States locations as compared to 2017.

PEMEX Corporate Matters

In addition to the operating activities that we undertake through the activities of our subsidiary entities and subsidiary companies, we have certain centralized corporate operations that coordinate general labor, safety, insurance and legal matters.

Industrial Safety and Environmental Protection

Our Corporate Office of Planning, Coordination and Performance is responsible for planning, conducting and coordinating programs to:

- foster a company culture of safety and environmental protection;
- improve the safety of our workers and facilities;
- reduce risks to residents of the areas surrounding our facilities;

- reduce greenhouse gas emissions and identify the risks associated with climate change in Mexico in order to develop strategies to minimize the impact of climate change on our operations; and
- strengthen efforts in our operations with partners, contractors, subcontractors, suppliers and service providers.

We intend to further develop industrial safety and environmental programs for each subsidiary entity. The environmental and safety division of each subsidiary entity coordinates closely with the Corporate Office of Planning, Coordination and Performance, in order to strengthen our sustained and continuous improvement.

Insurance

We maintain a comprehensive property and general liability insurance program for onshore and offshore properties and liabilities. All onshore properties, such as refineries, processing plants, pipelines and storage facilities are covered, as are all of our offshore assets, such as drilling platforms, rigs, gas gathering systems, maritime terminals and production facilities.

Our insurance covers risks of sudden and accidental physical damage to or destruction of our properties, as well as risk of sudden and accidental physical loss, including as a consequence of purposeful terrorist acts. This insurance also provides coverage for the contents of pipelines and storage facilities, and any of our liabilities arising from such acts. Our insurance also covers extraordinary costs related to the operation of offshore wells, such as control and re-drilling costs, evacuation expenses and liability costs associated with spills. We also maintain protection and indemnity insurance for our full marine fleet, in addition to life insurance, automobile and heavy equipment insurance, cargo and marine hull insurance, as well as insurance for deep water drilling activities and onshore and offshore construction on operating facilities.

In accordance with Mexican law, we have entered into all of our insurance contracts with Mexican insurance carriers. These policies have limits of U.S. \$1.8 billion for onshore property, U.S. \$1.9 billion for offshore property, U.S. \$0.3 billion for extraordinary costs related to the operation of offshore wells, U.S. \$1.0 billion for marine-related liabilities, U.S. \$1.1 billion for onshore and offshore liabilities, U.S. \$0.5 billion for offshore terrorist acts and U.S. \$0.5 billion for onshore terrorist acts. Limits of insurance policies purchased for each category of risk are determined using professional risk management assessment surveys conducted by international companies on an annual basis and the market capacity available per risk, and must be in compliance with local regulations enacted following the energy reform. In addition, in compliance with the regulations enacted in June of 2016 by the National Agency for Industrial Safety and Environmental Protection of the Hydrocarbons Sector (ASEA), we maintain insurance coverage with respect to third party liability, liability for environmental damage and control of well, works or drilling activities and extraction of hydrocarbons, the treatment and refining of crude oil and the processing of natural gas. We have also ensured that we maintain insurance coverage in connection with our strategic alliances and other joint arrangements.

Since June 2003, we have not maintained business interruption insurance, which in the past compensated us for loss of revenues resulting from damages to our facilities. Instead, we purchase *ad-hoc* business interruption mitigation insurance coverage, which compensates us for the additional expenses necessary to recover our production capabilities in the shortest time possible.

During 2018 we continued to engage in deep water exploratory and drilling activities that were covered by our existing insurance program. In August 2012, we purchased a policy to increase the coverage available for potential property damage, third-party liability and control of well risks related to these activities. Under this policy, we maintain coverage for each deep water well drilled, and the limits are determined based on the risk profile of the corresponding well. This policy has a limit of U.S. \$3.3 billion, including U.S. \$1.3 billion for control of well risks, U.S. \$1.1 billion for casualty and U.S. \$0.9 billion for property damage. This policy also contemplates additional coverage for environmental liabilities and remediation activities relating to deep water exploration and drilling.

All of our insurance policies are in turn reinsured through Kot Insurance Company, AG (which we refer to as Kot AG). Kot AG is a wholly owned subsidiary company that was originally formed in 1993 under the laws of Bermuda as Kot Insurance Company, Ltd. and was subsequently organized under the laws of Switzerland in 2004. Kot AG is used as a risk management tool to structure and distribute risks across the international reinsurance markets. The purpose of Kot AG is to reinsure policies held through our local insurance carriers and to maintain control over the cost and quality of the insurance covering our risks. Kot AG reinsures over 80% of its reinsurance policies with unaffiliated third-party reinsurers. Kot AG carefully monitors the financial performance of its reinsurers and actively manages counterparty credit risk across its reinsurance portfolio to ensure its own financial stability and maintain its creditworthiness. Kot AG maintains solid capitalization and solvency margins consistent with guidelines provided by Swiss insurance authorities and regulations. As of December 31, 2018, Kot AG's net risk retention is U.S. \$257 million spread across different reinsurance coverages to mitigate potential aggregation factors.

Ethics Committee

Our Ethics Committee consists of members from our management team, with the head of the Institutional Internal Control Unit at Petróleos Mexicanos serving as its chairman.

Our Ethics Committee is primarily responsible for:

- promoting awareness and use of our code of ethics and code of conduct, including through online training available for our employees, in order to improve our culture of ethics;
- establishing procedures that implement the principles found in our code of ethics in order to increase compliance and to detect behavior that adversely affects our activities;
- analyzing and giving instructions to the appropriate areas on possible violations to our code of ethics and code of conduct that are reported through the Ethics Line; and
- working with the Liabilities Unit at Petróleos Mexicanos and our Internal Auditing Area to exchange information regarding violations of our code of ethics and our code of conduct.

See “Item 16B—Code of Ethics” for more information regarding our code of ethics.

Collaboration and Other Agreements

On October 27, 2014, Petróleos Mexicanos and the *Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación* (SAGARPA) signed a collaboration agreement to provide community and environmental support to communities within the zones of influence of the oil industries. This collaboration agreement expired in November 2018.

On February 5, 2015, Petróleos Mexicanos and the *Instituto Politécnico Nacional* (National Polytechnic Institute) of Mexico entered into a collaboration agreement for the development of human resources, technology and research, with the aim of promoting and supporting joint research programs and the development of knowledge related to the hydrocarbons industry.

On February 18, 2015, Petróleos Mexicanos and the Organisation for Economic Co-operation and Development (OECD) signed a memorandum of understanding with the aim of benefiting from the OECD’s knowledge of and experiences with international best practices relating to the procurement of goods and services.

On February 19, 2015, Petróleos Mexicanos signed a memorandum of understanding with the Infraestructura Energética Nova, S.A.B. de C.V. and Sempra LNG units of the U.S. energy company Sempra Energy for the potential joint development of a natural gas liquefaction project at the site of the Energía Costa Azul facility located in Ensenada, Mexico.

On April 7, 2015, Petróleos Mexicanos and First Reserve signed a memorandum of understanding and cooperation to explore new opportunities for joint energy projects, which would provide access to financing, as well as the exchange of technical and operational experience. This agreement contemplates up to U.S. \$1.0 billion of investments in potential projects relating to infrastructure, maritime transport and power cogeneration, among others.

On May 12, 2015, Petróleos Mexicanos and Global Water Development Partners, a company founded by private equity funds operated by Blackstone, signed a memorandum of understanding with the aim of creating a partnership to invest in water and wastewater infrastructure for Petróleos Mexicanos’ upstream and downstream facilities. This partnership is intended to finance and carry out environmentally sustainable projects for water treatment in Petróleos Mexicanos’ operations.

On June 1, 2015, Petróleos Mexicanos and the U.S. based global asset manager BlackRock Inc. signed a memorandum of understanding with the aim of accelerating the development and financing of energy-related infrastructure projects that are of strategic importance to Petróleos Mexicanos.

On July 20, 2015, Petróleos Mexicanos, through its Corporate Office of Procurement and Supply, signed an agreement with the OECD with the aim of adopting and promoting best practices in procurement and fostering efficient management strategies and transparency in Petróleos Mexicanos' processes. The agreement also contemplates the training of our personnel by the OECD on issues of transparency and ethics, the design of procurement procedures and mitigating risks of collusion.

On July 22, 2015, Petróleos Mexicanos and the *Secretaría de Desarrollo Agrario, Territorial y Urbano* (Ministry of Agriculture, Land and Urban Development) signed a collaboration agreement with the aim of establishing consulting and training mechanisms for the development of hydrocarbon exploration, extraction and distribution projects in strict observance of the applicable legal framework and with full respect for agricultural landowners.

On July 23, 2015, Petróleos Mexicanos and the Instituto Tecnológico y de Estudios Superiores de Monterrey, A.C. signed a collaboration agreement with the purpose of (1) fostering competitive development within the Mexican oil and gas industry; (2) carrying out specialized research and consulting services, including lectures, seminars, conferences and other events of common interest to the institutions; and (3) providing postgraduate studies for our employees and internships for college students at Petróleos Mexicanos.

On July 28, 2015, Petróleos Mexicanos and Banco Santander, S.A. (Santander) signed a collaboration agreement with the purpose of providing our franchisees with access to Santander banking services such as bank card sales, deposits and e-banking services, payroll management and the transportation of money.

On September 9, 2015, Petróleos Mexicanos and General Electric signed a memorandum of understanding with the aim of creating a partnership to invest in new technology and financing initiatives for gas compression, power generation and the production of hydrocarbons, both onshore and offshore, including in deepwater fields.

On October 10, 2015, Petróleos Mexicanos and the United Nations Development Programme in Mexico reaffirmed their commitment to use best practices in terms of inclusion, equality and non-discrimination in the workplace.

On November 30, 2015, Petróleos Mexicanos and Global Water Development Partners agreed to create a joint venture intended to invest U.S. \$800 million in water and wastewater treatment infrastructure for upstream and downstream facilities in Mexico. This partnership aims to (1) provide access to advanced technology to meet the supply and treatment requirements of wastewater at our facilities, in both onshore and offshore production areas, as well as in refineries and petrochemical plants; and (2) in the future, to potentially implement and finance environmentally sustainable solutions for water management.

On January 19, 2016, Petróleos Mexicanos and Mubadala Petroleum signed a memorandum of understanding agreeing to joint projects to explore the Mexican energy sector, including its upstream activities, primary midstream activities and infrastructure projects for a total investment of U.S. \$4.0 billion. Among these projects is a commercial logistic infrastructure system in the Salina Cruz, Oaxaca area, for an approximate investment in excess of U.S. \$3.0 billion.

On January 19, 2016, Petróleos Mexicanos and the Abu Dhabi National Oil Company signed a memorandum of understanding with the aim to share each company's best practices with respect to different upstream activities, including exploration, development and production in oil fields; improved recovery, handling and processing of liquefied natural gas; as well as human resources training, sustainability, internal controls, transparency, process development and cyber-security.

On January 19, 2016, Petróleos Mexicanos and Saudi Aramco signed a memorandum of understanding renewing and strengthening the relationship between both companies and establishing an exchange of ideas surrounding operational excellence, sustainability and energy efficiency, and innovation and technological development.

These broad agreements of technological and scientific collaboration are strictly non-commercial, *i.e.*, there is no transfer of resources among the parties.

Property, Plants and Equipment

General

Substantially all of our property, consisting of refineries, storage, production, manufacturing and transportation facilities and certain retail outlets, is located in Mexico, including Mexican waters in the Gulf of Mexico. The location, character, utilization and productive capacity of our exploration, drilling, refining, petrochemical production, transportation and storage facilities are described above. See “—Exploration and Production,” “—Drilling and Services,” “Industrial Transformation,” “—Ethylene,” “—Fertilizers” and “—Logistics.” The insurance program covering all of our properties is also described above. See “—Insurance.”

Reserves

Under Mexican law, all crude oil and other oil and gas reserves located in the subsoil of Mexico are owned by the Mexican nation and not by us. The Mexican Government has granted us the right to exploit the petroleum and other oil and gas reserves assigned to us in connection with the process that occurred in August 2014 and is commonly referred to as Round Zero, as well as the right to explore for and exploit petroleum and other oil and gas reserves in areas that have been granted to us in Round 1.4. Productive state-owned companies and other companies participating in the Mexican oil and gas industry may report assignments or contracts and the corresponding expected benefits for accounting and financial purposes. See “Information on the Company—History and Development—Legal Regime” above in this Item 4. Our estimates of hydrocarbons reserves are described under “—Exploration and Production—Reserves” above.

GENERAL REGULATORY FRAMEWORK

Petróleos Mexicanos is regulated by the Mexican Constitution, the Petróleos Mexicanos Law and the Hydrocarbons Law, among other regulations. The purpose of the Petróleos Mexicanos Law is to regulate the organization, management, operation, monitoring, evaluation and accountability of Petróleos Mexicanos as a productive-state owned company of the Mexican Government. On October 31, 2014, the Regulations to the Petróleos Mexicanos Law were published in the Official Gazette of the Federation. These regulations were modified on February 9, 2015. The purpose of these regulations is to regulate, among other things, the appointment and removal of the members of the Board of Directors of Petróleos Mexicanos, potential conflicts of interest for Board members, and the evaluation of Petróleos Mexicanos.

The Mexican Government and its ministries regulate our operations in the oil and gas sector. The Ministry of Energy monitors our operations, and the Secretary of Energy acts as the chairperson of the Board of Directors of Petróleos Mexicanos. In addition, the *Ley de los Órganos Reguladores Coordinados en Materia Energética* (Coordinated Energy Regulatory Bodies related to the Energy Matters Law), which took effect on August 12, 2014, establishes mechanisms for the coordination of these entities with the Ministry of Energy and other ministries of the Mexican Government. The CNH has the authority to award and execute contracts for exploration and production in connection with competitive bidding rounds. The CRE has the authority to grant permits for the storage, transportation and distribution of oil, gas, petroleum products and petrochemicals in Mexico, and to regulate the first-hand sale of these products. The regulatory powers of the CNH and the CRE extend to all oil and gas companies operating in Mexico, including Petróleos Mexicanos and our subsidiary entities.

On December 2, 2014, the Ministry of Energy published in the Official Gazette of the Federation a statement declaring that the new Board of Directors of Petróleos Mexicanos was performing its duties and the mechanisms for our oversight, transparency and accountability had been implemented in accordance with the Petróleos Mexicanos Law. As a result, the special regime that governs Petróleos Mexicanos’ activities relating to productive state-owned subsidiaries, affiliates, compensation, assets, administrative liabilities, budget, debt levels and the state dividend took effect. On June 10, 2015 the General Provisions for Contracting with Petróleos Mexicanos and its Productive State-Owned Subsidiaries were published in the Official Gazette of the Federation, and on June 11, 2015, the special regime for acquisitions, leases, services and public became effective. On May 18, 2018, new General Provisions for Contracting with Petróleos Mexicanos and its Productive State-Owned Subsidiaries were published in the Official Gazette of the Federation, repealing the previous general provisions published in June 2015 and their subsequent amendments. These General Provisions regulate the legal process for acquisitions, leases, works and services needed for our projects and require that our suppliers, contractors and other participants with whom we have or intend to have a commercial relationship recognize and adopt our Compliance Program (as defined below) and establish prevention and compliance systems in accordance with applicable law. New amendments to these General Provisions were published in the Official Gazette of the Federation on August 1, 2018.

In accordance with the *Petróleos Mexicanos* Law, each year the Ministry of Finance and Public Credit provides us with estimated macroeconomic indicators for the following fiscal year, which we are to use to prepare the consolidated annual budget for *Petróleos Mexicanos* and the subsidiary entities, including our financing program. Upon approval by the Board of Directors of *Petróleos Mexicanos*, our consolidated budget and financing program is then submitted to the Ministry of Finance and Public Credit, which has the authority to adjust our financial balance goal and the ceiling on our wage and salary expenditures for the fiscal year. The consolidated annual budget and financing program of *Petróleos Mexicanos* and the subsidiary entities, including any adjustments made by the Ministry of Finance and Public Credit, is then incorporated into the federal budget for approval by the Chamber of Deputies. The Mexican Government is not, however, liable for the financial obligations that we incur. In approving the federal budget, the Chamber of Deputies authorizes our financial balance goal and the ceiling on our wage and salary expenditures for the fiscal year, which it may subsequently adjust at any time by modifying the applicable law.

We are also subject to various domestic and international laws and regulations related to anti-corruption, anti-bribery and anti-money laundering, such as the *Código Penal Federal* (Federal Criminal Code), which criminalizes certain corrupt practices, including bribery, embezzlement and abuse of authority; the *Ley General del Sistema Nacional Anticorrupción* (General Law of the National Anti-Corruption System); the *Ley de Fiscalización y Rendición de Cuentas de la Federación* (Federal Audit and Accountability Law) and the *Ley General de Responsabilidades Administrativas* (General Law of Administrative Liabilities), among others. These laws establish a national anti-corruption system designed to coordinate efforts among the Mexican Government, federal entities, states and municipalities to prevent, investigate and punish corrupt activities and oversee public resources, as well as determine administrative liabilities of public officials and the applicable penalties.

We also employ internal control procedures and guidelines designed to monitor the activities of our employees, including senior management, and to ensure compliance with applicable anti-corruption, anti-bribery and anti-money laundering laws and regulations. The *Lineamientos que regulan el sistema de control interno en Petróleos Mexicanos, sus empresas productivas subsidiarias y empresas filiales* (Guidelines governing the internal control system of *Petróleos Mexicanos*, its productive subsidiary entities and affiliates) set forth the principles underlying our internal controls system and the procedures necessary for its implementation and monitoring. In addition, the *Lineamientos para regular a los Testigos Sociales en Petróleos Mexicanos y sus empresas productivas subsidiarias* (Guidelines to regulate public witnesses in *Petróleos Mexicanos* and its productive subsidiary entities), delineates the ways in which public witnesses may act as third-party observers in connection with our procurement procedures. These internal controls and guidelines are applicable to *Petróleos Mexicanos* and the subsidiary entities. For a description of the risks relating to anti-corruption, anti-bribery and anti-money laundering laws and regulations, see “Item 3—Key Information—Risk Factors—Risk Factors Related to our Operations—We are subject to Mexican and international anti-corruption, anti-bribery and anti-money laundering laws. Our failure to comply with these laws could result in penalties, which could harm our reputation, prevent us from obtaining governmental authorizations needed to carry out our operations and have an adverse effect on our business, results of operations and financial condition.”

On July 14, 2017, the Board of Directors of *Petróleos Mexicanos* approved our “Compliance Program”, a series of procedures aimed to comply with legal, accounting, and financial provisions to prevent corruption and to promote ethical values. These procedures include a focus on internal controls, risk management, ethical principles and corporate integrity, policies promoting transparency and accountability.

On August 28, 2017, a new *Código de Conducta de Petróleos Mexicanos, sus empresas productivas subsidiarias y, en su caso, empresas filiales* (Code of Conduct of *Petróleos Mexicanos*, its productive subsidiary entities and, where applicable, affiliated companies, or the Code of Conduct) was published in the Official Gazette of the Federation, replacing the code of conduct issued in February 2015. This Code of Conduct delineates behaviors expected of and banned for our employees, in accordance with the values established in the Code of Ethics, which was also published on that same day in the Official Gazette of the Federation, approved by the Board of the Directors of *Petróleos Mexicanos* in November 2016, such as: respect, non-discrimination, honesty, loyalty, responsibility, legality, impartiality and integrity, among others.

On September 11, 2017, the *Políticas y Lineamientos Anticorrupción para Petróleos Mexicanos, sus empresas productivas subsidiarias y, en su caso, Empresas Filiales* (Anti-corruption Policies and Guidelines for *Petróleos Mexicanos*, its productive subsidiary entities and, where applicable, affiliated companies) and the *Políticas y Lineamientos para el desarrollo de la Debida Diligencia en Petróleos Mexicanos, sus empresas productivas subsidiarias y, en su caso, Empresas Filiales, en Materia de Ética e Integridad Corporativa* (Policies and Guidelines to carry out Due Diligence in *Petróleos Mexicanos*, its productive subsidiary entities and, where applicable, affiliated companies, in Ethics and Corporate Integrity matters) became effective. The purpose of these regulations is to set up actions against acts of corruption as well as provide means to confront and fight them and mitigate our own risks as well as third-party risks that may affect the activities of PEMEX for acts of corruption, lack of ethics or corporate integrity or our involvement in illicit acts of any kind.

As an issuer of debt securities that are registered under the Securities Act and in connection with certain representations and covenants included in our financing agreements, we must comply with the U.S. Foreign Corrupt Practices Act, or the FCPA. The FCPA generally prohibits companies and anyone acting on their behalf from offering or making improper payments or providing benefits to government officials for the purpose of obtaining or keeping business. In addition, we are subject to other international laws and regulations related to anti-corruption, anti-bribery and anti-money laundering, including the U.K. Bribery Act 2010, which prohibits the solicitation of, the agreement to receive and the acceptance of bribes.

ENVIRONMENTAL REGULATION

Legal Framework

We are subject to the environmental laws and regulations issued by the state governments where our facilities are located, including those associated with atmospheric emissions, water usage and wastewater discharge, as well as the management of hazardous and non-hazardous waste. In particular, we are subject to the provisions of the *Ley General del Equilibrio Ecológico y la Protección al Ambiente* (General Law on Ecological Equilibrium and Environmental Protection, which we refer to as the Environmental Law) and related regulations, the *Ley General para la Prevención y Gestión Integral de los Residuos* (General Law on Waste Prevention and Integral Management), the *Ley General de Cambio Climático* (General Law on Climate Change) and other technical environmental standards issued by the *Secretaría del Medio Ambiente y Recursos Naturales* (Ministry of the Environment and Natural Resources, or SEMARNAT) and the *Agencia de Seguridad, Energía y Ambiente* (National Agency for Industrial Safety and Environmental Protection of the Hydrocarbons Sector, or ASEA).

In April 1997, the SEMARNAT issued regulations governing the procedures for obtaining an environmental license, under which new industrial facilities can comply with all applicable environmental requirements through a single administrative procedure. Each environmental license integrates all of the different permits, licenses and authorizations related to environmental matters for a particular facility. Since these regulations went into effect, we have been required to obtain an environmental license for any new facility.

Before we carry out any activity that may have an adverse impact on the environment, we are required to obtain certain authorizations from ASEA, the SEMARNAT, the Ministry of Energy, the National Water Commission and the Mexican Navy, as applicable. In particular, specific environmental regulations apply to petrochemical, crude oil refining and extraction activities, as well as to the construction of crude oil and natural gas pipelines. Before authorizing a new project, ASEA requires the submission of an environmental impact and risk analysis.

ASEA is an administrative body of the SEMARNAT that operates with technical and administrative autonomy and has the authority to regulate and supervise companies participating in the hydrocarbon sector through its issuance of rules establishing safety standards, limits on greenhouse gas emissions and guidelines for the dismantling and abandonment of facilities, among other things. The *Ley de la Agencia Nacional de Seguridad Industrial y de Protección al Medio Ambiente del Sector Hidrocarburos* (Law of the Hydrocarbons Industrial Safety and Environmental Protection Agency of the Hydrocarbon Sector) provides that until the general administrative provisions and Official Mexican Standards proposed by the Hydrocarbons Industrial Safety and Environmental Protection Agency are in effect, obligations will continue under the guidelines, technical and administrative arrangements, agreements and Official Mexican Standards promulgated by the SEMARNAT, CNH and CRE.

We are also subject to the NOM-001-SEMARNAT-1996 issued by CONAGUA in conjunction with the Procuraduría Federal de Protección al Ambiente (PROFEPA), which sets forth the maximum permissible levels of pollutants in wastewater that can be discharged into national bodies of water. In addition, we are subject to the NOM-052-SEMARNAT-2006, which regulates hazardous waste, the NOM-161-SEMARNAT-2011, which regulates special waste management procedures, as well as the NOM-138-SEMARNAT/SSA1-2012, which establishes the maximum permissible levels of hydrocarbons in the soil and sets forth guidelines with respect to soil testing and the treatment of sites affected by hydrocarbon production.

Federal and state authorities are authorized to inspect any facility to determine its compliance with the Environmental Law, state environmental laws, regulations and technical environmental regulations. Violations or non-compliance with environmental standards and regulations may result in substantial fines, temporary or permanent shutdown of a facility, required capital expenditures to minimize the effect of our operations on the environment, cleanup of contaminated soil and water, cancellation of a concession or revocation of an authorization to carry out certain activities and, in certain cases, criminal proceedings. See “Item 3—Key Information—Risk Factors—Risk Factors Related to Our Operations—Our compliance with environmental regulations in Mexico could result in material adverse effects on our results of operations.”

Mexico generally reviews and updates its environmental regulatory framework every five years, and we work with the Mexican Government to develop new environmental regulations of activities related to the oil and gas industry.

During 2018, ASEA issued regulations that establish comprehensive guidelines for the prevention and control of methane emissions, as well as for special waste management.

In addition, ASEA published environmental standard NOM-006-ASEA-2017, which provides technical guidelines and criteria for industrial safety, operational safety and environmental protection for each of the phases of the design, construction, pre-start, operation, maintenance, closing and, finally, the dismantling of land installations for the storage of petroleum and petroleum products, except liquefied petroleum gas.

Climate Change

The General Law on Climate Change was published in the Official Gazette of the Federation on June 6, 2012, and was subsequently amended on July 13, 2018. The purpose of the General Law on Climate Change is to (i) regulate emissions of greenhouse gases and compounds, (ii) reduce vulnerability to the effects of climate change, (iii) regulate the mitigation and adaptation efforts with respect to climate change and (iv) establish the framework for Mexico's compliance with the Paris Agreement.

The Mexican Government participates in international discussions and negotiations to develop and promote agreements and initiatives that mitigate the effects of climate change. In September 2016, the Mexican Government ratified the international agreement on climate change referred to as the Paris Agreement. Pursuant to the Paris Agreement, the Mexican Government agreed to reduce greenhouse gas emissions by 22% and black carbon emissions by 51% by the year 2030, using 2013 emission levels as a baseline. In July 2018, the General Law on Climate Change was amended to include emission targets for specific industries in Mexico in order to achieve these targets. Pursuant to these amendments, the oil and gas industry in which we operate is required to reduce emissions by 14% by the year 2030. In addition, ASEA issued a new regulation to prevent and control methane emissions, which is applicable to us. See “—Legal Framework” above.

The Mexican Government has indicated its commitment to adhere to its “nationally determined contribution” targets, including the targets that 35% of all energy generated by 2024 must be generated from renewable sources and 43% by 2030. The Mexican Government has also indicated a commitment to replace heavy fuels with natural gas, biomass and other forms of clean energy, and to reduce the leakage, venting and controlled burning of methane.

In accordance with the actions carried out by the Mexican Government to mitigate global climate change, we have established a goal of reducing our greenhouse gas emissions by 25% by the year 2021, as compared to 2016 levels. During 2018, we recorded greenhouse gas emissions of 36.5 million tons of carbon dioxide equivalent, which represents a 5.5% decrease compared to 2017. This decrease was mainly due to an increase in the use of associated gas in our shallow water projects, as well as a decrease in the amount of methane sent to burners in our refineries as a result of reduced crude oil processing. Emissions were estimated considering a global warming potential (the amount of energy the emission of one ton of a gas will absorb over a given period of time, relative to the emissions of one ton of carbon dioxide) for methane of 28 and flare efficiency of 84%, consistent with the national emissions inventory.

We also work with national and international entities to develop, promote and implement initiatives that mitigate our impact on climate change. For instance, we participate in the United Nations Environmental Programme's Climate and Clean Air Coalition (CCAC). Through participation in the CCAC, we aim to identify emission sources in our key facilities and substantially reduce emissions of short-lived climate pollutants. In 2018, with the support of the Global Methane Initiative, we developed a workshop on the key sources of methane emissions and the inspection of our facilities. In addition, as a member of the Oil and Gas Climate Initiative (OGCI), we joined the collective commitment to reduce the methane intensity of aggregate upstream oil and gas operations by 0.25% by the year 2025, using 2017 as a baseline.

Furthermore, we continue to analyze the implementation of carbon capture, use and storage (CCUS) techniques. In 2014, the “CCUS Technology Roadmap for Mexico” was developed in conjunction with the *Secretaría de Energía* (the Ministry of Energy or SENER), SEMARNAT and CFE. This led to the execution of integrated carbon dioxide capture projects at Petróleos Mexicanos and CFE facilities and enhanced oil recovery (EOR) initiatives. Between 2016 and 2018, several studies and tools were developed to evaluate the first CCUS-EOR project in Mexico, as well as the necessary environmental and social safeguards for the pilot projects. In 2018, the CCUS Technology Roadmap for Mexico was updated by the relevant stakeholders, and we signed a collaboration framework agreement with SENER, SEMARNAT and CFE, pursuant to which the Mexican CCUS Center was created. The Mexican CCUS Center seeks to channel all of our CCUS pilot projects going forward.

Additionally, we continue the implementation of the 2016-2019 strategic gas exploitation plan of Pemex Exploration and Production, in order to increase the use of associated gas and reduce gas flaring and greenhouse gas emissions. In 2018, we began the second phase of the verification of greenhouse gas emission levels for all sites that recorded emissions between 100,000 and 1,000,000 tCO₂e (the volume of greenhouse gas emissions equivalent to one ton of carbon dioxide) per year.

Biodiversity

In 2018, we continued to support several biodiversity conservation and indirect climate change mitigation projects. These projects are designed to increase carbon dioxide and water capture and to preserve the ecosystems in which we operate. These projects include:

- *Proyecto de Conservación, Manejo y Restauración de los Ecosistemas Naturales de la Cuenca Media del Río Usumacinta* (Conservation, Management and Restoration Project of the Natural Ecosystems of the Rio Usumacinta Basin) in Chiapas;
- *Educación Ambiental y Operación de la Casa del Agua* (Environmental Education and Operation of the House of Water), in the Pantanos de Centla; and
- *Operación y manejo del corredor ecológico JATUSA* (Operation and Management of the JATUSA Ecological Corridor) in the Jaguaroundi and Tuzandépetl ecologic parks and the Santa Alejandrina swamp.

In 2018, we provided financial support for these projects, which we consider to be important initiatives to support biodiversity. The “House of Water” center, for example, is, at this time, the only wetland education center of its class in Mexico and is dedicated to environmental education and training for the conservation and restoration of wetlands. The center is located in the Pantanos de Centla Biosphere Reserve in the state of Tabasco, which is one of the most important locations for birds and aquatic plant diversity in Mesoamerica. Similarly, our Jaguaroundi Ecological Park, which saw improvements to its museum and the conditions for captive organisms exhibited therein, continued providing environmental education services to the surrounding communities and industry. We also continued to manage the JATUSA Ecological Corridor. The JATUSA Ecological Corridor is an important conservation initiative designed to unite natural or modified spaces, ecosystems and habitats to facilitate the conservation of biodiversity.

HEALTH, SAFETY AND ENVIRONMENTAL PERFORMANCE

We believe that we are in substantial compliance with current federal and state environmental laws and that we maintain an organizational structure designed to identify and solve environmental risks. In addition, our subsidiary entities have specialized departments that implement their own internal environmental programs, audits and facilities inspections. When these internal audits reveal problems or deficiencies, the subsidiary entities take the necessary measures to eliminate them.

Since 1993, we have participated in the National Environmental Audit Program (NEAP), a voluntary alternative to the traditional system of inspections and penalties, with PROFEPA and now with ASEA. This program was created by PROFEPA in 1992 as a regulatory incentive for companies to voluntarily correct any environmental irregularities in their operations.

In general terms, voluntary environmental auditing consists of three stages: (i) an audit and compliance diagnosis; (ii) development of an action plan to correct irregularities; and (iii) the implementation of the action plan. If a company satisfactorily completes these three stages, ASEA grants the audited company a clean industry certificate, which means that it complies with the applicable environmental legislation of their industry.

As of December 31, 2018, we have registered 221 of our facilities with NEAP with the objective of obtaining a “clean industry” certificate for each facility. During 2018, 69 of our facilities were re-certified and an additional 32 facilities were certified for the first time. The audits of the remaining 120 facilities are still under review. We will continue including new facilities under this program, as we expand our activities in the areas of exploration, exploitation, refining and distribution of hydrocarbons.

During 2018, we did not experience any major incident that had significant environmental consequences. We did, however, experience the following five material blasts or hazardous events at our facilities, none of which had significant environmental consequences:

- On February 6, 2018, an employee lost his life when struck by a heavy truck on a lubrication ramp at a Poza Rica garage.
- On March 5, 2018, a subcontractor lost his life due to a fall while working on repairs at the Nejo 2D oil well.
- On March 14, 2018, a contractor lost his life due to an accident at our Madero refinery, as he was applying corrosion-resistant coating at a lifting platform.
- On June 26, 2018, a contractor lost his life due to an accident while inspecting a production pipe at the Arenque C platform.
- On July 5, 2018, a tank truck from the Saltillo storage terminal overturned and caught fire. As a result of this accident, the driver of the tank truck lost his life and two passengers from another vehicle were injured.

As part of our accident prevention strategy, we conduct root cause investigations of all incidents that occur during our operations. These investigations allow us to identify the causes and establish corrective measures to avoid the recurrence of such type of incident.

In 2018, our lost time injury rate decreased 26.5% from 0.34 in 2017 to 0.25 in 2018. The segment that contributed most to this decrease was our logistics segment. Our lost days indicator due to injuries decreased 28.6% from 21 to 15 lost days per million man-hours worked with risk exposure from 2017 to 2018. Lost days are those missed as a result of incapacitating injuries suffered at work or those on which compensation is paid for partial, total or permanent incapacity or death. From 2017 to 2018, our contractors’ lost time injury rate increased 55.6% from 0.09 to 0.14 injuries per million man-hours worked with risk exposure.

In 2018, our primary initiatives in industrial safety, health and environmental protection (or, EH&S) included the following:

- Weekly visits to and technical support for our productive subsidiary entities’ facilities to supervise the alignment of EH&S functions and execution of the PEMEX-SSPA system. The PEMEX-SSPA system is the system we developed, based on international best practices, to ensure compliance with our EH&S policies, principles and objectives, and which we continue to evolve and improve;
- Execution of the campaigns “Layers of Protection,” “Order and Cleaning” and “Planning and Safe Work Execution;”
- Improved accountability for EH&S leadership teams in our productive subsidiary entities;
- Application of the PEMEX-SSPA effective execution program with the *Sindicato de Trabajadores Petroleros de la República Mexicana* (the Petroleum Workers’ Union of the Mexican Republic, or the Petroleum Workers’ Union);
- Implementation of work cycles for critical procedures, such as the opening of pipelines, electrical safety and special protection equipment for personnel;
- Establishment of several task forces in critical facilities of the productive subsidiary entities to reverse causes of serious accidents;
- Application of culture and leadership evaluations to command line personnel under our new PEMEX-SSPA system in order to establish actions required to address critical elements;

- Technical support to implement EH&S standards in the new operating scenarios permitted under the Energy Reform;
- Training of the EH&S professionals in four roles: auditing, establishing norms, training and technical support;
- Supervision on compliance with the *Sistema de Seguridad Industrial, Seguridad Operativa y Protección Ambiental* (The Industrial Safety, Operational Safety and Environmental Protection System, or SASISOPA) resolutions issued by ASEA, which establish certain requirements relating to industrial safety, operational safety and environmental protection, and which apply to Pemex Exploration and Production and Pemex Industrial Transformation;
- Evolve the PEMEX-SSPA system to ensure disciplined execution and prioritization of leadership, risk management and the human factor;
- Review of compliance with the twelve “zero tolerance” guidelines in the PEMEX-SSPA system;
- Verification and advice in the application of nine critical safety procedures; and
- Supervision of the execution of the *Binomio* project by EH&S professionals of the productive subsidiary entities. The *Binomio* project is an audit program with corresponding technical support for the effective execution of the PEMEX-SSPA system and the immediate verification and mitigation of risks.

Additionally, in 2018, as part of our continuous improvement of the PEMEX-SSPA system, we developed the Policies and Guidelines and the Operational Technical Guides for the improved PEMEX-SSPA system. In developing the foregoing, we consulted and incorporated international best practices and we adhered to the General Administrative Provisions of ASEA and the international standard ISO - 45001, which we believe strengthens our PEMEX-SSPA system.

Environmental Liabilities

As of December 31, 2018, our estimated and accrued environmental liabilities totaled Ps. 11,219.3 million. Of this total, Ps. 1,671.7 million belong to Pemex Exploration and Production, Ps. 3,152.4 million to Pemex Industrial Transformation and Ps. 6,395.2 million to Pemex Logistics. The following tables detail our environmental liabilities by productive subsidiary entity and operating region at December 31, 2018.

Pemex Exploration and Production

	<u>Estimated Affected Area</u> (in hectares)	<u>Estimated Liability</u> (in millions of pesos)
Northern region	417.4	Ps. 1,135.2
Southern region	228.3	366.7
Total⁽¹⁾	645.7	Ps. 1,501.9

Note: Numbers may not total due to rounding.

(1) During 2018, environmental remediation was completed on 60.81 hectares. There were 376.28 hectares of additional affected areas in 2018, as a result of spills from pipelines mainly.

Source: PEMEX.

	<u>Number of Holding Ponds</u> <u>Reported as Liabilities⁽¹⁾</u>	<u>Estimated Liability</u> (in millions of pesos)
Southern region	11	Ps. 20.8
Northern region	69	149.0
Total	80	Ps. 169.8
Total estimated environmental liabilities of Pemex Exploration and Production		Ps. 1,671.7

Note: Numbers may not total due to rounding.

(1) In 2018, no new ponds were added, and no holding ponds were restored. As a result, as of December 31, 2018, 80 ponds remain to be reported.

Source: Pemex Exploration and Production.

Pemex Industrial Transformation ⁽¹⁾

	<u>Estimated Affected Area</u> (in hectares)	<u>Estimated Liability</u> (in millions of pesos)
Refineries	285.5	Ps. 3,152.4
Total estimated environmental liabilities of Pemex Industrial Transformation	285.5	Ps. 3,152.4

Note: Numbers may not total due to rounding.

(1) In 2017, Pemex Industrial Transformation reported a total of 297.01 hectares of contaminated sites. Nevertheless, in 2018, the environmental liability of the Reynosa Gas Complex Processor (11.52 hectares) was transferred to the government of Tamaulipas, so the total environmental liabilities of Pemex Industrial Transformation at the end of 2018 is 285.5 hectares

Source: Pemex Industrial Transformation.

Pemex Logistics

	<u>Estimated Affected Area</u> (in hectares)	<u>Estimated Liability</u> (in millions of pesos)
Storage and Distribution Terminals	67.8	Ps. 1,178.7
Pipelines	600.4	5,216.5
Total estimated environmental liabilities of Pemex Logistics	668.2	Ps. 6,395.2

Note: Numbers may not total due to rounding.

Source: Pemex Logistics.

Our estimates of environmental liabilities include cost estimates for site-specific evaluation studies, which are based on previous evaluations for sites with comparable characteristics and the corresponding remediation. The remediation sites consist of facilities identified in the audit process described above, as well as those previously identified sites in more mature petroleum operating areas that were not cleaned up in the past. Our environmental liabilities also include the elimination of holding ponds created by abandoned petroleum wells. Additionally, our environmental liabilities include an accrual based on information received periodically from field managers regarding probable environmental liabilities identified in their respective areas of responsibility. We accrue environmental liabilities when sufficient basic knowledge is available to form a preliminary estimation as to remediation cost. Although the full potential scope of the remediation cost may not be known with certainty, these accruals are made when the liability is probable and the amount may be reasonably estimated, in accordance with IAS 37 "Provisions, Contingent Liabilities and Contingent

Assets” for IFRS purposes. These estimated liabilities include assumptions resulting from an initial evaluation of damage, including land acreage to be remediated, depth and type of contamination. While the initial evaluation is extensive, there is a possibility that the actual scope of remediation could vary depending upon information gathered during the remediation process. For a further discussion of our environmental liabilities, see Note 3-K to our consolidated financial statements included herein.

Unasserted or additional claims are not reflected in our identified liabilities. At the end of 2018, we were not aware of uncertainties with respect to joint and several liabilities that could affect our assessment of environmental contingencies or otherwise result in a major environmental liability. As a result, we believe we are positioned to know immediately of any claims and are therefore directly accountable for any claims that may be brought against us.

Pemex Exploration and Production remains responsible for handling existing environmental liabilities—these responsibilities are not part of the Integrated E&P Contracts. Nevertheless, the Integrated E&P Contracts include environmental clauses related to contractors’ and Pemex Exploration and Production’s responsibility to ensure an adequate environmental performance, and also establish the terms for compensation and repair of any new environmental impacts.

The timing of remediation or cleanup of the sites to which these environmental liabilities relate is dependent upon the annual budget approved by the Mexican Congress.

On August 1, 2017, we were granted a favorable judgment by the Supreme Court of Justice of the Nation, which determined that we are not liable for material and environmental damages caused by hydrocarbons spills related to illegal tapping of pipelines, since the environmental damage was caused by third party criminal behavior. As of the date of this annual report, there has been no definitive resolution with respect to our liability for such damages.

Environmental Projects and Expenditures

In 2018, we spent Ps. 3,219.1 million on environmental projects and related expenditures, as compared to Ps. 5,760 million in 2017. For 2019, we have budgeted Ps. 832.3 million for environmental projects and expenditures, including modernization of installations, implementation of systems and mechanisms to monitor and control atmospheric pollution, acquisition of equipment to address contingencies related to oil and gas spills, the expansion of water effluent systems, restoration and reforestation of affected areas, studies for environmental investigation and environmental audits. In addition, we continue to conduct research and development efforts to increase our capacity to produce gasoline, diesel and fuel oil with lower sulfur content at our refineries in Mexico.

We do not believe that the cost of complying with environmental laws or environmental requirements related to the NAFTA among the governments of Mexico, the United States and Canada, the Vienna Convention for the Protection of the Ozone Layer, the Agreement on Environmental Cooperation between the Governments of Mexico and Canada or Mexico's membership in the Organization for Economic Cooperation and Development, has caused or will cause a significant increase in our environmental expenditures.

Social Responsibility

During 2018, we implemented and continued various corporate social responsibility initiatives, primarily with respect to the protection and preservation of the environment, relations with communities where we operate, ethical work practices, respect for labor rights and the general promotion of quality of life for communities and employees.

Our corporate and social responsibility goals are carried out through the following mechanisms:

- cash donations;
- product donations of fuels and asphalt;
- donations of movable properties;
- mutually beneficial public works, or mutual benefit projects, which are projects we carry out in collaboration with local authorities and communities to improve infrastructure that is beneficial both to us and to the community;
- the *Programa de apoyo a la comunidad y medio ambiente* (Program to support communities and the environment, which we refer to as PACMA), which supports and implements social programs, actions and public works designed to promote the economic and social development of the communities in which we operate and to protect their environment; and
- other instruments that provide a positive impact on communities, including Integrated E&P Contracts and the sustainable development annexes and clauses to our contracts (which we refer to as SD Annexes), in which we and our contractors commit to improving the quality of life in communities where we operate, directly or indirectly.

In 2018, the total value of our social responsibility donations and contributions amounted to Ps. 2,103.8 million. Our cash donations amounted to Ps. 22.0 million and our asphalt, fuel and movable property donations amounted to Ps. 1,300.5 million. Contributions made through provisions of our Integrated E&P Contracts amounted to Ps. 120.5 million, SD Annexes amounted to Ps. 20.2 million and PACMA and mutual benefit project contributions amounted to Ps. 592.6 million and Ps. 48.0 million, respectively.

Approximately 90.1% of our donations and contributions were assigned to twelve states with greater activity in the oil and gas industry (Campeche, Chiapas, Coahuila, Guanajuato, Hidalgo, Nuevo León, Oaxaca, Puebla, San Luis Potosí, Tabasco, Tamaulipas and Veracruz); and the remaining 9.9% to the remaining states. Notably, we took the following specific actions in 2018:

- contributed Ps. 1,320.9 million in cash and in-kind donations. Of our 2018 cash and in-kind donations, 66.7% was concentrated in the states of Tabasco, Campeche, Veracruz and Tamaulipas. Cash donations made during 2018 were used for conservation of natural areas and scholarship programs;
- contributed a total of fourteen movable properties, which were delivered to the following states: Tabasco (three), Veracruz (two), Sinaloa (two), Campeche (one), Oaxaca (one), Hidalgo (one), Puebla (one), Chiapas (one), Tlaxcala (one) and Coahuila (one);
- contributed, via our SD Annexes, Ps. 16.4 million in Veracruz, which was used for community health, education, sports and environmental protection, and Ps. 3.8 million in Puebla, which was directed towards community health and education;
- contributed a total of Ps. 48.0 via our mutual benefit projects, Ps. 47.4 million of which was directed towards the state of Tabasco. We also contributed Ps. 0.6 million to mutual benefit projects in Veracruz. These projects were mainly in infrastructure, such as the pavement of roads, and for the construction of community use domes and the rehabilitation of schools; and
- carried out 66 projects related to Integrated E&P Contracts in the states of Veracruz and Tamaulipas for a total amount of Ps. 120.5 million. In Veracruz, we contributed Ps.109.8 million and in Tamaulipas we contributed Ps.10.7 million. These projects were mainly in the areas of education, sports, infrastructure, environmental protection and community health.

In addition, in 2018 we made several donations under our PACMA program, approximately 38.8% of which were allocated to Tabasco, approximately 28.0% to Veracruz and approximately 14.0% to Campeche. The remainder, or approximately 19.2% was allocated to Tamaulipas, Oaxaca, Hidalgo, Guanajuato, Puebla, Nuevo León, San Luis Potosí, Chiapas, Tlaxcala and Yucatán. Specifically, in 2018 we contributed Ps. 220.9 million under this program to public safety and civil protection, mainly for security equipment and lighting systems. We also contributed Ps. 192.4 million under this program for infrastructure, mainly for the construction of community use domes and the pavement and rehabilitation of roads. Finally, we contributed an additional amount of Ps. 110.5 million under this program, Ps. 68.8 million of which is allocated to ambulances and health center equipment.

In sum, we contributed Ps. 732.8 million to infrastructure, Ps. 1,105.4 million to public safety and civil protection, Ps. 85.4 million to community health, Ps. 88.8 million to productive projects, Ps. 30.9 million to education and sports, Ps. 48.5 million to environmental protection and Ps. 12.0 million to community equity.

TRADE REGULATION AND EXPORT AGREEMENTS

Though Mexico is not a member of Organization of the Petroleum Exporting Countries (which we refer to as OPEC), it has periodically announced increases and decreases in our crude oil exports reflecting production revisions made by other oil producing countries, in order to contribute to crude oil prices stabilization. However, we have not changed our export goals because of announcements made by OPEC since 2004, and we believe that Mexico has no current plans to change our current level of crude oil exports.

NAFTA has not affected Mexico's rights, through us or other companies, to explore and exploit crude oil and natural gas in Mexico, to refine and process crude oil and natural gas and to produce petrochemicals in Mexico. Since 2003, petrochemical products have enjoyed a zero tariff under NAFTA and, subject to limited exceptions, exports of crude oil and petroleum products from Mexico to the United States and Canada have been free or exempt from tariffs. Similarly, since 2003, Mexico's imports of petroleum products from the United States and Canada have also been exempt from tariffs. In addition, in 2004, NAFTA approved lower tariffs on certain materials and equipment imported by Mexico. The zero tariff on Mexico's imports of petrochemicals from the United States and Canada could have increased competition in the petrochemicals industry in Mexico. To the extent that domestic and international prices for our products remain constant, lower tariffs on products, materials and equipment that we import from and export to the United States and Canada, reduce our expenses and increase our revenue.

On November 30, 2018, the presidents of Mexico, the United States and Canada signed the United States-Mexico-Canada Agreement, or the USMCA, which, if ratified by the legislatures of the three countries, would replace NAFTA. As of the date of this annual report, there is uncertainty about whether the USMCA will be ratified, as well as the timing thereof, and the potential for further re-negotiation, or even termination, of NAFTA. See "Item 3—Key Information—Risk Factors—Risk Factors Related to Mexico— Economic and political developments in Mexico and the United States may adversely affect Mexican economic policy and, in turn, PEMEX's operations."

TAXES, DUTIES AND OTHER PAYMENTS TO THE MEXICAN GOVERNMENT

General

Taxes and duties applicable to us are a significant source of revenues to the Mexican Government. We contributed approximately 11.3% of the Mexican Government's revenues in 2017 and 11.0% in 2018. In 2018, we paid a number of special oil and gas taxes and duties, in addition to the other taxes and duties paid by some of the subsidiary companies, as described below under "—Other Taxes." The fiscal regime in effect for Petróleos Mexicanos and the subsidiary entities for 2018 (which we refer to as the fiscal regime) became effective in 2015 and can be subsequently modified from time to time. The implementing legislation published in August 2014 set forth a fiscal regime applicable to the new contractual arrangements that governs exploration and production activities conducted in Mexico beginning on January 1, 2015, as well as a state dividend to be paid by Petróleos Mexicanos and the subsidiary entities beginning on January 1, 2016. See "—Fiscal Regime" and "—Other Payments to the Mexican Government" below.

Fiscal Regime for PEMEX

Fiscal Regime

The Hydrocarbons Revenue Law sets forth, among other things, the following duties applicable to us in connection with our assignments granted by the Mexican Government:

- *Derecho por la Utilidad Compartida* (Profit-Sharing Duty): As of January 1, 2015, this duty was equivalent to 70% of the value of oil and gas produced in the relevant area, less certain permitted deductions. Pursuant to the Hydrocarbons Revenue Law, this duty decreases on an annual basis. As of January 1, 2019, this duty was set at 65%. During 2018, we accrued Ps. 443,294 million in connection with this duty, an 18.8% increase from Ps. 372,903 million paid in 2017, primarily resulting from an increase in oil and gas prices. On August 18, 2017, a decree was published in the Official Gazette of the Federation that increased the amount we can deduct for investments, costs and expenses made pursuant to this duty and resulted in a benefit of Ps. 11,170 million.
- *Derecho de Extracción de Hidrocarburos* (Hydrocarbons Extraction Duty): This duty is to be determined based on a rate linked to the type of hydrocarbons (e.g., crude oil, associated natural gas, non-associated natural gas or condensates), the volume of production and the relevant market price. During 2018, we paid Ps. 83,027 million under this duty, a 41.9% increase from Ps. 58,523 million in 2017, mainly due to an increase in oil and gas prices.
- *Derecho de Exploración de Hidrocarburos* (Exploration Hydrocarbons Duty): The Mexican Government is entitled to collect a monthly payment of Ps. 1,294.71 per square kilometer of non-producing areas. After 60 months, this duty increases to Ps. 3,096.04 per square kilometer for each additional month that the area is not producing. These amounts will be updated on an annual basis in accordance with the national consumer price index (NCPI). During 2018, we paid Ps. 1,027 million under this duty, a 4.7% increase from Ps. 981 million in 2017.
- In 2018, Mexican companies paid a corporate income tax at a rate of 30.0% applied to revenues, less certain deductions. Beginning in 2015, Petróleos Mexicanos and the subsidiary entities became subject to the *Ley del Impuesto sobre la Renta*, or Mexican Income Tax Law. During 2018 and 2017, we did not pay any tax under this law, as compared to the Ps. 1,333 million we paid in 2016.

Under the 2018 fiscal regime, some of our products are subject to the following IEPS Taxes, which we withhold from our customers and pay to the tax authorities. The IEPS tax is not included in our sales or expenses.

- *IEPS sobre la venta de los combustibles automotrices* (IEPS Tax on the Sale of Automotive Fuels): This tax is a fee on domestic sales of automotive fuels, gasoline and diesel, that Pemex Industrial Transformation collects on behalf of the Mexican Government. The applicable fees for this tax are Ps. 4.59 per liter of Magna gasoline; Ps. 3.88 per liter of Premium gasoline and Ps. 5.04 per liter of diesel. The amount of the fee will depend on the class of fuel, and is fixed yearly and adjusted on a weekly basis by the Ministry of Finance and Public Credit. The fees apply to sales in Mexico and imports.

- *IEPS beneficio de entidades federativas, municipios y demarcaciones territoriales* (IEPS Tax in Favor of States, Municipalities and Territories): This tax is a fee on domestic sales of automotive fuels, gasoline and diesel, that Pemex Industrial Transformation collects on behalf of the Mexican Government. The applicable fees for this tax are 40.52 cents per liter of Magna gasoline, 49.44 cents per liter of Premium gasoline and 33.63 cents per liter of diesel. This fee changes yearly in accordance with inflation. Funds gathered by this fee are allocated to Mexican states and municipalities as provided for in the *Ley de Coordinación Fiscal* (Tax Coordination Law). The fees only apply to sales in Mexico and are not subject to VAT.
- *IEPS a los combustibles fósiles* (IEPS Tax on Fossil Fuels): This tax is a fee on domestic sales of fossil fuels that Pemex Industrial Transformation collects on behalf of the Mexican Government. The applicable fees for this tax are 6.93 cents per liter for propane, 8.98 cents per liter for butane, 12.17 cents per liter for gasoline and aviation gasoline, 14.54 cents per liter for jet fuel and other kerosene, 14.76 cents per liter for diesel, 15.76 cents per liter for fuel oil, Ps. 18.29 per ton for petroleum coke, Ps. 42.88 per ton for coal coke, Ps. 32.29 per ton for mineral carbon and Ps. 46.67 per ton for carbon from other fossil fuels. This fee changes yearly in accordance with inflation and applies to imports to Mexico.

The Hydrocarbons Revenue Law also establishes the fiscal terms to be applied to the contracts for exploration and production granted by the Mexican Government to us or to other companies in connection with potential future competitive bidding rounds. Specifically, these fiscal terms contemplate the following taxes, duties, royalties and other payments to the Mexican Government (in addition to any taxes owed pursuant to the *Ley de Ingresos de la Federación* (Federal Revenue Law) for the applicable year and other applicable tax laws):

- *Cuota Contractual para la Fase Exploratoria* (Exploration Phase Contractual Fee): During the exploration phase of a project governed by a license, production-sharing contract or profit-sharing contract, the Mexican Government is entitled to collect a monthly payment of Ps. 1,294.71 per square kilometer of non-producing areas. After 60 months, this fee increases to Ps. 3,096.04 per square kilometer for each additional month that the area is not producing. The fee amount will be updated on an annual basis in accordance with the NCPI.
- *Regalías* (Royalties): Royalty payments to the Mexican Government are determined based on the “contractual value” of the relevant hydrocarbons, which is based on a variety of factors, including the type of underlying hydrocarbons (*e.g.*, crude oil, associated natural gas, non-associated natural gas or condensates), the volume of production and the market price. Royalties are payable in connection with licenses, production-sharing contracts and profit-sharing contracts.
- *Pago del Valor Contractual* (Contractual Value Payment): Licenses require a payment calculated as a percentage of the “contractual value” of the hydrocarbons produced, as determined by the Ministry of Finance and Public Credit on a contract-by-contract basis.
- *Porcentaje a la Utilidad Operativa* (Operating Profit Payment): Production-sharing contracts and profit-sharing contracts require a payment equivalent to a specified percentage of operating profits. In the case of production-sharing contracts, this payment is to be made in-kind through delivery of the hydrocarbons produced. In the case of profit-sharing contracts, this payment is to be made in cash.
- *Bono a la Firma* (Signing Bonus): Upon execution of a license or migration of an assignment, a signing bonus is to be paid to the Mexican Government in an amount specified by the Ministry of Finance and Public Credit.
- *Impuesto por la actividad de Exploración y Extracción de Hidrocarburos* (Hydrocarbons Exploration and Extraction Activities Tax): Contracts for exploration and extraction and assignments granted by the Mexican Government will include a specified tax on the exploration and extraction activities carried out in the relevant area. A monthly tax of Ps. 1,688.74 per square kilometer is payable during the exploration phase until the extraction phase begins. During the extraction phase of a project, a monthly tax of Ps. 6,754.99 per square kilometer is payable until the relevant contract for exploration and extraction or assignment is terminated.

Under the Hydrocarbons Revenue Law, exploration and production activities associated with contracts for exploration and production are not subject to a value added tax.

Fluctuating crude oil price levels directly affect the level of certain taxes and duties that we pay. See “Item 3—Key Information—Risk Factors—Risk Factors Related to our Relationship with the Mexican Government—We pay significant taxes and duties to the Mexican Government, and, if certain conditions are met, to pay a state dividend, which may limit our capacity to expand our investment program or negatively impact our financial condition generally.”

Other Payments to the Mexican Government

Pursuant to the Petróleos Mexicanos Law, as of January 1, 2016, Petróleos Mexicanos and the subsidiary entities are required to pay a state dividend to the Mexican Government on an annual basis. In July of each year, Petróleos Mexicanos and the subsidiary entities are required to provide the Ministry of Finance and Public Credit a report disclosing their financial results for the previous fiscal year and their investment and financing plans for the following five years, together with an analysis of the profitability of these investments and the relevant projections of their financial positions. The Ministry of Finance and Public Credit will rely on this report and a favorable opinion issued by a technical committee of the Mexican Petroleum Fund for Stabilization and Development to determine the amount of the state dividend to be paid by Petróleos Mexicanos and each of the subsidiary entities. The Petróleos Mexicanos Law provides that the aggregate amount of the state dividend to be paid in 2016 was to be equal to, at minimum, 30% of the total revenues of Petróleos Mexicanos and the subsidiary entities, after taxes, from the previous fiscal year. It further provides that that percentage will decrease in subsequent years, until reaching 15% in 2021 and 0% in 2026. In accordance with the Federal Revenue Law for 2016, the Federal Revenue Law for 2017, the Federal Revenue Law for 2018 and the Federal Revenue Law for 2019, Petróleos Mexicanos was not required to pay a state dividend in 2016, 2017 and 2018 and will not be required to pay a state dividend in 2019.

The following table sets forth the taxes and duties that we recorded for each of the past three years.

	Year ended December 31,					
	2016		2017		2018	
	(in millions of pesos) ⁽¹⁾					
Hydrocarbon extraction duties and others	Ps.	277,162	Ps.	338,044	Ps.	469,934
Income tax		(12,640)		(5,064)		(8,355)
Total	Ps.	264,522	Ps.	332,980	Ps.	461,579

Note: For a description of these taxes and duties, see “Item 4—Information on the Company—Taxes, Duties and Other Payments to the Mexican Government.” Numbers may not total due to rounding.

(1) Figures are stated in nominal pesos.

Source: PEMEX’s audited financial statements, prepared in accordance with IFRS.

Other Taxes

Since 1994, our interest payments on our external debt have been subject to Mexican Government withholding taxes. Nevertheless, withholding taxes do not represent a substantial portion of our total tax liability.

We are subject to municipal and state taxes, such as real property and payroll taxes. However, because most of our facilities are located on federal property, which is not subject to municipal taxation, real property taxes are not a significant part of our overall taxes. Similarly, payroll taxes do not represent a substantial portion of our total tax liability.

In addition, we have a number of non-Mexican subsidiary companies that may be subject to taxation in the jurisdiction of their incorporation or operations. The aggregate taxes paid by the subsidiary companies were Ps. 7,200.9 million in 2016, Ps. 2,536.3 million in 2017 and Ps. 1,616.7 million in 2018.

No assurance can be given that our tax regime will not change in the future. See “Item 3—Key Information—Risk Factors—Risk Factors Related to our Relationship with the Mexican Government—We pay significant taxes and duties to the Mexican Government, and, if certain conditions are met, to pay a state dividend, which may limit our capacity to expand our investment program or negatively impact our financial condition generally.”

UNITED MEXICAN STATES

The information in this section with regard to Mexico has been derived from publicly available information published by, or on the websites of, the Comisión Nacional Bancaria y de Valores (National Banking and Securities Commission), Banco de México (the Mexican central bank), the Ministry of Finance and Public Credit and the Instituto Nacional de Estadística y Geografía (INEGI).

Form of Government

The President of Mexico (or the President) is the chief of the executive branch of the Mexican Government. The President is elected by the popular vote of Mexican citizens who are eighteen years of age or older. The Mexican Constitution limits the President to one six-year term; the President may not run for reelection. General elections were held in Mexico on July 1, 2018. Mr. Andrés Manuel López Obrador, the candidate from the National Regeneration Movement, was elected president. Mr. Andrés Manuel López Obrador took office on December 1, 2018, replacing President Enrique Peña Nieto, a member of the *Partido Revolucionario Institucional* (Institutional Revolutionary Party, or PRI). President López Obrador will serve for five years and ten months due to a change of the inauguration date effective starting in 2024.

From 1929 to 1994, the PRI won all presidential elections, and, from 1929 until July 1997, the PRI held a majority of the seats in both chambers of the Mexican Congress. From 1929 until 1989, the PRI also won all of the state gubernatorial elections. In July 2000, the candidate from the *Alianza por el Cambio* (Alliance for Change), a coalition of the *Partido Acción Nacional* (National Action Party, or PAN), the oldest opposition party in the country, and the *Partido Verde Ecologista de México* (Ecological Green Party), won the presidential election.

Each of Mexico's 31 states is headed by a state governor. Mexico's Federal District, Mexico City, is headed by an elected mayor.

Legislative authority is vested in the Mexican Congress, which is composed of the Senate and the Chamber of Deputies. Members of the Mexican Congress are elected either directly or through a system of proportional representation by the popular vote of Mexican citizens who are 18 years of age or older. The Senate is composed of 128 members, 96 of whom are elected directly, while the other 32 are elected through a system of proportional representation. The Chamber of Deputies is composed of 500 members, 300 of whom are elected directly by national electoral districts, while the other 200 are elected through a system of proportional representation. Under this proportional representation system, seats are allocated to political party representatives based on the proportion of the votes cast for those parties that receive at least 3.0% of the national vote, among other requirements.

The Mexican Constitution provides that the President may veto bills and that the Mexican Congress may override such vetoes with a two-thirds majority vote of each chamber.

Senators serve a six-year term and deputies serve a three-year term. Federal deputies are eligible for immediate reelection for up to four term periods and senators are eligible for immediate reelection for up to two term periods. Congressional elections for all 500 seats in the Chamber of Deputies were last held on July 1, 2018. The new Congress took office on September 1, 2018. The following table provides the distribution as of March 29, 2019 of Congressional seats, reflecting certain post-election changes in the party affiliations of certain senators and deputies.

Party Representation in the Mexican Congress⁽¹⁾

	Senate		Chamber of Deputies	
	Seats	% of Total	Seats	% of Total
National Regeneration Movement	59	46.1%	259	51.8%
National Action Party	24	18.8%	78	15.6%
Institutional Revolutionary Party	14	10.9%	47	9.4%
Citizen Movement Party	8	6.3%	28	5.6%
Labor Party	6	4.7%	28	5.6%
Ecological Green Party of Mexico	6	4.7%	11	2.2%
Social Encounter Party	5	3.9%	29	5.8%
Democratic Revolution Party	5	3.9%	11	2.2%
Unaffiliated	1	0.8%	9	1.8%
Total	128	100.0%	500	100.0%

Note: Numbers may not total due to rounding.

(1) As of March 29, 2019. Individual members of Congress may change party affiliations.

Source: *Senate and Chamber of Deputies*.

The Economy

General

According to World Bank data, the Mexican economy, as measured by 2016 gross domestic product (GDP) (at current prices in U.S. dollars), is the 15th largest in the world. The Mexican economy had a real GDP of Ps. 18,157.0 billion in 2017.

Gross Domestic Product

The following table sets forth the percentage change in Mexico's real GDP by economic sector in percentage terms for the periods indicated.

Real GDP Growth by Sector (% change against prior years)⁽¹⁾

	2013	2014	2015	2016	2017 ⁽²⁾	2018 ⁽²⁾
GDP	1.4%	2.8%	3.3%	2.9%	2.1%	2.0%
Primary activities:						
Agriculture, forestry, fishing, hunting and livestock ⁽³⁾	2.3	3.8	2.1	3.8	3.2%	2.4%
Secondary Activities:						
Mining	(0.6)	(1.9)	(4.4)	(4.1)	(8.2)%	(5.5)%
Utilities	0.6	8.1	1.7	0.1	(0.4)%	2.1%
Construction	(1.6)	2.7	2.4	2.0	(0.9)%	0.6%
Manufacturing	0.5	4.0	2.7	1.5	2.8%	1.7%
Tertiary Activities:						
Wholesale and retail trade	1.7	3.8	4.4	2.8	3.4%	3.1%
Transportation and warehousing	2.5	3.5	4.3	3.1	4.2%	3.1%
Information	4.3	4.5	716.9	19.1	8.5%	6.0%
Finance and insurance	16.0	8.6	14.8	12.2	5.8%	6.3%
Real estate, rental and leasing	0.9	1.8	2.5	2.0	1.6%	1.9%
Professional, scientific and technical services	(1.2)	1.7	4.2	7.5	0.4%	1.3%
Management of companies and enterprises	(1.7)	7.2	4.3	(0.2)	1.5%	(0.4)%
Administrative support, waste management and remediation services	4.4	(0.3)	(1.3)	4.3	5.9%	5.1%
Education services	0.5	0.5	(0.1)	1.0	1.2%	0.2%
Health care and social assistance	1.1	(0.3)	(1.8)	2.7	1.3%	2.5%
Arts, entertainment and recreation	7.0	(4.2)	4.1	4.5	2.0%	0.2%
Accommodation and food services	1.1	2.7	7.5	3.2	4.1%	1.0%
Other services (except public administration)	1.8	1.4	2.4	2.6	(0.2)%	(1.1)%
Public administration	(1.4)	2.0	2.4	0.3	0.2%	1.8%

Note: Numbers may not total due to rounding.

(1) Based on GDP calculated in constant pesos with purchasing power as of December 31, 2013.

(2) Preliminary figures.

(3) GDP figures relating to agricultural production set forth in this table and elsewhere herein are based on figures for "agricultural years," with the definition of the relevant "agricultural year" varying from crop to crop based on the season during which it is grown. Calendar year figures are used for the other components of GDP.

Source: INEGI.

According to preliminary figures, Mexico's GDP increased by 2.0% in real terms during 2018. This reflects slower growth as compared to an increase of 2.1% in 2017, mainly due to low industrial activity throughout the year and a negative trend in investment. In particular, investment was affected by a drop in construction and production of machinery, global economic slowdown and a greater level of uncertainty regarding policies to be implemented by the administration. The decreases in industrial activity and investment were partially offset by an increase in internal demand, which was boosted by increasing consumption of goods and services.

Employment and Labor

According to preliminary *Tasa de Desocupación Abierta* (open unemployment rate) figures, Mexico's unemployment rate was 3.4% as of December 31, 2018, a 0.3 percentage point increase from the rate registered on December 31, 2017. As of December 31, 2018, the economically active population was 56.0 million individuals.

On December 20, 2018, President López Obrador, along with authorities of the *Secretaría del Trabajo y Previsión Social* (Ministry of Labor) and the *Comisión Nacional de los Salarios Mínimos* (National Minimum Wage Commission), announced a new policy for determining the minimum wage. Under the new policy, Mexico will have two minimum wages: one rate applicable to municipalities located on the border with the United States, which were included in a newly created Northern Border Free Trade Zone, and a different rate applicable to the rest of Mexico.

Along with the new policy, the National Minimum Wage Commission announced the following new minimum wages, which have been in effect since January 1, 2019: Ps. 176.72 per day for municipalities in the Northern Border Free Trade Zone, a 100% increase from the minimum wage of Ps. 88.36 per day in effect prior to January 1, 2019, and Ps. 102.68 per day for the rest of Mexico, a 16.2% increase from the prior minimum wage.

Principal Sectors of the Economy

Manufacturing

The following table sets forth the change in industrial manufacturing output by sector for the periods indicated.

Industrial Manufacturing Output Differential by Sector⁽¹⁾

	2013	2014	2015 ⁽²⁾	2016 ⁽²⁾	2017 ⁽²⁾	2018 ⁽²⁾
Food	0.9%	0.2%	2.2%	2.7%	1.8%	1.8%
Beverage and tobacco products	0.7	3.3	5.3	7.6	1.9	5.6
Textile mills	(2.4)	(1.9)	5.0	(0.7)	(0.8)	2.0
Textile product mills	0.4	5.9	6.9	3.9	(10.8)	6.6
Apparel	3.5	(0.2)	4.1	(1.7)	0.5	0.8
Leather and allied products	(0.8)	(0.7)	1.9	(0.7)	(1.3)	(1.9)
Wood products	(2.5)	1.4	3.8	(4.7)	4.8	(2.1)
Paper	2.3	2.7	3.5	3.5	2.1	1.2
Printing and related support activities	(7.8)	(0.2)	2.0	0.4	(1.7)	7.4
Petroleum and coal products	4.1	(4.8)	(7.1)	(13.1)	(18.4)	(16.9)
Chemicals	1.2	(1.3)	(3.6)	(2.8)	(1.7)	(0.5)
Plastics and rubber products	(5.4)	2.5	5.8	(0.9)	3.4	1.3
Nonmetallic mineral products	(2.5)	2.8	6.6	2.3	2.4	0.8
Primary metals	(0.1)	8.1	(5.6)	1.9	1.5	(1.8)
Fabricated metal products	(9.2)	5.4	3.4	0.8	0.7	1.3
Machinery	(11.9)	9.0	0.9	1.6	8.3	1.4
Computers and electronic products	5.1	12.7	7.5	6.1	6.8	3.7
Electrical equipment, appliances and components	(1.9)	6.8	5.8	4.5	1.0	1.9
Transportation equipment	5.9	9.6	6.8	1.2	8.3	3.8
Furniture and related products	(5.8)	(3.4)	7.2	(3.4)	(4.2)	6.5
Miscellaneous	0.3	3.2	3.3	3.9	6.1	(2.9)
Total expansion/contraction	0.5	4.0	2.7	1.5	2.8	1.7

(1) Percent change against prior years. Percent change reflects differential in constant 2013 pesos.

(2) Preliminary figures.

Source: INEGI.

Financial System

Monetary Policy, Inflation and Interest Rates

Banco de México's M1 monetary aggregate consists of bills and coins held by the public, *plus*: (1) checking accounts denominated in local currency and foreign currency; (2) interest-bearing deposits denominated in pesos and operated by debit cards; and (3) savings and loan deposits. M2 consists of M1, *plus*: (1) bank deposits; (2) Mexican Government-issued securities; (3) securities issued by firms and non-bank financial intermediaries; and (4) Mexican Government and INFONAVIT liabilities related to the Retirement Savings System. M3 consists of M2, *plus* financial assets issued in Mexico and held by non-residents. M4 consists of M3, *plus* deposits abroad at foreign branches and agencies of Mexican banks.

The following table shows Mexico's M1 and M4 money supply aggregates at each of the dates indicated. The data in this table was calculated in accordance with the methodology for calculating money supply aggregates adopted on January 31, 2018 to reflect the Monetary and Financial Statistics Manual and Compilation Guide published by the International Monetary Fund (IMF) in 2016 and applied to all historical figures from December 31, 2000.

Money Supply

December 31,

	2013	2014	2015	2016	2017	2018 ⁽¹⁾
	(in millions of nominal pesos)					
M1:						
Bills and coins	Ps. 792,928	Ps. 928,052	Ps. 1,087,271	Ps. 1,261,697	Ps. 1,372,884	Ps. 1,494,949
Checking deposits						
In domestic currency	1,080,978	1,168,417	1,299,508	1,472,683	1,630,929	1,746,611
In foreign currency	189,020	232,467	333,094	469,185	537,826	506,151
Interest-bearing peso deposits	438,012	534,973	614,312	647,414	702,744	739,278
Savings and loan deposits	11,097	12,598	14,560	17,332	19,635	23,797
Total M1	Ps. 2,511,369	Ps. 2,876,506	Ps. 3,348,743	Ps. 3,868,311	Ps. 4,264,018	Ps. 4,510,786
M4	Ps. 8,648,389	Ps. 9,630,957	Ps. 10,127,696	Ps. 10,818,147	Ps. 11,705,849	Ps. 12,285,498

Note: Numbers may not total due to rounding.

(1) Preliminary figures.

Source: Banco de México.

Consumer inflation for 2018 was 4.8%, which was above *Banco de México*'s 3.0% (+/- 1.0%) target inflation for the year and 2.0 percentage points lower than the 6.8% consumer inflation for 2017. This was mainly a combined result of the monetary policy actions implemented by *Banco de México*, which helped anchor mid- and long-term expectations, as well as lower annual growth rates in energy prices, such as LP gas, gasoline and electricity rates.

The following table shows, in percentage terms, the changes in price indices and annual increases in the minimum wage for the periods indicated.

Changes in Price Indices

	National Producer Price Index ⁽¹⁾⁽³⁾⁽⁴⁾⁽⁵⁾	National Consumer Price Index ⁽¹⁾⁽²⁾	Increase in Minimum Wage ⁽⁶⁾
2013	1.6	4.0	3.9
2014	3.3	4.1	3.9
2015	2.8	2.1	6.9
2016	8.5	3.4	4.2
2017	6.8	4.7	10.4
2018	4.8	6.4	-
2019			-
January	4.4	5.0	-
February	3.9	4.5	-

(1) For annual figures, changes in price indices are calculated each December.

(2) For 2013, 2014, 2015, 2016 and 2017 National Consumer Price Index takes the second half of December 2010 as a base date. For 2018 and 2019 National Consumer Price Index uses the second half of July 2018 as a base date.

(3) National Producer Price Index figures represent the changes in the prices for basic merchandise and services (excluding oil prices). The index is based on a methodology implemented in June 2012.

(4) 2018 and 2019 figures are preliminary

(5) National Producer Price Index takes June 2012 as a base date.

(6) Increase in Minimum Wage numbers for 2019 and 2019 not available.

Sources: INEGI; Ministry of Labor.

During 2018, interest rates on 28-day *Cetes* averaged 7.6%, as compared to 6.7% in 2017. Interest rates on 91-day *Cetes* averaged 7.8%, as compared to 6.9% in 2017.

For March 28, 2019, the 28-day *Cetes* rate was 7.9% and the 91-day *Cetes* rate was 8.1%.

Exchange Controls and Foreign Exchange Rates

On March 28, 2019, the peso/dollar exchange rate closed at Ps. 19.3793 = U.S.\$1.00, a 1.6% appreciation in dollar terms as compared to the rate on December 31, 2018. The peso/dollar exchange rate published by *Banco de México* on March 26, 2019 (which took effect on the second business day thereafter) was Ps. 19.3500 = U.S.\$1.00.

Securities Markets

The *Bolsa Mexicana de Valores* (Mexican Stock Exchange, or BMV) is the largest authorized stock exchange involved in the listing and trading of equity and debt securities in Mexico. The BMV is a *sociedad anónima bursátil de capital variable* (public company). Both debt and equity securities are listed and traded on the BMV, including stocks and bonds of private sector corporations, equity certificates or shares issued by banks, commercial paper, bankers' acceptances, certificates of deposit, Mexican Government debt and special hedging instruments.

The Mexican equity market is one of Latin America's largest in terms of market capitalization, but it remains relatively small and illiquid compared to major world markets.

On August 29, 2017, as part of its program to develop the Mexican securities market, the Ministry of Finance and Public Credit published a concession for a new stock exchange. The new *Bolsa Institucional de Valores* (Institutional Stock Exchange, or BIVA) began operations on July 26, 2018.

The BMV publishes the *Índice de Precios y Cotizaciones* (Stock Market Index, or IPC) based on a group of the thirty-five most actively traded shares.

On March 28, 2019, the IPC stood at 42,942 points, representing a 3.1% increase from the level at December 31, 2018.

Foreign Trade and Balance of Payments

Foreign Trade

The following table provides information about the value of Mexico's merchandise exports and imports (excluding tourism) for the periods indicated.

Exports and Imports

	2013	2014	2015	2016	2017	2018 ⁽¹⁾
	(in millions of U.S. dollars, except average price of the Mexican crude oil mix)					
Merchandise exports (f.o.b.)						
Oil and oil products	U.S.\$ 49,481	U.S.\$ 42,369	U.S.\$ 23,100	U.S.\$ 18,825	U.S.\$ 23,701	U.S.\$ 30,572
Crude oil	42,712	35,638	18,451	15,582	20,023	26,483
Other	6,770	6,731	4,648	3,243	3,678	4,089
Non-oil products	330,534	354,542	357,450	355,122	385,700	420,000
Agricultural	11,246	12,181	12,971	14,672	15,828	16,255
Mining	4,714	5,064	4,505	4,368	5,427	6,232
Manufactured goods ⁽²⁾	314,573	337,297	339,975	336,081	364,445	397,514
Total merchandise exports	380,015	396,912	380,550	373,947	409,401	450,572
Merchandise imports (f.o.b.)						
Consumer goods	57,329	58,299	56,279	51,950	57,333	63,111
Intermediate goods ⁽²⁾	284,823	302,031	297,713	295,395	322,022	355,280
Capital goods	39,057	39,647	41,240	39,719	41,014	45,885
Total merchandise imports	381,210	399,977	395,232	387,064	420,369	464,277
Trade balance	U.S.\$ (1,195)	U.S.\$ (3,066)	U.S.\$ (14,683)	U.S.\$ (13,118)	U.S.\$ (10,968)	U.S.\$ (13,704)
Average price of Mexican oil mix ⁽³⁾	U.S.\$ 98.44	U.S.\$ 85.48	U.S.\$ 43.12	U.S.\$ 35.65	U.S.\$ 46.79	U.S.\$ 61.34

Note: Numbers may not total due to rounding.

(1) Preliminary figures.

(2) Includes the in-bond industry.

(3) In U.S. dollars per barrel.

Source: Banco de México / PEMEX.

Balance of Payments and International Reserves

In 2018, Mexico's current account registered a deficit of 1.8% of GDP, or U.S.\$22.2 million, a slight increase from the current account deficit in 2017 of 1.7% of GDP, or U.S.\$19.4 million. The increase in the current account deficit, as compared to 2017, was principally due to increases in the deficits of the petroleum commercial balance and the primary income account. These increases were partially offset by a greater surplus of the secondary income account, which was the result of record high remittances as well as a greater surplus balance of the non-petroleum commercial

balance. In particular, in the current account deficit in the fourth quarter of 2018 was higher than the deficit during the same period of 2017 in the context of a weakening of the global economy and increased trade tensions at a global scale.

The Mexican Government gradually removed price controls on gasoline and diesel over the course of 2017 to liberalize domestic fuel prices so that they are determined according to market forces. Domestic fuel prices may vary without regard to any specific range determined by the Mexican Government. On December 27, 2016, the Ministry of Finance and Public Credit announced an increase, effective January 1, 2017, in the maximum gasoline and diesel prices to be applied in certain regions of Mexico, which caused an increase of gasoline prices of up to 20% in those areas. The removal of price controls and the resulting price increases led to protests across Mexico. Mexico cannot predict the effect of changes in gasoline and diesel prices and any related political and social unrest on the Mexican economy or whether the Mexican Government may alter its strategy for price liberalization in the future. The December 27, 2016 announcement by the Ministry of Finance and Public Credit further provided that the maximum fuel prices applicable to each region of the country would be determined daily as of February 18, 2017.

The following table sets forth *Banco de México*'s international reserves and net international assets at the end of each period indicated.

International Reserves and Net International Assets⁽³⁾

Year	End-of-Period International Reserves ⁽¹⁾⁽²⁾		End-of-Period Net International Assets	
	(in millions of U.S. dollars)			
2013	U.S.\$	176,579	U.S.\$	178,686
2014		193,045		196,288
2015		176,735		177,629
2016		176,542		178,057
2017		172,802		175,479
2018 ⁽⁴⁾		174,609		176,096
2019 ⁽⁴⁾				
January		175,156		179,970
February		175,694		180,589

(1) Includes gold, Special Drawing Rights (international reserve assets created by the IMF) and foreign exchange holdings.

(2) "International reserves" are equivalent to: (a) gross international reserves, minus (b) international liabilities of *Banco de México* with maturities of less than six months.

(3) "Net international assets" are defined as: (a) gross international reserves, plus (b) assets with maturities greater than six months derived from credit agreements with central banks, less (x) liabilities outstanding to the IMF and (y) liabilities with maturities of less than six months derived from credit agreements with central banks.

(4) Preliminary figures.

Source: *Banco de México*.

Public Finance

Fiscal Policy

The *Programa Nacional de Financiamiento del Desarrollo 2013-2018* (National Program to Finance Development 2013-2018, or PRONAFIDE), which was approved on December 16, 2013, establishes the Mexican Government's fiscal policy goals. These goals include securing sufficient fiscal resources to strengthen social infrastructure and productivity. To this end, PRONAFIDE has outlined several specific objectives, including the promotion of economic development and macroeconomic stability on a federal and state level, as well as the improvement of the financial system, to generate additional resources and to transform the financial system into a simpler, more progressive and more transparent system through spending efficiency and the facilitation of access to financial services.

2018 UMS Budget and Fiscal Results

On September 8, 2017, the President of Mexico submitted the proposed Federal Revenue Law for 2018 and the proposed *Presupuesto de Egresos de la Federación para el Ejercicio Fiscal 2018* (Federal Expenditure Budget for 2018, or the 2018 Expenditure Budget) to the Mexican Congress for its approval. The Federal Revenue Law for 2018 was approved by the Chamber of Deputies on October 19, 2017 and by the Senate on October 27, 2017. The Federal Revenue Law for 2018 was published in the Official Gazette of the Federation on November 15, 2017. The 2018 Expenditure Budget was approved by the Chamber of Deputies on November 9, 2017 and was published in the Official Gazette of the Federation on November 29, 2017. We refer to these two bills together as Mexico's 2018 budget (the 2018 UMS Budget).

The following table illustrates the composition of public sector budgetary revenues for 2017 and 2018.

	Actual		2018	2019
	2017	2018 ⁽¹⁾	Budget ⁽²⁾	Budget ⁽²⁾
	(in billions of pesos) ⁽³⁾			
Budgetary revenues	Ps. 4,947.6	Ps. 5,113.1	Ps. 4,778.3	Ps. 5,298.2
Mexican Government	3,838.1	3,871.6	3,584.9	3,952.4
Taxes	2,849.5	3,062.3	2,957.5	3,311.4
Income tax	1,573.8	1,664.6	1,566.2	1,752.5
Value-added tax	816.0	922.2	876.9	995.2
Excise taxes	367.8	347.4	421.8	437.9
Import duties	52.3	65.5	47.3	70.3
Tax on the exploration and exploitation of hydrocarbons	4.3	5.5	4.7	4.5
Export duties	0.0	0.0	0.0	0.0
Other	35.2	57.1	40.5	51.0
Non-tax revenue	988.5	809.3	627.4	641.0
Fees and tolls	61.3	64.3	46.4	46.3
Transfers from the Mexican Petroleum Fund for Stabilization and Development	442.9	541.7	456.8	520.7
Contributions	7.8	9.8	6.4	6.8
Fines and surcharges	476.5	193.4	117.8	67.2
Other	0.1	0.1	0.0	0.0
Public enterprises and agencies	1,109.5	1,241.5	1,193.4	1,345.8
PEMEX	389.8	436.8	423.3	524.3
Others	719.7	804.6	770.0	821.5

Note: Numbers may not total due to rounding.

(1) Preliminary figures.

(2) Figures for the 2018 UMS Budget, as published in the Official Gazette on November 29, 2017, and the 2019 UMS Budget, as published in the Official Gazette on December 28, 2018, represent budgetary estimates based on the economic assumptions contained in the General Economic Policy Guidelines and in the Economic Program for 2018 and the General Economic Policy Guidelines and in the Economic Program for 2019, respectively. These figures do not reflect actual results for the year or updated estimates of Mexico's 2018 and 2019 economic results.

(3) Current pesos.

Source: Ministry of Finance and Public Credit.

2019 UMS Budget

On December 15, 2018, the Ministry of Finance and Public Credit submitted the proposed Federal Revenue Law for 2019 and the proposed *Presupuesto de Egresos de la Federación para el Ejercicio Fiscal 2019* (Federal Expenditure Budget for 2019, or the 2019 Expenditure Budget) to the Mexican Congress for its approval. The Federal Revenue Law for 2019 was approved by the Senate on December 20, 2018. The 2019 Expenditure Budget was approved by the Chamber of Deputies on December 23, 2018. They were published in the Official Gazette of the Federation on December 28, 2018. We refer to these two bills together as Mexico's 2019 budget (the 2019 UMS Budget).

Public Debt

Internal Public Debt

The Mexican Government's "net internal debt" includes only the internal portion of indebtedness incurred directly by the Mexican Government and the assets of the *Fondo del Sistema de Ahorro Para el Retiro* (Retirement Savings System Fund). In addition, "net internal debt" is comprised of *Cetes* and other securities sold to the public in auctions for new issuances (primary auctions) but does not include any debt allocated to *Banco de México* for its use in *Regulación Monetaria* (regulating the money supply). It also does not include debt by the *Instituto para la Protección al Ahorro Bancario* (Bank Savings Protection Institute, or IPAB) or the debt of budget-controlled or administratively-controlled agencies.

Over the last two decades, the Mexican Government has actively sought to increase its average debt maturity date. Accordingly, the Mexican Government has issued new debt instruments bearing longer maturities. In doing so, the Mexican Government hopes to mitigate any risk associated with the refinancing of its internal public debt. This practice has had the effect of establishing a long-dated benchmark yield curve. These issuances have also encouraged long-term investments in the following areas: (1) fixed-rate contracts; (2) peso-denominated securities of Mexican companies; (3) Mexican financial hedging products; and (4) long-term investment projects financed by long-term savings.

The following table summarizes the gross and net internal debt of the Mexican Government at each of the dates indicated.

Gross and Net Internal Debt of the Mexican Government⁽¹⁾

	2013		2014		2015		At December 31, 2016		2017		2018 ⁽²⁾	
	(in billions of pesos, except percentages)											
Gross Debt												
Government Securities	Ps. 3,734.1	91.9%	Ps. 4,223.3	92.9%	Ps. 4,701.2	92.7%	Ps. 4,915.3	87.5%	Ps. 5,326.0	90%	Ps. 5,837.0	90.8%
<i>Cetes</i>	635.6	15.6	678.7	14.9	655.8	12.9	634.7	11.3	701.6	11.9	734.5	11.4
Floating Rate Bonds	216.6	5.3	232.6	5.1	296.5	5.8	397.9	7.1	471.3	8.0	548.2	8.5
Inflation-Linked Bonds	888.7	21.9	1,011.1	22.2	1,196.6	23.6	1,223.5	21.8	1,397.7	23.6	1,656.0	25.8
Fixed Rate Bonds	1,989.6	49.0	2,295.8	50.5	2,546.2	50.2	2,652.1	47.2	2,747.9	46.4	2,890.3	45.0
STRIPS of UdiBonos	3.6	0.1	5.1	0.1	6.1	0.1	7.2	0.1	7.6	0.1	7.9	0.1
Other ⁽³⁾	329.1	8.1	323.3	7.1	372.8	7.3	705.0	12.5	594.1	10.0	592.4	9.2
Total Gross Debt	Ps. 4,063.2	100.0 %	Ps. 4,546.6	100.0%	Ps. 5,074.0	100.0 %	5,620.3	100.0 %	Ps. 5,920.2	100.0 %	Ps. 6,429.3	100.0 %
Net Debt												
Financial Assets ⁽⁴⁾	(169.3)		(222.5)		(259.9)		(224.0)		205.9		225.7	
Total Net Debt	Ps. 3,893.9		Ps. 4,324.1		Ps. 4,814.1		Ps. 5,396.3		Ps. 5,714.3		Ps. 6,203.6	
Gross Internal Debt/GDP ⁽⁵⁾	25.0%		26.0%		27.4%		28.0%		27.0%		27.3%	
Net Internal Debt/GDP ⁽⁵⁾	23.9%		24.7%		26.0%		26.8%		26.1%		26.3%	

Note: Numbers may not total due to rounding.

- (1) Internal debt figures do not include securities sold by *Banco de México* in open-market operations to manage liquidity levels pursuant to *Regulación Monetaria*. This is because the securities do not increase the Mexican Government's overall level of internal debt. *Banco de México* must reimburse the Mexican Government for any allocated debt that *Banco de México* sells into the secondary market and that is presented to the Mexican Government for payment. If *Banco de México* undertakes extensive sales of allocated debt in the secondary market, however, this can result in an elevated level of outstanding internal debt as compared to the Mexican Government's figure for net internal debt.
- (2) Preliminary figures.
- (3) Includes Ps. 165.5 billion for 2013, Ps. 161.5 billion for 2014, Ps. 153.8 billion for 2015, Ps. 147.5 billion for December 31, 2016, Ps. 145.1 billion for December 31, 2017 and Ps. 141.8 billion for December 31, 2018 in liabilities associated with social security under the ISSSTE Law.
- (4) Includes the net balance (denominated in pesos) of the Federal Treasury's General Account in *Banco de México*.
- (5) Percentage of GDP for 2017 is calculated using the annual average of GDP calculated in constant pesos with purchasing power as of December 31, 2013. Percentage of GDP for 2018 is calculated using the estimated annual GDP for 2018 published in December 2018 by the Ministry of Finance and Public Credit in the 2019 General Economic Policy Pre-Guidelines.

Source: Ministry of Finance and Public Credit

External Public Debt

Mexico's external public debt goals are intended to provide the Mexican Government with flexibility to finance its stated needs, while also accounting for market volatility and unforeseen developments. The policy also seeks to maintain costs and risks at stable levels. Mexico primarily seeks debt financing through local markets, supplemented by external financing from the U.S., Europe and Japan. Mexico's principal objectives in connection with its external financing include improving the terms and conditions of Mexico's external liabilities, as well as strengthening and diversifying Mexico's investor base, with specific consideration to Mexico's continued presence in the most influential international markets. Objectives also include strengthening Mexico's benchmark bonds and maintaining a constant relationship with international investors in order to ensure transparency and to promote investment in Mexico. "External public sector debt" consists of the external portion of the long-term indebtedness incurred directly by the Mexican Government, the external long-term indebtedness incurred by budget-controlled agencies and productive state-owned companies, the external long-term indebtedness incurred directly or guaranteed by administratively-controlled agencies (including, but not limited to, national development banks) and the short-term external debt of the public sector. External public sector debt does not include, among other things, repurchase obligations of *Banco de México* with the IMF (none of which was outstanding as of December 31, 2018).

According to preliminary figures, as of December 31, 2018, outstanding gross public sector external debt totaled U.S.\$202.4 billion, an approximate U.S.\$8.4 billion increase from the U.S.\$194.0 billion outstanding on December 31, 2017. Of this amount, U.S.\$198.2 billion represented long-term debt and U.S.\$4.2 billion represented short-term debt. Net external indebtedness also increased by U.S.\$9.0 billion during 2018.

The following tables set forth a summary of Mexico's external public debt, including a breakdown of such debt by currency, net external public sector debt, the Mexican Government's gross external debt, the Mexican Government's net external debt and the Mexican Government's net debt.

Summary of External Public Debt By Type⁽¹⁾

	Long-Term Direct Debt of the Mexican Government		Long-Term Debt of Budget-Controlled Agencies		Other Long-Term Public Debt ⁽²⁾		Total Long-Term Debt		Total Short-Term Debt		Total Long-and Short-Term Debt	
At December 31,	(in billions of U.S. dollars)											
2013	U.S.\$	\$71.8	U.S.\$	53.4	U.S.\$	5.7	U.S.\$	130.9	U.S.\$	3.5	U.S.\$	134.4
2014		78.4		58.9		5.6		142.9		4.8		147.7
2015		82.5		69.6		6.9		159.1		3.2		162.2
2016		88.1		82.7		7.1		177.9		3.1		181.0
2017		91.1		91.8		7.9		190.7		3.3		194.0
2018 ⁽²⁾		95.8		94.4		8.0		198.2		4.2		202.4

By Currency⁽¹⁾

	At December 31,																	
	2013		2014		2015		2016		2017		2018 ⁽²⁾							
	(in billions of U.S. dollars, except for percentages)																	
U.S. Dollars	U.S. \$	111.6	83.0%	U.S. \$	121.9	82.6%	U.S. \$	131.7	81.2%	U.S. \$	144.2	79.7%	U.S. \$	148.7	76.7%	U.S. \$	152.6	75.4%
Japanese Yen		5.5	4.1		5.1	3.4		4.9	3.0		6.4	3.5		6.8	3.5		8.1	4.0
Swiss Francs		1.0	0.7		0.4	0.3		1.0	0.6		1.3	0.7		1.4	0.7		1.5	0.7
Pounds Sterling		1.4	1.0		2.8	1.9		2.7	1.7		2.3	1.3		3.1	1.6		2.9	1.4
Euro		11.5	8.5		14.0	9.5		18.8	11.6		24.4	13.5		31.5	16.3		34.8	17.2
Others		3.4	2.6		3.4	2.3		3.1	1.9		2.4	1.3		2.5	1.3		2.5	1.2
Total	U.S. \$	134.4	100.0%	U.S. \$	147.7	100.0%	U.S. \$	162.2	100.0%	U.S. \$	181.0	100.0%	U.S. \$	194.0	100.0%	U.S. \$	202.4	100.0%

Net External Debt of the Public Sector⁽¹⁾

	At December 31,																
	2013		2014		2015		2016		2017		2018 ⁽²⁾						
	(in billions of U.S. dollars, except for percentages)																
Total Net Debt	U.S.\$	130.9		U.S.\$	145.6		U.S.\$	161.6		U.S.\$	177.7		U.S.\$	192.3		U.S.\$	201.3
Gross External Debt/GDP ⁽⁴⁾		10.8%		12.4%		15.1%		18.7%		17.5%		16.9%		17.5%		16.9%	
Net External Debt/GDP ⁽⁴⁾		10.5%		12.3%		15.0%		18.3%		17.3%		16.8%		17.3%		16.8%	

Gross External Debt of the Mexican Government⁽¹⁾

	At December 31,																	
	2013		2014		2015		2016		2017		2018							
	(in billions of U.S. dollars, except for percentages)																	
U.S. Dollars	U.S.\$	62.3	86.3%	U.S.\$	65.1	82.9%	U.S.\$	66.3	80.3%	U.S.\$	67.5	76.6%	U.S.\$	68.0	74.7%	U.S.\$	70.8	73.9%
Japanese Yen		3.6	5.0		3.7	4.7		3.7	4.4		4.5	5.1		4.7	5.1		5.9	6.1
Swiss Francs		-	-		-	-		-	-		-	-		-	-		-	-
Pounds Sterling		0.8	1.1		2.3	2.9		2.2	2.6		1.8	2.1		2.0	2.2		1.9	2.0
Euros		5.4	7.6		7.4	9.5		10.4	12.6		14.3	16.2		16.3	17.9		17.2	18.0
Others		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.02	0.02		0.02	0.02
Total	U.S. \$	72.2	100.0%	U.S. \$	78.6	100.0%	U.S. \$	82.6	100.0%	U.S. \$	88.2	100.0%	U.S. \$	91.1	100.0%	U.S. \$	95.8	100.0%

Net External Debt of the Mexican Government⁽¹⁾

	At December 31,					
	2013	2014	2015	2016	2017	2018
	(in billions of U.S. dollars, except for percentages)					
Total Net Debt	U.S.\$ 69.9	U.S.\$ 77.4	U.S.\$ 82.3	U.S.\$ 86.7	U.S.\$ 90.6	U.S.\$ 95.7
Gross External Debt/GDP ⁽⁴⁾	5.8%	6.6%	7.7%	9.1%	8.2%	8.0%
Net External Debt/GDP ⁽⁴⁾	5.6%	6.5%	7.6%	8.9%	8.2%	8.0%

Net Debt of the Mexican Government

	At December 31,					
	2013	2014	2015	2016	2017	2018
External Debt ⁽¹⁾	19.0%	20.8%	22.7%	25.0%	23.9%	23.3%
Internal Debt	81.0%	79.2%	77.3%	75.0%	76.1%	76.7%

Note: Numbers may not total due to rounding.

- (1) External debt denominated in foreign currencies other than U.S. dollars has been translated into dollars at exchange rates as of each of the dates indicated. External public debt does not include (a) repurchase obligations of *Banco de México* with the IMF (none of which was outstanding as of December 31, 2018) or (b) loans from the Commodity Credit Corporation to public sector Mexican banks. External debt is presented herein on a “gross” basis and includes external obligations of the public sector at their full outstanding face or principal amount. For certain informational and statistical purposes, Mexico sometimes reports its external public sector debt on a “net” basis, which is calculated as the gross debt net of certain financial assets held abroad. These financial assets include Mexican public sector external debt that is held by public sector entities but that has not been cancelled.
- (2) Adjusted to reflect the effect of currency swaps.
- (3) Includes development banks’ debt and the debt of other administratively-controlled agencies whose finances are consolidated with those of the Mexican Government.
- (4) Percentage of GDP for 2017 is calculated using the annual average of GDP calculated in constant pesos with purchasing power as of December 31, 2013. Percentage of GDP for 2018 is calculated using the estimated annual GDP for 2018 published in December 2018 by the Ministry of Finance and Public Credit in the 2019 General Economic Policy Pre-Guidelines.

Source: Ministry of Finance and Public Credit.

Recent Securities Offerings

Mexico offers additional debt securities from time to time, and in order to manage the composition of its outstanding liabilities, Mexico engages from time to time in a variety of transactions including tender offers, open market purchases and early redemptions.

On January 11, 2018, Mexico issued U.S. \$2.6 billion of its 3.750% Global Notes due 2028 and U.S. \$0.6 billion of its 4.600% Global Notes due 2048. Concurrently, the Mexican Government conducted a tender offer pursuant to which Mexico offered to purchase for cash its outstanding notes of the series set forth in the offer to purchase dated January 3, 2018.

On January 17, 2018, Mexico issued €1.5 billion of its 1.750% Global Notes due 2028.

On January 22, 2019, Mexico issued U.S. \$2.0 billion of its 4.500% Global Notes due 2029.

On April 1, 2019, Mexico issued €1.5 billion of its 1.625% Global Notes due 2026 and €1.0 billion of its 2.875% Global Notes due 2039.

Legal and Political Reforms

Access to Information and Government Transparency

On May 7, 2018, the *Secretaría de la Función Pública* (Ministry of Public Administration) announced that, as of June 30, 2018, it will make all information in the Declaranet system regarding the *declaraciones patrimoniales* (declarations of assets and interests) of public servants available to the public in open data, including historical data.

Since July 18, 2016, the Ministry of Public Administration has been undergoing a process of institutional strengthening through implementation of the *Sistema Nacional Anticorrupción* (National Anticorruption System) and the *Plataforma Digital Nacional* (National Digital Platform). The Ministry of Public Administration seeks to combat corruption by requiring that certain details of public officials’ personal finances be

made publicly available. On April 18, 2018, a report by the *Secretaría Ejecutiva del Sistema Nacional Anticorrupción* (Executive Secretariat of the National Anticorruption System) provided logistical details for fourteen public institutions, including the *Instituto Nacional de Estadística y Geografía* (National Institute of Statistics and Geography, or INEGI), the Suprema Corte de Justicia de la Nación (Supreme Court) and the *Instituto Federal de Telecomunicaciones* (Federal Telecommunications Institute), on how to comply with this new regulatory framework.

Economic Development

On March 9, 2018, President Enrique Peña Nieto signed the *Ley para Regular las Instituciones de Tecnología Financiera*, or *Ley FINTECH* (FINTECH Law), which regulates the organization, operation, functioning and authorization of companies that offer alternative means of access to finance and investment, such as crowdfunding, the issuance and management of electronic payments and the exchange of virtual assets or cryptocurrency. The FINTECH Law also establishes new types of financial entities: the Crowdfunding and Electronic Payment Institutions. These entities undertake financing, investment, savings, payments or transfer activities through interfaces like electronic applications, the internet or any other means of electronic or digital communications and require an approval from the CNBV.

On May 21, 2018, INEGI and the *Autoridad Federal para el Desarrollo de las Zonas Económicas Especiales* (Federal Authority for the Development of Special Economic Zones) signed a general agreement of collaboration in order to strengthen the implementation, operation and development of the areas of influence of the *Zonas Económicas Especiales* (Special Economic Zones). This agreement will facilitate training, research, dissemination and technical and technological support.

On November 6, 2018 the *Ley Federal de Remuneraciones de los Servidores Públicos* (Federal Public Servants Salary Law) went into effect. This law was enacted with the purpose of regulating the salaries, defined broadly, of federal public officials, which subject to certain limitations shall not exceed (i) the salary received by the President or (ii) the salary received by such public official's hierarchical superior. On February 13, 2019, the Second Chamber of the Supreme Court ruled in favor of maintaining the suspension granted on December 7, 2018 against the Federal Public Servants Salary Law. As a result, this law remains suspended until a final determination is reached by the Supreme Court.

Judicial Review

In its first ever general declaration of unconstitutionality, on February 14, 2019 the Supreme Court struck down as excessive a provision of the *Ley Federal de Telecomunicaciones y Radiodifusión* (Federal Telecommunications and Broadcasting Law) that provided for a minimum fine of 1% of a radio and television concessionaires' and licensees' taxable income for any violation of the regulatory framework not specifically provided for in the law.

In December 2018, federal legislators initiated actions challenging the constitutionality of the *Ley Orgánica de la Administración Pública Federal* (Organic Law of the Federal Public Administration, or LOAPF) enacted on November 11, 2018. The LOAPF: (1) consolidates the Mexican Government's procurement process, which was transferred to the domain of the Ministry of Finance and Public Credit in an effort to prevent and reduce corruption; (2) creates a new *Secretaría de Seguridad y Protección Ciudadana* (Ministry of Security and Citizen Protection) which will be directly responsible for, among others, public safety services; and (3) establishes federal delegates in each state of Mexico tasked with coordinating the federal social and development programs among the three levels of government, among other things.

Anti-Money Laundering

On March 1, 2019 the *Unidad de Inteligencia Financiera* (Financial Intelligence Unit or FIU) of the Ministry of Finance and Public Credit and the mayor of Mexico City signed an agreement to exchange information to combat money laundering and the financing of terrorism. This agreement will allow for greater coordination to prevent and detect assistance of any kind given to aid crime with resources of illegal origin.

Anti-Corruption

On March 14, 2019 a reform to Articles 22 and 73 of the Constitution was published in the Official Gazette of the Federation. This reform is intended, among other things, to extend the reach of Mexican Government *extinción de dominio* (seizures), which will now be permitted over assets related to a broader list of offenses now including acts of corruption, crimes committed by public officials, organized crime, kidnapping, extortion, human trafficking, crimes relating to hydrocarbons, among others, and for which there is no proof that they were obtained legally.

Item 4A. Unresolved Staff Comments

Not applicable.

Item 5. Operating and Financial Review and Prospects

General

We earn income from:

- export sales, which consist of sales of crude oil and condensates, petroleum products and petrochemical products;
- domestic sales, which consist of sales of natural gas, petroleum products (such as gasoline, diesel fuel and LPG) and petrochemical products; and
- other sources, including financial and investment income and insurance revenue.

Our operating expenses include:

- cost of sales, including the cost of purchases of imported petroleum and other products, depreciation and amortization, salaries, wages and benefits, a portion of the net cost of employee benefits for the period, the variation of inventories, maintenance, and exploration and unsuccessful drilling expenses;
- transportation and distribution expenses (including a portion of the net cost of employee benefits for the period); and
- administrative expenses (including a portion of the net cost of employee benefits for the period).

Our income is affected by a number of factors, including:

- changes in international prices of crude oil, petroleum products and petrochemical products, which are denominated in U.S. dollars, and domestic prices of petroleum products, which are denominated in pesos;
- the type and volume of crude oil produced and exported;
- the type and volume of natural gas produced, processed and sold domestically and internationally;
- the results of development and exploration activities;
- the amount of taxes, duties and other payments that we are required to make to the Mexican Government;
- fluctuations in the peso-U.S. dollar exchange rate; and
- Mexican and global economic conditions, including the levels of international interest rates.

Overview

In 2018, we experienced significant operational challenges as a result of the continued decline in our proved hydrocarbon reserves and production. We focused on stabilizing our operations and our financial position. While we experienced significant operational challenges, we were favorably affected by improved industry-wide price conditions and the higher peso to U.S. dollar exchange rate. However, prices remain significantly below 2014 levels and fluctuated greatly in 2018. The weighted average Mexican crude oil export price increased from U.S. \$46.79 per barrel in 2017 to U.S. \$61.34 per barrel in 2018 and our total crude oil production in 2018 amounted to 1,822.5 thousand barrels per day, below our target of 1,951.0 thousand barrels per day.

Going Concern

Our consolidated financial statements as of December 31, 2018 and 2017 have been prepared on a going concern basis, which assumes that we can meet our payment obligations. As we describe in Note 24-e to our consolidated financial statements, there exists substantial doubt about our ability to continue as a going concern. We discuss below, and in Note 24-e to our consolidated financial statements, the circumstances that have caused these negative trends and the concrete actions we are taking to improve our results, strengthen our ability to continue operating and achieve revenue maximization and efficiencies. We continue operating as a going concern, and our consolidated financial statements do not contain any adjustments that might result from the outcome of this uncertainty.

We have recognized continuous net losses during 2018, 2017 and 2016 of Ps. 180,419.8 million, Ps. 280,850.6 million and Ps. 191,144.3 million, respectively. In addition, we had a negative equity of Ps. 1,459,405.4 million and Ps. 1,502,352.8 million as of December 31, 2018 and 2017, respectively, mainly due to continuous net losses. We had a negative working capital of Ps. 54,666.3 million and Ps. 25,600.8 million, as of December 31, 2018 and 2017, respectively.

We also have significant debt. This debt was incurred mainly to finance necessary operational investments. Due to our heavy fiscal burden resulting from the payment of hydrocarbons extraction duties and other taxes that we are required to pay to the Mexican Government, in recent years the cash flow derived from our operations has not been sufficient to fund our operating and investment costs and other expenses. In turn, our indebtedness has increased significantly. Our working capital has also decreased in part as a result of the drop in oil prices that began at the end of 2014 and the subsequent ongoing oil price fluctuations.

In addition, at the beginning of 2019, certain rating agencies downgraded our credit rating, which could have an impact on the cost and terms of our new debt, as well as our contract renegotiations during 2019.

All these matters show the existence of substantial doubt about our ability to continue as a going concern.

New Business Plan and Recent Initiatives

We are in the process of developing and refining our new long-term business plan. We are also, in collaboration with the Mexican Government, implementing initiatives intended to help us meet our working capital needs, to continue to service our debt as it comes due and to improve our capital expenditure programs. These initiatives incorporate strict internal cost-control measures designed to stabilize our debt. We are also coordinating closely and continuously with the Mexican Government in order to secure additional external support measures. The following sets forth a summary of these initiatives:

- **Government Support:** On February 15, 2019, the Mexican Government announced that, as part of its *Programa de Fortalecimiento de Petróleos Mexicanos* (Strengthening Program for Petróleos Mexicanos), it would provide a support program centered on improving our financial position and increasing our production and, in turn, our profitability. In particular, this support program includes:
 - o Ps. 25.0 billion capital injection;
 - o Ps. 34.9 billion in prepayment of promissory notes receivable to help pay our pension liabilities;
 - o a reduction of our tax burden; and
 - o expected additional revenues that would result from a reduction in the illicit market in fuels as a result of government measures against the illicit market in fuels.
- **Annual Operational and Financial Work Program:** On February 26, 2019, the Board of Directors of Petróleos Mexicanos authorized the *Programa Operativo y Financiero Anual de Trabajo 2019* (the Annual Operational and Financial Work Program 2019, or POFAT). The POFAT sets forth operational goals with respect to both our exploration and production activities and our industrial transformation activities, and projects our financial results for the year 2019 based on our budget as approved by the Mexican Congress. The projected financial results for 2019 set forth in the POFAT are in line with the objectives contemplated in the business plan for the five-year period from 2017 through 2021, under which we have operated in previous years.
- **Exploration and Production:** We intend to focus our exploration and production activities in areas where we have greater expertise and higher historical success rates. In line with this plan, we intend to re-allocate resources away from deep-water projects, which tend to be expensive and long-term activities, and instead focus on shallow-water and onshore projects, which have the potential for near-term results. We will also increase our focus on secondary and tertiary recovery systems for mature fields with significant reserve potential. In 2019, we plan to develop 20 new fields, 16 of which will be in shallow waters and four of which will be onshore.
- **Refinery Rehabilitation Plan:** We intend to allocate additional resources for the maintenance of our six existing refineries, with the goal of improving efficiency. This improved efficiency, in turn, would help meet the national demand for refined products and maintain prices at competitive levels. We are evaluating alternatives to fund these investments in a manner that does not adversely impact our financial position.
- **Improve Financial Position:** We continue to take specific measures to improve our financial position, including the following:

- o *Modified Financing Strategy:* We intend to continue our strategy of decreased reliance on debt financing. In 2018, we executed several liability management transactions, and, in 2019, we will continue to evaluate market conditions for opportunities to execute liability management transactions. We expect the execution of further liability management transactions in 2019 will allow us to improve the terms of our outstanding debt, in line with our objective of reducing our net debt.
 - o *Pension Reform:* We continue to operate our defined contribution plan for employees hired since January 1, 2016, pursuant to which both we and our employees contribute to each employee's individual account, in contrast to the defined benefit pension plan, pursuant to which only we contribute. To further reduce our pension liabilities, we continue to incentivize employees to migrate from the defined benefit pension plan to the defined contribution plan.
 - o *Crude Oil Hedge Program:* We continue to carry out our crude oil hedge program in order to partially protect our cash flows from decreases in the price of Mexican crude oil.
- **New Budget:** On July 13, 2018, the Board of Directors of Petróleos Mexicanos approved a proposal for the consolidated annual budget of Petróleos Mexicanos and the subsidiary entities for 2019, which was subsequently approved by the Mexican Congress on December 23, 2018 and published in the Official Gazette of the Federation on December 28, 2018. The consolidated annual budget of Petróleos Mexicanos and the subsidiary entities for 2019 approved by the Mexican Chamber of Deputies is Ps. 464.6 billion, an increase of approximately 18.5% as compared to the Ps. 391.9 billion consolidated annual budget for 2018.

For more information on the circumstances that have caused these negative trends and the concrete actions we are taking to improve our results, strengthen our ability to continue operating and achieve revenue maximization and efficiencies, see Note 24-e to our consolidated financial statements included herein.

Results of operations and financial condition in 2018

For the year ended December 31, 2018, we decreased our net loss by 35.8%, from a net loss of Ps. 280.9 billion (U.S. \$14.2 billion) in 2017 to a net loss of Ps. 180.4 billion (U.S. \$9.2 billion) in 2018. This decrease in net loss was primarily due to:

- a Ps. 284.1 billion increase in total sales, mainly due to an increase in the average price of crude oil and natural gas;
- a Ps. 172.9 billion decrease in impairment of wells, pipelines, properties, plant and equipment;
- a Ps. 17.9 billion increase in other revenues, net;
- a Ps. 1.2 billion increase in profit sharing in joint ventures, associates and other; and
- a Ps. 0.5 billion increase in exchange gain, net.

These effects were partially offset by:

- a Ps. 195.3 billion increase in cost of sales, mainly due to an increase in total sales;
- a Ps. 128.6 billion increase in taxes and other duties;
- a Ps. 35.3 billion increase in financing cost, net; and
- a Ps. 16.8 billion increase in general expenses.

For more information on our results of operations, see “—Results of Operations of Petróleos Mexicanos, the Subsidiary Entities and the Subsidiary Companies—For the Year Ended December 31, 2018 Compared to the Year Ended December 31, 2017” below.

In 2018, our total equity (deficit) improved by Ps. 43.0 billion from negative Ps. 1,502.4 billion as of December 31, 2017 to negative Ps. 1,459.4 billion as of December 31, 2018. For more information on the improvement of our total equity (deficit) see “—Liquidity and Capital Resources—Equity Structure and Mexican Government Contributions” below. This improvement was mainly due to a Ps. 222.5 billion increase in actuarial gains on employee benefits and a Ps. 1.3 billion accumulated income from the foreign currency translation effect, partially offset by our net loss for the year of Ps. 180.4 billion.

Our accounts receivable decreased 0.6% in 2018, from Ps. 168.1 billion as of December 31, 2017 to Ps. 167.1 billion as of December 31, 2018, mainly due to a decrease in our accounts receivable from customers caused by a decrease in sales in the month of December 2018, which was partially offset by an increase in our accounts receivable from sundry debtors (mainly IEPS tax) from larger gasoline imports at the end of the year. .

As of December 31, 2018, we owed our suppliers Ps. 149.8 billion as compared to Ps. 140.0 billion as of December 31, 2017. As of December 31, 2018, we have paid the total outstanding balance due to suppliers and contractors as of December 31, 2017 and, as of March 31, 2019, we have paid approximately 73.7% of the total outstanding balance due to suppliers and contractors as of December 31, 2018.

Operating Challenges

In 2018, we experienced significant operating challenges. Our crude oil production totaled 1,822.5 thousand barrels per day, which, was below our crude oil production target of 1,951.0 thousand barrels per day and represented a decrease of 125.8 thousand barrels per day, or 6.5%, as compared to our 2017 production of 1,948.3 thousand barrels per day. This decrease was primarily due to the natural decline of certain of our mature fields and an increase in fractional water flow of wells at certain of our fields, including the Xanab field. We describe the reasons for the natural decline of our fields under “Item 4—Information on the Company—Business Overview—Exploration and Production—Crude Oil and Natural Gas Production.” For 2019, we have set a crude oil production target of 1,725.0 thousand barrels per day and a natural gas production target, excluding nitrogen, of 3,486.0 million cubic feet per day.

In 2018, we processed a total of 611.9 thousand barrels of crude oil per day, a 20.2% decrease as compared to 2017, mainly as a result of operational challenges relating to the reliability of certain of our refineries. As a result, we used 37.6% of our primary distillation capacity in 2018, a 20.2% decrease as compared to 2017. In 2018, our variable refining margin decreased by U.S. \$ 4.47 per barrel to U.S. \$0.96 per barrel, an 82.3% decrease as compared to 2017. This decrease was primarily a result of a decrease in prices and weak refining margins in the U.S. Gulf Coast region in November and December 2018, which were caused by decreased demand for gasoline and heightened levels of refinery production.

Critical Accounting Policies

Some of our accounting policies require the application of estimates, judgments and assumptions by management which affect the reported amounts of assets and liabilities as of the date of our financial statements, as well as the reported amounts of revenues and expenses during the periods presented in this report. By their nature, these estimates, judgments and assumptions are subject to a degree of uncertainty and are based on: our historical experience; terms of existing contracts; management’s view of trends in the oil and gas industry, both internationally and within Mexico; economic factors in Mexico; and information from outside sources. We believe that the following critical accounting policies, among others, affect management’s judgments and estimates used in the preparation of our consolidated financial statements according to IFRS, and could potentially impact our financial results and future financial performance. There can be no assurance that actual results do not differ from these estimates. These policies are more fully described in Note 3 to our consolidated financial statements included herein.

Successful Efforts Method of Oil and Gas Accounting

We apply the successful efforts method for the exploration and production of crude oil and gas activities, considering the criteria mentioned in IFRS 6, “Exploration for and Evaluation of Mineral Resources,” in relation to the recognition of exploration and drilling assets. Costs of development wells and related plant, property and equipment involved in the exploitation of oil and gas are recorded as part of the cost of assets. The costs of exploratory wells in areas that have not yet been designated as containing proved reserves are recorded as intangible assets until it is determined whether such reserves are commercially viable. Otherwise, the costs of drilling an exploratory well are charged to exploration expense. Other expenditures on exploration are charged to exploration expense, as incurred.

Depreciation and amortization of capitalized costs associated with wells are based on the estimated commercial life of the field to which the well corresponds, taking into account the relationship between the field’s production levels for the period and proved developed reserves, as of the beginning of the year and as updated on a quarterly basis for new development investments.

Reserves estimates are determined in accordance with earth science and petroleum engineering principles and practices pursuant to Rule 4-10(a) and, where necessary, in accordance with the Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserves Information promulgated by the SPE as of February 19, 2007. These procedures are consistent with international reserves reporting practices. The estimation of these reserves depends on assumptions made and the interpretation of the data available, and can vary as a result of changes in such factors as forecasted oil and gas prices, reservoir performance and developments in oil field technology. The results of drilling activities, test wells and production after the date of estimation are utilized in future revisions of reserves estimates.

Downward revision of reserves estimates can result in: higher depreciation and depletion expense per barrel in future periods; an immediate write-down of an asset's book value in accordance with accounting rules for the impairment of properties; or changes in our accrual of the asset retirement obligation. An impairment of oil and gas producing fixed assets will result if the downward revisions are so significant that the estimated future cash flows from the remaining reserves in the field are insufficient to recover the unamortized capitalized costs. Conversely, if the oil and gas reserves quantities are revised upward, our per barrel depreciation and depletion expense will be lower.

The application of successful efforts accounting can also cause material fluctuations between periods in exploration expenses if drilling results are different than expected or if we change our exploration and development plans. The determination that exploratory drilling was unsuccessful in finding economically producible reserves requires the immediate expensing of previously capitalized drilling costs. We make periodic assessments of the amounts included within intangible assets to determine whether capitalization is initially appropriate and should continue. Exploration wells capitalized beyond 12 months are subject to additional evaluation as to whether the facts and circumstances have changed, and therefore whether the conditions described below no longer apply. Exploration wells more than 12 months old are expensed unless: they are in an area requiring major capital expenditures before production can begin, commercially productive quantities of reserves have been found, and they are subject to further exploration or appraisal activity, in that either drilling of additional exploratory wells is underway or firmly planned for the near future; or proved reserves are identified within 12 months following the completion of exploratory drilling.

Environmental Remediation and Asset Retirement Obligations

We are required to make judgments and estimates in recording liabilities for environmental cleanup and asset retirement obligations. In accordance with applicable legal requirements and accounting practices, we recognize an environmental liability when the cash outflows are probable and the amount is reasonably estimable. We account for disbursements related to the conservation of the environment that are linked to revenue from current or future operations as costs or assets, depending on the circumstances of each disbursement. Moreover, we account for disbursements related to past operations, which no longer contribute to current or future revenues, as current period costs. We accrue a liability for a future disbursement when an obligation related to environmental remediation is identified and the amount thereof can be reasonably estimated.

Estimated liabilities for environmental remediation and asset retirement obligations are subject to change as a result of: changes in laws, regulations and their interpretation; the review of additional information on the extent and nature of site contamination; the determination of additional works that need to be undertaken; improvements in technology; the nature and timing of expenditure; foreign currency exchange rates to the extent that some of these costs are incurred in U.S. dollars; and changes in discount rates.

We do not recognize the obligations related to the costs of future retirement of assets associated with the principal refining processes for gas and petrochemicals. These assets are considered to have an indefinite useful life due to the potential for maintenance and repairs, and, accordingly, we lack sufficient information to reasonably determine the date on which they will be decommissioned.

Financial Instruments

We face market risk caused by the volatility of hydrocarbon prices, exchange rates and interest rates. In order to monitor and manage this risk, Petróleos Mexicanos and the subsidiary entities have developed policies and guidelines that promote an integrated scheme for market risk management, regulate the use of DFIs, guide the development of hedging strategies and provide strategies for the formulation of risk limits.

We enter into derivatives transactions with the sole purpose of hedging financial risks related to our operations. Nonetheless, some of these transactions do not qualify for hedge accounting treatment because they do not meet the strict requirements of IAS 39, "Financial Instruments Recognition and Measurement" for designation as hedges. They are therefore recorded in the financial statements as non-hedge instruments or as

instruments entered into for trading purposes, despite the fact that their cash flows are offset by the cash flows of the positions to which they relate. As a result, the changes in their fair value are recognized in the financing cost. See Note 3, Note 8 and Note 19 to our consolidated financial statements included herein.

Impairment of Non-Financial Assets

At each reporting date, we evaluate whether there is objective evidence that non-financial assets, other than inventory or deferred taxes, are impaired. Significant judgment is required to appropriately assess the recoverable amount, represented by the higher of the value in use and the fair value, less costs to sell or otherwise dispose of our reporting units. Our future net cash flow projections are based on the best available estimates of the cash-generating unit income and expenses using forecasts, prior results and the outlook for the business's performance and the market's development. Our annual budget and business plan set macroeconomic forecasts for each of the cash-generating units, which are calculated based on different assumptions regarding projected commodity sales prices, volume of production and overhead costs, foreign currency exchange rates and inflation, among other items, that are used to quantify income and expense estimates. Any change in the assumptions upon which the forecasts for each cash-generating unit are based can materially affect the anticipated cash flows to be generated by non-financial assets.

These estimated future net cash flows are discounted at present value using cash-generating unit specific discount rates determined as a function of the currency in which their respective cash flows are denominated and the risks associated with these cash flows. The discount rates are intended to reflect current market assessments of the time value of money and the risks specific to the asset. Accordingly, the various discount rates used take into consideration country risk. To ensure that the calculations are consistent and avoid double counting, the cash flow projections do not factor in risks that have already been built into the discount rates used. The discount rates used reflect current market conditions and specific risks related to those fixed assets. See Note 3-H and Note 15 to our consolidated financial statements included herein.

As of December 31, 2018, we have carried out an impairment test to assess the carrying amount of non-financial assets, other than inventories and deferred taxes. The impairment test has resulted in a net reversal of impairment of Ps. 21.4 billion, primarily resulting from a Ps. 65.0 billion reversal of impairment for Pemex Exploration and Production, mainly due to a decrease in the discount rate used to calculate the value in use from 14.40% in 2017 to 7.03% in 2018, as well as lower discount rates used to calculate the value in use of certain of our other business units. This was partially offset by an impairment of Ps. 40.3 billion for Pemex Logistics, mainly due to a 46% decrease in annual average income and a 40% increase in the cost of non-operating losses, partially offset by a 58% decrease in direct operating costs. For more information on the impairment of our non-financial assets, see Note 15 to our consolidated financial statements included herein.

Income Taxes

As described under "Item 4—Information on the Company—Taxes, Duties and Other Payments to the Mexican Government" above and in Note 3-M and Note 23 to our consolidated financial statements included herein, the fiscal regime applicable to Petróleos Mexicanos and the subsidiary entities and certain subsidiary companies as of December 31, 2018 became effective on January 1, 2015. Effective as of this date, the Hydrocarbons Revenue Law and the Federal Revenue Law of the applicable year comprise the fiscal regime applicable to us.

As of December 31, 2018, Petróleos Mexicanos and the subsidiary entities are required to estimate taxable income according to IAS 12, "Income Taxes." This process involves an estimation of our actual current tax and an assessment of temporary differences resulting from differing treatment of items for tax and accounting purposes. These differences result in deferred assets and liabilities, which are included within our consolidated balance sheet. We must then assess the likelihood that our deferred assets will be recovered from future taxable income.

Management judgment is required in determining our provision for income taxes. In the event that actual results differ from our estimates, any adjustments recorded will affect our net income during the corresponding period.

Exploration and Production Taxes and Duties

The fiscal regime applicable to the exploration and production assignments granted to us by the Mexican Government includes the following taxes and duties:

- *Profit-Sharing Duty.* The Profit-Sharing Duty is calculated based on the value of hydrocarbons produced in the relevant area minus certain permitted deductions. As of January 1, 2018, the applicable rate of this duty was 66.25%. Pursuant to the Hydrocarbons Revenue Law, the Profit-Sharing Duty decreases on an annual basis. As of January 1, 2019, this duty was set at 65%.

- *Hydrocarbons Extraction Duty.* The Hydrocarbons Extraction Duty is calculated based on a rate that varies according to (i) the type of hydrocarbon (e.g., crude oil, associated natural gas, non-associated natural gas or condensates), (ii) the volume of production and (iii) the relevant market price.
- *Exploration Hydrocarbons Duty.* The Exploration Hydrocarbons Duty is calculated by applying a quote per square kilometer for each assigned phase of production and extraction phase. Pemex Exploration and Production must make monthly payments of this duty. The Mexican Government is entitled to collect a monthly payment of Ps. 1,294.71 per square kilometer of non-producing areas. After 60 months, this tax increases to Ps. 3,096.04 per square kilometer for each additional month that the area is not producing. These amounts will be updated on an annual basis in accordance with the national price index.

For more information on the taxes and duties applicable to and paid by Pemex Exploration and Production, see Note 23 to our consolidated financial statements included herein.

Contingencies

In the ordinary course of business, we are named in a number of lawsuits of various types. We evaluate the merit of each claim and assess the likely outcome. Liabilities for loss contingencies are recorded when it is probable that a liability has been incurred and the amount thereof can be reasonably estimated. We do not recognize contingent revenues, earnings or assets until their realization is assured. We have not recorded provisions related to ongoing legal proceedings whenever we do not expect an unfavorable resolution in such proceedings, except as disclosed in “Item 8—Financial Information—Legal Proceedings—Civil Actions” and Notes 21 and 29 to our consolidated financial statements included herein.

Employee Benefits

As described under “Item 6—Directors, Senior Management and Employees—Employees” below and in Note 3-L and Note 20 to our consolidated financial statements included herein, as of January 1, 2016, we are operating both a defined contribution plan and defined benefit pension plan. Until December 31, 2015, we only operated a defined benefit pension plan.

Contribution Plan

Under the defined contribution plan, both we and our employees contribute to each employee’s individual account, in contrast to the existing defined benefit plan, pursuant to which only we contribute. We account for our contributions as costs, expenses or assets. Contributions to the defined contribution plan that are not expected to be fully settled within 12 months after the end of the annual reporting period in which the employee rendered related services will be discounted using the defined benefits plan discount rate.

Benefit Pension Plan

Under the defined benefit pension plan, we are the only contributor to a trust, which is managed separately. We recognize the cost for the defined benefit pension plan based on independent actuarial computations applying the projected unit credit method. Actuarial gains and losses are recognized within other comprehensive results for the period in which they occur. The costs of prior services are recognized within profit or loss for the period in which they are incurred.

Our net obligation with respect to the defined benefit pension plan equals the present value of the defined benefit obligation less the fair value of plan assets for which obligations have yet to be settled. The value of any asset is limited to the present value of the economic benefit represented by the plan reimbursements and reductions in future contributions to the plan.

In addition, other long-term employee benefits include seniority premiums payable for disability, death and survivors’ benefits, medical services, gas and basic food baskets for beneficiaries. Termination benefits are recognized in profit or loss for the year in which they are incurred.

Benefits to employees were 30.6% and 34.6% of our total liabilities as of December 31, 2018 and 2017, respectively, and any adjustments recorded will affect our net income and/or comprehensive net income during the corresponding period.

New Accounting Standards

IFRS 9

On January 1, 2018, we adopted the new accounting standard IFRS 9 “Financial Instruments” as issued by the International Accounting Standards Board. IFRS 9 sets out, among others, new requirements for classification and measurement of financial assets, measurement and recognition of expected credit losses on financial assets, changes in the terms of financial assets and financial liabilities, hedge accounting and related disclosures. We expect that the new measurement and recognition of expected credit losses on financial assets could lead to increased impairment losses and increased volatility in the value of financial instruments. The initial application of IFRS 9 on January 1, 2018 did not have a significant impact on our reserves of financial assets and we have not restated the comparative information.

IFRS 15

On January 1, 2018, we adopted the new accounting standard IFRS 15 “Revenue from Contracts with Customers” as issued by the International Accounting Standards Board. IFRS 15 establishes a comprehensive framework for determining whether, how much and when revenue is recognized. We adopted IFRS 15 using the modified retrospective transition method on January 1, 2018 and, accordingly, we have not restated comparative information. As a result of our adoption of IFRS 15, sales to our Trading Company are no longer presented as intersegment sales and are instead classified as trade sales.

IFRIC 22

On January 1, 2018, we adopted the new interpretation of accounting standard IFRIC 22 “Foreign Currency Transactions and Advance Considerations” as issued by the International Accounting Standards Board. The interpretation clarified when an entity recognizes a non-monetary asset or non-monetary liability arising from the payment or receipt of advance consideration before the entity recognizes the related asset, expense or income. Our adoption of IFRIC 22 did not have an impact on our consolidated financial statements included herein.

For more information on the requirements and impacts of IFRS 9, IFRS 15 and IFRS 22, see Note 4-A to our consolidated financial statements included herein.

Recently Issued Accounting Standards

New accounting interpretations and revisions under IFRS that apply to annual periods beginning on or after January 1, 2019, including IFRS 16 “Leases,” as well as additional standards, amendments or interpretations that, even though not yet effective, could have a material impact on our consolidated financial statements, and a breakdown of the effect of such new accounting interpretations and revisions are disclosed in Note 31 to our consolidated financial statements included herein.

Sales Volumes and Prices

The profitability of our operations in any particular accounting period is directly related to the sales volume of, and average realized prices for, the crude oil and natural gas that we sell. These average realized prices for crude oil and natural gas fluctuate from one period to another due to world market conditions and other factors.

Export Volumes and Prices

Pemex Exploration and Production sells crude oil to PMI, which then sells it to international clients. The volume of crude oil that we export is the volume delivered to international clients as adjusted for water content according to the bill of lading and standard market practice. PMI bases crude oil export price formulas on a basket of international reference prices and a constant set according to specific market conditions. We determine export prices of refined products, petrochemicals and natural gas by reference to market conditions and direct negotiations with our clients.

Significant changes in international crude oil prices directly affect our financial results. The impact of changes in crude oil prices on our refining activities and petrochemicals business depends on:

- the magnitude of the change in crude oil prices;
- how quickly petroleum and petrochemical product prices in international markets adjust to reflect changes in crude oil prices; and
- the extent to which prices in Mexico, where we sell most of our petroleum products and petrochemicals, reflect international prices for those products.

The following table sets forth the weighted average market price per barrel of crude oil that PMI received from exports and the average price of the United States benchmark, West Texas Intermediate (or WTI) crude oil, for the years indicated. The average price differential between WTI and the crude oil that we exported in the last five years fluctuated between U.S. \$7.8 in 2014 and U.S. \$3.86 in 2018, which is mainly the result of fluctuations in the price of other benchmarks on which our pricing formulas for crude oil are based. See “Item 4—Information on the Company—Business Overview—International Trading.”

	Year ended December 31,				
	2014	2015	2016	2017	2018
	(in dollars per barrel)				
West Texas Intermediate crude oil average price	U.S. \$93.28	U.S. \$48.71	U.S. \$43.34	U.S. \$50.79	U.S. \$65.20
PEMEX crude oil weighted average export price	85.48	43.12	35.65	46.73	61.34

Note: The numbers in this table are daily average prices for the full year, which differ from spot prices at year end. On April 26, 2019, the spot price for West Texas Intermediate crude oil was U.S. \$63.30 per barrel and the spot price for the PEMEX crude oil basket was an estimated U.S. \$63.21 per barrel.

Sources: PEMEX’s oil statistics and Platt’s U.S. MarketScan (S&P Global Inc.).

Domestic Prices

As of December 31, 2017, domestic fuel prices are fully liberalized and are determined according to market forces and may vary without regard to any specific range determined by the Mexican Government. For further information on domestic prices, see “Item 4—Business Overview—Industrial Transformation—Refining—Pricing Decrees” and “Item 4—Business Overview—Industrial Transformation—Gas and Aromatics—Pricing Decrees” above.

The following table compares the average prices in nominal terms of selected petroleum and petrochemical products in Mexico for the years indicated:

	Year ended December 31,				
	2014	2015	2016	2017	2018
Petroleum Products					
Unleaded regular gasoline ⁽¹⁾	Ps. 1,460.45	Ps. 1,463.02	Ps. 1,460.19	Ps. 1,413.27	Ps. 1,813.33
Premium gasoline ⁽¹⁾	1,272.73	1,127.40	931.81	1,277.53	1,948.66
Diesel ⁽¹⁾	1,457.16	1,482.90	1,457.27	1,543.52	1,935.54
Jet fuel ⁽¹⁾	1,458.34	1,370.67	1,268.38	1,187.40	1,815.91
Natural Gas ⁽²⁾	5.44	6.18	5.81	6.99	5.57
Liquified Petroleum ⁽²⁾	21.77	22.18	30.43	36.13	39.24
Selected Petrochemicals					
Ammonia ⁽³⁾	6,125.17	6,275.83	6,083.33	6,433.61	7,905.97
Polyethylene ⁽³⁾	20,300.29	19,798.58	23,402.82	22,300.62	22,945.27

(1) Pesos per barrel.

(2) Pesos per hundred cubic feet.

(3) Pesos per ton.

Source: *Petróleos Mexicanos*.

IEPS Tax, Hydrocarbon Duties and Other Taxes

The following table sets forth the taxes and duties that we recorded for each of the past three years.

	Year ended December 31,		
	2016	2017	2018
	(in millions of pesos) ⁽¹⁾		
Hydrocarbon extraction duties and others	Ps. 277,162	Ps. 338,044	Ps. 469,934
Income tax	(12,640)	(5,064)	(8,355)
Total	Ps. 264,522	Ps. 332,980	Ps. 461,579

Note: For a description of these taxes and duties, see “Item 4—Information on the Company—Taxes, Duties and Other Payments to the Mexican Government.”
Numbers may not total due to rounding.

(1) Figures are stated in nominal pesos.

Source: PEMEX’s audited financial statements, prepared in accordance with IFRS.

Relation to the Mexican Government

Petróleos Mexicanos and the subsidiary entities are public entities of the Mexican Government, rather than Mexican corporations. Therefore, we do not have the power to issue shares of equity securities evidencing ownership interests and are not required, unlike Mexican corporations, to have multiple shareholders. However, our financing obligations do not constitute obligations of and are not guaranteed by the Mexican Government. The President of Mexico appoints five of the ten members of the Board of Directors of Petróleos Mexicanos as representatives of the Mexican Government, including the Secretary of Energy, who serves as the Chairperson of the Board of Directors of Petróleos Mexicanos, and the Secretary of Finance and Public Credit. The President of Mexico also appoints five independent members to the Board of Directors of Petróleos Mexicanos, whose appointments are ratified by the Senate.

Pursuant to the Petróleos Mexicanos Law, the consolidated annual budget of Petróleos Mexicanos and the subsidiary entities, including our financing program, must be submitted to the Ministry of Finance and Public Credit, which has the authority to adjust our financial balance goal and the ceiling on our wage and salary expenditures for the fiscal year. The Mexican Government incorporates our consolidated annual budget and financing program into its budget, which the Chamber of Deputies must approve each year. The Mexican Congress has the authority to adjust our annual financial balance goal at any time by amending the applicable law. In addition, any adjustment proposed by the Board of Directors of Petróleos Mexicanos to change our annual financial balance goal or increase the limit on our wage and salary expenditures or our financing program must be approved by the Chamber of Deputies.

Inflation

Mexico experienced high inflation during the 1980s. The annual rate of inflation (as measured by the change in the NCPI) decreased from a high of 159.2% in 1987 to 11.9% in 1992, 8.0% in 1993 and 7.1% in 1994. However, the economic events that followed the devaluation of the peso against the U.S. dollar in late 1994 and 1995, along with turbulence in international financial markets, caused inflation to increase to 52.0% in 1995. After 1995, inflation decreased to 27.7% in 1996 and 15.7% in 1997. The annual inflation rate was 4.1% in 2014, 2.1% in 2015, 3.4% in 2016, 6.8% in 2017 and 4.8% in 2018.

We do not use inflation accounting, unless the economic environment in which we operate qualifies as “hyperinflationary,” as defined by IFRS. In accordance with IFRS, the threshold for considering an economy hyperinflationary, and consequently, adjusting certain line items in the financial statements for inflation, is reached when the cumulative three-year inflation rate is 100% or more. Because the economic environment in the three-year periods ended December 31, 2016, 2017 and 2018 did not qualify as hyperinflationary, we did not use inflation accounting to prepare our consolidated financial statements as of December 31, 2016, 2017 and 2018 included herein.

Consolidation

Our financial statements consolidate the results of Petróleos Mexicanos, the subsidiary entities and the subsidiary companies. Certain non-material subsidiary companies are not consolidated and are accounted for under either the cost method or the equity method. For a list of the consolidated subsidiary companies, see Note 3-A and Note 5 to our consolidated financial statements included herein.

Export Agreements

Though Mexico is not a member of OPEC, it has periodically announced increases and decreases in our crude oil exports, reflecting production revisions made by other oil producing countries in order to contribute to crude oil prices stabilization. However, we have not changed our export goals because of announcements made by OPEC since 2004, and we believe that Mexico has no plans to change our current level of crude oil exports.

Results of Operations of Petróleos Mexicanos, the Subsidiary Entities and the Subsidiary Companies—For the Year Ended December 31, 2018 Compared to the Year Ended December 31, 2017

Total Sales

Total sales increased by 20.3%, or Ps. 284.1 billion, in 2018, from Ps. 1,397.0 billion in 2017 to Ps. 1,681.2 billion in 2018, primarily due to increases in the average sales prices of our petroleum products and the weighted average price of Mexican crude oil.

Domestic Sales

Domestic sales increased by 11.8%, from Ps. 877.4 billion in 2017 to Ps. 980.6 billion in 2018, primarily due to an increase in the average prices of gasoline, diesel, fuel oil and jet fuel. Domestic sales of petroleum products increased by 14.7% in 2018, from Ps. 738.9 billion in 2017 to Ps. 847.5 billion in 2018, primarily due to a 19.7% increase in the average price of gasoline, a 20.1% increase in the average price of diesel, a 46.0% increase in the average price of fuel oil and a 38.8% increase in the average price of jet fuel. These price increases were partially offset by a 14.0% decrease in the volume of sales of premium gasoline, primarily due to a decrease in demand from retail service stations. Domestic sales of natural gas decreased by 28.2% in 2018, from Ps. 70.9 billion in 2017 to Ps. 50.9 billion in 2018, primarily due to a 23.1% decrease in the average sales price of natural gas and a 6.6% decrease in the volume of sales of natural gas, mainly due to competition. Domestic petrochemical sales (including sales of certain by-products of the petrochemical production process) increased by 43.0%, from Ps. 16.0 billion in 2017 to Ps. 22.9 billion in 2018, primarily as a result of an increase in the volume of sales of polyethylene.

Export Sales

Export sales increased by 36.1% in peso terms in 2018 (with U.S. dollar-denominated export revenues translated to pesos at the exchange rate on the date of the corresponding export sale), from Ps. 508.5 billion in 2017 to Ps. 691.9 billion in 2018. This increase was primarily due to a 31.8% increase in the weighted average Mexican crude oil export price in 2018, from U.S. \$47.26 per barrel in 2017 to U.S. \$62.29 per barrel in 2018.

Excluding the trading activities of the Trading Companies (in order to show only the amount of export sales related to the subsidiary entities), export sales by the subsidiary entities to the Trading Companies and third parties increased by 32.8% in peso terms, from Ps. 430.6 billion in 2017 to Ps. 571.8 billion in 2018. In U.S. dollar terms, excluding the trading activities of the Trading Companies, total export sales (which are U.S. dollar-denominated) increased by 30.1% in 2018, from U.S. \$22.7 billion in 2017 to U.S. \$29.7 billion in 2018. This was primarily due to the 31.8% increase in the weighted average Mexican crude oil export price. The trading and export activities of the Trading Companies generated additional marginal revenues of Ps. 120.0 billion in 2018, 54.5% higher in peso terms than the Ps. 77.9 billion of additional revenues generated in 2017, mainly due to an increase in the average prices of diesel and gasoline. Export sales of PMI-NASA, one of our principal Trading Companies, increased by 35.6% in 2018, from Ps. 65.8 billion in 2017 to Ps. 89.2 billion in 2018.

Crude oil and condensate export sales accounted for 89.7% of total export sales (excluding the trading activities of the Trading Companies) in 2018, as compared to 88.4% in 2017. These crude oil and condensate sales increased in peso terms by 34.9% in 2018, from Ps. 380.5 billion in 2017 to Ps. 513.2 billion in 2018, and in U.S. dollar terms by 32.3%, from U.S. \$20.1 billion in 2017 to U.S. \$26.6 billion in 2018. The weighted average Mexican crude oil export price in 2018 was U.S. \$62.29 per barrel, 31.8% higher than the weighted average price of U.S. \$47.26 per barrel in 2017.

Export sales of petroleum products, including natural gas and natural gas liquids, by our industrial transformation segment decreased from 10.7% of total export sales (excluding the trading activities of the Trading Companies) in 2017 to 9.2% of those export sales in 2018. Export sales of petroleum products, including products derived from natural gas and natural gas liquids, increased by 15.2%, from Ps. 46.0 billion in 2017 to Ps. 53.0 billion in 2018, primarily due to an increase in the average sales price of fuel oil and naphthas.

Export sales of petrochemical products (including certain by-products of the petrochemical process) increased by Ps. 1,043.4 million in 2018, from Ps. 4,625.3 million in 2017 to Ps. 5,668.7 million in 2018, primarily due to an increase in export sales by Fertinal in 2018.

Services Income

Services income decreased by 21.6% in 2018, from Ps. 11.1 billion in 2017 to Ps. 8.7 billion in 2018, primarily as a result of the recognition of transportation services as part of sales in 2018.

Cost of Sales

Cost of sales increased by 19.4%, from Ps. 1,004.2 billion in 2017 to Ps. 1,199.5 billion in 2018. This increase was mainly due to: (1) an increase of Ps. 175.0 billion in product purchases, mainly a Ps. 123.0 billion increase in the value of imports, primarily Magna gasoline, diesel and jet fuel, mainly due to an increase in the price of imports, (2) a Ps. 24.2 billion increase in hydrocarbon exploration and extraction duties and taxes due to higher average sales prices in 2018, (3) a Ps. 16.5 billion increase in non-operating losses resulting from the illicit market in fuels and (4) a Ps. 15.8 billion increase in the cost of unsuccessful wells and exploration expenses. This increase was partially offset by a Ps. 3.3 billion decrease in depreciation of fixed assets and amortization of wells, primarily due to the decreased value of assets to be depreciated as a result of the impairment recorded in 2017.

Impairment of Wells, Pipelines, Properties, Plant and Equipment

Impairment of wells, pipelines, properties, plant and equipment decreased by Ps. 172.8 billion in 2018, from a net impairment of Ps. 151.4 billion in 2017 to a net reversal of impairment of Ps. 21.4 billion in 2018, mainly due to a decrease in the discount rate used to calculate the value in use of our Cantarell business unit from 14.40% in 2017 to 7.03% in 2018, as well lower discount rates used to calculate the value in use of certain other business units, including Aceite Terciario del Golfo.

General Expenses

General expenses increased by Ps. 16.9 billion, from Ps. 141.8 billion in 2017 to Ps. 158.7 billion in 2018, mainly due to an increase in administrative expenses relating to the contributions to the defined contribution pension plan and incentives to encourage employees to migrate from the defined benefit pension plan to the defined contribution plan and the net periodic cost of employee benefits.

Other Revenues/Expenses, Net

Other revenues, net, increased by Ps. 17.9 billion in 2018, from other revenues, net, of Ps. 5.2 billion in 2017 to other revenues, net, of Ps. 23.1 billion in 2018. This increase was primarily due to contracts signed for participation rights in the Cardenas-Mora, Misión, Santuario and Ogarrio blocks in the amount of Ps. 14.2 billion, partially offset by the recognition of a Ps. 12.5 billion loss in the disposal of wells, pipelines, property, plant and equipment.

Financing Income

Financing income increased by Ps. 15.4 billion in 2018, from Ps. 16.2 billion in 2017 to Ps. 31.6 billion in 2018, primarily due to: (1) the recognition of the premium from notes exchanged in February 2018, (2) interest income on the promissory notes issued by the Mexican Government in relation to our pension liabilities, (3) increased interest income on other financial products and securities as a result of higher interest rates and (4) gains on the plugging of wells as a result of a lower discount rate.

Financing Cost

Financing cost increased by 2.6% in 2018, from Ps. 117.6 billion in 2017 to Ps. 120.7 billion in 2018, primarily due to an increase in interest expense in 2018 following higher levels of indebtedness.

Derivative Financial Instruments Income (Cost)

Derivative financial instruments income, net, decreased by Ps. 47.6 billion, from a net income of Ps. 25.3 billion in 2017 to a net cost of Ps. 22.3 billion in 2018, primarily due to the appreciation of the U.S. dollar relative to other foreign currencies we hedge, such as euros, Japanese yen and pounds.

Exchange Gain, Net

A substantial portion of our indebtedness, 86.9% as of December 31, 2018, is denominated in foreign currencies. Our exchange gain, net, increased by Ps. 0.5 billion in 2018, from an exchange gain of Ps. 23.2 billion in 2017 to an exchange gain of Ps. 23.7 billion in 2018, primarily as a result of a 0.5% appreciation of the peso relative to the U.S. dollar in 2018. Due to the fact that 100.0% of our revenues from exports and domestic sales are referenced to prices denominated in U.S. dollars, and only 75.0% of our expenses, including financing costs, are linked to U.S. dollar prices, the appreciation of the peso relative to the U.S. dollar had a favorable effect on our ability to meet peso-denominated obligations. The value of the peso in U.S. dollar terms appreciated by 0.5% in 2018, from Ps. 19.7867 per U.S. \$1.00 on December 31, 2017 to Ps. 19.6829 per U.S. \$1.00 on December 31, 2018, as compared to a 4.3% appreciation of the peso in U.S. dollar terms in 2017.

Taxes, Duties and Other

Hydrocarbon extraction duties and other duties and taxes paid increased by 38.6% in 2018, from Ps. 333.0 billion in 2017 to Ps. 461.6 billion in 2018, primarily due to the 38.6% increase in the weighted average price of the Mexican crude oil export price, from U.S. \$47.26 per barrel in 2017 to U.S. \$62.29 per barrel in 2018. Income related duties and taxes represented 27.5% of total sales in 2018, as compared to 23.8 % of total sales in 2017.

Net Income/Loss

In 2018, we had a net loss of Ps. 180.4 billion from Ps. 1,681.2 billion in total sales revenues, as compared to a net loss of Ps. 280.9 billion from Ps. 1,397.0 billion in total sales revenues in 2017. This decrease in net loss relative to 2017 was primarily explained by:

- a Ps. 284.1 billion increase in total sales, mainly due to an increase in the average price of crude oil and natural gas;
- a Ps. 172.9 billion decrease in impairment of wells, pipelines, properties, plant and equipment;
- a Ps. 17.9 billion increase in other revenues, net;
- a Ps. 1.2 billion increase in profit sharing in joint ventures, associates and other; and
- a Ps. 0.5 billion increase in exchange gain, net.

These effects were partially offset by:

- a Ps. 195.3 billion increase in cost of sales, mainly due to an increase in total sales;
- a Ps. 128.6 billion increase in taxes and other duties;
- a Ps. 35.3 billion increase in financing cost, net; and
- a Ps. 16.8 billion increase in general expenses.

Other Comprehensive Results

In 2018, we had a net gain of Ps. 223.4 billion in other comprehensive results, as compared to a net gain of Ps. 11.5 billion in 2017, primarily due to a decrease in the reserve for employee benefits that resulted from the increase in the discount rate and expected rate of return on plan assets used in the actuarial computation method from 7.9% in 2017 to 9.3% in 2018.

Results of Operations of Petróleos Mexicanos, the Subsidiary Entities and the Subsidiary Companies—For the Year Ended December 31, 2017 Compared to the Year Ended December 31, 2016

Total Sales

Total sales increased by 30.1%, or Ps. 322.9 billion, in 2017, from Ps. 1,074.1 billion in 2016 to Ps. 1,397.0 billion in 2017, primarily due to an increase in the volume of our domestic and export sales, mainly due to an increase in the average sales prices of our petroleum products for the reasons explained in further detail below.

Domestic Sales

Domestic sales increased by 30.9% in 2017, from Ps. 670.0 billion in 2016 to Ps. 877.4 billion in 2017, primarily due to an increase in the average prices of fuel oil, diesel, gasoline and liquefied natural gas. Domestic sales of petroleum products increased by 39.6% in 2017, from Ps. 529.3 billion in 2016 to Ps. 738.9 billion in 2017, primarily due to a 34.1% increase in the average price of gasoline, a 60.7% increase in the average price of diesel, a 26.2% increase in the average price of jet fuel and a 78.9% increase in the average price of fuel oil. These price increases were partially offset by a 27.1% decrease in the volume of sales of premium gasoline, primarily due to a decrease in demand from retail service stations and a 15.8% decrease in the volume of sales of liquefied natural gas. Domestic sales of natural gas increased by 19.0% in 2017, from Ps. 59.6 billion in 2016 to Ps. 70.9 billion in 2017, primarily due to a 43.0% increase in the average sales price of natural gas, partially offset by a 16.8% decrease in the volume of sales of natural gas. Domestic sales of liquefied natural gas decreased by 3.7% in 2017, from Ps. 50.9 billion in 2016 to Ps. 49.0 billion in 2017, primarily as a result of a 15.8% decrease in the volume of sales of liquefied natural gas due to the market share loss that resulted from increased competition due to the liberalization of imports that began in 2016, which was partially offset by a 14.4% increase in the average sales price of liquefied natural gas. Domestic petrochemical sales (including sales of certain by-products of the petrochemical production process) decreased by 47.0%, from Ps. 30.2 billion in 2016 to Ps. 16.0 billion in 2017, primarily as a result of a decrease in the volume of sales of polyethylene.

Export Sales

Export sales increased by 28.7% in peso terms in 2017 (with U.S. dollar-denominated export revenues translated to pesos at the exchange rate on the date of the corresponding export sale), from Ps. 395.1 billion in 2016 to Ps. 508.5 billion in 2017. This increase was primarily due to a 33.9% increase in the weighted average Mexican crude oil export price, a 63.4% increase in the export sales of fuel oil, mainly due to an increase in the average sales price of fuel oil, a 4.5% increase in the export sales of naphthas and a Ps. 1,087.8 million increase in the export sales of petrochemical products. This increase in export sales was partially offset by a 2.7% decrease in the volume of export sales of petroleum products.

Excluding the trading activities of the Trading Companies (in order to show only the amount of export sales related to the subsidiary entities), export sales by the subsidiary entities to the Trading Companies and third parties increased by 31.4% in peso terms, from Ps. 327.8 billion in 2016 to Ps. 430.6 billion in 2017. In U.S. dollar terms, excluding the trading activities of the Trading Companies, total export sales (which are U.S. dollar-denominated) increased by 29.7% in 2017, from U.S. \$17.5 billion in 2016 to U.S. \$22.7 billion in 2017. This was primarily due to the 33.9% increase in the weighted average Mexican crude oil export price. The trading and export activities of the Trading Companies generated additional marginal revenues of Ps. 77.9 billion in 2017, 15.6% higher in peso terms than the Ps. 67.4 billion of additional revenues generated in 2016, mainly due to an increase in the average prices of diesel and gasoline. Export sales of PMI-NASA, one of our principal Trading Companies, increased by 13.6% in 2017, from Ps. 57.9 billion in 2016 to Ps. 65.8 billion in 2017. The weighted average price per barrel of crude oil that PMI sold to third parties in 2017 was U.S. \$47.73, or 33.9%, higher than the weighted average price of U.S. \$35.63 in 2016.

Crude oil and condensate export sales to PMI accounted for 88.4% of total export sales (excluding the trading activities of the Trading Companies) in 2017, as compared to 88.1% in 2016. These crude oil and condensate sales increased in peso terms by 31.8% in 2017, from Ps. 288.6 billion in 2016 to Ps. 380.5 billion in 2017, and increased in U.S. dollar terms by 29.7% in 2017, from U.S. \$15.5 billion in 2016 to U.S. \$20.1 billion in 2017. The weighted average price per barrel of crude oil that Pemex Exploration and Production sold to PMI for export in 2017 was U.S. \$47.26, 34.4% higher than the weighted average price of U.S. \$35.17 in 2016.

Export sales of petroleum products, including natural gas and natural gas liquids, by our industrial transformation segment to the Trading Companies and third parties decreased from 10.9% of total export sales (excluding the trading activities of the Trading Companies) in 2016 to 10.7% of those export sales in 2017. Export sales of petroleum products, including products derived from natural gas and natural gas liquids, increased by 29.2%, from Ps. 35.6 billion in 2016 to Ps. 46.0 billion in 2017, primarily due to an increase in the average sales prices of fuel oil and naphthas. In U.S. dollar terms, export sales of petroleum products, including products derived from natural gas and natural gas liquids, increased by 26.3%, from U.S. \$1.9 billion in 2016 to U.S. \$2.4 billion in 2017. Export sales of natural gas increased by 3.3%, from Ps. 21.0 million in 2016 to Ps. 21.7 million in 2017, primarily due to an increase in the average sales price of natural gas.

Petrochemical products accounted for the remainder of export sales in 2016 and 2017. Export sales of petrochemical products (including certain by-products of the petrochemical process) increased by Ps. 1,087.8 million in 2017, from Ps. 3,537.5 million in 2016 to Ps. 4,625.3 million in 2017, primarily due to an increase in export sales of Fertinal in 2017. In U.S. dollar terms, export sales of petrochemical products (including certain by-products of the petrochemical process) decreased by 2.7% in 2017, from U.S. \$218.7 million in 2016 to U.S. \$212.8 million in 2017.

Services Income

Services income increased by 23.3% in 2017, from Ps. 9.0 billion in 2016 to Ps. 11.1 billion in 2017, primarily as a result of an increase in transportation services provided by Pemex Logistics to CENAGAS and an increase in freight services provided by Pemex Industrial Transformation to third parties.

Cost of Sales

Cost of sales increased by 16.0%, from Ps. 865.8 billion in 2016 to Ps. 1,004.2 billion in 2017. This increase was mainly due to: (1) an increase of Ps. 131.2 billion in purchases of imports, primarily Magna gasoline, diesel and natural gas, mainly due to an increase in the price of imports and an increase in the volume of imports required to meet domestic demand; (2) a Ps. 15.5 billion increase in hydrocarbon exploration and extraction duties and taxes due to higher average sales prices in 2017; (3) a Ps. 9.5 billion increase in operating expenses, mainly due to an increase in expenses for materials and spare parts; and (4) a Ps. 6.2 billion increase in depreciation of fixed assets and amortization of wells, primarily due to the increased value of assets to be depreciated as a result of the partial reversal of the impairment recorded in 2016. This increase was partially offset by a Ps. 26.0 billion decrease in the cost of unsuccessful wells, primarily due to a decrease in investment.

Impairment of Wells, Pipelines, Properties, Plant and Equipment

Impairment of wells, pipelines, properties, plant and equipment increased by Ps. 482.7 billion in 2017, from a net reversal of impairment of Ps. 331.3 billion in 2016 to a net impairment of Ps. 151.4 billion in 2017, mainly due to: (1) the deferral of the development investments in the first five years of the economic horizon in the proved reserves, (2) insufficient cash flows to make up for costs recovery at the Burgos and Lakach projects resulting from the 4.3% appreciation of the Mexican peso against the U.S. dollar from a peso–U.S. dollar exchange rate of Ps. 20.6640 to U.S. \$1.00 as of December 31, 2016 to a peso–U.S. dollar exchange rate of Ps. 19.7867 to U.S. \$1.00 as of December 31, 2017, due to the fact that cash inflows are denominated in U.S. dollars and then translated to the reporting currency using the exchange rate at the end of the period; (3) a 0.3% increase in the discount rate; (4) a 7.2% decrease in crude oil forward prices, and (5) the natural decline in production in the Macuspana project.

General Expenses

General expenses increased by Ps. 3.9 billion, from Ps. 137.9 billion in 2016 to Ps. 141.8 billion in 2017, mainly due to an increase in administrative expenses relating to the contributions to the defined contribution pension plan and incentives to encourage employees to migrate from the defined benefit pension plan to the defined contribution plan.

Other Revenues/Expenses, Net

Other revenues, net, decreased by Ps. 17.5 billion in 2017, from other revenues, net, of Ps. 22.7 billion in 2016 to other revenues, net, of Ps. 5.2 billion in 2017. This decrease was primarily due to the recognition of a Ps. 8.4 billion loss in the disposal of wells, pipelines, properties, plant and equipment and a Ps. 3.3 billion loss in the sale of our shares in Repsol. The decrease in other revenues, net, was partially offset by a Ps. 3.1 billion gain from the sale of our 50% interest in Ductos y Energéticos del Norte and the recovery of a Ps. 13.6 million insurance payment relating to an accident that occurred on our Abkatún-A platform in April 2015.

Financing Income

Financing income increased by Ps. 2.4 billion in 2017, from Ps. 13.8 billion in 2016 to Ps. 16.2 billion in 2017, primarily due to interest on the promissory notes issued by the Mexican Government in relation to our pension liabilities.

Financing Cost

Financing cost increased by 18.8% in 2017, from Ps. 98.8 billion in 2016 to Ps. 117.6 billion in 2017, primarily due to an increase in interest expense in 2017 following higher levels of indebtedness and the 4.3% appreciation of the peso relative to the U.S. dollar in 2017 as compared to 2016.

Derivative Financial Instruments Income (Cost)

Derivative financial instruments income (cost), net, increased by Ps. 39.3 billion, from a net cost of Ps. 14.0 billion in 2016 to a net income of Ps. 25.3 billion in 2017, primarily due to the depreciation of the U.S. dollar relative to other foreign currencies we hedge and the restructuring of certain of our derivative financial instruments.

Exchange Gain, Net

A substantial portion of our indebtedness, 86.6% as of December 31, 2017, is denominated in foreign currencies. Our exchange gain, net, increased by Ps. 277.2 billion in 2017, from an exchange loss of Ps. 254.0 billion in 2016 to an exchange gain of Ps. 23.2 billion in 2017, primarily as a result of a 4.3% appreciation of the peso relative to the U.S. dollar in 2017. Due to the fact that 100.0% of our revenues from are referenced to prices denominated in U.S. dollars, and only 74.0% of our expenses, including financing costs, are linked to U.S. dollar prices, the appreciation of the peso relative to the U.S. dollar had an unfavorable effect on our ability to meet peso-denominated obligations. The value of the peso in U.S. dollar terms appreciated by 4.3% in 2017, from Ps. 20.6640 = U.S. \$1.00 on December 31, 2016 to Ps. 19.7867 = U.S. \$1.00 on December 31, 2017, as compared to a 20.1% depreciation of the peso in U.S. dollar terms in 2016.

Taxes, Duties and Other

Hydrocarbon extraction duties and other duties and taxes paid increased by 25.9% in 2017, from Ps. 264.5 billion in 2016 to Ps. 333.0 billion in 2017, primarily due to the 34.4% increase in the weighted average price of the Mexican crude oil export price, from U.S. \$35.63 per barrel in 2016 to U.S. \$47.26 per barrel in 2017. Income related duties and taxes represented 23.8% of total sales in 2017, as compared to 24.6 % of total sales in 2016.

Net Income/Loss

In 2017, we had a net loss of Ps. 280.9 billion from Ps. 1,397.0 billion in total sales revenues, as compared to a net loss of Ps. 191.1 billion from Ps. 1,074.1 billion in total sales revenues in 2016. This increase in net loss was primarily explained by:

- a Ps. 482.7 billion increase in the impairment of fixed assets;
- a Ps. 68.5 billion increase in taxes and other duties, mainly due to the increase in the weighted average price of the Mexican crude oil export price; and
- a Ps. 17.5 billion decrease in other revenues, net.

This increase was partially offset by:

- a Ps. 322.9 billion increase in total sales, mainly due to the increase in average sales prices of our domestic refined petroleum products and export crude oil;
- a Ps. 277.2 billion increase in exchange gain, net; and
- a Ps. 39.3 billion increase in derivative financial instruments income, net.

Other Comprehensive Results

In 2017, we had a net gain of Ps. 11.5 billion in other comprehensive results, as compared to a net gain of Ps. 127.9 billion in 2016, primarily due to an increase in the reserve for employee benefits that resulted from the decrease in the discount rate and expected rate of return on plan assets used in the actuarial computation method from 8.2% in 2016 to 7.9% in 2017, as well as the effect of employees migrating from the defined benefits pension plan to the defined contribution plan.

Changes in Statement of Financial Position of Petróleos Mexicanos, the Subsidiary Entities and the Subsidiary Companies—from December 31, 2017 to December 31, 2018

Assets

Cash and cash equivalents decreased by Ps. 16.0 billion, or 16.3%, in 2018, from Ps. 97.9 billion as of December 31, 2017 to Ps. 81.9 billion as of December 31, 2018. This decrease was mainly due to an increase in payments to suppliers and contractors, payments on our debt instruments and taxes.

Accounts receivable, net, decreased by Ps. 1.0 billion, or 0.6%, in 2018, from Ps. 168.1 billion as of December 31, 2017 to Ps. 167.1 billion as of December 31, 2018. This was mainly due to a decrease in our accounts receivable from customers caused by a decrease in sales in the month of December 2018, which was partially offset by an increase in our accounts receivable from sundry debtors (mainly IEPS tax) from larger gasoline imports at the end of the year.

The current portion of our promissory notes increased by Ps. 35.7 billion in 2018, mainly due to recognition of the current portion of six promissory notes with original maturities ranging from 2032 to 2047.

Inventories increased by Ps. 18.1 billion, or 28.3%, in 2018, from Ps. 63.9 billion as of December 31, 2017, to Ps. 82.0 billion as of December 31, 2018, mainly due to an increase in the value of imports of refined products.

Derivative financial instruments decreased by Ps. 7.7 billion in 2018, from Ps. 30.1 billion as of December 31, 2017 to Ps. 22.4 billion as of December 31, 2018. This decrease was mainly due to the decrease in the fair value of cross-currency swaps as a result of the appreciation of the U.S. dollar relative to most of the other relevant currencies.

Wells, pipelines, properties, plant and equipment decreased by Ps. 34.0 billion in 2018, from Ps. 1,436.5 billion as of December 31, 2017 to Ps. 1,402.5 billion as of December 31, 2018. This decrease was primarily due to depreciation of Ps. 153.4 billion and disposals of wells, pipelines, property, plant and equipment of Ps. 16.8 billion, which were partially offset by acquisitions of wells, pipelines, properties, plant and equipment of Ps. 114.8 billion and a net reversal of impairment of Ps. 21.4 billion.

Deferred taxes decreased by Ps. 23.4 billion, or 16.0%, in 2018, from Ps. 146.2 billion as of December 31, 2017 to Ps. 122.8 billion as of December 31, 2018, mainly due to an increase in the valuation reserve for our deferred Profit-Sharing Duty assets.

Liabilities

Total debt, including accrued interest, increased by Ps. 44.4 billion, or 2.2%, in 2018, from Ps. 2,037.9 billion as of December 31, 2017 to Ps. 2,082.3 billion as of December 31, 2018, mainly due to higher levels of indebtedness.

Line items related to suppliers and contractors increased by Ps. 9.8 billion, or 7.0%, in 2018, from Ps. 140.0 billion as of December 31, 2017 to Ps. 149.8 billion as of December 31, 2018, primarily due to an increase in our operations towards the end of 2018.

Taxes and duties payable increased by Ps. 14.3 billion, or 28.0%, in 2018, from Ps. 51.0 billion as of December 31, 2017 to Ps. 65.3 billion as of December 31, 2018, primarily due to a Ps. 9.6 billion increase in the IEPS tax and a Ps. 4.6 billion increase in the Profit-Sharing Duty.

Derivative financial instruments liabilities decreased by Ps. 1.8 billion, or 10.2%, in 2018, from Ps. 17.7 billion as of December 31, 2017 to Ps. 15.9 billion as of December 31, 2018. This decrease was mainly due to a decrease in the fair value of our crude oil options and the termination of our currency forwards, which was partially offset by the decrease in the fair value of our cross-currency swaps.

Employee benefits liabilities decreased by Ps. 177.9 billion, or 14.1%, in 2018, from Ps. 1,258.4 billion as of December 31, 2017 to Ps. 1,080.5 billion as of December 31, 2018. This decrease was primarily due to an increase in actuarial gains and contributions made to the *Fondo Laboral Pemex* (Pemex Labor Fund) trust.

Total Equity (Deficit)

Our total equity (deficit) improved by Ps. 43.0 billion, or 2.9%, in 2018, from negative Ps. 1,502.4 billion as of December 31, 2017 to negative Ps. 1,459.4 billion as of December 31, 2018. This improvement was mainly due to a Ps. 222.5 billion increase in actuarial gains on employee benefits and a Ps. 1.3 billion accumulated gain from the foreign currency translation effect, partially offset by our net loss for the year of Ps. 180.4 billion.

Liquidity and Capital Resources

Overview

During 2018, we were able to strengthen our liquidity position by increasing our accounts receivable, decreasing our accounts payable to suppliers and managing our liquidity risk through derivative financial instruments.

Our principal use of funds in 2018 was the repayment of debt, primarily with cash provided by cash flows from borrowings, which amounted to Ps. 2,082.3 billion. During 2018, our net cash flow from operating activities, together with our funds from financing activities, was sufficient to fund our capital expenditures and other expenses. See “—Overview—New Business Plan and Recent Initiatives” above for more information and a discussion of actions being taken in response to the imbalance of our resources.

For 2018, our capital expenditures increased slightly by approximately 0.2% from 2017. As of December 31, 2018, we owed our suppliers Ps. 149.8 billion as compared to Ps. 140.0 billion as of December 31, 2017. As of December 31, 2018, we have paid the total outstanding balance due to suppliers and contractors as of December 31, 2017. The average number of days outstanding of our accounts payable decreased from 62 days as of December 31, 2017 to 53 days as of December 31, 2018. Despite these obligations, we believe net cash flows from our operating and financing activities, together with available cash and cash equivalents, will be sufficient to meet our working capital, debt service and capital expenditure requirements in 2019 because, in collaboration with the Mexican Government, we have begun to implement initiatives intended to help us meet our working capital needs, continue to service our debt as it comes due and improve our capital expenditure programs and we are in the process of developing and refining our new long-term business plan, as described above under “—Overview—New Business Plan and Recent Initiatives” and as further described below:

- *Changes to Our Business Plan.* We are operating under the POFAT for 2019 and are currently developing and refining our new long-term business plan in order to improve our financial position and stop, or even reverse, the decline in our reserves and production.
- *Government Support.* The Mexican Government has announced that, as part of its Strengthening Program for Petróleos Mexicanos, it would provide a support program to help improve our financial position and increase our production and, in turn, our profitability.
- *Modified Financing Strategy.* We intend to continue our strategy of decreased reliance on debt financing and we expect further liability management transactions in 2019 will allow us to improve the terms of our outstanding debt, in line with our objective of reducing our net debt.
- *Crude Oil Hedge Program.* We continue to carry out our crude oil hedge program in order to partially protect our cash flows from decreases in the price of Mexican crude oil.
- *No Payment of Dividend.* The Mexican Government announced that Petróleos Mexicanos was not required to pay a state dividend in 2016, 2017 and 2018 and will not be required to pay one in 2019. See Item 4—Taxes, Duties and Other Payments to the Mexican Government—Fiscal Regime for PEMEX—Other Payments to the Mexican Government” above for more information.

The Federal Revenue Law applicable to us as of January 1, 2019, provides for the incurrence of up to Ps. 112.8 billion in net indebtedness through a combination of domestic and international capital markets offerings and borrowings from domestic and international financial institutions.

We have a substantial amount of debt. Due to our heavy tax burden, our cash flow from operations in recent years has not been sufficient to fund our capital expenditures and other expenses and, accordingly, our debt has significantly increased and our working capital has deteriorated. Relatively low oil prices and declining production have also had a negative impact on our ability to generate positive cash flows, which, together with our heavy tax burden, has further exacerbated our ability to fund our capital expenditures and other expenses. Despite the relatively low and fluctuating oil prices and our heavy tax burden, our cash flow from operations in 2018, together with our funds from financing activities, was sufficient to fund our capital expenditures and other expenses. We expect that net cash flows from our operations and financing activities will also be sufficient to meet our working capital requirements, debt service and capital expenditures for 2019.

As of December 31, 2018, our total indebtedness, including accrued interest, was Ps. 2,082.3 billion (U.S. \$105.8 billion), in nominal terms, which represents a 2.2% increase compared to our total indebtedness, including accrued interest, of Ps. 2,037.9 billion (U.S. \$103.5 billion) as of December 31, 2017. 27.2% of our existing debt as of December 31, 2018, or Ps. 566.1 billion (U.S. \$28.8 billion), is scheduled to mature in the next three years. Our working capital decreased from a negative working capital of Ps. 25.6 billion (U.S. \$1.3 billion) as of December 31, 2017 to a negative working capital of Ps. 54.7 billion (U.S. \$2.8 billion) as of December 31, 2018. Our level of debt may increase further in the short or medium term, as a result of new financing activities or future depreciation of the peso as compared to the U.S. dollar, and may have an adverse effect on our financial condition, results of operations and liquidity position. To service our debt, we have relied and may continue to rely on a combination of cash flow from operations, drawdowns under our available credit facilities and the incurrence of additional indebtedness (including refinancings of existing indebtedness). In addition, we are taking actions to improve our financial position, as discussed above.

Certain rating agencies have expressed concerns regarding: (1) our heavy tax burden; (2) the total amount of our debt and the ratio of our debt to our proven reserves; (3) the significant increase in our indebtedness over the last several years; (4) our negative free cash flow; (5) the natural decline of certain of our oil fields and lower quality of crude oil; (6) our substantial unfunded reserve for retirement pensions and seniority premiums, which was equal to Ps. 1,080.5 billion (U.S. \$54.9 billion) as of December 31, 2018; (7) the persistence of our operating expenses notwithstanding declines in oil prices; (8) the possibility that our budget for capital expenditures will be insufficient to maintain and exploit reserves; and (9) the involvement of the Mexican Government in our strategy, financing and management.

On April 12, 2018, Moody's Investors Service announced the revision of its outlook for our credit ratings from negative to stable and affirmed our global foreign currency rating as Baa3 and our global local currency credit rating as Aa3. On January 29, 2019, Fitch Ratings lowered our credit rating from BBB+ to BBB- in both global local and global foreign currency and affirmed the outlook for our credit ratings as negative. On March 4, 2019, Standard and Poor's announced the revision of the outlook for our credit ratings from stable to negative and affirmed our global foreign currency credit rating as BBB+ and our global local currency rating as A-.

Any further lowering of our credit ratings, particularly below investment grade, may have material adverse consequences on our ability to access the financial markets and/or our cost of financing. In turn, this could significantly harm our ability to meet our existing obligations, financial condition and results of operations.

If such constraints occur at a time when our cash flow from operations is less than the resources necessary to meet our debt service obligations, in order to provide additional liquidity to our operations, we could be forced to further reduce our planned capital expenditures, implement further austerity measures and/or sell additional non-strategic assets in order to raise funds. A reduction in our capital expenditure program could adversely affect our financial condition and results of operations. Additionally, such measures may not be sufficient to permit us to meet our obligations.

Going Concern

Our consolidated financial statements have been prepared on a going concern basis, which assumes that we can meet our payment obligations. As we describe in Note 24-e to our consolidated financial statements, there exists substantial doubt about our ability to continue as a going concern. We discuss the circumstances that have caused these negative trends, as well our plans in regard to these matters in "Operating and Financial Review and Prospects—Overview" above in this Item 5 and Note 24-e to our consolidated financial statements included herein. We are currently evaluating our new business plan in light of the recent announcements by the Mexican Government in connection with the energy sector in Mexico, and we intend to continue taking actions to improve our results of operation, capital expenditures plans and financial condition. We continue operating as a going concern, and our consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Equity Structure and Mexican Government Contributions

Our total equity (deficit) as of December 31, 2018 was negative Ps. 1,459.4 billion, and our total capitalization (long-term debt plus equity) totaled Ps. 1,555.5 billion. During 2018, our total equity (deficit) improved by Ps. 43.0 billion from negative Ps. 1,502.4 billion as of December 31, 2017, primarily due to a Ps. 222.5 billion increase in actuarial gains on employee benefits and a Ps. 1.3 billion accumulated gain from the foreign currency translation effect, partially offset by our net loss for the year of Ps. 180.4 billion. Under the *Ley de Concursos Mercantiles* (Commercial Bankruptcy Law of Mexico), *Petróleos Mexicanos* and the subsidiary entities cannot be subject to a bankruptcy proceeding. In addition, our current financing agreements do not include financial covenants or events of default that would be triggered as a result of our having negative equity.

In 2018 and 2017, we did not receive any capital contribution from the Mexican Government.

On December 24, 2015, the Ministry of Finance and Public Credit published in the Official Gazette of the Federation the *Disposiciones de carácter general relativas a la asunción por parte del Gobierno Federal de obligaciones de pago de pensiones y jubilaciones a cargo de Petróleos Mexicanos y sus empresas productivas subsidiarias* (General provisions regarding the assumption by the Mexican Government of the payment obligations related to pensions and retirement plans of Petróleos Mexicanos and its productive state-owned subsidiaries). On August 3, 2016, the Ministry of Finance and Public Credit informed us that the Mexican Government would assume Ps. 184.2 billion in payment liabilities related to our pensions and retirement plans, and accordingly replaced the Ps. 50.0 billion promissory note issued to us on December 24, 2015 with Ps. 184.2 billion in promissory notes.

As of December 31, 2017 and 2018, the balance of Mexican Government contributions to Petróleos Mexicanos was Ps. 43.7 billion. As of December 31, 2017 and 2018, the total amount of contributions in the form of Certificates of Contribution “A” was Ps. 356.5 billion.

On January 31, 2019, the Mexican Government notified the Board of Directors of Petróleos Mexicanos that the Mexican Government would make payments to us through the SENER in a total amount of Ps. 25.0 billion. On March 8, 2018, we received a payment for Ps. 10.0 billion and on April 11, 2019, we received a payment for Ps. 5.0 billion. These payments are part of the Mexican Government’s Strengthening Program for Petróleos Mexicanos. See “Item 5—Operating and Financial Review and Prospects—Overview.”

Cash Flows from Operating, Financing and Investing Activities

During 2018, net funds provided by operating activities totaled Ps. 141.8 billion, as compared to Ps. 63.4 billion in 2017, due to an increase in sales and a lower corresponding increase in cost of sales resulting from improvements in our operations. During 2018, our net cash flows used in investing activities totaled Ps. 101.1 billion, as compared to net cash flows used in investing activities of Ps. 80.7 billion in 2017. Our net cash flows used in financing activities totaled Ps. 56.6 billion in 2018, as compared to net cash flows used in financing activities of Ps. 46.3 billion in 2017.

At December 31, 2018, our cash and cash equivalents totaled Ps. 81.9 billion, as compared to Ps. 97.9 billion at December 31, 2017. See Note 9 to our consolidated financial statements included herein for more information about our cash and cash equivalents.

Liquidity Position

We define liquidity as funds available under our lines of credit as well as cash and cash equivalents. The following table summarizes our liquidity position as of December 31, 2018 and 2017.

	As of December 31,	
	2018	2017
	(millions of pesos)	
Borrowing base under lines of credit	Ps.152,170	Ps.130,348
Cash and cash equivalents	81,912	97,852
Liquidity	<u>Ps.235,082</u>	<u>Ps.228,200</u>

The following table summarizes our sources and uses of cash for the years ended December 31, 2018 and 2017.

	For the years ended December 31,	
	2018	2017
	(millions of pesos)	
Net cash flows (used in) from operating activities	Ps. 141,787	Ps. 63,398
Net cash flows used in investing activities	(101,084)	(80,690)
Net cash flows (used in) financing activities	(56,554)	(46,255)
Effect of change in cash value	(88)	(2,133)
Net increase (decrease) in cash and cash equivalents	Ps. (15,939)	Ps. (65,682)

Note: Numbers may not total due to rounding.

Investment Policies

Our Finance and Treasury Department maintains financial resources sufficient to meet our payment commitments and those of the subsidiary entities, as well as a comprehensive, consolidated cash position and related projections in anticipation of such commitments.

Our investment policies attempt to take advantage of favorable market conditions by accessing the most favorable terms offered to us by financial institutions. Investments of financial resources by our Finance and Treasury Department are made in accordance with the following policies:

Investments of Mexican Pesos

In connection with investments in Mexican pesos, we are obligated, during the structuring and development phase of our financial transactions, to observe and comply with the investment guidelines for resources in pesos that were approved by our Financial Resources Committee on July 24, 2017, as modified from time to time. We may only invest in the following:

- (a) securities issued or guaranteed by the Mexican Government;
- (b) securities issued by Sociedades Nacionales de Crédito (National Credit Societies), the balance of which may not exceed 50% of our cash and cash equivalents;
- (c) repurchase agreements that use securities issued or guaranteed by the Mexican Government;
- (d) time deposits with major financial institutions, the balance of which may not exceed 30% of our cash and cash equivalents; and
- (e) shares of mutual funds whose investments are limited to securities issued or guaranteed by the Mexican Government.

In addition to the above limits, demand deposit accounts must be traded with financial institutions that maintain, at a minimum, the following credit ratings as issued by the applicable rating agency:

Domestic scale	Fitch Ratings	S&P	Moody's
Long term	AA(mex)	mxAA	Aa2.mx
Short term	F1(mex)	A-1	Mx-1

Investments of Financial Resources in Dollars

Investments of financial resources in dollars must meet our operational and strategic requirements and must be previously approved by *Banco de México* on a case-by-case basis. Currently, our investments in dollars are limited to operational accounts, short-term money market funds and time deposits. Our dollar investments are managed by *Banco de México*.

Operational Currencies

The main currencies for investing cash and cash equivalents are pesos and dollars. Similarly, we generate revenues from the domestic and international sales of our products in those two currencies and our expenses, including those relating to our debt service, are payable in these two currencies.

Commitments for Capital Expenditures and Sources of Funding

Our current aggregate commitments for capital expenditures for 2019 total Ps. 159.1 billion. For a general description of our current commitments for capital expenditures, see “Item 4—Information on the Company—History and Development—Capital Expenditures.” The amount of our aggregate capital expenditures commitments for 2019 remains subject to adjustment by the Mexican Government. See “Item 3—Key Information—Risk Factors—Risk Factors Related to our Relationship with the Mexican Government—The Mexican Government controls us and it could limit our ability to satisfy our external debt obligations or could reorganize or transfer us or our assets.”

The following table sets forth our total capital expenditures, excluding non-capitalizable maintenance, by segment for the year ended December 31, 2018, and the budget for these expenditures for 2019. Capital expenditure amounts are derived from our budgetary records, which are prepared on a cash basis. Accordingly, these capital expenditure amounts do not correspond to capital expenditure amounts included in our consolidated financial statements prepared in accordance with IFRS. For more information see “Item 4—History and Development—Capital Expenditures.”

	<u>Year ended December 31,</u> <u>2018</u>	<u>Budget</u> <u>2019⁽¹⁾</u>
	(millions of pesos)	
Exploration and Production	Ps.71,107	Ps.98,226
Industrial Transformation	17,026	57,500
Drilling and Services	1,388	1,295
Logistics	5,042	1,200
Ethylene	975	300
Fertilizers	331	500
Corporate and other Subsidiaries	893	107
Total	Ps.96,762	Ps.159,128

Note: Numbers may not total due to rounding.

(1) Original budget published in the Official Gazette of the Federation on January 17, 2019.

Source: *Petróleos Mexicanos*.

Our current commitments for capital expenditures have fluctuated in recent years as compared to previous years. Based on past experience, we expect to generate sufficient funds for our working capital, capital expenditures and investments through:

- cash flow generated by operations;
- the issuance of *certificados bursátiles* (peso-denominated publicly traded notes) in the Mexican market;
- the issuance of debt securities in the international capital markets;
- the renewal of existing lines of credit and the entering into of new lines of credit from international and local commercial banks; and
- other financing activities.

The securities that we issue may vary in tenor, amount, currency and type of interest rate. We may issue debt securities in U.S. dollars, Japanese yen, euros, pounds, pesos or Swiss francs, among others; these securities may be issued with fixed or floating rates and with maturities of one or more years, including perpetual debt securities, depending on market conditions and funding requirements. We may issue securities in the international capital markets or in the Mexican domestic market, or in both markets. Commercial bank syndicated loans may be established with single or multiple tranches with varying maturities. Bilateral loans may vary in tenor and range, which may be of one year or more. See also “—Financing Activities” below.

Financing Activities

2019 Financing Activities. During the period from January 1 to April 30, 2019, we did not participate in any material new financing activities.

2018 Financing Activities. During 2018, we participated in the following activities:

- On February 12, 2018, Petróleos Mexicanos issued U.S. \$4,000,000,000 of debt securities under its U.S. \$92,000,000,000 Medium-Term Notes Program, Series C, in two tranches: (1) U.S. \$2,500,000,000 5.35% Notes due 2028 and (2) U.S. \$1,500,000,000 6.35% Bonds due 2048. All debt securities under this program are guaranteed by Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services and Pemex Logistics and their respective successors and assignees.
- On February 12, 2018, Petróleos Mexicanos consummated an exchange offer pursuant to which it exchanged (1) U.S. \$952,454,000 aggregate principal amount of its outstanding 5.500% Bonds due 2044 for U.S. \$881,899,000 aggregate principal amount of its new 6.350% Bonds due 2048 and (2) U.S. \$1,021,065,000 aggregate principal amount of its outstanding 5.625% Bonds due 2046 for U.S. \$946,764,000 aggregate principal amount of its new 6.350% Bonds due 2048.
- On February 12, 2018, Petróleos Mexicanos consummated a tender offer pursuant to which it purchased U.S.\$ 2,052,000 aggregate principal amount of its outstanding 5.500% Bonds due 2044 and U.S.\$ 2,488,000 aggregate principal amount of its outstanding 5.625% Bonds due 2046.
- On March 5, 2018, Petróleos Mexicanos consummated a tender offer pursuant to which it purchased U.S. \$138,598,000 aggregate principal amount of its outstanding 3.125% Notes due 2019, U.S. \$558,644,000 aggregate principal amount of its outstanding 5.500% Notes due 2019, U.S. \$91,843,000 aggregate principal amount of its outstanding 8.000% Notes due 2019, U.S. \$183,017,000 aggregate principal amount of its outstanding 6.000% Notes due 2020 and U.S. \$817,303,000 aggregate principal amount of its outstanding 3.500% Notes due 2020.
- On March 27, 2018, Petróleos Mexicanos entered into a loan agreement in the amount of U.S. \$181,101,291, which bears interest at a floating rate linked to LIBOR and matures in 2025.
- On April 17, 2018, Petróleos Mexicanos increased its Medium-Term Notes Program from U.S. \$92,000,000,000 to U.S. \$102,000,000,000.
- On May 24, 2018, Petróleos Mexicanos issued €3,150,000,000 of debt securities under its U.S. \$102,000,000,000 Medium Term Notes Program, Series C in four tranches: (1) €600,000,000 of its 2.500% Notes due 2022, (2) €650,000,000 of its Floating Rate Notes due 2023, (3) €650,000,000 of its 3.625% Notes due 2025 and (4) €1,250,000,000 of its 4.750% Notes due 2029. All debt securities issued under this program are guaranteed by Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services and Pemex Logistics and their respective successors and assignees.
- On June 4, 2018, Petróleos Mexicanos issued CHF365,000,000 of its 1.750% Notes due 2023 under its U.S. \$102,000,000,000 Medium Term Notes Program, Series C. All debt securities issued under this program are guaranteed by Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services and Pemex Logistics and their respective successors and assignees.
- On June 26, 2018, one of our subsidiary companies, Pro-Agroindustrias, S.A. de C.V., refinanced a credit line for U.S. \$250,000,000 by entering into a new credit line for the same amount, which bears interest at a floating rate linked to LIBOR and matures in 2025. This credit agreement is guaranteed by Petróleos Mexicanos.
- On August 23, 2018, Petróleos Mexicanos entered into a loan agreement in the amount of U.S. \$200,000,000, which bears interest at a floating rate linked to LIBOR and matures in 2023.
- On October 23, 2018, Petróleos Mexicanos issued U.S. \$2,000,000,000 of its 6.500% Notes due 2029 under its U.S. \$102,000,000,000 Medium Term Notes Program, Series C. All debt securities issued under this program are guaranteed by Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services and Pemex Logistics and their respective successors and assignees.

- On November 9, 2018, Petróleos Mexicanos entered into a revolving credit facility in the amount of Ps. 9,000,000,000, which matures in 2023.
- On November 30, 2018, Petróleos Mexicanos borrowed U.S. \$250,000,000 from a bilateral credit line, which bears interest at a floating rate linked to LIBOR and matures in 2028.

As of December 31, 2018, Petróleos Mexicanos had U.S. \$6,700,000,000 and Ps. 32,500,000,000 in available revolving credit lines in order to ensure liquidity, with U.S. \$6,400,000,000 and Ps. 26,200,000,000 remaining available as of December 31, 2018, and U.S. \$3,210,000,000 and Ps. 12,500,000,000 remaining available as of April 23, 2019.

2017 Financing Activities. During 2017 we participated in the following activities:

- On February 14, 2017, Petróleos Mexicanos issued €4,250,000,000 of debt securities under its U.S. \$72,000,000,000 Medium-Term Notes Program, Series C, in three tranches: (1) €1,750,000,000 of its 2.5% Notes due 2021; (2) €1,250,000,000 of its 3.75% Notes due 2024; and (3) €1,250,000,000 of its 4.875% Notes due 2028. All debt securities issued under this program are guaranteed by Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services and Pemex Logistics and their respective successors and assignees.
- On April 6, 2017, Petróleos Mexicanos obtained a loan from a line of credit for U.S. \$132,000,000, which bears interest at a fixed rate of 5.25% and matures in 2024. The line of credit is guaranteed by Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services and Pemex Logistics.
- On May 15, 2017, Petróleos Mexicanos entered into a term loan credit facility in the amount of U.S. \$400,000,000, which bears interest at a floating rate linked to LIBOR and matures in 2020. The term loan is guaranteed by Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services and Pemex Logistics.
- On June 16, 2017, Petróleos Mexicanos increased its Medium-Term Notes Program from U.S. \$72,000,000,000 to U.S. \$92,000,000,000.
- On July 17, 2017, Petróleos Mexicanos entered into a revolving credit facility in the amount of U.S. \$1,950,000,000, which matures in 2020.
- On July 18, 2017, Petróleos Mexicanos issued U.S. \$5,000,000,000 of debt securities under its U.S. \$92,000,000,000 Medium-Term Notes Program, Series C, in two tranches: (1) U.S. \$2,500,000,000 of its 6.50% Notes due 2027 and (2) U.S. \$2,500,000,000 of its 6.75% Bonds due 2047. All debt securities under this program are guaranteed by Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services and Pemex Logistics and their respective successors and assignees.
- On July 21, 2017, Petróleos Mexicanos consummated a tender offer pursuant to which it purchased U.S. \$922,485,000 aggregate principal amount of its outstanding 5.750% Notes due 2018, U.S. \$644,374,000 aggregate principal amount of its outstanding 3.500% Notes due 2018 and U.S. \$172,591,000 aggregate principal amount of its outstanding 3.125% Notes due 2019.
- On November 16, 2017, Petróleos Mexicanos issued \$450,000,000 of its 3.750% Notes due 2025 under its U.S. \$92,000,000,000 Medium-Term Notes Program, Series C. All debt securities under this program are guaranteed by Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services and Pemex Logistics and their respective successors and assignees.
- On December 18, 2017, Petróleos Mexicanos entered into a credit line facility in the amount of U.S. \$200,000,000, which bears interest at a floating rate linked to LIBOR and matures in 2020.
- On December 21, 2017, Petróleos Mexicanos borrowed U.S. \$300,000,000 from a bilateral credit line, which bears interest at a floating rate linked to LIBOR and matures in 2022.

As of December 31, 2017, Petróleos Mexicanos had U.S. \$6,700,000,000 and Ps. 23,500,000,000 in available revolving credit lines in order to ensure liquidity, with U.S. \$5,400,000,000 and Ps. 23,500,000,000 remaining available.

Indebtedness

During 2018, our total debt increased by 2.2%, from Ps. 2,037.9 billion at December 31, 2017 to Ps. 2,082.3 billion at December 31, 2018, primarily due to the financing activities undertaken during this period, as described in Note 18 to our consolidated financial statements included herein.

As of December 31, 2018 and as of the date of this annual report, we were not in default on any of our financing agreements.

The following table sets forth the analysis of our total indebtedness (not including accrued interest) as of December 31, 2018 based on short- and long-term debt and fixed or floating rates:

	In millions of U.S. dollars
Short-term debt	
Short-term bonds with floating interest rates	U.S. \$ 1,120
Lines of credit with variable interest rates established under committed credit facilities with various international commercial banks	1,804
Lines of credit with fixed interest rates	5,122
Total short-term debt⁽¹⁾	U.S. \$ 8,046
Long-term debt	
Fixed rate instruments	
Instruments with fixed annual interest rates ranging from 0.5% to 9.5% and maturities ranging from 2020 to 2048 and perpetual bonds with no maturity date	U.S. \$ 84,847
Variable rate instruments	
Drawings under lines of credit based on LIBOR and other variable rates with maturities ranging from 2020 to 2030	7,787
Floating rate notes with maturities ranging from 2020 to 2025	3,413
Total variable rate instruments	U.S. \$ 11,200
Total long-term debt	U.S. \$ 96,047
Total indebtedness⁽¹⁾	U.S. \$ 104,093

Note: Numbers may not total due to rounding.

(1) Excludes U.S. \$1,698.7 million of accrued interest and includes notes payable to contractors.

The table below sets forth our total indebtedness as of December 31 for each of the three years from 2016 to 2018.

Total Indebtedness of PEMEX

	As of December 31, ⁽¹⁾		
	2016	2017	2018
	(in millions of U.S. dollars) ⁽²⁾		
Domestic debt in various currencies	U.S. \$ 16,651	U.S. \$ 13,595	U.S. \$ 13,669
External debt in various currencies ⁽³⁾			
Bonds ⁽⁴⁾	67,523	76,007	80,134
Direct loans	3,808	6,244	5,609
Project financing ⁽⁵⁾	4,125	3,284	2,650
Financial leases	2,181	2,036	1,878
Notes payable to contractors	338	205	153
Total external debt	U.S. \$ 77,975	U.S. \$ 87,776	U.S. \$ 90,424
Total indebtedness	U.S. \$ 94,626	U.S. \$ 101,371	U.S. \$ 104,093

Note: Numbers may not total due to rounding.

- (1) Figures do not include accrued interest. Accrued interest was U.S. \$1,346.1 million, U.S. \$1,602.5 million and U.S. \$1,698.7 million at December 31, 2016, 2017 and 2018, respectively.
- (2) Indebtedness payable in currencies other than U.S. dollars was first converted into pesos for accounting purposes at the exchange rates set by *Banco de México* and then converted from pesos to U.S. dollars at the following exchange rates: Ps.20.6640 = U.S. \$1.00 for 2016, Ps. 19.7867 = \$1.00 for 2017 and Ps. 19.6829 = \$1.00 for 2018. See Notes 3 and 18 to our consolidated financial statements included herein.
- (3) Indebtedness payable other than in pesos and owed to persons or institutions having their head offices or chief places of business outside of Mexico and payable outside the territory of Mexico.
- (4) Includes, as of December 31, 2016 and 2017, U.S. \$0.16 billion and U.S. \$0.06 billion, respectively, of bonds issued by Pemex Finance, Ltd. See “—Financing Activities of Pemex Finance, Ltd.” below.
- (5) All credits included in this line are insured or guaranteed by export credit agencies.

Source: PEMEX's consolidated financial statements, prepared in accordance with IFRS.

Financing Activities of Pemex Finance, Ltd.

Commencing on December 1, 1998, Petróleos Mexicanos, Pemex-Exploration and Production, PMI and P.M.I. Services, B.V. have entered into several agreements with Pemex Finance, Ltd. Under these contracts, Pemex Finance, Ltd. purchases certain existing PMI accounts receivable for crude oil as well as certain accounts receivable to be generated in the future by PMI related to crude oil. The receivables sold are those generated by the sale of Maya and Altamira crude oil to designated customers in the United States, Canada and Aruba. The net proceeds obtained by Pemex Exploration and Production, which assumed all of the rights and obligations of Pemex-Exploration and Production under these agreements, from the sale of such receivables under the agreements are utilized for capital expenditures. Pemex Finance, Ltd. obtains resources for the acquisition of such accounts receivable through the placement of debt instruments in the international markets.

On July 1, 2005, we entered into an option agreement with BNP Paribas Private Bank and Trust Cayman Limited giving us an option to acquire 100% of the shares of Pemex Finance, Ltd. As a result, the financial results of Pemex Finance, Ltd. under IFRS are consolidated into our financial statements, and PMI's sales of accounts receivable to Pemex Finance, Ltd. have been reclassified as debt.

On December 17, 2018, we exercised the option to acquire 100% of the shares of Pemex Finance, Ltd.

As of December 31, 2018, Pemex Finance, Ltd. had no outstanding debt.

2018 Financing Activities. During 2018, Pemex Finance, Ltd. made payments of U.S. \$62.5 million in principal of its notes, thereby paying in full the remaining aggregate principal amount of its notes outstanding. Pemex Finance, Ltd. did not incur any additional indebtedness during 2018.

2017 Financing Activities. During 2017, Pemex Finance, Ltd. made payments of U.S. \$100.0 million in principal of its notes. Pemex Finance, Ltd. did not incur any additional indebtedness during 2017.

Off-Balance Sheet Arrangements

As of December 31, 2018, we did not have any off-balance sheet arrangements of the type that we are required to disclose under Item 5.E of Form 20-F. See “Item 11—Quantitative and Qualitative Disclosures about Market Risk.”

Contractual Obligations

Information about our long-term contractual obligations as of December 31, 2018 is set forth below. This information is important in understanding our financial position. In considering the economic viability of investment opportunities we view any source of financing, for example, operating leases or sales of future accounts receivable, as being economically equivalent to consolidated debt.

Contractual Obligations as of December 31, 2018⁽¹⁾

	Payments due by period				
	Total	Less than 1 year	1 – 3 years (in millions of U.S. dollars)	4 – 5 years	After 5 years
Contractual obligations recognized in balance sheet:					
Debt ⁽²⁾	U.S. \$103,761	U.S.\$ 9,533	U.S. \$18,691	U.S. \$16,964	U.S. \$ 58,573
Notes payable to contractors ⁽³⁾	153	85	51	17	–
Capital lease obligations ⁽⁴⁾	1,878	127	273	303	1,175
Other long-term liabilities:					
Dismantlement and abandonment costs obligations ⁽⁵⁾	4,270	39	715	331	3,185
Employee benefits plan ⁽⁶⁾	54,898	3,490	7,208	7,968	36,232
Total contractual obligations recognized in balance sheet	164,960	13,274	26,938	25,583	99,165
Other contractual obligations not recognized in liabilities:					
Infrastructure works contracts ⁽⁷⁾	24,574	1,724	16,410	2,817	3,623
Financed Public Works Contracts (FPWC) ⁽⁸⁾	508	227	77	76	128
Nitrogen supply contracts ⁽⁹⁾	2,149	238	505	509	897
Total contractual obligations not recognized in liabilities⁽¹⁰⁾	27,231	2,189	16,992	3,402	4,648
Total contractual obligations	U.S. \$192,191	U.S. \$15,463	U.S. \$43,930	U.S. \$28,985	U.S. \$103,813

Note: Numbers may not total due to rounding.

(1) All amounts calculated in accordance with IFRS.

(2) See Note 18 to our consolidated financial statements included herein. Figures in this line item do not include notes payable to contractors and capital lease obligations, which are presented in separate line items, but do include accrued interest as of December 31, 2017.

(3) See Note 18 to our consolidated financial statements included herein.

(4) See Note 18 to our consolidated financial statements included herein.

(5) See Notes 3-K and 15-c to our consolidated financial statements included herein.

(6) See Note 20 to our consolidated financial statements included herein.

(7) See Note 28-e to our consolidated financial statements included herein.

(8) The amounts presented for Financed Public Works Contracts in this table correspond to works the performance and delivery of which by the relevant contractors are pending. For more information on the FPWC program, see “Item 4—Information on the Company—Business Overview—Pemex Exploration and Production—Integrated Exploration and Production Contracts and Financed Public Works Contracts” and Note 28-c to our consolidated financial statements included herein.

(9) See Note 28-b to our consolidated financial statements included herein.

(10) No amounts have been included for Integrated E&P Contracts in this table, since payments for these contracts will be made on a per-barrel basis and performance and delivery by the relevant contractors is pending. For more information on the Integrated E&P Contracts program, see “Item 4—Information on the Company—Business Overview—Pemex Exploration and Production—Integrated Exploration and Production Contracts and Financed Public Works Contracts” and Note 28-d to our consolidated financial statements included herein.

Source: PEMEX's consolidated financial statements, prepared in accordance with IFRS.

Results of Operations by Business Segment

This section presents the results of our operations by business segment, including our central corporate operations and the operations of the consolidated subsidiary companies.

Revenue by Business Segment

The following table sets forth our trade and intersegment net sales revenues by business segment for the fiscal years ended December 31, 2016, 2017 and 2018 as well as the percentage change in sales revenues for those years.

	Year Ended December 31,			2017	2018
	2016	2017	2018	vs. 2016	vs. 2017
	(in millions of pesos) ⁽¹⁾			(%)	(%)
Exploration and Production					
Trade sales ⁽²⁾	Ps. —	Ps. —	Ps. 482,286	n.a.	100
Intersegment sales	616,381	762,637	397,200	23.7	(47.9)
Total net sales	616,381	762,637	879,486	23.7	15.3
Industrial Transformation					
Total trade sales	653,654	863,573	961,104	32.1	11.3
Total intersegment sales	117,096	150,360	141,997	28.4	(5.6)
Total net sales	770,750	1,013,933	1,103,101	31.6	8.8
Drilling and Services					
Trade sales ⁽²⁾	70	42	199	(40.0)	373.8
Intersegment sales	1,982	3,400	3,414	71.5	0.4
Total net sales	2,052	3,442	3,613	67.7	5.0
Logistics					
Trade sales ⁽²⁾	2,814	3,715	4,708	32.0	26.7
Intersegment sales	68,317	70,672	63,673	3.4	(9.9)
Total net sales	71,131	74,387	68,381	4.6	(8.1)
Cogeneration and Services⁽³⁾					
Trade sales ⁽²⁾	133	335	—	151.9	n.a.
Intersegment sales	52	114	—	119.2	n.a.
Total net sales	184	449	—	142.7	n.a.
Fertilizers					
Trade sales ⁽²⁾	3,875	4,125	2,938	6.5	(28.8)
Intersegment sales	900	643	66	(28.6)	(89.7)
Total net sales	4,776	4,768	3,004	(0.1)	(37.0)
Ethylene					
Trade sales ⁽²⁾	15,453	12,648	12,822	(18.2)	1.4
Intersegment sales	1,764	1,566	1,635	(11.2)	4.4
Total net sales	17,217	14,214	14,457	(17.4)	1.7
Trading Companies					
Trade sales ⁽²⁾	395,354	508,606	204,168	28.6	(59.9)
Intersegment sales	405,293	539,193	640,382	33.0	18.8
Total net sales	800,648	1,047,799	844,550	30.9	(19.4)
Corporate and other subsidiary companies					
Trade sales ⁽²⁾	2,740	3,985	12,893	45.4	223.5
Intersegment sales and eliminations	(1,211,785)	(1,528,585)	(1,248,367)	26.1	(18.3)
Total net sales	(1,209,045)	(1,524,600)	(1,235,474)	26.1	(19.0)
Total net sales	Ps. 1,074,093	Ps. 1,397,029	Ps. 1,681,118	30.1	20.3

Note: Numbers may not total due to rounding.

n.a. Not available.

(1) Figures for 2016, 2017 and 2018 are stated in nominal pesos.

(2) Trade sales represent sales to external customers. See "Item 3—Key Information—Selected Financial Data."

(3) This company was liquidated in 2018. See "Item 4—Information on the Company—History and Development".

Source: PEMEX's consolidated financial statements, prepared in accordance with IFRS.

Income by Business Segment

The following table sets forth our net income (loss) by business segment for each year in the three-year period ended December 31, 2018, as well as the percentage change in income for the years 2016 to 2018.

Business Segment	Year Ended December 31,			2017	2018
	2016	2017	2018	vs. 2016	vs. 2017
	(in millions of pesos) ⁽¹⁾			(%)	(%)
Exploration and Production	Ps. (45,879)	Ps. (151,037)	Ps. (8,147)	229.2	94.6
Industrial Transformation	(69,865)	(55,787)	(57,049)	(20.2)	(2.3)
Drilling and Services	(142)	1,266	217	(988.7)	82.9
Logistics	(10,018)	(834)	(62,576)	(91.7)	(7,403.1)
Cogeneration and Services ⁽³⁾	(35)	(92)	—	165.4	n.a.
Fertilizers	(1,659)	(4,270)	(5,330)	157.3	(24.8)
Ethylene	2,097	(1,442)	(4,986)	(168.8)	(245.8)
Trading Companies	11,167	12,045	4,778	7.9	60.3
Corporate and other subsidiary companies ⁽²⁾	(76,809)	(80,699)	(47,330)	5.1	41.3
Total net income (loss)	Ps. (191,144)	Ps. 280,851	Ps. (180,422)	246.9	164.2

Note: Numbers may not total due to rounding.

n.a. not available.

(1) Figures are stated in nominal pesos. See “Item 3—Key Information—Selected Financial Data.”

(2) Includes intersegment eliminations.

(3) This company was liquidated in 2018. See “Item 4—Information on the Company—History and Development”.

Source: PEMEX's consolidated financial statements, prepared in accordance with IFRS.

2018 compared to 2017

We present below the results of our operations by business segment. For more information on our operating segments, see “Item 4—Information on the Company—History and Development—Corporate Structure” and Note 1 to our consolidated financial statements included herein. For a detailed description of the financial results of each segment, see Note 1 and Note 6 to our consolidated financial statements included herein.

Exploration and Production

In 2018, total sales increased by 15.3%, primarily due to the increase in crude oil export prices. In 2017, sales of crude oil to the Trading Companies were presented as intersegment sales but, as a result of our implementation of accounting standard IFRS 15 in 2018 and the determination that PMI is considered an agent of Pemex Exploration and Production, all of Pemex Exploration and Production's crude oil export sales are recognized as sales to third parties in 2018. For further information on the impact of our implementation of IFRS 15, see Note 4-A to our consolidated financial statements included herein. The weighted average price of crude oil sold by our exploration and production segment for export was U.S. \$62.29 in 2018, as compared to U.S.\$ 47.26 in 2017. Net loss related to exploration and production activities decreased by Ps. 142,890 million, from a Ps. 151,037 million loss in 2017 to a Ps. 8,147 million loss in 2018, primarily due to net reversal of impairment of our fixed assets in this segment.

Industrial Transformation

In 2018, trade sales related to industrial transformation activities increased by 11.3%, from Ps. 863,573 million in 2017 to Ps. 961,104 million in 2018, primarily due to an increase in the average sales prices of petroleum products. Intersegment sales decreased by 5.6%, from Ps. 150,360 million in 2017 to Ps. 141,997 million in 2018, primarily due to a decrease in sales of natural gas. In 2018, our net loss related to industrial transformation activities was Ps. 57,049 million, 2.3% higher than the loss of Ps. 55,787 million in 2017. The increase in loss was primarily due to an increase in operating expenses.

Drilling and Services

In 2018, total sales related to the drilling and services segment increased by 5.0%, from Ps. 3,442 million in 2017 to Ps. 3,613 million in 2018. This increase was primarily due to an increase in services provided to Pemex Exploration and Production. Net income related to drilling and services decreased by Ps. 1,048 million, from a net income of Ps. 1,266 million in 2017 to net income of Ps. 217 million in 2018, primarily due to an increase in operating expenses.

Logistics

In 2018, total sales related to the logistics segment decreased by 8.1%, from Ps. 74,387 million in 2017 to Ps. 68,381 million in 2018, primarily due to a decrease in the services provided to Pemex Industrial Transformation. In 2018, our net loss related to logistics activities was Ps. 62,576 million, which was Ps. 61,742 million more than our net loss of Ps. 834 million in 2017. The increase in net loss was primarily due to net impairment of our fixed assets in this segment.

Cogeneration and Services

In 2018 our cogeneration and services segment did not have operations, as all of the assets, liabilities, rights and obligations of Pemex Cogeneration and Services were assumed by, and transferred to, Pemex Industrial Transformation and Pemex Cogeneration and Services was subsequently dissolved. For further information on the dissolution of Pemex Cogeneration and Services, see “Item 4— Information on the Company—History and Development—Corporate Structure” and Notes 1 and 6 to our consolidated financial statements included herein.

Fertilizers

In 2018, total sales related to the fertilizers segment decreased by 37.0%, from Ps. 4,768 million in 2017 to Ps. 3,004 million in 2018. This decrease was primarily due to a decrease in the trade sales of ammonia. In 2018, our net loss related to our fertilizers activities increased by 24.8%, from a net loss of Ps. 4,270 million in 2017 to a net loss of Ps. 5,330 million in 2018, primarily due to a decrease in profit sharing in joint ventures and associates.

Ethylene

In 2018, total sales related to our ethylene segment increased by 1.7%, from Ps. 14,214 million in 2017 to Ps. 14,457 million in 2018, primarily due to an increase in sales of monoethylenglecol. In 2018, our net loss related to our ethylene activities increased by Ps. 3,544 million, from a net loss of Ps. 1,442 million in 2017 to a net loss of Ps. 4,986 million in 2018. This increase in loss was primarily due an increase in cost of sales and taxes.

Trading Companies

In 2018, total sales relating to the Trading Companies’ exports of crude oil and petroleum products to third parties (including services income) decreased in peso terms, from Ps. 508,606 million in 2017 to Ps. 204,168 million in 2018, primarily as a result of the derecognition of revenue from sales by Pemex Exploration and Production to the Trading Companies as a result of our implementation of IFRS 15 in 2018. For further information on the impact of our implementation of IFRS 15, see Note 4-A to our consolidated financial statements included herein. In 2018, net income related to the Trading Companies decreased by 60.3%, from Ps. 12,045 million in 2017 to Ps. 4,778 million in 2018, primarily as a result of our implementation of IFRS 15.

Corporate and Other Subsidiary Companies

In 2018, the total sales relating to corporate and other subsidiary companies after inter-company eliminations decreased from Ps. 1,524,600 million in 2017 to Ps. 1,235,474 million in 2018, primarily due to a decrease in total intercompany sales as a result of an increase in the import of products. Net loss related to corporate and other subsidiary companies after inter-company eliminations decreased 41.3%, from a net loss of Ps. 80,699 million in 2017 to a net loss of Ps. 47,330 million in 2018, primarily due to favorable results from subsidiary companies.

2017 compared to 2016

We present below the results of our operations by business segment. For more information on our operating segments, see “Item 4— Information on the Company—History and Development—Corporate Structure” and Note 1 to our consolidated financial statements included herein. For a detailed description of the financial results of each segment, see Note 1 and Note 6 to our consolidated financial statements included herein.

Exploration and Production

In 2017, total intersegment sales, which include sales to our industrial transformation segment and the Trading Companies, increased by 23.7%, primarily due to the increase in crude oil export prices. As compared to 2016, our exploration and production segment's sales of crude oil to the Trading Companies in 2017 increased by 40.0% in U.S. dollar terms, primarily due to an increase in exports to the United States and an increase in crude oil export prices. The weighted average price of crude oil sold by our exploration and production segment to the Trading Companies for export was U.S. \$47.26 in 2017, as compared to U.S. \$35.17 in 2016. Net loss related to exploration and production activities increased by 229.2%, or Ps. 105,158 million, from a Ps. 45,879 million loss in 2016 to a Ps. 151,037 million loss in 2017, primarily due to net impairment of our fixed assets in this segment.

Industrial Transformation

In 2017, trade sales related to industrial transformation activities increased by 32.1%, from Ps. 653,654 million in 2016 to Ps. 863,573 million in 2017, primarily due to an increase in the average sales prices of petroleum products. Intersegment sales increased by 28.4%, from Ps. 117,096 million in 2016 to Ps. 150,360 million in 2017, primarily due to an increase in the prices of petroleum products sold. In 2017, our net loss related to industrial transformation activities was Ps. 55,787 million, 20.2% lower than the loss of Ps. 69,865 million in 2016. The decrease in loss was primarily due to a decrease in cost and operating expenses.

Drilling and Services

In 2017, total sales related to the drilling and services segment increased by 67.7%, from Ps. 2,052 million in 2016 to Ps. 3,442 million in 2017. This increase was primarily due to an increase in services provided to Pemex Exploration and Production. Net income related to drilling and services increased by Ps. 1,408 million, from a loss of Ps. 142 million in 2016 to a net income of Ps. 1,266 million in 2017, primarily due to an increase in foreign exchange income.

Logistics

In 2017, total sales related to the logistics segment increased by Ps. 3,256 million, from Ps. 71,131 million in 2016 to Ps. 74,387 million in 2017, primarily due to an increase in the services provided to Pemex Industrial Transformation. In 2017, our net loss related to logistics activities was Ps. 834 million, a 91.7% decrease as compared to the loss of Ps. 10,018 million in 2016. The decrease in net loss was primarily due to our foreign exchange income.

Cogeneration and Services

In 2017, total sales related to our cogeneration and services segment increased by Ps. 264 million from Ps. 185 million in 2016 to Ps. 449 million in 2017, primarily due to an increase in the services provided to Pemex Industrial Transformation. In 2017, our net loss related to our cogeneration and services activities increased by Ps. 57 million, from a net loss of Ps. 35 million in 2016 to a net loss of Ps. 92 million in 2017. This increase in loss was primarily due to an increase in costs and operating expenses as well as increased financing costs.

Fertilizers

In 2017, total sales related to the fertilizers segment decreased by Ps. 7 million, from Ps. 4,775 million in 2016 to Ps. 4,768 million in 2017. This decrease was primarily due to a decrease in the trade sales of ammonia. In 2017, our net loss related to our fertilizers activities increased by Ps. 2,611 million, from a net loss of Ps. 1,659 million in 2016 to a net loss of Ps. 4,270 million in 2017, primarily due to the net impairment of our fixed assets in this segment.

Ethylene

In 2017, total sales related to our ethylene segment decreased by Ps. 3,003 million, from Ps. 17,217 million in 2016 to Ps. 14,214 in 2017, primarily due to a decrease in sales of polyethylene, ethylene oxides, acrylonitrile and monoethyleneglycol products. In 2017, our net income related to our ethylene activities decreased by Ps. 3,538 million, from a net income of Ps. 2,097 million in 2016 to a net loss of Ps. 1,442 in 2017. This decrease in income was primarily due a decrease in total sales.

Trading Companies

In 2017, total sales relating to the Trading Companies' exports of crude oil and petroleum products to third parties (including services income) increased in peso terms, from Ps. 395,354 million in 2016 to Ps. 508,606 in 2017, primarily as a result of an increase in the prices of crude oil exports. In 2017, net income related to the Trading Companies increased by 7.9%, from Ps. 11,167 million in 2016 to Ps. 12,045 million in 2017, primarily due to an increase in the permanent investment in associates that was recognized at fair value.

Corporate and Other Subsidiary Companies

In 2017, the total sales relating to corporate and other subsidiary companies after inter-company eliminations increased from Ps. 1,209,045 million in 2016 to Ps. 1,524,600 million in 2017, primarily due to an increase in total intercompany sales as a result of an increase in the import of products. Net loss related to corporate and other subsidiary companies after inter-company eliminations decreased by Ps. 3,890 million, from a net loss of Ps. 76,809 million in 2016 to a net loss of Ps. 80,699 million in 2017, primarily due to unfavorable results from subsidiary companies and a loss in joint ventures and associates.

Research and Development

Our research and development activities are focused on developing the Mexican energy sector through advancing products and solutions that are intended to be high quality, high performance and technologically efficient.

The *Instituto Mexicano del Petróleo* (Mexican Petroleum Institute or IMP) is a public research organization under the SENER. The objective of the IMP is to develop the Mexican petroleum, petrochemical and chemical industries and assist us in the development of the Mexican energy sector. We work closely with the IMP on many of our research and development initiatives.

For example, we collaborate with the IMP on the development of our gasoline additives. On October 11, 2018, we launched the seventh generation of our high end performance additive that blends with our Pemex Magna and Pemex Premium gasolines. This additive will be promoted as Pemex Aditec. Pemex Aditec is a multifunctional additive and is formulated to obtain optimum performance, cleanliness and protection of the motor.

Additionally, we collaborate with the IMP through their *Centro de Tecnología para Aguas Profundas* (Deep-Water Technology Center or CTAP). The CTAP is equipped with various laboratories to research drilling of wells, characterization of natural and operational risks and qualification and design of production tools, equipment and systems for use by the petroleum sector in deep water. The center is located in Boca del Río, Veracruz.

Item 6. Directors, Senior Management and Employees

Under the *Petróleos Mexicanos* Law, *Petróleos Mexicanos* is governed by a ten-member Board of Directors composed as follows:

- the Secretary of Energy, who serves as the Chairperson and has the right to cast a tie-breaking vote;
- the Secretary of Finance and Public Credit;
- three Mexican Government representatives, who are appointed by the President of Mexico; and
- five independent members, who are appointed by the President of Mexico, subject to ratification by the Senate. Independent members perform their duties on a part-time basis, are not public officials (*i.e.*, individuals holding federal, state or municipal government positions in Mexico) and have not been employed by *Petróleos Mexicanos* or any of the subsidiary entities during the two years prior to their appointment.

The *Petróleos Mexicanos* Law authorizes only the Secretary of Energy and the Secretary of Finance and Public Credit to designate an alternate to serve in his or her place, provided that the alternate is a public official at the undersecretary level, at minimum. This alternate may attend meetings of the Board of Directors of *Petróleos Mexicanos* and otherwise assume the duties of the director, except that the Chairperson's designated alternate may not cast a tie-breaking vote. In addition, any ministry-level secretary serving as a member of the Board of Directors of *Petróleos Mexicanos* may designate an alternate to attend meetings on his or her behalf, provided that such alternate is a public official at the undersecretary level, at minimum.

Under the *Petróleos Mexicanos* Law, all public officials serving as members of the Board of Directors of *Petróleos Mexicanos* are required to act impartially and for the benefit and in the best interests of *Petróleos Mexicanos*, separating at all times the interests of the ministry or governmental entity for which they work from their duties as members of the Board of Directors.

Except in the case of the independent members first appointed in 2014 under the *Petróleos Mexicanos* Law, the five independent members are appointed to staggered five-year terms, and may be appointed for an additional term of the same length. The remaining members of the Board of Directors of *Petróleos Mexicanos* are not appointed for a specific term.

Under the *Petróleos Mexicanos* Law, each of the boards of directors of the subsidiary entities will consist of not less than five and no more than seven members. The majority of the members of each of the board of directors shall be appointed by and represent the Board of Directors of *Petróleos Mexicanos*. The Ministry of Energy and the Ministry of Finance and Public Credit may also appoint members to each board of directors of the subsidiary entities, subject to approval by the Board of Directors of *Petróleos Mexicanos*.

The structure, organizational basis and functions of the administrative units of *Petróleos Mexicanos* and each of the subsidiary entities are established in the *Estatuto Orgánico* (Organic Statute) approved by the Board of Directors of each entity.

The following tables set forth certain information with respect to directors and executive officers of *Petróleos Mexicanos* and each of the subsidiary entities as of April 10, 2019.

Name	Petróleos Mexicanos—Directors and Executive Officers Position with <i>Petróleos Mexicanos</i>	Year Appointed
Ms. Norma Rocío Nahle García	Chairwoman of the Board of Directors of <i>Petróleos Mexicanos</i> and Secretary of Energy <i>Born:</i> 1964 <i>Business experience:</i> Senator of the LXIV Legislature; Federal Deputy of the LXIII Legislature and Coordinator of the MORENA Parliamentary Group for the XI District of Veracruz; and Advisor of the Energy Commission of the Senate of the LXII Legislature. <i>Other board memberships:</i> Chairwoman of CFE; Chairwoman of the Centro Nacional de Control de Energía; Chairwoman of CENAGAS; Chairwoman of the Instituto Nacional de Investigaciones Nucleares; Chairwoman of Instituto Nacional de Electricidad y Energías Limpias; Chairwoman of the Instituto Mexicano del Petróleo; and Fondo Mexicano del Petróleo.	2018
Mr. Alberto Montoya Martín del Campo	Alternate Board Member of <i>Petróleos Mexicanos</i> and Undersecretary of Hydrocarbons of the Ministry of Energy <i>Born:</i> 1952 <i>Business experience:</i> Advisor to the Senate; President of the Centro de Estudios Estratégicos Nacionales, A.C.; and Professor Researcher of the Universidad Iberoamericana, A.C.	2018

Born: 1955

Business experience: Professor Researcher of the Instituto Tecnológico y de Estudios Superiores de Monterrey, A.C. (ITESM); Director and Founder of the ITESM Graduate School of Public Administration and Public Policy; and Secretary of Finance of the Federal District.

Other board memberships: Chairman of Casa de Moneda de México; Chairman of Comisión Nacional para la Protección y Defensa de los Usuarios de Servicios Financieros; Chairman of Financiera Nacional de Desarrollo Agropecuario, Rural, Forestal y Pesquero; Chairman of Instituto para la Protección al Ahorro Bancario; Chairman of Lotería Nacional para la Asistencia Pública; Chairman of Pronósticos para la Asistencia Pública; Chairman of Servicio de Administración y Enajenación de Bienes; Chairman of Agroasemex, S.A.; Chairman of Banco del Ahorro Nacional y Servicios Financieros, S.N.C.; Chairman of Banco Nacional de Comercio Exterior, S.N.C.; Chairman of Banco Nacional de Obras y Servicios Públicos; Chairman of Banco Nacional del Ejército, Fuerza Aérea y Armada, S.N.C.; Chairman of Nacional Financiera, S.N.C.; Chairman of Seguros de Crédito a la Vivienda SHF, S.A. de C.V.; Chairman of Sociedad Hipotecaria Federal, S.N.C.; CNBV; Comisión Nacional de Seguros y Fianzas; Chairman of Comisión Nacional del Sistema de Ahorro para el Retiro; Chairman of Servicio de Administración Tributaria; Instituto Mexicano de la Juventud; Instituto Nacional de las Personas Adultas Mayores; Consejo Nacional para el Desarrollo y la Inclusión de las Personas con Discapacidad; Coordinación Nacional de PROSPERA Programa de Inclusión Social; Comisión Nacional Forestal; Instituto Mexicano de Tecnología del Agua; Instituto Nacional de Ecología y Cambio Climático; Comisión Nacional del Agua; Agencia Nacional de Seguridad Industrial y de Protección al Medio Ambiente del Sector Hidrocarburos; Caminos y Aeropuertos y Servicios Auxiliares; Caminos y Puentes Federales de Ingresos y Servicios Conexos; Servicio Postal Mexicano; Telecomunicaciones de México; Consejo Nacional de Fomento Educativo; Fondo de Cultura Económica; Instituto Mexicano de la Radio; Instituto Nacional para la Educación de los Adultos; Instituto del Fondo Nacional para el Consumo de los Trabajadores; Comisión Nacional de Vivienda; Instituto Nacional de Ciencias Penales; Comisión Nacional para el Desarrollo de los Pueblos Indígenas; Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado; Instituto del Fondo Nacional de la Vivienda para los Trabajadores; Instituto Mexicano del Seguro Social; Instituto Nacional de las Mujeres; CFE; Comisión de Política Gubernamental en materia de Derechos Humanos; Consejo Nacional de Educación para la Vida y el Trabajo; Consejo Nacional para las Comunidades Mexicanas en el Exterior; Comisión Coordinadora para la Negociación de Precios de Medicamentos y Otros Insumos para la Salud; Chairman of Comisión de Cambios; Comisión Nacional de Inversiones Extranjeras; Banco Interamericano de Desarrollo y Corporación Interamericana de Inversiones; World Bank (Banco Internacional de Reconstrucción y Fomento y el Organismo Multilateral de Garantía de Inversiones); and Banco de Desarrollo del Caribe.

Mr. Arturo Herrera Gutiérrez	<p>Alternate Board Member of Petróleos Mexicanos and Undersecretary of Finance and Public Credit of the Ministry of Finance and Public Credit</p> <p><i>Born:</i> 1966</p> <p><i>Business experience:</i> Practice Manager for East Asia at the World Bank; Practice Manager for Latin America and the Caribbean at the World Bank; and Public Sector Manager at the World Bank.</p> <p><i>Other board memberships:</i> Agencia Mexicana de Cooperación Internacional para el Desarrollo; Casa de Moneda de México; Comisión Nacional para la Protección y Defensa de los Usuarios de Servicios Financieros (Alternate); Financiera Rural; Lotería Nacional para la Asistencia Pública (Alternate); Pronósticos para la Asistencia Pública (Alternate); Servicio de Administración y Enajenación de Bienes; Agroasemex, S.A.; Banco del Ahorro Nacional y Servicios Financieros, S.N.C.; Banco Nacional de Comercio Exterior, S.N.C., Institución de Banca de Desarrollo; Banco Nacional de Obras y Servicios Públicos; Banco Nacional del Ejército, Fuerza Aérea y Armada, S.N.C.; Nacional Financiera, S.N.C.; Seguros de Crédito a la Vivienda SHF, S.A. de C.V.; Sociedad Hipotecaria Federal, S.N.C.; Fondo de Capitalización e Inversión del Sector Rural: Fondo de Garantía y Fomento para la Agricultura, Ganadería y Avicultura; Fondo de Garantía y Fomento para Actividades Pesqueras; Fondo de Operación y Financiamiento Bancario a la Vivienda; CNBV; Comisión Nacional de Seguros y Fianzas; Comisión Nacional del Sistema de Ahorro para el Retiro; Servicio de Administración Tributaria (Alternate); Centro Nacional de Control de Gas Natural; Centro Nacional de Control de la Energía; CFE (Alternate); Comisión Nacional de la Vivienda (Alternate); Comisión de Comercio Exterior; Consejo Nacional de Armonización Contable; Comité Técnico del Fondo Mexicano del Petróleo para la Estabilización y el Desarrollo (Alternate); Consejo Consultivo Nacional del Sistema Nacional de Información Estadística y Geográfica; Comité Nacional de Productividad (Alternate) and; Comité de Representantes de la Comisión Nacional de Inversiones Extranjeras and Comisión Tripartita a que se refiere el artículo 15 de la Ley de Ayuda Alimentaria para los Trabajadores.</p>	2018
Ms. Graciela Márquez Colín	<p>Board Member of Petróleos Mexicanos and Secretary of Economy</p> <p><i>Born:</i> 1965</p> <p><i>Business experience:</i> Professor Researcher of El Colegio de México; Visiting Professor of the University of California; and Academic Coordinator of El Colegio de México.</p>	2018
Mr. José Francisco Quiroga Fernández	<p>Alternate Board Member of Petróleos Mexicanos and Undersecretary of Mining of the Ministry of Economy</p> <p><i>Born:</i> 1973</p> <p><i>Business experience:</i> Director of Trading of Steelcom; Director of Operations of Coutinho & Ferrostaal; and Director of Human Resources and Chief of Staff of the Chief Executive Officer of ArcelorMittal Mexico.</p> <p><i>Other board memberships:</i> CFE (Alternate); Comisión Nacional del Agua (Alternate); Chairman of Exportadora de la Sal; Fideicomiso de Fomento Minero (Alternate); and Servicio Geológico Mexicano (Alternate).</p>	2019

Mr. Manuel Bartlett Díaz	<p>Board Member of Petróleos Mexicanos and Director General of CFE</p> <p><i>Born:</i> 1936</p> <p><i>Business experience:</i> Senator of the LXIII and LXII Legislatures; Senator of the LVIII and LIX Legislatures; and Governor of Puebla.</p> <p><i>Other board memberships:</i> Chairman of CFE Generación I; Chairman of CFE Generación II; Chairman of CFE Generación III; Chairman of CFE Generación IV; Chairman of CFE Generación V, Chairman of CFE Generación VI; Chairman of CFE Transmisión; Chairman of CFE Distribución; Chairman of Suministrador de Servicio Básico; Chairman of CFE Calificados; Chairman of CFEEnergía; and Chairman of CFE Internacional.</p>	2018
Ms. Josefa González Blanco Ortiz Mena	<p>Board Member of Petróleos Mexicanos and Secretary of the Environmental and Natural Resources</p> <p><i>Born:</i> 1965</p> <p><i>Business experience:</i> Director General of Acajungla A.C.; Independent Manager of Social and Conservation Programs; and Manager of Social and Environmental Administration.</p> <p><i>Other board memberships:</i> Comisión Nacional de Normalización; Comisión Nacional de Inversiones Extranjeras; Comisión Intersecretarial de Desarrollo Social, Comité Técnico del Fondo Nacional de Turismo; Comisión Intersecretarial para el Desarrollo del Gobierno Electrónico; Comisión Nacional Coordinadora de Investigación Oceanográfica; Comisión Intersecretarial de Vivienda; Comisión Intersecretarial para el Desarrollo Rural Sustentable; Comisión Intersecretarial de Bioseguridad y Organismos Genéticamente Modificados; Comisión Intersecretarial de Cambio Climático; Comisión Nacional para el Conocimiento y Uso de la Biodiversidad; Comisión Intersecretarial para el Desarrollo de los Bioenergéticos; Comisión Intersecretarial para el Manejo Sustentable de Mares y Costas; Consejo Nacional de Protección Civil; Consejo Nacional para la Competitividad de la Micro, Pequeña y Mediana Empresa; Comisión Nacional del Agua; Comisión Nacional Forestal; Instituto Mexicano de Tecnología del Agua; CFE; Comisión Nacional de Vivienda; Instituto Nacional de los Pueblos Indígenas; Instituto del Fondo Nacional de la Vivienda Para Los Trabajadores; Sistema Nacional de Sanidad, Inocuidad y Calidad Agropecuaria y Alimentaria; Consejo Nacional de Población; Instituto Nacional de las Mujeres; Centro Nacional de Prevención de Desastres; Instituto de Seguridad y Servicios Sociales para los Trabajadores del Estado; Consejo Nacional de Protección Civil; Comisión Intersecretarial de Desarrollo Social; Fondo para el Cambio Climático; Subsistema Nacional de Información Geográfica y del Medio Ambiente; Fideicomiso del Fondo Sectorial de Investigación Ambiental; Consejo General de Investigación Científica, Desarrollo Tecnológico e Innovación; Comisión Intersecretarial de Gasto Público, Financiamiento y Desincorporación; Consejo Nacional de Áreas Naturales Protegidas; Entidad Mexicana de Acreditación; and Agencia de Seguridad, Energía y Ambiente.</p>	2018

Ms. Katya Puga Cornejo	<p>Alternate Board Member of Petróleos Mexicanos and Undersecretary of Planning and Environmental Policies of the Ministry of the Environmental and Natural Resources</p> <p><i>Born:</i> 1984</p> <p><i>Business experience:</i> Head of the Social Participation Coordination and Transparency of the Ministry of Environmental and Natural Resources; General Director of Social Impact and Superficial Occupation of the Ministry of Energy; and Deputy General Director of Social Impact Evaluation and Previous Enquiry of the Ministry of Energy.</p>	2019
Mr. Carlos Elizondo Mayer-Serra	<p>Independent Board Member of Petróleos Mexicanos</p> <p><i>Born:</i> 1962</p> <p><i>Business experience:</i> Assistant Professor of ITESM; Professor and Researcher of the Centro de Investigación y Docencia Económicas, A.C.; and Ambassador of Mexico to the Organización para la Cooperación y Desarrollo Económicos.</p> <p><i>Other board memberships:</i> Corporación Interamericana de Entretenimiento, S.A.B. de C.V. (Independent); and Consejo Nacional de Ciencia y Tecnología and TYASA, S.A. de C.V.</p>	2014
Mr. Octavio Francisco Pastrana Pastrana	<p>Independent Board Member of Petróleos Mexicanos</p> <p><i>Born:</i> 1952</p> <p><i>Business experience:</i> Partner of SFO Strategy, S.A.P.I de C.V.; Partner of Administradora Ictineo Infraestructura, S.A.P.I. de C.V.; and President and Chief Executive Officer of Isolux Mexico of Isolux Corsán, S.A.</p> <p><i>Other board memberships:</i> COREMAR Empresa de Servicios Portuarios, S.A.; and Grupo Aeroportuario de la Ciudad de México, S.A. de C.V. (Independent).</p>	2014

Vacant	Independent Board Member of Petróleos Mexicanos	
Vacant	Independent Board Member of Petróleos Mexicanos	
Vacant	Independent Board Member of Petróleos Mexicanos	
Mr. Octavio Romero Oropeza	Chief Executive Officer/Director General <i>Born:</i> 1959 <i>Business experience:</i> President of the Morena Political State Council of Tabasco, Head Official of the Federal District Government; and Federal Deputy of the LVI Legislature. <i>Other board memberships:</i> CFE	2018
Mr. Alberto Velázquez García	Chief Financial Officer / Corporate Director of Finance <i>Born:</i> 1970 <i>Business experience:</i> Director of Projects and Public Finance of Grupo Financiero Banorte, S.A.B. de C.V.; Independent Consultant for Financing Structuring and Investment Projects; and Director of Public Policy Analysis of Consultora EF&I.	2018
Mr. Marcos Manuel Herrería Alamina	Corporate Director of Management and Services <i>Born:</i> 1967 <i>Business experience:</i> Director General of Management of the Ministry of Finance of Mexico City; Private Secretary of the Head Official of the Federal District Government; and Administrative Coordinator of the Procuraduría General de Justicia of the Federal District.	2018
Mr. Víctor Manuel Navarro Cervantes	Corporate Director of Planning, Coordination and Performance <i>Born:</i> 1963 <i>Business experience:</i> Managing Director of Urvan Servicios de Consultoría para la Administración Pública; General Coordinator of Administrative Modernization of the Administrative Office of Federal District Government; and Director General of Management and Finance of the Sistema de Transporte Colectivo of the Federal District.	2018
Ms. Brenda Fierro Cervantes	Acting Chief Information Officer/Acting Corporate Director of Information Technology and Deputy Director of Technologic Alliance. <i>Born:</i> 1974 <i>Business experience:</i> Project Leader of Lingo Systems, S.A. de C.V.; Director of New Technologies of the Government of the Federal District; and Deputy Director of Programming and Design of the Government of the Federal District.	2018
Mr. Jorge Valadez Montoya	Acting Corporate Director of Alliances and New Businesses <i>Born:</i> 1973 <i>Business experience:</i> Acting Deputy Director of Businesses Development of Exploration and Production of Petróleos Mexicanos; Associate Managing Director of Alliances and New Businesses for Production Support of Petróleos Mexicanos; and Deputy Director of Project Analysis of PMI.	2018

Ms. Luz María Zarza Delgado	Acting Legal Director and Deputy Director of Legal Consulting <i>Born:</i> 1968 <i>Business experience:</i> General Counsel of the Universidad Autónoma del Estado de México; Legal Counsel of the Estado de México; and Magistrate of the Electoral Court of the Estado de México.	2018
Mr. José Salvador de la Mora Real	Head of the Institutional Internal Control Unit <i>Born:</i> 1959 <i>Business experience:</i> Operative Secretary of Information Technologies and Communications of the Tribunal Federal de Justicia Administrativa; Head of the Internal Control Body in Financiera Nacional para el Desarrollo Agropecuario, Rural, Forestal y Pesquero; and Associate Managing Director of Planning and Project Management of Petróleos Mexicanos.	2018
Mr. Francisco Javier Vega Rodríguez	Head of Internal Auditing <i>Born:</i> 1955 <i>Business experience:</i> Advisor “A” of Internal Auditing of Petróleos Mexicanos; Analysis Director of Superior Audit of the ASF; and Analysis Deputy Director of Government Functions of the ASF.	2019

Pemex Exploration and Production—Directors and Executive Officers

<u>Name</u>	<u>Position with Pemex Exploration and Production</u>	<u>Year Appointed</u>
Mr. Octavio Romero Oropeza	Chairman of the Board of Pemex Exploration and Production (refer to Petróleos Mexicanos)	2018
Mr. Alberto Velázquez García	Board Member of Pemex Exploration and Production (refer to Petróleos Mexicanos)	2018
Mr. Miguel Gerardo Breceda Lapeyre	Board Member of Pemex Exploration and Production and Director General of Pemex Industrial Transformation <i>Born:</i> 1949 <i>Business experience:</i> General Coordinator of the Instituto Nacional de Ecología y Cambio Climático; Professor Researcher of the Universidad Autónoma de la Ciudad de México; and Professor Researcher of the Universidad Politécnica de Sinaloa. <i>Other board memberships:</i> Administración Portuaria Integral Dos Bocas; and Instituto Mexicano del Petróleo.	2018
Mr. Javier Núñez López	Board Member of Pemex Exploration and Production and Acting Operative Director of Procurement and Supply of Petróleos Mexicanos <i>Born:</i> 1965 <i>Business experience:</i> Director of Management of Xalapa, Veracruz; Chief of Staff of the Congress of the State of Tabasco; and Director General of Management of the Ministry of Health of the Tabasco Government.	2019

Mr. Jorge Alberto Arévalo Villagrán	Board Member of Pemex Exploration and Production and Director General of Exploration and Extraction of Hydrocarbons of the Ministry of Energy <i>Born:</i> 1961 <i>Business experience:</i> Visiting Professor in Petroleum Engineering of Universidad Nacional Autónoma de México; Technical Director of Special Projects of Soluciones en Software Especializado Némesis, S.A. de C.V.; and Associate Managing Director of Strategies and Plans of Pemex Exploration and Production. <i>Other board memberships:</i> Fondo Sectorial CONACYT- Secretaria de Energia-Hidrocarburos.	2018
Mr. Arturo Herrera Gutiérrez	Board Member of Pemex Exploration and Production and Acting Undersecretary of Income of the Ministry of Finance and Public Credit (refer to Petróleos Mexicanos)	2018
Mr. Ulises Hernández Romano	Board Member of Pemex Exploration and Production, Acting Director General of Pemex Exploration and Production and Director of Resources, Reserves and Associations of Pemex Exploration and Production <i>Born:</i> 1970 <i>Business experience:</i> Deputy Director of Geosciences and Technical Assurance of Pemex Exploration and Production; Deputy Director of Portfolio Management and Access to New Areas of Pemex Exploration and Production; and Associate Managing Director of Deposits Geology of Pemex Exploration and Production.	2019

Pemex Industrial Transformation—Directors and Executive Officers

<u>Name</u>	<u>Position with Pemex Industrial Transformation</u>	<u>Year Appointed</u>
Mr. Octavio Romero Oropeza	Chairman of the Board of Pemex Industrial Transformation (refer to Petróleos Mexicanos)	2018
Mr. Marcos Manuel Herrería Alamina	Board Member of Pemex Industrial Transformation (refer to Petróleos Mexicanos)	2018

Pemex Industrial Transformation—Directors and Executive Officers

Name	Position with Pemex Industrial Transformation	Year Appointed
Mr. Leopoldo Vicente Melchi García	Board Member of Pemex Industrial Transformation and Director General of Natural Gas and Petrochemicals of the Ministry of Energy <i>Born:</i> 1953 <i>Business experience:</i> Director General of Petroleum Agreements of the Ministry of Energy; Associate Managing Director of Evaluation and Auditing of Petróleos Mexicanos; and General Coordinator of Design and Implementation of the Institutional Program of Auditing and Support for Effective Execution of Pemex-SSPA System of Petróleos Mexicanos. <i>Other board memberships:</i> Technical Advisor Committee of the National Contingency Plan to Fight and Control Hydrocarbons Spills and other Harmful Substances in the Sea of the Armada de México, Secretaría de Marina; Centro Nacional de Metrología (Alternate); Committee of Financing and Accounting Information of the Centro Nacional de Control de Gas Natural; Fideicomiso Público de Administración y Pago CENAGAS – BANCOMEXT No. 0637; and Committee of Control and Institutional Performance of CENAGAS.	2018
Mr. Ulises Hernández Romano	Board Member of Pemex Industrial Transformation (refer to Pemex Exploration and Production)	2019
Mr. Alberto Velázquez García	Board Member of Pemex Industrial Transformation (refer to Petróleos Mexicanos)	2018
Mr. Arturo Herrera Gutiérrez	Board Member of Pemex Industrial Transformation (refer to Petróleos Mexicanos)	2018
Mr. Miguel Gerardo Breceda Lapeyre	Board Member of Pemex Industrial Transformation and Director General of Pemex Industrial Transformation (refer to Pemex Exploration and Production)	2018

Pemex Drilling and Services—Directors and Executive Officers

Name	Position with Pemex Drilling and Services	Year Appointed
Mr. Octavio Romero Oropeza	Chairman of the Board of Pemex Drilling and Services (refer to Petróleos Mexicanos)	2018
Mr. Víctor Manuel Navarro Cervantes	Board Member of Pemex Drilling and Services (refer to Petróleos Mexicanos)	2018
Mr. Marcos Manuel Herrería Alamina	Board Member of Pemex Drilling and Services (refer to Petróleos Mexicanos)	2018
Ms. Brenda Fierro Cervantes	Board Member of Pemex Drilling and Services (refer to Petróleos Mexicanos)	2018
Mr. Ulises Hernández Romano	Board Member of Pemex Drilling and Services (refer to Pemex Exploration and Production)	2019

Pemex Drilling and Services—Directors and Executive Officers		
Name	Position with Pemex Drilling and Services	Year Appointed
Ms. Beatriz Eugenia Rebolledo Díaz	Board Member of Pemex Drilling and Services, Acting Deputy Director of Businesses Development of Exploration and Production of Petróleos Mexicanos and Associate Managing Director of New Models of Execution of Exploration and Production of Petróleos Mexicanos. <i>Born:</i> 1970 <i>Business experience:</i> Project Leader of Petróleos Mexicanos; Associate Managing Director of Economic and Technical Regulation of Petróleos Mexicanos; and Deputy Manager of Economic Regulatory Models of Pemex Industrial Transformation.	2018
Mr. Roberto Patlán Esponda	Board Member of Pemex Drilling and Services and Coordinator of Procurement and Supply for Exploration and Production of Petróleos Mexicanos <i>Born:</i> 1980 <i>Business experience:</i> Administrative Manager of Scarlet Wircom Telecomunicaciones; Deputy Manager of General Services of the National System for Family Integral Development of the Mexico City Government; and Advisor to the Director of Material Resources and General Services of the National System for Family Integral Development of the Mexico City Government.	2018
Mr. Carlos Francisco Rangel Hernández	Acting Director General of Pemex Drilling and Services <i>Born:</i> 1960 <i>Business experience:</i> Deputy Director of Operations in Well Interventions of Pemex Drilling and Services; Associate Managing Director of Drilling and Repairs of On-Shore Wells of Pemex Drilling and Services; and Acting Associate Managing Director of Drilling and Wells Maintenance North and South Divisions of Pemex Exploration and Production. <i>Other board memberships:</i> Asociación de Ingenieros Petroleros, A.C.	2018

Pemex Logistics—Directors and Executive Officers		
Name	Position with Pemex Logistics	Year Appointed
Mr. Octavio Romero Oropeza	Chairman of the Board of Pemex Logistics (refer to Petróleos Mexicanos)	2018
Mr. Marcos Manuel Herrera Alamina	Board Member of Pemex Logistics (refer to Petróleos Mexicanos)	2018
Ms. Brenda Fierro Cervantes	Board Member of Pemex Logistics (refer to Petróleos Mexicanos)	2018
Mr. Jorge Francisco Cuéllar Mata	Board Member of Pemex Logistics and Acting Deputy Director of Strategic Planning and Regulatory Analysis of Petróleos Mexicanos <i>Born:</i> 1955 <i>Business experience:</i> Associate Managing Director of Investment Portfolio Management of Petróleos Mexicanos; Associate Managing Director of Investment Portfolio of Petróleos Mexicanos; and Associate Managing Director of Investment Analysis of Petróleos Mexicanos.	2018

Mr. Carlos Fernando Cortez González	<p>Board Member of Pemex Logistics and Acting Deputy Director of Budget of Petróleos Mexicanos <i>Born:</i> 1971 <i>Business experience:</i> Associate Managing Director of Programming and Financial Analysis of Petróleos Mexicanos; Deputy Manager of Income and Operational Outcomes of Petróleos Mexicanos; and Technical Specialist “B” of the Deputy Associate Managing Direction of Financial Analysis of Petróleos Mexicanos.</p>	2019
Ms. Reyna María Basilio Ortiz	<p>Board Member of Pemex Logistics and Coordinator of Procurement and Supply for Industrial Transformation of Petroleos Mexicanos <i>Born:</i> 1961 <i>Business experience:</i> Executive Director of Operations of the Metro Project of the Federal District; and Advisor and Director of Management of Contracts of the Metro Project of the Federal District.</p>	2018
Mr. Antonio López Velarde Loera	<p>Board Member of Pemex Logistics and Deputy Director of Risk Management and Reinsurance of Petróleos Mexicanos <i>Born:</i> 1976 <i>Business experience:</i> Associate Managing Director of Financial Risk Management of Petróleos Mexicanos; Deputy Manager of Capital Markets and Derivatives of Petróleos Mexicanos; and Deputy Manager of Derivative Transactions of Petróleos Mexicanos.</p>	2018
Mr. Javier Emiliano González del Villar	<p>Director General of Pemex Logistics <i>Born:</i> 1972 <i>Business experience:</i> Internal Affairs for the Comisión Nacional de Seguridad; and Advisor of the National Commissioner of the Comisión Nacional contra las Adicciones.</p>	2018

Pemex Fertilizers—Directors and Executive Officers

Name	Position with Pemex Fertilizers	Year Appointed
Mr. Octavio Romero Oropeza	Chairman of the Board of Pemex Fertilizers (refer to Petróleos Mexicanos)	2017
Mr. Luis Rodolfo Capitanachi Dagdug	Board Member of Pemex Fertilizers and Associate Managing Director of Finance, Industrial Processes and Logistics of Petróleos Mexicanos <i>Born:</i> 1971 <i>Business experience:</i> Associate Managing Director of Accounting for Productive State-Owned Subsidiaries and Other Businesses of Petróleos Mexicanos; Acting Deputy Director of Management and Finance of Pemex-Petrochemicals; and Associate Managing Director of Financial Resources of Pemex-Petrochemicals.	2015
Mr. Raúl Rodríguez Ramírez	Board Member of Pemex Fertilizers and Deputy Director of Economic-Financial Performance of Petróleos Mexicanos. <i>Born:</i> 1967 <i>Business experience:</i> Associate Managing Director of Project Portfolio Analysis of Petróleos Mexicanos; Manager of IBM Global Services; and Technical Support Specialist of IBM Company.	2017
Mr. Marco Manuel Herrería Alamina	Board Member of Pemex Fertilizers (refer to Petróleos Mexicanos)	2018
Mr. Javier Emiliano González del Villar	Board Member of Pemex Fertilizers (refer to Pemex Logistics)	2018
Mr. Nazario Pérez Monsalvo	Board Member of Pemex Fertilizers and Acting Deputy Director of Business Performance of Petróleos Mexicanos <i>Born:</i> 1951 <i>Business experience:</i> Analyst at Urvian Consulting; Deputy Director of Human Resources at the Cineteca Nacional; and Financial Resources Manager at the Collective Transport System.	2019
Mr. Ángel Rossette Rodríguez	Board Member of Pemex Fertilizers and Deputy Director of Gas and Petrochemicals Process of Pemex Industrial Transformation <i>Born:</i> 1960 <i>Business experience:</i> Acting Associate Managing Director of Salina Cruz Refinery of Pemex Industrial Transformation; Associate Managing Director of Nuevo Pemex GPC of Pemex Industrial Transformation; and Associate Managing Director of Cactus GPC of Pemex Industrial Transformation. <i>Other board memberships:</i> Instituto Mexicano de Ingenieros Químicos, A.C. (Chairman).	2018
Mr. Rogelio Hernández Cázares	Director General of Pemex Fertilizers <i>Born:</i> 1982 <i>Business experience:</i> State of Coahuila Liaison for the Movement of National Regeneration (Morena); Managing Director of the Statewide Regime of Social Protection in Healthcare of the State of Oaxaca; and Managing Director of Monte de Piedad of the State of Oaxaca.	2018

Pemex Ethylene—Directors and Executive Officers

Name	Position with Pemex Ethylene	Year Appointed
Mr. Octavio Romero Oropeza	Chairman of the Board of Pemex Ethylene (refer to Petróleos Mexicanos)	2018
Mr. Carlos Fernando Cortez González	Board Member of Pemex Ethylene (refer to Pemex Logistics)	2019
Mr. Miguel Ángel García Montoya	Board Member of Pemex Ethylene and Acting Associate Managing Director of Alliances and New Business Development to Support Production of the Corporate Direction of Alliances and New Businesses of Petróleos Mexicanos <i>Born:</i> 1962 <i>Business experience:</i> Project Leader for the Development and Implementation of Integral Services Contracts for Exploration and Extraction of Pemex Exploration and Production; and Representative of Cinco Presidentes Business Unit of Pemex Exploration and Production.	2018
Mr. Nazario Pérez Monsalvo	Board Member of Pemex Ethylene (refer to Pemex Fertilizers)	2019
Ms. Reyna María Basilio Ortiz	Board Member of Pemex Ethylene (refer to Pemex Logistics)	2018
Mr. Rogelio Hernández Cázares	Board Member of Pemex Ethylene (refer to Pemex Fertilizers)	2018
Mr. Ángel Rossette Rodríguez	Board Member of Pemex Ethylene (refer to Pemex Fertilizers)	2018
Mr. Manuel Antonio Mijares Bravo	Director General of Pemex Ethylene <i>Born:</i> 1950 <i>Business experience:</i> Director of Expenses and Investment of the Ministry of Energy; Director of Evaluation and Industrial Promotion of the Petrochemicals Industry of the Ministry of Energy; and Director of Budget Control and Financial Analysis of Metallurgy Public Sector Entities of the Ministry of Energy, Mining and Parastatal Industries.	2019

Board Appointments

On April 11, 2019, the Senate ratified the following independent members to the Board of Directors of Petróleos Mexicanos appointed by the President of Mexico:

- Mr. Juan José Paullada Figueroa, replacing Mr. Felipe Duarte Olvera, who resigned on December 17, 2018. Juan José Paullada Figueroa's term will end on September 17, 2019; and
- Mr. José Eduardo Beltrán Hernández, replacing Mr. Jorge José Borja Navarrete, whose term ended on September 18, 2018. Mr. José Eduardo Beltrán Hernández's term will end on April 11, 2024.

As of the date of this annual report, one seat on the Board of Petróleos Mexicanos remains vacant following the resignation of Ms. María Teresa Fernández Labardini in March 2019.

Compensation of Directors and Officers

For the year ended December 31, 2018, the aggregate compensation of executive officers of Petróleos Mexicanos and the existing subsidiary entities (17 people) paid or accrued in that year for services in all capacities was Ps. 51.2 million. Except in the case of the independent members, with respect to the previous Board of Directors of Petróleos Mexicanos and the boards of directors of the existing subsidiary entities, and the independent members, with respect to the new Board of Directors of Petróleos Mexicanos, the members of our boards of directors do not receive compensation for their services. The compensation paid or accrued during 2018 to the professional members of the previous Board of Directors of Petróleos Mexicanos and boards of directors of the existing subsidiary entities was Ps. 8.9 million. See "Item 7—Major Shareholders and Related Party Transactions—Related Party Transactions" for information about the salary advances that we offer to our executive officers as an employee benefit.

Board Practices

Except in the case of the independent members with respect to the Board of Directors of Petróleos Mexicanos, neither the members of the boards of directors nor the executive officers of Petróleos Mexicanos or the productive state-owned subsidiaries are appointed for a specific term. The length of the terms of the Secretary of Energy and the Secretary of Finance and Public Credit is, however, limited by the length of their respective positions in the Mexican Government. Except in the case of the independent members first appointed under the Petróleos Mexicanos Law, the five independent members of the Board of Directors of Petróleos Mexicanos will be appointed for five-year terms, and may be appointed for an additional term of the same length.

The Mexican Government representatives that serve as members of the boards of directors of Petróleos Mexicanos and each of the existing subsidiary entities may be removed at the discretion of the President of Mexico. The independent members of the Board of Directors of Petróleos Mexicanos may be removed for cause, including failure to carry out the duties and obligations set forth in the Petróleos Mexicanos Law, by the President of Mexico upon Senate approval.

On October 14, 2014, the Board of Directors of Petróleos Mexicanos appointed members to and convened the four committees established by the Petróleos Mexicanos Law to support its work. Unless otherwise specified in the Petróleos Mexicanos Law, the memberships of these committees must consist of at least three, but no more than five, members of the Board of Directors of Petróleos Mexicanos. Each of these committees must include two independent members of the Board of Directors of Petróleos Mexicanos, with the exception of the Audit Committee, which must include three independent members. Each of the Secretary of Energy, the Secretary of Finance and Public Credit and any ministry-level secretary serving as a member of the Board of Directors of Petróleos Mexicanos may designate one or more alternates to take his or her place at committee meetings, provided that these alternates are public officials whose positions are not more than two levels below such secretary's position in the Mexican Government.

The committees may authorize a representative of the Director General to attend their meetings as a guest with the right to participate, but not vote, when deemed advisable for the performance of their duties.

Audit Committee

The Audit Committee of the Board of Directors of Petróleos Mexicanos is required to, among other duties, oversee our management, evaluate our financial and operational performance, monitor the status of our internal control systems, as well as nominate our external auditors, whose appointments are approved by the Board of Directors of Petróleos Mexicanos. See “Item 16C—Principal Accountant Fees and Services.” Pursuant to the Petróleos Mexicanos Law, our Audit Committee must include three independent members. As of the date of this annual report, our Audit Committee has not been constituted by the Board of Directors of Petróleos Mexicanos due to the recent appointments of the new independent members. Accordingly, the entire Board of Directors of Petróleos Mexicanos is presently acting as our audit committee within the meaning of Section 3(a)(58)(B) of the Exchange Act.

Human Resources and Compensation Committee

The Human Resources and Compensation Committee is chaired by an independent member of the Board of Directors of Petróleos Mexicanos and includes the Secretary of Finance and Public Credit as a permanent member. The duties of the Human Resources and Compensation Committee include, among others, proposing the compensation of the Director General and other members of senior management of Petróleos Mexicanos within three levels of the Director General, as well as proposing hiring policies, performance management guidelines and the compensation of all other employees of Petróleos Mexicanos.

The Human Resources and Compensation Committee of Petróleos Mexicanos consists of the following members:

- Mr. Carlos Elizondo Mayer-Serra, independent member of the Board of Directors of Petróleos Mexicanos and Chairperson of the Human Resources and Compensation Committee;
- Mr. Octavio Francisco Pastrana Pastrana, independent member of the Board of Directors of Petróleos Mexicanos;
- Mr. Carlos Manuel Urzúa Macías, member of the Board of Directors of Petróleos Mexicanos;
- Ms. Graciela Márquez Colín, member of the Board of Directors of Petróleos Mexicanos; and
- Ms. Josefa González Blanco Ortiz Mena, member of the Board of Directors of Petróleos Mexicanos.

Strategy and Investment Committee

The Strategy and Investment Committee is chaired by an independent member of the Board of Directors of Petróleos Mexicanos on a rotating annual basis and is required to, among other duties, analyze our business plan and assist the Board of Directors of Petróleos Mexicanos in the approval of guidelines, priorities and general policies related to investments made by Petróleos Mexicanos.

The Strategy and Investment Committee of Petróleos Mexicanos consists of the following members:

- Mr. Octavio Francisco Pastrana Pastrana, independent member of the Board of Directors of Petróleos Mexicanos and Chairperson of the Strategy and Investment Committee;
- Mr. Carlos Elizondo Mayer-Serra, independent member of the Board of Directors of Petróleos Mexicanos;
- Ms. Norma Rocío Nahle García, member of the Board of Directors of Petróleos Mexicanos;
- Mr. Carlos Manuel Urzúa Macías, member of the Board of Directors of Petróleos Mexicanos; and
- Ms. Graciela Márquez Colín, member of the Board of Directors of Petróleos Mexicanos.

Acquisitions, Leasing, Public Works and Services Committee

The Acquisitions, Leasing, Public Works and Services Committee, among other duties, reviews, evaluates, monitors and develops recommendations regarding the annual programs of Petróleos Mexicanos for acquisition, construction and services contracts, and determines whether an exception to the public bidding process is applicable in specific cases.

The Acquisitions, Leasing, Public Works and Services Committee of Petróleos Mexicanos consists of the following members:

- Ms. Norma Rocío Nahle García, member of the Board of Directors of Petróleos Mexicanos;
- Mr. Carlos Manuel Urzúa Macías, member of the Board of Directors of Petróleos Mexicanos; and
- Mr. Graciela Márquez Colín, member of the Board of Directors of Petróleos Mexicanos.
- The two remaining seats are currently vacant.

Employees

Excluding employees employed by us on a temporary basis, at December 31, 2018, Petróleos Mexicanos, its subsidiary entities and subsidiary companies had 132,021 employees, as compared to 127,941 at December 31, 2017. During 2018, Petróleos Mexicanos and the productive state-owned subsidiaries employed an average of 6,173 temporary employees.

The following table sets forth our employee numbers for the five years ended December 31, 2018:

Year	Petróleos Mexicanos and Subsidiary Entities	Subsidiary Companies	Total
2014	153,085	804	153,889
2015	138,397	786	139,183
2016	126,940	3,393	130,333
2017	124,660	3,281	127,941
2018	124,818	3,203	128,021

Source: Petróleos Mexicanos and the subsidiary companies.

As of December 31, 2018, the Petroleum Workers' Union represented approximately 81.0% of the work force of Petróleos Mexicanos and the productive state-owned subsidiaries. The members of the Petroleum Workers' Union are PEMEX employees and they elect their own leadership from among their ranks. Our relationship with our employees is regulated by the *Ley Federal de Trabajo* (which we refer to as the Federal Labor Law), a collective bargaining agreement between Petróleos Mexicanos and the Petroleum Workers' Union and the *Reglamento de Trabajo del Personal de Confianza de Petróleos Mexicanos y Organismos Subsidiarios* (Employment Regulation for White Collar Employees of PEMEX and Subsidiary Entities). The collective bargaining agreement is subject to renegotiation every two years, although salaries are reviewed annually. Since the Petroleum Workers' Union's was officially established in 1938, we have not experienced labor strikes; we have experienced work stoppages for short periods of time, but none of these stoppages had a material adverse effect on our operations.

On June 25, 2018, Petróleos Mexicanos and the Petroleum Workers' Union amended their collective bargaining agreement, which amendment became effective on August 1, 2018. The amended agreement provides for a 3.42% increase in wages, and will regulate their labor relations until July 31, 2019.

As of November 11, 2015, pursuant to an agreement with the Petroleum Workers' Union, the retirement age for employees with less than 15 years of service is 60 (compared to 55 for employees with more than 15 years of service). Employees must serve for at least 30 years in order to be eligible to receive full retirement benefits. New employees hired as of that date receive individual defined contributions retirement plans. Employees who began serving prior to that date are permitted and incentivized to opt into the defined contributions retirement plans from their existing defined benefits retirement plans.

On December 24, 2015, the Ministry of Finance and Public Credit published in the Official Gazette of the Federation the *Disposiciones de carácter general relativas a la asunción por parte del Gobierno Federal de obligaciones de pago de pensiones y jubilaciones a cargo de Petróleos Mexicanos y sus empresas productivas subsidiarias* (General provisions regarding the assumption by the Mexican Government of the payment obligations related to pensions and retirement plans of Petróleos Mexicanos and its productive state-owned subsidiaries). On August 3, 2016, the Ministry of Finance and Public Credit informed us that the Mexican Government would assume Ps. 184.2 billion in payment liabilities related to our pensions and retirement plans, and accordingly replaced the Ps. 50.0 billion promissory note issued to us on December 24, 2015 with Ps. 184.2 billion in promissory notes. As of December 31, 2018, these promissory notes amounted to Ps. 157.0 billion.

On January 25, 2019, the Mexican Government prepaid promissory notes receivable 25 and 26A with original maturity dates of 2041 and 2042, respectively, for a total amount of Ps. 9.4 billion. On February 24, 2019, the Mexican Government prepaid promissory note receivable 24 with original maturity date of 2040, for a total amount of Ps. 5.9 billion. On March 20, 2019, the Mexican Government prepaid promissory note receivable 23 with an original maturity date of 2039, for a total amount of Ps. 6.2 billion. On April 17, 2019, the Mexican Government prepaid promissory note receivable 22 with an original maturity date of 2039, for a total amount of Ps. 6.5 billion. These prepayments were part of the Mexican Government's Strengthening Program for Petróleos Mexicanos. See "Item 5—Operating and Financial Review and Prospects—Overview."

In accordance with the Federal Labor Law and collective bargaining agreement in effect as of December 31, 2018, Petróleos Mexicanos and the productive state-owned subsidiaries are under an obligation to pay seniority premiums to retiring employees and pensions to retired employees, as well as death benefits and pensions to certain survivors of retired employees. Retirees are entitled to receive increases in their pensions, of at least the increase in NCPI, whenever salary increases are granted to current employees. We also provide health and medical benefits to employees, retired employees and their beneficiaries and, subject to our overall budgetary constraints, we provide an interest-rate subsidy on employees' mortgage loans.

On November 5, 1997, the Ministry of Finance and Public Credit and the Board of Directors of Petróleos Mexicanos authorized the formation of a trust called the Pemex Labor Fund. This fund is a vehicle to fund labor liabilities, current pension payments and seniority premiums. We have designed a contribution plan to increase the funds held in this trust and to continue to make payments on outstanding labor and pension liabilities. Our contributions to the plan assets for our retirement benefits totaled Ps. 51,952 million in 2017 and Ps. 55,654 million in 2018. As of December 31, 2017 and 2018, the balance of the Pemex Labor Fund was Ps. 8,485 million and Ps. 7,200 million, respectively.

Item 7. Major Shareholders and Related Party Transactions

Major Shareholders

Petróleos Mexicanos and the subsidiary entities have no shareholders because they are public entities of the Mexican Government. The Mexican Government controls us and incorporates the consolidated annual budget and financing program of Petróleos Mexicanos and the subsidiary entities into its budget, which must be approved by the Chamber of Deputies each year. Any adjustment proposed by the Board of Directors of Petróleos Mexicanos to change our annual financial balance goal or increase the limit on our wage and salary expenditures budget or our financing program must be approved by the Chamber of Deputies. See "Item 4—Information on the Company—General Regulatory Framework" for more information about the Mexican Government's authority with respect to our budget. Our operations in the oil and gas sector are also regulated by the Mexican Government and its ministries.

Mexican Government officials hold five of the ten seats on the Board of Directors of Petróleos Mexicanos, and the Secretary of Energy is the Chairperson of the Board of Directors of Petróleos Mexicanos with the power to cast a tie-breaking vote. An additional five seats on the Board of Directors are held by independent members appointed by the President of Mexico and ratified by the Senate. The Director General of Petróleos Mexicanos is a member of the President of Mexico's cabinet. See also "Item 3—Key Information—Risk Factors—Risk Factors Related to our Relationship with the Mexican Government."

Related Party Transactions

Directors and employees of Petróleos Mexicanos and the Subsidiary Entities are subject to regulations addressing conflicts of interest, including the *Petróleos Mexicanos Law*, *Ley Federal de Responsabilidades Administrativas de los Servidores Públicos* (Federal Law of Administrative Responsibilities of Public Officials) and the *Políticas y Lineamientos Anticorrupción para Petróleos Mexicanos, sus Empresas Productivas Subsidiarias y, en su caso, Empresas Filiales* (Anticorruption Policies and Guidelines for Petróleos Mexicanos, its Subsidiary Productive Companies and, where applicable, Subsidiary Companies). Under these provisions, directors and employees of Petróleos Mexicanos are obligated to "recuse themselves from intervening in any way in the attention to, processing or resolution of matters in which they might have personal, family or business interest, including those where some benefit can result for themselves, their spouse, blood or affinity relatives up to the fourth degree, or civil relatives, or for third parties with which they have professional, labor or business relations, or for partners or partnerships where the public officials or the persons referred above are or have been members thereof."

The Board of Directors of Petróleos Mexicanos, including the independent members who are not public officials, are subject to the duties of loyalty and diligence. In accordance with the Petróleos Mexicanos Law, an independent member of the Board of Directors of Petróleos Mexicanos may be removed from his or her position for, among other causes: (1) utilizing for personal benefit or for the benefit of any third party the information made available to him or her in connection with the exercise of his or her duties as a board member; (2) disclosing such information in violation of applicable law; or (3) not recusing him or herself from discussion of and voting on matters in respect of which he or she has a conflict of interest. A member of the Board of Directors of Petróleos Mexicanos or of the board of directors of an existing subsidiary entity who acts in contravention of the Petróleos Mexicanos Law may be held liable for any damages that he or she caused to Petróleos Mexicanos or an existing subsidiary entity.

As an employee benefit, we offer salary advances to all of our eligible Petroleum Workers' Union and non-union workers, including our executive officers, pursuant to the programs set forth in the collective bargaining agreement and in the Employment Regulation of White Collar Employees of Petróleos Mexicanos and Subsidiary Entities, respectively. The salary advances, which are non-interest bearing, are offered to each eligible employee in an amount up to a maximum of four months' salary and are repaid through salary deductions in equal installments over a period of either one or two years, as elected by the employee. Most of our employees take advantage of this benefit. The largest amount of salary advances outstanding to executive officers at any one time during 2018 was Ps. 3.5 million. As of March 31, 2019, the aggregate amount of salary advances outstanding to our executive officers was Ps. 0.3 million.

Mr. Manuel Bartlett Díaz, Chief Executive Officer of CFE, was appointed member of the Board of Directors of Petróleos Mexicanos in December 2018. CFE has executed several purchase agreements with Pemex Industrial Transformation. During 2018, CFE acquired the following products from Pemex Industrial Transformation:

Product	2018
Heavy fuel oil	Ps. (38,499,999)
Trade condition	135,667
Industrial diesel	(6,148,283)
Freights	(154,115)
Natural Gas	(3,760,115)
87 octane gasoline	(707)
Total	Ps. (48,427,552)

Item 8. Financial Information

Consolidated Statements and Other Financial Information

See Item 18. “Financial Statements”.

Legal Proceedings

Labor-Related Proceedings

We are a party to various legal actions involving labor claims of former and present employees. These labor disputes relate to severance payments, life insurance benefits, extensions of labor contracts, level of wages, improper termination and employee housing. We do not expect these lawsuits to have a material adverse effect on our financial condition or future results of operations.

For information on our negotiations with the Petroleum Workers’ Union and collective bargaining agreements, see “Item 6—Directors, Senior Management and Employees—Employees.”

Audits and Other Investigations by the Mexican Government

The *Auditoría Superior de la Federación* (Superior Audit Office of the Federation, or the ASF), annually reviews the *Cuenta Pública* (Public Account) of Mexican Government entities, including Petróleos Mexicanos and our subsidiary entities. This review focuses mainly on the entities’ compliance with budgetary benchmarks and budget and accounting laws. The ASF prepares reports of its observations based on this review. The reports are subject to our analysis and, if necessary, our clarification and explanation of any issues raised during the audit. Discrepancies in amounts spent may subject our officials to legal sanctions. However, in most instances, any observed issues are clarified and disposed of.

The Liabilities Unit at Petróleos Mexicanos, which is part of the *Secretaría de la Función Pública* (Ministry of Public Function, or the SFP), is responsible for receiving complaints and investigating violations of the General Law of Administrative Liabilities, as well as imposing administrative penalties in accordance with the law. The Liabilities Unit at Petróleos Mexicanos provided us with the information below regarding the main investigations and administrative proceedings against our employees and former employees.

Oceanografía

On April 24, 2014, the SFP issued a resolution imposing penalties against several public sector employees in connection with operations executed with Oceanografía, S.A. de C.V. Four employees of Pemex Exploration and Production were barred from public sector employment for six months to one year. The employees filed motions requesting that the penalties be declared null and void. The following sets forth the status of the proceedings that were ongoing during 2018:

- On April 4, 2015, a judgment was issued (file No. 14/8891-01-02-08-OT) before the *Sala Regional de Chiapas-Tabasco* (Regional Court of Chiapas-Tabasco) of the former *Tribunal de Justicia Fiscal y Administrativa* (Fiscal and Administrative Justice Court) declaring the resolution null and void and requesting that a new judgment be issued. On September 29, 2016, a new resolution was issued and the employee was barred from public sector employment for three months. The employee filed a new administrative claim (file No. 518/16-26-01-2) against this resolution before the *Sala Regional de Tabasco* (Regional Court of Tabasco) of the *Tribunal de Justicia Administrativa* (Administrative Justice Court). On June 12, 2017, a judgment was issued declaring the resolution null and void. The SFP filed a motion to review this resolution before the *Tribunal Colegiado en Materias Administrativa y del Trabajo del Décimo Circuito* (Joint Administrative and Labor Court of the Tenth Circuit) (file No. R.F. 32/2017). As of the date of this annual report, a final resolution is still pending.
- On May 9, 2015, a judgment was issued (file No. 10781/14-17-10-5) before the *Décima Sala Regional Metropolitana* (Tenth Regional Metropolitan Court) of the former Fiscal and Administrative Justice Court declaring the resolution valid. The employee filed an *amparo* against this resolution requesting a new judgment to be issued, which was granted on December 14, 2016. On June 27, 2017, a new resolution was issued declaring the resolution against the employee valid. The employee subsequently filed a new *amparo* before the *Octavo Tribunal Colegiado en Materia Administrativa del Primer Circuito* (Eighth Administrative Joint Court of the First Circuit) (file D.A. 638/2017), which was denied on October 25, 2018 and declared definitive on January 16, 2019. As of the date of this annual report, this proceeding has concluded.

Key Energy Services

On August 11, 2016, the SEC announced that Key Energy Services, Inc. agreed to pay U.S. \$5 million to settle SEC charges that it violated the internal controls and books-and-records provisions of the U.S. Foreign Corrupt Practices Act. These violations arose from payments allegedly made by its subsidiary, Key Mexico, to one of our employees to induce him to provide advice, assistance and inside information that was used by Key Energy Services, Inc. and Key Mexico in negotiating contracts with us. The Liabilities Unit at Petróleos Mexicanos conducted an investigation, and, on November 6, 2018, sent a report of alleged liability to the Liabilities Unit at Pemex Exploration and Production. The report of alleged liability indicated misuse of non-public information, fraudulent payments and fraudulent cost adjustments by several Pemex Exploration and Production employees. On November 29, 2018, the report was declared inadmissible due to limitations on the powers of the Liabilities Unit. As of the date of this annual report, this matter has concluded.

Odebrecht

On December 21, 2016, the U.S. Department of Justice publicly disclosed that Odebrecht, a global construction conglomerate based in Brazil, pleaded guilty to charges of bribery and corruption in connection with, among other things, bribes paid for more than 100 projects in twelve countries. The report further disclosed that, between 2010 and 2014, Odebrecht had bribed officials of the Mexican government for an amount equal to U.S. \$10.5 million, including the payment to a high-level official of a Mexican state-owned and state-controlled company of a bribe of U.S. \$6 million.

On December 22, 2016, the Liabilities Unit at Petróleos Mexicanos commenced an investigation into instances of bribery or corruption related to these allegations. On January 25, 2017, we filed a criminal complaint with the Federal Attorney General's Office against any party for acts that may have been committed against PEMEX.

As a result of investigations being conducted by the Liabilities Unit at Petróleos Mexicanos, the SFP and the Federal Attorney General's Office, agreements executed by Odebrecht and its affiliates with various public entities of the Mexican Government have been reviewed. As of the date of this annual report, the SFP has initiated a total of eight administrative sanctioning proceedings, four against Odebrecht and its affiliates, two against legal representatives of Odebrecht and two against employees of PEMEX. In addition, as of the date of this annual report, the SFP is preparing three additional administrative sanctioning proceedings against Odebrecht affiliates and an additional investigation is outstanding. The results of these investigations have resulted in the following actions:

- On June 14, 2017, the Ministry of the Public Function, through the Liabilities Unit at Petróleos Mexicanos, initiated four administrative sanctioning proceedings against two affiliates of Odebrecht and its representatives for probable wrongful payments related to a public work contract in our Miguel Hidalgo refinery.
- On June 16, 2017, we notified Odebrecht Ingeniería y Construcción Internacional de México, S.A. de C.V. (or ODM) of the termination of the engineering, procurement and construction contract between ODM and Pemex Industrial Transformation dated November 12, 2015. This contract was valued at Ps. 1.8 billion and covered works related to the construction of access ways and external works for the residual exploitation project for the Miguel Hidalgo refinery. We terminated this contract due to ODM's failure to comply with its obligations. ODM filed a commercial claim (file No. 564/2018-V) against Pemex Industrial Transformation seeking Ps. 1,838.7 million for failure to make payments and breach of contract. On March 6, 2019, Pemex Industrial Transformation filed a response to this claim. On March 29, 2019, ODM filed a reply to this response. As of the date of this annual report, a final resolution is still pending.
- On September 11, 2017 and October 8, 2017, the SFP, through the Liabilities Unit at Petróleos Mexicanos, announced that it had identified additional irregularities in connection with payments of Ps. 119 million and Ps. 2.5 million, respectively, related to the execution of public work contracts in our Miguel Hidalgo refinery involving an affiliate of Odebrecht and an employee of Pemex Industrial Transformation. As a result of the administrative sanctioning proceedings initiated in September and October 2017, respectively, the SFP has issued a total of four sanctioning resolutions, two banning Constructora Norberto Odebrecht, S.A. from bidding for and entering into contracts with the Mexican Government and PEMEX for four years and two years, respectively, and two against the employee of Pemex Industrial Transformation, who was barred from public sector employment for a period of ten years and was fined Ps. 119 million and Ps. 2.5 million due to irregularities related to improper payments of indirect costs and duplicated services, respectively.

- On April 17, 2018, the Liabilities Unit at Petróleos Mexicanos announced that it had banned each of ODM and Constructora Norberto Odebrecht, S.A for two years and six months from bidding for and entering into Mexican government contracts, including contracts with PEMEX, and fined each of them in an aggregate amount of Ps. 543.5 million for wrongful acts committed in connection with, and failure to comply with the requirements of, the contract executed with Pemex Industrial Transformation for the Miguel Hidalgo refinery. The SFP also announced it had banned each of the Director General, Mr. Luis Alberto de Meneses Weyll, and the Director of Management and Finance, Mr. Gleiber José de Faria, of ODM, for two years and three months and fined each of them in an aggregate amount of Ps. 1.26 million for wrongful acts committed in connection with, and failure to comply with the requirements of, the contract executed with Pemex Industrial Transformation for the Miguel Hidalgo refinery.
- On August 16, 2018, the SFP announced it had initiated an administrative sanctioning proceeding against an Odebrecht affiliate for giving false information in connection with a SEMARNAT license related to the execution of works for our Miguel Hidalgo refinery. As of the date of this annual report, the SFP is in the process of preparing a resolution.
- On October 29, 2018, the SFP announced it had initiated an administrative sanctioning proceeding against Constructora Norberto Odebrecht, S.A. for excess charges related to the execution of a contract for our Miguel Hidalgo refinery. As of the date of this annual report, the SFP is in the process of preparing a resolution.
- On November 12, 2018, the Liabilities Unit at Pemex Industrial Transformation announced that the *Decimocuarto Tribunal Colegiado en Materia Administrativa del Primer Circuito* (Fourteenth Administrative Joint Court of the First Circuit) issued a resolution dated September 28, 2018 regarding a motion to review (R.A. 192/2018) filed by Constructora Norberto Odebrecht, S.A. in connection with a judgment issued on April 23, 2018 by the *Juzgado Decimoquinto de Distrito en Materia Administrativa* (Fifteenth Administrative District Court) in Mexico City in connection with the *amparo* 1252/2017. This judgment requested that one of the four sanctioning proceedings be replaced. The proceeding is in the evidentiary phase, and once the court has concluded its examination of the evidence, the SFP will issue a resolution.
- On November 27, 2018, the SFP announced it had barred an employee of Pemex Industrial Transformation from public sector employment for a period of ten years and imposed a fine of Ps. 8.3 million, for failure to apply conventional penalties to an affiliate of Odebrecht related to works performed at our Miguel Hidalgo refinery.
- On April 26, 2019, the Liabilities Unit at Pemex Industrial Transformation announced that it had concluded an administrative sanctioning proceeding (file No. PTRI-S-001/2018) banning ODM for three years from bidding for and entering into Mexican government contracts.

The administrative sanctions imposed by the SFP are independent of any criminal charges that may be brought as a result of the criminal investigation that is being carried out by the Attorney General's Office, which, as of the date of this annual report, is still ongoing.

We are collaborating with the SFP, the Liabilities Unit at Petróleos Mexicanos, and the Federal Attorney General's Office in order to hold those responsible for these acts accountable and ensure that we recover any damages to which we are entitled.

Pemex Fertilizers

On September 9, 2018, the SFP announced that it had initiated, through the Liabilities Unit at Petróleos Mexicanos, an administrative sanctioning proceeding against a former employee of Pemex Fertilizers in connection with alleged irregularities in the 2016 acquisition of Fertinal by one of our subsidiary companies, PMX Fertilizantes Pacífico, S.A. de C.V. As of the date of this annual report, a resolution of this sanctioning proceeding is still pending.

On September 9, 2018, the SFP also announced that it had initiated an administrative sanctioning proceeding against a former employee of Pemex Fertilizers for alleged damages against PEMEX of U.S. \$273 million in connection with the 2014 acquisition of assets from Agro Nitrogenados, S.A. de C.V., a subsidiary of Altos Hornos de México.

On November 30, 2018, the SFP announced that it had concluded its investigation and had initiated a liability proceeding against a former employee for alleged damages of U.S. \$193.9 million. The proceedings relate to the rehabilitation of the Agro Nitrogenados plant for alleged damages of Ps. 4,206 million (U.S. \$212 million). As of the date of this annual report, this proceeding is in the evidentiary stage, pleadings to be filed by the employee are still pending and a final resolution has not been issued.

Pemex Logistics

On September 18, 2018, the SFP announced that it had initiated, through the Liabilities Unit at Pemex Logistics, an administrative sanctioning proceeding against three employees of Pemex Logistics for alleged irregularities in connection with a payment of Ps. 6.3 million in 2015 related to dredging and underwater cleaning services at the Madero Maritime Terminal. On December 11, 2018, the Liabilities Unit at Petróleos Mexicanos issued a resolution temporarily suspending these three employees from public sector employment and imposing a fine of Ps. 2.1 million. As of the date of this annual report, final resolutions of the administrative proceedings filed by the employees against this resolution are still pending.

Actions Against the Illicit Market in Fuels

The illicit market in fuels in Mexico involves the theft, adulteration and illegal transport and distribution of the hydrocarbons that we and other companies produce. This criminal activity mainly consists of the following:

- Illegal tapping of our pipelines, which threatens the integrity of our pipeline system, thereby increasing the associated risks for personnel, facilities, the general population and the environment. Illegal tapping of our pipelines has caused explosions, loss of life, injuries and environmental damage.
- Tampering with product quality, which negatively impacts consumers and our reputation.
- Theft and illegal trade in fuels, which reduces our revenues by the amount that would have been generated from the sale of the stolen products and reduces our net income because the production cost of stolen product is included in our cost of sales.

In recent years we have experienced an increase in theft of and illegal trade in the fuels that we produce. We estimate that the average theft of fuel amounted to approximately 55.9 thousand barrels per day in 2018. For the years ended December 31, 2018 and 2017, non-operating losses resulting from fuel theft amounted to Ps. 39,439.1 million and Ps. 22,945.4 million, respectively.

Given the sophistication and breadth of these illegal networks, in recent years we have implemented several initiatives that aim to develop a sustainable operating model to safeguard the areas in which we operate, which comprise approximately 2.0 million square kilometers of onshore fields and 3.2 million square kilometers of Mexican territorial waters. These initiatives have sought to:

- integrate a strategic safeguard system, allowing us to respond in a timely manner to risks of illegal activity;
- strengthen coordination and collaboration between Petróleos Mexicanos and our subsidiary entities, as well as with authorities in the three orders of government, including the Federal Attorney General's Office, Federal Consumer's Office, Tax Administration System, federal, state and municipal police, the *Secretaría de la Defensa Nacional* (Ministry of National Defense) and the Mexican Navy;
- optimize our human capital and modernize our technology;
- modernize our information systems to improve our strategic decision making and our response time; and
- revise our security strategy to incorporate innovations from the fields of industrial safety, civil protection and environmental preservation.

Additionally, the new administration has set forth the *Plan Conjunto para el Combate al Robo de Combustibles* (Joint Plan for Combating Fuel Theft), which is aimed at further preventing and eliminating the illicit market in fuels. The principal measures of this plan are:

- Support of fifteen government institutions and agencies, including the *Secretaría de Gobernación* (Ministry of the Interior), the *Secretaría de Seguridad Pública* (Ministry of Public Security), the *Secretaría del Trabajo y Previsión Social* (Ministry of Labor and Public Welfare), the Ministry of Finance and Public Credit, the Ministry of Energy, the *Consejería Jurídica del Ejecutivo Federal* (Legal Counsel of the Federal Executive), the *Fiscalía General de la República* (Federal Attorney General's Office), the *Servicio de Administración Tributaria* (Tax Administration Service or SAT) and the *Procuraduría Federal del Consumidor* (Federal Consumer's Office);
- Removal of personnel involved in the illicit market for fuels;
- Improved monitoring of our pipeline systems, supported by the Ministry of National Defense, the Mexican Navy and the federal police;
- Special attention to 58 facilities identified as requiring priority, including 39 storage and dispatch terminals, 12 repumping stations, six refineries and one control center Mexico;
- Closure of certain pipelines and increased use of trucks for the transportation of fuel; and
- Identification and guard control of vehicle access to priority facilities, control rooms and vertical tank areas.

These measures led to the recovery of 25.3 million liters of hydrocarbon product in 2018, which represents an increase of approximately 11.9% as compared to the 22.6 million liters recovered in 2017.

These efforts also led to the identification and sealing of 14,910 illegal pipeline taps in 2018, as compared to the identification and sealing of 10,316 illegal pipeline taps during 2017, which represents a 44.5% increase. This increase resulted from both increased surveillance and an increase in the number of criminal attempts to divert our products. Our renewed focus on the detection of illegal pipeline taps in 2018 enabled us to collect more information and develop more effective strategies to combat fuel theft, which in turn improved our ability to deploy ground patrol for the immediate identification and sealing of pipeline taps and prevent additional extraction of our hydrocarbon products.

On June 1, 2017, we announced the cancellation of the franchise contracts of seven gas stations located in the state of Puebla, which allegedly committed irregularities in their fuel trade procedures and had tax inconsistencies. The announcement was the result of an operation involving PEMEX, the *Secretaría de Hacienda y Crédito Público* (Ministry of Finance and Public Credit) through the Tax Administration Service and its Financial Intelligence Unit, as well as the *Fiscalía General de la República* (Attorney General's Office), the *Secretaría de la Defensa Nacional* (Ministry of National Defense) and the *Comisión Nacional de Seguridad* (National Security Commission), through the federal and state police. Through measures like these, we seek to provide certainty to our customers, as well as to combat the illicit market in fuels, tax evasion, money laundering and commercial fraud.

On January 18, 2019, at least 93 people lost their lives when a ruptured gas pipeline exploded in the State of Hidalgo. The pipeline rupture was the result of attempted fuel theft. The Federal Attorney General's Office is investigating the explosion.

Additionally, some of our personnel have been implicated for their involvement in organized fuel theft and trade. The Liabilities Unit at *Petróleos Mexicanos* provided us with the following information regarding the main investigations and administrative proceedings against our employees and former employees related to this issue.

On February 14, 2018, the Liabilities Unit at *Petróleos Mexicanos* imposed penalties on eight employees from the storage and distribution terminal of Pemex Logistics in the state of Chihuahua for operating technological devices to alter the measurement parameters to fill fuel tankers and for deviating from expected routes. Three of these employees were dismissed and barred from holding public sector positions for one year and five employees were suspended. Three of these eight employees filed claims challenging the applicable resolutions. One resolution was declared null and void. Final judgments on the claims challenging the other two resolutions are pending as of the date of this annual report.

On March 14, 2018, the Liabilities Unit at Petróleos Mexicanos dismissed three employees from Sector Pipelines Bajío of Pemex Logistics and barred them from holding public sector positions for ten years for the tapping of diesel in the Tula-Salamanca pipeline in Celaya, Guanajuato. The three employees filed claims against the resolutions under which they were dismissed. Two resolutions have been ratified. A final judgment on the claim against the third resolution is still pending as of the date of this annual report.

On March 27, 2018, the Liabilities Unit at Petróleos Mexicanos suspended an employee from Sector Pipelines Minatitlán of Pemex Logistics. This employee allegedly belongs to an organized network that repeatedly manipulated and altered the valves of the Minatitlán-México pipeline in Acayucan, Veracruz. The suspension of the employee has since been lifted. An investigation by the *Subprocuraduría Especializada en Investigación de Delincuencia Organizada* (Special Prosecutor's Office in Organized Crime Investigation) is pending as of the date of this annual report.

Civil Actions

In the ordinary course of our business, we are a party to a number of lawsuits of various types. We evaluate the merit of each claim and assess the likely outcome, accruing a contingent liability when an unfavorable decision is probable and the amount is reasonably estimable. At December 31, 2017 and 2018, we had accrued a reserve of Ps. 7.8 billion and Ps. 6.5 billion, respectively, for our contingent liabilities in connection with these lawsuits. Our material legal proceedings are described in Note 29 and Note 30 to our audited financial statements included in this report, and those descriptions are incorporated by reference under this Item.

Dividends

Pursuant to the Petróleos Mexicanos Law, as of January 1, 2016, Petróleos Mexicanos and its subsidiary entities are subject to a dividend policy that requires them to pay a state dividend to the Mexican Government on an annual basis. In accordance with the Federal Revenue Law of 2016, the Federal Revenue Law of 2017, the Federal Revenue Law of 2018 and the Federal Revenue Law of 2019, Petróleos Mexicanos was not required to pay a state dividend in 2016, 2017 and 2018 and will not be required to pay a state dividend in 2019. For more information, see “Item 4—Taxes, Duties and Other Payments to the Mexican Government—Fiscal Regime for PEMEX—Other Payments to the Mexican Government.”

Item 9. The Offer and Listing

Trading in the debt securities issued by Petróleos Mexicanos takes place primarily in the over-the-counter market. All the debt securities issued by Petróleos Mexicanos that are registered pursuant to the U.S. Securities Act of 1933 (which we refer to as the Securities Act) are also listed on the Luxembourg Stock Exchange and traded on the Euro MTF market of the Luxembourg Stock Exchange.

Item 10. Additional Information

Memorandum and Articles of Association

The Mexican Congress established Petróleos Mexicanos by a decree dated June 7, 1938, effective July 20, 1938. None of Petróleos Mexicanos or the subsidiary entities has bylaws or articles of association. Petróleos Mexicanos and the subsidiary entities, are public entities of the Mexican Government and each is a legal entity empowered to own property and carry on business in its own name.

The activities of Petróleos Mexicanos and the subsidiary entities are regulated by the Mexican Constitution, the Petróleos Mexicanos Law, Regulations to the Petróleos Mexicanos Law, the Hydrocarbons Law and other federal laws and regulations. See “Item 4—Information on the Company—History and Development.” Under the Petróleos Mexicanos Law, the Board of Directors of Petróleos Mexicanos has the following committees: the Audit Committee, the Human Resources and Compensation Committee, the Strategy and Investment Committee and the Acquisitions, Leasing, Public Works and Services Committee. As of the date of this annual report, the entire Board of Directors of Petróleos Mexicanos is presently acting as our audit committee. See “Item 6—Directors, Senior Management and Employees.”

Under the Petróleos Mexicanos Law and the Regulations to the Petróleos Mexicanos Law, our directors are obligated to abstain from voting on a proposal, arrangement or contract in which they have a personal, family or business interest. Our directors do not have the power to vote compensation to themselves or any other member of the board. Except in the case of the independent board members, our directors do not receive compensation for their services as members of the boards of directors of Petróleos Mexicanos and the subsidiary entities. Under the Petróleos Mexicanos Law, our directors must perform their duties without obtaining or attempting to obtain any benefits greater than those granted by law. Therefore, our directors do not have borrowing powers exercisable by themselves. There is no requirement for early retirement for our directors.

Material Contracts

As of December 31, 2017 and 2018, we have entered into contracts with various contractors for approximate amounts of Ps. 698,905 million and Ps. 483,687 million, respectively. These contracts are for the development of investment projects. See Note 28 to our consolidated financial statements included herein.

On January 27, 2009, Petróleos Mexicanos entered into an indenture with Deutsche Bank Trust Company Americas, as Trustee. This agreement provides for the issuance by Petróleos Mexicanos from time to time of unsecured debt securities. On the same date, Petróleos Mexicanos entered into a distribution agreement with Calyon Securities (USA) Inc. (now known as Credit Agricole Securities (USA) Inc.), Citigroup Global Markets Inc., Citigroup Global Markets Limited, HSBC Securities (USA) Inc. and Santander Investment Securities Inc. pursuant to which Petróleos Mexicanos established a U.S. \$7.0 billion medium-term note, Series C, program. Pursuant to the 1996 guaranty agreement referred to above, Petróleos Mexicanos' obligations under all notes issued under this program are jointly and severally guaranteed by Pemex-Exploration and Production, Pemex-Refining and Pemex-Gas and Basic Petrochemicals. In December 2010, Petróleos Mexicanos appointed Credit Suisse Securities (USA) LLC as an agent under the 2009 distribution agreement referred to above. In each of December 2010 and January 2011, Petróleos Mexicanos increased the size of this program to U.S. \$12.0 billion and U.S. \$22.0 billion, respectively. Petróleos Mexicanos issued U.S. \$3.5 billion of notes and bonds under this program in 2011. In 2012, Petróleos Mexicanos issued U.S. \$5.3 billion of notes and bonds under this program. In 2013, Petróleos Mexicanos increased the size of this program to U.S. \$32.0 billion and issued U.S. \$6.9 billion of notes and bonds under it. In 2014, Petróleos Mexicanos increased the size of this program to U.S. \$42.0 billion and issued U.S. \$7.9 billion of notes and bonds under it. In 2017, Petróleos Mexicanos increased the size of this program to U.S. \$92.0 billion and issued €4.3 billion, U.S. \$5.0 billion and £450.0 million of notes and bonds under it. In 2018, Petróleos Mexicanos increased the size of this program to U.S. \$102.0 billion and issued U.S. \$6.0 billion, €3.15 billion and Swiss francs 365.0 million of notes and bonds under it. See "Item 5—Operating and Financial Review and Prospects—Liquidity and Capital Resources—Financing Activities."

Exchange Controls

Mexico has had a free market for foreign exchange since 1991, and the Mexican Government has allowed the peso to float freely against the U.S. dollar since December 1994. We have no control over or influence on this exchange rate policy. The Mexican Government has announced that it does not intend to change its floating exchange rate policy, but there is no guarantee that the Mexican Government will not change this policy.

Taxation

The 1997 Securities, the 1999 Securities, the 2003 Securities, the 2004 Securities, the 2006 Securities, the 2008 Securities, the 2009 Securities, the 2010 Securities, the 2011 Securities, the 2012 Securities, the 2013 Securities, the 2014 Securities, the 2016 Securities and the 2018 Securities.

As of the date of this annual report, we have registered the following securities with the Securities and Exchange Commission.

Pursuant to a registration statement on Form F-4 (File No. 333-7796), which was declared effective by the SEC on October 17, 1997, Petróleos Mexicanos, Pemex-Exploration and Production, Pemex-Refining and Pemex-Gas and Basic Petrochemicals registered pursuant to the Securities Act up to U.S. \$400,000,000 of 9.50% Global Guaranteed Bonds due 2027, which we refer to as the 1997 Securities. In December 2004 and February 2006, an aggregate amount of U.S. \$376,250,000 of the 1997 Securities were exchanged for bonds issued by the Pemex Project Funding Master Trust (which we refer to as the Master Trust).

Pursuant to a registration statement on Form F-4 (File No. 333-10706), which was declared effective by the SEC on October 1, 1999, Petróleos Mexicanos, Pemex-Exploration and Production, Pemex-Refining and Pemex-Gas and Basic Petrochemicals registered pursuant to the Securities Act up to U.S. \$500,000,000 of 9.50% Puttable or Mandatorily Exchangeable Securities (POMESSM) due 2027, which we refer to as the 1999 Securities. In December 2004 and February 2006, an aggregate amount of U.S. \$421,522,000 of the 1999 Securities were exchanged for POMESSM issued by the Master Trust. All outstanding 1999 Securities of Petróleos Mexicanos were, on March 16, 2006, mandatorily exchanged for 9.50% Global Guaranteed Bonds due 2027 issued by Petróleos Mexicanos, thereby increasing the outstanding amount of the 1997 Securities.

Pursuant to a registration statement on Form F-4 (File No. 333-103197), which was declared effective by the SEC on February 24, 2003, the Master Trust, Petróleos Mexicanos, Pemex-Exploration and Production, Pemex-Refining and Pemex-Gas and Basic Petrochemicals registered pursuant to the Securities Act up to U.S. \$500,000,000 of 8.625% Bonds due 2022. Pursuant to a registration statement on Form F-4 (File No. 333-107905), which was declared effective by the SEC on August 21, 2003, the Master Trust, Petróleos Mexicanos, Pemex-Exploration and Production, Pemex-Refining and Pemex-Gas and Basic Petrochemicals registered pursuant to the Securities Act up to U.S. \$510,154,000 of 8.625% Bonds due 2022. We refer to the securities registered in 2003 under these registration statements as the 2003 Securities.

Pursuant to a registration statement on Form F-4 (File No. 333-118373), which was declared effective by the SEC on August 31, 2004, the Master Trust, Petróleos Mexicanos, Pemex-Exploration and Production, Pemex-Refining and Pemex-Gas and Basic Petrochemicals registered pursuant to the Securities Act up to U.S. \$47,085,000 of 8.625% Bonds due 2022. We refer to the securities registered in 2004 as the 2004 Securities.

Pursuant to a registration statement on Form F-4 (File No. 333-126941), which was declared effective by the SEC on January 13, 2006, the Master Trust, Petróleos Mexicanos, Pemex-Exploration and Production, Pemex-Refining and Pemex-Gas and Basic Petrochemicals registered pursuant to the Securities Act up to U.S. \$228,735,000 of 8.625% Bonds due 2023, U.S. \$354,477,000 of 9.50% Bonds due 2027, U.S. \$403,746,000 of POMESSM due 2027 and U.S. \$500,000,000 of 6.625% Guaranteed Bonds due 2035. Pursuant to a registration statement on Form F-4 (File No. 333-126948), which was declared effective by the SEC on January 13, 2006, the Master Trust, Petróleos Mexicanos, Pemex-Exploration and Production, Pemex-Refining and Pemex-Gas and Basic Petrochemicals registered pursuant to the Securities Act up to U.S. \$21,265,000 of 8.625% Bonds due 2023, U.S. \$45,523,000 of 9.50% Bonds due 2027 and U.S. \$96,254,000 of POMESSM due 2027. All outstanding POMES registered under these registration statements were, on March 15, 2006, mandatorily exchanged for 9.50% Bonds due 2027. Pursuant to a registration statement on Form F-4 (File No. 333-136674), which was declared effective by the SEC on November 3, 2006, the Master Trust, Petróleos Mexicanos, Pemex-Exploration and Production, Pemex-Refining and Pemex-Gas and Basic Petrochemicals registered pursuant to the Securities Act up to U.S. \$751,995,000 of 6.625% Guaranteed Bonds due 2035. We refer to the securities registered in 2006 under these registration statements as the 2006 Securities.

Pursuant to a registration statement on Form F-4 (File No. 333-152486), which was declared effective by the SEC on December 18, 2008, the Master Trust, Petróleos Mexicanos, Pemex-Exploration and Production, Pemex-Refining and Pemex-Gas and Basic Petrochemicals registered pursuant to the Securities Act up to U.S. \$501,000,000 of 6.625% Guaranteed Bonds due 2035 and up to U.S. \$500,000,000 of 6.625% Guaranteed Bonds due 2038. We refer to the securities registered in 2008 as the 2008 Securities.

Pursuant to a registration statement on Form F-4 (File No. 333-160799), which was declared effective by the SEC on August 25, 2009, Petróleos Mexicanos, Pemex-Exploration and Production, Pemex-Refining and Pemex-Gas and Basic Petrochemicals registered pursuant to the Securities Act up to U.S. \$2,000,000,000 of 8.00% Notes due 2019. We refer to the securities registered in 2009 as the 2009 Securities.

Effective as of September 30, 2009, Petróleos Mexicanos assumed, as primary obligor, all of the Master Trust's obligations as issuer of the 2001 Securities, the 2003 Securities, the 2004 Securities, the 2006 Securities and the 2008 Securities. As a result, effective as of September 30, 2009, Petróleos Mexicanos is the issuer of all Registered Securities (as defined below).

Pursuant to a registration statement on Form F-4 (File No. 333-168326), which was declared effective by the SEC on August 31, 2010, Petróleos Mexicanos, Pemex-Exploration and Production, Pemex-Refining and Pemex-Gas and Basic Petrochemicals registered pursuant to the Securities Act up to U.S. \$63,314,000 of 8.00% Notes due 2019, up to U.S. \$1,000,000,000 of 6.000% Notes due 2020, up to U.S. \$2,000,000,000 of 5.50% Notes due 2021 and up to U.S. \$1,000,000,000 of 6.625% Bonds due 2035. We refer to the securities registered in 2010 as the 2010 Securities.

Pursuant to a registration statement on Form F-4 (File No. 333-175821), which was declared effective by the SEC on August 31, 2011, Petróleos Mexicanos, Pemex-Exploration and Production, Pemex-Refining and Pemex-Gas and Basic Petrochemicals registered pursuant to the Securities Act up to U.S. \$1,000,000,000 of 5.50% Notes due 2021 and up to U.S. \$1,250,000,000 of 6.500% Bonds due 2041. We refer to the securities registered in 2011 as the 2011 Securities.

Pursuant to a registration statement on Form F-4 (File No. 333-182553), which was declared effective by the SEC on July 23, 2012, Petróleos Mexicanos, Pemex-Exploration and Production, Pemex-Refining and Pemex-Gas and Basic Petrochemicals registered pursuant to the Securities Act up to U.S. \$2,100,000,000 of 4.875% Notes due 2022 and up to U.S. \$1,750,000,000 of 5.500% Bonds due 2044. We refer to the securities registered in 2012 as the 2012 Securities.

Pursuant to a registration statement on Form F-4/A (File No. 333-189852), which was declared effective by the SEC on July 25, 2013, Petróleos Mexicanos, Pemex-Exploration and Production, Pemex-Refining and Pemex-Gas and Basic Petrochemicals registered pursuant to the Securities Act up to U.S. \$2,100,000,000 of 3.500% Notes due 2023, up to U.S. \$1,000,000,000 of 4.875% Notes due 2024, up to U.S. \$500,000,000 of 6.500% Bonds due 2041 and up to U.S. \$1,000,000,000 of 5.50% Bonds due 2044. We refer to the securities registered in 2013 as the 2013 Securities.

Pursuant to a registration statement on Form F-4 (File No. 333-198588), which was declared effective by the SEC on September 22, 2014, Petróleos Mexicanos, Pemex-Exploration and Production, Pemex-Refining and Pemex-Gas and Basic Petrochemicals registered pursuant to the Securities Act up to U.S. \$500,000,000 of 4.875% Notes due 2024 and up to U.S. \$3,000,000,000 of 6.375% Bonds due 2045. We refer to the securities registered in 2014 as the 2014 Securities.

Pursuant to a registration statement on Form F-4 (File No. 333-205763), which was declared effective by the SEC on February 22, 2016, Petróleos Mexicanos, Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services and Pemex Logistics registered pursuant to the Securities Act up to U.S. \$1,500,000,000 of 3.500% Notes due 2020, up to U.S. \$1,000,000,000 of 4.250% Notes due 2025, \$1,500,000,000 of 4.500% Notes due 2026, up to U.S. \$1,500,000,000 of 5.50% Bonds due 2044 and up to U.S. \$3,000,000,000 of 5.625% Bonds due 2046. Pursuant to a registration statement on Form F-4 (File No. 333-213351), which was declared effective by the SEC on November 11, 2016, Petróleos Mexicanos, Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services and Pemex Logistics registered pursuant to the Securities Act up to U.S. \$1,250,000,000 of 6.375% Notes due 2021, up to U.S. \$2,069,302,000 of 4.625% Notes due 2023, up to U.S. \$3,000,000,000 of 6.875% Notes due 2026, and up to U.S. \$3,500,000,000 of 6.750% Notes due 2047. We refer to the securities registered in 2016 as the 2016 Securities.

Pursuant to a registration statement on Form F-4 (File No. 333-220721), which was declared effective by the SEC on February 22, 2018, Petróleos Mexicanos, Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services and Pemex Logistics registered pursuant to the Securities Act up to U.S. \$1,500,000,000 5.375% Notes due 2022, up to U.S. \$1,000,000,000 Floating Rate Notes due 2022, up to U.S. \$5,500,000,000 6.500% Notes due 2027 and up to U.S. \$2,500,000,000 6.750% Bonds due 2047. Pursuant to a registration statement on Form F-4/A (File No. 333-227508), which was declared effective by the SEC on November 16, 2018, Petróleos Mexicanos, Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services and Pemex Logistics registered pursuant to the Securities Act up to U.S. \$2,500,000,000 5.350% Notes due 2028, up to U.S. \$2,000,000,000 6.500% Notes due 2029 and up to U.S. \$3,328,663,000 6.350% Bonds due 2048. We refer to the securities registered in 2018 as the 2018 Securities and, together with the 1997 Securities, the 2003 Securities, the 2004 Securities, the 2006 Securities, the 2008 Securities, the 2009 Securities, the 2010 Securities, the 2011 Securities, the 2012 Securities, the 2013 Securities, the 2014 Securities and the 2016 Securities, as the Registered Securities.

Taxation Generally

The following summary contains a description of the principal Mexican and U.S. federal income tax consequences of the ownership and disposition of the Registered Securities, but it does not purport to be a comprehensive description of all of the tax considerations that may be relevant to a decision to invest in, or dispose of, the Registered Securities.

This summary is based on the federal tax laws of Mexico and the United States in force on the date of this Form 20-F, including the provisions of the income tax treaty between the United States and Mexico together with related protocols (which are subject to change), and does not describe any tax consequences arising under the laws of any state or municipality in Mexico, the United States or any other jurisdiction, or the laws of any taxing jurisdiction other than the federal laws of Mexico and the United States.

Mexico has also entered into, or is negotiating, tax treaties with various countries that may have effects on holders of Registered Securities. This report does not discuss the consequences (if any) of such treaties.

Each holder or beneficial owner of Registered Securities should consult its tax advisor as to the Mexican, United States or other tax consequences of the ownership and disposition of those securities, including the effect of any foreign, state or municipal tax laws, and the consequences of the application of any tax treaty to which Mexico is a party.

Mexican Taxation

This summary of certain Mexican federal tax considerations refers only to holders of Registered Securities that are not residents of Mexico for Mexican tax purposes and that will not hold the Registered Securities or a beneficial interest therein through a permanent establishment for tax purposes (we refer to any such non-resident holder as a Foreign Holder).

For purposes of Mexican taxation, an individual is a resident of Mexico if he/she has established his/her domicile in Mexico. When an individual also has a place of residence in another country, that individual will be considered a resident of Mexico for tax purposes, if such individual has his/her center of vital interest in Mexico. An individual would be deemed to have his/her center of vital interest in Mexico if, among other things: (a) more than 50% of his/her total income for the year were derived from Mexican sources, or (b) his/her principal center of professional activities were located in Mexico.

A legal entity is a resident of Mexico if:

- it maintains the principal administration of its business in Mexico; or
- it has established its effective management in Mexico.

A Mexican national is presumed to be a resident of Mexico unless such person can demonstrate the contrary. If a legal entity or individual has a permanent establishment in Mexico, such permanent establishment shall be required to pay taxes in Mexico on income attributable to such permanent establishment in accordance with Mexican federal tax law.

Taxation of Interest. Under the Mexican Income Tax Law and rules issued by the Ministry of Finance and Public Credit applicable to PEMEX, payments of interest (which are deemed to include any amounts paid in excess of the original issue price of the relevant securities), made by a Mexican issuer (including Petróleos Mexicanos) in respect of notes or bonds and other debt securities to a Foreign Holder will generally be subject to a Mexican withholding tax assessed at a rate of 4.9%, if the following requirements are met:

- notice relating to the offering of such notes or bonds is given to the CNBV as required under the Securities Market Law and evidence of such notice is timely filed with the Ministry of Finance and Public Credit;
- such notes or bonds are placed outside of Mexico through banks or brokerage houses in a country that is party to a treaty to avoid double taxation with Mexico; and
- the issuer duly complies with the information requirements established in the general rules issued by the Ministry of Finance and Public Credit for such purposes.

If the effective beneficiaries, directly or indirectly, individually or jointly with related parties, receive more than 5% of the interest paid on such notes or bonds and are holders, directly or indirectly, individually or jointly, with related parties of more than 10% of the voting stock of the issuer or entities 20% or more of whose stock is owned directly or indirectly, individually or jointly, by parties related to the issuer, the withholding tax rate applicable to payment of interest on such notes or bonds may be significantly higher.

Payments of interest made by Petróleos Mexicanos or the subsidiary entities, except for Pemex Fertilizers and Pemex Ethylene, in respect of the Registered Securities to non-Mexican pension or retirement funds will be exempt from Mexican withholding taxes, provided that:

- such fund is duly organized pursuant to the laws of its country of origin and is the effective beneficiary of the interest payment;
- the income from such interest payment is exempt from income tax in its country of residence; and
- such fund delivers certain information as per rules issued by the Ministry of Finance and Public Credit.

Additional Amounts. Petróleos Mexicanos and the subsidiary entities, except for Pemex Fertilizers and Pemex Ethylene, have agreed, subject to specified exceptions and limitations, to:

- pay Additional Amounts (as defined in the indenture dated as of September 18, 1997, as supplemented, between Petróleos Mexicanos and Deutsche Bank) to the holders of the 1997 Securities in respect of the Mexican withholding taxes mentioned above;
- pay Additional Amounts (as defined in the indenture dated as of August 7, 1998, as supplemented, between Petróleos Mexicanos and Deutsche Bank) to the holders of the 1998 Securities in respect of the Mexican withholding taxes mentioned above;

- pay Additional Amounts (as defined in the indenture dated as of July 31, 2000, as supplemented, between Petróleos Mexicanos and Deutsche Bank) to the holders of the 2003 Securities and the 2004 Securities in respect of the Mexican withholding taxes described above;
- pay Additional Amounts (as defined in the indenture dated as of December 30, 2004, as supplemented, between Petróleos Mexicanos and Deutsche Bank) to the holders of the 2006 Securities and the 2008 Securities in respect of the Mexican withholding taxes described above; and
- pay Additional Amounts (as defined in the indenture dated as of January 27, 2009, as supplemented, between Petróleos Mexicanos and Deutsche Bank) to the holders of the 2009 Securities, the 2010 Securities, the 2011 Securities, the 2012 Securities, the 2013 Securities, the 2014 Securities and the 2016 Securities in respect of the Mexican withholding taxes described above.

If Petróleos Mexicanos pays Additional Amounts in respect of such Mexican withholding taxes, any refunds received with respect to such Additional Amounts will be for the account of Petróleos Mexicanos.

Holders or beneficial owners of the Registered Securities may be required to provide certain information or documentation necessary to enable Petróleos Mexicanos and the subsidiary entities to apply the appropriate Mexican withholding tax rate applicable to holders or beneficial owners of the Registered Securities. In the event that the specified information or documentation concerning such holder or beneficial owner, if requested, is not provided on a timely basis, the obligation of Petróleos Mexicanos and the subsidiary entities to pay Additional Amounts may be limited.

Taxation of Dispositions. Capital gains resulting from the sale or other disposition of the Registered Securities by a Foreign Holder will not be subject to Mexican income or withholding taxes.

Other Mexican Tax Considerations. Under the Income Tax Law, any discount received by a non-resident upon purchase of the notes or bonds from a Mexican resident or a non-resident with a permanent establishment in Mexico is deemed interest income, and therefore, subject to taxes in Mexico. Such interest income results from the difference between the face value (plus accrued interest not subject to withholding) and the purchase price of such notes or bonds.

Transfer and Other Taxes. There are no Mexican stamp, registration or similar taxes payable by a Foreign Holder in connection with the purchase, ownership or disposition of the Registered Securities. A Foreign Holder of the Registered Securities will not be liable for Mexican estate, succession, gift, inheritance or similar tax with respect to such securities.

United States Taxation

This summary of certain U.S. federal income tax considerations deals principally with persons that hold the Registered Securities as capital assets and whose functional currency is the U.S. dollar. As used in this section “Taxation,” the term “United States Holder” means a beneficial owner of a Registered Security that is an individual who is a citizen or resident of the United States, a U.S. domestic corporation or any other person that is subject to U.S. federal income taxation on a net income basis in respect of its investment in the Registered Securities.

This summary does not purport to be a comprehensive description of all the tax considerations that may be relevant to any particular investor, including tax considerations that arise from rules of general application or that are assumed to be known to investors. This summary generally does not address the tax treatment of holders that may be subject to special tax rules, such as banks, insurance companies, tax-exempt organizations, dealers in securities or currencies, certain short-term holders of Registered Securities, traders in securities electing to mark-to-market, or persons that hedge their exposure in the Registered Securities or hold the Registered Securities as a position in a “straddle” for tax purposes or as part of a “synthetic security” or a “hedging” or “conversion” transaction or other integrated investment comprised of such Registered Securities and one or more other investments, nonresident aliens present in the United States for more than 182 days in a taxable year, U.S. expatriates, entities taxed as partnerships or the partners therein, persons that have a “functional currency” other than the U.S. dollar, nor does it address the tax treatment of holders that did not acquire the Registered Securities at their issue price as part of the initial distribution. Investors who purchased the Registered Securities at a price other than the issue price should consult their tax advisor as to the possible applicability to them of the amortizable bond premium or market discount rules.

In addition, this summary does not discuss the application of the Medicare contribution tax on net investment income or the alternative minimum tax. United States Holders should consult their own tax advisers concerning the U.S. federal, state, local, and other tax consequences of purchasing, owning, and disposing of a Registered Security in their particular circumstances.

United States Holders that use an accrual method of accounting for tax purposes (“accrual method holders”) generally are required to include certain amounts in income no later than the time such amounts are reflected on certain financial statements (the “book/tax conformity rule”). The application of the book/tax conformity rule thus may require the accrual of income earlier than would be the case under the general tax rules described below. It is not clear to what types of income the book/tax conformity rule applies, or in some cases, how the rule is to be applied if it is applicable. Accrual method holders should consult with their tax advisors regarding the potential applicability of the book/tax conformity rule to their particular situation.

Taxation of Interest and Additional Amounts. A United States Holder will treat the gross amount of interest and Additional Amounts (*i.e.*, without reduction for Mexican withholding taxes) as ordinary interest income in respect of the Registered Securities. Mexican withholding taxes paid at the appropriate rate applicable to the United States Holder will be treated as foreign income taxes eligible, subject to generally applicable limitations and conditions, for credit against such United States Holder’s U.S. federal income tax liability, at the election of such United States Holder, or for deduction in computing such United States Holder’s taxable income, provided that the United States Holder does not elect to claim a foreign tax credit for any foreign income taxes paid or accrued for the relevant taxable year. Interest and Additional Amounts will constitute income from sources without the United States and generally will be treated separately along with other items of “passive” income for purposes of determining the credit for foreign income taxes allowed under the Internal Revenue Code of 1986, as amended.

The calculation and availability of foreign tax credits or deductions involves the application of rules that depend on a United States Holder’s particular circumstances. United States Holders should consult their own tax advisors regarding the availability of foreign tax credits and the treatment of Additional Amounts.

Taxation of Dispositions. Upon the sale, exchange or retirement of a Registered Security, a United States Holder will generally recognize a gain or loss equal to the difference between the amount realized (less any amounts attributable to accrued and unpaid interest not previously includible in gross income, which will be taxable as ordinary income) and the holder’s tax basis in such security, which is generally equal to the cost of the Registered Security to the United States Holder. Gain or loss recognized by a United States Holder on the sale, redemption or other disposition of the Registered Securities generally will be long-term capital gain or loss if, at the time of disposition, the securities have been held for more than one year. Long-term capital gain realized by an individual United States Holder is generally taxed at lower rates than short-term capital gains or ordinary income.

Non-United States Holders. Subject to the discussion below under “Backup Withholding and Information Reporting,” holders of the Registered Securities that are not United States Holders (which we refer to as Non-United States Holders) generally will not be subject to U.S. federal income or withholding tax on interest income in respect of the Registered Securities or on any gain realized on the disposition of the Registered Securities.

Backup Withholding and Information Reporting. Information returns may be filed with the Internal Revenue Service with respect to payments made to certain United States Holders of the Registered Securities. In addition, certain United States Holders may be subject to a backup withholding tax in respect of such payments, unless they (1) provide their accurate taxpayer identification numbers to the principal paying agent and certify that they are not subject to backup withholding or (2) otherwise establish an exemption from the backup withholding tax. Backup withholding is not an additional tax. Non-United States Holders may be required to comply with applicable certification procedures to establish that they are not United States Holders in order to avoid the application of such information reporting requirements and backup withholding tax.

Specified Foreign Financial Assets. Certain United States Holders that own “specified foreign financial assets” with an aggregate value in excess of U.S. \$50,000 are generally required to file an information statement along with their tax returns, currently on Form 8938, with respect to such assets. “Specified foreign financial assets” include any financial accounts held at a non-U.S. financial institution, as well as securities issued by a non-U.S. issuer (which would include the Registered Securities) that are not held in accounts maintained by financial institutions. Higher reporting thresholds apply to certain individuals living abroad and to certain married individuals. Regulations extend this reporting requirement to certain entities that are treated as formed or availed of to hold direct or indirect interests in specified foreign financial assets based on certain objective criteria. United States Holders who fail to report the required information could be subject to substantial penalties. In addition, the statute of limitations for assessment of tax would be suspended, in whole or part. Prospective investors should consult their own tax advisors concerning the application of these rules to their investment in the Registered Securities, including the application of the rules to their particular circumstances.

Documents on Display

We are subject to the information requirements of the Exchange Act. In accordance with these requirements, we file reports, including annual reports on Form 20-F, and other information with the SEC. Any filings we make electronically with the SEC will be available to the public over the Internet at the SEC's website at <http://www.sec.gov>. We maintain an Internet site at the following location: <http://www.pemex.com> (this website address is for information only and is not intended to be an active link or to incorporate any website information into this annual report).

Item 11. Quantitative and Qualitative Disclosures About Market Risk

QUALITATIVE DISCLOSURE

Policies for Risk Management and the Use of Derivative Financial Instruments

We face market risk caused by the volatility of hydrocarbon prices, exchange rates and interest rates, credit risk associated with investments and financial derivatives, as well as liquidity risk. In order to monitor and manage these risks, we have approved general provisions relating to financial risk management, which are comprised of policies and guidelines that promote an integrated framework for risk management, regulate the use of DFIs, and guide the development of risk mitigation strategies.

This regulatory framework establishes that DFIs should be used only for the purpose of mitigating financial risk. The use of DFIs for any other purpose must be approved in accordance with our current internal regulation. We have a Financial Risk Working Group (FRWG) which is a specialized working group with decision-making authority on financial risk exposure, financial risk mitigation schemes, and DFIs trading of Petróleos Mexicanos, the subsidiary entities and, where applicable, the subsidiary companies.

In addition, certain PMI Subsidiaries have implemented a regulatory framework for risk management with respect to its activities, which consists of policies, guidelines and procedures to manage the market risk associated with its commodity trading activities in accordance with industry best practices, such as: 1) the use of DFIs for financial risk mitigation purposes; 2) the segregation of duties; 3) valuation and monitoring mechanisms, such as the generation of a daily portfolio risk report, value at risk (VaR) computation; and 4) VaR limits, both at a global and business unit level and the implementation of stop loss mechanisms. In addition, PMI Trading also has its own risk management subcommittee that supervises the trading of DFIs.

Approved DFIs are mainly traded on the over-the-counter (OTC) market; however, exchange traded instruments may also be used. In the case of PMI Trading, DFIs are traded on CME-ClearPort.

The different types of DFIs that we trade are described below in the subsections corresponding to each type of risk and the applicable trading markets. See Note 19 to our consolidated financial statements included herein.

One of our policies is to contribute to minimizing the impact that unfavorable changes in financial risk factors have on our financial results by promoting an adequate balance between incoming cash flows from operations and outgoing cash flows related to our liabilities.

As part of the regulatory framework for financial risk management, we have established the counterparties with which we may trade DFIs and other financial instruments.

Given that the outstanding DFIs of Petróleos Mexicanos have been entered into for risk mitigation purposes, particularly with economic hedging purposes, there is no need to establish and monitor market risk limits.

For those portfolios with an open market risk exposure, our financial risk management regulatory framework establishes the implementation and monitoring of market risk limits such as VaR and capital at risk (an aggregation of fair value or mark-to-market (MtM) and profit and loss (P&L), or CaR).

We have also established credit guidelines for DFIs that Pemex Industrial Transformation offers to its domestic customers, which include the use of guarantees and credit lines. For exchange traded DFIs, we trade under the margin requirements of the corresponding exchange market, and therefore do not have internal policies for these DFIs.

DFIs held with financial counterparties do not require collateral exchange clauses. Notwithstanding, our regulatory framework promotes credit risk mitigation strategies such as collateral exchange

We do not have an independent third party to verify the compliance with these internal standards; however, we have internal control procedures that certify our compliance with existing policies and guidelines.

Description about Valuation Techniques

Fair Value of DFIs

We periodically evaluate our exposure to international hydrocarbon prices, interest rates and foreign currencies, and we use derivative instruments as a mitigation mechanism when potential sources of market risk are identified.

We monitor the fair value of our DFI portfolio on a periodic basis. The fair value represents the price at which one party would assume the rights and obligations of the other, and is calculated for DFIs through models commonly used in the international financial markets, based on inputs obtained from major market information systems and price providers. As such, we do not have an independent third party to value our DFIs.

We calculate the fair value of our DFIs through the tools developed by market information providers such as Bloomberg, and through valuation models implemented in software packages used to integrate all of our business areas and accounting, such as System Applications Products (SAP). We do not have policies to designate a calculation or valuation agent.

Our DFI portfolio is composed primarily of swaps, for which fair value is estimated by projecting future cash flows and discounting them by the corresponding discount factor. For currency options, this is done through the Black Scholes model and, for crude oil options, through the Levy model for Asian options.

Because our hedges are cash flow hedges, their effectiveness is preserved regardless of the variations in the underlying assets or reference variables, thus asset flows are fully offset by liabilities flows. Therefore, it is not necessary to measure or monitor the hedges' effectiveness.

Fair value hierarchy

We value our DFIs using standard methodologies commonly applied in the financial markets. The fair-value assumptions and inputs utilized are classified in the three levels of the fair value hierarchy for market participant assumptions, as described below.

The fair values determined by Level 1 inputs utilize quoted prices in financial markets for identical assets or liabilities. Fair values determined by Level 2 inputs are based on quoted prices for similar assets or liabilities in financial markets, and inputs other than quoted prices that are observed for assets or liabilities. Level 3 inputs are unobservable inputs for the assets or liabilities, and include situations where there is little, if any, market activity for the assets or liabilities. Management uses appropriate valuation techniques based on the available inputs to measure the fair values of our applicable assets and liabilities.

When available, we measure fair value using Level 1 inputs, because they generally provide the most reliable evidence of fair value.

The fair-value assumptions and inputs utilized in the valuation of our DFIs' fair value, fall under Level 2 of the fair value hierarchy.

Liquidity Sources

Liquidity Risk

Our main internal source of liquidity comes from our operations. Additionally, through our debt planning and the purchase and sale of U.S. dollars, we currently preserve a cash balance at a level of liquidity in domestic currency and U.S. dollars that is considered adequate to cover our investment and operating expenses, as well as other payment obligations, such as those related to DFIs.

In addition, as of December 31, 2018, we have acquired committed revolving credit lines in order to mitigate liquidity risk, three of which provide access to Ps. 3,500 million, Ps. 20,000 million and Ps. 9,000 million with expiration dates in June 2019, November 2019 and November 2023, respectively, and three others that provide access to U.S. \$1,500 million, U.S. \$3,250 million and U.S. \$1,950 million with expiration dates in December 2019, February 2020 and January 2021, respectively.

Finally, the investment strategies of our portfolios are structured by selecting time horizons that consider each currency's cash flow requirements in order to preserve liquidity.

Certain PMI Subsidiaries mitigate their liquidity risk through several mechanisms, the most important of which is the centralized treasury or "in-house bank," which provides access to a syndicated credit line for up to U.S. \$ 700 million and cash surplus capacity in the custody of the centralized structure. In addition, certain PMI Subsidiaries have access to bilateral credit lines from financial institutions for up to U.S. \$500 million.

These companies monitor their cash flow on a daily basis and protect their creditworthiness in the financial markets. Liquidity risk is mitigated by monitoring the maximum/minimum permissible financial ratios as set forth in the policies approved by each company's board of directors.

Changes in Exposure to Main Risks

Market Risk

(i) Interest Rate Risk

We are exposed to fluctuations in floating interest rate liabilities. We are exposed to U.S. dollar LIBOR and to Mexican peso TIE. As of December 31, 2018, 15.3% of our total net debt outstanding, including DFIs, consisted of floating rate debt.

Moreover, we invest in pesos and U.S. dollars in compliance with applicable internal regulations, through portfolios that have different purposes that seek an adequate return subject to risk parameters that reduce the probability of capital losses. The objective of the investments made through these portfolios is to meet our obligations payable in pesos and U.S. dollars.

The investments made through our portfolios are exposed to domestic and international interest rate risk and credit spread risk derived from government and corporate securities, and inflation risk arising from the relationship between UDIs and pesos. However, these risks are mitigated by established limits on exposure to market risk.

Interest Rate Swaps

Occasionally, for strategic reasons or in order to offset the expected inflows and outflows, we have entered into interest rate swaps. Under our interest rate swap agreements, we acquire the obligation to make payments based on a fixed interest rate and are entitled to receive floating interest rate payments based on LIBOR, TIE or a rate referenced to or calculated from TIE.

As of December 31, 2018, we were a party to four interest rate swap agreements denominated in U.S. dollars for an aggregate notional amount of U.S. \$1,401.3 million at a weighted average fixed interest rate of 2.4% and a weighted average term of 6.3 years.

Similarly, in order to eliminate the volatility associated with variable interest rates of long-term financing operations, PMI NASA has executed interest rate swap agreements denominated in U.S. dollars for an aggregate notional amount of U.S. \$56.7 million, at a weighted average fixed interest rate of 4.2% and a weighted average term of 3.4 years.

(ii) Exchange Rate Risk

Most of our revenues are denominated in U.S. dollars, a significant amount of which is derived from exports of crude oil and petroleum products, which are priced and payable in U.S. dollars. Additionally, our revenues from domestic sales of gasoline and diesel, net of IEPS Tax, tax duties, incentives, and other related taxes, as well as domestic sales of natural gas and its byproducts, LPG and petrochemicals, are referenced to international U.S. dollar-denominated prices.

Our expenses related to hydrocarbon duties are calculated based on international U.S. dollar-denominated prices and the cost of hydrocarbon imports that we acquire for resale in Mexico or use in our facilities are indexed to international U.S. dollar-denominated prices. By contrast, our capital expenditure and operating expenses are established in pesos.

As a result of this cash flow structure, the depreciation of the peso against the U.S. dollar increases our financial balance. The appreciation of the peso relative to the U.S. dollar has the opposite effect. We manage this risk without the need for hedging instruments, because the impact on our revenues of fluctuations in the exchange rate between the U.S. dollar and the peso is offset in whole or in part by its impact on our obligations.

Cross-Currency Swaps

We prioritize debt issuances denominated in U.S. dollars; nonetheless, this is not always achievable. As such, non-U.S. dollar denominated debt issued in international currencies is hedged through DFIs to mitigate its exchange rate exposure, either by with swaps to convert the debt into U.S. dollars or through other derivative structures. The rest of the debt is denominated in pesos or in UDIs, for which most of the debt denominated in UDIs has been converted into pesos through DFIs in order to eliminate the inflationary risk exposure.

As a consequence of the above, our debt issued in international currencies other than U.S. dollars has exchange rate risk mitigation strategies. We have selected strategies that further seek to reduce our cost of funding by leaving, in some cases, part of this exchange rate exposure unhedged when assessed as appropriate.

The underlying currencies of our DFIs are the euro, Swiss franc, Japanese yen and pound against the U.S. dollar and UDIs against the peso.

As of December 31, 2018, we entered into various cross-currency swaps to hedge inflation risk arising from debt obligations denominated in UDIs for an aggregate notional amount of Ps. 6,844.9 million and, during 2017, we entered into the same kind of instruments to hedge inflation risk arising from debt denominated in UDIs, for an aggregate notional amount of Ps. 6,292.0 million.

In 2018, in order to hedge the notional risk of four debt issues in euros for an aggregate notional amount of € 3,150 million and an issue of debt in Swiss Francs for Fr. 365 million, we entered into, without cost, structures which are composed of a cross-currency swap and the sale of a call option, guaranteeing complete protection up to a certain exchange rate and partial protection above that level.

Moreover, in 2017 we entered into, without cost, three options structures called “*Seagull Option*” to hedge the notional risk of three debt issues in euros for an aggregate notional amount of € 4,250 million. These structures protect the short exposure in euros against an appreciation of the euro versus the U.S. dollar in a specific range, and recognize a benefit if the euro depreciates up to a certain exchange rate, for each debt issue. In order to mitigate the exchange rate risk caused by the coupons of these issues we entered into only coupon swaps.

Additionally, in 2017, we entered into, without cost, a structure which is composed of a cross-currency swap and the sale of a call option, in order to hedge the notional risk of a debt issue in pounds for £ 450 million, guaranteeing complete protection up to a certain exchange rate and partial protection above that level.

We recorded a total net foreign exchange gain of Ps. 23,659.5 million for the year ended December 31, 2018, a total net foreign exchange gain of Ps. 23,184.1 million for the year ended December 31, 2017 and a total net foreign exchange loss of Ps. 254,012.7 million for the year ended December 31, 2016. These gains and losses include unrealized foreign exchange gains associated with debt of Ps. 19,762.2 million for the year ended December 31, 2018 and Ps. 16,685.4 million for the year ended December 31, 2017 and unrealized foreign exchange loss associated with debt of Ps. 243,182.8 million for the year ended December 31, 2016. The appreciation of the peso during 2018 and 2017 caused a total net foreign exchange gain in 2018 because a significant portion of our debt, 89.8% (principal only) as of December 31, 2018, is denominated in foreign currency. Unrealized foreign exchange gains and losses do not impact our cash flows. Due to the cash flow structure described above, the depreciation of the peso relative to the U.S. dollar does not affect our ability to meet U.S. dollar-denominated financial obligations and it improves our ability to meet peso-denominated financial obligations. On the other hand, the appreciation of the peso relative to the U.S. dollar may increase our peso-denominated debt service costs on a U.S. dollar basis. Our foreign exchange gain in 2018 was due to the appreciation of the peso, from Ps. 19.7867 per U.S. \$1.00 on December 31, 2017 to Ps. 19.6829 per U.S. \$1.00 on December 31, 2018. Our foreign exchange gain in 2017 was due to the appreciation of the peso, from Ps. 20.6640 per U.S. \$1.00 on

December 31, 2016 to Ps. 19.7867 per U.S. \$1.00 on December 31, 2017. Our foreign exchange loss in 2016 was due to the depreciation of the peso, from Ps. 17.2065 per U.S. \$1.00 on December 31, 2015 to Ps. 20.6640 per U.S. \$1.00 on December 31, 2016.

Certain of the PMI Subsidiaries face market risks generated by fluctuations in foreign exchange rates. In order to mitigate these risks, the boards of directors of several of these companies have authorized a policy which stipulates that no more than 5% of a company's total financial assets may be denominated in a currency other than its functional currency, unless the company owes a duty or expected payment in a currency other than its functional one. Accordingly, some PMI Subsidiaries will, from time to time, enter into DFIs in order to mitigate the risk associated with financing operations denominated in currencies other than a company's functional currency.

Finally, a significant amount of PMI Trading's income and expenses, including the cost of sales and related sales costs, is derived from the trade of refined products, petrochemicals and gas liquids to our subsidiaries and third parties, whose prices are determined and are payable in U.S. dollars. PMI Trading's exposure to foreign currency risk results primarily from the need to fund tax payments denominated in domestic currency, as well as from certain related sales costs denominated in domestic currency.

PMI Trading believes it can adequately manage the risk created by the payment of taxes in domestic currency without the need to enter into hedging instruments because the exposure to this risk is marginal relative to the total flows of U.S. dollar. In addition, in the event that a potential foreign exchange risk arises in connection with a commercial transaction, PMI Trading may implement risk mitigation measures by entering into DFIs.

(iii) Hydrocarbon Price Risk

We periodically assess our revenues and expenditures structure in order to identify the main market risk factors that our cash flows are exposed to in connection with international hydrocarbon prices. Based on this assessment, we monitor our exposure to the most significant risk factors and quantify their impact on our financial balance.

Our exports and domestic sales are directly or indirectly related to international hydrocarbon prices. Therefore, we are exposed to fluctuations in these prices. In terms of crude oil and natural gas, part of this risk is transferred to the Mexican Government under our current fiscal regime.

Our exposure to hydrocarbon prices is partly mitigated by natural hedges between our inflows and outflows.

Additionally, we continuously evaluate the implementation of risk mitigation strategies, including those involving the use of DFIs, taking into consideration their operative and budgetary feasibility.

Commodity Derivatives

In 2017, the Board of Directors of Petróleos Mexicanos approved the establishment of an annual oil hedging program. Since then, we have implemented hedging strategies to partially protect our cash flows from falls in the Mexican crude oil basket price below the one established in the Federal Revenue Law.

In April 2017, we entered into a crude oil hedge for fiscal year 2017, pursuant to which we hedged 409 thousand barrels per day from May to December of that fiscal year, for U.S. \$133.5 million. Subsequently, during the second half of 2017, we entered into a crude oil hedge for fiscal year 2018, pursuant to which we hedged 440 thousand barrels per day from January to December of that fiscal year, for U.S. \$449.9 million.

During 2018, the crude oil hedge for fiscal year 2019 was implemented, pursuant to which we hedged 320 thousand barrels per day for the period between December 2018 and December 2019, for U.S. \$149.6 million.

In addition to supplying natural gas, Pemex Industrial Transformation offers DFIs to its domestic customers in order to provide them with support to mitigate the risk associated with the volatility of natural gas prices. Until 2016, Pemex Industrial Transformation entered into DFIs with Mex Gas Supply, S.L. under the opposite position to those DFIs offered to its customers in order to mitigate the market risk it bears under such offered DFIs. Mex Gas Supply, S.L. then transferred the related price risk derived from the DFI position held with Pemex Industrial Transformation to international financial counterparties by entering into these opposite position DFIs with such parties. As of 2017, Pemex Industrial Transformation must enter into DFIs with Petróleos Mexicanos under the opposite position to those DFIs offered to its customers, thereby replacing Mex Gas Supply, S.L. However, as of December 31, 2018, no DFIs had been carried out under this mechanism.

Pemex Industrial Transformation maintains a negligible or even null exposure to market risk. These portfolios have VaR and CaR limits in order to limit market risk exposure.

PMI Trading faces market risk generated by the terms of the purchase and sale of refined products and natural gas liquids, as well as the volatility of oil prices. Accordingly, it frequently enters into DFIs in order to mitigate this risk, thereby reducing the volatility of its financial results.

In accordance with the risk management regulatory framework that PMI Trading has implemented, VaR and the change in profit and loss by portfolio are calculated daily and compared to the maximum applicable limits in order to implement risk mitigation mechanisms as necessary.

Counterparty or Credit Risk

When the fair value of a DFI is favorable to us, we face the risk that the counterparty will not be able to meet its obligations. We monitor our counterparties' creditworthiness and calculate the credit risk exposure for our DFIs. As a risk mitigation strategy, we only enter into DFIs with major financial institutions with a minimum credit rating of BBB-. These ratings are issued and revised periodically by risk rating agencies. Furthermore, we seek to maintain a diversified portfolio of counterparties.

In order to estimate our credit risk exposure to each financial counterparty, the potential future exposure is calculated by projecting the risk factors used in the valuation of each DFI in order to estimate the MtM value for different periods, taking into account any credit risk mitigation provisions.

Moreover, we have entered into various long-term cross-currency swaps agreements with "recouping" provisions (pursuant to which the payments on the swaps are adjusted when the MtM exceeds the relevant threshold specified in the swap), thereby limiting our exposure with our counterparties to a specific threshold amount. The specified thresholds were reached in seven cross-currency swaps from the first to the fourth quarter of 2018, which were used to hedge the exchange rate exposure to the euro and to the pound, and in three cross-currency swaps during 2017, which were used to hedge the exchange rate exposure to the euro. This resulted in the cash settlement of such swaps and the resetting of swap terms to return their mark-to-market value to zero. During 2018, we did not enter into any cross-currency swap with these characteristics.

In addition, we have entered into long-term DFIs with mandatory early termination clauses (pursuant to which, at a given date, and irrespective of the then current MtM, the DFI will terminate and settle at the corresponding MtM, and we can either enter into a new DFI with the same counterparty or a new counterparty), which reduces the credit risk generated by the term of the DFI by bounding it to a specific date. As of December 31, 2018, we have entered into two Japanese yen Seagull Option structures, with termination clauses in 2021.

According to IFRS 13 "Fair Value Measurement," the fair value or MtM value of DFIs must reflect the creditworthiness of the parties. Consequently, the fair value of a DFI takes into account the risk that either party may default on its obligation. Due to the above, we apply the credit value adjustment ("CVA") method to calculate the fair value of our DFIs.

For each DFI, the CVA is calculated by determining the difference between the MtM and the estimated MtM adjusted for credit risk. In determining the credit risk, the CVA method takes into account the current market perception about the credit risk of both counterparties, using the following inputs: a) the MtM projection for each payment date based on forward yield curves; b) the implied default probability obtained from both our and the counterparty's credit default swaps at each payment date; and c) the default recovery rates of each counterparty.

Furthermore, by means of its credit guidelines for DFI operations, Pemex Industrial Transformation has significantly reduced its credit risk exposure related to the DFIs offered to its customers to assist them in mitigating the risk associated with the volatility of the natural gas price.

In order to qualify for these DFIs, Pemex Industrial Transformation's customers must be party to a current natural gas supply contract and sign a domestic master derivative agreement.

Additionally, beginning on October 2, 2009, DFIs with these customers must be initially secured by cash deposits, letters of credit or other collateral provisions, as required. In accordance with these guidelines, in the event that a client does not meet its payment obligations, DFIs related to

this client are terminated, rights to collateral are exercised and, if the collateral is insufficient to cover the fair value, natural gas supply is suspended until the payment is made.

On August 20, 2014, certain amendments to the credit guidelines were enacted, which allowed Pemex-Gas and Petrochemicals, and now Pemex Industrial Transformation, to offer to its clients with an adequate credit rating, based on an internal financial and credit assessment, DFIs with an exemption from collateral requirements up to certain amount through a credit line approved by the credit committee. Moreover, if the credit line is insufficient to cover each client's exposure, the client is obligated to deposit collateral. If a client suffers an event of default, DFIs related to this client are terminated early and natural gas supply is suspended until the payment is made.

PMI Trading's credit risk associated with DFI transactions is mitigated through the use of futures and standardized instruments that are cleared through CME-ClearPort.

Accounting Standards Applied and the Impact on Results

We enter into derivatives transactions with the sole purpose of hedging financial risks related to our operations, firm commitments, planned transactions and assets and liabilities recorded on our statement of financial position. Nonetheless, some of these transactions do not qualify for hedge accounting treatment because they do not meet the requirements of the accounting standards for being designated as hedges. They are therefore recorded in the financial statements as non-hedge instruments or as instruments entered into for trading purposes, despite the fact that their cash flows are offset by the cash flows of the positions (assets or liabilities) to which they are related. As a result, the changes in their fair value are recognized in the "Derivative financial instruments (cost) income, net" line item in the consolidated statement of comprehensive income.

As of December 31, 2018 and 2017, the net fair value of our DFIs (including both DFIs that have not reached maturity and those that have reached maturity but have not been settled), recognized in our consolidated statement of financial position, was Ps. 6,487.0 million and Ps. 12,367.5 million, respectively. As of December 31, 2018 and 2017, we did not have any DFIs designated as hedges. See Note 19 to our consolidated financial statements included herein.

For the year ended December 31, 2018, we recognized a net loss of Ps. 22,258.6 million, for the year ended December 31, 2017, we recognized a net gain of Ps. 25,338.3 million and for the year ended December 31, 2016, we recognized a net loss of Ps. 14,001.0 million, in the "Derivative financial instruments (cost) income, net" line item with respect to DFIs treated as instruments entered into for trading purposes.

According to established accounting policies, we have analyzed the different contracts that we have entered into and have determined that according to the terms thereof none of these agreements meet the criteria to be classified as embedded derivatives. Accordingly, as of December 31, 2018 and 2017, we did not recognize any embedded derivatives (foreign currency or index).

As of December 31, 2018, we recognized a loss of Ps. 3,412.7 million in the "Derivative financial instruments (cost) income, net" line item which resulted from changes in the fair value of accounts receivable from the sale of hydrocarbons whose performance obligations have been met and whose determination of the final price is indexed to future prices of the hydrocarbons.

QUANTITATIVE DISCLOSURE

Fair Value

The following tables show our cash flow maturities as well as the fair value of our debt and DFI portfolios as of December 31, 2018. It should be noted that:

- For debt obligations, these tables present principal cash flow and the weighted average interest rates for fixed rate debt.
- For interest rate swaps, cross-currency swaps, currency options and currency forwards, these tables present notional amounts and weighted average interest rates by expected (contractual) maturity dates.
- Weighted average variable rates are based on implied forward rates obtained from the interbank market yield curve at the reporting date.

- For natural gas DFIs, volumes are presented in millions of British thermal units (MMBtu), and fixed average and strike prices are presented in U.S. dollars per MMBtu.
- For crude oil, volumes are presented in millions of barrels, and fixed average and strike prices are presented in U.S. dollars per barrel.
- A DFI's fair value includes CVA and is calculated based on market quotes obtained from market sources such as Bloomberg. Forward curves and implied volatilities for natural gas and crude oil are supplied by Bloomberg.
- For PMI Trading, the prices used in commercial transactions and DFIs are published by reputable sources that are widely used in international markets, such as CME-NYMEX, Platts and Argus, among others.
- Fair value is calculated internally, either by discounting cash flows with the corresponding zero-coupon yield curve in the original currency, or through other standard methodologies commonly used in financial markets for specific instruments.
- For all instruments, the tables are based on the contract terms in order to determine the future cash flows that are categorized by expected maturity dates.

This information is presented in thousands of pesos, except as noted.

Quantitative Disclosure of Debt Cash Flow's Maturities as of December 31, 2018⁽¹⁾

Year of expected maturity date

	2019	2020	2021	2022	2023	2024 thereafter	Total carrying value	Fair value
Liabilities								
Outstanding debt								
Fixed rate (U.S. dollars)	Ps. 53,962,520	Ps. 40,098,959	Ps. 94,686,304	Ps. 83,674,076	Ps. 91,790,092	Ps. 827,719,134	Ps. 1,191,931,085	Ps. 1,084,252,622
Average interest rate (%)							5.8927%	
Fixed rate (Japanese yen)	-	-	-	-	5,379,000	14,317,126	19,696,126	16,603,524
Average interest rate (%)							1.3484%	
Fixed rate (pounds)	-	-	-	8,763,410	-	11,205,575	19,968,985	20,257,139
Average interest rate (%)							5.7248%	
Fixed rate (pesos)	-	10,017,084	20,257,747	1,999,192	-	88,324,131	120,598,154	101,639,764
Average interest rate (%)							7.4872%	
Fixed rate (UDIs)	19,386,459	4,999,710	4,066,182	-	-	31,275,418	59,727,769	51,079,974
Average interest rate (%)							2.7362%	
Fixed rate (euros)	21,466,509	29,215,492	39,343,306	35,884,701	31,437,421	173,348,554	330,695,983	325,772,611
Average interest rate (%)							3.7123%	
Fixed rate (Swiss Francs)	5,991,035	11,966,770	3,001,116	-	7,264,850	-	28,223,771	27,916,889
Average interest rate (%)							1.8697%	
Total fixed rate debt	100,806,523	96,298,015	161,354,655	130,321,379	135,871,363	1,146,189,938	1,770,841,873	1,627,522,522
Variable rate (U.S. dollars)	23,231,281	63,823,350	14,517,807	32,878,778	11,136,784	17,616,801	163,204,801	169,873,202
Variable rate (Japanese yen)	-	11,475,200	-	-	-	-	11,475,200	11,264,120
Variable rate (euros)	-	-	-	-	14,601,014	-	14,601,014	16,093,157
Variable rate (pesos)	34,322,574	18,352,215	8,456,465	8,407,405	6,968,237	12,220,826	88,727,722	88,624,217
Total variable rate debt	57,553,855	93,650,765	22,974,272	41,286,183	32,706,035	29,837,627	278,008,737	285,854,697
Total debt	Ps. 158,360,378	Ps. 189,948,780	Ps. 184,328,927	Ps. 171,607,562	Ps. 168,577,398	Ps. 1,176,027,565	Ps. 2,048,850,610	Ps. 1,913,377,218

Note: Numbers may not total due to rounding.

(1) The information in this table has been calculated using exchange rates at December 31, 2018 of: Ps. 19.6829 = U.S. \$1.00; Ps. 0.17930 = 1.00 Japanese yen; Ps. 25.0878 = 1.00 pound; Ps. 6.226631 = 1.00 UDI; Ps. 22.5054 = 1.00 euro; and Ps. 19.9762 = 1.00 Swiss Franc.

Source: *Petróleos Mexicanos*

Quantitative Disclosure of Cash Flow's Maturities from Derivative Financial Instruments Held or Issued for Purposes Other than Trading as of December 31, 2018^{(1) (2)}

	Year of expected maturity date						Total Notional Amount	Fair Value ⁽³⁾
	2019	2020	2021	2022	2023	2024 Thereafter		
Hedging instruments⁽²⁾⁽⁴⁾								
Interest rate DFIs								
Interest rate swaps								
<i>(U.S. dollars)</i>								
Variable to fixed	Ps. 4,692,574	Ps. 4,706,039	Ps. 4,661,811	Ps. 4,546,095	Ps. 4,406,561	Ps. 5,683,437	Ps. 28,696,517	Ps. 644,746
Average pay rate	3.18%	3.20%	3.22%	3.25%	3.37%	3.74%	N.A.	N.A.
Average receive rate	4.22%	4.07%	3.94%	4.08%	4.40%	5.25%	N.A.	N.A.
Cross-currency swaps								
Receive euros/Pay U.S. dollars	20,782,857	28,568,548	36,709,101	35,121,361	45,930,033	175,091,781	342,203,681	5,495,541
Receive Japanese yen/ Pay U.S. dollars	-	12,971,158	-	-	4,750,499	-	17,721,657	(1,112,629)
Receive pounds/ Pay U.S. dollars	-	-	-	9,819,995	-	11,645,585	21,465,580	(297,318)
Receive UDI/ Pay pesos	23,740,341	7,292,520	3,000,000	-	-	27,450,032	61,482,893	(4,392,093)
Receive Swiss francs/ Pay U.S. dollars	6,466,978	11,488,074	2,978,666	-	7,184,259	-	28,117,977	486,310
Currency Options								
Buy Put, Sell Put and sell Call on Japanese yen	-	-	-	-	-	14,355,685	14,355,685	222,491
Buy call, Sell call and Sell put on euros	-	-	39,497,823	13,542,111	14,670,620	99,308,812	167,019,366	165,458
Sell Call on pound	-	-	-	-	-	11,296,695	11,296,695	(232,636)
Sell Call on Swiss Francs	-	-	-	-	7,315,424	-	7,315,424	(183,093)

N.A.= not applicable.

Numbers may not total due to rounding.

(1) The information in this table has been calculated using exchange rates at December 31, 2018 of: Ps. 19.6829 = U.S. \$1.00 and Ps. 22.5054 = 1.00 euro.

(2) We use these DFIs to hedge market risk; however, these DFIs do not qualify for accounting purposes as hedges and are recorded in the financial statements as entered into for trading purposes.

(3) Positive numbers represent a favorable fair value to us.

(4) PMI's risk management policies and procedures establish that DFIs should be used only for hedging purposes; however DFIs are not recorded as hedges for accounting purposes.

Source: *Petróleos Mexicanos*

Quantitative Disclosure of Cash Flow's Maturities from Derivative Financial Instruments (Natural Gas) Held or Issued for Purposes other than Trading as of December 31, 2018⁽¹⁾⁽²⁾

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u> <u>Thereafter</u>	<u>Total</u> <u>Volume</u>	<u>Fair</u> <u>Value⁽²⁾</u>
	(in MMBtu, except that average fixed and strike prices are in U.S. \$ per MMBtu)					(in thousands of nominal pesos)		
Derivatives entered into with Customers of Pemex Industrial Transformation								
Short								
European Call Option	(13,750)	-	-	-	-	-	(13,750)	3.74
Average strike price	3.65	-	-	-	-	-	3.65	
Variable to Fixed Swap ⁽³⁾	(62,364)	-	-	-	-	-	(62,364)	135.72
Average fixed price	2.99	-	-	-	-	-	2.99	
Long								
European Call Option	13,750	-	-	-	-	-	13,750	(3.74)
Average strike price	3.65	-	-	-	-	-	3.65	
Variable to Fixed Swap ⁽⁴⁾	62,364	-	-	-	-	-	62,364	(107.57)
Average fixed price	2.96	-	-	-	-	-	2.96	
Derivatives entered into with Third Parties to Offset Transactions entered into with Customers								
Short								
European Call Option	(13,750)	-	-	-	-	-	13,750	3.74
Average strike price	3.65	-	-	-	-	-	3.65	
Variable to Fixed Swap ⁽³⁾	(62,364)	-	-	-	-	-	62,364	107.57
Average fixed price	2.96	-	-	-	-	-	2.96	
Long								
European Call Option	13,750	-	-	-	-	-	(13,750)	(3.74)
Average strike price	3.65	-	-	-	-	-	3.65	
Variable to Fixed Swap ⁽⁴⁾	62,364	-	-	-	-	-	(62,364)	(94.14)
Average fixed price	2.95	-	-	-	-	-	2.95	

Notes: Numbers may not total due to rounding.

(1) The information in this table has been calculated using the exchange rate at December 31, 2018 of: Ps. 19.6829 = U.S. \$1.00.

(2) Positive numbers represent a favorable fair value to us.

(3) Under short variable to fixed swaps entered into with customers of Pemex Industrial Transformation, we will pay a variable price and receive the fixed price specified in the contract.

(4) Under long variable to fixed swaps entered into with customers of Pemex Industrial Transformation, we will pay the fixed price specified in the contract and receive a variable price.

Source: Pemex Industrial Transformation

Quantitative Disclosure of Cash Flows' Maturities from Derivative Financial Instruments (Petroleum Products) Held or Issued for Purposes other than Trading as of December 31, 2018⁽¹⁾

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2023</u> <u>Thereafter</u>	<u>Total</u> <u>Volume</u>	<u>Fair</u> <u>Value⁽²⁾</u>
	(in thousands of barrels)							(in thousands of nominal pesos)
Hedging Instruments								
Exchange-traded futures ^{(3) (5)}	2.60	-	-	-	-	-	2.60	441,954
Exchange-traded swaps ^{(4) (5)}	4.92	-	-	-	-	-	4.92	760,603

Note: Numbers may not total due to rounding.

(1) The information in this table has been calculated using the exchange rate at December 31, 2018 of: Ps. 19.6829 = U.S. \$1.00

(2) Positive numbers represent a favorable fair value to PMI Trading.

(3) Net position.

(4) Swaps registered in CME ClearPort are included in these figures.

(5) The balance of these financial instruments is recognized as cash and cash equivalents. PMI Trading considered these financial assets to be fully liquid.

Source: PMI Trading

Sensitivity Analysis

We have entered into DFIs with the purpose to completely mitigate the market risk for specific flows or predetermined volumes associated with our operations. Our DFIs have the same characteristics (e.g. underlying assets, payment dates, amounts, or volumes) as the hedged position, but with the opposite exposure to the market risk factors. As a result of these mitigation strategies, we have a negligible sensitivity to the hedged market risk factors. See Note 19 from our consolidated financial statements included herein.

Given that our hedges are cash flow hedges, their effectiveness is maintained regardless of variations in the underlying assets or reference variables since, through time, asset flows are fully offset by liabilities flows. Therefore, it is not necessary to measure or monitor the hedge effectiveness.

Natural gas DFIs that Pemex Industrial Transformation offers to its domestic customers are reported as transactions with trading purposes. However, such operations are fully compensated by the operations entered into with their financial counterparts through Petróleos Mexicanos, which replaced Mex Gas Supply, S.L. as of 2017. Through this mechanism (back-to-back), Pemex Industrial Transformation maintains a negligible or even null market risk exposure, so we do not consider it necessary to conduct either a sensitivity analysis or to measure or monitor the hedge effectiveness.

Other DFIs seek to hedge the changes in the price of the commercialized products, such that the DFIs' underlying assets have correlations with the prices of the products involved in commercialization. PMI Trading estimates the VaR of these DFIs. Notably, DFIs of PMI Trading (all of them related to petroleum derivatives), are classified under cash and cash equivalents for accounting purposes due to their liquidity.

Item 12. Description of Securities Other than Equity Securities

Not applicable.

PART II

Item 13. Defaults, Dividend Arrearages and Delinquencies

None.

Item 14. Material Modifications to the Rights of Security Holders and Use of Proceeds

None.

Item 15. Controls and Procedures

(a) Disclosure Controls and Procedures

We carried out an evaluation under the supervision and with the participation of our management, including our *Director General* (Chief Executive Officer or CEO) and our *Director Corporativo de Finanzas* (Chief Financial Officer or CFO), of the effectiveness of the design and operation of our disclosure controls and procedures as of December 31, 2018. There are inherent limitations to the effectiveness of any system of disclosure controls and procedures, including the possibility of human error and the circumvention or overriding of the controls and procedures. Accordingly, effective disclosure controls and procedures can provide only reasonable assurance of achieving their control objectives.

Based upon our evaluation, and because of the material weaknesses in internal control over financial reporting described below, our CEO and CFO concluded that our disclosure controls and procedures as of December 31, 2018 were not effective to provide reasonable assurance that information required to be disclosed in the reports we file and submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and that such information is accumulated and communicated to our management, including to our CEO and CFO, as appropriate, to allow timely decisions regarding required disclosures.

(b) Management's Annual Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting. Our internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with IFRS. Our internal control over financial reporting includes those policies and procedures that:

- (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of our assets;
- (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with IFRS and with Item 18 of Form 20-F, and that our receipts and expenditures are being made only in accordance with authorizations of management and directors of the relevant entity; and
- (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on our financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness for future periods are subject to the risk that the related controls may become inadequate because of changes in conditions, or that the degree of compliance with policies or procedures may deteriorate.

We conducted an assessment of the effectiveness of our internal controls over financial reporting as of December 31, 2018. In making this assessment, management used the criteria set for in the "Internal Control—Integrated Framework" published by the Committee of Sponsoring Organizations of the Treadway Commission in 2013, supplemented for information technologies with the guidelines suggested by IT Control Objectives for Sarbanes-Oxley (3rd Edition), published by the Information Systems Audit and Control Association, in effect as of December 31, 2015. Management relied on Auditing Standard No. 2201 of the PCAOB in order to create an appropriate framework to evaluate the effectiveness of the design and operation of our internal control over financial reporting.

Management concluded that our internal control over financial reporting was not effective as of December 31, 2018. Based on our assessment and criteria, management concluded that two material weaknesses existed in connection with our internal control over financial reporting as of December 31, 2018.

Our management concluded that, as of December 31, 2018, a material weakness existed in our internal control over financial reporting due to the ineffectiveness of the design and implementation of controls providing reasonable assurances regarding prevention of unauthorized disposition of assets by having certain employees involved in the illicit market in fuels, which could have a material effect on our financial statements. During 2018, we have experienced a significant increase in non-operating losses resulting from the illicit market in fuels due in part to the ineffectiveness of our internal controls. Although formal governmental procedures exist for reporting illegal activity to the authorities, we did not have in place internal procedures to detect and investigate such matters. For the year ended December 31, 2018, we recognized losses in the amount of Ps. 39.4 billion resulting from the illicit market in fuels.

In response to the material weakness described above, we are in the process of executing a remediation plan that includes, among other things, designing and implementing formal internal procedures to detect and investigate incidents related to the illicit market in fuels in our facilities in order to mitigate the risk that our financial reporting could be affected. We have created a special tip line for the reporting of complaints and put in place further mechanisms dedicated to monitoring and investigating these incidents, and we have allocated additional capital and human resources to these remediation plans. In addition, the Mexican Government has announced additional measures aimed at further preventing and eliminating the illicit market in fuels. See “Item 8—Financial Information—Legal Proceedings—Actions Against the Illicit Market in Fuels.”

Our management also concluded that, as of December 31, 2018, a material weakness existed in our internal control over financial reporting associated with a change in the accounting principle related to the discount rate of long-lived assets, which is used in the calculation of impairment. As a consequence of the lack of consistency in the reporting of, and the failure to timely determine, the amounts of the variables used to calculate the impairment of assets of Ps. 26.0 billion and to review and authorize such calculations, and, in turn, deferred taxes, we were unable to ascertain with reasonable assurance the amount of impairment of assets and deferred taxes at the time that we filed our unaudited consolidated financial statements for the year ended December 31, 2018 with the Mexican Stock Exchange. In connection with the preparation of our audited consolidated financial statements, we were able to determine the definitive amounts of the variables used in the calculation of the impairment of assets and, in turn, deferred taxes. As a result, we recognized additional deferred taxes in the amount of Ps. 20.4 billion in our audited consolidated financial statements included herein, which were not reflected in our unaudited consolidated financial statements filed with the Mexican Stock Exchange.

In response to the material weakness described above, we are in the process of executing a remediation plan that includes the following actions:

- (1) Strengthening of the process for consolidating, reviewing and finalizing the financial statements of Petróleos Mexicanos and its subsidiary entities.
- (2) Strengthening of our controls over changes in accounting policies that may affect our consolidated financial statements so that such changes are disseminated and implemented in a timely manner.
- (3) Updating the relevant internal procedures to ensure the responsibility and oversight of the specific operational areas involved in reporting the underlying information necessary to calculate impairment of assets, including deferred taxes.
- (4) Updating our evaluation and monitoring of the existing internal controls, pursuant to which we submit quarterly reports to our audit committee, in order to ensure that our remediating actions are implemented effectively.

Remediation

We also reported material weaknesses in internal control over financial reporting in our annual reports on Form 20-F for the years ended December 31, 2015 and 2016, both of which related to the calculation of the impairment of our assets, and the year ended December 31, 2017, related to our calculation of recognized deferred taxes at the time that we filed our unaudited consolidated financial statements with the Mexican Stock Exchange.

2017

For the year ended December 31, 2017, we lacked consistency in the reporting of, and failed to timely determine, the amounts of the variables used in the calculation of deferred taxes, and our controls to review and authorize such calculation were ineffective. We were therefore unable to ascertain with reasonable assurance the amount of deferred taxes for the fiscal year ended December 31, 2017. In addition, the calculation of deferred taxes included in our unaudited consolidated financial statements did not take into account new regulations issued by the Ministry of Finance and Public Credit. As a result, our unaudited consolidated financial statements as of and for the year ended December 31, 2017 reflected a net loss in the amount of Ps. 333.4 billion. In connection with the preparation of our audited consolidated financial statements, we were able to determine the definitive amounts of the variables used in the calculation of deferred taxes and performed the calculation in accordance with the new regulations. As a result, we reported a net loss of Ps. 280.9 billion, or Ps. 52.5 billion less than the Ps. 333.4 billion we reported in our unaudited consolidated financial statements. This favorable effect was primarily due to the Ps. 37.2 billion increase in deferred taxes resulting from the implementation of the new regulations issued by the Ministry of Finance and Public Credit.

In response to the material weaknesses described above, we executed remediation plans that, among other things, ensure that we respond adequately and in a timely manner to updated regulatory criteria for the calculation of deferred taxes that may affect our financial reporting, such that this material weakness no longer exists.

2016

For the year ended December 31, 2016, we incorrectly assumed, for purposes of the impairment analysis of our exploration and production cash generating units, the economic landscape related to the two-year life-of-field for certain fields assigned to *Petróleos Mexicanos* on a temporary basis rather than 25-year life-of-field allowed by the CNH. As a result, our unaudited consolidated financial statements as of and for the year ended December 31, 2016 only reflected a net reversal of impairment in the amount of Ps. 246.3 billion. In connection with the preparation of our audited consolidated financial statements as of and for the year ended December 31, 2016, we applied the 25-year life-of-field assumption allowed by the CNH which, combined with the certified reserves data, resulted in a net reversal of impairment in the amount of Ps. 331.3 billion, a difference, while favorable, of Ps. 85.0 billion.

In response to the material weakness described above, in 2017 we remediated the material weakness by executing remediation plans that, among other things, ensure that we apply the accurate life-of-field criteria in the calculation of the impairment of our assets such that this material weakness no longer exists.

2015

For the year ended December 31, 2015, we had not, at the relevant time, established an effective design of processes and procedures to effectively respond to the nature and magnitude of the changes in the economic landscape at such time. In particular, the sharp decline in the price of crude oil in the fourth quarter of 2015 triggered the need to test carrying amounts of our wells, pipelines, properties, plant and equipment for impairment. In performing the tests, the discount rates used were lower than those required by IFRS and those used by peers in the sector and categorized our entire refinery system as a single cash generating unit instead of viewing each refinery as an independent cash-generating unit in order to determine impairment charges with respect to our wells, pipelines, properties, plant and equipment, as required by IFRS. That resulted in an estimation of recoverable amounts of assets that did not accurately reflect operating and economic conditions as of the date of our consolidated financial statements. For the reasons set forth above, those unaudited financial statements reflected only a Ps. 229.1 billion impairment of wells, pipelines, properties, plant and equipment in 2015, Ps. 248.8 billion less than the actual impairment of Ps. 477.9 billion. In addition, at that time, our internal controls did not provide a mechanism that enabled us to ensure that our disclosure regarding our impairment evaluation and our liquidity condition complied with IFRS. In our unaudited financial statements as of and for the fiscal year ended December 31, 2015, we did not appropriately disclose the assumptions for the computation of the impairment, the uncertainties about the estimates used to calculate impairment and the relevant assets impacted by the impairment and issues related to significant doubt about our ability to continue operating as a going concern in accordance with IFRS.

In response to the material weakness described above, we executed remediation plans that, among other things, put in place adequate procedures to respond to the nature and magnitude of changes in the economic environment, including the use of independent cash-generating units to determine the amount of impairment, such that this material weakness no longer exists.

(c) Attestation Report of the Independent Registered Public Accounting Firm

Not applicable.

(d) Changes in Internal Control over Financial Reporting

As discussed above, during 2018, we conducted remediation actions intended to help ensure that we adequately calculate the impairment of our assets and, as a result, deferred taxes, as well as to respond promptly to changes in accounting policies. We also continued to execute the changes made to our internal controls in 2017 and 2016 in order to ensure that we effectively respond to changes in regulatory criteria and business rules for the calculation of impairment of our assets and the nature and magnitude of the changes in the economic landscape.

Except for these changes, there has been no change in our internal control over financial reporting during 2018 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Item 16A. Audit Committee Financial Expert

We do not currently have the necessary number of independent members to form the Audit Committee of our Board of Directors in accordance with the *Petróleos Mexicanos* Law. Thus, the entire Board of Directors of *Petróleos Mexicanos* is presently acting as our audit committee as specified by Section 3(a)(58)(B) of the Exchange Act.

The Board of Directors of *Petróleos Mexicanos* has determined that it does not have an “audit committee financial expert” within the meaning of this Item 16A. We believe that the combined knowledge, skills and experience of the members of our Board of Directors enable them, as a group, to perform their acting responsibilities as members of the audit committee. In addition, the Board of Directors can consult with outside experts as it deems appropriate in order to provide it with advice on matters related to its tasks and responsibilities. See “Item 6—Directors, Senior Management and Employees.” Because we do not have securities listed or quoted on a U.S. exchange, we are not required to comply with the independence requirements established by Rule 10A-3 of the Exchange Act.

Item 16B. Code of Ethics

In accordance with the *Petróleos Mexicanos* Law, on November 2016, we issued the *Código de Ética para Petróleos Mexicanos, sus empresas productivas subsidiarias y empresas filiales* (Code of Ethics for *Petróleos Mexicanos*, its productive subsidiary entities and affiliates, or the Code of Ethics), a code of ethics as defined in Item 16B of Form 20-F under the Exchange Act. Our Code of Ethics applies to the members of the Boards Directors of *Petróleos Mexicanos* and the subsidiary entities and all of our employees, including our Director General, our Chief Financial Officer, our chief accounting officer and all other employees performing similar functions, as well as other individuals and companies whose actions may affect our reputation. The Code of Ethics defines values such as respect, non-discrimination, honesty, loyalty, responsibility, legality, impartiality and integrity, among others, that we expect will help us achieve our goals and which should be reflected in the daily behavior of employees of *Petróleos Mexicanos*.

Our Code of Ethics is available on our website at <http://www.pemex.com>. If we amend the provisions of our Code of Ethics or if we grant any waiver of such provisions, we will disclose such amendment or waiver on our website at the same address.

On December 7, 2016, our Ethics Committee was formed to monitor the implementation and enforcement of the Code of Ethics. See “Item 4—Information on the Company—Business Overview—PEMEX Corporate Matters—Ethics Committee” for more information.

On August 28, 2017, the *Código de Conducta de Petróleos Mexicanos, sus empresas productivas subsidiarias y, en su caso, empresas filiales* (Code of Conduct of *Petróleos Mexicanos*, its productive subsidiary entities and, where applicable, affiliated companies, or the Code of Conduct) was published in the Official Gazette of the Federation. This Code of Conduct delineates behaviors expected of and banned for our employees, in accordance with the values established in the Code of Ethics approved by the Board of the Directors of *Petróleos Mexicanos* in November 2016.

On September 11, 2017, the *Políticas y Lineamientos Anticorrupción para Petróleos Mexicanos, sus empresas productivas subsidiarias y, en su caso, Empresas Filiales* (Anticorruption Policies and Guidelines for *Petróleos Mexicanos*, its productive subsidiary entities and, where applicable,

affiliated companies) and the *Políticas y Lineamientos para el desarrollo de la Debida Diligencia en Petróleos Mexicanos, sus empresas productivas subsidiarias y, en su caso, Empresas Filiales, en Materia de Ética e Integridad Corporativa* (Policies and Guidelines to carry out Due Diligence in Petróleos Mexicanos, its productive subsidiary entities and, where applicable, affiliated companies, in Ethics and Corporate Integrity matters) became effective.

Additionally, we have an Ethics Line and a telephone number available on our website, as a mechanism to provide advice to address questions on ethics and integrity issues within PEMEX and to facilitate receipt of complaints about possible violations to our Code of Ethics or our Code of Conduct. The information received is channeled to the Ethics Committee and the appropriate areas authorized to investigate and, if applicable, pursue cases in accordance with the applicable laws.

We believe that the regulations and mechanisms mentioned above, along with the legal framework applicable to PEMEX, will allow us to improve our ability to mitigate our exposure to bribery and corruption risks in our relationships with third parties. See “Item 3—Key Information—Risk Factors—Risk Factors Related to Our Operations—We are subject to Mexican and international anti-corruption, anti-bribery and anti-money laundering laws. Our failure to comply with these laws could result in penalties, which could harm our reputation, prevent us from obtaining governmental authorizations needed to carry out our operations and have an adverse effect on our business, results of operations and financial condition.”

Item 16C. Principal Accountant Fees and Services

In its meeting held on October 5, 2017, the Board of Directors of Petróleos Mexicanos appointed BDO Mexico as external auditor of Petróleos Mexicanos, its productive state-owned subsidiaries and subsidiary companies for the fiscal year 2017 based on the proposal of the audit committee. The Board of Directors of Petróleos Mexicanos also appointed KPMG Mexico as external auditor of Petróleos Mexicanos, its productive state-owned subsidiaries and subsidiary companies for the fiscal year 2018 based on the proposal of the audit committee. See “Item 6—Directors, Senior Management and Employees—Audit Committee.”

Audit and Non-Audit Fees

The following table sets forth the aggregate fees billed to us for the fiscal year 2017 by BDO Mexico, our independent registered public accounting firm for the year ended December 31, 2017, and by KPMG Mexico, our independent registered public accounting firm for the year ended December 31, 2018.

	Year ended December 31,	
	2017	2018
	(in thousands of nominal pesos)	
Audit fees	Ps. 42,507	Ps. 75,511
Audit-related fees	—	10,167
Tax Fees	—	5,409
All other fees	—	—
Total fees	Ps. 42,507	Ps. 91,087

Audit fees for the year ended December 31, 2017 in the table above are the aggregate fees billed by BDO Mexico and audit fees for the year ended December 31, 2018 in the table above are the aggregate fees billed by KPMG Mexico, in each case for services provided in connection with the audits of our annual financial statements, statutory filings and statutory audits, filings with financial regulators, regulatory filings, limited review of interim financial information, review of public filings of financial information and reviews of documents related to offerings of securities, as well as comfort and consent letters, and services provided in accordance with the instructions of the audit committee.

Audit Committee Approval Policies and Procedures

In accordance with the Petróleos Mexicanos Law, the audit committee nominates the external auditor for approval by the Board of Directors of Petróleos Mexicanos and issues an opinion regarding the external auditor’s report on our financial statements. As we currently do not have the necessary number of independent members to form an the Aaudit Committee, the entire Board of Directors of Petróleos Mexicanos is presently acting as our audit committee within the meaning of Section 3(a)(58)(B) of the Exchange Act. See “Item 6—Directors, Senior Management and Employees—Audit Committee.”

Item 16D. Exemptions from the Listing Standards for Audit Committees

Not applicable.

Item 16E. Purchases of Equity Securities by the Issuer and Affiliated Purchasers

Not applicable.

Item 16F. Change in Registrant's Certifying Accountant

BDO Mexico previously served as our independent registered public accounting firm for the fiscal years ended December 31, 2013 through 2017. In a meeting held on October 5, 2017, the Board of Directors of Petróleos Mexicanos appointed KPMG Mexico as independent registered public accounting firm of Petróleos Mexicanos, its productive state-owned subsidiaries and subsidiary companies for the fiscal year ended December 31, 2018 based on the proposal of the Audit Committee. Our auditor-client relationship with BDO Mexico formally ceased on July 20, 2018. The change of auditor was due to BDO Mexico's completion of the maximum time period for an external auditor to render services to us, as set forth in the criteria issued by the Audit Committee for the performance of services by the external auditor in accordance with Article 23 of the Petróleos Mexicanos Law. See "Item 16C—Principal Accountant Fees and Services—Audit Committee Approval Policies and Procedures."

BDO Mexico's reports with respect to our consolidated financial statements as of and for the years ended December 31, 2016 and 2017 did not contain any adverse opinion or disclaimer of opinion and were not qualified or modified as to uncertainty, audit scope or accounting principles.

During the fiscal years ended December 31, 2016 and 2017 and the subsequent interim period through March 31, 2018, there were no disagreements with BDO Mexico, whether or not resolved, on any matter of accounting principles or practices, financial statement disclosure or auditing scope or procedures, which if not resolved to BDO Mexico's satisfaction would have caused it to make reference to the subject matter of the disagreements in connection with any reports it would have issued.

During the fiscal years ended December 31, 2016 and 2017, there were no "reportable events" as that term is defined in Item 16F(a)(1)(v) of Form 20-F other than the identification of material weaknesses in our internal control over financial reporting as described in our annual report on Form 20-F for the year ended December 31, 2016 (the "2016 20-F") and our annual report on Form 20-F for the year ended December 31, 2017 (the "2017 20-F").

As more fully disclosed in the 2017 20-F, our management concluded that our internal control over financial reporting was not effective as of December 31, 2017 due to a material weakness that affected our calculation of recognized deferred taxes at the time that we filed our unaudited consolidated financial statements with the Mexican Stock Exchange. Due to the lack of consistency in the reporting of, and the failure to timely determine, the amounts of the variables used in the calculation of deferred taxes, and the ineffectiveness of controls to review and authorize such calculation, we were unable to ascertain with reasonable assurance the amount of deferred taxes for the fiscal year ended December 31, 2017. In addition, the calculation of deferred taxes included in our unaudited consolidated financial statements did not take into account new regulations issued by the Ministry of Finance and Public Credit.

Further, as more fully disclosed in the 2016 20-F, our management concluded that our internal control over financial reporting was not effective as of December 31, 2016 due to a material weakness because, when we calculated the impairment effect at the time of our unaudited financial statements, we incorrectly assumed, for purposes of the impairment analysis of our exploration and production cash generating units, the economic landscape related to the two-year life-of-field for those fields assigned to Petróleos Mexicanos on temporary basis pursuant to Round Zero rather than 25-year life-of-field allowed by the CNH.

Our Board of Directors has discussed these material weaknesses with BDO Mexico and we have authorized BDO Mexico to respond fully to the inquiries of the successor independent registered public accounting firm concerning these matters.

We have provided BDO Mexico with a copy of the foregoing disclosure and have requested that BDO Mexico furnish us a letter addressed to the SEC stating whether or not BDO Mexico agrees with such disclosure. A copy of BDO Mexico's letter, dated April 30, 2019, is filed as Exhibit 15.1 to this report.

During the fiscal years ended December 31, 2016 and 2017, we did not consult with KPMG Mexico regarding either (i) the application of accounting principles to a specified transaction, either completed or proposed, or the type of audit opinion that might be rendered on our consolidated financial statements or (ii) any matter that was either the subject of a disagreement or a “reportable event” as that term is defined in Item 16F(a)(1)(v) of Form 20-F. Further, during the fiscal years ended December 31, 2016 and 2017, KPMG Mexico did not provide any written report or oral advice that was an important factor considered by us in reaching a decision as to any such accounting, auditing or financial reporting issue.

Item 16G. Corporate Governance

Not applicable.

Item 16H. Mine Safety Disclosure

Not applicable.

PART III

Item 17. Financial Statements

Not applicable.

Item 18. Financial Statements

See pages F-1 through F-144, incorporated herein by reference.

Item 19. Exhibits. Documents filed as exhibits to this Form 20-F:

- 1.1 [Ley de Petróleos Mexicanos \(Petróleos Mexicanos Law\), effective October 7, 2014 \(English translation\) \(previously filed as Exhibit 1.1 to Petróleos Mexicanos' annual report on Form 20-F \(File No. 0-99\) on April 30, 2015 and incorporated by reference herein\).](#)
- 1.2 [Reglamento de la Ley de Petróleos Mexicanos \(Regulations to the Petróleos Mexicanos Law\), effective November 1, 2014 and as amended as of February 9, 2015 \(English translation\) \(previously filed as Exhibit 1.2 to Petróleos Mexicanos' annual report on Form 20-F \(File No. 0-99\) on April 30, 2015 and incorporated by reference herein\).](#)
- 1.3 [Acuerdo de Creación de la Empresa Productiva del Estado Subsidiaria de Petróleos Mexicanos, denominada Pemex Exploración y Producción \(Creation Resolution of the Productive State-Owned Subsidiary of Petróleos Mexicanos, denominada Pemex Exploración and Production\), effective June 1, 2015 \(English translation\) \(previously filed as Exhibit 3.4 to the Petróleos Mexicanos Registration Statement on Form F-4 \(File No. 333-205763\) on July 21, 2015 and incorporated by reference herein\).](#)
- 1.4 [Acuerdo de Creación de la Empresa Productiva del Estado Subsidiaria de Petróleos Mexicanos, denominada Pemex Cogeneración y Servicios \(Creation Resolution of the Productive State-Owned Subsidiary of Petróleos Mexicanos, denominada Pemex Cogeneración and Services\), effective June 1, 2015 \(English translation\) \(previously filed as Exhibit 3.5 to the Petróleos Mexicanos Registration Statement on Form F-4 \(File No. 333-205763\) on July 21, 2015 and incorporated by reference herein\).](#)
- 1.5 [Acuerdo de Creación de la Empresa Productiva del Estado Subsidiaria de Petróleos Mexicanos, denominada Pemex Perforación y Servicios \(Creation Resolution of the Productive State-Owned Subsidiary of Petróleos Mexicanos, denominada Pemex Drilling and Services\), effective August 1, 2015 \(English translation\) \(previously filed as Exhibit 3.5 to Amendment No. 1 to the Petróleos Mexicanos Registration Statement on Form F-4 \(File No. 333-205763\) on February 8, 2016 and incorporated by reference herein\).](#)
- 1.6 [Acuerdo de Creación de la Empresa Productiva del Estado Subsidiaria de Petróleos Mexicanos, denominada Pemex Logística \(Creation Resolution of the Productive State-Owned Subsidiary of Petróleos Mexicanos, denominada Pemex Logistics\), effective October 1, 2015 \(English translation\) \(previously filed as Exhibit 3.6 to Amendment No. 1 to the Petróleos Mexicanos Registration Statement on Form F-4 \(File No. 333-205763\) on February 8, 2016 and incorporated by reference herein\).](#)
- 1.7 [Acuerdo de Creación de la Empresa Productiva del Estado Subsidiaria de Petróleos Mexicanos, denominada Pemex Transformación Industrial \(Creation Resolution of the Productive State-Owned Subsidiary of Petróleos Mexicanos, denominada Pemex Industrial Transformation\), effective November 1, 2015 \(English translation\) \(previously filed as Exhibit 3.7 to Amendment No. 1 to the Petróleos Mexicanos Registration Statement on Form F-4 \(File No. 333-205763\) on February 8, 2016 and incorporated by reference herein\).](#)
- 1.8 [Adecuación al Acuerdo de Creación de la Empresa Productiva del Estado Subsidiaria de Petróleos Mexicanos, denominada Pemex Exploración y Producción \(Amendment to Creation Resolution of the Productive State-Owned Subsidiary of Petróleos Mexicanos, denominada Pemex Exploración and Production\), effective December 29, 2015 \(English Translation\) \(previously filed as Exhibit 3.4 to the Petróleos Mexicanos Registration Statement on Form F-4 \(File No. 333-220721\) on September 29, 2017 and incorporated by reference herein\).](#)

- 1.9 [Adecuación al Acuerdo de Creación de la Empresa Productiva del Estado Subsidiaria de Petróleos Mexicanos, denominada Pemex Exploración y Producción \(Amendment to Creation Resolution of the Productive State-Owned Subsidiary of Petróleos Mexicanos, denominada Pemex Exploration and Production\), effective May 12, 2016 \(English translation\) \(previously filed as Exhibit 3.4 to the Petróleos Mexicanos Registration Statement on Form F-4 \(File No. 333-213351\) on November 30, 2016 and incorporated by reference herein\).](#)
- 1.10 [Declaratoria de Liquidación y Extinción de Pemex Cogeneración y Servicios, \(Declaration of Liquidation and Extinction of Pemex Cogeneration and Services\), effective July 27, 2018 \(English Translation\).](#)
- 2.1 Indenture, dated as of September 18, 1997, between Petróleos Mexicanos and Deutsche Bank Trust Company Americas (formerly known as Bankers Trust Company) (previously filed as Exhibit 4.1 to the Petróleos Mexicanos Registration Statement on Form F-4 (File No. 333-7796) on October 17, 1997 and incorporated by reference herein). (P)
- 2.2 Indenture, dated as of August 7, 1998, between Petróleos Mexicanos and Deutsche Bank Trust Company Americas (formerly known as Bankers Trust Company) (previously filed as Exhibit 4.1 to the Petróleos Mexicanos Registration Statement on Form F-4 (File No. 333-9310) on August 24, 1998 and incorporated by reference herein). (P)
- 2.3 Indenture, dated as of July 31, 2000, among the Pemex Project Funding Master Trust, Petróleos Mexicanos and Deutsche Bank Trust Company Americas (formerly known as Bankers Trust Company) (previously filed as Exhibit 2.5 to the Petróleos Mexicanos Annual Report on Form 20-F (File No. 0-99) on June 28, 2001 and incorporated by reference herein). (P)
- 2.4 [First supplemental indenture dated as of September 30, 2009, between Petróleos Mexicanos and Deutsche Bank Trust Company Americas, to the indenture dated as of July 31, 2000 \(previously filed as Exhibit 2.4 to the Petróleos Mexicanos Annual Report on Form 20-F \(File No. 0-99\) on June 29, 2010 and incorporated by reference herein\).](#)
- 2.5 [Indenture, dated as of December 30, 2004, among the Pemex Project Funding Master Trust, Petróleos Mexicanos and Deutsche Bank Trust Company Americas \(previously filed as Exhibit 2.7 to Petróleos Mexicanos' Annual Report on Form 20-F \(File No. 0-99\) on June 30, 2005 and incorporated by reference herein\).](#)
- 2.6 [First supplemental indenture dated as of September 30, 2009, between Petróleos Mexicanos and Deutsche Bank Trust Company Americas, to the indenture dated as of December 30, 2004 \(previously filed as Exhibit 2.6 to the Petróleos Mexicanos Annual Report on Form 20-F \(File No. 0-99\) on June 29, 2010 and incorporated by reference herein\).](#)
- 2.7 [Indenture, dated as of January 27, 2009, between Petróleos Mexicanos and Deutsche Bank Trust Company Americas \(previously filed as Exhibit 2.5 to the Petróleos Mexicanos Annual Report on Form 20-F \(File No. 0-99\) on June 30, 2009 and incorporated by reference herein\).](#)
- 2.8 Fiscal Agency Agreement between Petróleos Mexicanos and Deutsche Bank Trust Company Americas (formerly known as Bankers Trust Company), dated as of June 16, 1993, and amended and restated as of February 26, 1998 (previously filed as Exhibit 3.1 to the Petróleos Mexicanos Annual Report on Form 20-F (File No. 0-99) on June 29, 2000 and incorporated by reference herein). (P)
- 2.9 Trust Agreement, dated as of November 10, 1998, among The Bank of New York, The Bank of New York (Delaware) and Petróleos Mexicanos (previously filed as Exhibit 3.1 to the Petróleos Mexicanos Annual Report on Form 20-F (File No. 0-99) on June 30, 1999 and incorporated by reference herein). (P)
- 2.10 [Amendment No. 1, dated as of November 17, 2004, to the Trust Agreement among The Bank of New York, The Bank of New York \(Delaware\) and Petróleos Mexicanos dated as of November 10, 1998 \(previously filed as Exhibit 2.10 to the Petróleos Mexicanos Annual Report on Form 20-F \(File No. 0-99\) on June 30, 2005 and incorporated by reference herein\).](#)

- 2.11 [Amendment No. 2, dated as of December 22, 2004, to the Trust Agreement among The Bank of New York, The Bank of New York \(Delaware\) and Petróleos Mexicanos dated as of November 10, 1998 \(previously filed as Exhibit 2.11 to the Petróleos Mexicanos Annual Report on Form 20-F \(File No. 0-99\) on June 30, 2005 and incorporated by reference herein\).](#)
- 2.12 [Amendment No. 3, dated as of August 17, 2006, to the Trust Agreement among The Bank of New York, The Bank of New York \(Delaware\) and Petróleos Mexicanos dated as of November 10, 1998 \(previously filed as Exhibit 3.4 to the Petróleos Mexicanos Registration Statement on Form F-4/A \(File No. 333-136674\) on October 27, 2006 and incorporated by reference herein\).](#)
- 2.13 Assignment and Indemnity Agreement, dated as of November 10, 1998, among Petróleos Mexicanos, Pemex-Exploración y Producción, Pemex-Refinación, Pemex-Gas y Petroquímica Básica and the Pemex Project Funding Master Trust (previously filed as Exhibit 3.2 to the Petróleos Mexicanos Annual Report on Form 20-F (File No. 0-99) on June 30, 1999 and incorporated by reference herein). (P)
- 2.14 [Amendment No. 1, dated as of August 17, 2006, to the Assignment and Indemnity Agreement among Petróleos Mexicanos, Pemex-Exploración y Producción, Pemex-Refinación, Pemex-Gas y Petroquímica Básica, Pemex-Petroquímica, and the Pemex Project Funding Master Trust dated as of November 10, 1998 \(previously filed as Exhibit 4.7 to the Petróleos Mexicanos Registration Statement on Form F-4/A \(File No. 333-136674-04\) on October 27, 2006 and incorporated by reference herein\).](#)
- 2.15 Guaranty Agreement, dated July 29, 1996, among Petróleos Mexicanos, Pemex-Exploración y Producción, Pemex-Refinación and Pemex-Gas y Petroquímica Básica (previously filed as Exhibit 4.4 to the Petróleos Mexicanos Registration Statement on Form F-4 (File No. 333-7796) on October 17, 1997 and incorporated by reference herein). (P)
- 2.16 [Amendment Agreement dated as of June 24, 2014, between Petróleos Mexicanos and Deutsche Bank Trust Company Americas, amending the terms and conditions of the Petróleos Mexicanos 8.625% Bonds due 2023 issued pursuant to the Fiscal Agency Agreement between Petróleos Mexicanos and Deutsche Bank Trust Company \(as amended and restated\) \(previously filed as Exhibit 4.9 to the Petróleos Mexicanos Registration Statement on Form F-4 \(File No. 333-198588\) on September 5, 2014 and incorporated by reference herein\).](#)
- 2.17 [First supplemental indenture dated as of June 24, 2014, between Petróleos Mexicanos and Deutsche Bank Trust Company Americas, to the indenture dated as of September 18, 1997 \(previously filed as Exhibit 4.10 to the Petróleos Mexicanos Registration Statement on Form F-4 \(File No. 333-198588\) on September 5, 2014 and incorporated by reference herein\).](#)
- 2.18 [First supplemental indenture dated as of June 24, 2014, between Petróleos Mexicanos and Deutsche Bank Trust Company Americas, to the indenture dated as of August 7, 1998 \(previously filed as Exhibit 4.11 to the Petróleos Mexicanos Registration Statement on Form F-4 \(File No. 333-198588\) on September 5, 2014 and incorporated by reference herein\).](#)
- 2.19 [Second supplemental indenture dated as of June 24, 2014, between Petróleos Mexicanos and Deutsche Bank Trust Company Americas, to the indenture dated as of July 31, 2000 \(previously filed as Exhibit 4.12 to the Petróleos Mexicanos Registration Statement on Form F-4 \(File No. 333-198588\) on September 5, 2014 and incorporated by reference herein\).](#)
- 2.20 [Second supplemental indenture dated as of June 24, 2014, between Petróleos Mexicanos and Deutsche Bank Trust Company Americas, to the indenture dated as of December 30, 2004 \(previously filed as Exhibit 4.13 to the Petróleos Mexicanos Registration Statement on Form F-4 \(File No. 333-198588\) on September 5, 2014 and incorporated by reference herein\).](#)
- 2.21 [Fourth supplemental indenture dated as of June 24, 2014, between Petróleos Mexicanos and Deutsche Bank Trust Company Americas, to the indenture dated as of January 27, 2009 \(previously filed as Exhibit 4.14 to the Petróleos Mexicanos Registration Statement on Form F-4 \(File No. 333-198588\) on September 5, 2014 and incorporated by reference herein\).](#)

- 2.22 [Third supplemental indenture dated as of September 10, 2014, between Petróleos Mexicanos and Deutsche Bank Trust Company Americas, to the indenture dated as of July 31, 2000 \(previously filed as Exhibit 2.22 to Petróleos Mexicanos' annual report on Form 20-F \(File No. 0-99\) on April 30, 2015 and incorporated by reference herein\).](#)
- 2.23 [Fifth supplemental indenture dated as of October 15, 2014, between Petróleos Mexicanos and Deutsche Bank Trust Company Americas, to the indenture dated as of January 27, 2009 previously filed as Exhibit 2.23 to Petróleos Mexicanos' annual report on Form 20-F \(File No. 0-99\) on April 30, 2015 and incorporated by reference herein\).](#)
- 2.24 [Sixth supplemental indenture dated as of December 8, 2015 between Petróleos Mexicanos and Deutsche Bank Trust Company Americas, to the indenture dated as of January 27, 2009 \(previously filed as Exhibit 4.17 to Amendment No. 1 to the Petróleos Mexicanos Registration Statement on Form F-4 \(File No. 333-205763\) on February 8, 2016 and incorporated by reference herein\).](#)
- 2.25 [Seventh supplemental indenture dated as of June 14, 2016 between Petróleos Mexicanos and Deutsche Bank Trust Company Americas, to the indenture dated as of January 27, 2009 \(previously filed as Exhibit 4.18 to Amendment No. 1 to the Petróleos Mexicanos Registration Statement on Form F-4 \(File No. 333-213351\) on August 26, 2016 and incorporated by reference herein\).](#)
- 2.26 [Eighth supplemental indenture dated as of February 16, 2018 between Petróleos Mexicanos and Deutsche Bank Trust Company Americas, to the indenture dated as of January 27, 2009.](#)
- 2.27 [Ninth Supplemental Indenture dated as of June 4, 2018 between Petróleos Mexicanos and Deutsche Bank Trust Company Americas, to the indenture dated as of January 27, 2009.](#)

The registrant agrees to furnish to the U.S. Securities and Exchange Commission, upon request, copies of any instruments that define the rights of holders of long-term debt of the registrant that are not filed as exhibits to this report.

- 8.1 [For a list of subsidiaries, their jurisdiction of incorporation and the names under which they do business, see "Consolidated Structure of PEMEX" on page 4.](#)
- 10.1 [Consent letters of GLJ Petroleum Consultants LTD.](#)
- 10.2 [Reports on Reserves Data by GLJ Petroleum Consultants LTD., Independent Qualified Reserves Evaluator or Auditor, as of December 31, 2018.](#)
- 10.3 [Consent letters of Netherland, Sewell International, S. de R.L. de C.V.](#)
- 10.4 [Reports on Reserves Data by Netherland, Sewell International, S. de R.L. de C.V., Independent Qualified Reserves Evaluator or Auditor, as of January 1, 2019.](#)
- 10.5 [Consent letters of DeGolyer and MacNaughton.](#)
- 10.6 [Reports on Reserves Data by DeGolyer and MacNaughton, Independent Qualified Reserves Evaluator or Auditor, as of January 1, 2019.](#)
- 12.1 [CEO Certification pursuant to Rule 13a-14\(a\)/15d-14\(a\).](#)
- 12.2 [CFO Certification pursuant to Rule 13a-14\(a\)/15d-14\(a\).](#)
- 13.1 [Certification pursuant to Rule 13a-14\(b\)/15d-14\(b\) and 18 U.S.C. §1350.](#)
- 15.1 [Letter from Castillo Miranda y Compañía, S.C. addressed to the U.S. Securities and Exchange Commission.](#)
- 101.INS XBRL Instance Document.
- 101.SCH XBRL Taxonomy Extension Schema Document.
- 101.CAL XBRL Taxonomy Extension Calculation Linkbase Document.

- 101.DEF XBRL Taxonomy Extension Definition Linkbase Document.
- 101.LAB XBRL Taxonomy Extension Label Linkbase Document.
- 101.PRE XBRL Taxonomy Extension Presentation Linkbase Document.

(P) Filed via paper.

SIGNATURE

Pursuant to the requirements of Section 12 of the Securities Exchange Act of 1934, as amended, the registrant hereby certifies that it meets all of the requirements for filing on Form 20-F and has duly caused and authorized the undersigned to sign this annual report on its behalf.

PETRÓLEOS MEXICANOS

By: /s/ ALBERTO VELÁZQUEZ GARCÍA
Name: Alberto Velázquez García
Title: Chief Financial Officer/Corporate
Director of Finance

Date: April 30, 2019

**PETRÓLEOS MEXICANOS,
PRODUCTIVE STATE-OWNED SUBSIDIARIES
AND SUBSIDIARY COMPANIES**

**CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2018, 2017 AND 2016 AND
REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

PETRÓLEOS MEXICANOS, PRODUCTIVE STATE-OWNED SUBSIDIARIES
AND SUBSIDIARY COMPANIES

CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2018, 2017 AND 2016

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Report of Independent Registered Public Accounting Firm

To the Board of Directors of
Petróleos Mexicanos, Productive State-Owned Company:

(figures stated in thousands of pesos)

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated statement of financial position of Petróleos Mexicanos, Productive State-Owned Subsidiaries and Subsidiary Companies (PEMEX) as of December 31, 2018, the related consolidated statements of comprehensive income, changes in equity (deficit), and cash flows for the year ended December 31, 2018, and the related notes collectively, the consolidated financial statements. In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of PEMEX as of December 31, 2018, and the results of its operations and its cash flows for the year ended December 31, 2018, in conformity with International Financial Reporting Standard as issued by the International Accounting Standards Board.

Going Concern

The accompanying consolidated financial statements have been prepared assuming that PEMEX will continue as a going concern. As discussed in Note 24 e) to the consolidated financial statements, PEMEX has suffered recurring losses from operations, has a net capital deficiency and net equity deficit. These issues, together with its fiscal regime, the significant increase in its indebtedness and the reduction of its working capital raise substantial doubt about its ability to continue as a going concern. Management's plans in regard to these matters are also described in Note 24 e). The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Change in Accounting Principle

As discussed in note 15 to the consolidated financial statements, in 2018 PEMEX has elected to change its method of computing the discount rate applied to cash flows derived from its oil and gas production activities for the impairment calculation of long lived assets, related to exploration and production cash generating units.

Illicit fuel market Non-operating losses

As discussed in note 25 to the consolidated financial statements, transportation of hydrocarbons and other products through the pipeline network is affected by unauthorized subtractions resulting in an illicit fuel market risk. These non-operating losses significantly increased 71.8% during 2018, representing a total cost of \$39,439,107 at December 31, 2018.

(Continued)

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audit. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. PEMEX is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audit, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audit included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG CÁRDENAS DOSAL, S.C.

We have served as PEMEX's auditor since 2018

Mexico City, April 30, 2019

Report of Independent Registered Public Accounting Firm

The Board of Directors
Petróleos Mexicanos

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated statement of financial position of Petróleos Mexicanos, Productive State-Owned Subsidiaries and Subsidiary Companies (“PEMEX”) as of December 31, 2017 and 2016, and the related consolidated statements of comprehensive income, changes in equity (deficit), and cash flows for each of the two years in the period ended December 31, 2017, and the related notes (collectively referred to as the “consolidated financial statements”). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of Petróleos Mexicanos, Productive State-Owned Subsidiaries and Subsidiary Companies as of December 31, 2017 and 2016, and the consolidated results of their operations and their cash flows for each of the two years in the period ended December 31, 2017, in conformity with International Financial Reporting Standards as issued by the International Accounting Standards Board (“IASB”).

Going concern

The accompanying consolidated financial statements have been prepared assuming that PEMEX will continue as a going concern. As described in Note 2-b to the consolidated financial statements, PEMEX has suffered recurring losses from operations, has a working capital deficiency and a net equity deficit. As stated in Note 2-b, these events or conditions, along with other matters as set forth in such Note, indicate that a material uncertainty exists that may cast significant doubt on the PEMEX’s ability to continue as a going concern. Management’s plans in regard to these matters are also described in Note 2-b. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company’s management. Our responsibility is to express an opinion on the PEMEX’s consolidated financial statement based on our audit. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (“PCAOB”) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB and in accordance with International Standards on Auditing issued by International Federation of Accountants. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audit included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audit provides a reasonable basis for our opinion.

CASTILLO MIRANDA Y COMPAÑÍA, S. C.

/s/ JOSE LUIS VILLALOBOS ZUAZUA

C.P.C. Jose Luis Villalobos Zuazua

Mexico City,
April 30, 2018

PETRÓLEOS MEXICANOS, PRODUCTIVE STATE-OWNED SUBSIDIARIES AND SUBSIDIARY COMPANIES
CONSOLIDATED STATEMENTS OF FINANCIAL POSITION
AS OF DECEMBER 31, 2018 AND 2017
(FIGURES STATED IN THOUSANDS, EXCEPT AS NOTED)

	Note	December 31, 2018 (Unaudited; U.S. dollars)	December 31, 2018	December 31, 2017
ASSETS				
Current assets:				
Cash and cash equivalents	8,9	U.S. \$ 4,161,603	Ps. 81,912,409	Ps. 97,851,754
Accounts receivable, net	8,10	8,491,624	167,139,778	168,123,028
Inventories	11	4,167,199	82,022,568	63,858,930
Current portion of notes receivable	8,17-a	1,938,426	38,153,851	2,522,206
Held—for—sale non—financial assets	13	63,692	1,253,638	—
Equity instruments	8,12	12,470	245,440	1,056,918
Derivative financial instruments	8,19	1,137,143	22,382,277	30,113,454
Total current assets		19,972,157	393,109,961	363,526,290
Non-current assets:				
Investments in joint ventures and associates	14	855,643	16,841,545	16,707,364
Wells, pipelines, properties, plant and equipment, net	15	71,254,037	1,402,486,084	1,436,509,326
Long-term notes receivable, net of current portion	8,17-a	6,087,954	119,828,598	148,492,909
Deferred income taxes and duties	23	6,238,142	122,784,730	146,192,485
Intangible assets, net	16	697,079	13,720,540	14,678,640
Other assets	17-b	326,467	6,425,810	5,895,100
Total non-current assets		85,459,322	1,682,087,307	1,768,475,824
Total assets		<u>U.S. \$105,431,479</u>	<u>Ps. 2,075,197,268</u>	<u>Ps. 2,132,002,114</u>
LIABILITIES				
Current liabilities:				
Short-term debt and current portion of long—term debt	8,18	U.S. \$ 9,744,281	Ps. 191,795,709	Ps. 157,209,467
Suppliers		7,612,837	149,842,712	139,955,378
Taxes and duties payable	23	3,318,869	65,324,959	51,004,960
Accounts and accrued expenses payable	8	1,265,955	24,917,669	23,211,401
Derivative financial instruments	8,19	807,566	15,895,245	17,745,979
Total current liabilities		<u>22,749,508</u>	<u>447,776,294</u>	<u>389,127,185</u>
Long-term liabilities:				
Long-term debt, net of current portion	8,18	96,047,351	1,890,490,407	1,880,665,604
Employee benefits	20	54,897,502	1,080,542,046	1,258,436,122
Provisions for sundry creditors	21	5,169,627	101,753,256	87,677,423
Other liabilities		484,095	9,528,385	14,194,237
Deferred taxes	23	229,250	4,512,312	4,253,928
Total long-term liabilities		<u>156,827,825</u>	<u>3,086,826,406</u>	<u>3,245,227,314</u>
Total liabilities		<u>U.S. \$179,577,333</u>	<u>Ps. 3,534,602,700</u>	<u>Ps. 3,634,354,499</u>
EQUITY (DEFICIT)				
Controlling interest:				
Certificates of Contribution “A”		U.S. \$ 18,114,427	Ps. 356,544,447	Ps. 356,544,447
Mexican Government contributions		2,221,755	43,730,591	43,730,591
Legal reserve		50,914	1,002,130	1,002,130
Accumulated other comprehensive result		3,655,308	71,947,067	(151,887,182)
Accumulated deficit:				
From prior years		(89,048,485)	(1,752,732,435)	(1,471,862,579)
Net loss for the year		(9,164,013)	(180,374,350)	(280,844,899)
Total controlling interest		<u>(74,170,094)</u>	<u>(1,459,882,550)</u>	<u>(1,503,317,492)</u>
Total non-controlling interest		24,240	477,118	965,107
Total equity (deficit)		<u>U.S. \$ (74,145,854)</u>	<u>Ps. (1,459,405,432)</u>	<u>Ps. (1,502,352,385)</u>
Total liabilities and equity (deficit)		<u>U.S. \$105,431,479</u>	<u>Ps. 2,075,197,268</u>	<u>Ps. 2,132,002,114</u>

The accompanying notes are an integral part of these consolidated financial statements.

PETRÓLEOS MEXICANOS, PRODUCTIVE STATE-OWNED SUBSIDIARIES AND SUBSIDIARY COMPANIES
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
FOR THE YEARS ENDED DECEMBER 31, 2018, 2017 AND 2016
(Figures stated in thousands, except as noted)

	Note	2018 (Unaudited; U.S. dollars)	2018	2017	2016
Net sales:					
Domestic	7	U.S. \$49,817,839	Ps. 980,559,538	Ps. 877,360,038	Ps. 670,000,473
Export	7	35,151,660	691,886,610	508,539,112	395,118,117
Services income	7	440,636	8,673,002	11,130,569	8,974,642
Total of sales		85,410,135	1,681,119,150	1,397,029,719	1,074,093,232
(Reversal) impairment of wells, pipelines, properties, plant and equipment, net	15-e	(1,088,203)	(21,418,997)	151,444,560	(331,314,343)
Cost of sales	25	60,941,810	1,199,511,561	1,004,204,880	865,822,221
Gross income		25,556,528	503,026,586	241,380,279	539,585,354
Other revenues, net	26	1,171,195	23,052,511	5,174,076	22,649,606
General expenses:					
Distribution, transportation and sale expenses	25	1,207,868	23,774,354	21,889,670	25,231,240
Administrative expenses	25	6,824,273	134,321,481	119,939,454	112,653,533
Impairment of accounts receivables	10	29,613	582,855	—	—
Operating income		18,665,969	367,400,407	104,725,231	424,350,187
Financing income ¹		1,603,276	31,557,122	16,165,853	13,749,255
Financing cost ²		(6,133,599)	(120,727,022)	(117,644,548)	(98,844,464)
Derivative financial instruments (cost) income, net		(1,130,860)	(22,258,613)	25,338,324	(14,000,987)
Foreign exchange gain (loss), net		1,202,032	23,659,480	23,184,122	(254,012,743)
		(4,459,151)	(87,769,033)	(52,956,249)	(353,108,939)
Profit sharing in joint ventures and associates	14	77,581	1,527,012	360,440	2,135,845
Income before duties, taxes and other		14,284,399	281,158,386	52,129,422	73,377,093
Profit sharing duty, net	23	23,875,221	469,933,595	338,044,209	277,161,804
Income tax benefit	23	(424,499)	(8,355,372)	(5,064,168)	(12,640,369)
Total duties, taxes and other		23,450,722	461,578,223	332,980,041	264,521,435
Net loss		(9,166,323)	(180,419,837)	(280,850,619)	(191,144,342)
Other comprehensive results:					
Items that will be reclassified subsequently to profit or loss:					
Currency translation effect		42,991	846,191	(6,096,459)	21,386,903
Available-for-sale financial assets		—	—	5,564,130	207,817
Items that will not be reclassified subsequently to profit or loss:					
Actuarial gains—employee benefits		11,306,543	222,545,556	12,038,710	106,277,761
Total other comprehensive results		11,349,534	223,391,747	11,506,381	127,872,481
Total comprehensive loss		U.S. \$ 2,183,211	Ps. 42,971,910	Ps. (269,344,238)	Ps. (63,271,861)
Net loss attributable to:					
Controlling interest		U.S. \$ (9,164,013)	Ps. (180,374,350)	Ps. (280,844,899)	Ps. (191,645,606)
Non-controlling interest		(2,310)	(45,487)	(5,720)	501,264
Net loss		U.S. \$ (9,166,323)	Ps. (180,419,837)	Ps. (280,850,619)	Ps. (191,144,342)
Other comprehensive results attributable to:					
Controlling interest		U.S. \$11,372,016	Ps. 223,834,249	Ps. 11,512,259	Ps. 127,650,318
Non-controlling interest		(22,482)	(442,502)	(5,878)	222,163
Total other comprehensive results		U.S. \$11,349,534	Ps. 223,391,747	Ps. 11,506,381	Ps. 127,872,481
Comprehensive (loss) income:					
Controlling interest		U.S. \$ 2,208,003	Ps. 43,459,899	Ps. (269,332,640)	Ps. (63,995,288)
Non-controlling interest		(24,792)	(487,989)	(11,598)	723,427
Total comprehensive loss		U.S. \$ 2,183,211	Ps. 42,971,910	Ps. (269,344,238)	Ps. (63,271,861)

The accompanying notes are an integral part of these consolidated financial statements.

¹ Includes financing income from investments and gain on discount rate of plugging of wells in 2018, 2017 and 2016.

² Mainly interest on debt.

PETROLÉOS MEXICANOS, PRODUCTIVE STATE-OWNED SUBSIDIARIES AND SUBSIDIARY COMPANIES

**CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY (DEFICIT)
FOR THE YEARS ENDED DECEMBER 31, 2018, 2017 AND 2016**
(Figures stated in thousands, except as noted)
(See Note 24)

	Controlling interest										Non controlling interest	Total Equity (deficit), net
	Certificates of Contribution "A"	Mexican Government contributions	Legal reserve	Available-for-sale financial assets	Accumulated other comprehensive income (loss)	Cumulative currency translation effect	Actuarial (losses) gains on employee benefits effect	Accumulated deficit		Total		
For the year								From prior years				
Balance as of January 1, 2016	Ps. 194,604,835	Ps. 43,730,591	Ps. 1,002,130	Ps. (5,771,947)	Ps. 29,550,360	Ps. (329,801,386)	Ps. (712,434,997)	Ps. (552,808,762)	Ps. (1,331,929,176)	Ps. 253,278	Ps. (1,331,675,898)	
Transfer to accumulated deficit	—	—	—	—	—	—	712,434,997	(712,434,997)	—	—	—	
Increase in Certificates of Contribution "A"	161,939,612	—	—	—	—	—	—	—	161,939,612	—	161,939,612	
Reclassification of other comprehensive income	—	—	—	—	14,973,214	—	—	(14,973,214)	—	—	—	
Total comprehensive income (loss)	—	—	—	207,817	21,169,662	106,272,839	(191,645,606)	—	(63,995,288)	723,427	(63,271,861)	
Balance as of December 31, 2016	Ps. 356,544,447	Ps. 43,730,591	Ps. 1,002,130	Ps. (5,564,130)	Ps. 50,720,022	Ps. (208,555,333)	Ps. (191,645,606)	Ps. (1,280,216,973)	Ps. (1,233,984,852)	Ps. 976,705	Ps. (1,233,008,147)	
Transfer to accumulated deficit	—	—	—	—	—	—	191,645,606	(191,645,606)	—	—	—	
Total comprehensive income (loss)	—	—	—	5,564,130	(6,087,010)	12,033,139	(280,844,899)	—	(269,332,640)	(11,598)	(269,344,238)	
Balance as of December 31, 2017	Ps. 356,544,447	Ps. 43,730,591	Ps. 1,002,130	Ps. —	Ps. 44,633,012	Ps. (196,520,194)	Ps. (280,844,899)	Ps. (1,471,862,579)	Ps. (1,503,317,492)	Ps. 965,107	Ps. (1,502,352,385)	
Initial effect by the adoption of IFRS 9 (Note 4b)	—	—	—	—	—	—	—	(24,957)	(24,957)	—	(24,957)	
Balance adjusted as of January 1, 2018	Ps. 356,544,447	Ps. 43,730,591	Ps. 1,002,130	Ps. —	Ps. 44,633,012	Ps. (196,520,194)	Ps. (280,844,899)	Ps. (1,471,887,536)	Ps. (1,503,342,449)	Ps. 965,107	Ps. (1,502,377,342)	
Transfer to accumulated deficit	—	—	—	—	—	—	280,844,899	(280,844,899)	—	—	—	
Total comprehensive income (loss)	—	—	—	—	1,287,215	222,547,034	(180,374,350)	—	43,459,899	(487,989)	42,971,910	
Balance as of December 31, 2018	Ps. 356,544,447	Ps. 43,730,591	Ps. 1,002,130	Ps. —	Ps. 45,920,227	Ps. 26,026,840	Ps. (180,374,350)	Ps. (1,757,732,435)	Ps. (1,459,882,550)	Ps. 477,118	Ps. (1,459,405,432)	
Balance as of December 31, 2018 (Unaudited U.S. dollars)	U.S.\$ 18,114,427	U.S.\$ 2,221,755	U.S.\$ 50,914	U.S.\$ —	U.S.\$ 2,333,001	U.S.\$ 1,322,307	U.S.\$ (9,164,013)	U.S.\$ (89,048,485)	U.S.\$ (74,170,094)	U.S.\$ 24,240	U.S.\$ (74,145,854)	

The accompanying notes are an integral part of these consolidated financial statements.

PETRÓLEOS MEXICANOS, PRODUCTIVE STATE-OWNED SUBSIDIARIES AND SUBSIDIARY COMPANIES

**CONSOLIDATED STATEMENTS OF CASH FLOWS
FOR THE YEARS ENDED DECEMBER 31, 2018, 2017 AND 2016**

(Figures stated in thousands, except as noted)

	<u>2018</u> (Unaudited; U.S. dollars)	<u>2018</u>	<u>2017</u>	<u>2016</u>
Operating activities				
Net loss	(9,166,323)	(180,419,837)	(280,850,619)	(191,144,342)
Items related to investment activities				
Depreciation and amortization	7,792,655	153,382,040	156,704,513	150,439,491
Amortization of intangible assets	134,296	2,643,326	—	—
(Reversal) impairment of wells, pipelines, properties, plant and equipment	(1,088,203)	(21,418,997)	151,444,560	(331,314,343)
Unsuccessful wells	784,594	15,443,086	6,164,624	29,106,084
Exploration costs	(110,310)	(2,171,218)	(1,447,761)	(2,022,826)
Loss from derecognition of disposal of wells, pipelines, properties, plant and equipment	857,865	16,885,264	17,063,671	3,771,287
Disposal of held—for—sale current non—financial assets	—	—	2,808,360	—
Loss in sale of fixed assets	—	—	—	27,882,480
Net loss on available-for-sale financial assets	—	—	3,523,748	—
Decrease on available-for-sale financial assets	—	—	1,360,205	—
(Gain) on sale of share in joint ventures and associates	(35,623)	(701,171)	(3,139,103)	(15,211,039)
Impairment of goodwill	—	—	—	4,007,018
Effects of net present value of reserve for well abandonment	(353,261)	(6,953,200)	7,774,000	11,968,966
Profit sharing in joint ventures and associates	(77,581)	(1,527,012)	(360,440)	(2,135,845)
Dividends	—	—	(180,675)	(293,397)
Items related to financing activities				
Unrealized foreign exchange (income) loss	(1,004,029)	(19,762,208)	(16,685,439)	243,182,764
Interest expense	6,133,599	120,727,022	117,644,548	98,844,464
Interest income	(483,717)	(9,520,962)	—	—
	<u>3,383,962</u>	<u>66,606,133</u>	<u>161,824,192</u>	<u>27,080,762</u>
Funds used in operating activities				
Profit sharing duty and income tax	22,690,377	446,612,429	375,258,833	311,015,217
Taxes and duties paid	(22,546,741)	(443,785,240)	(372,240,560)	(303,593,175)
Derivative financial instruments	298,759	5,880,442	(38,377,961)	310,905
Accounts receivable	(14,556)	(286,509)	(27,124,228)	(55,104,439)
Long-term accounts receivable	—	—	114,693	(3,277,724)
Intangible assets	—	—	(5,166,184)	(19,745,821)
Inventories	(922,813)	(18,163,638)	(17,966,870)	(1,358,878)
Other assets	(26,963)	(530,711)	(1,972,532)	(2,104,985)
Accounts payable and accrued expenses	86,688	1,706,268	4,544,794	3,097,660
Suppliers	502,331	9,887,334	(11,694,162)	(15,664,703)
Provisions for sundry creditors	(302,311)	(5,950,348)	(7,266,629)	15,585,374
Employee benefits	2,723,424	53,604,884	50,065,396	47,293,069
Other taxes and duties	1,331,386	26,205,546	(46,601,312)	(45,431,344)
Net cash flows from (used in) operating activities	<u>7,203,544</u>	<u>141,786,590</u>	<u>63,397,470</u>	<u>(41,898,082)</u>
Investing activities				
Long-term receivables from the Mexican Government	120,107	2,364,053	—	—
Resources from the sale of available-for-sale financial assets	—	—	8,026,836	—
Interest received for long-term receivable from the Mexican Government	9,532	187,615	—	—
Other notes receivable	63,342	1,246,763	—	—
Proceeds from the sale of associates	207,202	4,078,344	3,141,710	22,684,736
Proceeds from the sale of fixed assets	—	—	—	560,665
Business acquisition	—	—	—	(4,329,769)
Acquisition of wells, pipelines, properties, plant and equipment	(4,775,902)	(94,003,596)	(91,859,465)	(151,408,481)
Intangible assets	(759,903)	(14,957,093)	—	—
Net cash flows used in investing activities	<u>(5,135,622)</u>	<u>(101,083,914)</u>	<u>(80,690,919)</u>	<u>(132,492,849)</u>
Excess cash to apply in financing activities	2,067,922	40,702,676	(17,293,449)	(174,390,931)
Financing activities				
Increase in equity due to Certificates of Contribution "A"	—	—	—	73,500,000
Loans obtained from financial institutions	45,713,234	899,769,012	704,715,468	841,991,767
Debt payments, principal only	(42,729,140)	(841,033,392)	(642,059,819)	(614,987,329)

Interest paid	<u>(5,857,338)</u>	<u>(115,289,389)</u>	<u>(108,910,417)</u>	<u>(88,754,141)</u>
Net cash flows from financing activities	<u>(2,873,244)</u>	<u>(56,553,769)</u>	<u>(46,254,768)</u>	<u>211,750,297</u>
Net (decrease) increase in cash and cash equivalents	(805,322)	(15,851,093)	(63,548,217)	37,359,366
Effects of foreign exchange on cash balances	(4,484)	(88,252)	(2,132,542)	16,804,267
Cash and cash equivalents at the beginning of the period	<u>4,971,409</u>	<u>97,851,754</u>	<u>163,532,513</u>	<u>109,368,880</u>
Cash and cash equivalents at the end of the period (Note 9)	<u><u>4,161,603</u></u>	<u><u>81,912,409</u></u>	<u><u>97,851,754</u></u>	<u><u>163,532,513</u></u>

The accompanying notes are an integral part of these consolidated financial statements.

PETRÓLEOS MEXICANOS, PRODUCTIVE STATE-OWNED SUBSIDIARIES AND SUBSIDIARY COMPANIES

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS FOR THE YEARS ENDED DECEMBER 31, 2018, 2017 AND 2016 (FIGURES STATED IN THOUSANDS, EXCEPT AS NOTED)

NOTE 1. STRUCTURE AND BUSINESS OPERATIONS OF PETRÓLEOS MEXICANOS, SUBSIDIARY ENTITIES AND SUBSIDIARY COMPANIES

Petróleos Mexicanos was created by a decree issued by the Mexican Congress on June 7, 1938. The decree was published in the Diario Oficial de la Federación (“Official Gazette of the Federation”) on July 20, 1938 and came into effect on that date. On December 20, 2013, the Decreto por el que se reforman y adicionan diversas disposiciones de la Constitución Política de los Estados Unidos Mexicanos, en Materia de Energía (Decree that amends and supplements various provisions of the Mexican Constitution relating to energy matters), was published in the Official Gazette of the Federation, came into effect on December 21, 2013 and included transitional articles setting forth the general framework for implementing legislation relating to the energy sector.

As part of this legal framework, on August 11, 2014, the Ley de Petróleos Mexicanos (the “Petróleos Mexicanos Law”) was published in the Official Gazette of the Federation. The Petróleos Mexicanos Law became effective on October 7, 2014, except for certain provisions. On December 2, 2014, the Secretaría de Energía (“Ministry of Energy”) published in the Official Gazette of the Federation the declaration pursuant to which the special regime governing Petróleos Mexicanos’ activities relating to productive state-owned subsidiaries, affiliates, compensation, assets, administrative liabilities, state dividend, budget and debt came into effect. On June 10, 2015 the Disposiciones Generales de Contratación para Petróleos Mexicanos y sus Empresas Productivas Subsidiarias (General Contracting Provisions for Petróleos Mexicanos and its productive state-owned subsidiaries) was published in the Official Gazette of the Federation and the following day the special regime for acquisitions, leases, services and public works matters came into effect.

Once the Petróleos Mexicanos Law came into effect, Petróleos Mexicanos was transformed from a decentralized public entity to a productive state-owned company. Petróleos Mexicanos is a legal entity empowered to own property and carry on business in its own name with the purpose of carrying out exploration and extraction of crude oil and other hydrocarbons in Mexico. In addition, Petróleos Mexicanos performs activities related to refining, gas processing and engineering and research projects to create economic value and to increase the income of the Mexican Government, as its owner, while adhering to principles of equity and social and environmental responsibility.

The Subsidiary Entities, Pemex Exploración y Producción (Pemex Exploration and Production), Pemex Transformación Industrial (Pemex Industrial Transformation), Pemex Perforación y Servicios (Pemex Drilling and Services), Pemex Logística (Pemex Logistics), Pemex Fertilizantes (Pemex Fertilizers) and Pemex Etileno (Pemex Ethylene), are productive state-owned subsidiaries empowered to own property and carry on business in their own name, subject to the direction and coordination of Petróleos Mexicanos (the “Subsidiary Entities”).

The Subsidiary Entities of Petróleos Mexicanos prior to the Corporate Reorganization (defined below) were Pemex-Exploración y Producción, Pemex-Refinación (Pemex-Refining), Pemex-Gas and Petroquímica Básica (Pemex-Gas and Basic Petrochemicals) and Pemex-Petroquímica (Pemex-Petrochemicals), which were decentralized public entities with a technical, industrial and commercial nature with their own corporate identity and equity, with the legal authority to own property and conduct business in their own names, and were 100% owned by Petróleos Mexicanos and controlled by the Mexican Government; they had been consolidated into and had the characteristics of subsidiaries of Petróleos Mexicanos.

The Board of Directors of Petróleos Mexicanos, in its meeting held on November 18, 2014, approved the Corporate Reorganization proposed by the Director General of Petróleos Mexicanos. Pursuant to the corporate reorganization, the existing four Subsidiary Entities were transformed into two new productive state-owned subsidiaries, which have assumed all of the rights and obligations of the existing Subsidiary Entities. Pemex-Exploration and Production was transformed into Pemex Exploration and Production, a productive state-owned subsidiary, and Pemex-Refining, Pemex-Gas and Basic Petrochemicals and Pemex-Petrochemicals were transformed into the productive state-owned subsidiary Pemex Industrial Transformation.

The Board of Directors of Petróleos Mexicanos also approved the creation of the following Subsidiary Entities: Pemex Drilling and Services, Pemex Logistics, Pemex Cogeneración y Servicios (Pemex Cogeneration and Services), Pemex Fertilizers and Pemex Ethylene (the "Corporate Reorganization"). Each of these productive state-owned subsidiaries may be transformed into an affiliate of Petróleos Mexicanos if certain conditions set forth in the Petróleos Mexicanos Law are met.

On March 27, 2015, the Board of Directors of Petróleos Mexicanos approved the acuerdos de creación (creation resolutions) of each productive state-owned subsidiary.

On April 28, 2015 the creation resolutions of the seven productive state-owned subsidiaries were published in the Official Gazette of the Federation.

On May 29, 2015 the statements related to the creation resolution of the productive state-owned subsidiary Pemex Exploration and Production and the productive state-owned subsidiary Pemex Cogeneration and Services issued by the Board of Directors of Petróleos Mexicanos were published in the Official Gazette of the Federation and, accordingly, these creation resolutions came into effect on June 1, 2015.

On December 29, 2015 and May 12, 2016, modifications to the creation resolution of the productive state-owned subsidiary Pemex Exploration and Production were published in the Official Gazette of the Federation and became effective that same date, respectively.

On July 31, 2015, the statements related to the creation resolution of the productive state-owned subsidiary Pemex Drilling and Services, the productive state-owned subsidiary Pemex Fertilizers and the productive state-owned subsidiary Pemex Ethylene issued by the Board of Directors of Petróleos Mexicanos were published in the Official Gazette of the Federation and, accordingly, these creation resolutions came into effect on August 1, 2015.

On October 1, 2015, the statement related to the creation resolution of the productive state-owned subsidiary Pemex Logistics issued by the Board of Directors of Petróleos Mexicanos was published in the Official Gazette of the Federation and, accordingly, these creation resolutions came into effect on October 1, 2015.

On October 6, 2015, the statement related to the creation resolution of the productive state-owned subsidiary Pemex Industrial Transformation issued by the Board of Directors of Petróleos Mexicanos was published in the Official Gazette of the Federation and, accordingly, these creation resolutions came into effect on November 1, 2015.

On July 13, 2018, the Board of Directors of Petróleos Mexicanos issued the Declaration of Liquidation and Extinction of Pemex Cogeneration and Services, which was published in the Official Gazette of the Federation and became effective on July 27, 2018. As of July 27, 2018, Pemex Industrial Transformation assumed all of the assets, liabilities, rights and obligations, and became, as a matter of Mexican law, the successor to Pemex Cogeneration and Services.

The Subsidiary Entities, and their primary purposes, are as follows:

- Pemex Exploration and Production: This entity is in charge of exploration and extraction of crude oil and solid, liquid or gaseous hydrocarbons in Mexico, in the exclusive economic zone of Mexico and abroad.
- Pemex Industrial Transformation: This entity performs activities related to refining, processing, importing, exporting, trading and the sale of hydrocarbons.
- Pemex Drilling and Services: This entity performs drilling services and repair and services of wells.
- Pemex Logistics: This entity provides transportation, storage and related services for crude oil, petroleum products and petrochemicals to PEMEX (as defined below) and other companies, through pipelines and maritime and terrestrial means, and provides guard and management services.
- Pemex Fertilizers: This entity produces, distributes and commercializes ammonia, fertilizers and its derivatives, as well as provides related services.
- Pemex Ethylene: This entity commercializes, distributes and trades methane, ethane and propylene, directly or through others.

The principal distinction between the Subsidiary Entities and the Subsidiary Companies (as defined below) is that the Subsidiary Entities are productive state-owned entities, whereas the Subsidiary Companies are affiliate companies that were formed in accordance with the applicable laws of each of the respective jurisdictions in which they were incorporated.

The “Subsidiary Companies” are defined as those companies which are controlled, directly or indirectly, by Petróleos Mexicanos (see Note 3-A).

“Associates,” as used herein, means those companies in which Petróleos Mexicanos has significant influence but not control or joint control over its financial and operating policies (see Note 3-A). Petróleos Mexicanos, the Subsidiary Entities and the Subsidiary Companies are referred to collectively herein as “PEMEX.”

PEMEX’s address and its principal place of business is: Av. Marina Nacional No. 329, Col. Verónica Anzures, Alcaldía Miguel Hidalgo, 11300 Ciudad de México, México.

NOTE 2. AUTHORIZATION AND BASIS OF PREPARATION

Authorization

On April 30, 2019, these consolidated financial statements under IFRS and the notes hereto were authorized for issuance by the following officers: Mr. Octavio Romero Oropeza, Chief Executive Officer, Mr. Alberto Velázquez García, Chief Financial Officer, Mr. Manuel Salvador Cruz Flores, Deputy Director of Accounting and Tax Matters, and Mr. Oscar René Orozco Piliado, Associate Managing Director of Accounting.

These consolidated financial statements and the notes hereto as of December 31, 2018 were approved by the Board of Petróleos Mexicanos on April 23, 2019, pursuant to the terms of Article 13 Fraction VI of the Petróleos Mexicanos Law, Article 104 Fraction III, paragraph a, of the Ley del Mercado de Valores (Securities Market Law), and of Article 33 Fraction I, paragraph a, section 3 and Article 78 of the Disposiciones de carácter general aplicables a las emisoras de valores y a otros participantes del mercado de valores (“General provisions applicable to securities’ issuers and other participants of the securities market”).

Audit appraisal matters are reported to the Audit Committee.

These consolidated financial statements are PEMEX’s first annual consolidated financial statements in which *IFRS 15, Revenue from Contract with Customers* (“IFRS 15”) and *IFRS 9, Financial Instruments* (“IFRS 9”) have been applied. Changes to significant accounting policies are described in Note 4.

Basis of accounting

A. Statement of compliance

PEMEX prepared its consolidated financial statements as of December 31, 2018 and 2017, and for the years ended December 31, 2018, 2017 and 2016, in accordance with International Financial Reporting Standards (“IFRS”) as issued by the International Accounting Standards Board (“IASB”).

B. Basis of measurement

These consolidated financial statements have been prepared using the historical cost basis method, with the exception of the following items, which have been measured using an alternative basis.

<u>Item</u>	<u>Basis of measurement</u>
Derivative Financial Instruments (“DFIs”)	Fair Value
Debt	Amortized Cost
Employee Benefits	Fair Value of plan assets less present value of the obligation
Wells, pipelines, properties, plant and equipment	Some components at value in use

C. Going concern

The consolidated financial statements have been prepared on a going concern basis, which assumes that PEMEX can meet its payment obligations. (See Note 24-E)

D. Functional and reporting currency

These consolidated financial statements are presented in Mexican pesos, which is both PEMEX's functional currency and reporting currency, due to the following:

- i. The economic environment in which PEMEX operates is Mexico, where the legal currency is the Mexican peso;
- ii. Petróleos Mexicanos and its Subsidiary Entities have budgetary autonomy, subject only to maintaining the financial balance (the difference between income and total net spending, including the financial cost of the public debt of the Mexican Government and the entities directly controlled by the Mexican Government) and the spending cap of personnel services proposed by SHCP and approved by the Mexican Congress, in Mexican pesos.
- iii. Employee benefits provision was approximately 31% and 35% of PEMEX's total liabilities as of December 31, 2018 and 2017, respectively. This provision is computed, denominated and payable in Mexican pesos; and
- iv. Cash flows for payment of general expenses, taxes and duties are realized in Mexican pesos.

Although the sales prices of several products are based on international U.S. dollar-indices, final domestic selling prices are governed by the economic and financial policies established by the Mexican Government. Accordingly, cash flows from domestic sales are generated and received in Mexican pesos.

Mexico's monetary policy regulator, the Banco de México, requires that Mexican Government entities other than financial entities sell their foreign currency to the Banco de México in accordance with its terms, receiving Mexican pesos in exchange, which is the currency of legal tender in Mexico.

Terms definition

References in these consolidated financial statements and the related notes to "pesos" or "Ps." refers to Mexican pesos, "U.S. dollars" or "US\$" refers to dollars of the United States of America, "yen" or "¥" refers to Japanese yen, "euro" or "€" refers to the legal currency of the European Economic and Monetary Union, "Pounds sterling" or "£" refers to the legal currency of the United Kingdom and "Swiss francs" or "CHF" refers to the legal currency of the Swiss Confederation. Figures in all currencies are presented in thousands of the relevant currency unit, except exchange rates and product and share prices.

E. Use of judgments and estimates

The preparation of the consolidated financial statements in accordance with IFRS requires the use of estimates and assumptions made by PEMEX's management that affect the recorded amounts of assets and liabilities and the disclosures of contingent assets and liabilities as of the date of these consolidated financial statements, as well as the recorded amounts of income, costs and expenses during the year. Actual results may differ from these estimates.

Significant estimates and underlying assumptions are reviewed, and the effects of such revisions are recognized in the years in which any estimates are revised and in any future periods affected by such revision.

Information about estimates, assumptions and critical accounting policies that have the most significant effects on the amounts recognized in the consolidated financial statements are described in the following notes:

- Note 3-C Financial instruments – Fair Value and expected credit losses
- Note 3-E Wells, pipelines, properties, plant and equipment – Value in use
- Note 3-F Intangible assets and oil and natural gas exploration and license, appraisal and development expenditure; successful efforts method
- Note 3-H Impairment of non-financial assets – cash flow estimates and discount rates determination
- Note 3-K Provisions - Environmental liabilities and retirement of assets
- Note 3-L Employee benefits – actuarial assumptions
- Note 3-M Income taxes, duties and royalties – recoverably assesment of deferred tax assets
- Note 3-N Contingencies – probability assessment

Measurement of fair values

Some of PEMEX's accounting policies and disclosures require the measurement of the fair values of financial assets and liabilities, as well as non-financial assets and liabilities.

PEMEX has an established control framework with respect to the measurement of fair values. This includes a valuation team that has overall responsibility for overseeing all significant fair value measurements, including Level 3 fair values.

The valuation team regularly reviews significant unobservable inputs and valuation adjustments. If third party information, such as broker quotes or pricing services, is used to measure fair values, then the valuation team assesses the evidence obtained from the third parties to support the conclusion that these valuations meet the requirements of IFRS, including the level in the fair value hierarchy in which the valuations should be classified.

When measuring the fair value of an asset or a liability, PEMEX uses market observable data as far as possible. Fair values are categorized into different levels in a fair value hierarchy based on the inputs used in the valuation techniques as follows.

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices).
- Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

If the inputs used to measure the fair value of an asset or a liability might be categorized in different levels of the fair value hierarchy, then the fair value measurement is categorized in its entirety in the same level of the fair value hierarchy as the lowest level input that is significant to the entire measurement.

PEMEX recognizes transfers between levels of the fair value hierarchy at the end of the reporting period during which the change has occurred.

NOTE 3. SIGNIFICANT ACCOUNTING POLICIES

PEMEX has consistently applied the following accounting policies to each of the periods presented in the preparation of its consolidated financial statements, except for what is mentioned in Note 4, Accounting changes.

Below is a summary of the principal accounting policies:

A. Basis of consolidation

The consolidated financial statements include the financial statements of Petróleos Mexicanos and those of its subsidiaries over which it has control.

i. *Subsidiaries*

Subsidiaries are entities controlled by PEMEX. PEMEX “controls” an entity when it is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date on which control commences until the date on which control ceases.

For more information about the Subsidiary Companies, see Note 5.

ii. *Non-controlling interests (NCI)*

NCI are measured initially at their proportionate share of the acquiree’s identifiable net assets at the date of acquisition.

Changes in the ownership interest in a subsidiary that do not result in a loss of control are accounted for as equity transactions.

iii. *Loss of control*

When PEMEX loses control over a subsidiary, it derecognizes the assets and liabilities of the subsidiary, and any related NCI and other components of equity. Any resulting gain or loss is recognized in profit or loss. Any interest retained in the former subsidiary is measured at fair value when control is lost.

iv. *Interests in equity-accounted investees*

PEMEX’s interests in equity-accounted investees comprise interests in associates and a joint venture.

Associates are those entities in which PEMEX has significant influence, but not control or joint control, over the financial and operating policies. A joint venture is an arrangement in which PEMEX has joint control, whereby PEMEX has rights to the net assets of the arrangement, rather than rights to its assets and obligations for its liabilities (joint operation).

Interests in associates and the joint venture are accounted for using the equity method. They are initially recognized at cost, which includes transaction costs. Subsequent to initial recognition, the consolidated financial statements include PEMEX’s share of the profit or loss and other comprehensive income (OCI) of equity accounted investees, until the date on which significant influence or joint control ceases.

When the value of the share of losses exceeds the value of PEMEX’s investment in an associate or joint venture, the carrying value of the investment, including any long-term investment, is reduced to zero and PEMEX ceases to recognize additional losses, except in cases where PEMEX is liable for obligations incurred by those associates and joint ventures.

For more information about associates and joint ventures, see Note 14.

v. *Transactions eliminated on consolidation*

Intra-group balances and transactions, and any unrealized income and expenses arising from intra-group transactions, are eliminated. Unrealized gains arising from transactions with equity-accounted investees are eliminated against the investment to the extent of the PEMEX interest in the investee. Unrealized losses are eliminated in the same way as unrealized gains, but only to the extent that there is no evidence of impairment.

B. *Foreign currency*

i. *Foreign currency transactions*

Transactions in foreign currencies are translated into the respective functional currencies of PEMEX companies at the exchange rates at the dates of the transactions.

Monetary assets and liabilities denominated in foreign currencies are translated into the functional currency at the exchange rate at the reporting date. Non-monetary assets and liabilities that are measured at fair value in a foreign currency are translated into the functional currency at the exchange rate when the fair value was determined. Non-monetary items that are measured based on

historical cost in a foreign currency are translated at the exchange rate at the date of the transaction. Foreign currency differences are generally recognized in consolidated statements of comprehensive income and presented within foreign exchange.

Foreign currency differences arising from the translation of investment in equity are designated at fair value in OCI. For 2017, available-for-sale equity investments are recognized in OCI (except for impairment, in which case foreign currency differences that have been recognized in OCI are reclassified to profit or loss).

ii. *Foreign operation*

The financial statements of foreign subsidiaries and associates are translated into the reporting currency by first identifying if the functional currency is different from the currency for recording the foreign operations, and, if so, the recording currency is translated into the functional currency and then into the reporting currency using the year-end exchange rate of each period for assets and liabilities reported in the consolidated statements of financial position; the historical exchange rate at the date of the transaction for equity items; and the weighted average exchange rate of the year for income and expenses reported in the consolidated statement of comprehensive income.

Foreign currency differences are recognized in OCI and accumulated in the currency translation effect, except to the extent that the translation difference is allocated to NCI.

When a foreign operation is disposed of in its entirety or partially such that control, significant influence or joint control is lost, the cumulative amount in the translation reserve related to that foreign operation is reclassified to the consolidated statement of comprehensive income as part of the gain or loss on disposal. If PEMEX disposes of part of its interest in a subsidiary but retains control, the relevant portion of the cumulative amounts is reclassified to the consolidated statement of comprehensive income.

C. *Financial instruments*

i. *Recognition and initial measurement*

Financial assets and liabilities, including accounts receivable and payable, are initially recognized when these assets are contractually originated or acquired, or when these liabilities are contractually issued or assumed.

Financial assets and financial liabilities (unless it is an account receivable or account payable without a significant financing component) are measured and initially recognized at fair value, in the case of financial assets or liabilities not measured at fair value with changes through OCI, plus the transaction costs directly attributable to acquisition or issuance, when subsequently measured at amortized cost. An account receivable or account payable without a significant financing component is initially measured at the transaction price.

ii. *Classification and subsequent measurement*

Financial Assets- Applicable policy beginning January 1, 2018

On initial recognition, a financial asset is classified as measured at: Amortized Cost; Fair Value Through Other Comprehensive Income ("FVTOCI")-debt investment; FVTOCI-equity investment; or FVTPL.

Financial assets are not reclassified subsequent to their initial recognition unless PEMEX changes its business model for managing financial assets, in which case all affected financial assets are reclassified on the first day of the first reporting period following the change in the business model.

FINANCIAL ASSETS:**MEASUREMENT:****Amortized Cost**

A financial asset is measured at amortized cost if it meets both of the following conditions and is not designated as at FVTPL:

- it is held within a business model that has the objective of holding assets to collect contractual cash flows; and
- its contractual terms give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

Debt investment

A debt instrument is measured at FVTOCI only if it meets both of the following conditions and is not designated as at FVTPL:

- it is held within a business model that has the objective of both collecting contractual cash flows and selling financial assets; and
- its contractual terms give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

Equity investment

On initial recognition of an equity investment that is not held for trading, PEMEX may irrevocably elect to present subsequent changes in fair value in OCI. This election is made on an investment-by-investment basis.

All financial assets not classified as measured at amortized cost or FVTOCI (as described above) are measured at FVTPL. This includes all derivative financial assets (see Note 19). On initial recognition, PEMEX may irrevocably designate a financial asset that otherwise meets the requirements to be measured at amortized cost or at FVOCI as FVTPL, if doing so eliminates or significantly reduces an accounting mismatch that would otherwise arise.

Financial assets - Business model assessment: Applicable policy beginning January 1, 2018

PEMEX makes an assessment of the objective of the business model in which a financial asset is held at a portfolio level because this best reflects the way the business is managed and information is provided to management. The information considered includes:

- the stated policies and objectives for the portfolio and the operation of those policies in practice, which include whether management's strategy focuses on earning contractual interest income, maintaining a particular interest rate profile, matching the duration of the financial assets to the duration of any related liabilities or expected cash outflows or realizing cash flows through the sale of the assets;
- how the performance of the portfolio is evaluated and reported to PEMEX management;
- the risk that affects the performance of the business model (and the financial assets held within that business model) and how those risks are managed;
- how managers of the business are compensated (e.g., whether compensation is based on the fair value of the assets managed or the contractual cash flows collected); and
- the frequency, volume and timing of sales in prior periods, the reasons for such sales and expectations about future sales activity.

Transfers of financial assets to third parties in transactions that do not qualify for derecognition are not considered sales for this purpose, consistent with PEMEX's continuing recognition of the assets.

Financial assets that are held for trading or managed and the performance of which is evaluated on a fair value basis are measured at FVTPL.

Financial Asset - Assessment whether contractual cash flows are solely payments of principal and interest: Applicable policy beginning January 1, 2018

For the purposes of this assessment, principal is defined as the fair value of the financial assets on initial recognition.

Interest is defined as consideration for the time value of money and for the credit risk associated with the principal amount outstanding during the relevant period of time and for the basic lending risks and costs (e.g., liquidity risk and administrative costs), as well as profit margin.

In assessing whether the contractual cash flows are solely payments of principal and interest, PEMEX considers the contractual terms of the instrument, which includes assessing whether the financial asset contains a contractual term that could change the timing or amount of contractual cash flows such that it would not meet this condition. In making this assessment, PEMEX considers:

- contingent events that would change the amount or timing of cash flows;
- terms that may adjust the contractual coupon rate, including variable rate features;
- prepayment and extension features; and
- terms that limit PEMEX's claim to cash flows from specified assets (for example, non-recourse features).

A prepayment feature is consistent solely with the payments of principal and interest criterion if the prepayment amount substantially represents unpaid amounts of principal and interest on the principal amount outstanding, which may include reasonable additional compensation for early termination of the contract. Additionally, for a financial asset acquired at a significant discount or premium to its contractual par amount, a feature that permits or requires prepayment at an amount that substantially represents the contractual par amount plus accrued (but unpaid) contractual interest (which may also include reasonable additional compensation for early termination) is treated as consistent with this criterion if the fair value of the prepayment feature is insignificant at initial recognition.

Financial assets – Subsequent measurement and gain and losses: Applicable policy beginning January 1, 2018

Financial assets at FVTPL	Financial assets at FVTPL are measured at fair value and changes therein, including any interest or dividend income, are recognized in profit or loss.
Financial assets at amortized cost	These assets are subsequently measured at amortized cost using the effective interest method. The amortized cost is reduced by impairment losses. Interest income, foreign exchange gains and losses and impairment are recognized in profit or loss. Any gain or loss on derecognition is recognized in profit or loss.
Debt investments at FVOCI	These assets are subsequently measured at fair value. Interest income calculated using the effective interest method, foreign exchange gains and losses and impairment are recognized in profit or loss. Other net gains and losses are recognized in OCI. On derecognition, gains and losses accumulated in OCI are reclassified to profit or loss.
Equity investments at FVOCI	These assets are subsequently measured at fair value. Dividends are recognized as income in profit or loss unless the dividend clearly represents a recovery of part of the cost of the investment. Other net gains and losses are recognized in OCI and are never reclassified to profit or loss.

Financial assets - Applicable policy before January 1, 2018

Financial instruments are classified as: (i) financial instruments measured at fair value through profit or loss; (ii) financial instruments held to maturity; (iii) available-for-sale financial assets; (iv) investments in equity instruments; (v) loans and receivables; and (vi) DFIs. PEMEX determines the classification of its financial instruments at the time of initial recognition.

The following are the policies applicable before January 1, 2018 of the financial instruments operated by PEMEX on that date:

Financial instruments measured at fair value through profit or loss

A financial instrument is measured at fair value through profit or loss if it is classified as held for trading or designated as such upon initial recognition. Financial assets are designated at fair value through profit or loss if PEMEX manages such investments and makes purchase and sale decisions based on their fair value in accordance with PEMEX's documented risk management or investment strategy. In addition, directly attributable transaction costs are recognized in the consolidated statements of comprehensive income for the year. These financial instruments are recognized at fair value and corresponding changes relating to dividend income are recognized in the consolidated statements of comprehensive income.

Available-for-sale financial assets

Until January 1, 2018, available-for-sale financial assets were non-DFIs that were designated as available-for-sale or were not classified in any of the previous categories. PEMEX's investments in certain equity securities and debt securities were classified as available-for-sale financial assets. Available-for-sale financial assets were recognized initially at fair value plus any directly attributable transaction costs.

Subsequent to initial recognition, available-for-sale financial assets are measured at fair value. In addition, any gains or losses associated with such instruments, as well as foreign exchange differences are recognized in other comprehensive results and presented in the fair value reserve in equity. When an investment is derecognized, any gains or losses accumulated in the equity are reclassified to profit or loss.

Sales and purchases of financial assets that require the delivery of such assets within a period of time established by market practice are recognized as of the negotiation date (the date on which PEMEX commits to purchase or sell the asset).

Loans and receivables

Loans and receivables are initially recognized at fair value. After initial recognition, loans and debt securities that bear interest are measured at amortized cost using the effective interest rate ("EIR") method, less impairment losses.

The amortized cost is calculated based on any discount or premium on acquisition and fees and costs that are an integral part of the EIR method. Amortization of costs is included under the heading of financing cost in the consolidated statements of comprehensive income.

Derivative financial instruments

The DFIs presented in the consolidated statement of financial position are valued at fair value. In the case of derivatives for trading purposes, changes in fair value are taken directly to profit or loss for the period. In the case of derivatives formally designated and classified as DFIs for hedging purposes, they are accounted for following the fair value or cash flow hedge accounting model.

Embedded derivatives

PEMEX evaluates the potential existence of embedded derivatives, which may be found in the terms of its contracts, or combined with other host contracts, which could be structured financial instruments (debt or equity instruments with embedded derivatives). Embedded derivatives have terms that implicitly or explicitly meet the characteristics of a DFI. In some instances, these embedded derivatives must be segregated from the underlying contracts and measured, recognized, presented and disclosed as DFIs, such as when the economic risks and terms of the embedded derivative are not clearly and closely related to the underlying contract.

Financial liabilities: Classification, subsequent measurement and gains and losses

Financial liabilities are classified as measured at amortized cost or FVTPL. A financial liability is classified as FVTPL if it is classified as held-for-trading, it is a derivative or it is designated as such on initial recognition. Financial liabilities at FVTPL are measured at fair value and net gains and losses, including any interest expense, are recognized in profit or loss. Other financial liabilities are subsequently measured at amortized cost using the effective interest method. Interest expense and foreign exchange gains and losses are recognized in profit or loss. Any gain or loss on derecognition is also recognized in profit or loss.

iii. *Derecognition*

Financial assets

PEMEX derecognizes a financial asset when the contractual rights to the cash flows from the financial asset expire, or it transfers the rights to receive the contractual cash flows in a transaction in which substantially all of the risks and rewards of ownership of the financial asset are transferred or in which PEMEX neither transfers nor retains substantially all of the risks and rewards of ownership and it does not retain control of the financial asset.

PEMEX enters into transactions whereby it transfers assets recognized in its statement of financial position but retains either all or substantially all of the risks and rewards of the transferred assets. In these cases, the transferred assets are not derecognized.

Financial liabilities

PEMEX derecognizes a financial liability when its contractual obligations are discharged, cancelled or expired. PEMEX also derecognizes a financial liability when its terms are modified and the cash flows of the modified liability are substantially different, in which case a new financial liability based on the modified terms is recognized at fair value.

On derecognition of a financial liability, the difference between the carrying amount extinguished and the consideration paid (including any non-cash assets transferred or liabilities assumed) is recognized in profit or loss.

iv. *Offsetting*

Financial assets and financial liabilities are offset, and the net amount is presented in the statement of financial position when, and only when, PEMEX has a legally enforceable right to set off the amounts and it intends either to settle them on a net basis or to realize the asset and settle the liability simultaneously.

v. *Derivative financial instruments and hedge accounting*

PEMEX uses DFIs to hedge the risk exposure in foreign currency, interest rate and the price of commodities related to its products. Embedded derivatives are separated from the host contract and accounted for separately if the host contract is not a financial asset and certain criteria are met.

DFIs are initially measured at fair value. Subsequent to initial recognition, DFIs are measured at fair value, and changes therein are generally recognized in profit or loss.

However, these contracts are not accounted as designated hedging instruments. DFIs are initially recognized at fair value on the date on which a derivative contract is entered into and after initial recognition are measured again at fair value. DFIs are accounted for as financial assets when the fair value is positive and as a financial liability when the fair value is negative. Any gain or loss arising from changes in the fair value of the DFIs is recognized directly in the income statement.

vi. *Impairment - Applicable policy beginning January 1, 2018*

Financial instruments and contract assets

PEMEX recognizes loss allowances for Estimated Credit Losses (“ECLs”) on:

- financial assets measured at amortized cost;
- debt investments measured at FVOCI; and
- contract assets.

PEMEX measures loss allowances at an amount equal to lifetime ECL, except for the following, which are measured as 12-month ECLs:

- debt securities that are determined to have low credit risk at the reporting date; and
- other debt securities and bank balances for which credit risk (i.e. the risk of default occurring over the expected life of the financial instrument) has not increased significantly since initial recognition.

Loss allowances for trade receivables and contract assets are always measured at an amount equal to lifetime ECL.

When determining whether the credit risk of a financial asset has increased significantly since initial recognition and when estimating ECL, PEMEX considers reasonable and supportable information that is relevant and available without undue cost or effort. This includes both quantitative and qualitative information and analysis, based on PEMEX’s historical experience and informed credit assessment which includes forward-looking information.

PEMEX assumes that the credit risk on a financial asset has increased significantly if it does not comply with the terms established in the contract.

PEMEX considers a financial asset to be in default when the borrower is unlikely to pay its credit obligations to PEMEX in full, without recourse by PEMEX to actions such as realizing security (if any is held).

PEMEX considers that a debt instrument has a low credit risk, when its credit rating is classified as “investment grade”. The investment grade classification is based on minimum credit ratings of Baa3 (Moody’s) and BBB- (S & P and Fitch), as well as its equivalent in other rating agencies

Lifetime ECLs are the credit losses that result from all possible default events over the expected life of a financial instrument.

12-month ECLs are the portion of ECLs that result from default events that are possible within the 12 months after the reporting date (or a shorter period if the expected life of the instrument is less than 12 months).

The maximum period considered when estimating ECLs is the maximum contractual period over which PEMEX is exposed to credit risk.

Measurement of ECLs

ECLs are a probability-weighted estimate of credit losses. Credit losses are measured as the present value of all cash shortfalls (for example, the difference between the cash flows due to the entity in accordance with the contract and the cash flows that PEMEX expects to receive).

ECLs are discounted at the effective interest rate of the financial asset.

Credit-impaired financial assets

At each reporting date, PEMEX assesses whether financial assets carried at amortized cost and debt securities at FVOCI are credit-impaired. A financial asset is ‘credit-impaired’ when one or more events that have a detrimental impact on the estimated future cash flows of the financial asset have occurred.

Evidence that a financial asset is credit-impaired includes the following observable data:

- significant financial difficulty of the borrower or issuer;
- a breach of contract such as a default or being more than 90 days past due;
- the restructuring of a loan or advance by PEMEX on terms that it would not consider otherwise;
- it is probable that the borrower will enter bankruptcy or other financial reorganization; or
- the disappearance of an active market for a security because of financial difficulties.

Presentation of allowance for ECL in the statement of financial position

Loss allowances for financial assets measured at amortized cost are deducted from the gross carrying amount of the assets.

For debt securities at FVOCI, the loss allowance is charged to profit or loss and is reclassified from OCI.

Write-off

The gross carrying amount of a financial asset is written off (either partially or in full) to the extent that there is no realistic prospect of recovery. This is generally the case when PEMEX determines that the debtor does not have assets or sources of income that could generate sufficient cash flows to repay the amounts subject to the write-off. However, financial assets that are written off could still be subject to enforcement activities in order to comply with PEMEX’s procedures for recovery of amounts due.

Impairment of financial assets - Policy applicable before January 1, 2018

At each reporting date, PEMEX evaluates whether there is objective evidence that a financial asset or group of financial assets is impaired, in which case the value of the recoverable amount of the asset is calculated. A financial asset is impaired if objective evidence indicates that a loss event has occurred after the initial recognition of the asset, and that the loss event had a negative effect on the estimated future cash flows of the financial asset.

Objective evidence that a financial asset or group of assets is impaired includes significant financial difficulty of the issuer or obligor, a breach of contract, such as a default or delinquency in interest or principal payments; the lender, for economic or legal reasons relating to the borrower's financial difficulty, granting the borrower a concession that the lender would not otherwise consider; it becoming probable that the borrower will enter bankruptcy or other financial reorganization; the disappearance of an active market for that financial asset because of financial difficulties; or observable data indicating that there is a measurable decrease in the estimated future cash flows. Impairments by asset are:

- Impairment of financial assets carried at amortized cost

The impairment of financial assets carried at amortized cost is measured as the difference between the assets' carrying amount and the present value of estimated future cash flows (excluding future credit losses that have not been incurred) discounted at the financial asset's original effective interest rate. The amount of the loss shall be recognized in profit or loss.

If, in a subsequent period, the amount of the impairment loss decreases and the decrease can be related objectively to an event occurring after the impairment was recognized, the impairment loss previously recognized shall be reversed in profit or loss.

- Impairment in available-for-sale financial assets

In addition, a significant or prolonged decline in the fair value of an investment in an available-for-sale equity instrument is also objective evidence of impairment.

When there is objective evidence of the impairment of an asset, the accumulated loss recognized in OCI shall be reclassified from equity to profit or loss even though the financial asset has not been derecognized.

If, in a subsequent period, the impairment loss decreases, the reversal shall be reflected as a reversal in OCI.

D. Inventories and cost of sales

Inventories are valued at the lower of cost or net realizable value. Cost is determined based on the cost of production or acquisition of inventory and other costs incurred in transporting such inventory to its present location and in its present condition, using the average cost formula. Net realizable value is the estimated selling price in the ordinary course of business less the estimated costs of completion and the estimated selling costs. The estimate takes into consideration, among other things, the decrease in the value of inventories due to obsolescence.

Cost of sales represents the cost of production or acquisition of inventories at the time of sale, increased, where appropriate, by declines in net realizable value of inventories during the year.

Advance payment to suppliers for inventory purchases are recognized as part of inventory when the risks and benefits of the ownership of the inventory have been transferred to PEMEX.

E. Wells, pipelines, properties, plant and equipment

i. Recognition and measurement

Items of wells, pipelines, properties, plant and equipment are recorded at acquisition or construction cost, which includes capitalized borrowing cost, less accumulated depreciation and accumulated impairment losses.

Initial costs of wells, pipelines, properties, plant and equipment are initially recorded at cost, which includes their original purchase price or construction cost, any costs attributable to bringing the assets to a working condition for their intended use and the costs of dismantling and removing the items and restoring the site on which they are located, including the estimated cost of plugging and abandoning wells.

The cost of financing projects that require large investments and financing incurred for projects, net of interest revenues from the temporary investment of these funds, is recognized as part of wells, pipelines, properties, plant and equipment when the cost is directly attributable to the construction or acquisition of a qualifying asset. The capitalization of these costs is suspended during periods in which the development of construction is interrupted, and its capitalization ends when the activities necessary for the use of the qualifying asset are substantially completed. All other financing costs are recognized in the consolidated statements of comprehensive income in the period in which they are incurred.

The cost of self-constructed assets includes the cost of materials and direct labor, interest on financing and any other costs directly attributable to start up. In some cases, the cost also includes the present value of the costs of plugging of wells and removal.

Expenditures related to the construction of wells, pipelines, properties, plant and equipment during the stage prior to commissioning are stated at cost as intangible assets or construction in progress, in accordance with the characteristics of the asset. Once the assets are ready for use, they are transferred to the respective component of wells, pipelines, properties, plant and equipment and depreciation or amortization begins.

If significant parts of an item of wells, pipelines, properties, plant and equipment have different useful lives, then they are accounted for as separate items (major components) of property, plant and equipment.

The capitalized value of finance leases is also included in the line item of wells, pipelines, properties, plant and equipment.

Any gain or loss on disposal of an item of wells, pipelines, properties, plant and equipment is recognized in profit or loss.

Advance payments for the acquisition of pipelines, properties, plant and equipment are also recognized in the line item of wells, pipelines, properties, plant and equipment when the risks and benefits of the ownership have been transferred to PEMEX.

ii. Subsequent expenditure

The costs of major maintenance or replacement of a significant component of an item of wells, pipelines, properties, plant and equipment are recognized in the carrying amount of the item if it is probable that the future economic benefits embodied within the component will flow to PEMEX and its cost can be measured reliably. The costs of recurring maintenance, repairs and renovations of wells, pipelines, properties, plant and equipment carried out to maintain the facilities in normal operation conditions are recognized in profit or loss as incurred.

iii. Depreciation

Depreciation and amortization of capitalized costs in wells are determined based on the estimated economic life of the field to which the wells belong, considering the relationship between the production of barrels of oil equivalent for the period and proved developed reserves of the field, as of the beginning of the period, with quarterly updates for new development investments.

Depreciation of other elements of pipelines, properties, plant and equipment is recognized in profit or loss on a straight-line basis over the estimated useful life of the asset, beginning as of the date that the asset is available for use, or in the case of construction, from the date that the asset is completed and ready for use.

Properties, plant and equipment acquired through financial leases are depreciated over the shorter of the lease term or the useful life of the asset.

The estimated useful lives of wells, pipelines, properties, plant and equipment for current and comparative periods are described in Note 15.

Estimated useful lives of items of properties, plant and equipment are reviewed and updated prospectively if expectations differ from previous estimates.

F. Intangible assets and oil and natural gas exploration and license, appraisal and development expenditure

Intangible assets mainly include expenditure on the exploration for and evaluation of oil and natural gas resources, right-of-way and easements and licenses software.

i. Intangible assets

Intangible assets acquired separately are measured at the time the initial cost of acquisition is recognized. After the initial recognition, intangible assets are measured at their acquisition cost, less (i) accumulated amortization, measured using the straight-line method during the estimated useful life of the intangible asset and (ii) accumulated impairment.

Rights-of-way and easements and licenses software are amortized over the contract period or over the remaining life of the fixed asset or property to which they pertain.

The estimated useful lives of intangible assets for current and comparative periods are described in Note 15.

The estimated useful lives and residual values of intangible assets are reviewed at each reporting date and adjusted if appropriate.

ii. Oil and natural gas exploration and license, appraisal and development expenditure

Oil and natural gas exploration, appraisal and development expenditure is accounted for using the principles of the successful efforts method of accounting as described below.

Exploration and appraisal expenditure

Geological and geophysical exploration costs are recognized as an expense as incurred.

Costs directly associated with an exploration well are initially capitalized as an intangible asset until the drilling of the well is complete and the results have been evaluated. These costs include employee remuneration, materials and fuel used, rig costs and payments made to contractors.

If potentially commercial quantities of hydrocarbons are not found, the exploration well costs are written off against profit or loss. If hydrocarbons are found and, subject to further appraisal activity, are likely to be capable of commercial development, the costs continue to be carried as an asset. If it is determined that development will not occur, then the costs are expensed against profit or loss.

Costs directly associated with appraisal activity undertaken to determine the size, characteristics and commercial potential of a reservoir following the initial discovery of hydrocarbons, including the costs of appraisal wells where hydrocarbons were not found, are initially capitalized as an intangible asset. When proved reserves of oil and natural gas are determined and development is approved by management, the relevant expenditure is transferred to wells, pipelines, properties, plant and equipment.

Exploration wells more than 12 months old are expensed unless: (i) they are in an area requiring mayor capital expenditure before production can begin, (ii) commercially productive quantities of reserves have been found, and (iii) they are subject to further exploration or appraisal activity, in that either drilling or additional exploration wells is underway or firmly planned for the near future.

PEMEX periodically assesses the amounts included within fixed assets to determine whether capitalization is initially appropriate and can continue. Exploration wells capitalized beyond 12 months are subject to additional scrutiny as to whether the facts and circumstances have changed and therefore whether the conditions described in the preceding paragraph no longer apply.

Development expenditure

Expenditure on the construction, installation and completion of infrastructure facilities such as platforms, pipelines and the drilling of development wells, including service and unsuccessful development or delineation wells, is capitalized within wells, pipelines, properties, plant and equipment and is depreciated from the commencement of production as described in the accounting policy for wells, pipelines, properties, plant and equipment.

G. Crude oil and natural gas reserves

Under Mexican law, all crude oil and other hydrocarbon reserves located in the subsoil of Mexico are owned by the Mexican nation and not by PEMEX. In accordance with the aforementioned and based on the applicable regulation as of the date of these consolidated financial statements, the reserves assigned to PEMEX by the Mexican Government are not registered for accounting purposes because they are not PEMEX's property. PEMEX estimates total proved oil and natural gas reserve volumes in accordance with the definitions, methods and procedures established in Rule 4-10(a) of Regulation S-X ("Rule 4-10(a)") of the U.S. Securities and Exchange Commission ("SEC") as amended, and where necessary, in accordance with the Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserves Information promulgated by the Society of Petroleum Engineers (the "SPE") as of February 19, 2007. These procedures are consistent with international reserves reporting practice. The estimation of these reserves depends on assumptions made and the interpretation of the data available and may vary among analysts. The results of drilling activities, test wells and production after the date of estimation are utilized in future revisions of reserves estimates.

Although PEMEX does not own the oil and other hydrocarbon reserves within Mexico, these procedures allow PEMEX to record the effects that such oil and other hydrocarbon reserves have on its consolidated financial statements, including, for example, in the depreciation and amortization line item.

H. Impairment of non-financial assets

The carrying amounts of PEMEX's non-financial assets, other than inventories and deferred taxes, are assessed for indicators of impairment at the end of each reporting period. If the net carrying value of the asset or its cash-generating unit exceeds the recoverable amount, PEMEX records an impairment charge in its consolidated statement of comprehensive income.

A cash-generating unit is the smallest identifiable group of assets which can generate cash flows independently from other assets or groups of assets.

The recoverable amount of an asset or a cash-generating unit is defined as the higher of its fair value minus the costs of disposal and its value in use. The value in use is the discounted present value of the net future cash flows expected to arise from the continuing use of an asset and from its disposal at the end of its useful life. In measuring value in use, the discount rate applied is the pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the asset. Fair value is calculated using discounted cash flows determined by the assumptions that market participants would apply in order to estimate the price of an asset or cash generating unit, assuming that such participants were acting in their best economic interest.

In the case of cash-generating assets or items dedicated to the exploration and evaluation of hydrocarbons reserves, the recoverable amount is determined using the value in use based on the proved reserves and probable reserves, in some cases, for the risk factor associated with such reserves.

Both impairment losses and reversals are recognized in the statement of comprehensive income in the costs and expenses line items in which the depreciation and amortization are recognized. Impairment losses may not be presented as part of the costs that have been capitalized in the value of any asset. Impairment losses related to inventories are recognized as part of cost of sales. Impairment losses on investments in associates, joint ventures and other investments are recognized as profit (loss) sharing in associates.

An impairment loss shall be reversed if there has been a change in the estimates used since the date when the impairment loss was recognized. These reversals will not exceed the carrying value of the asset as though no impairment had been recognized. Impairment losses and reversals are presented in a separate line item in the consolidated statement of comprehensive income.

I. Leases

The determination of whether an agreement is or contains a lease is based on the economic substance of the agreement at the date of execution. An agreement contains a lease if performance under the agreement depends upon the use of a specific asset or assets, or if the agreement grants the right to use the asset.

Finance leases, which transfer to PEMEX substantially all the inherent benefits and risks of the leased property, are capitalized at the date the lease commences, and the value is recorded as the lower of the fair value of the leased property and the present value of the minimum lease payments. Payments on the lease are divided between the financial costs and the amortization of the remaining debt principal in order to achieve a constant effective interest rate for the outstanding liability. The financing costs are recognized in the consolidated statement of comprehensive income.

Operating lease payments are recognized as expenses in the consolidated statement of comprehensive income on a straight-line basis over the term of the lease and variable rent payments are recognized in the operating results on an accrued basis.

J. Assets held-for-sale

Non-current assets, or disposal groups comprising assets and liabilities, are classified as held-for-sale if it is highly probable that they will be recovered primarily through sale rather than through continuing use.

Such assets, or disposal groups, are generally measured at the lower of their carrying amount and fair value less costs to sell. Any impairment loss on a disposal group is allocated first to goodwill, and then to the remaining assets and liabilities on a pro rata basis, except that no loss is allocated to inventories, financial assets, deferred tax assets, employee benefit assets, investment property or biological assets, which continue to be measured in accordance with PEMEX's other accounting policies. Impairment losses on initial classification as held-for-sale or held-for-distribution and subsequent gains and losses on remeasurement are recognized in profit or loss.

Once classified as held-for-sale, intangible assets and property, plant and equipment are no longer amortized or depreciated, and any equity-accounted investee is no longer equity accounted.

K. Provisions

Provisions are determined by discounting the expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability. The unwinding of the discount is recognized as finance cost.

PEMEX recognizes provisions when, as a result of a past event, PEMEX has incurred a legal or assumed present obligation for which a future disbursement is probable and the value of such disbursement is reasonably estimable. In certain cases, such amounts are recorded at their present value.

Environmental liabilities

In accordance with applicable legal requirements and accounting practices, an environmental liability is recognized when the cash outflows are probable and the amount is reasonably estimable. Disbursements related to the conservation of the environment that are linked to revenue from current or future operations are accounted as expenses or assets, depending on the circumstances of each disbursement. Disbursements related to past operations, which no longer contribute to current or future revenues, are accounted for as current period expenses.

The accrual of a liability for a future disbursement occurs when an obligation related to environmental remediation, for which PEMEX has the information necessary to determine a reasonable estimated cost, is identified.

Retirement of assets

The obligations associated with the future retirement of assets, including those related to the retirement of wells, pipelines, properties, plant and equipment and their components are recognized at the date that the retirement obligation is incurred, based on the discounted cash flow method. The determination of the fair value is based on existing technology and regulations. If a reliable estimation of fair value cannot be made at the time the obligation is incurred, the accrual will be recognized when there is sufficient information to estimate the fair value.

The obligations related to the costs of future retirement of assets associated with the principal refining processes for gas and petrochemicals are not recognized. These assets are considered to have an indefinite useful life due to the potential for maintenance and repairs.

The abandonment costs related to wells currently in production and wells temporarily closed are recorded in the statement of comprehensive income based on the units of production method. Total cost of abandonment and plugging for non-producing wells is recognized in the statement of comprehensive income at the end of each period. All estimations are based on the useful lives of the wells, considering their discounted present value. Salvage values are not considered, as these values commonly have not traditionally existed.

L. Employee benefits

i. Short-term employee benefits

Short-term employee benefits are expensed as the related service is provided. A liability is recognized for the amount expected to be paid if PEMEX has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee and the obligation can be estimated reliably.

ii. Defined contribution plans

Obligations for contributions to defined contribution plans are expensed as the related service is provided. Prepaid contributions are recognized as an asset to the extent that a cash refund or a reduction in future payments is available.

iii. Defined benefit plan

PEMEX's net obligation in respect of defined benefit plans is calculated separately for each plan by estimating the amount of future benefit that employees have earned in the current and prior periods, discounting that amount and deducting the fair value of any plan assets.

The calculation of defined benefit obligations is performed annually by a qualified actuary using the projected unit credit method. When the calculation results in a potential asset for PEMEX, the recognized asset is limited to the present value of economic benefits available in the form of any future refunds from the plan or reductions in future contributions to the plan. To calculate the present value of economic benefits, consideration is given to any applicable minimum funding requirements.

Remeasurements of the net defined benefit liability, which comprise actuarial gains and losses, the return on plan assets (excluding interest) and the effect of the asset ceiling (if any, excluding interest), are recognized immediately in OCI. PEMEX determines the net interest expense (income) on the net defined benefit liability (asset) for the period by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period to the net defined benefit liability (asset) at such time, taking into account any changes in the net defined benefit liability (asset) during the period as a result of contributions and benefit payments. Net interest expense and other expenses related to defined benefit plans are recognized in profit or loss.

When the benefits of a plan are changed or when a plan is curtailed, the resulting change in benefit that relates to past service or the gain or loss on curtailment is recognized immediately in profit or loss. PEMEX recognizes gains and losses from the settlement of a defined benefit plan when the settlement occurs.

iv. Other long-term employee benefits

PEMEX's net obligation in respect of long-term employee benefits is the amount of future benefit that employees have earned in return for their service in the current and prior periods. That benefit is discounted to determine its present value. Remeasurements are recognized in profit or loss in the period in which they arise.

v. Termination benefits

Termination benefits are expensed at the earlier of when PEMEX can no longer withdraw its offer of those benefits and when PEMEX recognizes costs for a restructuring. If benefits are not expected to be settled in full within 12 months of the reporting date, then they are discounted.

M. Income taxes, duties and royalties

Income tax expense comprises current and deferred tax. It is recognized in profit or loss except to the extent that it relates to a business combination, or items recognized directly in equity or in OCI.

The interest and penalties related to income taxes, including uncertain tax treatments, do not meet the definition of income taxes, and are therefore accounted for under IAS 37 "Provisions, Contingent Liabilities and Contingent Assets."

i. Current tax

Current tax comprises the expected tax payable or receivable on the taxable income or loss for the year and any adjustment to the tax payable or receivable in respect of previous years. The amount of current tax payable or receivable is the best estimate of the tax amount expected to be paid or received that reflects uncertainty related to income taxes, if any. It is measured using tax rates enacted or substantively enacted at the reporting date. Current tax also includes any tax arising from dividends.

Current tax assets and liabilities are offset only if certain criteria are met.

ii. Deferred tax

Deferred tax is recognized in respect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for taxation purposes. Deferred tax is not recognized for:

- temporary differences on the initial recognition of assets or liabilities in a transaction that is not a business combination and that affects neither accounting nor taxable profit or loss;
- temporary differences related to investments in subsidiaries, associates and joint arrangements to the extent that PEMEX is able to control the timing of the reversal of the temporary differences and it is probable that they will not reverse in the foreseeable future; and
- taxable temporary differences arising from the initial recognition of goodwill.

Deferred tax assets are recognized for unused tax losses, unused tax credits and deductible temporary differences to the extent that it is probable that future taxable profits will be available against which they can be used. Future taxable profits are determined based on the reversal of relevant taxable temporary differences. If the amount of taxable temporary differences is insufficient to recognize a deferred tax asset in full, then future taxable profits, adjusted for reversals of existing temporary differences, are considered, based on the business plans of PEMEX. Deferred tax assets are reviewed at each reporting date and are reduced to the extent that it is no longer probable that the related tax benefit will be realized. Such reductions are reversed when the probability of future taxable profits improves.

Unrecognized deferred tax assets are reassessed at each reporting date and recognized to the extent that it has become probable that future taxable profits will be available against which they can be used.

Deferred tax is measured at the tax rates that are expected to be applied to temporary differences when they reverse, using tax rates enacted or substantively enacted at the reporting date.

The measurement of deferred tax reflects the tax consequences that would follow from the manner in which PEMEX expects, at the reporting date, to recover or settle the carrying amount of its assets and liabilities.

Deferred tax assets and liabilities are offset only if certain criteria are met.

iii. Duties, royalties and considerations

Duties

PEMEX is subject to taxes and special duties, which are based on the value of hydrocarbons extracted, with certain deductions.

These taxes and duties are recognized in accordance with IAS 12, "Income Taxes" (IAS 12), when they have the characteristics of income tax, which occurs when such taxes are set by a government authority and are determined based on a formula that considers the balance of income (or extraction valued at a selling price) less expenses. Taxes and duties that meet this criteria should be recognized for current and deferred income tax based on the above paragraphs. Taxes and duties that do not meet this criteria are recognized as liabilities, affecting the costs and expenses relating to the transactions that gave rise to them.

Royalties and considerations

Royalties and considerations are payable pursuant to license agreements. These royalties are recognized as liabilities and affect the items of costs and expenses related to the operations that gave rise to them. See note 15.

N. Contingencies

Contingency losses are recorded when it is probable that a liability has been incurred and the amount thereof can be reasonably estimated. When a reasonable estimation cannot be made, qualitative disclosure is provided in the notes to the consolidated financial statements. Contingent revenues, earnings or assets are not recognized until realization is assured.

O. Fair value

'Fair value' is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date in the principal or, in its absence, the most advantageous market to which PEMEX has access at that date. The fair value of a liability reflects its non-performance risk.

A number of PEMEX accounting policies and disclosures require the measurement of fair values, for both financial and non-financial assets and liabilities (see Note 8).

When one is available, PEMEX measures the fair value of an instrument using the quoted price in an active market for that instrument. A market is regarded as 'active' if transactions for the asset or liability take place with sufficient frequency and volume to provide pricing information on an ongoing basis.

If there is no quoted price in an active market, then PEMEX uses valuation techniques that maximize the use of relevant observable inputs and minimize the use of unobservable inputs. The chosen valuation technique incorporates all of the factors that market participants would take into account in pricing a transaction.

If an asset or a liability measured at fair value has a bid price and an ask price, then PEMEX measures assets and long positions at the bid price and liabilities and short positions at the ask price.

The best evidence of the fair value of a financial instrument on initial recognition is normally the transaction price (i.e., the fair value of the consideration given or received). If PEMEX determines that the fair value on initial recognition differs from the transaction price and the fair value is evidenced neither by a quoted price in an active market for an identical asset or liability nor based on a valuation technique for which any unobservable inputs are judged to be insignificant in relation to the measurement, then the financial instrument is initially measured at fair value, adjusted to defer the difference between the fair value on initial recognition and the transaction price. Subsequently, that difference is recognized in profit or loss on an appropriate basis over the life of the instrument but no later than when the valuation is fully supported by observable market data or the transaction is closed out.

P. Revenue from contracts with customers

PEMEX initially applied IFRS 15 as of January 1, 2018. Information about accounting policies relating to contracts with customers and the effect of initially applying IFRS 15 is described in Note 4-A).

Q. Operating segments

Operating segments are identifiable components of PEMEX that pursue business activities from which PEMEX earns revenues and incurs expenses and for which information is available to management on a segmented basis and is assessed by the Board of Directors in order to allocate resources and assess the profitability of the segments.

R. Presentation of consolidated statements of comprehensive income

Costs and expenses shown in PEMEX's consolidated statements of income are presented based on their function, which allows for a better understanding of the components of PEMEX's operating income. This classification allows for a comparison to the industry to which PEMEX belongs.

i. Operating profit

Operating profit is the result generated from the continuing principal revenue-producing activities of PEMEX as well as other income and expenses related to operating activities. Operating profit excludes net finance costs, share of profit of equity-accounted investees and income taxes.

Revenues

Represents revenues from sale of products or services.

Cost of sales

Cost of sales represents the acquisition and production costs of inventories, depreciation, amortization, salaries, wages and benefits, a portion of the cost of the reserve for employee benefits and operating expenses related to the production process, production taxes and duties, exploration costs, non-operating costs, among others.

Other revenues (expenses), net

Other revenues (expenses), net consist primarily of income and expenses that are not related directly to the operation of PEMEX.

Transportation, distribution and sale expenses

Transportation, distribution and sale expenses are costs in connection with the storage, sale and delivery of products, such as the depreciation and operating expenses associated with these activities.

Administrative expenses

Administrative expenses are costs related to PEMEX's areas that provide administrative support.

ii. Financing income and financing cost and derivative financial instruments income (cost), net

Financing income

Financing income is comprised of interest income, financial income and other income from financial operations between PEMEX and third parties.

Financing cost

Financing cost is comprised of interest expenses, commissions and other expenses related to PEMEX's financing operations less any portion of the financing cost that is capitalized.

When calculating interest income and expenses, the effective interest rate is applied to the gross carrying amount of the asset (when the asset has no credit impairment) or to the amortized cost of the liability. However, for financial assets with credit impairment after initial recognition, interest income is calculated by applying the effective interest rate at the amortized cost of the financial asset. If the asset ceases to be impaired, the interest income calculation returns to the gross base.

Derivative financial instruments income (cost), net

Includes the result of changes in the fair value of derivative financial instruments.

NOTE 4. ACCOUNTING CHANGES AND RECLASSIFICATIONS

A. Accounting changes

As of January 1, 2018, PEMEX adopted IFRS 15 and IFRS 9.

i. IFRS 15

IFRS 15 establishes a comprehensive framework for determining whether, how much and when revenue is recognized. It replaces existing revenue recognition guidance, including IAS 18 Revenue, IAS 11 Construction Contracts, IFRIC 13 Customer Loyalty Programs and IFRIC 15 Agreements for the Construction of Real Estate.

PEMEX adopted IFRS 15 using the modified retrospective transition method at January 1, 2018. Under this transition method, comparative information has not been restated and continues to be presented under IAS 18, IAS 11 and related interpretations. As of January 1, 2018, no significant uncompleted contracts were identified, so there was no impact on the consolidated financial statements due to the initial adoption of the standard.

Under IFRS 15, revenue is measured based on the consideration specified in a contract with a customer and excludes amounts collected on behalf of third parties. PEMEX recognizes revenue when it transfers control over a product or service to a customer.

In the case of comparative periods, revenue was measured at the fair value of the consideration received or receivable. Revenue from the sale of goods was recognized when the significant risks and rewards of ownership had been transferred to the customer, recovery of the consideration was probable, the associated costs and possible return of goods could be estimated reliably. Revenue from rendering of services was recognized in proportion to the stage of completion of the work performed at the reporting date.

The details of the main impacts generated by the adoption of IFRS 15 are the following:

a. Nature of revenues of products and services

For a description of the nature and sources of PEMEX’s primary revenues, see Note 6.

- Crude oil sales

Nature, performance obligations and timing of revenue recognition

Export sales of crude oil are based on delivery terms established in contracts or orders. All sales are performed by the Free on Board International commercial term (“FOB” Incoterm). Therefore, revenue is recognized at a point in time when control of the crude oil has transferred to the customer, which occurs when the product is delivered at the point of shipping. Invoices are generated at that time and are mostly payable within the deadlines established in contracts or orders.

Determination and allocation of the transaction price

The price of the product is determined based on a market components formula and, with respect to crude oil, in accordance with the provisions of the Hydrocarbon Trading Strategies Management.

For international market crude oil sales, revenue is recognized with a provisional price, which undergoes subsequent adjustments until the product has arrived at the port of destination. There may be a period of up to 2 months in determining the final sale price, such as in the case of sales to the European market, the Middle East and Asia.

Crude oil sale contracts consider possible customers’ claims due to product quality, volume or delays in boarding, which are estimated in the price of the transaction.

Therefore, due to the implementation of IFRS 15, the main impacts on revenue recognition with respect to the previous year are as follows:

IFRS 15	IAS 18
<p>For orders that have variations in price, revenue is adjusted on the closing date of each period. The subsequent variations in the fair value at the different reporting dates are recognized according to IFRS 9</p> <p>Revenue is measured initially estimating the variable compensations such as quality and volume claims, delays in boarding etc.</p>	<p>For orders that have variations in price, revenue was adjusted upon the product’s arrival at its final destination and the final price is defined.</p> <p>A decrease in revenue was recognized when quality and volume claims, or other variable compensations were known.</p>

- Sale of petroleum products

Nature, performance obligations and timing of revenue recognition

Refined products and their derivatives are sold within the national market. The *Comisión Federal de Electricidad* (Federal Electricity Commission, or “CFE”) purchases a significant portion of the fuel oil production, while *Aeropuertos y Servicios Auxiliares* (the Airports and Auxiliary Services Agency) purchases most of the jet fuel. The most important refined products are gasoline and diesel.

Revenue is recognized at a point in time when control is transferred to the customer, which occurs either at the point of shipping or when it is delivered at the customer’s facilities. Therefore, transportation fees can be included in the price of sale of the product and are considered part of a single performance obligation since transportation is rendered before control is transferred.

Determination and allocation of the transaction price

The price is determined based on the price at the point of delivery, adding the price of the services rendered (freight, handling of jet fuel, etc.) with the provisions and terms established by the *Comisión Reguladora de Energía* (Energy Regulatory Commission or “ERC”). There are penalties for delivery failures and/or payment obligations, as well as quality and volume claims, which are known days after the transaction.

Therefore, due to the implementation of IFRS 15, the main impacts on revenue recognition with respect to the previous year are as follows:

IFRS 15	IAS 18
For all petroleum products, there is only one performance obligation that includes transport and handling services to the point of delivery.	Transportation and handling services were recognized as a separate service income, on the basis of prices established in the service orders. However, service income was also recognized at the point of delivery.
Revenue is measured initially estimating the variable compensations such as quality and volume claims, etc.	A decrease in revenue was recognized at the time quality and volume claims, or other variable compensations were known.

- Sales of natural gas

The sale of natural gas, liquefied petroleum gas, naphtha, butane, ethane and some other petrochemicals such as methane derivatives, ethane derivatives, aromatics and derivatives are mainly carried out in the domestic market.

Revenue is recognized at a point in time when control is transferred to the customer, which occurs when it is delivered at the customer’s facilities. Therefore, transportation fees can be included in the price of sale of the product and are considered part of a single performance obligation since transportation is rendered before control is transferred.

Determination and allocation of the transaction price

The transaction price is established at the time of sale, including the estimation of variable considerations such as capacity, penalties, extraordinary sales not included in contracts, adjustments for quality or volume claims, and incentives for the purchase of products; which are known days after the transaction.

Therefore, due to the implementation of IFRS 15, the main impacts on revenue recognition with respect to the previous year are as follows:

IFRS 15	IAS 18
There is only one performance obligation that includes transport and handling services to the point of delivery.	Natural gas supply, transportation and fuel capacity were considered as performance obligations. Sales of natural gas were recorded as sale of products while the amount charged to customers for transportation and fuel capacity was recognized as other revenue at the point of delivery.
Revenue is measured initially estimating the variable compensations as quality and volume claims, etc.	A decrease in revenue was recognized at the time quality and volume claims, or other variable compensations were known

- Drilling services

PEMEX provides drilling, termination and repair of wells services, as well as the execution of well services. The services are provided in accordance with the purchase orders which include the price of the transaction at the date of the service. There are adjustment clauses for quality or volume claims or incentives for the purchase of products, which are known after the transaction.

Therefore, due to the implementation of IFRS 15, the main impacts on the recognition of income with respect to the previous year are as follow:

IFRS 15	IAS 18
If the customer can benefit from the different services within the same service order but separately, each service will be considered as a performance obligation.	Income was recognized when all services within the same service order have been completed, so the entire service order was considered a performance obligation.
If the customer cannot benefit separately and the service is considered as a whole, the service order will be considered as a single performance obligation.	
The price of the transaction is estimated, considering the prices established in the service orders at the date of sale and variable compensations are estimated, such as penalties for non-delivery, quality claims, etc.	Income was recognized for sale of services. Subsequently, a decrease in income for quality and volume claims was recognized separately as it was known.
Price is not distributed when there is a performance obligation, except, when there is more than one performance obligation, in which case, the price of the transaction will be assigned according to the service price established in the service order.	The price is determined according to the service order as performance obligation.
Income is recognized at a point in time, when the service is rendered.	Income was recognized on a monthly straight line basis, regardless of whether the service had been rendered.

- Logistics services

PEMEX provides transport for hydrocarbons, oil and petrochemicals, through transport strategies by employing pipelines and offshore and onshore resources, as well as the sale of capacity for its storage and management. The prices are established in the contracts, which also include penalties.

Therefore, due to the implementation of IFRS 15, the main impacts on the recognition of income with respect to the previous year are as follow:

IFRS 15	IAS 18
In the case of the contract with CENAGAS, operation and maintenance services for a period of one year are considered a performance obligation; any additional maintenance will be considered a separate performance obligation.	All services were recognized as a single performance obligation.
For all the other contracts with third parties, in cases where within the same service order there are transportation and storage services, there could exist more than one performance obligation, depending on the term of the service.	
The final price is estimated as follows:	
For CENAGAS, the price of the transaction is considered based on the prices established in the contract and in the service orders for each additional maintenance.	The sale of the service was recorded at the price of the sale date without the terms of the contract and a decrease in income was recognized at the time the claims for quality and volume were known.
For all other contracts, the price of the transaction is considered based on the prices established in the service orders.	
In all cases, variable compensations are estimated such as penalties for non-compliance with delivery, quality and volume claims, etc.	
Price is not distributed when there is a performance obligation, except, when there is more than one performance obligation, in which case, the price of the transaction will be assigned according to the service price established in the service order.	The price is determined according to the service order as performance obligation.
Income is recognized at a point in time, when the service is rendered.	Income was recognized on a monthly straight line basis, regardless of whether the service had been rendered.

- Other products

Ethylene receives revenues from sales of methane, ethane and propylene products, as well as fertilizers and their derivatives. Most sales are made in the domestic market. The sale and delivery of the product are made at the same time and because they are FOB, transportation fees are included in the price of sale of the product.

The transaction price is established at the time of sale, including the estimation of variable considerations such as capacity, penalties, extraordinary sales not included in contracts, adjustments for quality or volume claims, and incentives for the purchase of products; which are known days after the transaction. In the case of fertilizers and their derivatives, there are three types of prices, the list price, the retail customer price (which represents a discount compared to the list price) and the wholesale customer price (which represents a discount compared to the retail customer price).

Therefore, due to the implementation of IFRS 15, the main impacts on the recognition of income with respect to the previous year are as follow:

IFRS 15	IAS 18
There is only one performance obligation that includes transportation for delivery to destination.	An income was recognized for the sale of the products and another for the transportation.
The price of the product is estimated on the date of sale and considered as variable compensations such as quality and volume claims, etc.	The sale is recorded with the price at the time of the sale and delivery of the product and subsequently a decrease in income is recognized at the time quality and volume claims were known.
There is only one performance obligation so the price is not distributed.	The sale of product, freight and other services had their own prices.

ii. IFRS 9

In July 2014, the IASB finalized the accounting reform of financial instruments and issued IFRS 9 which contains: (a) the requirements for the classification and measurement of financial assets and liabilities, (b) the requirements for the impairment methodology, and (c) general information about hedge accounting. IFRS 9 replaces IAS 39 “Financial Instruments: Recognition and Measurement” (“IAS 39”) as of its effective date.

PEMEX has adopted IFRS 9 issued in July 2014 with a date of initial application of January 1, 2018. The requirements of IFRS 9 represent a significant change from IAS 39.

The nature and effects of the key changes to PEMEX’s accounting policies resulting from its adoption of IFRS 9 are summarized below.

As a result of the adoption of IFRS 9, PEMEX adopted consequential amendments to IAS 1 Presentation of Financial Statements, which requires impairment of financial assets to be presented in a separate line item in the statement of profit or loss and OCI. Previously, PEMEX’s approach was to include the impairment of trade receivables in other expenses.

- Classification of financial assets and financial liabilities

IFRS 9 contains three principal classification categories for financial assets: measured at amortized cost, FVOCI and FVTPL. The classification of financial assets under IFRS 9 is generally based on the business model in which a financial asset is managed and its contractual cash flow characteristics. IFRS 9 eliminates the previous IAS 39 categories of trading, held to maturity, loans and receivables and available for sale. Under IFRS 9, derivatives embedded in contracts where the host is a financial asset in the scope of the standard are never separated. Instead, the hybrid financial instrument as a whole is assessed for classification.

With respect to financial liabilities, the current classification and measurement criteria under IAS 39 have been transferred to IFRS 9, including the criteria for using the fair value option. The only change contemplated by IFRS 9 in relation to financial liabilities is related to liabilities designated at FVTPL. Changes in the fair value of such financial liabilities attributable to changes in the entity's own credit risk will be presented in OCI instead of in the period's results. The adoption of IFRS 9 has not had a significant effect on PEMEX's accounting policies for financial liabilities.

- Impairment of financial assets

IFRS 9 replaces the "incurred loss" model in IAS 39 with an ECL model. The new impairment model applies to financial assets measured at amortized cost, contract assets and debt investments at FVOCI, but not to investments in equity instruments. Under IFRS 9, credit losses are recognized earlier than under IAS 39.

- Hedge accounting

PEMEX, as part of the initial adoption of, and as permitted under, IFRS 9, elected to continue applying the hedge accounting requirements of IAS 39, instead of those included in IFRS 9. PEMEX uses DFIs to hedge the risk exposure in foreign currency, interest rate and the price of commodities related to its products. However, these contracts are not accounted as designated hedging instruments. DFIs are initially recognized at fair value on the date on which a derivative contract is entered into and after initial recognition are measured again at fair value. DFIs are accounted for as financial assets when the fair value is positive and as a financial liability when the fair value is negative. Any gain or loss arising from changes in the fair value of the DFIs is recognized directly in the income statement. This policy applies to the comparative information presented in 2018 and 2017.

- Transition

PEMEX has defined January 1, 2018 as the initial date of adoption of IFRS 9 and according to the transitional standard in IFRS 9, PEMEX will not restate previous periods for comparison purposes and any difference that may arise as a result of the adoption of IFRS 9 between the previous carrying amount and the carrying amount at the beginning of the reporting period shall be recognized in accumulated results over the opening initial period.

Classification and measurement

The following table sets forth the original measurement categories under IAS 39 and the new measurement categories under IFRS 9 for each class of PEMEX's financial assets at January 1, 2018.

Financial Assets	Classification IAS 39	Classification IFRS 9	Carrying amount IAS 39	Carrying amount IFRS 9
Cash and equivalents	Loans and receivables	FVTPL	Ps. 97,851,754	Ps. 97,851,754
Account receivables short term				
– net	Loans and receivables	Amortized Cost	170,645,234	*170,670,191
Equity instruments	Financial assets available for sale	FVTOCI	1,056,918	1,056,918
Derivative financial instrument	FVTPL	FVTPL	30,113,454	30,113,454
Account receivables long term – net	Loans and receivables	Amortized Cost	148,492,909	*148,492,909
Total financial assets			Ps. 448,160,269	Ps. 448,185,226

- * Short-term accounts receivable, which were classified as loans and items receivable under IAS 39, are now classified at amortized cost. An increase of Ps. 24,957 was recognized in the allowance for impairment for these receivables in accumulated results as of January 1, 2018 when the transition to IFRS 9 was made.

Impairment

PEMEX has concluded that the financial assets most affected by the impairment estimate under the ECL model will be its accounts receivables, in relation to PEMEX's holding of the long-term notes issued by the Mexican Government. The evaluation of the possible impairment of the notes was made using the general approach for calculating impairment contemplated under IFRS 9. The evaluation does not have material effects.

PEMEX considers it probable that impairment losses increase and present more volatility for instruments under the new ECL model. Furthermore, PEMEX considers that most of its accounts receivable are short-term without a significant financial component. Accordingly, PEMEX has elected to apply the simplified approach.

PEMEX considers that the application of the impairment requirements of IFRS 9 as of December 31, 2017 did not significantly impact the reserves as of January 1, 2018. The adjustment as of January 1, 2018 of the reserves of financial assets in comparison with impairment losses incurred under IAS 39 was approximately Ps. 24,957.

- Interpretation of IFRIC 22 *Foreign Currency Transactions and Advance Considerations* ("IFRIC 22")

As of December 2016, the IASB published an interpretation of IFRIC 22 developed by the International Financial Reporting Standards Interpretations Committee (the Interpretations Committee). The interpretation clarified when to recognize payments and collections of foreign currency transactions paid in advance due the fact that it observed some diversity in practice regarding these transactions.

The interpretations recognized foreign currency transactions when:

- there is consideration that is denominated or priced in a foreign currency;
- the entity recognizes a prepayment asset or a deferred income liability in respect of that consideration, in advance of the recognition of the related asset, expense or income; and
- the prepayment asset or deferred income liability is non-monetary.

The Interpretations Committee concluded that:

- The date of the transaction, for the purpose of determining the exchange rate, is the date of initial recognition of the non-monetary prepayment asset or deferred income liability.
- If there are multiple payments or receipts in advance, a date of transaction is established for each payment or receipt.

IFRIC 22 is effective for annual reporting periods beginning on or after January 1, 2018. Entities may apply the rule retrospectively, or prospectively, in accordance with IAS 8, with certain exemptions.

The adoption of this interpretation did not have any impact on the consolidated financial statements.

B. Reclassifications

The following amounts as of December 31, 2017 were reclassified to conform their presentation to the statement of financial position for 2018:

Line item	2017		
	As previously reported	Reclassification	Following Reclassification
Accounts receivable, net ⁽ⁱ⁾	Ps. 170,645,234	Ps. (2,522,206)	Ps. 168,123,028
Short-term notes receivable ⁽ⁱ⁾	—	2,522,206	2,522,206
Intangible assets ⁽ⁱⁱ⁾	Ps. 9,088,563	Ps. 5,590,077	Ps. 14,678,640
Other assets ⁽ⁱⁱ⁾	11,485,177	(5,590,077)	5,895,100

- (i) Due to the fact that Short-term notes receivable are now presented in a separate line item, figures for 2017 were reclassified from Accounts receivable, net.
- (ii) Due to the fact that intangible assets are now presented in a separate line item, figures for 2017 were reclassified from Other assets.

NOTE 5. SUBSIDIARY ENTITIES AND SUBSIDIARY COMPANIES

As of December 31, 2018 and 2017, the Subsidiary Entities consolidated in these financial statements include Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Cogeneration and Services (until July 27, 2018, see Note 1), Pemex Drilling and Services, Pemex Logistics, Pemex Fertilizers and Pemex Ethylene.

As of December 31, 2018 and 2017, the consolidated Subsidiary Companies are as follows:

- PEP Marine, DAC. (PEP DAC) ^{(i)(xi)}
- P.M.I. Services, B.V. (PMI SHO) ⁽ⁱ⁾
- P.M.I. Holdings, B.V. (PMI HBV) ^{(i)(vi)}
- P.M.I. Trading DAC (PMI DAC) ^{(i)(xii)}
- PEMEX Internacional España, S. A. (PMI SES) ^{(i)(iv)}
- P.M.I. Holdings Petróleos España, S. L. (HPE) ⁽ⁱ⁾
- P.M.I. Services North America, Inc. (PMI SUS) ⁽ⁱ⁾
- P.M.I. Holdings North America, Inc. (PMI HNA) ^{(i)(v)}
- P.M.I. Norteamérica, S. A. de C. V. (PMI NASA) ⁽ⁱ⁾
- P.M.I. Comercio Internacional, S. A. de C. V. (PMI CIM) ⁽ⁱ⁾⁽ⁱⁱ⁾
- P.M.I. Field Management Resources, S. L. (FMR) ^{(i)(vii)}
- P.M.I. Campos Maduros SANMA, S. de R. L. de C. V. (SANMA)
- Pro-Agroindustria, S. A. de C. V. (AGRO)
- P.M.I. Azufre Industrial, S. A. de C. V. (PMI AZIND) ^(ix)
- P.M.I. Infraestructura de Desarrollo, S. A. de C. V. (PMI ID) ⁽ⁱ⁾
- P.M.I. Cinturón Transoceánico Gas Natural, S. A. de C. V. (PMI CT) ⁽ⁱ⁾
- P.M.I. Transoceánico Gas LP, S. A. de C. V. (PMI TG) ⁽ⁱ⁾
- P.M.I. Servicios Portuarios Transoceánicos, S. A. de C. V. (PMI SP) ⁽ⁱ⁾
- P.M.I. Midstream del Centro, S. A. de C. V. (PMI MC) ⁽ⁱ⁾
- PEMEX Procurement International, Inc. (PPI)
- Hijos de J. Barreras, S. A. (HJ BARRERAS) ⁽ⁱⁱ⁾
- PEMEX Finance, Ltd. (FIN) ^(x)
- Mex Gas Internacional, S. L. (MGAS)
- Pemex Desarrollo e Inversión Inmobiliaria, S. A. de C. V. (PDII)

- Kot Insurance Company, AG. (KOT)
 - PPQ Cadena Productiva, S.L. (PPQCP)
 - III Servicios, S. A. de C. V. (III Servicios)
 - P.M.I. Ducto de Juárez, S. de R.L. de C.V. (PMI DJ)⁽ⁱ⁾
 - PMX Cogeneración Internacional, S.L. (MG COG) ^(viii)
 - PMX Cogeneración S.A.P.I. de C.V. (PMX COG) ^(viii)
 - PMX Fertilizantes Holding, S.A de C.V. (PMX FH)
 - PMX Fertilizantes Pacífico, S.A. de C.V. (PMX FP)
 - Grupo Fertinal (GP FER)
 - Compañía Mexicana de Exploraciones, S.A. de C.V. (COMESA)⁽ⁱⁱ⁾
 - P.M.I. Trading Mexico, S.A. de C.V. (TRDMX) ⁽ⁱⁱⁱ⁾
 - Holdings Holanda Services, B.V. (HHS) ^(vi)
- i. Member Company of the “PMI Subsidiaries”.
 - ii. Non-controlling interest company.
 - iii. As of January 2017, this company started operations and was included in the consolidated financial statements of PEMEX.
 - iv. As of February 2017, this company merged with HPE.
 - v. As of June 2017, this company merged with SUS.
 - vi. As of October 2017, PMI HBV was divided, and HHS was created and included in the consolidated financial statements of PEMEX.
 - vii. This company was liquidated in 2017.
 - viii. As of December 2017, PEMEX acquired shares in these companies and they were included in the consolidated financial statements of PEMEX.
 - ix. As of August 2018, this company was consolidated by MGAS.
 - x. On December 17, 2018 PEMEX acquired the total shares in this company and as of December 31, 2018 this company is no longer part of the non-controlling interest.
 - xi. Formerly P.M.I. Marine DAC until August, 2018
 - xii. Formerly P.M.I. Trading Ltd until August, 2018.

NOTE 6. Segment financial information

PEMEX’s primary business is the exploration and production of crude oil and natural gas, as well as the production, processing, marketing and distribution of petroleum and petrochemical products. After the Corporate Reorganization, PEMEX’s operations have been conducted through nine business segments: Exploration and Production, Industrial Transformation, Cogeneration and Services (until July 27, 2018, see Note 1), Drilling and Services, Logistics, Ethylene, Fertilizers, the Trading Companies and Corporate and Other Operating Subsidiary Companies. Due to PEMEX’s structure, there are significant amounts of inter-segment sales among the reporting segments, which are made at internal transfer prices established by PEMEX that are intended to reflect international market prices.

The primary sources of revenue for PEMEX’s business segments are as described below:

- The exploration and production segment earns revenues from domestic sales of crude oil and natural gas, and from exporting crude oil through certain of the Trading Companies. Export sales are made through PMI CIM to approximately 30 major customers in various foreign markets. Approximately half of PEMEX’s crude oil is sold to Pemex Industrial Transformation.
- The industrial transformation segment earns revenues from sales of refined petroleum products and derivatives, mainly to third parties within the domestic market. This segment also sells a significant portion of the fuel oil it produces to the CFE and a significant portion of jet fuel produced to the Airports and Auxiliary Services Agency. The refining segment’s most important products are different types of gasoline and diesel.
The industrial transformation segment also earns revenues from domestic sources generated by sales of natural gas, liquefied petroleum gas, naphtha, butane and ethane and certain other petrochemicals such as methane derivatives, ethane derivatives, aromatics and derivatives.
- The cogeneration segment received income from the cogeneration, supply and sale of electricity and thermal energy and also provides technical and management activities associated with these services. During 2018 this company did not generate income. This entity was liquidated on July 27, 2018 (see Note 1).

- The drilling segment receives income from drilling services, and servicing and repairing wells.
- The logistics segment earns income from transportation and storage of crude oil, petroleum products and petrochemicals, as well as related services, which it provides by employing pipelines and offshore and onshore resources, and from providing services related to the maintenance, handling, guarding and management of these products.
- The ethylene segment earns revenues from the distribution and trade of methane, ethane and propylene in the domestic market.
- The fertilizers segment earns revenues from trading ammonia, fertilizers and its derivatives, mostly in the domestic market.
- The trading companies segment, which consist of PMI CIM, PMI NASA, PMI Trading and MGAS (the “Trading Companies”), earn revenues from trading crude oil, natural gas and petroleum and petrochemical products in international markets.
- The segment related to corporate and other operating Subsidiary Companies provides administrative, financing, consulting and logistical services, as well as economic, tax and legal advice and re-insurance services to PEMEX’s entities and companies.

The following tables present the condensed financial information of these segments, after elimination of unrealized intersegment gain (loss), and include only select line items. As a result, the line items presented below may not total. These reporting segments are those which PEMEX’s management evaluates in its analysis of PEMEX and on which it bases its decision-making.

As of/for the year ended December 31, 2018	Exploration and Production	Industrial Transformation	Cogeneration and Services ⁽¹⁾	Drilling and Services	Logistics	Fertilizers	Ethylene	Trading Companies	Corporate and Other Operating Subsidiary Companies	Intersegment eliminations	Total
Sales:											
Trade	Rs. 482,262,631	Rs. 960,538,229	Rs. —	Rs. —	Rs. —	Rs. 2,933,424	Rs. 12,809,114	Rs. 204,103,954	Rs. 9,778,796	Rs. —	Rs. 1,672,446,148
Intersegment	397,199,590	141,997,392	—	3,414,033	63,672,574	65,802	1,635,050	640,382,216	119,762,378	(1,368,129,035)	—
Services income	23,110	546,136	—	198,775	4,708,217	4,742	13,379	64,038	3,114,605	—	8,673,002
(Reversal)	—	—	—	—	—	—	—	—	—	—	—
Impairment of wells pipelines, properties, plant and equipment, net	(65,013,616)	(659,610)	—	—	40,288,338	2,246,264	—	1,719,627	—	—	(21,418,997)
Cost of sales	402,979,694	1,091,796,331	—	(1,350,678)	42,694,683	4,509,881	15,952,951	837,820,025	54,148,722	(1,249,040,048)	1,199,511,561
Gross income (loss)	541,519,253	11,965,036	—	4,963,486	(14,602,230)	(3,752,177)	(1,495,408)	5,010,556	78,507,057	(119,088,987)	503,026,586
Other revenue	—	—	—	—	—	—	—	—	—	—	—
(expenses), net	12,475,283	5,370,430	1,788	(3,797,729)	(40,069,840)	71,419	149,028	1,791,001	6,771,950	40,289,181	23,052,511
Distribution, transportation and sales expenses	106,510	26,616,527	—	63	82,755	387,397	251,459	280,407	94,457	(3,462,366)	24,357,209
Administrative expenses	67,988,247	51,613,434	—	965,397	11,592,604	785,883	1,860,759	1,541,092	74,525,804	(76,551,739)	134,321,481
Operating income (loss)	485,899,779	(60,894,495)	1,788	200,297	(66,347,429)	(4,854,038)	(3,458,598)	4,980,058	10,658,746	1,214,299	367,400,407
Financing income	94,009,399	7,475,509	1	350,326	1,351,514	4,916	26,565	702,471	142,481,311	(214,884,800)	31,557,122
Financing cost	(127,343,514)	(1,910,666)	—	(771,639)	(220,721)	(478,044)	(79,335)	(1,379,583)	(202,865,030)	214,321,510	(120,727,022)
Derivative financial instruments (cost) income, net	(19,132,060)	(11,304)	—	—	—	—	—	382,568	(3,497,812)	(5)	(22,258,613)
Foreign exchange (loss) income, net	28,035,087	(1,707,558)	—	31,051	167,982	(2,577)	(28,542)	920,488	(3,756,451)	—	23,659,480
Profit (loss) sharing in joint ventures and associates	54,149	—	—	—	(1,092)	—	—	1,012,490	(124,094,148)	124,555,613	1,527,012
Taxes, duties and other	469,669,529	—	—	(407,217)	(2,474,189)	—	1,446,202	1,840,409	(8,496,511)	—	461,578,223
Net (loss) income	(8,146,689)	(57,048,514)	1,789	217,252	(62,575,557)	(5,529,743)	(4,986,112)	4,778,083	(172,576,873)	125,246,527	(180,419,837)
Total current assets	1,109,407,361	238,486,786	—	11,478,067	15,343,841	2,772,995	8,337,752	137,727,664	723,490,973	(1,853,935,478)	393,109,961
Total non current assets	1,023,144,103	283,521,897	—	15,267,696	100,097,224	4,187,744	17,771,292	28,939,309	1,624,995,944	(1,415,837,902)	1,682,087,307
Total current liabilities	334,709,929	155,402,987	—	2,962,370	31,418,555	9,682,768	6,710,315	98,007,805	1,662,808,360	(1,853,926,795)	447,776,294
Total non current liabilities	2,254,024,319	529,484,079	—	10,739,495	10,332,359	108,467	149,750	4,272,341	2,116,660,861	(1,838,945,265)	3,086,826,406
Equity (deficit), net	(456,182,784)	(162,878,383)	—	13,043,898	73,690,151	(2,830,496)	19,248,979	64,386,827	(1,430,982,304)	423,098,680	(1,459,405,432)
Depreciation and amortization	124,671,118	19,183,640	—	1,483,248	4,409,226	(246,697)	1,385,445	403,122	2,092,938	—	153,382,040
Net periodic cost of employee benefits	33,688,888	51,239,055	—	27,105	191,132	9,162	8,839	(321,683)	26,861,666	2,917,450	114,621,614

(1) This company was liquidated on July 27, 2018. Except for certain expenses incurred in the liquidation, all operations were transferred to Pemex Industrial Transformation. (See Note 1)

As of/for the year ended												
December 31,												
2017												
Sales:	Exploration and Production	Industrial Transformation	Cogeneration and Services ^(a)	Drilling and Services	Logistics	Fertilizers	Ethylene	Trading Companies	Corporate and Other Operating Subsidiary Companies	Intersegment eliminations	Total	
Trade	Ps. —	Ps. 857,456,146	Ps. —	Ps. —	Ps. —	Ps. 4,123,006	Ps. 12,621,648	Ps. 508,539,112	Ps. 3,159,238	Ps. —	Ps. 1,385,899,150	
Interscgment	762,637,362	150,360,283	114,233	3,400,456	70,671,871	642,965	1,565,757	539,193,190	79,031,944	(1,607,618,061)	—	
Services income	—	6,116,937	334,755	41,741	3,714,941	2,339	26,733	66,621	826,502	—	11,130,569	
(Reversal) Impairment of wells pipelines, properties, plant and equipment, net	129,350,315	15,952,092	—	—	—	1,935,500	—	—	4,206,653	—	151,444,560	
Cost of sales	391,089,410	1,004,683,554	472,732	468,171	50,926,263	6,001,259	14,272,340	1,031,997,901	33,033,923	(1,528,740,673)	1,004,204,880	
Gross income (loss)	242,197,637	(6,702,280)	(23,744)	2,974,026	23,460,549	(3,168,449)	(58,202)	15,801,022	45,777,108	(78,877,388)	241,380,279	
Other revenue	—	—	—	—	—	9,013	23,030	307,212	—	(5,344,872)	5,174,076	
(expenses), net	10,204,045	1,515,538	2,646	(31,454)	(24,134,436)	—	—	—	—	—	—	
Distribution, transportation and sales expenses	—	26,049,566	13,581	888,776	73,526	528,370	334,663	375,482	59,043	(5,544,561)	21,889,670	
Administrative expenses	58,539,119	38,994,887	37,679	7,459,928	7,459,928	352,537	1,105,554	1,564,859	62,001,641	(51,005,526)	119,939,454	
Operating income (loss)	193,862,563	(70,231,195)	(72,358)	2,053,796	(8,207,341)	(4,040,343)	(1,475,389)	14,167,893	(21,628,448)	296,053	104,725,231	
Financing income	121,293,404	11,427,907	147	57,313	1,622,827	2,248	46,113	905,405	145,907,795	(265,097,306)	16,165,853	
Financing cost	(136,378,338)	(2,398,643)	(19,882)	(795,947)	(2,307,427)	(211,004)	(1,964)	(1,328,827)	(239,003,771)	(264,801,255)	(117,644,548)	
Derivative financial instruments (cost)	—	—	—	—	—	—	—	—	—	—	—	
income, net	(1,613,874)	5,835	—	—	—	—	—	(772,143)	27,718,506	—	25,338,324	
Foreign exchange (loss) income, net	10,043,316	4,924,209	—	227,365	613,099	(20,925)	(10,486)	(4,318)	7,411,862	—	23,184,122	
Profit (loss) sharing in joint ventures and associates	(75,195)	485,224	—	—	(74)	—	—	1,049,809	(212,666,494)	211,567,170	360,440	
Taxes, duties and other	338,169,260	—	—	276,967	(7,444,967)	—	—	1,972,718	6,063	—	332,980,041	
Net (loss) income	(151,037,384)	(55,786,663)	(92,093)	1,265,560	(833,949)	(4,270,024)	(1,441,726)	12,045,101	(292,266,613)	211,567,172	(280,850,619)	
Total current assets	1,036,063,541	570,380,888	179,807	6,871,148	49,391,784	3,155,476	3,994,381	158,414,445	506,187,594	(1,971,112,774)	363,526,290	
Total non current assets	1,021,972,864	286,815,419	—	19,349,601	142,504,209	5,767,980	19,147,664	28,394,454	1,605,553,140	(1,361,029,507)	1,768,475,824	
Total current liabilities	284,656,058	459,130,165	531,580	2,201,936	44,521,371	6,455,246	2,183,654	112,046,527	1,439,097,882	(1,961,697,234)	389,127,185	
Total non current liabilities	2,285,756,339	617,978,584	—	11,684,489	12,184,880	1,008,804	125,236	4,796,353	2,148,891,089	(1,836,290,460)	3,245,227,314	
Equity (deficit), net	(512,375,992)	(219,912,442)	(351,773)	12,334,324	135,189,742	2,367,406	20,833,155	69,966,018	(1,476,248,237)	465,845,413	(1,502,352,385)	
Depreciation and amortization	127,742,568	17,935,112	—	2,368,123	4,562,140	422,930	1,688,493	(19,798)	2,004,945	—	156,704,513	
Net employee benefits	32,794,386	52,538,989	—	39,697	(4,954)	(1,999)	(12,561)	16,166	22,703,351	—	108,073,075	

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For the year ended December 31, 2016	Corporate and Other										Total
	Exploration and Production	Industrial Transformation	Cogeneration and Services	Drilling and Services	Logistics	Fertilizers	Ethylene	Trading Companies	Operating Subsidiary Companies	Intersegment eliminations	
Sales:	Ps.	Ps.	Ps.	Ps.	Ps.	Ps.	Ps.	Ps.	Ps.	Ps.	Ps.
Trade	—	648,088,013	—	—	—	3,873,403	15,392,552	395,118,117	2,646,505	—	1,065,118,590
Intersegment	616,380,615	117,096,378	51,913	1,981,754	68,316,958	900,464	1,764,438	405,293,283	50,683,175	(1,262,468,978)	—
Services	—	5,565,604	132,521	70,112	2,813,887	1,908	60,141	236,230	473,415	(379,176)	8,974,642
(Reversal)	—	—	—	—	—	—	—	—	—	—	—
Impairment of wells pipelines, properties, plant and equipment, net	(271,709,433)	(52,498,881)	—	—	(5,829,520)	—	(1,276,509)	—	—	—	(331,314,343)
Cost of sales	359,064,884	823,763,927	166,721	143,956	61,248,584	5,506,198	13,936,213	783,691,245	7,260,043	(1,188,959,550)	865,822,221
Gross income (loss)	529,025,164	(515,051)	17,713	1,907,910	15,711,781	(730,423)	4,557,427	16,956,385	46,543,052	(73,888,604)	539,585,354
Other revenue	—	—	—	—	—	—	—	—	—	—	—
Distribution, transportation and sales expenses	27,346,794	19,964,654	—	591,704	(27,189,969)	32,710	63,989	3,412,711	(906,183)	(666,804)	22,649,606
Administrative expenses	—	50,792,317	8,232	6	148,215	185,168	481,727	229,432	49,162	(26,663,019)	25,231,240
Operating income (loss)	54,509,047	34,183,846	32,126	983,560	7,175,451	731,479	2,101,834	1,157,182	60,497,232	(48,718,224)	112,653,533
Financing income	501,862,911	(65,526,560)	(22,645)	1,516,048	(18,801,854)	(1,614,360)	2,037,855	18,982,482	(14,909,525)	825,835	424,350,187
Financing cost	56,040,129	11,056,345	—	72,995	373,301	4,338	64,582	1,098,079	125,964,466	(180,925,000)	13,749,255
Derivative financial instruments (cost) income, net	(109,946,363)	(3,188,892)	(12,055)	(642,711)	(481,741)	(20,217)	(2,980)	(1,342,351)	(163,400,779)	(180,193,625)	(98,844,464)
Foreign exchange (loss) income, net	—	3,172	—	—	—	—	—	(1,951,959)	(12,052,200)	—	(14,000,987)
Profit (loss) sharing in joint ventures and associates	(217,166,718)	(12,858,875)	—	(1,570,317)	(1,118,537)	(29,263)	(2,843)	174,866	(21,441,056)	—	(254,012,743)
Taxes, duties and other	(21,164)	649,520	—	—	—	—	—	1,586,503	(117,426,818)	117,347,804	2,135,845
Net (loss) income	276,647,448	—	—	(481,581)	(10,010,686)	—	—	7,380,870	(9,014,616)	—	264,521,435
Depreciation and amortization	(45,878,653)	(69,865,290)	(34,700)	(142,404)	(10,018,145)	(1,659,482)	2,096,614	11,166,750	(194,251,296)	117,442,264	(191,144,342)
Net periodic cost of employee benefits	124,329,921	17,425,472	—	2,559,357	2,230,557	481,241	1,395,232	86,707	1,931,004	—	150,439,491
	32,617,215	52,886,397	5,860	31,491	30,340	(1,178)	1,424	(552,735)	24,719,602	—	109,738,416

PEMEX's management measures the performance of the segments based on operating income and net segment income before elimination of unrealized intersegment gain (loss), as well as by analyzing the impact of the results of each segment on the consolidated financial statements. For certain of the items in these consolidated financial statements to conform with the individual financial statements of the operating segments, they must be reconciled. The tables below present the financial information of PEMEX's operating segments, before intersegment eliminations:

The following tables present accounting reconciliations between individual and consolidated information.

	As of for the year ended December 31, 2018										
	Exploration and Production	Industrial Transformation	Cogeneration and Services ⁽¹⁾	Drilling and Services	Logistics	Fertilizers	Ethylene	Trading Companies	Operating Subsidiary Companies	Corporate and Other	
Sales:											
By segment	Ps. 910,443,812	1,105,255,786	—	8,716,657	68,380,791	3,051,428	14,457,543	844,550,208	132,655,779	—	
Less unrealized intersegment sales	(30,958,481)	(2,154,029)	—	(5,103,849)	—	(47,460)	—	—	—	—	
Total consolidated sales	<u>Ps. 879,485,331</u>	<u>1,103,101,757</u>	—	<u>3,612,808</u>	<u>68,380,791</u>	<u>3,003,968</u>	<u>14,457,543</u>	<u>844,550,208</u>	<u>132,655,779</u>	—	
Operating income (loss):											
By segment	Ps. 488,151,914	(70,799,130)	1,788	406,574	(97,029,061)	(5,162,552)	(9,520,020)	4,913,736	10,658,746	—	
Less unrealized intersegment sales	(30,958,481)	(2,154,029)	—	(5,103,849)	—	(47,460)	—	—	—	—	
Less unrealized gain due to production cost valuation of inventory	(596,889)	12,058,664	—	4,537,200	—	—	—	—	66,322	—	
Less capitalized refined products	(1,774,227)	—	—	—	—	—	—	—	—	—	
Less amortization of capitalized interest	118,981	—	—	—	—	—	—	—	—	—	
Less depreciation and impairment of revaluated transferred assets	30,958,481	—	—	360,372	30,681,632	355,974	6,061,422	—	—	—	
Total consolidated operating income (loss)	<u>Ps. 485,899,779</u>	<u>(60,894,495)</u>	<u>1,788</u>	<u>200,297</u>	<u>(66,347,429)</u>	<u>(4,854,038)</u>	<u>(3,458,598)</u>	<u>4,980,058</u>	<u>10,658,746</u>	—	
Net income (loss):											
By segment	Ps. (5,867,212)	(65,286,932)	1,789	971,701	(85,357,751)	(6,248,709)	(6,144,326)	4,711,761	(172,576,873)	—	
Less unrealized intersegment sales	(30,958,481)	(2,154,029)	—	(5,103,849)	—	(47,460)	—	—	—	—	
Less unrealized gain due to production cost valuation of inventory	(596,889)	12,058,664	—	3,799,980	—	—	—	—	66,322	—	
Less capitalized refined products	(1,774,227)	—	—	—	—	—	—	—	—	—	
Less equity method elimination	(27,342)	(1,666,217)	—	—	666	610,452	(3,457,006)	—	—	—	
Less amortization of capitalized interest	118,981	—	—	—	—	—	—	—	—	—	
Less depreciation and impairment of revaluated transferred assets, net of deferred taxes	30,958,481	—	—	549,420	22,781,528	355,974	4,615,220	—	—	—	
Total consolidated net (loss) income	<u>Ps. 8,146,689</u>	<u>(57,048,514)</u>	<u>1,789</u>	<u>217,252</u>	<u>(62,575,557)</u>	<u>(5,329,743)</u>	<u>(4,986,112)</u>	<u>4,778,083</u>	<u>(172,576,873)</u>	—	
Assets:											
By segment	Ps. 2,161,126,244	567,768,812	—	28,400,765	176,047,827	10,018,775	31,365,663	177,684,447	2,348,486,917	—	
Less unrealized gain due to production cost valuation of inventory	1,557,729	(7,544,007)	—	—	7,184	(26,886)	(5,304)	(408,060)	—	—	
Less capitalized refined products	(4,254,421)	(30,320,566)	—	—	—	(47,460)	—	(9,339,859)	—	—	
Less depreciation and impairment of revaluated transferred assets, net of deferred taxes	(1,774,227)	—	—	—	—	—	—	—	—	—	
Less equity method elimination	(23,660,467)	—	—	(1,655,002)	(60,523,859)	(1,801,679)	(5,186,318)	(424,850)	—	—	
Less amortization of capitalized interest	(562,375)	(7,903,679)	—	—	(90,087)	(1,182,011)	(64,997)	(844,705)	—	—	
Less equity method for unrealized profits	118,981	8,123	—	—	—	—	—	—	—	—	
Total consolidated assets	<u>Ps. 2,132,551,464</u>	<u>522,008,683</u>	—	<u>26,745,763</u>	<u>115,441,065</u>	<u>6,960,739</u>	<u>26,109,044</u>	<u>166,666,973</u>	<u>2,348,866,917</u>	—	
Liabilities:											
By segment	Ps. 2,588,734,248	689,306,996	—	12,328,030	41,750,914	9,791,235	6,860,065	104,239,692	3,779,469,221	—	
Less unrealized intersegment sales	—	(4,419,930)	—	1,373,835	—	—	—	(1,959,546)	—	—	
Total consolidated liabilities	<u>Ps. 2,588,734,248</u>	<u>684,887,066</u>	—	<u>13,701,865</u>	<u>41,750,914</u>	<u>9,791,235</u>	<u>6,860,065</u>	<u>102,280,146</u>	<u>3,779,469,221</u>	—	

(1) This company was liquidated on July 27, 2018. Except for certain expenses incurred in the liquidation, all operations were transferred to Pemex Industrial Transformation. (See Note 1)

As of/for the year ended December 31, 2017	Exploration and Production	Industrial Transformation	Cogeneration and Services	Drilling and Services	Logistics	Fertilizers	Ethylene	Trading Companies	Corporate and Other Operating Subsidiary Companies
Sales:									
By segment	Ps. 762,637,362	1,015,157,118	448,988	6,679,132	74,386,812	4,795,196	14,214,138	1,047,874,453	83,017,684
Less unrealized intersegment sales	—	(1,223,752)	—	(3,236,935)	—	(26,886)	—	—	(75,530)
Total consolidated sales	Ps. 762,637,362	1,013,933,366	448,988	3,442,197	74,386,812	4,768,310	14,214,138	1,047,798,923	83,017,684
Operating income (loss):									
By segment	Ps. 194,814,292	(59,989,652)	(72,358)	882,692	(61,696,313)	(7,148,431)	(4,698,838)	14,490,017	(21,628,448)
Less unrealized intersegment sales	—	(1,223,752)	—	(3,236,935)	—	(26,886)	—	—	(75,530)
Less unrealized gain due to production	—	—	—	—	—	—	—	—	—
cost valuation of inventory	(496,329)	(9,017,791)	—	2,932,663	—	—	—	—	(246,594)
Less capitalized refined products	(574,381)	—	—	—	—	—	—	—	—
Less amortization of capitalized interest	118,981	—	—	—	—	—	—	—	—
Less depreciation and impairment of revalued transferred assets	—	—	—	1,475,376	53,488,972	3,134,974	3,223,449	—	—
Total consolidated operating income (loss)	Ps. 193,862,563	(70,231,195)	(72,358)	2,053,796	(8,207,341)	(4,040,343)	(1,475,389)	14,167,893	(21,628,448)
Net income (loss):									
By segment	Ps. (150,388,699)	(44,599,751)	(358,862)	345,913	(40,300,942)	(8,616,130)	(5,866,542)	5,200,268	(292,266,613)
Less unrealized intersegment sales	—	(1,223,752)	—	(3,236,935)	—	(26,886)	—	—	(75,530)
Less unrealized gain due to production	—	—	—	—	—	—	—	—	—
cost valuation of inventory	(496,329)	(9,017,791)	—	2,932,663	—	—	—	—	(246,594)
Less capitalized refined products	(574,381)	—	—	—	—	—	—	—	—
Less equity method elimination	303,044	(945,369)	266,769	—	333	1,238,018	1,201,367	7,166,957	—
Less amortization of capitalized interest	118,981	—	—	—	—	—	—	—	—
Less depreciation and impairment of revalued transferred assets, net of deferred taxes	—	—	—	1,223,919	39,466,660	3,134,974	3,223,449	—	—
Total consolidated net (loss) income	Ps. (151,037,384)	(55,786,663)	(92,093)	1,265,560	(833,949)	(4,270,024)	(1,441,726)	12,045,101	(292,266,613)
Assets:									
By segment	Ps. 2,084,553,745	912,770,881	179,807	28,256,876	276,537,764	17,689,305	35,498,783	195,538,239	2,111,740,734
Less unrealized intersegment sales	858,094	(5,389,977)	—	—	7,183	—	(5,303)	(408,059)	—
Less unrealized gain due to production cost valuation of inventory	(3,657,242)	(42,379,229)	—	—	—	(26,886)	—	(7,163,664)	—
Less capitalized refined products	(574,381)	—	—	—	—	—	—	—	—
Less depreciation and impairment of revalued transferred assets, net of deferred taxes	(22,503,168)	—	—	(2,036,127)	(84,557,831)	(2,165,068)	(9,522,686)	(424,849)	—
Less equity method for unrealized profits	(759,624)	(7,813,492)	—	—	(91,123)	(6,573,895)	(2,828,749)	(732,768)	—
Less amortization of capitalized interest	118,981	8,124	—	—	—	—	—	—	—
Total consolidated assets	Ps. 2,058,036,405	857,196,307	179,807	26,220,749	191,895,993	8,923,456	23,142,045	186,808,899	2,111,740,734
Liabilities:									
By segment	Ps. 2,570,412,397	1,081,528,677	531,580	13,186,297	56,706,251	6,556,050	2,308,890	116,648,398	3,587,988,971
Less unrealized intersegment sales	—	(4,419,928)	—	700,128	—	—	—	194,482	—
Total consolidated liabilities	Ps. 2,570,412,397	1,077,108,749	531,580	13,886,425	56,706,251	6,556,050	2,308,890	116,842,880	3,587,988,971

	Exploration and Production	Industrial Transformation	Cogeneration and Services	Drilling and Services	Logistics	Fertilizers	Ethylene	Trading Companies	Corporate and Other Operating Subsidiary Companies
For the year ended December 31, 2016									
Sales:									
By segment	Ps. 616,380,615	771,597,427	184,434	6,263,093	71,130,845	4,775,775	17,217,131	800,979,076	53,803,095
Less unrealized intersegment sales	—	(847,432)	—	(4,211,227)	—	—	—	(331,446)	—
Total consolidated sales	Ps. 616,380,615	770,749,995	184,434	2,051,866	71,130,845	4,775,775	17,217,131	800,647,630	53,803,095
Operating income (loss):									
By segment	Ps. 503,679,153	(60,347,367)	(22,645)	1,271,202	(25,701,065)	(2,877,725)	(3,504,812)	19,526,997	(14,909,525)
Less unrealized intersegment sales	—	(847,432)	—	(4,211,227)	—	—	—	(331,446)	—
Less unrealized gain due to production	—	—	—	—	—	—	—	—	—
cost valuation of inventory	(273,237)	3,572,498	—	3,815,371	—	905,910	(2,163)	(213,069)	—
Less capitalized refined products	(1,661,986)	(7,904,259)	—	—	—	—	—	—	—
Less amortization of capitalized interest	118,981	—	—	—	—	—	—	—	—
Less depreciation and impairment of revaluated assets	—	—	—	640,702	6,899,211	357,455	5,544,830	—	—
Total consolidated operating income (loss)	Ps. 501,862,911	(65,526,560)	(22,645)	1,516,048	(18,801,854)	(1,614,360)	2,037,855	18,982,482	(14,909,525)
Net income (loss):									
By segment	Ps. (44,069,001)	(61,639,067)	(381,214)	(387,250)	(16,917,356)	(7,820,835)	(3,780,706)	11,711,265	(194,251,296)
Less unrealized intersegment sales	—	(847,432)	—	(4,211,227)	—	—	—	(331,446)	—
Less unrealized gain due to production	—	—	—	—	—	—	—	—	—
cost valuation of inventory	(273,237)	3,572,498	—	3,815,371	—	905,910	(2,163)	(213,069)	—
Less capitalized refined products	(1,661,986)	(7,904,259)	—	—	—	—	—	—	—
Less equity method elimination	6,590	(3,047,030)	346,514	—	—	4,897,988	334,653	—	—
Less amortization of capitalized interest	118,981	—	—	—	—	—	—	—	—
Less depreciation of revaluated assets	—	—	—	640,702	6,899,211	357,455	5,544,830	—	—
Total consolidated net (loss) income	Ps. (45,878,653)	(69,865,290)	(34,700)	(142,404)	(10,018,145)	(1,659,482)	2,096,614	11,166,750	(194,251,296)

Supplemental geographic information:

	For the years ended December 31,		
	2018	2017	2016
Domestic sales	Ps. 980,559,538	Ps. 877,360,038	Ps. 670,000,473
Export sales:			
United States	434,838,159	302,912,999	221,954,461
Canada, Central and South America	11,274,714	13,943,080	14,058,897
Europe	158,900,339	71,470,613	64,348,997
Other	86,873,398	120,212,420	94,755,762
Total export sales	691,886,610	508,539,112	395,118,117
Services income	8,673,002	11,130,569	8,974,642
Total sales	Ps. 1,681,119,150	Ps. 1,397,029,719	Ps. 1,074,093,232

PEMEX does not have significant long-lived assets outside of Mexico.

The following table shows income by product:

	For the years ended December 31,		
	2018	2017	2016
Domestic sales			
Refined petroleum products and derivatives (primarily gasolines)	Ps. 850,342,124	Ps. 738,943,017	Ps. 578,718,674
Gas	110,219,691	116,021,269	59,648,576
Petrochemical products	19,997,723	22,395,752	31,633,223
Total domestic sales	Ps. 980,559,538	Ps. 877,360,038	Ps. 670,000,473
Export sales			
Crude oil	Ps. 482,259,045	Ps. 356,623,114	Ps. 288,625,794
Refined petroleum products and derivatives (primarily gasolines)	167,796,526	124,644,353	92,705,248
Gas	34,446,277	22,253,493	20,995
Petrochemical products	7,384,762	5,018,152	13,766,080
Total export sales	Ps. 691,886,610	Ps. 508,539,112	Ps. 395,118,117

NOTE 7. REVENUE

As of December 31, 2018 and 2017, the revenues were as follows:

A. Revenue disaggregation

For the period ended December 31,	Exploration and Production	Industrial Transformation	Cogeneration and Services ⁽¹⁾	Drilling and Services	Logistics	Fertilizers	Ethylene	Trading Companies	Corporate and Other Operating Subsidiary Companies	Total
Geographical market										
2018										
United States	276,785,650	—	—	—	—	—	—	158,713,210	—	435,498,860
Other	51,708,232	—	—	—	—	—	—	40,743,480	5,660,310	98,112,022
Europe	153,765,163	—	—	—	—	—	—	4,647,265	2,905,858	161,318,286
Local	26,696	961,104,365	—	198,775	4,708,217	2,938,167	12,822,493	64,037	4,327,232	986,189,982
Total	482,285,741	961,104,365	—	198,775	4,708,217	2,938,167	12,822,493	204,167,992	12,893,400	1,681,119,150
2017*										
United States	—	—	—	—	—	—	—	320,069,332	—	320,069,332
Other	—	—	—	—	—	—	—	71,209,448	—	71,209,448
Europe	—	—	—	—	—	—	—	117,260,334	1,062,795	118,323,129
Local	—	863,573,083	334,755	41,741	3,714,941	4,125,345	12,648,381	66,619	2,922,945	887,427,810
Total	—	863,573,083	334,755	41,741	3,714,941	4,125,345	12,648,381	508,605,733	3,985,740	1,397,029,719
2016*										
United States	—	—	—	—	—	—	—	236,095,685	—	236,095,685
Other	—	—	—	—	—	—	—	67,377,456	72,660	67,450,116
Europe	—	—	—	—	—	—	—	90,817,488	—	90,817,488
Local	—	653,653,617	132,521	70,112	2,813,887	3,875,311	15,452,693	862,641	2,869,161	679,729,943
Total	—	653,653,617	132,521	70,112	2,813,887	3,875,311	15,452,693	395,153,270	2,941,821	1,074,093,232
Major products and services										
2018										
Crude oil	482,259,045	—	—	—	—	—	—	—	—	482,259,045
Gas	3,586	110,216,105	—	—	—	—	—	34,446,277	—	144,665,968
Refined petroleum products	—	850,342,124	—	—	—	—	—	167,796,526	—	1,018,138,650
Other	—	—	—	—	—	2,933,425	12,809,114	1,861,152	9,778,794	27,382,485
Services	23,110	546,136	—	198,775	4,708,217	4,742	13,379	64,037	3,114,606	8,673,002
Total	482,285,741	961,104,365	—	198,775	4,708,217	2,938,167	12,822,493	204,167,992	12,893,400	1,681,119,150
2017*										
Crude oil	—	—	—	—	—	—	—	356,623,113	—	356,623,113
Gas	—	116,021,269	—	—	—	—	—	22,253,493	—	138,274,762
Refined petroleum products	—	738,943,017	—	—	—	—	—	124,644,353	—	863,587,370
Other	—	2,491,860	—	—	—	4,123,006	12,621,648	5,018,152	3,159,239	27,413,905
Services	—	6,116,937	334,755	41,741	3,714,941	2,339	26,733	66,622	826,501	11,130,569
Total	—	863,573,083	334,755	41,741	3,714,941	4,125,345	12,648,381	508,605,733	3,985,740	1,397,029,719
2016*										
Crude oil	—	—	—	—	—	—	—	268,999,873	—	268,999,873
Gas	—	115,997,297	—	—	—	—	—	13,813,301	—	129,810,598
Refined petroleum products	—	529,322,404	—	—	—	—	—	106,770,273	—	636,092,677
Other	—	2,768,313	—	—	—	3,873,402	15,392,552	5,534,217	2,646,958	30,215,442
Services	—	5,565,603	132,521	70,112	2,813,887	1,909	60,141	35,606	294,863	8,974,642
Total	—	653,653,617	132,521	70,112	2,813,887	3,875,311	15,452,693	395,153,270	2,941,821	1,074,093,232
Timing of revenue recognition										
2018										
Products transferred at a point in time	482,262,631	960,558,229	—	—	—	2,933,425	12,809,114	204,103,954	9,778,794	1,672,446,147
Products and services transferred over the time	23,110	546,136	—	198,775	4,708,217	4,742	13,379	64,038	3,114,606	8,673,003
Total	482,285,741	961,104,365	—	198,775	4,708,217	2,938,167	12,822,493	204,167,992	12,893,400	1,681,119,150
2017*										
Products transferred at a point in time	—	857,456,146	—	—	—	4,123,006	12,621,648	508,539,111	3,159,239	1,385,899,150
Products and services transferred over the time	—	6,116,937	334,755	41,741	3,714,941	2,339	26,733	66,622	826,501	11,130,569
Total	—	863,573,083	334,755	41,741	3,714,941	4,125,345	12,648,381	508,605,733	3,985,740	1,397,029,719
2016*										
Products transferred at a point in time	—	648,088,014	—	—	—	3,873,402	15,392,552	395,117,664	2,646,958	1,065,118,590
Products and services transferred over the time	—	5,565,603	132,521	70,112	2,813,887	1,909	60,141	35,606	294,863	8,974,642
Total	—	653,653,617	132,521	70,112	2,813,887	3,875,311	15,452,693	395,153,270	2,941,821	1,074,093,232

* PEMEX applied the modified retrospective transition method to the implementation of IFRS 15. Under this method the comparative financial information is not re-established.

⁽¹⁾ This company was liquidated on July 27, 2018. Except for certain expenses incurred in the liquidation, all the operations were transferred to Pemex Industrial Transformation. (See Note 1)

B. Accounts receivable in the Statement of Financial Position

As of December 31, 2018 and 2017, PEMEX had accounts receivable derived from customer contracts in the amounts of Ps. 87,740,515 and Ps. 114,486,024, respectively (see Note 10).

C. Practical expedients

- 1) Expiration of contracts.

PEMEX has no outstanding performance obligations to meet as of December 31, 2018 due to the nature of its operations (see Note 4-A).

- 2) Significant financial component, less than one year.

PEMEX does not need to adjust the amount committed in consideration for goods and services to account for the effects of a significant financing component, since the transfer and the time of payment of a good or service committed to the customer is less than one year.

3) PEMEX applied the practical file, so disclosure about remaining performance obligations that conclude in less than one year is not needed.

When PEMEX is entitled to consideration for an amount that directly corresponds to the value of the performance that PEMEX has completed, it may recognize an income from ordinary activities for the amount to which it has the right to invoice.

NOTE 8. FINANCIAL INSTRUMENTS

A. Accounting classifications and fair values of financial instruments

The following tables present information about PEMEX's carrying amounts and fair values of financial assets and financial liabilities, including their levels in the fair value hierarchy, as of December 31, 2018 and 2017. It does not include fair value information for financial assets and financial liabilities not measured at fair value if the carrying amount is a reasonable approximation of fair value.

As of December 31, 2018	Carrying amount						Fair value hierarchy				
	In thousands of pesos	FVTPL	FVOCI – debt instruments	FVOCI – equity instruments	Financial assets at amortized cost	Other financial liabilities	Total carrying amount	Level 1	Level 2	Level 3	Total
Financial assets measured at fair value											
Derivative financial instruments	Ps. 22,382,277	—	—	—	—	—	Ps. 22,382,277	—	22,382,277	—	22,382,277
Equity instruments	—	—	245,440	—	—	—	245,440	—	245,440	—	245,440
Total	Ps. 22,382,277	—	245,440	—	—	—	Ps. 22,627,717				
Financial assets not measured at fair value											
Cash and cash equivalents	Ps. —	—	—	81,912,409	—	—	Ps. 81,912,409	—	—	—	—
Accounts receivable, net	—	—	—	167,139,778	—	—	167,139,778	—	—	—	—
Investments in joint ventures, associates and other	—	—	—	16,841,545	—	—	16,841,545	—	—	—	—
Long-term notes receivable	—	—	—	157,982,449	—	—	157,982,449	—	—	—	—
Total	Ps. —	—	—	423,876,181	—	—	Ps. 423,876,181				
Financial liabilities measured at fair value											
Derivative financial instruments	Ps. (15,895,245)	—	—	—	—	—	Ps. (15,895,245)	—	(15,895,245)	—	(15,895,245)
Total	Ps. (15,895,245)	—	—	—	—	—	Ps. (15,895,245)				
Financial liabilities not measured at fair value											
Suppliers	Ps. —	—	—	—	(149,842,712)	—	Ps. (149,842,712)	—	—	—	—
Accounts and accrued expenses payable	—	—	—	—	(24,917,669)	—	(24,917,669)	—	—	—	—
Debt	—	—	—	—	(2,082,286,116)	—	(2,082,286,116)	—	(1,913,377,218)	—	(1,913,377,218)
Total	Ps. —	—	—	—	(2,257,046,497)	—	Ps. (2,257,046,497)				

As of December 31, 2017	Carrying amount						Fair value hierarchy				
	In thousands of pesos	FVTPL	Held-to-maturity	Loans and receivables	Available-for-sale	Other financial liabilities	Total carrying amount	Level 1	Level 2	Level 3	Total
Financial assets measured at fair value											
Derivative financial instruments	Ps. 30,113,454	—	—	—	—	—	Ps. 30,113,454	—	30,113,454	—	30,113,454
Equity instruments	—	—	—	1,056,918	—	—	1,056,918	—	1,056,918	—	1,056,918
Total	Ps. 30,113,454	—	—	1,056,918	—	—	Ps. 31,170,372				
Financial assets not measured at fair value											
Cash and cash equivalents	Ps. —	—	97,851,754	—	—	—	Ps. 97,851,754	—	—	—	—
Accounts receivable, net	—	—	168,123,028	—	—	—	168,123,028	—	—	—	—
Investments in joint ventures, associates and other	—	16,707,364	—	—	—	—	16,707,364	—	—	—	—
Long-term notes receivable	—	151,015,115	—	—	—	—	151,015,115	—	—	—	—
Total	Ps. —	167,722,479	265,974,782	—	—	—	Ps. 433,697,261				
Financial liabilities measured at fair value											
Derivative financial instruments	Ps. (17,745,979)	—	—	—	—	—	Ps. (17,745,979)	—	(17,745,979)	—	(17,745,979)
Total	Ps. (17,745,979)	—	—	—	—	—	Ps. (17,745,979)				
Financial liabilities not measured at fair value											
Suppliers	Ps. —	—	—	—	(139,955,378)	—	Ps. (139,955,378)	—	—	—	—
Accounts and accrued expenses payable	—	—	—	—	(23,211,401)	—	(23,211,401)	—	—	—	—
Debt	—	—	—	—	(2,037,875,071)	—	(2,037,875,071)	—	(2,153,383,220)	—	(2,153,383,220)
Total	Ps. —	—	—	—	(2,201,041,850)	—	Ps. (2,201,041,850)				

Debt is valued and registered at amortized cost and the fair value of debt is estimated using quotes from major market sources which are then adjusted internally using standard market pricing models. As a result of relevant assumptions, the estimated fair value does not necessarily represent the actual terms at which existing transactions could be liquidated or unwound.

As of December 31, 2018 and 2017, PEMEX had monetary assets and liabilities denominated in foreign currency as indicated below:

	As of December 31, 2018				
	Foreign currency			Exchange rate	Equivalent in Mexican Pesos
	Asset	Liability	Net Asset (Liability)		
U.S. dollar	8,458,532	80,583,838	(72,125,306)	19.6829	(1,419,635,185)
Euro	14,459	15,714,542	(15,700,083)	22.5054	(353,336,648)
Pounds sterling	—	816,469	(816,469)	25.0878	(20,483,411)
Japanese yen	—	467,077,295	(467,077,295)	0.1793	(83,746,959)
Swiss francs	—	2,843,298	(2,843,298)	19.9762	(56,798,290)
Total					Ps.(1,934,000,493)

	As of December 31, 2017				
	Foreign currency			Exchange rate	Equivalent in Mexican Pesos
	Asset	Liability	Net Asset (Liability)		
U.S. dollar	12,942,402	79,871,378	(66,928,976)	19.7867	(1,324,303,569)
Euro	701,619	13,988,051	(13,286,432)	23.7549	(315,617,864)
Pounds sterling	—	870,661	(870,661)	26.7724	(23,309,685)
Japanese yen	—	341,603,010	(341,603,010)	0.1757	(60,019,649)
Swiss francs	—	2,642,304	(2,642,304)	20.2992	(53,636,657)
Total					Ps.(1,776,887,424)

The information related to “Cash and cash equivalents”, “Accounts receivable, net”, “Equity instruments”, “Investment in joint ventures and associates”, “Long-term notes receivable and other assets”, “Debt” and “Derivative Financial Instruments” is described in the following notes, respectively:

- Note 9, Cash and cash equivalents.
- Note 10, Accounts receivable, net.
- Note 12, Equity instruments.
- Note 14, Investment in joint ventures and associates.
- Note 17, Long-term notes receivable and other assets.
- Note 18, Debt.
- Note 19, Derivative financial instruments.

B. Fair value hierarchy

PEMEX values the fair value of its financial instruments under standard methodologies commonly applied in the financial markets. PEMEX’s related assumptions and inputs therefore fall under the three Levels of the fair value hierarchy for market participant assumptions, as described below.

The fair values determined by Level 1 inputs utilize quoted prices in active markets for identical assets or liabilities. Fair values determined by Level 2 inputs are based on quoted prices for similar assets or liabilities in active markets, and inputs other than quoted prices that are observed for assets or liabilities. Level 3 inputs are unobservable inputs for the assets or liabilities, and include situations where there is little, if any, market activity for the assets or liabilities.

Management uses appropriate valuation techniques based on the available inputs to measure the fair values of PEMEX's applicable financial assets and liabilities.

When available, PEMEX measures fair value using Level 1 inputs, because they generally provide the most reliable evidence of fair value.

NOTE 9. CASH AND CASH EQUIVALENTS

a. As of December 31, 2018 and 2017, cash and cash equivalents were as follows:

	<u>2018</u>	<u>2017</u>
Cash on hand and in banks ⁽ⁱ⁾	Ps. 41,974,735	Ps. 55,871,127
Highly liquid investments ⁽ⁱⁱ⁾	39,937,674	41,980,627
	<u>Ps. 81,912,409</u>	<u>Ps. 97,851,754</u>

(i) Cash on hand and in banks is primarily composed of cash in banks.

(ii) Mainly composed of short-term Mexican Government investments.

NOTE 10. ACCOUNTS RECEIVABLE, NET

As of December 31, 2018 and 2017, accounts receivable and other receivables were as follows:

a. Customers

	<u>2018</u>	<u>2017</u>
Domestic customers, net	Ps. 48,520,478	Ps. 60,057,141
Export customers, net	39,220,037	54,428,883
Total customers	<u>Ps. 87,740,515</u>	<u>Ps. 114,486,024</u>
Sundry debtors ⁽ⁱ⁾	53,388,512	23,583,497
Taxes to be recovered and prepaid taxes	18,405,990	23,039,023
Employees and officers	6,333,216	5,681,478
Advances to suppliers	597,700	1,250,846
Other accounts receivable	673,845	82,160
Total account receivable	<u>Ps. 79,399,263</u>	<u>Ps. 53,637,004</u>
Total account receivable, net	<u>Ps. 167,139,778</u>	<u>Ps. 168,123,028</u>

(i) Mainly Special Tax on Production and Services.

The following table shows a breakdown of accounts receivable based on their credit history at December 31, 2018 and 2017, as well as the relation between the breakdown and the impaired amount:

	Domestic customers	
	2018	2017
1 to 30 days	Ps. 1,172,961	Ps. 10,188,070
31 to 60 days	133,538	4,081,862
61 to 90 days	375,790	777,409
More than 90 days	584,886	11,345,933
Past due	2,267,175	26,393,274
Impaired (reserved) ⁽¹⁾	(1,409,014)	(951,932)
Unimpaired	858,161	25,441,342
Current	47,662,317	34,615,799
Total	Ps. 48,520,478	Ps. 60,057,141

⁽¹⁾ The increase in the impairment of domestic customers of Ps. 457,082 in 2018, comes mainly from accounts receivables of Pemex Industrial Transformation.

	Export customers	
	2018	2017
1 to 30 days	Ps. 34,839	Ps. 334,155
31 to 60 days	3,313	—
61 to 90 days	26,444	—
More than 90 days	307,089	315,888
Past due	371,865	650,043
Impaired (reserved)	(321,438)	(272,813)
Unimpaired	50,247	377,230
Current	39,169,790	54,051,653
Total	Ps. 39,220,037	Ps. 54,428,883

As of December 31, 2018 and 2017, PEMEX has exposure to credit risk related to accounts receivable with an average payment term of 36 and 43 days, respectively.

Additionally, the reconciliation for impaired accounts receivable is as follows:

	Domestic customers	
	2018	2017
Balance at the beginning of the year	Ps. (951,932)	Ps. (458,428)
Adjustment on initial application of IFRS9	44,590	—
Balance at January 1 under IFRS 9	(907,342)	(458,428)
Additions against income	—	(493,514)
Amount used	—	10
Impairment accounts receivable	(501,672)	—
Balance at the end of the year	Ps. (1,409,014)	Ps. (951,932)
	Export customers	
	2018	2017
Balance at the beginning of the year	Ps. (272,813)	Ps. (374,699)
Adjustment on initial application of IFRS9	(69,639)	—
Balance at January 1 under IFRS 9	(342,452)	(374,699)
Additions against income	—	(204,713)
Amount used	—	297,047
Translation effects	—	9,552
Impairment accounts receivable	21,014	—
Balance at the end of the year	Ps. (321,438)	Ps. (272,813)

Methodology to determine the estimation of the impairment of the accounts receivable

PEMEX allocates each exposure to a credit risk grade based on data that is determined to be predictive of the risk of loss (including but not limited to, audited financial statements, management accounts and cash flow projections and available information about customers) and applying experienced credit judgment. Credit risk grades are defined using qualitative and quantitative factors that are indicative of the risk of default. Exposures within each credit risk grade are segmented by each Subsidiary Entity and its commercial business lines, so the expected credit loss rate is calculated for each segment based on actual credit loss experienced over the past two years. These rates are multiplied by scale factors to reflect differences between the economic conditions during the period over which historical data has been collected, current conditions and PEMEX's view of economic conditions over the expected lives of the receivables.

As of December 31, 2018, the expected percentage of credit loss for accounts receivable for each Subsidiary Entity and Subsidiary Company was: 0.72% for Pemex Fertilizers, 2.70% for Pemex Industrial Transformation, 3.15% for Pemex Corporate, 0.69% for Pemex Ethylene, 10.80% for Pemex Logistics, 21.71% for Pemex Drilling and Services, 0.06% for PMI CIM and 4.65% for PMI TRD.

The amount of impairment of accounts receivables recognized in the income statement was Ps. 582,855, which includes the impairment of customers and other accounts receivables.

NOTE 11. INVENTORIES

As of December 31, 2018 and 2017, inventories were as follows:

	2018	2017
Refined and petrochemicals products	Ps. 43,134,519	Ps. 27,862,384
Products in transit	16,260,213	19,112,606
Crude oil	16,708,606	11,445,780
Materials and products in stock	5,292,796	5,172,779
Materials in transit	490,403	180,711
Gas and condensate products	136,031	84,670
	<u>Ps. 82,022,568</u>	<u>Ps. 63,858,930</u>

NOTE 12. EQUITY INSTRUMENTS

As of December 31, 2017, PEMEX was in the process of selling its shares of TAG Norte Holding, S. de R.L. de C.V. and TAG Pipeline Sur, S. de R.L. de C.V. These shares were valued at their net realizable value, which, as of December 31, 2017, resulted in a negative value that was recognized in the profit or loss at the end of the year. As of December 31, 2017, available-for-sale current non-financial assets amounted to Ps. 1,056,918.

On September 4 and 5, 2018, PEMEX received the payment for the sale of its 5% interest in TAG Norte Holding, S. de R.L. de C.V., which was recorded as equity instruments in the amount of U.S.\$ 43,036 (Ps. 826,046), obtaining a net profit of Ps.10,257.

As of December 31, 2018, due to the adoption of IFRS 9, PEMEX classified its TAG Pipeline Sur, S. de R.L. de C.V. shares of Ps. 245,440 as equity instruments.

Before the initial application of IFRS 9 on January 1, 2018, PEMEX classified these investments as available-for-sale financial assets. Beginning January 1, 2018 these investments are now classified as equity instruments.

NOTE 13. HELD-FOR-SALE NON-FINANCIAL ASSETS

As of December 31, 2018, Pemex Logistics has Ps. 1,253,638 as held-for-sale current non-financial assets, the potential sale of which is being given careful consideration to maximize its value and maintain a presence in the market.

These held-for-sale current non-financial assets consisted of the following:

	December 31, 2018
Plants	Ps. 712,246
Pipelines	143,434
Buildings	116,868
Lands	92,400
Telecommunications equipment	6,311
Other assets	1,278
	<u>Ps.1,072,537</u>

The details relating to the potential sale of these assets are classified as “reserved”, pursuant to Article 110, sections VIII and XIII of the Ley Federal de Transparencia y Acceso a la información Pública (Federal Law on Transparency and Access to Public Information), in relation to Article 82 and Article 111 of the Petróleos Mexicanos Law, since the details are still being considered and evaluated and contain sensitive facts about the commercial and economic scope, which only pertain to PEMEX and its commercial partners.

In addition to the Ps. 1,072,537, there are Ps. 181,101 in held-for-sale assets to CENAGAS, composed of 74 buildings and 10 undeveloped properties.

NOTE 14. INVESTMENTS IN JOINT VENTURES AND ASSOCIATES

The investments in joint ventures and associates as of December 31, 2018 and 2017, were as follows:

	Percentage of investment	December 31,	
		2018	2017
Deer Park Refining Limited	49.99%	Ps. 14,731,030	Ps. 14,405,542
Sierrita Gas Pipeline LLC	35.00%	1,068,995	1,084,169
Frontera Brownsville, LLC.	50.00%	472,898	471,085
Texas Frontera, LLC.	50.00%	228,564	239,782
CH 4 Energía, S. A.	50.00%	155,878	315,713
Administración Portuaria Integral de Dos Bocas, S. A. de C.V.	40.00%	118,478	64,328
PMV Minera, S. A. de C. V. ⁽ⁱⁱⁱ⁾	44.09%	—	45,133
Ductos el Peninsular, S. A. P. I. de C. V.	30.00%	17,244	18,336
Other-net	Various	48,458	63,276
		<u>Ps. 16,841,545</u>	<u>Ps. 16,707,364</u>

Profit (loss) sharing in joint ventures and associates:

	2018	2017	2016
Deer Park Refining Limited	Ps. 872,885	Ps. 920,409	Ps.1,437,850
Sierrita Gas Pipeline LLC	124,209	129,401	105,825
Frontera Brownsville, LLC.	59,973	66,798	57,769
Texas Frontera, LLC.	55,316	51,412	50,710
CH4 Energía S.A. de C.V.	15,395	125,132	—
Administración Portuaria Integral de Dos Bocas, S.A. de C.V.	54,149	(75,195)	—
PMV Minera, S.A. de C.V. (iii)	6,863	6,253	—
Ductos el Peninsular, S. A. P. I. de C. V.	(1,092)	74	—
Petroquímica Mexicana de Vinilo, S. A. de C. V. (iii)	352,816	(1,223,640)	(190,468)
Ductos y Energéticos del Norte, S.A. de C.V.(i)	—	360,092	—
Gasoductos de Chihuahua, S. de R. L. de C. V. (ii)	—	—	638,126
Other, net	(13,502)	(296)	45,800
Profit sharing in joint ventures and associates, net	Ps. 1,527,012	Ps. 360,440	Ps.2,135,845

- i. On November 16, 2017, PEMEX sold its 50% interest in Ductos y Energéticos del Norte, S. de R.L. de C. V., to Infraestructura Energética Nova, S.A.B. of C.V. for a total of U.S. \$ 3,141,710, yielding a gain of Ps. 3,139,103.
- ii. On September 28, 2016, PEMEX completed the divestiture of its 50% ownership interest in the Gasoductos de Chihuahua S. de R.L. de C.V. joint venture with Infraestructura Energética Nova, S.A.B. de C.V. The stock was sold for Ps. 22,684,736, yielding a gain of Ps. 15,211,039.
- iii. On November 30, 2018, PEMEX received the payment for the sale of its total 44.09% interest in Petroquímica Mexicana de Vinilo, S.A. de C.V. and 44.09% interest in PMV Minera, S.A. de C.V. which were recorded as investments in joint ventures and associates. The sale price was Ps. 3,198,597 and Ps. 53,701, respectively, for a gain of Ps. 689,268 and Ps. 1,646, respectively.

The following tables show condensed financial information of major investments recognized under the equity method during 2018 and 2017:

	Condensed statements of financial position			
	Deer Park Refining Limited		Sierrita Gas Pipeline, LLC	
	2018	2017	2018	2017
Total assets	Ps. 41,119,684	Ps. 41,075,547	Ps. 3,140,289	Ps.3,518,036
Total liabilities	Ps. 11,654,678	Ps. 12,261,581	Ps. 86,014	Ps. 420,410
Total equity	29,465,006	28,813,966	3,054,275	3,097,626
Total liabilities and equity	Ps. 41,119,684	Ps. 41,075,547	Ps. 3,140,289	Ps.3,518,036

	Condensed statements of comprehensive income					
	Deer Park Refining Limited			Sierrita Gas Pipeline, LLC		
	December 31,			December 31,		
	2018	2017	2016	2018	2017	2016
Sales and other income	Ps. 17,519,219	Ps.16,427,064	Ps.16,750,155	Ps. 615,150	Ps. 840,414	Ps. 717,351
Costs and expenses	15,773,274	14,586,061	13,874,172	260,272	470,697	414,994
Net result	Ps. 1,745,945	Ps. 1,841,003	Ps. 2,875,983	Ps. 354,878	Ps. 369,717	Ps. 302,357

Additional information about the significant investments in joint ventures and associates is presented below:

- *Deer Park Refining Limited.* On March 31, 1993, PMI NASA acquired 49.99% of the Deer Park Refinery. In its capacity as general partner of Deer Park Refining Limited Partnership, Shell is responsible for the operation and management of the refinery, the purpose of which is to provide oil refinery services to PMI NASA and Shell for a processing fee. Shell is responsible for determining the crude oil and production materials requirements and both partners are required to contribute in equal amounts. Deer Park returns to PMI NASA and Shell products in the same amounts. Shell is responsible for purchasing the total amount of finished products in stock at market prices. This joint venture is recorded under the equity method.
- *Petroquímica Mexicana de Vinilo, S.A. de C.V.* On September 13, 2013, Pemex-Petrochemicals (now Pemex Industrial Transformation), through its subsidiary PPQ Cadena Productiva, S.L. and Mexichem founded Petroquímica Mexicana de Vinilo, S.A. de C.V. (“Mexicana de Vinilo”). The principal activity of *Mexicana de Vinilo* is the production and sale of chemicals. Mexicana de Vinilo’s main products are chlorine, caustic soda, ethylene and monomers of vinyl chloride. Mexichem has been responsible for operational and financial decisions for Mexicana de Vinilo. In November 2018, PEMEX sold its total ownership interest in this company.

- *Sierrita Gas Pipeline LLC*. This company was created on June 24, 2013. Its main activity is the developing of projects related to the transportation infrastructure of gas in the United States. This investment is recorded under the equity method.
- *Frontera Brownsville, LLC*. Effective April 1, 2011, PMI SUS entered into a joint venture with TransMontaigne Operating Company L.P (TransMontaigne) to create Frontera Brownsville, LLC. Frontera Brownsville, LLC was incorporated in Delaware, United States, and has the corporate power to own and operate certain facilities for the storage and treatment of clean petroleum products. This investment is recorded under the equity method.
- *Texas Frontera, LLC*. This company was constituted on July 27, 2010, and its principal activity is the lease of tanks for the storage of refined product. PMI SUS, which owns 50% interest in Texas Frontera, entered into a joint venture with Magellan OLP, L.P. (Magellan), and together they are entitled to the results in proportion of their respective investment. The company has seven tanks with a capacity of 120,000 barrels per tank. This joint venture is recorded under the equity method.
- *CH4 Energía, S.A.* This company was constituted on December 21, 2000. CH4 Energía engages in the purchase and sale of natural gas and in activities related to the trading of natural gas, such as transport and distribution in Valle de Toluca, México. This joint venture is recorded under the equity method.
- *Administración Portuaria Integral de Dos Bocas, S.A. de C.V.* This company was constituted on August 12, 1999. Its primary activity is administrating the Dos Bocas port, which is in Mexico's public domain, promoting the port's infrastructure and providing related port services. This investment is recorded under the equity method.
- *PMV Minera, S.A. de C.V.* This company was constituted on October 1, 2014 and the principal activity is the extraction and sale of salmuera (mixture of salt and water). This investment is recorded under the equity method. In November 2018, PEMEX sold its total ownership interest in PMV Minera, S.A. de C.V.
- *Ductos el Peninsular S.A.P.I. de C.V.* This company was created on September 22, 2014. Its primary activity is the construction and operation of an integral transportation system and storage of petroleum products in the Peninsula of Yucatán.

NOTE 15. WELLS, PIPELINES, PIPELINES, PROPERTIES, PLANT AND EQUIPMENT, NET

Investment	Plants	Drilling equipment	Pipelines	Wells	Buildings	Offshore platforms	Furniture and equipment	Transportation equipment	Construction in progress (1)	Land	Unproductive fixed assets	Other fixed assets	Total fixed assets
Balance as of January 1, 2017	Ps. 758,446,110	23,269,116	460,145,428	1,318,822,917	62,743,033	322,704,205	50,746,687	19,442,845	207,414,148	44,571,618	—	491,506	3,268,797,613
Acquisitions	10,018,030	418,283	7,054,793	14,937,882	802,300	7,811,374	1,183,679	284,445	51,410,469	58,563	—	—	93,979,818
Reclassifications	3,146,955	—	(53,349)	—	98,245	(10,199,213)	(96,899)	(75,674)	(812,943)	(560)	—	4,072,464	(3,920,974)
Capitalization	43,033,864	—	21,357,074	36,564,811	1,265,246	8,677,765	30,879	3,746,395	(114,700,828)	29,248	—	(4,454)	—
Impairment	(48,020,616)	—	2,226,771	(83,236,991)	—	(15,564,190)	—	—	(6,849,534)	—	—	—	(151,444,560)
Disposals	(10,598,983)	(244,283)	(8,862,541)	(19,340,709)	(208,353)	—	(806,694)	(226,375)	(6,724,930)	(112,170)	—	(4,440,865)	(51,565,902)
Balance as of December 31, 2017	Ps. 756,025,360	23,443,116	481,868,176	1,267,747,910	64,700,471	313,429,941	51,057,652	23,171,636	129,736,382	44,546,699	—	118,651	3,155,845,995
Acquisitions	13,362,218	1,059,027	852,308	38,829,246	329,969	4,958,299	473,812	117,632	54,407,962	434,698	(106)	—	114,825,065
Reclassifications	1,400,531	45,268	(1,603,022)	—	37,343	(4,039,499)	3,015,144	101,424	32,280	(6,620)	—	(869)	1,762,246
Capitalization	25,752,538	—	2,456,977	21,269,614	991,061	—	163,000	227,334	(50,828,761)	—	—	(31,765)	—
Impairment	20,226,139	—	(59,632,531)	59,774,797	(831,561)	12,133,524	—	(6,981,561)	(3,269,810)	—	—	—	21,418,997
Disposals	(5,496,395)	(4,466,446)	(2,705,958)	(8,297,844)	(382,120)	—	(2,689,566)	(1,476,513)	(725,540)	(623,152)	(2,780,160)	(53,361)	(29,697,055)
Balance as of December 31, 2018	Ps. 811,270,391	20,080,965	421,235,950	1,379,323,723	64,845,163	326,482,265	52,020,042	15,159,952	129,352,513	44,351,625	—	32,659	3,264,155,248
Accumulated depreciation and amortization													
Balance as of January 1, 2017	Ps. (360,016,979)	(2,942,575)	(152,365,227)	(850,536,754)	(39,124,631)	(153,161,770)	(36,990,666)	(5,916,763)	—	—	—	—	(1,601,055,365)
Depreciation and amortization	(45,709,123)	(2,198,867)	(15,095,115)	(74,673,473)	(1,906,164)	(13,192,369)	(2,890,563)	(1,038,839)	—	—	—	—	(156,704,513)
Reclassifications	2,799,244	—	(72,841)	—	(69,236)	1,146,904	102,375	14,532	—	—	—	—	3,920,978
Disposals	8,902,711	127,458	7,573,769	16,810,591	59,022	—	805,916	222,764	—	—	—	—	34,502,231
Balance as of December 31, 2017	(394,024,147)	(5,013,984)	(159,959,414)	(908,399,636)	(41,041,009)	(165,207,235)	(38,972,938)	(6,718,306)	—	—	—	—	(1,719,336,669)
Depreciation and amortization	(44,925,549)	(1,347,046)	(14,799,664)	(70,255,577)	(2,026,403)	(15,968,324)	(2,827,887)	(1,231,590)	—	—	—	—	(153,382,040)
Reclassifications	(212,207)	(45,953)	232,680	—	17,387	1,344,469	(3,003,850)	(94,772)	—	—	—	—	(1,762,246)
Disposals	2,558,780	408,502	1,262,358	5,187,467	125,769	—	2,643,297	625,618	—	—	—	—	12,811,791
Balance as of December 31, 2018	Ps. (436,603,123)	(5,998,481)	(173,264,040)	(973,467,746)	(42,924,256)	(179,831,090)	(42,161,378)	(7,419,050)	—	—	—	—	(1,861,669,164)
Wells, pipelines, properties, plant and equipment—net as of													
December 31, 2017	Ps. 362,001,214	18,429,132	321,908,762	359,348,274	23,659,462	148,222,706	12,084,714	16,453,330	129,736,382	44,546,699	—	118,651	1,436,509,326
December 31, 2018	Ps. 374,667,268	14,082,484	247,971,910	405,855,977	21,920,907	146,651,175	9,838,664	7,740,902	129,352,513	44,351,625	—	32,659	1,402,486,084
Depreciation rates Estimated useful lives													
3 to 5%	20 to 35	20	15 to 45	3 to 7%	33 to 35	25	3 to 10	4 to 20%	—	—	—	—	—

(1) Mainly wells, pipelines and plants

a. As of December 31, 2018, 2017 and 2016, the financing cost identified with fixed assets in the construction or installation stage, capitalized as part of the value of such fixed assets, was Ps. 2,198,191, Ps. 3,060,963 and Ps. 3,667,752, respectively.

- b. The combined depreciation of fixed assets and amortization of wells for the fiscal years ended December 31, 2018, 2017 and 2016, recognized in operating costs and expenses, was Ps. 153,382,040, Ps.156,704,513 and Ps. 150,439,491, respectively, which includes costs related to plugging and abandonment of wells for the years ended December 31, 2018, 2017 and 2016 of Ps. 983,438, Ps. 850,015 and Ps. 1,698,312, respectively.
- c. As of December 31, 2018 and 2017, provisions relating to future plugging of wells costs amounted to Ps. 84,050,900 and Ps. 68,797,600, respectively, and are presented in the “Provisions for plugging of wells” (see Note 21).
- d. As of December 31, 2018 and 2017, acquisitions of property, plant and equipment include transfers from wells unassigned to a reserve for Ps. 6,726,769 and Ps. 16,440,645, respectively (see Note 16) and Ps. 4,652,314 from available-for-sale non-financial assets as of December 31, 2017.
- e. As of December 31, 2018 and 2017, PEMEX recognized a net reversal of impairment of Ps. 21,418,997 and a net impairment of Ps. (151,444,560), respectively, which is presented as a separate line item in the consolidated statement of comprehensive income as follows:
- i. As of December 31, 2018, the net reversal of impairment was as follows:

	(Impairment)	Reversal of impairment	Reversal of impairment / (Impairment)
Pemex Logistics	Ps. (40,288,338)	Ps. —	Ps.(40,288,388)
Pemex Fertilizers	(2,246,264)	—	(2,246,264)
PMI NASA	(1,719,627)	—	(1,719,627)
Pemex Exploration and Production	(63,252,635)	128,266,251	65,013,616
Pemex Industrial Transformation	(13,788,470)	14,448,080	659,610
Total	<u>Ps.(121,295,334)</u>	<u>Ps.142,714,331</u>	<u>Ps. 21,418,997</u>

Cash Generating Units of Pemex Logistics

Cash Generating Units of pipelines

As of December 31, 2018, Pemex Logistics recognized an impairment in the CGU of pipelines for Ps. 40,288,338, mainly due to a decrease in income flows projection of 46%, from an annual average income of Ps. 47,219,903 at the end of 2017 to Ps. 25,271,404 at the end of 2018, in addition to an increase in the cost of non-operating losses of 40%, from an annual average of Ps. 18,067,730 at the end of 2017 to Ps. 25,226,769 at the end of 2018. This increase was partially offset by a decrease in direct operating costs of 58%, from annual average costs at the end of 2017 of Ps. 16,485,969 to Ps. 6,880,967 at the end of December 2018, as well as a decrease in the discount rate, from 15.41% at the end of 2017 to 13.55% at the end of 2018.

The recoverable amounts of the assets as of December 31, 2018, corresponding to the discounted cash flows at the rate of 13.55% are the following:

TAD, TDGL, TOMS (Storage terminals)	Ps. 92,772,003
Land Transport (white pipes)	445,377
Primary logistics	<u>111,941,265</u>
Total	<u>Ps.205,158,645</u>

Cash Generating Units of Pemex Fertilizers

Cash generating units are plants used in the ammonia process.

The recoverable amount of assets is based on each asset's value in use. To determine cash flows, volumes to be produced and sales to be carried out were taken into consideration. The discount rate used was 8.92%.

As of December 31, 2018, Pemex Fertilizers recognized an impairment of Ps. (2,246,264). The impairment is presented as a separate line item in the consolidated statement of comprehensive income.

Cash Generating Units of PMI NASA

As of December 31, 2018, PMI NASA recognized an impairment of Ps. (1,719,627), due to the disuse of the Cerro de la Pez Flotel, as a consequence of the reduction in the development of projects in recent months. This impairment was calculated by comparing the disbursement that would have to be made to acquire a flotel with similar characteristics compared to the valuation made by a specialized company of the flotel.

Cash Generating Unit of Pemex Exploration and Production

As of December 31, 2018, Pemex Exploration and Production recognized a net reversal of impairment in the amount of Ps. 65,013,616 mainly due to (i) an advance of production in Cantarell for rethinking physical goals for the period from 2024 to 2029 with a recovery of Ps. 98,673,388. This computation was projected using a discount rate of 7.03% and a tax rate of 30% (observable market) on the operating profit with an economic horizon of 25 years, compared to a discount rate of 14.40% that includes the cost of financing and the pyramiding of taxes and observable rights in similar companies, including the Profit-sharing; (ii) application in the fourth quarter of the relevant discount rate and tax rate (observable market), a net benefit was generated in most of the projects with respect to the previous year, mainly in the Aceite Terciario del Golfo project in the amount of Ps. 29,592,863. The foregoing was partially offset by an impairment of Ps. (63,252,635), mainly in (i) the Aguas Someras 2 projects in the amount of Ps. (58,318,030), (ii) the Crudo Ligerero Marino projects, mainly due to higher water and salt content in the hydrocarbons reserves, (iii) the Yaxche Project, due to operating impacts in the fields directly related to production, and (iv) the Tsimin Xux and Chuc projects, mainly due to the natural decline of proved hydrocarbon reserves.

The cash generating units of Pemex Exploration and Production are investment projects in productive fields with hydrocarbon reserves associated with proved reserves. These productive hydrocarbon fields contain varying degrees of heating power consisting of a set of wells and are supported by fixed assets associated directly with production, such as pipelines, production facilities, offshore platforms, specialized equipment and machinery.

Each project represents the smallest unit which can concentrate the core revenues, with clear costs and expenses that enable future cash flows (value in use) to be determined.

To determine the value in use of long-lived assets associated to hydrocarbon extraction, the net present value of reserves is determined based on the following assumptions:

Average crude oil price	58.02 USD/bl
Average gas price	4.89 USD/mpc
Average condensates price	43.21 USD/bl
Discount rate	7.03% annual

Pemex Exploration and Production, in compliance with practices observed in the industry, estimates the recovery value of asset by determining its value in use, based on cash flows associated with proved reserves after taxes and using a discount rate, also after taxes.

During 2018, Pemex Exploration and Production performed an analysis of the discount rate for its oil and gas activities cash flows in the domestic and international markets, taking into account the international price conditions, to value its production reserves.

In 2017, Pemex Exploration and Production used cash flows associated with proved reserves before tax and used an equally pre-tax discount rate, which was based on a weighted average cost of capital ("WACC") grossed-up after taxes with a weight of the corporate tax rate of 30%, and the median of taxes and duties on hydrocarbon extraction from countries with similar conditions to the fields in Mexico, which discount rate was 57%.

As a result of the analysis performed in 2018, Pemex Exploration and Production noted that the industry is currently using after tax discount rates. Accordingly, Pemex Exploration and Production determined it would comply with the practices observed in the industry and started using the after-tax discount rate. The after-tax discount rate considers the present value of future cash flows, increasing interest rates of debt incurred by Petróleos Mexicanos, the risk of the country and specific industry-related risks (calculated as the median of the beta of industry companies), which is then used to calculate the WACC. The discount rate is independent of the capital structure of the subsidiary entity. The WACC considers the median proportion of debt and capital observed for companies in the sector.

Taking into consideration the assumptions described above, the pre-tax discount rate used by Pemex Exploration and Production in 2018 for the value in use was 7.03%, resulting in a net reversal or impairment of Ps. 65,013,616 for 2018.

For 2017, the pre-tax discount rate was 14.40%. If the same methodology had been applied in 2018, the discount rate after tax would have been 16.12% (the result of the gross-up of the 7.03% discount rate) and the net impairment would have been Ps. (958,060).

The total forecast production, calculated with a horizon of 25 years is 6,192 million barrels per day of crude oil equivalent.

Pemex Exploration and Production determines the recoverable amount of fixed assets based on the long-term estimated prices for Pemex Exploration and Production's proved reserves. The recoverable amount on each asset is the value in use.

Cash Generating Units of Pemex Industrial Transformation

As of December 31, 2018, Pemex Industrial Transformation recognized a net reversal of impairment of Ps. 659,610.

The net reversal of impairment was in the following cash generating units:

Minatitlán Refinery	Ps. 14,448,080
Reversal of impairment	<u>14,440,080</u>
Salina Cruz Refinery	(7,955,528)
Tula Refinery	(5,099,635)
Madero Refinery	<u>(733,307)</u>
Impairment	(13,788,470)
Net reversal of impairment	<u>Ps. 659,610</u>

The net reversal of impairment was mainly due to (i) an increase in processing of refined products due to higher imports of crude oil and humid gas resulting in an increase in income related to transportation fees; (ii) the appreciation of the U.S. dollar against the peso, from a peso-U.S. dollar exchange rate of Ps.19.7867 to U.S. \$1.00 as of December 31, 2017 to a peso-U.S. dollar exchange rate of Ps. 19.6829 to U.S. \$1.00 as of December 31, 2018; (iii) a decrease in the discount rate of cash generating units of refined products and gas and petrochemicals by 0.1% and 8.1%, respectively; and (iv) an increase in maintenance of the refineries and a decrease in gas production.

Cash-generating units in Pemex Industrial Transformation are processing centers grouped according to their types of processes as refineries, gas complex processors, and petrochemical centers. These centers produce various finished products for direct sale to customers or intermediate products that can be processed in another of its cash generating units or by a third party. Each processing center of Pemex Industrial Transformation represents the smallest unit that can concentrate the core revenues, with clear costs and expenses that enable future cash flows (value in use) to be determined.

Cash flow determinations are made based on PEMEX's business plans, operating financial programs, forecasts of future prices of products related to the processes of the cash generating units, budget programs and various statistical models that consider historical information of processes and the capacity of various processing centers.

To determine the value in use of long-lived assets associated with the cash-generating units of Pemex Industrial Transformation, the net present value of cash flows was determined based on the following assumptions:

	Refining	Gas	Petrochemicals
Average crude oil Price	53.98 U.S dollars	N.A.	N.A.
Processed volume	680 mbd	2,717 mmpcd of humid gas	Variable because the load inputs are diverse
Rate of U.S. dollar	Ps.19.6829 mxp/usd	Ps. 19.6829 mxp/usd	Ps. 19.6829 mxp/usd
Useful lives of the cash generating units	Average 14 years	Average 8 years	Average 7 years
Discount rate	11.52% annually	10.22% annually	8.92% annually
Period	2019-2034	2019-2027	2019-2026

The recoverable amount of assets is based on each asset's value in use. The value in use for each asset is calculated based on cash flows, taking into consideration the volumes to be produced and sales to be carried out. As of December 31, 2018, the value in use for the impairment or reversal of impairment of fixed assets was as follows:

Minatitlán Refinery	Ps. 54,846,565
Madero Refinery	21,083,328
Salina Cruz Refinery	9,428,152
Tula Refinery	39,429,897
Total value in use	<u>Ps.124,787,942</u>

ii. As of December 31, 2017, the net impairment was as follows:

	Impairment	Reversal of impairment	Net Impairment
Pemex Exploration and Production	Ps.(129,350,315)	Ps. —	Ps.(129,350,315)
Pemex Industrial Transformation	(19,751,882)	3,799,790	(15,952,092)
AGRO	(4,206,653)	—	(4,206,653)
Pemex Fertilizers	(1,935,500)	—	(1,935,500)
Total	<u>Ps.(155,244,350)</u>	<u>Ps.3,799,790</u>	<u>Ps.(151,444,560)</u>

Cash Generating Unit of Pemex Exploration and Production

Pemex Exploration and Production recognized an impairment in the amount of Ps. (129,350,315) as of December 31, 2017, arising from: (i) the deferral of the development investments in the first 5 years of the economic horizon in the proved reserves, which caused a decrease in production and consequently in income, as well as the re-categorization of part of the proved reserves as probable reserve, as a consequence of budget adjustments in the strategic investments in the Cantarell, Aceite terciario del Golfo, Crudo Ligerero Marino, Antonio J. Bermúdez and Tzimin Xux projects, (ii) insufficient cash flows to make up for costs recovery at the Burgos and Lakach projects as a result of the appreciation of the Mexican peso against the U.S. dollar by 4.3%, from a peso–U.S. dollar exchange rate of Ps. 20.6640 to U.S. \$1.00 as of December 31, 2016 to a peso–U.S. dollar exchange rate of Ps. 19.7867 to U.S. \$1.00 as of December 31, 2017, given that cash inflows are denominated in U.S. dollars and then translated to the reporting currency using the exchange rate at the date of report; (iii) a 0.3% increase in the discount rate; (iv) a 7.2% decrease in crude oil forward prices from 60.24 usd/bl in 2016 to 55.89 usd/bl in 2017 and (v) the natural decline in production in the Macuspana project.

The cash generating units of Pemex Exploration and Production are investment projects in productive fields with hydrocarbon reserves associated with proved reserves. These productive hydrocarbon fields contain varying degrees of heating power consisting of a set of wells and are supported by fixed assets associated directly with production, such as pipelines, production facilities, offshore platforms, specialized equipment and machinery.

Each project represents the smallest unit which can concentrate the core revenues, with clear costs and expenses that enable future cash flows (value in use) to be determined. To determine the value in use of long-lived assets associated with hydrocarbon extraction, the net present value of reserves is determined based on the following assumptions:

Average crude oil price	55.89 U.S. dollars/bl
Average gas price	4.92 U.S. dollars /mpc
Average condensates price	38.33 U.S. dollars /bl
Discount rate	14.40% annually

The total forecast production, calculated with a horizon of 25 years is 7,091 million barrels per day of crude oil equivalent.

Pemex Exploration and Production determines the recoverable amount of fixed assets based on the long-term estimated prices for Pemex Exploration and Production's proved reserves. The recoverable amount on each asset is the value in use.

Cash Generating Units of Pemex Industrial Transformation

As of December 31, 2017, Pemex Industrial Transformation recognized a net impairment of Ps.(15,952,092).

The impairment was in the following cash generating units:

Minatitlán Refinery	Ps. (5,691,005)
Madero Refinery	(8,480,880)
Salina Cruz Refinery	(5,579,997)
Total impairment of assets	(19,751,882)
Cangrejera Petrochemical Center	3,565,355
Independencia Petrochemical Center	112,292
Arenque gas processor complex	57,039
Matapionche gas processor complex	65,104
Reversal of impairment	3,799,790
Net impairment	<u>Ps.(15,952,092)</u>

The impairment was mainly due to (i) an increase in capitalizable maintenance expenses in refining; (ii) the appreciation of the Mexican peso against the U.S. dollar, from a peso–U.S. dollar exchange rate of Ps. 20.6640 to U.S. \$1.00 as of December 31, 2016 to a peso–U.S. dollar exchange rate of Ps. 19.7867 to U.S. \$1.00 as of December 31, 2017; partially offset by (i) an increase in the transportation fees; (ii) an increase in the processing of wet gas due to higher imports of this product and redistribution by Pemex Exploration and Production; (iii) an increase in prices arising from the price liberalization in 2017; and (iv) a decrease in the discount rate of cash generating units of refined products, gas and petrochemicals of 4.4%, 4.5%, and 5.6%, respectively.

Cash-generating units in Pemex Industrial Transformation are processing centers grouped according to their types of processes as refineries, gas complex processors, and petrochemical centers. These centers produce various finished products for direct sale to customers or intermediate products that can be processed in another of its cash generating units or by a third party. Each processing center of Pemex Industrial Transformation represents the smallest unit which can concentrate the core revenues, with clear costs and expenses that enable future cash flows (value in use) to be determined.

Cash flow determinations are made based on PEMEX's business plans, operating financial programs, forecasts of future prices of products related to the processes of the cash generating units, budget programs and various statistical models that consider historical information of processes and the capacity of the various processing centers.

To determine the value in use of long-lived assets associated with the cash-generating units of Pemex Industrial Transformation, the net present value of cash flows was determined based on the following assumptions:

	Refining	Gas	Petrochemicals
Average crude oil Price	51.30 U.S. dollars	N.A.	N.A.
Processed volume	767 mbd	3,085 mmpcd or sour gas	Variable because the load inputs are diverse
Rate of U.S. dollar	Ps.19.7867 mxp/usd	Ps.19.7867 mxp/usd	Ps.19.7867 mxp/usd
Useful lives of the cash generating units	Average of 16 years	Average of 9 years	Average of 6 years
Discount rate	11.53% annually	10.24% annually	9.71% annually
Period	2018-2034	2018-2029	2016-2024

The recoverable amount of assets is based on each asset's value in use. The value in use for each asset is calculated based on cash flows, taking into consideration the volumes to be produced and sales to be carried out. As of December 31, 2017, the value in use for the impairment or reversal of impairment of fixed assets was as follows:

Minatitlán Refinery	Ps.32,531,925
Madero Refinery	11,420,952
Salina Cruz Refinery	12,051,597
Cangrejera Petrochemical Center	17,544,825
Independencia Petrochemical Center	3,146,413
Arenque gas processor complex	1,283,201
Matapionche gas processor complex	1,074,729
Total value in use	<u>Ps.79,053,642</u>

Pro-Agroindustria, S.A. de C.V.

Pro-Agroindustria, S.A. de C.V. recognized an impairment for Ps. (4,206,653) related to its nitric acid, amonium nitrate and UAN 32 acquired plants, the rehabilitation of which has not yet commenced. The company will not be able to develop an alternate plan for the rehabilitation of these plants in the following five years due to its financing commitments.

Cash Generating Units of Pemex Fertilizers

Cash generating units are plants used in the ammonia process.

Pemex Fertilizers recognized an impairment of Ps. (1,935,500) for the year ended December 31, 2017 resulting from (i) a decrease in the production capacity in fertilizers plants due to a shortage of raw material; (ii) an increase in raw material prices; and (iii) a decrease in ammonia sale prices.

The recoverable amount of assets is based on each asset's value in use. To determine cash flows, volumes to be produced and sales to be carried out were taken into consideration. The value in use for the impairment of fixed assets was Ps. 2,744,600. The discount rate used was 9.71%.

f. Capital Lease Arrangements

As of December 31, 2013, PEMEX had entered into nine capital lease arrangements for drilling equipment. These leases expire on various dates over the next 10 years.

As of December 31, 2015, PEMEX had entered into certain capital lease arrangements for two offshore platforms. These leases expire on various dates over the next 10 years.

As of December 31, 2018 and 2017, assets acquired through these capital leases were as follows:

	2018	2017
Investment in tankers and drilling equipment	Ps.7,963,262	Ps.11,142,197
Less accumulated depreciation	(886,946)	(1,696,089)
	<u>Ps.7,076,316</u>	<u>Ps. 9,446,108</u>

The liabilities relating to the assets listed above are payable in the years following December 31, 2018 as presented below:

Year	Pesos	U.S. dollars
2019	Ps.1,255,105	U.S. \$ 63,766
2020	1,186,253	60,268
2021	1,186,253	60,268
2022	1,186,253	60,268
2023	1,186,253	60,268
2024 and thereafter	892,218	45,330
	<u>6,892,335</u>	<u>350,168</u>
Less: short-term unaccrued interest	251,768	12,791
Less: long-term unaccrued interest	<u>587,287</u>	<u>29,837</u>
Total capital leases	6,053,280	307,540
Less: current portion of leases (excluding interest)	934,546	47,480
Total long-term capital leases	<u>Ps.5,118,734</u>	<u>U.S. \$260,060</u>

The interest expense from capital leases for the years ended December 31, 2018, 2017 and 2016 was Ps. 301,449, Ps. 418,883 and Ps. 500,654, respectively.

g. PEMEX can conduct exploration and extraction activities through Exploration and Extraction Contracts (“EECs”). The EECs are awarded individually, through associations or joint ventures based on guidelines approved by the NHC and are classified into:

- a. Production-sharing contracts;
- b. Profit-sharing contracts;
- c. License agreements; and
- d. Service contracts.

EECs as of December 31, 2018 are:

- a. Production-sharing contracts:

The object of the Profit-sharing contracts is the execution of oil activities under shared production contracts among Mexico through the Mexican Government via the NHC, Pemex Exploration and Production (as contractor), for the contractual area and the sharing

of costs, risks, and terms and conditions involved in the contract and in accordance with the applicable regulations and best practices of the industry receiving, in exchange, benefits in favor of the contractor.

- Exploration and Extraction Contract related to Block 2 Tampico Misantla, pursuant to a consortium formed by Pemex Exploration and Production and DEA and Compañía Española de Petróleos, S. A. U., (jointly liable). The object of the contract is the realization of oil activities, under shared production contracts, by the contractor for the contractual area and the sharing of costs, risks, terms and conditions involved in the contract and in accordance with the applicable regulations and best practices of the industry, receiving in exchange, benefits in favor of the contractor. Pemex Exploration and Production and DEA each have a 50% interest in this contractual area. Pemex Exploration and Production is the operator under this contract.
- Exploration and Extraction Contract, related to Block 8 Cuencas del Sureste, pursuant to a consortium formed by Pemex Exploration and Production, EPC Hidrocarburos México, S. A. de C. V. (EPC), and Ecopetrol Global Energy, S. L. U. (jointly liable). Pemex Exploration and Production was designated by all the participating companies and with the approval of the NHC as the operator of this contract and all operational aspects of the petroleum activities will be carried out only by the operator on behalf of all participating companies. Pemex Exploration and Production and EPC each have a 50% interest in this contractual area.
- Exploration and Extraction Contract, related to Block 16, Tampico Misantla, pursuant to a consortium by Pemex Exploration and Production, DEUTSCHE Erdoel México S. de R.L. de C.V. (as operator) and CEPSA E.P. México S. de R.L. de C.V., as jointly liable. Pemex Exploration and Production owns 40% of this contractual area, DEUTSCHE Erdoel México S. de R.L. de C.V. owns 40%, and CEPSA E.P. México S. de R.L. de C.V. owns 20%.
- Exploration and Extraction Contract, related to Block 17, Tampico Misantla, pursuant to a consortium by Pemex Exploration and Production, DEUTSCHE Erdoel México S. de R.L. de C.V. (as operator) and CEPSA E.P. México S. de R.L. de C.V., as jointly liable. Pemex Exploration and Production owns 40% of this contractual area, DEUTSCHE Erdoel México S. de R.L. de C.V. owns 40%, and CEPSA E.P. México S. de R.L. de C.V. owns 20%.
- Exploration and Extraction Contract, related to Block 18, Tampico Misantla, pursuant to a consortium by Pemex Exploration and Production (as operator) and CEPSA E.P. México S. de R.L. de C.V. (as partner). Pemex Exploration and Production owns 80% of this contractual area, and CEPSA E.P. México S. de R.L. de C.V. owns 20%.
- Hydrocarbons Exploration and Extraction Contract for Block 29, Cuenca del Sureste, in which Pemex Exploration and Production owns 100% of the project.
- Hydrocarbons Exploration and Extraction Contract for Block 32, Cuenca del Sureste, by Pemex Exploration and Production (as operator) and Total E&P México, S.A. de C.V. (as partner). Pemex Exploration and Total E&P México, S.A. de C.V. each have a 50% interest in this contractual area.
- Hydrocarbons Exploration and Extraction Contract for Block 33, Cuenca del Sureste, by Pemex Exploration and Production (as operator) and Total E&P México, S.A. de C.V. Pemex Exploration and Total E&P México, S.A. de C.V. each have a 50% interest in this contractual area.
- Hydrocarbons Exploration and Extraction Contract for Block 35, Cuenca del Sureste, by Shell Exploración y Extracción de México, S.A. de C.V. (as operator) and Pemex Exploration and Production. Total E&P México, S.A. de C.V. and Pemex Exploration each have a 50% interest in this contractual area.
- Hydrocarbon Extraction Contract for the Ek-Balam (shallow water) Block. Pemex Exploration and Production owns 100% of this contractual area.

- Exploration and Extraction Contract, related to the Santuario El Golpe Block, pursuant to a consortium formed by Pemex Exploration and Production (as partner) and Petrofac México, S.A. de C.V. (PETROFAC), as operator. Pemex Exploration and Production owns 64% of this contractual area and PETROFAC owns 36%.
- Exploration and Extraction Contract, related to the Misión Block, pursuant to a consortium formed by Pemex Exploration and Production (as partner) and Servicios Múltiples de Burgos, S.A. de C.V. (as operator). Pemex Exploration and Production owns 51% of this contractual area and Servicios Múltiples de Burgos owns 49%.
- Exploration and Extraction Contract, related to Ébano Blocl, pursuant to a consortium formed by Pemex Exploration and Production (as partner), DS Servicios Petroleros, S.A. de C.V. (as operator) and D&S Petroleum S.A. de C.V. (as partner). Pemex Exploration and Production owns 45% of this contractual area, Servicios Múltiples de Burgos owns 54.99%, while D&S Petroleum S.A. de C.V. owns 0.01%.

b. License contracts

The nature of the contract relationship is the execution of oil activities, under the license contracting modality, under which the contractor is granted the right to explore and extract at its exclusive cost and risk hydrocarbons owned by the Mexican nation, who must comply with the obligations arising from the contract in the name and representation of each of the signatory companies in the contractual area in accordance with the applicable regulations, industry best practices and the terms and conditions of the contract. The contractor shall be entitled to payment for hydrocarbons produced, in accordance with the terms of the contracts, and after payments to the Mexican Government are made.

- Hydrocarbons Exploration and Extraction Contract for Block 3 “Plegado Perdido”, in deep waters, formed by INPEX Corporation (“INPEX”) (as partner), Chevron Energía de Mexico, S. de R.L. de C.V. (“Chevron”) (as operator) and Pemex Exploration and Production, (as partner). Chevron, Pemex Exploration and Production and Inpex have a 37.50%, 27.50% and 35.00% interest in this project, respectively, and will be jointly liable for all obligations of the contractors according to this contract regardless of their participation interest.
- Hydrocarbons Exploration and Extraction Contract for Block 2, Plegado Perdido, formed by Pemex Exploration and Production (as partner) and Shell Exploración y Extracción de México, S.A. de C.V. (as operator). Pemex Exploration and Production and Shell Exploración y Extracción de México, S.A. de C.V. each have a 50% interest in this project.
- Hydrocarbons Exploration and Extraction Contract for Block 5, Plegado Perdido, in which Pemex Exploration and Production owns 100% of the project.
- Hydrocarbons Exploration and Extraction Contract for Block 18, Cordilleras Mexicanas, in which Pemex Exploration and Production owns 100% of the project.
- Hydrocarbons Exploration and Extraction Contract for Block 22, Cuenca Salina, formed by Pemex Exploration and Production, Inpex E&P México, S.A. de C.V., (as partners), and Chevron (as operator). Chevron, Pemex Exploration and Production and Inpex E&P México, S.A. de C.V., have a 37.5%, 27.5% and 35% interest in this project, respectively.
- A licensing contract with BHP Billiton Petróleo Operaciones de México, S. de R.L. (“BHP Billiton”) for the Trión Block. BHP Billiton owns 60% of the contractual area, while Pemex Exploration and Production owns 40%, and each of the signatory companies are jointly liable for all obligations of the contractors.

- Hydrocarbons Exploration and Extraction Contract for the Cárdenas Mora Block, for onshore fields, formed by Pemex Exploration and Production (as partner), Petrolera Cárdenas Mora, S. A. P. I. de C. V. (as operator) and Cheiron Holding Limited (jointly liable). Pemex Exploration and Production and Petrolera Cárdenas Mora, S. A. P. I. de C. V. each have a 50% of interest in this project.
- Hydrocarbons Exploration and Extraction Contract for the Ogarrío Block, for onshore fields, formed by Pemex Exploration and Production (as partner), Deutsche Erdoel México, S. de R.L. de C.V. (as operator) and DEA Deutsche Erdoel, A.G. (“DEA”) (jointly liable). Pemex Exploration and Production and DEA each have a 50% interest in this project.
- Hydrocarbons Exploration and Extraction Contract for the Miquetla Block, for onshore fields, formed by Pemex Exploration and Production (as partner) and Operadora de Campos DWF, S.A. de C.V. (as operator). Pemex Exploration and Production has a 49% interest in this project while Operadora de Campos DWF, S.A. de C.V. has a 51% interest.

Certain of the EECs are operated through joint arrangements, for which PEMEX recognizes in its financial statements, both the rights to the assets and the obligations for the liabilities, as well as profits and losses relating to the arrangements.

See below for a condensed statement of comprehensive income and condensed statement of financial position, summarizing the projects listed above:

As of /For the year ended December 31, 2018	Production-sharing contracts										Santuario EI		Mission		Ehano	
	Batam	Block 2	Block 8	Block 16	Block 17	Block 18	Block 29	Block 32	Block 33	Block 35	Galpe	Mission	Ehano			
Sales:																
Net sales	10,374,061	—	—	—	—	—	—	—	—	—	1,268,482	644,768	421,591			
Cost of sales	4,204,499	57,197	67,481	12,485	10,332	60,624	8,072	5,871	8,337	20,142	305,733	306,110	97,643			
Gross income (loss)	6,169,562	(57,197)	(67,481)	(12,485)	(10,332)	(60,624)	(8,072)	(5,871)	(8,337)	(20,142)	962,749	338,658	323,948			
Other income (loss), net	157,876	—	—	—	—	—	—	—	—	—	—	—	—			
Administrative expenses	129,451	—	—	—	—	—	—	—	—	—	—	—	—			
Operating income (loss)	6,197,987	(57,197)	(67,481)	(12,485)	(10,332)	(60,624)	(8,072)	(5,871)	(8,337)	(20,142)	962,749	338,658	323,948			
Taxes, duties and other	3,980	—	—	—	—	—	—	—	—	—	—	—	—			
Net income (loss)	6,194,007	(57,197)	(67,481)	(12,485)	(10,332)	(60,624)	(8,072)	(5,871)	(8,337)	(20,142)	962,749	338,658	323,948			
Cash and cash equivalents	54,617	—	—	—	—	—	—	—	—	—	—	—	—			
Accounts receivable	11,698,071	27,376	27,189	874	927	—	—	10,578	35,454	3,701	1,308,008	669,805	335,434			
Total current assets	11,698,071	81,993	139,780	874	927	—	—	10,578	35,454	3,701	1,308,008	669,805	335,434			
Wells, pipelines, properties, plant and equipment, net	20,344,054	—	—	—	—	—	—	—	—	—	1,022,923	2,210,968	406,075			
Total assets	32,042,125	81,993	139,780	874	927	—	—	10,578	35,454	3,701	2,330,931	2,880,773	741,509			
Suppliers	1,466,286	—	—	—	—	—	—	—	—	—	—	—	—			
Taxes and duties payable	3,980	—	—	—	—	—	—	—	—	—	—	—	—			
Other current liabilities	2,436,996	139,190	207,261	13,359	11,259	60,624	8,072	16,449	43,791	23,843	301,619	207,387	—			
Total current liabilities	3,907,262	139,190	207,261	13,359	11,259	60,624	8,072	16,449	43,791	23,843	301,619	243,371	—			
Other liabilities	69,195	—	—	—	—	—	—	—	—	—	—	—	—			
Total liabilities	3,976,457	139,190	207,261	13,359	11,259	60,624	8,072	16,449	43,791	23,843	301,619	243,371	—			
Equity (deficit), net	21,871,661	—	—	—	—	—	—	—	—	—	1,066,563	2,298,744	417,561			

As of /For the year ended December 31, 2018	Licence contracts					Cárdenas		
	Block 3	Block 2	Block 5	Block 18	Block 22	Mora	Ogavrio	Miguella
Sales:								
Net sales	—	—	—	—	—	1,586,080	1,265,620	—
Cost of sales	58,261	41,156	52,555	9,390	186,693	714,233	604,373	2,713
Gross income (loss)	(58,261)	(41,156)	(52,555)	(9,390)	(186,693)	871,847	661,247	(2,713)
Other income (loss), net	—	—	—	—	—	—	—	—
Administrative expenses	—	—	—	—	—	—	—	—
Operating income (loss)	(58,261)	(41,156)	(52,555)	(9,390)	(186,693)	871,847	661,247	(2,713)
Taxes, duties and other	—	—	—	—	—	—	—	—
Net income (loss)	(58,261)	(41,156)	(52,555)	(9,390)	(186,693)	871,847	661,247	(2,713)
Cash and cash equivalents	—	—	—	—	—	—	—	—
Accounts receivable	14,888	6,151	—	3,362	—	1,820,428	1,300,773	406
Total current assets	14,888	6,151	—	3,362	—	1,820,428	1,300,774	406
Wells, pipelines, properties, plant and equipment, net	14,888	—	—	—	23,555	2,528,860	2,122,341	26,206
Total assets	29,776	6,151	—	3,362	23,555	4,349,288	3,423,115	26,612
Suppliers	—	—	—	—	—	—	—	—
Taxes and duties payable	—	—	—	—	—	—	—	—
Other current liabilities	73,149	47,307	52,555	12,752	210,248	860,137	564,565	2,943
Total current liabilities	73,149	47,307	52,555	12,752	210,248	860,137	564,565	2,943
Other liabilities	—	—	—	—	—	—	—	—
Total liabilities	73,149	47,307	52,555	12,752	210,248	860,137	564,565	2,943
Equity (deficit), net	—	—	—	—	—	2,617,304	2,197,303	26,382

As of /For the year ended December 31, 2017	Profit-sharing			License		Total
	<i>EK / Balam</i>	<i>Block 2</i>	<i>Block 8</i>	<i>Trion</i>	<i>Block 3</i>	
Sales:						
Net sales	7,009,464	—	—	—	—	7,009,464
Cost of sales	5,447,955	5,953	4,845	—	511	5,459,264
Gross income (loss)	1,561,509	(5,953)	(4,845)	—	(511)	1,550,200
Other income (loss), net	4,852	—	—	—	—	4,852
Administrative expenses	34,338	—	—	—	—	34,338
Operating income (loss)	1,532,023	(5,953)	(4,845)	—	(511)	1,520,714
Taxes, duties and other	158,347	—	—	—	—	158,347
Net income (loss)	1,373,676	(5,953)	(4,845)	—	(511)	1,362,367
Cash and cash equivalents	—	20	25	—	—	45
Accounts receivable	—	1,013	1,804	—	327	3,144
Total current assets	—	1,033	1,829	—	327	3,189
Wells, pipelines, properties, plant and equipment, net	14,869,906	—	—	4,498,234	1,107,311	20,475,451
Total assets	14,869,906	1,033	1,829	4,498,234	1,107,638	20,478,640
Suppliers	796,300	—	—	—	—	796,300
Taxes and duties payable	973	—	—	—	—	973
Other current liabilities	4,391	1,809	2,369	—	—	8,569
Total current liabilities	801,664	1,809	2,369	—	—	805,842
Total liabilities	801,664	1,809	2,369	—	—	805,842
Equity (deficit), net	14,068,242	(776)	(540)	4,498,234	1,107,638	19,672,798

NOTE 16. INTANGIBLE ASSETS, NET

At December 31, 2018 and 2017, intangible assets, net are wells unassigned to a reserve, which amounted to Ps. 13,720,540 and Ps. 14,678,640, respectively as follows:

	2018	2017
Wells unassigned to a reserve:		
Balance at the beginning of period	Ps. 9,088,563	Ps. 8,639,242
Additions to construction in progress	20,352,351	20,553,952
Transfers against expenses	(12,934,906)	(3,663,986)
Transfers against fixed assets	(6,726,769)	(16,440,645)
Balance at the end of period	Ps. 9,779,239	Ps. 9,088,563

In addition, as of December 31, 2018 and 2017, PEMEX recognized expenses related to unsuccessful wells of Ps. 2,508,180 and Ps. 2,500,638, respectively, directly in its statement of comprehensive income.

The other components of intangible assets are:

	Rights of way	Licenses	Exploration expenses, evaluation of assets and concessions	Total
As of December 31, 2018				
Cost				
Balance at the beginning of the year	Ps. 2,311,743	3,586,553	1,940,583	Ps. 7,838,879
Additions	40,323	638,479	325,471	1,004,273
Effects of foreign exchange	—	(10,397)	(10,503)	(20,900)
	<u>2,352,066</u>	<u>4,214,635</u>	<u>2,255,551</u>	<u>8,822,252</u>
Amortization accumulated				
Balance at the beginning of the year	(179,312)	(1,401,443)	(668,047)	(2,248,802)
Amortization	(86,332)	(2,480,760)	(76,234)	(2,643,326)
Effects of foreign exchange	—	10,761	416	11,177
	<u>(265,644)</u>	<u>(3,871,442)</u>	<u>(743,865)</u>	<u>(4,880,951)</u>
Balance at the end of the year	2,086,422	343,193	1,511,686	\$ 3,941,301
Useful lives	23 years	1 to 3 years	Up to 36 years	
As of December 31, 2017				
Cost				
Balance at the beginning of the year	2,311,743	2,990,011	1,940,316	7,242,070
Additions	—	589,918	267	590,185
Effects of foreign exchange	—	6,624	—	6,624
	<u>2,311,743</u>	<u>3,586,553</u>	<u>1,940,583</u>	<u>7,838,879</u>
Amortization accumulated				
Balance at the beginning of the year	(179,312)	(1,150,473)	(636,573)	(1,966,358)
Amortization	—	(250,970)	(30,026)	(280,996)
Effects of foreign exchange	—	—	(1,448)	(1,448)
	<u>(179,312)</u>	<u>(1,401,443)</u>	<u>(668,047)</u>	<u>(2,248,802)</u>
Balance at the end of the year	2,132,431	2,185,110	1,272,536	5,590,077
Useful lives	23 years	1 to 3 years	Up to 36 years	

NOTE 17. MEXICAN GOVERNMENT LONG-TERM NOTES RECEIVABLE AND OTHER ASSETS

A. Long-term notes receivable

As of December 31, 2018 and 2017, the balance of long-term notes receivable was as follows:

	2018	2017
Promissory notes issued by the Mexican Government	Ps. 118,827,894	Ps. 147,274,076
Other long-term notes receivable ⁽¹⁾	1,000,704	1,218,833
Total long-term notes receivable	Ps. 119,828,598	Ps. 148,492,909

⁽¹⁾ Mainly collection rights related to Value Added Tax from the non-recourse factoring contract between Pemex Logistics and Banco Interacciones, S.A.

Promissory notes issued by the Mexican Government

	2018	2017
Long-term promissory notes issued by the Mexican Government	Ps 156,981,745	Ps. 149,796,282
Less: current portion of notes receivable issued by the Mexican Government ⁽²⁾	38,153,851	2,522,206
Long-term promissory notes	Ps. 118,827,894	Ps. 147,274,076

⁽²⁾ For 2018, the increase relates to the principal and interest from promissory notes 21 to 26A, as well as promissory note No. 3 which matured on March 31, 2019. (see Note 30)

On December 24, 2015, the SHCP published in the Official Gazette of the Federation the *Disposiciones de carácter general relativas a la asunción por parte del Gobierno Federal de obligaciones de pago de pensiones y jubilaciones a cargo de Petróleos Mexicanos y sus empresas productivas subsidiarias* (General provisions regarding the assumption by the Mexican Government of the payment obligations related to pensions and retirement plans of Petróleos Mexicanos and its productive state-owned subsidiaries). These regulations stated the terms, conditions, financing mechanisms and payment arrangements pursuant to which the SHCP would assume a portion of the payment obligations related to PEMEX's pensions and retirement plans. An independent expert reviewed the calculation, the methodology used, the maturity profile and all of the information provided by PEMEX.

In accordance with these provisions and prior to the completion of the independent expert's review described above, on December 24, 2015, the Mexican Government issued in advance payment, through the SHCP, a Ps. 50,000,000 non-negotiable promissory note due December 31, 2050 payable to Petróleos Mexicanos. The promissory note, which accrued interest at a rate of 6.93% per year, was recognized as a long-term note receivable in non-current assets once the independent expert named by SHCP concluded its review.

On August 5, 2016, Petróleos Mexicanos received promissory notes issued by the Mexican Government at a value of Ps. 184,230,586 as of June 29, 2016, as part of the Mexican Government's assumption of a portion of the payment liabilities related to Petróleos Mexicanos and Subsidiary Entities' pensions and retirement plans, which notes were delivered in exchange for the Ps. 50,000,000 promissory notes issued to Petróleos Mexicanos on December 24, 2015. On August 15, 2016, Petróleos Mexicanos exchanged Ps. 47,000,000 of these promissory notes for short-term floating rate Mexican Government debt securities, known as Bonos de Desarrollo del Gobierno Federal (Development Bonds of the Mexican Government or "BONDES D"). Petróleos Mexicanos then sold the BONDES D to Mexican development banks at market prices.

Petróleos Mexicanos recognized a Ps. 135,439,612 increase in equity as a result of the Ps. 184, 230,586 of the promissory notes as of June 29, 2016, minus the Ps. 50,000,000 promissory note received by Petróleos Mexicanos on December 24, 2015, plus a Ps. 1,209,026 increase in the value of the promissory notes from June 29, 2016 to August 15, 2016, the date on which PEMEX received the promissory notes (see Note 24).

As of December 31, 2018 and 2017, these promissory notes amounted to Ps. 156,981,745 and Ps. 149,796,282, respectively. PEMEX intends to hold them to maturity. These promissory notes will be converted into cash with annual maturity dates ranging from 5.14% to 7.04% in 2018, as follows:

As of December 31, 2018			
Number of Promissory Notes	Maturity	Yield Rate Range	Principal Amount
7 ⁽¹⁾	2019	5.14% to 7.04%	Ps. 38,153,851
1	2020	5.39%	4,663,037
1	2021	5.57%	5,534,162
1	2022	5.74%	6,142,562
1	2022	5.88%	6,712,753
5	2024 to 2028	5.99% to 6.48%	37,123,836
5	2029 to 2033	6.62% to 6.85%	37,522,297
3	2034 to 2036	6.90% to 7.00%	21,129,247
	Total promissory notes		Ps. 156,981,745
	Less: current portion		38,153,851
	Long-term notes receivable		Ps. 118,827,894

⁽¹⁾ Includes promissory note No.3 with an original maturity date of March 31, 2019 and interest rates of 5.14%, and promissory notes No. 21 to 26A with original maturity dates ranging from 2037 to 2042 and interest rates from 6.94% to 7.04%.

From January 1 to December 31, 2018 PEMEX recognized Ps. 9,737,131 in accrued yields from these promissory notes, of which Ps. 28,818 corresponds to accrued interests. This amount was recognized as financing income in the consolidated statement of comprehensive income.

Yield rates for these promissory notes are fixed all throughout their lifespans and up to their maturities. In addition, PEMEX believes the promissory notes do not have a credit risk because they are issued by the Mexican Government in Mexican pesos. The expected credit losses as of December 31, 2018 are zero.

As of December 31, 2018 two promissory notes have expired: the first with maturity on March 31, 2017 in the amount of Ps. 1,562,288 (Ps. 1,518,932 of principal and Ps. 43,356 of interest), and the second with maturity on March 31, 2018 in the amount of Ps. 2,551,024 (Ps. 2,364,053 of principal and Ps. 186,971 of interest), which were transferred to the Fondo Laboral PEMEX (Pemex Labor Fund or "FOLAPE"), for the payment obligations related to pensions and retirement plans. The payment of the second promissory note was carried out two days after the expiration date, which generated additional interest of \$644. The monetized amount of the second promissory note was Ps. 2,551,668 (Ps. 2,364,053 of principal and Ps. 187,615 of interest).

B. Other assets

At December 31, 2018 and 2017, the balance of other assets was as follows:

	2018	2017
Insurance	Ps. 3,591,079	Ps. 3,089,801
Payments in advance	1,114,513	1,593,315
Other	1,720,218	1,211,984
Total other assets	<u>Ps. 6,425,810</u>	<u>Ps. 5,895,100</u>

NOTE 18. DEBT

The Federal Income Law applicable to PEMEX as of January 1, 2018, published in the Official Gazette of the Federation on November 15, 2017, authorized Petróleos Mexicanos and its Subsidiary Entities to incur an internal net debt up to Ps. 30,000,000 and an external net debt up to U.S. \$6,182,800. PEMEX can incur additional internal or external debt, as long as the total amount of net debt (Ps. 143,000,000 equivalent to U.S. \$7,813,000) does not exceed the ceiling established by the Federal Income Law.

The Board of Directors approves the terms and conditions for the incurrence of obligations that constitute public debt of Petróleos Mexicanos for each fiscal year, in accordance with the Petróleos Mexicanos Law and the Reglamento de la Ley de Petróleos Mexicanos (Regulations to the Petróleos Mexicanos Law). These terms and conditions are promulgated in accordance with the guidelines approved by the SHCP for Petróleos Mexicanos for the respective fiscal year.

Subsequently, the Board of Directors of PEMEX approved the debt program for fiscal year 2018 in accordance with Article 13 section XXVI of the Petróleos Mexicanos Law.

During the period from January 1 to December 31, 2018, PEMEX participated in the following financing activities:

- On February, 12, 2018, Petróleos Mexicanos issued U.S. \$4,000,000 of debt securities under its U.S. \$92,000,000 Medium-Term Notes Program, Series C, in two tranches: (1) U.S. \$2,500,000 5.35% Notes due 2028 and (2) U.S. \$1,500,000 6.35% Bonds due 2048.
- On February 12, 2018, Petróleos Mexicanos consummated an exchange offer pursuant to which it exchanged (1) U.S. \$952,454, aggregate principal amount of its outstanding 5.500% Bonds due 2044 for U.S. \$881,899, aggregate principal amount of its new 6.350% Bonds due 2048 and (2) U.S. \$ 1,021,065, aggregate principal amount of its outstanding 5.625% Bonds due 2046 for U.S. \$946,764, aggregate principal amount of its new 6.350% Bonds due 2048.
- On March 5, 2018, Petróleos Mexicanos consummated a tender offer pursuant to which it purchased U.S. \$138,598 aggregate principal amount of its outstanding 3.125% Notes due 2019, U.S. \$558,644 aggregate principal amount of its outstanding 5.500% Notes due 2019, U.S. \$91,843 aggregate principal amount of its outstanding 8.000% Notes due 2019, U.S. \$183,017 aggregate principal amount of its outstanding 6.000% Notes due 2020 and U.S. \$817,303 aggregate principal amount of its outstanding 3.500% Notes due 2020.
- On March 27, 2018, Petróleos Mexicanos entered into a credit line in the amount of U.S. \$181,101, which bears interest at a rate linked to LIBOR plus 70 basis points, due February 2025 and was used on April 13, 2018.
- On April 16, 2018, Petróleos Mexicanos increased its Medium-Term Notes Program, Series C, from U.S. \$92,000,000 to U.S. \$102,000,000.
- On May 24, 2018, Petróleos Mexicanos issued €3,150,000 of debt securities under its U.S.\$102,000,000 Medium Term Notes Program, Series C in four tranches: (i) €600,000 of its 2.500% Notes due on November 24, 2022; (ii) €650,000 of its Floating Rate Notes due on August 24, 2023; (iii) €650,000 of its 3.625% Notes due on November 24, 2025; and (iv) €1,250,000 of its 4.750% Notes due on February 26, 2029. All debt securities issued under this program are guaranteed by Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services and their respective successors and assignees.

- On June 4, 2018, Petróleos Mexicanos issued CHF365,000 of its 1.750% Notes due 2023 under its U.S.\$102,000,000 Medium Term Notes Program, Series C.
- On June 26, 2018, Pro-Agroindustrias, refinanced a credit line for U.S. \$250,000 by entering into a new credit line for the same amount, which bears interest at a floating rate linked to LIBOR plus 300 basis points on a quarterly basis and matures on December 26, 2025. This credit agreement is guaranteed by Petróleos Mexicanos.
- On August 23, 2018, Petróleos Mexicanos entered into a loan agreement in the amount of U.S. \$200,000, which bears interest at a floating rate linked to LIBOR and matures in 2023.
- On October 23, 2018 Petróleos Mexicanos issued U.S. \$ 2,000,000, of debt securities under U.S. \$ 102,000,000 of its 6.500%, Medium-Term Notes Program, Series C, due 2029.
- On November 9, 2018, Petróleos Mexicanos entered into a revolving credit facility in the amount of Ps. 9,000,000, which matures in 2023.
- On November 30, 2018, Petróleos Mexicanos borrowed U.S. \$250,000 from a bilateral credit line, which bears interest at a floating rate linked to LIBOR plus 80 basis points and matures in 2028.

As of December 31, 2018, Petróleos Mexicanos had U.S. \$6,700,000 and Ps. 32,500,000 in available credit lines in order to ensure liquidity, which U.S. \$6,400,000 and Ps. 26,200,000 are available.

All the financing activities were guaranteed by Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services (in the case of Pemex Cogeneration and Services, until July 27, 2018, the date it was liquidated (see Note 1)).

From January 1 to December 31, 2018, PMI HBV (until July 31, 2018) and P.M.I. Holdings Holland Services, B.V., obtained U.S. \$ 21,449,200 from its revolving credit line and repaid U.S. \$ 21,099,000. As of December 31, 2017, the outstanding amount under this revolving credit line was U.S. \$350,000. As of December 31, 2018, the outstanding amount under this revolving credit line was U.S. \$ 700,000.

The Federal Income Law applicable to PEMEX as of January 1, 2017, published in the Official Gazette of the Federation on November 17, 2016, authorized Petróleos Mexicanos and its Subsidiary Entities to incur an internal net debt up to Ps. 28,000,000 and an external net debt up to U.S. \$7,100,000. PEMEX can incur additional internal or external debt, as long as the total amount of net debt (Ps. 150,000,000 equivalent to U.S. \$8,055,900) does not exceed the ceiling established by the Federal Income Law.

On July 8, 2016, the Board of Directors of Petróleos Mexicanos approved policies and general requirements for obligations that constitute public debt of Petróleos Mexicanos and Subsidiary Entities, in accordance with Article 106 section I of the Petroleos Mexicanos Law.

Subsequently, the Board of Directors of PEMEX, approved the debt program for fiscal year 2017 in accordance with Article 13 section XXVI of the Petróleos Mexicanos Law.

During the period from January 1 to December 31, 2017, PEMEX participated in the following financing activities:

- a. On February 14, 2017, Petróleos Mexicanos issued € 4,250,000 of debt securities under its Medium-Term Notes Program, Series C in three tranches: (i) € 1,750,000 of its 2.50% Notes due August 2021;(ii) € 1,250,000 of its 3.75% Notes due February 2024; and (iii) € 1,250,000 of its 4.875% Notes due February 2028.

- b. On April 6, 2017, Petróleos Mexicanos executed a U.S. \$132,000, non-revolving bilateral credit line from Banco Mercantil del Norte, S.A., Institución de Banca Múltiple, Grupo Financiero Banorte, due on April 6, 2024, which bears a fixed interest rate of 5.25%.
- c. On May 15, 2017, Petróleos Mexicanos entered into a simple credit line in the amount of U.S. \$400,000 at a floating interest rate linked to LIBOR plus 165 basis points, due May 2020 and was used in two tranches of U.S. \$200,000 (on May 24, 2017 and July 14, 2017, respectively).
- d. On June 16, 2017, Petróleos Mexicanos increased its Medium-Term Notes Program, Series C, from U.S. \$72,000,000 to U.S. \$92,000,000.
- e. On July 17, 2017, Petróleos Mexicanos entered into a revolving credit facility in the amount of U.S. \$1,950,000 and matures in 2020.
- f. On July 18, 2017, Petróleos Mexicanos issued under its U.S.\$92,000,000 Medium-Term Notes Program, Series C: (i) U.S. \$2,500,000 of its 6.500% Notes due March 2027; and (ii) U.S. \$2,500,000 of its 6.75% Bonds due September 2047.
- g. On July 21, 2017, Petróleos Mexicanos consummated a tender offer pursuant to which it purchased U.S. \$922,485 aggregate principal amount of its outstanding 5.750% Notes due 2018, U.S. \$644,374 aggregate principal amount of its outstanding 3.500% Notes due 2018 and U.S. \$172,591 aggregate principal amount of its outstanding 3.125% Notes due 2019.
- h. On November 16, 2017, Petróleos Mexicanos issued £450,000 at a rate interest of its 3.750% Notes due 2025 under its U.S.\$92,000,000 Medium-Term Notes Program, Series C.
- i. On December 15, 2017, AGRO refinanced a credit line for U.S. \$390,000, prepaying U.S. \$140,000 and entering into a new credit line for the outstanding U.S. \$250,000, which bears interest at a floating rate linked to LIBOR plus 250 basis points on a quarterly basis and matures on June 29, 2018.
- j. On December 18, 2017, Petróleos Mexicanos entered into a bilateral credit line facility in the amount of U.S. \$200,000, which bears interest at a floating rate linked to LIBOR plus 165 basis points and matures on December 18, 2020.
- k. On December 21, 2017, Petróleos Mexicanos borrowed U.S. \$300,000 from a bilateral credit line which bears interest at a floating rate linked to LIBOR plus 175 basis points, which matures on December 21, 2022.

All the financing activities were guaranteed by Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services.

From January 1 to December 31, 2017, PMI HBV obtained U.S. \$15,141,500 in financing from its revolving credit line and repaid U.S. \$14,914,000. As of December 31, 2017, the outstanding amount under this revolving credit line was U.S. \$227,500.

As of December 31, 2017, Petróleos Mexicanos had U.S. \$6,700,000 and Ps. 23,500,000 in available credit lines in order to ensure liquidity. The available amounts are U.S. \$5,400,000 and Ps. 23,500,000, respectively.

Various financial transactions (including credit facilities and bond issuances) require compliance with various covenants that, among other things, place restrictions on the following types of transactions by PEMEX, subject to certain exceptions:

- The sale of substantial assets essential for the continued operations of its business.
- The incurrence of liens against its assets.
- Transfers, sales or assignments of rights to payment not yet earned under contracts for the sale of crude oil or natural gas, accounts receivable or other negotiable instruments.

As of December 31, 2018 and 2017 and as of the date of the issuance of these consolidated financial statements, PEMEX was in compliance with the covenants described above.

As of December 31, 2018, long-term debt was as follows:

	Rate of interest ⁽¹⁾	Maturity	Pesos (thousands)	Foreign currency (thousands)
U.S. dollars				
Bonds	Fixed from 1.7% to 9.5% and LIBOR plus 0.35% to 3.65%	Various to 2048	Ps. 1,163,861,026	US\$ 59,130,566
Purchasing loans	LIBOR plus 0.85%	Various to 2019	5,904,870	300,000
Project financing	Fixed from 2.45% to 3.81% and LIBOR plus 0.24% to 1.75%	Various to 2028	52,159,977	2,650,015
Direct loans	Fixed from 3.31% to 5.25% and LIBOR plus 1.65% to 1.75%	Various to 2031	51,365,998	2,609,676
Syndicated loans	LIBOR plus 0.85%	Various to 2020	39,164,611	1,989,778
Bank loans	LIBOR plus 1.19% to 3.50%	Various to 2023	2,704,412	137,399
Financial leases	Fixed from 4.44% to 4.54%	Various to 2025	6,053,280	307,540
Lease-back ⁽⁴⁾	Fixed from 5.4% to 8.4%	Various to 2036	30,903,650	1,570,076
Total financing in U.S. dollars			<u>1,352,117,824</u>	<u>US\$ 68,695,050</u>
Euros				
Bonds	Fixed from 1.875% to 5.5%	Various to 2030	334,044,298	€ 14,842,851
Financial leases	Fixed to 11.26%	Various to 2022	222	10
Direct loans	Fixed to 5.11%	Various to 2023	11,255,352	500,118
Total financing in Euros			<u>345,299,872</u>	<u>€ 15,342,979</u>
Japanese yen:				
Bonds	Fixed from 0.54% to 3.5% and LIBOR yen plus 0.75%	Various to 2026	31,171,326	¥ 173,850,117
Pesos				
Certificados bursátiles	Mexican Government Treasury Certificates ("Cetes"), TIIE ⁽¹⁾ less 0.06% to 1.35%, and fixed at 7.19% to 9.1%	Various to 2026	Ps. 148,090,688	
Direct loans	Fixed at 6.55% and TIIE plus 0.50% to 4.0%	Various to 2029	32,309,858	
Syndicated loans	TIIE plus 0.95%	Various to 2025	28,925,329	
Total financing in pesos			<u>Ps. 209,325,875</u>	
Unidades de Inversión Certificados bursátiles				
Certificados bursátiles	Zero rate and Fixed at 3.02% to 5.23%	Various to 2035	59,727,769	
Other currencies:				
Bonds	Fixed from 1.5% to 8.25%	Various to 2025	48,192,756	
Total principal in pesos ⁽²⁾			2,045,835,422	
Plus: accrued interest			33,432,631	
Notes payable to contractors ⁽³⁾			3,018,063	
Total principal and interest			2,082,286,116	
Less: short-term maturities			154,191,754	
Short-term portion of financing lease			2,490,963	
Current portion of notes payable to contractors ⁽³⁾			1,680,361	
Accrued interest			33,432,631	
Total short-term debt and current portion of long-term debt			<u>191,795,709</u>	
Long-term debt			<u>Ps. 1,890,490,407</u>	

As of December 31, 2017, long-term debt was as follows:

	Rate of interest ⁽¹⁾	Maturity	Pesos (thousands)	Foreign currency (thousands)
U.S. dollars				
Bonds	Fixed from 1.7% to 9.5% and LIBOR plus 0.35% to 3.65%	Various to 2047	Ps. 1,138,845,231	US\$ 57,556,097
Purchasing loans	LIBOR plus 0.85%	Various to 2018	25,722,710	1,300,000
Project financing	Fixed from 2.35% to 3.81% and LIBOR plus 0.24% to 1.75%	Various to 2025	64,974,389	3,283,741
Direct loans	Fixed from 5.25% to 5.44% and LIBOR plus 1.65%	Various to 2020	43,141,231	2,180,315
Syndicated loans	LIBOR plus 0.85%	Various to 2020	39,347,774	1,988,597
Bank loans	Fixed from 3.5% to 5.28%	Various to 2023	3,451,629	174,442
Financial leases	Fixed from 0.38% to 1.99%	Various to 2025	7,621,062	385,161
Lease-back ⁽⁴⁾	Fixed from 0.45% to 0.7%	Various to 2036	32,677,268	1,651,476
Total financing in U.S. dollars			<u>1,355,781,294</u>	<u>US\$ 68,519,829</u>
Euros				
Bonds	Fixed from 1.875% to 5.5%	Various to 2030	287,386,195	€ 12,097,975
Project financing	Fixed from 2.1% to 5.11%	Various to 2023	11,879,379	500,081
Total financing in Euros			<u>299,265,574</u>	<u>€ 12,598,056</u>
Japanese yen:				
Bonds	Fixed from 0.54% to 3.5% and LIBOR yen plus 0.75%	Various to 2026	30,541,407	¥ 173,827,018
Pesos				
Certificados bursátiles	Mexican Government Treasury Certificates ("Cetes"), TIIE ⁽¹⁾ less 0.06% to 1.35%, and fixed at 7.19% to 9.1%	Various to 2026	Ps. 149,564,918	
Direct loans	Fixed at 6.55% and TIIE plus 0.85% to 1.25%	Various to 2025	28,597,423	
Syndicated loans	TIIE plus 0.95	Various to 2025	33,646,107	
Total financing in pesos			<u>Ps. 211,808,448</u>	
Unidades de Inversión Certificados bursátiles				
Certificados bursátiles	Zero rate and Fixed at 3.02% to 5.23%	Various to 2035	57,197,211	
Other currencies:				
Bonds	Fixed from 1.5% to 8.25%	Various to 2025	47,148,936	
Total principal in pesos ⁽²⁾			2,001,742,870	
Plus: accrued interest			32,078,624	
Notes payable to contractors ⁽³⁾			4,053,577	
Total principal and interest			2,037,875,071	
Less: short-term maturities			119,855,835	
Short-term portion of financing lease			3,101,723	
Current portion of notes payable to contractors ⁽³⁾			2,173,285	
Accrued interest			32,078,624	
Total short-term debt and current portion of long-term debt			157,209,467	
Long-term debt			<u>Ps. 1,880,665,604</u>	

The following table presents the roll-forward of total debt of PEMEX for each of the year ended December 31, 2018 and 2017, which includes short and long-term debt:

	2018 ⁽ⁱ⁾	2017 ⁽ⁱ⁾
Changes in total debt:		
At the beginning of the year	Ps. 2,037,875,071	Ps. 1,983,170,730
Loans obtained - financing institutions	899,769,012	704,715,468
Debt payments	(838,934,803)	(639,950,041)
Accrued interest	120,727,022	117,644,548
Interest paid	(115,289,389)	(108,910,417)
Foreign exchange	(19,762,208)	(16,685,439)
Discounts and expenses related to debt issuance	(2,098,589)	(2,109,778)
At the end of the year	Ps. 2,082,286,116	Ps. 2,037,875,071

- (i) These amounts include accounts payable by Financed Public Works Contracts (“FPWC”) (formerly known as Multiple Services Contracts), which do not generate cash flows.

	2019	2020	2021	2022	2023	2024 and thereafter	Total
Maturity of the total principal outstanding and accrued interest as of December 31, 2018, for each of the years ending December 31.	Ps. 191,795,709	189,948,833	184,328,985	171,607,627	168,577,397	1,176,027,565	Ps. 2,082,286,116

- (1) As of December 31, 2018 and 2017, interest rates were as follows: 3 month LIBOR of 2.80763% and 1.69428%, respectively; 6 month LIBOR of 2.875630% and 1.83707%, respectively; TIIE rate of 8.5897% and 7.6241%, respectively, for 28 days; TIIE rate of 8.6375% and 7.6556%, respectively, for 91 days.
- (2) Includes financing from foreign banks of Ps. 1,746,196,819 and Ps. 1,701,363,406, as of December 31, 2018 and 2017, respectively.
- (3) The total amounts of notes payable to contractors as of December 31, 2018 and 2017, current and long-term, are as follows:

	2018	2017
Total notes payable to contractors ^{(a) (b)}	Ps. 3,018,063	Ps. 4,053,577
Less: current portion of notes payable to contractors	1,680,361	2,173,285
Notes payable to contractors (long-term)	<u>Ps. 1,337,702</u>	<u>Ps. 1,880,292</u>

- (a) PEMEX has entered into FPWCs pursuant to which the hydrocarbons and construction in progress are property of Pemex Exploration and Production. Pursuant to the FPWC, the contractors manage the work in progress, classified as development, infrastructure and maintenance. As of December 31, 2018 and 2017, PEMEX had an outstanding amount payable of Ps. 1,153,108 and Ps. 1,678,843, respectively.
- (b) During 2007, Pemex-Exploration and Production contracted for the purchase of a Floating Production Storage and Offloading (“FPSO”) vessel. The investment in the vessel totaled U.S. \$723,575. As of December 31, 2018 and 2017, the outstanding balances owed to the contractor were Ps. 1,864,955 (U.S. \$ 94,751) and Ps. 2,374,734 (U.S. \$120,017), respectively. In accordance with the contract, the estimated future payments are as follows:

Year	Amount
2019	U.S.\$25,267
2020	25,267
2021	25,267
2022	18,950
Total	<u>U.S \$94,751</u>

- (4) PEMEX obtained financing through the sale and leaseback of certain infrastructure assets and a plant, which will require periodic payments through 2036.

This transaction was recognized as a financing activity due to the fact that PEMEX retained all of the risks and benefits associated with ownership of the asset and substantially all of the operating rights to the assets.

The outstanding liability for this transaction is payable as follows:

Years	Pesos	U.S. dollars
2019	Ps. 3,865,651	U.S. \$ 196,396
2020	3,865,651	196,396
2021	3,865,651	196,396
2022	3,865,651	196,396
2023	3,865,651	196,396
2024 and thereafter	35,325,193	1,794,715
	<u>54,653,448</u>	<u>2,776,695</u>
Less: short-term unaccrued interest	2,309,281	117,324
Less: long-term unaccrued interest	21,440,519	1,089,297
Total financing	30,903,648	1,570,074
Less: short-term portion of financing (excluding interest)	1,556,370	79,072
Total long term financing	<u>Ps. 29,347,278</u>	<u>U.S.\$ 1,491,002</u>

- (5) As of December 31, 2018 and 2017, PEMEX used the following exchange rates to translate the outstanding balances in foreign currencies to pesos in the statement of financial position:

	2018	2017
U.S. dollar	Ps. 19.6829	Ps. 19.7867
Japanese yen	0.1793	0.1757
Pounds sterling	25.0878	26.7724
Euro	22.5054	23.7549
Swiss francs	19.9762	20.2992
Canadian dollar	14.4138	15.7858
Australian dollar	13.8617	15.4752

NOTE 19. DERIVATIVE FINANCIAL INSTRUMENTS

PEMEX faces market risk caused by the volatility of hydrocarbon prices, exchange rates and interest rates, credit risk associated with investments and financial derivatives, as well as liquidity risk. In order to monitor and manage these risks, PEMEX has approved general provisions relating to financial risk management, which are comprised of policies and guidelines that promote an integrated framework for risk management, regulate the use of DFIs, and guide the development of risk mitigation strategies.

This regulatory framework establishes that DFIs should be used only for the purpose of mitigating financial risk. The use of DFIs for any other purpose must be approved in accordance with PEMEX's current internal regulation. PEMEX has a Financial Risk Working Group (FRWG) which is a specialized working group with decision-making authority on financial risk exposure, financial risk mitigation schemes, and DFIs trading of Petróleos Mexicanos, the subsidiary entities, and where applicable, subsidiary companies.

Approved DFIs are mainly traded on the OTC (Over the Counter) market; however, exchange traded instruments may also be used. In the case of PMI Trading, DFIs are traded on CME-ClearPort.

The different types of DFIs that PEMEX trades are described below, in the subsections corresponding to the applicable trading markets.

One of PEMEX's policies is to contribute minimizing the impact that unfavorable changes in financial risk factors have on its financial results by promoting an adequate balance between incoming cash flows from operations and outgoing cash flows related to its liabilities.

As part of the regulatory framework for financial risk management, PEMEX has established the eligible counterparties with which it may trade DFIs and other financial instruments.

In addition, certain PMI companies have implemented a regulatory framework for risk management with respect to its activities, which consists of policies, guidelines and procedures to manage the market risk associated with its commodity trading activities in accordance with industry best practices, such as: 1) the use of DFIs for financial risk mitigation purposes; 2) the segregation of duties; 3) valuation and monitoring mechanisms, such as the generation of a daily portfolio risk report, value at risk ("VaR") computation; and 4) VaR limits, both at a global and business unit level and the implementation of stop loss mechanisms. In addition, PMI Trading also has its own risk management subcommittee which supervises the trading of DFIs.

Given that PEMEX's outstanding DFIs have been entered into for risk mitigation purposes, particularly with economic hedging purposes, there is no need to establish and monitor market risk limits.

For those portfolios with an open market risk exposure, PEMEX's financial risk management regulatory framework establishes the implementation and monitoring of market risk limits such as VaR and capital at risk (an aggregation of fair value or mark-to-market ("MtM") and profit and loss ("P&L"), or "CaR").

PEMEX has also established credit guidelines for DFIs that Pemex Industrial Transformation offers to its domestic customers, which include the use of guarantees and credit lines. For exchange traded DFIs, PEMEX trades under the margin requirements of the corresponding exchange market, and therefore does not have internal policies for these DFIs.

DFIs held with financial counterparties do not require collateral exchange clauses. Notwithstanding, PEMEX's regulatory framework promotes credit risk mitigation strategies such as collateral exchange.

PEMEX does not have an independent third party to verify compliance with these internal standards; however, PEMEX has internal control procedures that certify compliance with existing policies and guidelines.

A. Risk Management

I. Market Risk

i. Interest rate risk

PEMEX is exposed to fluctuations in floating interest rate liabilities. PEMEX is exposed to U.S. dollar LIBOR and to Mexican peso TIIE. As of December 31, 2018, approximately 15.3% of PEMEX's total net debt outstanding (including DFIs) consisted of floating rate debt.

Occasionally, for strategic reasons or in order to offset the expected inflows and outflows, PEMEX has entered into interest rate swaps. Under its interest rate swap agreements, PEMEX acquires the obligation to make payments based on a fixed interest rate and is entitled to receive floating interest rate payments based on LIBOR, TIIE or a rate referenced to or calculated from TIIE.

As of December 31, 2018, PEMEX was a party to four interest rate swap agreements denominated in U.S. dollars for an aggregate notional amount of U.S. \$1,401,250 at a weighted average fixed interest rate of 2.35% and a weighted average term of 6.29 years.

Similarly, in order to eliminate the volatility associated with variable interest rates of long-term financing operations, PMI NASA has executed interest rate swap agreements denominated in U.S. dollars for an aggregate notional amount of U.S. \$56,692, at a weighted average fixed interest rate of 4.17% and a weighted average term of 3.41 years.

Moreover, PEMEX invests in pesos and U.S. dollars in compliance with applicable internal regulations, through portfolios that have different purposes that seek an adequate return subject to risk parameters that reduce the probability of capital losses. The objective of the investments made through these portfolios is to meet PEMEX's obligations payable in pesos and U.S. dollars.

The investments made through PEMEX's portfolios are exposed to domestic and international interest rate risk and credit spread risk derived from government and corporate securities, and inflation risk arising from the relationship between UDIs and pesos. However, these risks are mitigated by established limits on exposure to market risk.

ii. Exchange rate risk

Most of PEMEX's revenues are denominated in U.S. dollars, a significant amount of which is derived from exports of crude oil and petroleum products, which are priced and payable in U.S. dollars. Additionally, PEMEX's revenues from domestic sales of gasoline and diesel net of IEPS Tax, tax duties, incentives, and other related taxes, as well as domestic sales of natural gas and its byproducts, LPG and petrochemicals, are referenced to international U.S. dollar-denominated prices.

PEMEX's expenses related to hydrocarbon duties are calculated based on international U.S. dollar-denominated prices and the cost of hydrocarbon imports that PEMEX acquires for resale in Mexico or use in its facilities are indexed to international U.S. dollar-denominated prices. By contrast, PEMEX's capital expenditure and operating expenses are established in pesos.

As a result of this cash flow structure, the depreciation of the peso against the U.S. dollar increases PEMEX's financial balance. The appreciation of the peso relative to the U.S. dollar has the opposite effect. PEMEX manages this risk without the need for hedging instruments, because the impact on PEMEX's revenues of fluctuations in the exchange rate between the U.S. dollar and the peso is offset in whole or in part by its impact on its obligations.

Therefore, PEMEX prioritizes debt issuances denominated in U.S. dollars; nonetheless, this is not always achievable, hence non-U.S. dollar denominated debt issued in international currencies is hedged through DFIs to mitigate their exchange rate exposure, either by swapping them into U.S. dollars or through other derivative structures. The rest of the debt is denominated in pesos or in UDIs, for which most of the debt denominated in UDIs has been converted into pesos through DFIs in order to eliminate the inflationary risk exposure.

As a consequence of the above, PEMEX's debt issued in international currencies other than U.S. dollars has exchange rate risk mitigation strategies. PEMEX has selected strategies that further seek to reduce its cost of funding by leaving, in some cases, part of this exchange rate exposure unhedged when assessed appropriate.

The underlying currencies of PEMEX's DFIs are the euro, Swiss franc, Japanese yen and Pound sterling against the U.S. dollar and UDIs against the peso.

As of December 31, 2018, PEMEX entered into various cross-currency swaps to hedge inflation risk arising from debt obligations denominated in UDIs for an aggregate notional amount of Ps. 6,844,866 and during 2017, PEMEX entered into the same kind of instruments to hedge inflation risk arising from debt denominated in UDIs, for an aggregate notional amount of Ps. 6,291,969.

Additionally, in 2018, PEMEX entered into, without cost, structures which are composed of a cross-currency swap and the sale of a call option, in order to hedge the notional risk of four debt issues in euros for an aggregate notional amount of € 3,150,000, and an issue of debt in swiss francs for Fr. 365,000, guaranteeing complete protection up to a certain exchange rate and partial protection above that level.

Moreover, in 2017 PEMEX entered into, without cost, three options structures called "Seagull Option" to hedge the notional risk of three debt issues in euros for an aggregate notional amount of € 4,250,000. These structures protect the short exposure in euros against an appreciation of the euro versus the U.S. dollar in a specific range and result in a benefit if the euro depreciates up to a certain exchange rate, for each debt issue. Whereas, in order to mitigate the exchange rate risk caused by the coupons of these issues PEMEX entered into only coupon swaps.

Additionally, in 2017, PEMEX entered into, without cost, a structure which is composed of a cross-currency swap and the sale of a call option, in order to hedge the notional risk of a debt issue in Pounds sterling for £ 450,000, guaranteeing complete protection up to a certain exchange rate and partial protection above that level.

PEMEX recorded a total net foreign exchange gain (loss) of Ps. 23,659,480, Ps. 23,184,122 and Ps. (254,012,743), for the years ended December 31, 2018, 2017 and 2016, respectively; these amounts include the unrealized foreign exchange gain (loss) associated with debt of Ps. 19,762,208, Ps. 16,685,439 and Ps. (243,182,764) for the years ended December 31, 2018, 2017 and 2016, respectively. The appreciation of the peso during 2018 and 2017 caused a total net foreign exchange gain because a significant part of PEMEX's debt, 89.77% (principal only) as of December 31, 2018 is denominated in foreign currency. Unrealized foreign exchange gains and losses do not impact PEMEX's cash flows. Due to the cash flow structure described above, the depreciation of the peso relative to the U.S. dollar does not affect PEMEX's ability to meet U.S. dollar-denominated financial obligations and improves PEMEX's ability to meet peso-denominated financial obligations. On the other hand, the appreciation of the peso relative to the U.S. dollar may increase PEMEX's peso debt service costs on a U.S. dollar basis. PEMEX's foreign exchange gain in 2018 was due to the appreciation of the peso, from Ps. 19.7867 = U.S. \$1.00 on December 31, 2017 to Ps. 19.6829 = U.S. \$1.00 on December 31, 2018. PEMEX's foreign exchange gain in 2017 was due to the appreciation of the peso, from Ps. 20.6640 = U.S. \$1.00 on December 31, 2016 to Ps. 19.7867 = U.S. \$1.00

on December 31, 2017. PEMEX's foreign exchange loss in 2016 was due to the depreciation of the peso, from Ps. 17.2065 = U.S. \$1.00 on December 31, 2015 to Ps. 20.6640 = U.S. \$1.00 on December 31, 2016.

Certain of the PMI companies face market risks generated by fluctuations in foreign exchange rates. In order to mitigate these risks, the boards of directors of several of these companies have authorized a policy which stipulates that no more than 5% of a company's total financial assets may be denominated in a currency other than its functional currency, unless the company owes a duty or expected payment in a currency other than its functional one. Accordingly, some PMI companies will, from time to time, enter into DFIs in order to mitigate the risk associated with financing operations denominated in currencies other than their respective functional currency.

Finally, a significant amount of PMI Trading's income and expenses, including the cost of sales and related sales costs, is derived from the trade of refined products, petrochemicals and gas liquids to PEMEX subsidiaries and third parties, whose prices are determined and are payable in U.S. dollars. PMI Trading's exposure to foreign currency risk results primarily from the need to fund tax payments denominated in domestic currency, as well as certain related sales costs denominated in domestic currency.

PMI Trading believes it can adequately manage the risk created by the payment of taxes in domestic currency without the need to enter into hedging instruments because the exposure to this risk is marginal relative to the total flows of U.S. dollar. In addition, in the event that a potential foreign exchange risk arises in connection with a commercial transaction, PMI Trading may implement risk mitigation measures by entering into DFIs.

iii. *Hydrocarbon Price Risk*

PEMEX periodically assesses its revenues and expenditures structure in order to identify the main market risk factors that PEMEX's cash flows are exposed to in connection with international hydrocarbon prices. Based on this assessment, PEMEX monitors its exposure to the most significant risk factors and quantifies their impact on PEMEX's financial balance.

PEMEX's exports and domestic sales are directly or indirectly related to international hydrocarbon prices. Therefore, PEMEX is exposed to fluctuations in these prices. In terms of crude oil and natural gas, part of this risk is transferred to the Mexican Government under PEMEX's current fiscal regime.

PEMEX's exposure to hydrocarbon prices is partly mitigated by natural hedges between its inflows and outflows.

Additionally, PEMEX continuously evaluates the implementation of risk mitigation strategies, including those involving the use of DFIs, considering the operative and budgetary feasibility of those strategies.

In 2017, the Board of Directors of Petróleos Mexicanos approved the establishment of an Annual Oil Hedging Program. Since then, PEMEX has implemented hedging strategies to partially protect its cash flows from drops in the Mexican crude oil basket price below the one established in the Federal Revenue Law.

In April 2017, PEMEX entered into a crude oil hedge for fiscal year 2017, in which PEMEX hedged 409 thousand barrels per day from May to December of fiscal year 2017, for U.S. \$133,503. Afterwards, during the second half of 2017, PEMEX entered into a crude oil hedge for fiscal year 2018, in which PEMEX hedged 440 thousand barrels per day from January to December of fiscal year 2018, for U.S. \$449,898.

During 2018, the crude oil hedge for fiscal year 2019 was implemented, pursuant to which PEMEX hedged 320 thousand barrels per day for the period between December 2018 and December 2019, for U.S. \$149,588.

In addition to supplying natural gas, Pemex Industrial Transformation offers DFIs to its domestic customers in order to provide them with support to mitigate the risk associated with the volatility of natural gas prices. Until 2016, Pemex Industrial Transformation entered into DFIs with Mex Gas Supply, S.L. under the opposite position to those DFIs offered to its customers in order to mitigate the market risk it bears under such offered DFIs. Mex Gas Supply, S.L. then transferred the related price risk derived from the DFI position held with Pemex Industrial Transformation to international financial counterparties by entering into these opposite position DFIs with such parties. As of 2017, Pemex Industrial Transformation must enter into DFIs with Petróleos Mexicanos under the opposite position to those DFIs offered to its customers, thereby replacing Mex Gas Supply, S.L. However, as of December 31, 2018, no DFI had been carried out under this mechanism.

Due to the above, Pemex Industrial Transformation maintains a negligible or even null exposure to market risk. These portfolios have VaR and CaR limits in order to limit market risk exposure.

PMI Trading faces market risk generated by the terms of the purchase and sale of refined products and natural gas liquids, as well as the volatility of oil prices. Accordingly, it frequently enters into DFIs in order to mitigate this risk, thereby reducing the volatility of its financial results.

iv. *Market risk quantification*

The quantification of market risk exposure in PEMEX’s financial instruments is presented below, in accordance with the applicable international risk management practices.

Interest rate risk quantification

The quantification of interest rate risk of investment portfolios is carried out by using the one-day horizon historical VaR, with a confidence level of 95%, over a period of one year. The VaR incorporates interest rate and spread risks. In addition, for portfolios in domestic currency, the VaR includes the inflation risk embedded in securities denominated in UDI. For portfolio management purposes, interest rate risk is mitigated by VaR limits.

As of December 31, 2018, the VaRs of PEMEX’s investment portfolios were Ps. (17.19) for the Peso Treasury Portfolio, Ps. 0.00 for the Fondo Laboral Pemex Portfolio (“FOLAPE”), and U.S. \$ 0.00 for the U.S. Dollar Treasury Portfolio. The Fideicomiso de Cobertura Laboral y de Vivienda Portfolio (“FICOLAVI”) and the Mexican Peso Treasury Portfolio managed by Operadora de Fondos Nafinsa S.A. de C.V. (“OFINSA”) were written off in 2018.

In addition to the exposure to interest rate fluctuations of the DFIs in which PEMEX is obligated to pay floating rates, PEMEX’s DFIs are exposed to MtM volatility as a result of changes in the interest rate curves used in their valuation.

Interest rate risk quantification was calculated for DFIs in conjunction with the interest rate risk quantification for the debt portfolio. The following table shows the sensitivity of PEMEX’s DFIs and debt portfolio to a parallel shift of 10 basis points (bp) over the zero coupon rate curves. The 10bp parallel shift may be used to estimate in a simple manner the impact for proportional values to this shift and was selected in accordance with market practices for financial risk management.

For the debt portfolio, interest rate risk sensitivity was calculated taking into account both the DFI interbank market yield curves and the PEMEX curves (which were also used to estimate the debt portfolios’ fair value). These metrics were calculated solely for informational purposes and are not used for portfolio management purposes because PEMEX does not intend to prepay its debt or terminate its DFIs early. Therefore, there is no interest rate risk arising from fixed rate obligations.

INTEREST RATE and CURRENCY DFIs

Interest rate sensitivity to + 10 bp

<u>Currency</u>	Interbank Yield Curves		Sensitivity net	PEMEX Curves Sensitivity debt
	Sensitivity debt	Sensitivity DFIs		
<i>in thousands U.S. dollars</i>				
CHF	3,816	(3,473)	343	3,340
Euro	103,859	(85,825)	18,034	73,784
Pound Sterling	5,871	(5,445)	426	4,598
Yen	7,600	(3,470)	4,130	5,518
Peso	24,783	1,693	26,476	19,808
UDI	14,032	(14,032)	0	9,803
U.S. dollar	779,844	93,006	872,850	333,180

In addition, PEMEX performed a retrospective sensitivity analysis of the impact on its financial statements for the years ended December 31, 2018, 2017 and 2016, in which PEMEX assumed either an increase or decrease of 25 basis points in the floating interest rates of its debt and corresponding hedges.

At December 31, 2018, 2017 and 2016, had market interest rates been 25 basis points higher, with all other variables remaining constant, net loss for the year would have been Ps. 649,339, Ps. 704,011 and Ps. 841,024 higher for December 31, 2018, 2017 and 2016, respectively, primarily as a result of an increase in interest expense. Conversely, had market interest rates been 25 basis points lower, net loss for the year would have been Ps. 649,339, Ps. 704,011 and Ps. 841,024 lower at December 31, 2018, 2017 and 2016, respectively, primarily as a result of a decrease in interest expense.

Exchange rate risk quantification

The investments of PEMEX's portfolios do not face foreign exchange rate risk because the funds of such portfolios are used to meet obligations in pesos and U.S. dollars.

Currency DFIs are entered into in order to hedge exchange rate risk arising from debt flows in currencies other than pesos and U.S. dollars or inflation risk arising from debt flows in UDIs. However, due to the accounting treatment, net income is exposed to mark-to-market volatility as a result of changes in the exchange rates used in their valuation.

Exchange rate risk quantification was calculated for DFIs in conjunction with the exchange rate risk quantification for the debt portfolio. The following table shows the sensitivity of PEMEX's DFIs and debt portfolio to an increase of 1% to the exchange rates of currencies against the U.S. dollar. The 1% may be used to estimate in a simple manner the impact for proportional values to this increase and was selected in accordance with market practices for financial risk management.

For the debt portfolio, exchange rate risk sensitivity was calculated taking into account both, interbank market yield curves and the PEMEX curves. In addition, the table shows the one-day horizon historical VaR of the remaining open position, with a confidence level of 95%, over a period of one year. These metrics were calculated solely for informational purposes. Nevertheless, in order to carry out management activities related to its debt portfolio, PEMEX periodically conducts quantitative analyses in order to estimate the exchange rate risk exposure generated by its debt issuances. Based on these analyses, PEMEX has elected to enter into DFIs as an exchange rate risk mitigation strategy. These DFIs along with the debt that they hedge are shown in the following table:

INTEREST RATE and CURRENCY DFIs

<u>Currency</u>	Interbank Yield Curves			VaR 95% Net	PEMEX Curves 1% Debt
	1% Debt	1% DFIs	1% Net		
<i>in thousands U.S. dollars</i>					
CHF	(15,283)	14,597	(686)	(463)	(14,183)
Euro	(214,136)	185,752	(28,384)	(25,365)	(173,687)
Pound Sterling	(12,318)	11,701	(617)	(527)	(10,292)
Yen	(17,118)	11,569	(5,549)	(4,482)	(14,158)
Peso	(104,478)	(32,064)	(136,542)	(164,722)	(95,975)
UDI	(30,163)	30,163	(0)	(0)	(25,951)

As shown in the table above, exchange rate risk derived from debt denominated in currencies other than pesos and U.S. dollars is almost fully hedged by DFIs. The exchange rate risk exposure to the Swiss franc, euro, Pound sterling and Japanese yen is a result of the delta of the structures described above (Seagull Options and Calls), and considering the current exchange rate levels, represents a lower funding cost than the hedging strategies carried through swaps.

In addition, PEMEX performed a retrospective sensitivity analysis of the impact on its financial statements of the years ended December 31, 2018, 2017 and 2016, in which PEMEX assumed either an increase or decrease of 10% in the exchange rate between the U.S. dollar and peso in order to determine the impact on net income and equity as a result of applying these new rates to the monthly balances of assets and liabilities denominated in U.S. dollars.

At December 31, 2018, 2017 and 2016, had the peso depreciated against the U.S. dollar by 10% with other variables remaining constant, net loss would have been Ps.192,025, Ps. 149,669 and Ps. 124,512 higher, respectively, primarily as a result of an increase in the exchange rate losses. However, had the peso appreciated against the U.S. dollar by 10%, net loss for the period would have decreased by Ps. 192,025, Ps. 149,669 and Ps. 124,512, respectively, primarily as a result of the decrease in exchange rate losses.

Hydrocarbon price risk quantification

Pemex Industrial Transformation occasionally faces market risk due to open positions arising from the mismatch between the DFI portfolio offered to domestic customers and hedges with international counterparties. As of December 31, 2018, Pemex Industrial Transformation's natural gas DFI portfolio had no market risk exposure.

Market risk exposure is measured using the 20-day Delta-Gamma VaR methodology, with a confidence level of 95%, based on 500 daily observations; VaR and CaR are monitored and mitigated by pre-established limits.

It should be noted that sensitivity analyses were not carried out for other financial instruments, such as accounts receivable and payable (as defined in the financial reporting standards). Such accounts are cleared in short-term, and therefore market risk is considered to be nonexistent. Most of these accounts are related to hydrocarbon prices.

In accordance with the risk management regulatory framework that PMI Trading has implemented, VaR and the change in profit and loss by portfolio are calculated daily and compared to the maximum applicable limits in order to implement risk mitigation mechanisms as necessary.

PMI Trading's global VaR associated with commodities market risk was U.S. \$(8,687) as of December 31, 2018. This VaR was calculated using the historical method with a 99% confidence level, two-year history and a one-day horizon. The minimum VaR recorded on the year was U.S. \$(2,903) (registered on June 11, 2018) and the maximum VaR recorded on the year was U.S. \$(26,533) (registered on September 21, 2018). As of December 31, 2017, the global VaR was U.S. \$(8,789).

The quantification of crude oil price risk is carried out by using the one-day horizon historical VaR, with a confidence level of 95%, over a period of one year. As of December 31, 2018, this was U.S.\$ (19,651).

II. Credit Risk

When the fair value of a DFI is favorable to PEMEX, PEMEX faces the risk that the counterparty will not be able to meet its obligations. PEMEX monitors its counterparties' creditworthiness and calculates the credit risk exposure for its DFIs. As a risk mitigation strategy, PEMEX only enters into DFIs with major financial institutions with a minimum credit rating of BBB-. These ratings are issued and revised periodically by risk rating agencies. Furthermore, PEMEX seeks to maintain a diversified portfolio of counterparties.

In order to estimate PEMEX's credit risk exposure to each financial counterparty, the potential future exposure is calculated by projecting the risk factors used in the valuation of each DFI in order to estimate the MtM value for different periods, taking into account any credit risk mitigation provisions.

Moreover, PEMEX has entered into various long-term cross-currency swaps agreements with "recouping" provisions (pursuant to which the payments on the swaps are adjusted when the MtM exceeds the relevant threshold specified in the swap), thereby limiting the exposure with its counterparties to a specific threshold amount. The specified thresholds were reached in seven cross-currency swaps from the first to the fourth quarter of 2018, which were used to hedge the exchange rate exposure to the euro and to the Pound sterling, and in three cross-currency swaps during 2017, which were used to hedge the exchange rate exposure to the euro. This resulted in the cash settlement of such swaps and the resetting of swap terms to return their mark-to-market value to zero. During 2018, PEMEX did not enter into any cross-currency swap with these characteristics.

In addition, PEMEX has entered into long-term DFIs with mandatory early termination clauses (pursuant to which, at a given date and irrespective of the current MtM, the DFI will terminate and settle at the corresponding MtM, and PEMEX can either enter into a new DFI with the same counterparty or a new counterparty), which reduces the credit risk generated by the term of the DFI by bounding it to a specific date. As of December 31, 2018, PEMEX has entered into two Japanese yen Seagull Option structures, with termination clauses in 2021.

According to IFRS 13 “Fair Value Measurement,” the fair value or MtM value of DFIs must reflect the creditworthiness of the parties. Consequently, the fair value of a DFI takes into account the risk that either party may default on its obligation. Due to the above, PEMEX applies the credit value adjustment (“CVA”) method to calculate the fair value of its DFIs.

For each DFI, the CVA is calculated by determining the difference between the MtM and the estimated MtM adjusted for credit risk. In determining the credit risk, the CVA method takes into account the current market perception about the credit risk of both counterparties, using the following inputs: a) the MtM projection for each payment date based on forward yield curves; b) the implied default probability obtained from both, PEMEX and the counterparty’s credit default swaps, at each payment date; and c) the default recovery rates of each counterparty.

The current and potential exposures, aggregated by credit rating, are as follows:

Maximum Credit Exposure by term in Petróleos Mexicanos

Rating	Current	Less than 1 year	1-3 years	3-5 years	5-7 years	7-10 years	More than 10 years
<i>in thousands U.S. dollars</i>							
A+	33,574	327,062	478,533	290,207	189,464	129,778	0
A	172,468	1,069,540	1,051,021	933,130	260,363	189,119	0
A-	54,288	143,584	9,780	0	0	0	0
BBB+	72,570	1,567,608	2,229,081	2,293,010	2,259,894	1,724,213	650,900
BBB-	(71,491)	33,290	127,099	151,033	156,401	160,631	0

PEMEX also faces credit risk derived from its investments. As of December 31, 2018, the notional amounts of investments in domestic currency, organized by the credit ratings of the issuances, were as follows:

Credit rating of issuances*	Notional amount
mxAAA	Ps.100,344

- * Minimum S&P, Moody’s and Fitch credit rating.
National Credit Rating Scale.
Does not include investments in Mexican Government bonds.

The table above does not include domestic currency Mexican Government bonds since it is considered that, given the current credit rating, the default probability in this currency is zero.

Furthermore, by means of its credit guidelines for DFI operations, Pemex Industrial Transformation has significantly reduced its credit risk exposure related to the DFIs offered to its customers to assist them in mitigating the risk associated with the volatility of natural gas prices.

In order to qualify for these DFIs, Pemex Industrial Transformation's customers must be party to a current natural gas supply contract and sign a domestic master derivative agreement.

Additionally, beginning on October 2, 2009, DFIs with these customers must be initially secured by cash deposits, letters of credit or other collateral provisions, as required. In accordance with these guidelines, in the event that a client does not meet its payment obligations, DFIs related to this client are terminated, rights to collateral are exercised and, if the collateral is insufficient to cover the fair value, natural gas supply is suspended until the payment is made.

On August 20, 2014, certain amendments to the credit guidelines were enacted, which allowed Pemex-Gas and Petrochemicals, and now Pemex Industrial Transformation, to offer to its clients with an adequate credit rating, based on an internal financial and credit assessment, DFIs with an exemption from collateral requirements up to certain amount through a credit line approved by the credit committee. Moreover, if the credit line is insufficient to cover each client's exposure, the client is obligated to deposit collateral. If a client suffers an event of default, DFIs related to this client are terminated early and natural gas supply is suspended until the payment is made.

As of December 31, 2018, Pemex Industrial Transformation's DFIs had a fair value of Ps. 143 (deferred premiums included) for clients with exempted credit lines and Ps. 134 for clients with guaranteed credit lines. The total amount of exempt credit lines rose to Ps. 21,391, representing 1% usage of available exempt credit lines, while the total amount of guaranteed credit lines rose to Ps. 1,000 representing a 13% usage of available guaranteed credit lines.

As of December 31, 2018, the overdue accounts of natural gas customers in the industrial and distribution sectors accounted for less than 1% of the total sales of Pemex Industrial Transformation.

As of December 31, 2018, Pemex Industrial Transformation had open DFIs with two customers. Of the total volume (in millions of British thermal units or MMBtu) of DFIs, industrial customers represented 100%.

As of December 31, 2018 and 2017, Pemex Industrial Transformation had not provided any collateral for DFIs entered into to hedge its DFIs with customers. This was due to the following: (i) natural gas prices maintained levels below the strike price, which has kept the credit limits within the set limits; and (ii) when certain DFIs matured, Pemex-Gas and Basic Petrochemicals, and now Pemex Industrial Transformation, had used domestic customers' payments to meet its international obligations.

It is not considered necessary to disclose the potential future exposure of the DFIs' portfolio held by Pemex Industrial Transformation through Mex Gas Supply S.L., due to the fact that these instruments are collateralized, the current notional amount does not represent a significant amount and the maturity is less than one year.

PMI Trading's credit risk associated with DFI transactions is mitigated through the use of futures and standardized instruments that are cleared through CME-Clearport.

III. Liquidity Risk

PEMEX's main internal source of liquidity comes from its operations. Additionally, through its debt planning and the purchase and sale of U.S. dollars, PEMEX currently preserves a cash balance at a level of liquidity in domestic currency and U.S. dollars that is considered adequate to cover its investment and operating expenses, as well as other payment obligations, such as those related to DFIs.

In addition, as of December 31, 2018, PEMEX has acquired committed revolving credit lines in order to mitigate liquidity risk, three of which provide access to Ps. 3,500,000, Ps. 20,000,000 and Ps. 9,000,000 with expiration dates in June 2019, November 2019 and November 2023, respectively; and three others that each provide access to U.S. \$1,500,000, U.S. \$3,250,000 and U.S. \$1,950,000 with expiration dates in December 2019, February 2020 and January 2021, respectively.

Finally, the investment strategies of PEMEX's portfolios are structured by selecting time horizons that consider each currency's cash flow requirements in order to preserve liquidity.

Certain PMI companies mitigate their liquidity risk through several mechanisms, the most important of which is the centralized treasury or “in-house bank,” which provides access to a syndicated credit line for up to U.S. \$ 700,000 and cash surplus capacity in the custody of the centralized structure. In addition, certain PMI companies have access to bilateral credit lines from financial institutions for up to U.S. \$500,000.

These companies monitor their cash flow on a daily basis and protect their creditworthiness in the financial markets. Liquidity risk is mitigated by monitoring the maximum/minimum permissible financial ratios as set forth in the policies approved by each company’s board of directors.

The following tables show the cash flow maturities as well as the fair value of PEMEX’s debt and DFI portfolios as of December 31, 2018 and 2017. It should be noted that:

- For debt obligations, these tables present principal cash flow and the weighted average interest rates for fixed rate debt.
- For interest rate swaps, cross currency swaps, currency options and currency forwards, these tables present notional amounts and weighted average interest rates by expected (contractual) maturity dates.
- Weighted average variable rates are based on implied forward rates obtained from the interbank market yield curve at the reporting date.
- For natural gas DFIs, volumes are presented in millions of British thermal unit (MMBtu), and fixed average and strike prices are presented in U.S. dollars per MMBtu.
- For crude oil, volumes are presented in millions of barrels, and fixed average and strike prices are presented in U.S. dollars per barrel.
- A DFI’s fair value includes CVA and is calculated based on market quotes obtained from market sources such as Bloomberg. Forward curves and implied volatilities for natural gas and crude oil are supplied by Bloomberg.
- For PMI Trading, the prices used in commercial transactions and DFIs are published by reputable sources that are widely used in international markets, such as CME-NYMEX, Platts and Argus, among others.
- Fair value is calculated internally, either by discounting cash flows with the corresponding zero-coupon yield curve in the original currency, or through other standard methodologies commonly used in financial markets for specific instruments.
- For all instruments, the tables are based on the contract terms in order to determine the future cash flows that are categorized by expected maturity dates.

This information is presented in thousands of pesos, except as noted.

Quantitative Disclosure of Debt Cash Flow's Maturities as of December 31, 2018⁽¹⁾

	Year of expected maturity date						Total carrying value	Fair value
	2019	2020	2021	2022	2023	2024 thereafter		
Liabilities								
Outstanding debt								
Fixed rate (U.S. dollars)	Ps. 53,962,520	Ps. 40,098,959	Ps. 94,686,304	Ps. 83,674,076	Ps. 91,790,092	Ps. 827,719,134	Ps. 1,191,931,085	Ps. 1,084,252,622
Average interest rate (%)							5.8927%	
Fixed rate (Japanese yen)	—	—	—	—	5,379,000	14,317,126	19,696,126	16,603,524
Average interest rate (%)							1.3484%	
Fixed rate (Pound sterling)	—	—	—	8,763,410	—	11,205,575	19,968,985	20,257,139
Average interest rate (%)							5.7248%	
Fixed rate (pesos)	—	10,017,084	20,257,747	1,999,192	—	88,324,131	120,598,154	101,639,764
Average interest rate (%)							7.4872%	
Fixed rate (UDIs)	19,386,459	4,999,710	4,066,182	—	—	31,275,418	59,727,769	51,079,974
Average interest rate (%)							2.7362%	
Fixed rate (euros)	21,466,509	29,215,492	39,343,306	35,884,701	31,437,421	173,348,554	330,695,983	325,772,611
Average interest rate (%)							3.7123%	
Fixed rate (Swiss Francs)	5,991,035	11,966,770	3,001,116	—	7,264,850	—	28,223,771	27,916,889
Average interest rate (%)							1.8697%	
Total fixed rate debt	100,806,523	96,298,015	161,354,655	130,321,379	135,871,363	1,146,189,938	1,770,841,873	1,627,522,522
Variable rate (U.S. dollars)	23,231,281	63,823,350	14,517,807	32,878,778	11,136,784	17,616,801	163,204,801	169,873,202
Variable rate (Japanese yen)	—	11,475,200	—	—	—	—	11,475,200	11,264,120
Variable rate (euros)	—	—	—	—	14,601,014	—	14,601,014	16,093,157
Variable rate (pesos)	34,322,574	18,352,215	8,456,465	8,407,405	6,968,237	12,220,826	88,727,722	88,624,217
Total variable rate debt	57,553,855	93,650,765	22,974,272	41,286,183	32,706,035	29,837,627	278,008,737	285,854,697
Total debt	Ps. 158,360,378	Ps. 189,948,780	Ps. 184,328,927	Ps. 171,607,562	Ps. 168,577,398	Ps. 1,176,027,565	Ps. 2,048,850,610	Ps. 1,913,377,218

Note: Numbers may not total due to rounding.

- (1) The information in this table has been calculated using exchange rates at December 31, 2018 of: Ps. 19.6829 = U.S. \$1.00; Ps. 0.17930 = 1.00 Japanese yen; Ps. 25.0878 = 1.00 Pound sterling; Ps. 6.226631 = 1.00 UDI; Ps. 22.5054 = 1.00 euro; and Ps. 19.9762 = 1.00 Swiss Franc.
Source: PEMEX

Quantitative Disclosure of Debt Cash Flow's Maturities as of December 31, 2017⁽¹⁾

	Year of expected maturity date						Total carrying value	Fair value
	2018	2019	2020	2021	2022	2023 thereafter		
Liabilities								
Outstanding debt								
Fixed rate (U.S. dollars)	Ps. 53,465,817	Ps. 59,498,256	Ps. 60,290,621	Ps. 95,232,448	Ps. 84,076,050	Ps. 808,836,547	Ps. 1,161,399,739	Ps. 1,213,404,769
Average interest rate (%)							5.7747%	
Fixed rate (Japanese yen)	—	—	—	—	—	19,296,607	19,296,607	18,040,398
Average interest rate (%)							1.3485%	
Fixed rate (Pound sterling)	—	—	—	—	9,345,839	11,952,816	21,298,655	24,381,394
Average interest rate (%)							5.7246%	
Fixed rate (pesos)	—	—	10,033,017	20,376,655	1,999,098	88,349,072	120,757,842	171,683,692
Average interest rate (%)							7.4876%	
Fixed rate (UDIs)	—	18,477,076	4,764,175	3,874,313	—	30,081,647	57,197,211	56,536,905
Average interest rate (%)							2.7458%	
Fixed rate (euros)	1,043	32,042,196	30,801,894	41,508,857	23,655,950	171,255,634	299,265,574	330,573,998
Average interest rate (%)							3.6736%	
Fixed rate (Swiss Francs)	4,565,075	6,088,686	12,149,953	3,046,567	—	—	25,850,281	26,957,785
Average interest rate (%)							1.8387%	
Total fixed rate debt	58,031,935	116,106,214	118,039,660	164,038,840	119,076,937	1,129,772,323	1,705,065,909	1,841,578,940
Variable rate (U.S. dollars)	58,364,536	15,302,101	62,289,546	12,809,666	31,289,725	18,379,557	198,435,131	206,254,219
Variable rate (Japanese yen)	—	—	11,244,800	—	—	—	11,244,800	11,361,079
Variable rate (pesos)	8,734,371	27,995,083	18,341,742	8,459,163	8,394,483	19,125,764	91,050,606	94,188,981
Total variable rate debt	67,098,907	43,297,184	91,876,088	21,268,829	39,684,208	37,505,321	300,730,537	311,804,280
Total debt	Ps. 25,130,842	Ps. 159,403,398	Ps. 209,915,748	Ps. 185,307,669	Ps. 158,761,145	Ps. 1,167,277,644	Ps. 2,005,796,446	Ps. 2,153,383,220

Note: Numbers may not total due to rounding.

- (1) The information in this table has been calculated using exchange rates at December 31, 2017 of: Ps. 19.7867 = U.S. \$1.00; Ps. 0.1757 = 1.00 Japanese yen; Ps. 26.7724 = 1.00 Pound sterling; Ps. 5.934551 = 1.00 UDI; Ps. 23.7549 = 1.00 euro; and Ps. 20.2992 = 1.00 Swiss Franc.
Source: PEMEX

**Quantitative Disclosure of Cash Flow's Maturities from Derivative Financial Instruments Held or Issued
for Purposes Other than Trading as of December 31, 2018^{(1) (2)}**

	Year of expected maturity date						Total Notional Amount	Fair Value ⁽³⁾
	2019	2020	2021	2022	2023	2024 Thereafter		
Hedging instruments⁽²⁾⁽⁴⁾								
Interest rate DFIs								
Interest rate swaps								
<i>(U.S. dollars)</i>								
Variable to fixed	Ps. 4,692,574	Ps. 4,706,039	Ps. 4,661,811	Ps. 4,546,095	Ps. 4,406,561	Ps. 5,683,437	Ps. 28,696,517	Ps. 644,746
Average pay rate	3.18%	3.20%	3.22%	3.25%	3.37%	3.74%	N.A.	N.A.
Average receive rate	4.22%	4.07%	3.94%	4.08%	4.40%	5.25%	N.A.	N.A.
Currency DFIs								
Cross-currency swaps								
Receive euros/Pay								
U.S. dollars	20,782,857	28,568,548	36,709,101	35,121,361	45,930,033	175,091,781	342,203,681	5,495,541
Receive Japanese yen/ Pay U.S. dollars								
	—	12,971,158	—	—	4,750,499	—	17,721,657	(1,112,629)
Receive Pounds sterling/ Pay U.S. dollars								
	—	—	—	9,819,995	—	11,645,585	21,465,580	(297,318)
Receive UDI/ Pay pesos								
	23,740,341	7,292,520	3,000,000	—	—	27,450,032	61,482,893	(4,392,093)
Receive Swiss francs/ Pay U.S. dollars								
	6,466,978	11,488,074	2,978,666	—	7,184,259	—	28,117,977	486,310
Currency Options								
Buy Put, Sell Put and Sell								
Call on Japanese yen	—	—	—	—	—	14,355,685	14,355,685	222,491
Buy call, Sell call and Sell								
Put on euros	—	—	39,497,823	13,542,111	14,670,620	99,308,812	167,019,366	165,458
Sell Call on Pound sterling								
	—	—	—	—	—	11,296,695	11,296,695	(232,636)
Sell Call on Swiss Francs								
	—	—	—	—	7,315,424	—	7,315,424	(183,093)
Currency Forward								
Receive U.S. dollars / Pay pesos								
	—	—	—	—	—	—	—	—

N.A. = not applicable.

Numbers may not total due to rounding.

- (1) The information in this table has been calculated using exchange rates at December 31, 2018 of: Ps. 19.6829 = U.S. \$1.00 and Ps. 22.5054 = 1.00 euro.
- (2) PEMEX's management uses these DFIs to hedge market risk; however, these DFIs do not qualify for accounting purposes as hedges and are recorded in the financial statements as entered into for trading purposes.
- (3) Positive numbers represent a favorable fair value to PEMEX.
- (4) PMI's risk management policies and procedures establish that DFIs should be used only for hedging purposes; however, DFIs are not recorded as hedges for accounting purposes.

Source: PEMEX

**Quantitative Disclosure of Cash Flow's Maturities from Derivative Financial Instruments Held or Issued
for Purposes Other than Trading as of December 31, 2017^{(1) (2)}**

	Year of expected maturity date						Total Notional Amount	Fair Value ⁽³⁾
	2018	2019	2020	2021	2022	2023 Thereafter		
Hedging instruments⁽²⁾⁽⁴⁾								
Interest rate DFIs								
<i>Interest rate swaps</i> (U.S. dollars)								
Variable to fixed	Ps. 4,704,170	Ps. 4,717,321	Ps. 4,730,857	Ps. 4,686,396	Ps. 4,570,070	Ps. 10,143,209	Ps. 33,552,022	Ps. 388,851
Average pay rate	3.16%	3.18%	3.20%	3.22%	3.26%	3.48%	N.A.	N.A.
Average receive rate	3.19%	3.44%	3.69%	3.81%	3.95%	4.48%	N.A.	N.A.
<i>Interest rate swaps</i> (pesos)								
Variable to fixed	—	—	—	—	—	—	—	—
Average pay rate	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Average receive rate	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Currency DFIs								
<i>Cross-currency swaps</i>								
Receive euros/Pay								
U.S. dollars	—	29,898,198	28,719,208	36,902,690	21,302,856	161,617,172	278,440,124	19,065,727
Receive Japanese yen/ Pay U.S. dollars	—	—	13,039,563	—	—	4,775,551	17,815,114	(1,670,533)
Receive Pounds sterling/ Pay U.S. dollars	—	—	—	—	10,310,216	11,706,999	22,017,215	1,151,096
Receive UDI/ Pay pesos	—	23,740,341	7,292,520	3,000,000	—	20,605,166	54,638,028	(4,720,592)
Receive Swiss francs/ Pay U.S. dollars	4,535,474	6,501,082	11,548,658	2,994,374	—	—	25,579,588	400,316
<i>Currency Options</i>								
Buy Put, Sell Put and Sell Call on Japanese yen	—	—	—	—	—	14,046,320	14,046,320	48,715
Buy Call, Sell call and Sell Put on euros	—	—	—	41,567,998	—	59,382,855	100,950,853	4,919,444
Sell Call on Pound sterling	—	—	—	—	—	12,031,728	12,031,728	(239,626)
<i>Currency Forward</i>								
Receive U.S. dollars / Pay pesos	59,360,100	—	—	—	—	—	59,360,100	(2,006,461)

N.A. = not applicable.

Numbers may not total due to rounding.

- (1) The information in this table has been calculated using exchange rates at December 31, 2017 of: Ps. 19.7867 = U.S. \$1.00 and Ps. 23.7549 = 1.00 euro.
- (2) PEMEX's management uses these DFIs to hedge market risk; however, these DFIs do not qualify for accounting purposes as hedges and are recorded in the financial statements as entered into for trading purposes.
- (3) Positive numbers represent a favorable fair value to PEMEX.
- (4) PMI's risk management policies and procedures establish that DFIs should be used only for hedging purposes; however DFIs are not recorded as hedges for accounting purposes.

Source: PEMEX

B. Fair value of derivative financial instruments

PEMEX periodically evaluates its exposure to international hydrocarbon prices, interest rates and foreign currencies and uses derivative instruments as a mitigation mechanism when potential sources of market risk are identified.

PEMEX monitors the fair value of its DFI portfolio on a periodic basis. The fair value represents the price at which one party would assume the rights and obligations of the other, and is calculated for DFIs through models commonly used in the international financial markets, based on inputs obtained from major market information systems and price providers. Therefore, PEMEX does not have an independent third party to value its DFIs.

PEMEX calculates the fair value of its DFIs through the tools developed by its market information providers such as Bloomberg, and through valuation models implemented in software packages used to integrate all of PEMEX's business areas and accounting, such as SAP (System Applications Products). PEMEX does not have policies to designate a calculation or valuation agent.

PEMEX's DFI portfolio is composed primarily of swaps, for which fair value is estimated by projecting future cashflows and discounting them with the corresponding discount factor; for currency options, this is done through the Black and Scholes Model, and for crude oil options, through the Levy model for Asian options.

According to IFRS 13 “Fair Value Measurement”, the MtM value of DFIs must reflect the creditworthiness of the parties. Consequently, the fair value of a DFI takes into account the risk that either party may default on its obligation. Due to the above, PEMEX applies the credit value adjustment (“CVA”) method to calculate the fair value of its DFIs.

Because PEMEX’s hedges are cash flow hedges, their effectiveness is preserved regardless of the variations in the underlying assets or reference variables, thus asset flows are fully offset by liabilities flows. Therefore, it is not necessary to measure or monitor the hedges’ effectiveness.

PEMEX’s assumptions and inputs considered in the calculation of the fair value of its DFIs fall under Level 2 of the fair value hierarchy for market participant assumptions.

Embedded derivatives

In accordance with established accounting policies, PEMEX has analyzed the different contracts that PEMEX has entered into and has determined that according to the terms thereof none of these agreements meet the criteria to be classified as embedded derivatives. Accordingly, as of December 31, 2018 and 2017, PEMEX did not recognize any embedded derivatives (foreign currency or index).

As of December 31, 2018, PEMEX recognized a loss of Ps. 3,142,662 in the “Derivative financial instruments (cost) income, net” line item which resulted from changes in the fair value of the accounts receivable from the sale of hydrocarbons whose performance obligations have been met and whose determination of the final price is indexed to future prices of the hydrocarbons.

Accounting treatment

PEMEX enters into derivatives transactions with the sole purpose of hedging financial risks related to its operations, firm commitments, planned transactions and assets and liabilities recorded on its statement of financial position. Nonetheless, some of these transactions do not qualify for hedge accounting treatment because they do not meet the requirements of the accounting standards for designation as hedges. They are therefore recorded in the financial statements as instruments entered into for trading purposes, despite the fact that their cash flows are offset by the cash flows of the positions (assets or liabilities) to which they relate. As a result, the changes in their fair value are recognized in the “Derivative financial instruments (cost) income, net” line item in the consolidated statement of comprehensive income.

As of December 31, 2018 and 2017, the net fair value of PEMEX’s DFIs (including both DFIs that have not reached maturity and those that have reached maturity but have not been settled), recognized in the consolidated statement of financial position, was Ps. 6,487,032 and Ps. 12,367,475, respectively. As of December 31, 2018 and 2017, PEMEX did not have any DFIs designated as hedges.

The following table shows the fair values and notional amounts of PEMEX’s DFIs, including those with an open position and those that have matured but that have not been settled, which were designated as non-hedges for accounting purposes and entered into for trading purposes as of December 31, 2018 and 2017. It should be noted that:

- A DFI’s fair value includes CVA and is calculated based on market quotes obtained from market sources such as Bloomberg. Forward curves and implied volatilities for natural gas and crude oil are supplied by Bloomberg.
- Fair value is calculated internally, either by discounting cash flows with the corresponding zero-coupon yield curve, in the original currency, or through other standard methodologies commonly used in the financial markets for certain specific instruments.
- The information is presented in thousands of pesos (except as noted).

DFI	POSITION	December 31, 2018		December 31, 2017	
		Notional Amount	Fair Value	Notional Amount	Fair Value
Interest rate swaps	PEMEX pays fixed in U.S. dollar and receives floating in 3-month U.S. dollar LIBOR + spread.	14,147,084	228,909	16,695,028	79,448
Interest rate swaps	PEMEX pays fixed in U.S. dollar and receives floating in 6-month U.S. dollar LIBOR + spread.	13,433,579	420,029	15,433,626	332,273
Cross-currency swaps	PEMEX pays the 28-day TIEE + spread in pesos and receives fixed in UDI.	37,742,553	(237,428)	30,897,687	(216,441)
Cross-currency swaps	PEMEX pays fixed in pesos and receives notional in UDI.	23,740,341	(4,154,665)	23,740,341	(4,504,151)
Cross-currency swaps	PEMEX pays floating in 6-month U.S. dollar LIBOR + spread and receives floating in 6-month yen LIBOR + spread.	12,971,158	(1,532,612)	13,039,563	(1,804,993)
Cross-currency swaps	PEMEX pays fixed in U.S. dollar and receives fixed in Japanese yen.	4,750,499	419,983	4,775,551	134,461
Cross-currency swaps	PEMEX pays floating in 3-month U.S. dollar LIBOR + spread and receives floating in 3-month euro LIBOR + spread.	15,073,938	(122,974)	—	—
Cross-currency swaps	PEMEX pays fixed in U.S. dollar and receives fixed in euro.	327,129,743	5,618,515	278,440,124	19,065,727
Cross-currency swaps	PEMEX pays floating in 6-month U.S. dollar LIBOR + spread and receives fixed in Pound sterling.	9,819,995	(2,573)	10,310,216	560,982
Cross-currency swaps	PEMEX pays fixed in U.S. dollar and receives fixed in Pound sterling.	11,645,585	(294,745)	11,706,999	590,113
Cross-currency swaps	PEMEX pays fixed in U.S. dollar and receives fixed in CHF.	28,117,976	486,310	25,579,588	400,316
Currency Options	PEMEX Buy Put, Sell Put and Sell Call on Japanese yen	14,355,685	222,491	14,046,320	48,715
Currency Options	PEMEX Buy Call, Sell Call and Sell Put on euro	95,923,285	2,708,534	100,950,853	4,919,444
Currency Options	PEMEX Sell Call on Pound sterling	11,296,695	(232,636)	12,031,728	(239,626)
Currency Options	PEMEX Sell Call on CHF	7,315,424	(183,093)	—	—
Currency Options	PEMEX Sell Call on euro	71,096,081	(2,543,075)	—	—
Currency Forward	PEMEX pays Pesos and receives U.S. dollar.	—	—	59,360,100	(2,006,461)
Natural gas swaps	PEMEX receives fixed.	(3,669)	136	(51,724)	6,934
Natural gas swaps	PEMEX receives floating.	3,622	(94)	50,846	(6,114)
Natural gas options	PEMEX Long Call.	989	4	18,625	398
Natural gas options	PEMEX Short Call.	(989)	(4)	(18,625)	(397)
Interest rate swaps	PEMEX pays fixed in U.S. dollar and receives floating in U.S. dollar LIBOR 1M.	1,115,854	(4,192)	1,423,368	(22,870)
<i>Subtotal</i>			<u>796,820</u>		<u>17,337,758</u>

DFI	December 31, 2018		December 31, 2017	
	Volume (MMb)	Fair Value	Volume (MMb)	Fair Value
Crude Oil Options	111.68	5,690,212	153.56	Ps.(5,010,187)

DFI	Market	December 31, 2018		December 31, 2017	
		Volume (MMb)	Fair value	Volume (MMb)	Fair value
Futures	Exchange traded	2.6	Ps.441,954	2.1	Ps.(141,693)
Petroleum Products Swaps	Exchange traded	4.9	Ps.760,603	1.3	Ps. (99,680)

Notes: Numbers may not total due to rounding.

(1) The fair value of the Futures and the Petroleum Products Swaps, was recognized as “Cash and cash equivalents” in the statement of financial position because PEMEX considered these financial assets to be fully liquid.

The exchange rate for U.S. dollars as of December 31, 2018 and 2017 was Ps. 19.6829 and Ps. 19.7867 per U.S. dollar, respectively. The exchange rate for euros as of December 31, 2018 and 2017 was Ps. 22.5054 and Ps. 22.3109 per euro, respectively.

For the years ended December 31, 2018, 2017 and 2016, PEMEX recognized a net (loss) gain of Ps. (22,258,613), Ps. 25,338,324 and Ps. (14,000,987), respectively, in the “Derivative financial instruments (cost) income, net” line item with respect to DFIs treated as instruments entered into for trading purposes.

The following table presents the fair value of PEMEX’s DFIs that are included in the consolidated statement of financial position in Derivative financial instruments (including both DFIs that have not reached maturity and those that have reached maturity but have not been settled), as of December 31, 2018 and 2017:

	Derivatives assets Fair value	
	December 31, 2018	December 31, 2017
Derivatives not designated as hedging instruments		
Crude oil options	Ps. 5,690,212	Ps. 397,630
Currency options	2,931,025	4,968,159
Natural gas options	4	398
Cross-currency swaps	13,111,838	24,126,452
Natural gas swaps	260	7,003
Propane swaps	—	—
Interest rate swaps	648,938	411,721
Others	—	202,091
Total derivatives not designated as hedging instruments	<u>22,382,277</u>	<u>30,113,454</u>
Total assets	<u>Ps.22,382,277</u>	<u>Ps.30,113,454</u>

	Derivatives liabilities Fair value	
	December 31, 2018	December 31, 2017
Derivatives not designated as hedging instruments		
Forwards	Ps. —	Ps. (2,006,461)
Crude oil options	—	(5,407,817)
Currency options	—	—
Natural gas options	(4)	(397)
Cross-currency swaps	(15,890,830)	(10,301,983)
Natural gas swaps	(218)	(6,182)
Interest rate swaps	(4,193)	(22,870)
Others	—	(269)
Total derivatives not designated as hedging instruments	<u>(15,895,245)</u>	<u>(17,745,979)</u>
Total liabilities	<u>Ps. (15,895,245)</u>	<u>Ps. (17,745,979)</u>
Net total	<u>Ps. 6,487,032</u>	<u>Ps. 12,367,475</u>

The following tables presents the net gain (loss) recognized in income on PEMEX's DFIs for the years ended December 31, 2018, 2017 and 2016, in the consolidated statement of comprehensive income which is presented in the "Derivative financial instruments (cost) income, net" line item:

Derivatives not designated as hedging instruments	Amount of gain (loss) recognized in the Statement of operations on derivatives		
	December 31, 2018	December 31, 2017	December 31, 2016
	Ps. (3,142,662)	Ps. —	Ps. —
Embedded derivatives	Ps. (3,142,662)	Ps. —	Ps. —
Forwards	2,007,393	(1,976,241)	—
Futures	374,112	(779,950)	(1,925,969)
Crude oil options	2,329,051	(3,771,604)	—
Currency options	(2,210,301)	5,255,931	(298,789)
Natural gas options	185	673	(671)
Cross-currency swaps	(21,902,567)	27,747,290	(11,633,605)
Natural gas swaps	117	1,780	831
Propane swaps	—	—	(3,805)
Interest rate swaps	286,059	(34,306)	(138,979)
Others	—	(1,105,249)	—
Total	Ps. (22,258,613)	Ps. 25,338,324	Ps. (14,000,987)

NOTE 20. EMPLOYEE BENEFITS

Until December 31, 2015, Petróleos Mexicanos and Subsidiary Entities only had defined benefit pension plans for the retirement of its employees, to which only Petróleos Mexicanos and the Subsidiary Entities contribute. Benefits under these plans are based on an employee's salary and years of service completed at retirement. As of January 1, 2016, Petróleos Mexicanos and Subsidiary Entities also has a defined contribution pension plan, in which both Petróleos Mexicanos and Subsidiary Entities and the employee contribute to an employee's individual account.

Benefits under the defined benefit plan are mainly based on the years of service completed by the employee, and their remuneration at the date of retirement. The obligations and costs of these plans are recognized based on an actuarial valuation prepared by independent experts. Within the regulatory framework of plan assets, there are no minimum funding requirements. Petróleos Mexicanos and the Subsidiary Entities have established additional plans to cover post-employment benefits, which are based on actuarial studies prepared by independent experts and which include disability, post-mortem pension and the death of retired employees, as well as medical services for retired employees and beneficiaries.

As of December 31, 2018, Petróleos Mexicanos and Subsidiary Entities funded its employees benefits through Mexican trusts, the resources of which come from the retirement line item of PEMEX's annual budget (an operating expense), or any other line item that substitutes or relates to this line item, or that is associated to the same line item and the interests, dividends or capital gains obtained from the investments of the trusts.

The following table show the amounts associated with PEMEX's labor obligations:

Defined Benefits Liabilities	December 31,	
	2018	2017
Liability for defined benefits at retirement and post-employment at the end of the year	Ps. 1,067,317,120	Ps. 1,241,072,307
Liability for other long-term benefits	13,224,926	17,363,815
Total liability for defined benefits recognized in the consolidated statement of financial position at the end of the year	Ps. 1,080,542,046	Ps. 1,258,436,122

The following tables contain detailed information regarding PEMEX's retirement and post-employment benefits:

Changes in the liability for defined benefits	December 31,	
	2018	2017
Liability for defined benefits at the beginning of the year	Ps. 1,241,072,307	Ps. 1,202,624,665
Recognition of the modifications in pensions plan	—	8,327
Current Service cost	20,819,804	13,079,341
Net interest	97,571,478	95,402,917
Defined benefits paid by the fund	(5,547,170)	(5,105,669)
Actuarial (gains) losses in other comprehensive results due to:		
Change in financial assumptions	(214,105,342)	47,182,448
Change in demographic assumptions	(71,958,462)	(70,012,604)
For experience during the year	53,779,484	10,272,231
In plan assets during the year	646,318	(453,206)
Effect of the liability ceiling*	279,674	—
Transfer to Long-term Benefits*	410,775	—
Remeasurements	2,146	26,417
Contributions paid to the fund	(55,653,892)	(51,952,560)
Defined benefit liabilities at end of year	Ps. 1,067,317,120	Ps. 1,241,072,307

* PMI

Changes in pension plan assets	December 31,	
	2018	2017
Plan assets at the beginning of year	Ps. 8,485,692	Ps. 9,489,666
Return on plan assets	862,175	902,550
Payments by the pension fund	(56,834,688)	(54,312,270)
Company contributions to the fund	55,653,892	51,952,559
Actuarial (gains) losses in plan assets	(653,583)	453,187
Effect of the liability ceiling	(313,017)	—
Pension plan assets at the end of year	Ps. 7,200,471	Ps. 8,485,692

In 2018, the net actuarial gains recognized in other comprehensive income (loss) net of deferred income tax were Ps. (222,545,556), related to retirement and post-employment benefits. This result was due to the increase in the discount and return on plan assets rates, from 7.89% in 2017 to 9.29% in 2018, as well as to the modification in the assumptions of family composition to the retirement for active personnel, and to the modification in the mortality assumptions for retired personnel. Other factors influencing the changes were the obligations based on changes in population, age, seniority, wages, pensions and benefits, increased rates of gas, gasoline and basic basket benefits (from 3.75% to 4.00%). For retired employees,

the increase in the wage rate (from 4.77% to 5.02%), as well as the long-term inflation assumption (from 3.75% to 4.00%) also influenced the changes.

In accordance with IFRS, the discount rate of labor liabilities has been estimated using as a reference the interest rates observed in Mexican Government bonds denominated in pesos (Cetes and M bonds). During 2018, the long-term interest rates of these bonds increased by an average of 100 basis points, as a consequence of the volatility registered in the Mexican financial markets towards the end of the year. The increase in these rates directly impacted the estimation of the discount rate of labor liabilities.

Contributions from Pemex to the Pemex Labor Fund include the promissory note matured on March 31, 2018 in the amount of Ps. 2,551,024, for the assumption by the Mexican Government of the payment obligations related to pensions and retirement plans of Petróleos Mexicanos and its Subsidiary Entities (see Note 17-A).

The expected contribution to the Pemex Labor Fund for 2019 amounts to Ps. 63,235,620 and the expected payments are Ps. 68,387,355.

As of December 31, 2018 and 2017, the amounts and types of plan assets are as follows:

	December 31,	
	2018	2017
Plan Assets		
Cash and cash equivalents	Ps. 4,976,125	Ps. 135,757
Held-for-sale financial assets	—	1,034,178
Debt instruments	2,224,346	7,315,757
Total plan assets	Ps. 7,200,471	Ps. 8,485,692
	December 31,	
	2018	2017
Changes in Defined Benefit Obligations (DBO)		
Defined benefit obligations at the beginning of the year	Ps. 1,249,557,999	Ps. 1,212,114,331
Service costs	18,365,156	19,762,661
Financing costs	98,759,209	96,331,015
Past service costs	(103,845)	—
Payments by the fund	(62,388,283)	(59,417,940)
Amount of (gains) and losses recognized through other comprehensive income ⁽¹⁾	(232,284,320)	(12,594,541)
Liquidated obligations	(457,168)	—
Modifications to the pension plan	2,782,151	(6,609,657)
Remeasurements	2,139	(1,471)
Reductions	—	(26,399)
Defined benefit obligations at the end of year	Ps. 1,074,233,038	Ps. 1,249,557,999

⁽¹⁾ These gains and losses are due to changes in financial assumptions, demographics and experience during the year.

The asset ceiling test was not applied because there was a deficit of labor liabilities at the beginning and end of the year.

The effect of an increase or decrease of one percentage point in the discount rate is a -10.56% increase or a 13.00% decrease in defined benefit obligations, respectively.

The effect of an increase or decrease of one percentage point in the increase rate in medical services with respect to the cost and obligations related to medical services point is a 2.15% increase or a -1.69% decrease in defined benefit obligations, respectively.

The effect of an increase or decrease of one percentage point in the inflation is a 8.54% and -7.54%, respectively in defined benefit obligations.

The effect of an increase or decrease of one percentage point in the wage is a 1.25% and -1.10%, respectively in defined benefit obligations.

The effects previously mentioned were determined using the projected unit credit method which was the same method used in the prior valuation.

Assumptions regarding future mortality are based on EMSSA2009 to Unique Circular of the Comisión Nacional de Seguros y Fianzas (National Commission of Insurance and Bonds) and include changes to the mortality rate established in 2018. For the December valuation, the mortality table for retired personnel was updated using an actuarial proposal based on the experience of Petróleos Mexicanos and its Subsidiary Entities. The mortality table for the incapacitated personnel is the EMSSInc-IMSS2012 and for the disabled personnel the EMSSInv-IMSS2012.

PEMEX's plan assets are held in the FOLAPE trust, which is managed by BBVA Bancomer, S. A. and a technical committee for the trust that is comprised of personnel from Petróleos Mexicanos and the trust.

The following tables present additional fair value disclosure about plan assets and indicate their rank, in accordance with IFRS 13, as of December 31, 2018 and 2017:

	Fair value measurements as of December 31, 2018			
	Quoted prices in active markets for identical assets (level 1)	Significant observable inputs (level 2)	Significant unobservable inputs (level 3)	Total
Plan assets				
Cash and cash equivalents	Ps. 4,976,125	Ps. —	Ps. —	Ps. 4,976,125
Debt instruments	2,224,346	—	—	2,224,346
Total	Ps. 7,200,471	Ps. —	Ps. —	Ps. 7,200,471

	Fair value measurements as of December 31, 2017			
	Quoted prices in active markets for identical assets (level 1)	Significant observable inputs (level 2)	Significant unobservable inputs (level 3)	Total
Plan assets:				
Cash and cash equivalents	Ps. 135,757	Ps. —	Ps. —	Ps. 135,757
Held-for-sale financial assets	1,034,178	—	—	1,034,178
Debt instruments	7,315,757	—	—	7,315,757
Total	Ps. 8,485,692	Ps. —	Ps. —	Ps. 8,485,692

As of December 31, 2018 and 2017, the principal actuarial assumptions used in determining the defined benefit obligation for the plans are as follows:

	December 31,	
	2018	2017
Rate of increase in salaries	5.02%	4.77%
Rate of increase in pensions	4.00%	3.75%
Rate of increase in medical services	7.65%	7.65%
Inflation assumption	4.00%	3.75%
Rate of increase in basic basket for active personnel	5.00%	5.00%
Rate of increase in basic basket for retired personnel	4.00%	3.75%
Rate of increase in gas and gasoline	4.00%	3.75%
Discount and return on plan assets rate	9.29%	7.89%
Average length of obligation (years)	15.04	18.40

In accordance with IFRS, the discount rate of labor liabilities has been estimated using as a reference the interest rates observed in Mexican Government bonds denominated in pesos (Cetes and M bonds). During 2018, the long-term interest rates of these bonds increased by an average of 100 basis points, as a consequence of the volatility registered in the Mexican financial markets towards the end of the year. The increase in these rates directly impacted the estimation of the discount rate of labor liabilities.

Other long-term benefits

Petróleos Mexicanos and Subsidiary Entities has established other long-term benefit plans for its employees, to which employees do not contribute, which correspond to the seniority premiums payable for disability, death and survivor benefits (payable to the widow and beneficiaries of worker), medical service, gas and basic basket for beneficiaries. Benefits under these plans are based on an employee's salary and years of service completed at separation date. Obligations and costs of such plans are recorded in accordance with actuarial valuations performed by independent actuaries.

The amounts recognized for long-term obligations for the years ended December 31, 2018 and 2017 are as follows:

	December 31,	
	2018	2017
Change in the liability for defined benefits		
Liabilities defined benefit at the beginning of year	Ps. 17,363,815	Ps.17,784,771
Present cost services	(18,085)	—
Charge to income for the year	2,885,875	3,277,847
Actuarial (gains) losses recognized in income due to:		
Change in financial assumptions	(3,741,132)	878,516
Change in demographic assumptions	(751,052)	(1,015,274)
For experience during the year	(2,259,569)	(3,558,599)
Real interest, excluding earned interests	125,485	—
Effect of the liability ceiling	33,344	—
Benefits paid	(2,980)	(3,446)
Transfer to the post-employment benefit fund recognized in other comprehensive income	(410,775)	—
Liabilities defined benefit at the end of year	Ps. 13,224,926	Ps.17,363,815

The expected long-term benefit payments amount to Ps.300,869.

The effects on liabilities for long-term benefits at the end of the period are:

- The effect of an increase or decrease of one percentage point in the discount rate is a -14.80% increase or a 19.25% decrease, respectively, in defined benefit obligations.
- The effect of an increase or decrease of one percentage point in the increase rate in medical services with respect to the cost and obligations related to medical services is a 4.64% increase or a -3.32% decrease, respectively, in defined benefit obligations.
- The effect of an increase or decrease of one percentage point in the inflation is a 0.48% increase or a 1.73% decrease, respectively, in defined benefit obligations.
- The effect of an increase or decrease of one percentage point in the wage is a 4.26% increase or a 3.88% decrease, respectively in defined benefit obligations.

The principal actuarial assumptions used in determining the defined benefit obligation for the plans are as follows:

	December 31,	
	2018	2017
Rate of increase in salaries	5.02%	4.77%
Inflation assumption	4.00%	3.75%
Rate of increase in basic basket for active personnel	5.00%	5.00%
Rate of increase in basic basket for retired personnel	4.00%	3.75%
Rate of increase in gas and gasoline	4.00%	3.75%
Discount and return on plan assets rate	9.29%	7.89%
Average length of obligation (years)	15.04	18.40

In accordance with IFRS, the discount rate of labor liabilities has been estimated using as a reference the interest rates observed in Mexican Government bonds denominated in pesos (Cetes and M bonds). During 2018, the long-term interest rates of these bonds increased by an average of 100 basis points, as a consequence of the volatility registered in the Mexican financial markets towards the end of the year. The increase in these rates directly impacted the estimation of the discount rate of labor liabilities.

NOTE 21. PROVISIONS FOR SUNDRY CREDITORS

At December 31, 2018 and 2017, the provisions for sundry creditors and others is as follows:

	2018	2017
Provision for plugging of wells (Note 15)	Ps. 84,050,900	Ps.68,797,600
Provision for trails in process (Note 29)	6,483,078	7,812,689
Provision for environmental costs	11,219,278	11,067,134
	<u>Ps.101,753,256</u>	<u>Ps.87,677,423</u>

The following tables show the allowance account for plugging of wells, trials in progress and environmental costs:

	Plugging of wells	
	2018	2017
Balance at the beginning of the year	Ps. 68,797,600	Ps. 64,967,710
Increase (decrease) capitalized in fixed assets	22,313,529	(3,791,482)
Unwinding of discount against income	(6,953,200)	7,774,000
Amount used	(107,029)	(152,628)
Balance at the end of the year	<u>Ps. 84,050,900</u>	<u>Ps. 68,797,600</u>

	Trials in progress	
	2018	2017
Balance at the beginning of the year	Ps. 7,812,689	Ps. 15,119,692
Additions against income	1,194,547	2,835,357
Provision cancellation	(2,502,807)	(1,973,153)
Amount used	(21,351)	(8,169,207)
Balance at the end of the year	<u>Ps. 6,483,078</u>	<u>Ps. 7,812,689</u>

	Environmental costs	
	2018	2017
Balance at the beginning of the year	Ps. 11,067,134	Ps. 8,230,476
Additions against income	1,390,838	3,203,982
Provision cancellation	(1,106,693)	(312,937)
Amount used	(132,001)	(54,387)
Balance at the end of the year⁽¹⁾	<u>Ps. 11,219,278</u>	<u>Ps. 11,067,134</u>

(1) PEMEX is subject to the provisions of the *Ley General del Equilibrio Ecológico y la Protección al Ambiente* (General Law on Ecological Equilibrium and Environmental Protection). To comply with this law, environmental audits of PEMEX's larger operating, storage and transportation facilities have been or are being conducted. Following the completion of such audits, PEMEX has signed various agreements with the *Procuraduría Federal de Protección al Ambiente* (Federal Attorney of Environmental Protection) to implement environmental remediation and improve environmental plans. Such plans contemplate remediation for environmental damages, as well as related investments for the improvement of equipment, maintenance, labor and materials.

Provision for plugging of wells

PEMEX records a provision at present value for the future plugging cost of an oil production facility or pipeline at the time that it is built.

The plugging provision represents the present value of plugging costs related to oil and gas properties. These provisions have been created based on internal estimates of PEMEX. PEMEX has made certain assumptions based on the current economic environment that PEMEX believes provide a reasonable basis on which to estimate the future liability. These estimates are reviewed regularly to take into account any material changes in the assumptions. However, actual plugging costs in the long run will depend on future market prices for the necessary plugging work, which reflect market conditions at the time the work is being performed.

Moreover, the time of plugging depends on when the fields cease to have economically viable production rates, which, in turn, depends on the inherently uncertain future prices of oil and gas.

NOTE 22. DISCLOSURE OF CASH FLOW

The following items represent non-cash transactions and are presented for disclosure purposes:

	For the years ended December 31,		
	2018	2017	2016
Investing activities			
Available-for-sale financial assets ⁽¹⁾	—	5,564,130	207,817
Financing activities			
Financed Public Works Contracts	—	—	146,217,292
Currency translation effect ⁽²⁾	846,191	6,096,459	21,386,903
Accrued interest not charged ⁽³⁾	9,333,347	9,053,852	3,597,654
Accrued interest unpaid ⁽⁴⁾	5,437,633	8,734,131	9,326,945

(1) Due to the change in fair value of shares of Repsol, S.A., this amount was reclassified from OCI to profit or loss.

(2) Represents the effect of valuation of the different subsidiaries of which the functional currency is different from the report currency.

(3) Represents mainly notes receivable from the Mexican Government.

(4) Represents unpaid interest accrued mainly from debt.

NOTE 23. INCOME TAXES AND DUTIES

The *Ley de Ingresos sobre Hidrocarburos* (“Hydrocarbons Revenue Law”) was published in the Official Gazette of the Federation on August 11, 2014, and came into effect, on January 1, 2015. The Hydrocarbons Revenue Law sets forth the fiscal regime for Petróleos Mexicanos applicable to the assignments and the contracts that were established on such date. Likewise, every year the Federal Revenue Law is published in the Official Gazette of the Federation and includes specific regulations for Petróleos Mexicanos and the Subsidiary Entities.

Tax regime applicable to Assignments

The tax regime applicable to the exploration and production for the assignments granted to PEMEX by the Mexican Government includes the following taxes and duties:

a. *Derecho por la Utilidad Compartida “DUC” (Profit-sharing Duty).*

As of January 1, 2015, Pemex Exploration and Production is obligated to pay a Profit-sharing Duty.

As of January 1, 2018 and 2017, the applicable rate of this duty was 66.25% and 67.50% respectively. The computation of this duty is based on the excess of the value of hydrocarbons produced during the fiscal year (including self-consumption, shrinkage and burning), minus certain permitted deductions by the Hydrocarbons Revenue Law, including part of the investments and some costs, expenses and duties. Pursuant to the Hydrocarbons Revenue Law, this duty has been decreased on an annual basis. As of January 1, 2019, this duty was set at 65%.

During 2018, this duty totaled Ps. 443,294,170 from annual payments presented on March 25, 2019 paid as follows: Ps. 443,785,240, in monthly installment payments and a payable balance amounting to Ps. 491,070, presented in accounts receivable, net line item in the statement of financial position.

During 2017, this duty totaled Ps. 372,902,629 from annual payments presented on March 31, 2018 paid as follows: Ps. 377,192,377, in monthly installment payments and a favorable balance amounting to Ps. 4,289,748, presented in accounts receivable, net line item in the statement of financial position.

The accounting result differs from the tax result mainly due to differences in depreciation, non-deductible expenses and others. Such differences generate a deferred DUC.

Total DUC and other as of December 31, 2018, 2017 and 2016 are integrated as follows:

	2018	2017	2016
DUC	Ps. 443,294,170	Ps. 372,902,629	Ps. 304,299,019
DUC from prior years	14,883	2,095,429	—
Other	446,464	260,775	514,356
Deferred DUC expense (benefit)	26,178,078	(37,214,624)	(27,651,571)
Total DUC and other	Ps. 469,933,595	Ps. 338,044,209	Ps. 277,161,804

The principal factors generating the deferred DUC are the following:

	2018	2017
Deferred DUC asset:		
Tax credits	Ps. 577,278,473	Ps. 541,360,940
Deferred DUC asset	577,278,473	541,360,940
Deferred Profit-sharing duty liability:		
Wells, pipelines, properties, plant and equipment	(288,913,978)	(455,697,786)
Deferred DUC liability	(288,913,978)	(455,697,786)
Deferred DUC asset net	288,364,495	85,663,154
Unrecognized Deferred DUC	(249,676,378)	(20,796,959)
Net, deferred DUC asset	Ps. 38,688,117	Ps. 64,866,195

The expected expense for DUC is different from that which would result from applying the 65% rate to the tax base, as a result of the items mentioned below:

	2018	2017	2016
Expected expense:	Ps. 307,269,035	Ps. 127,436,912	Ps. 159,897,683
Increase (decrease) resulting from:			
Expected benefit contract	(5,797,144)	—	—
Duties from prior year	9,860	—	—
Non-cumulative profit	(593,158,584)	(514,780,219)	(423,761,673)
Non-deductible expenses	291,676,831	387,343,306	263,863,990
Production value	610,206,103	518,433,469	441,655,000
Deductible duties	(55,005,397)	(39,503,110)	(29,918,201)
Deferred DUC reserve	—	(48,689,612)	69,486,571
Deferred DUC expense	26,178,078	—	—
Deductions cap	(111,906,534)	(94,552,741)	(204,575,922)
DUC from prior years	14,883	2,095,429	—
Other	446,464	260,775	514,356
DUC-Profit-sharing duty expense	Ps. 469,933,595	Ps. 338,044,209	Ps. 277,161,804

On August 18, 2017, the Official Gazette of the Federation published a decree, granting tax benefits for extraction activities in assignments with mature and / or marginal fields, substantially increasing the percentage of costs, expenses and investments that PEMEX could deduct for purposes of calculating the DUC. As a result, PEMEX received a tax benefit of Ps. 11,170,076 and Ps. 7,769,915, as of December 31, 2018 and 2017, respectively.

On November 30, 2017, the *Acuerdo por el que se reforman y adicionan diversas disposiciones de las Reglas de carácter general para definir los métodos de ajuste del valor de los hidrocarburos de los derechos sobre hidrocarburos* (Agreement by which various provisions of the general rules are reformed and added to define the methods of adjusting the value of hydrocarbons and hydrocarbon rights) was published in the Official Gazette of the Federation, resulting in new calibrations and adjustments of existing formulas of calculating the value of hydrocarbons and hydrocarbon rights. As a result, PEMEX received an estimated tax benefit of Ps. 8,854,391.

The compensation of Ps. 2,186,963 was also authorized for the recognition of the fair economic value of the investments affected as a result of the allocation process for assignments to carry out hydrocarbon exploration and extraction activities, in accordance with the provisions of Transitory Article 21 of the Federation Income Law of 2017.

b. *Derecho de Extracción de Hidrocarburos (Hydrocarbons Extraction Duty).*

This duty is to be calculated using a rate based on a formula applicable to each type of hydrocarbon, the volume of production and utilizing the relevant market price for hydrocarbons in U.S. Dollars.

During 2018 Pemex Exploration and Production made payments of Ps. 83,027,015, which are included in the cost of sales line item.

c. *Derecho de Exploración de Hidrocarburos (Exploration Hydrocarbons Duty).*

The Mexican Government is entitled to collect a monthly payment of Ps.1,294.71 per square kilometer of non-producing areas. After 60 months, this tax increases to Ps.3,096.04 per square kilometer for each additional month that the area is not producing. These amounts will be updated on an annual basis in accordance with the national consumer price index.

During 2018, Pemex Exploration and Production made payments under this duty, totaling Ps. 1,027,058, which are included in the cost of sales line item.

d. *Impuesto por la actividad de Exploración y Extracción de Hidrocarburos (Exploration and Extraction Hydrocarbons Duty).*

The assignments granted by the Mexican Government create a tax on the exploration and extraction activities carried out in the corresponding area. The monthly tax paid during the exploration phase and until the extraction phase begins is Ps. 1,688.74 per square kilometer. During the extraction phase, the monthly tax from the start of the extraction phase and until the assignment ends is Ps. 6,754.99 per square kilometer. During 2018 payments for this tax amounted Ps. 4,114,450, which are included in the cost of sales line item.

Tax Regime applicable to contracts:

As of January 1, 2015, the tax regime applicable to Pemex Exploration and Production for contracts is set forth in the Hydrocarbons Revenue law which regulates, among other things, the fiscal terms applicable to the exploration and extraction contracts (license, profit sharing contracts, production sharing and services) and sets duties and other taxes paid to the Mexican Government.

The Hydrocarbons Revenue Law also establishes the following duties applicable to PEMEX in connection with assignments granted to it by the Mexican Government:

- ***Cuota Contractual para la Fase Exploratoria (Exploration Phase Contractual Fee)***

During the exploration phase of an exploration and extraction contract, the Mexican Government is entitled to collect a monthly payment of Ps. 1,294.71 per square kilometer of non-producing areas. After 60 months, this fee increases to Ps. 3,096.04 per square kilometer for each additional month that the area is not producing. The fee amount will be updated on an annual basis in accordance with the national consumer price index.

- ***Regalías (Royalties)***

Royalty payments to the Mexican Government are determined based on the “contractual value” of the relevant hydrocarbons, which is based on a variety of factors, including the type of underlying hydrocarbons (e.g., crude oil, associated natural gas, non-associated natural gas or condensates), the volume of production and the market price. Royalties are payable in connection with licensing contracts, production-sharing contracts and profit-sharing contracts.

- ***Pago del Valor Contractual (Contractual Value Payment)***

Licensing contracts require a payment to the Mexican Government calculated as a percentage of the “contractual value” of the hydrocarbons produced, as determined by the SHCP on a contract-by-contract basis.

- ***Porcentaje a la Utilidad Operativa (Operating Profit Payment)***

Production-sharing contracts and profit-sharing contracts require a payment equivalent to a specified percentage of operating profits. In the case of production-sharing contracts, this payment shall be made in-kind through delivery of the hydrocarbons produced. In the case of profit-sharing contracts, this payment shall be made in cash.

- ***Bono a la Firma (Signing Bonus)***

Upon execution of a licensing contract, a signing bonus is to be paid to the Mexican Government in an amount specified by the SHCP in the relevant bidding terms and conditions or in the contracts resulting from a migration.

- ***Impuesto por la actividad de Exploración y Extracción de Hidrocarburos (Hydrocarbons Exploration and Extraction Activities Tax)***

Contracts for exploration and extraction granted by the Mexican Government will include a specified tax on the exploration and extraction activities carried out in the relevant area. A monthly tax of Ps. 1,688.74 per square kilometer is payable during the exploration phase until the extraction phase begins. During the extraction phase of a project, a monthly tax of Ps. 6,754.99 per square kilometer is payable from the starting date until the relevant contract for exploration and extraction is terminated.

Other applicable taxes

The Subsidiary Entities are subject to the Income Tax Law and the Value Added Tax Law. Pemex Industrial Transformation is also subject to the Special Tax on Production and Services (IEPS Tax).

2018 indirect taxes are as listed below:

a. *IEPS Tax*

IEPS Tax on the sale of automotive fuels: This is a tax imposed on domestic sales of automotive fuels, including gasoline and diesel, which Pemex Industrial Transformation collects on behalf of the Mexican Government. The applicable quotas for 2018 were: 4.59 pesos per liter of Magna gasoline; 3.88 pesos per liter of Premium gasoline and 5.04 pesos per liter of diesel. This fee is updated annually according to inflation and adjusted monthly by the tax authorities.

IEPS Tax to benefit Mexican states and municipalities: This tax is a quota on domestic sales of automotive fuels, including gasoline and diesel, which Pemex Industrial Transformation collects on behalf of the Mexican Government. The applicable quotas for 2018 were 40.52 cents per liter of Magna gasoline, 49.44 cents per liter of premium gasoline and 33.63 cents per liter of diesel. This rate is updated annually with inflation. The funds raised by this quota are allocated to the states and municipalities as provided in the Tax Coordination Law.

IEPS Tax on Fossil Fuels: This tax is a quota on the internal sales of fossil fuels, which Pemex Industrial Transformation collects on behalf of the Mexican Government. The applicable quotas for 2018 were 6.93 cents per liter for propane, 8.98 cents per liter for butane, 12.17 cents per liter for jet and other fuel, 14.54 cents per liter for turbosine and other kerosene, 14.76 cents per liter for diesel, 15.76 cents per liter for fuel oil and Ps. 18.29 per ton for petroleum coke. This rate is updated annually according to inflation.

b. Value Added Tax (“VAT”)

For VAT purposes, final monthly payments are determined based on PEMEX’s cash flow, in accordance with the provisions of the Value Added Tax Law, applicable to payers of this tax. The general rate to be applied is 16%. Certain activities with incentives will have the rate of 0%.

The VAT is caused by the sales of goods, rendering of services, granting of the temporary use of goods in the national territory and by the importation of goods and services to the national territory. VAT taxpayers transfer VAT to their customers and are entitled to credit the VAT paid to their suppliers and on their imports. The net balance between VAT transferred to customers and paid to suppliers and on imports results each month in the VAT to be paid to the tax authorities or in an amount in favor of the taxpayer. The taxpayer has the right to credit VAT in favor against VAT payable in future months, to request a refund or to offset it against other payable federal taxes.

Taxes on Income are described below:

c. Income Tax

As of January 1, 2015, Petróleos Mexicanos, Subsidiary Entities and the subsidiary companies residing in Mexico for tax purposes are subject to the Income Tax Law.

This tax is calculated by applying a rate of 30% to the tax result. Tax result is the excess of total revenues over the allowed deductions and tax losses from previous years.

Accounting income differs from taxable income primarily due to the effects of inflation and differences between depreciation and other non-deductible expenses.

For the years ended December 31, 2018, 2017 and 2016, Petroleos Mexicanos and its Subsidiary Companies incurred the following income tax expense (benefit):

	2018	2017	2016
Current income tax	Ps. 3,109,971	Ps. 3,546,912	Ps. 6,201,842
Deferred income tax	(11,465,343)	(9,334,064)	(18,842,211)
Total	Ps. (8,355,372)	Ps. (5,787,152)	Ps. (12,640,369)
Income tax REFIPRE (Preferent Fiscal Regime) from PMH HBV dividends	Ps. —	Ps. 722,984	Ps. —

As of December 31, 2018 and 2017, the deferred income tax asset net of Pemex Industrial Transformation and Pemex Exploration and Production has not been recognized because it is estimated that not enough taxable income will be generated in future periods.

	Tax effect	
	2018	2017
Assets		
Provisions	Ps.161,103,132	Ps. 86,967,057
Well, pipelines, properties, plant and equipment	17,825,338	—
Tax loss carryforwards	489,166,032	566,055,701
Total assets	Ps.668,094,502	Ps.653,022,758
Liabilities		
Well, pipelines, properties, plant and equipment	Ps.159,942,782	Ps.152,028,015
Other	1,072,383	429,818
Total liabilities	161,015,165	152,457,833
Total assets, net	Ps.507,079,337	Ps.500,564,925

The principal factors generating the deferred income tax are the following:

	2017	Recognized in profit and loss	Recognized in OCI	2018
Deferred income tax asset:				
Provisions	Ps. 7,110,665	Ps. 1,726,028	Ps. —	Ps. 8,836,693
Employee benefits provision	47,086,457	2,181,696	(8,953,404)	40,314,749
Advance payments from clients	42,208	(6,401)	—	35,807
Accrued liabilities	744,865	(133,213)	—	611,652
Reserve due to depreciation of inventories	—	982,228	—	982,228
Non-recoverable accounts receivable	739,748	24,176	—	763,924
Derivative financial instruments	79,255	(49,581)	—	29,674
Wells, pipelines, properties and equipment	3,990,113	7,872,663	—	11,862,776
Tax loss carryforwards ⁽¹⁾	21,532,979	(873,869)	—	20,659,110
Total deferred income tax asset	81,326,290	11,723,727	(8,953,404)	84,096,613
Deferred income tax liability:				
Wells, pipelines, properties, plant and equipment	(3,443,618)	813,021	—	(2,630,597)
Other	(810,310)	(1,071,405)	—	(1,881,715)
Total deferred income tax liability	(4,253,928)	(258,384)	—	(4,512,312)
Net long-term deferred income tax liability	Ps.77,072,362	Ps.11,465,343	Ps.(8,953,404)	Ps.79,584,301
	2016	Recognized in profit and loss	Recognized in OCI	2017
Deferred income tax asset:				
Provisions	Ps. 4,626,602	Ps. 2,484,063	Ps. —	7,110,665
Employee benefits provision	44,859,222	3,027,519	(800,284)	47,086,457
Advance payments from clients	30,324	11,884	—	42,208
Accrued liabilities	2,198,664	(1,453,799)	—	744,865
Non-recoverable accounts receivable	778,179	(38,431)	—	739,748
Derivative financial instruments	223,518	(144,263)	—	79,255
Wells, pipelines, properties and equipment	1,390,952	2,599,161	—	3,990,113
Tax loss carry-forwards ⁽¹⁾	18,565,657	2,967,322	—	21,532,979
Total deferred income tax asset	72,673,118	9,453,456	(800,284)	81,326,290
Deferred income tax liability:				
Wells, pipelines, properties, plant and equipment	(3,632,294)	188,676	—	(3,443,618)
Other	(502,242)	(308,068)	—	(810,310)
Total deferred income tax liability	(4,134,536)	(119,392)	—	(4,253,928)
Net long-term deferred income tax liability	Ps.68,538,582	Ps. 9,334,064	Ps. (800,284)	Ps.77,072,362

- (1) Tax loss carryforwards expire in 2028.

Expense attributable to the profit (loss) from continuing operations before income taxes was different from that which would result from applying the 30% rate to profit, as a result of the items listed below:

	For the years ended December 31,		
	2018	2017	2016
Expected income tax expense	Ps.(41,316,168)	Ps.(20,055,588)	Ps.(14,901,324)
Increase (decrease) resulting from:			
Tax effect of inflation-net	11,742,346	14,302,118	8,098,213
Difference between accounting and tax depreciation	(3,359,548)	(3,713,920)	(1,765,183)
Unrecognized Deferred tax asset ⁽¹⁾	21,885,731		
Non-deductible expenses	1,781,012	1,954,659	1,558,120
Others-net	911,255	1,725,579	(5,630,195)
Income tax expense	Ps. (8,355,372)	Ps. (5,787,152)	Ps.(12,640,369)

- (1) Deferred income tax assets of Ps. 21,885,731 arising from outstanding tax losses which expire between 2025 and 2018 have not been recognized since there are unlikely to be future tax gains which would allow Pemex Logistcs to use the benefits.

As of December 31, 2018 and 2017, the net accumulated effect of actuarial gains and losses on deferred tax was Ps. 8,734,628 and Ps. 17,688,032, respectively. In addition, as of December 31, 2018 and 2017, the deferred tax effect of actuarial gains and losses is presented in comprehensive (loss) income in the amounts of Ps. (8,953,404) and Ps. (800,824), respectively.

NOTE 24. EQUITY (DEFICIT)

a. *Certificates of Contribution "A"*

The capitalization agreement between Petróleos Mexicanos and the Mexican Government states that the Certificates of Contribution "A" constitute permanent capital.

On December 24, 2015, the Mexican Government, through the SHCP, issued a non-negotiable promissory note of Ps. 50,000,000 due December 31, 2050 for the assumption by the Mexican Government of the payment obligations related to pensions and retirement plans of Petróleos Mexicanos and its Subsidiary Entities (see Note 17-A).

On April 21, 2016, the Mexican Government made an equity contribution to Petróleos Mexicanos in the amount of Ps. 26,500,000 following the guidelines established in the Federal Budget and Fiscal Responsibility. This contribution was recognized as an increase in Certificates of Contribution "A."

On August 3, 2016, the Mexican Government issued Ps. 184,230,586 in exchange for the Ps. 50,000,000 non-negotiable promissory note issued to Petróleos Mexicanos on December 24, 2015, which was recognized as a Ps. 135,439,612 increase in equity. The Ps. 135,439,612 increase in equity was the result of the Ps. 184,230,586 value of the promissory notes as of June 29, 2016, minus the Ps. 50,000,000

promissory note received by Petróleos Mexicanos on December 24, 2015, plus a Ps. 1,209,026 increase in the value of the promissory notes from June 29, 2016 to August 15, 2016, the date on which Petróleos Mexicanos received the promissory notes (see Note 17-A).

PEMEX's Certificates of Contribution "A" are as follows:

	Amount
Certificates of Contribution "A" as of December 31, 2016	Ps. 356,544,447
Increase in Certificates of Contribution "A" during 2017	—
Certificates of Contribution "A" as of December 31, 2017	356,544,447
Increase in Certificates of Contribution "A" during 2018	—
Certificates of Contribution "A" as of December 31, 2018	<u>Ps. 356,544,447</u>

b. Mexican Government contributions

As of December 31, 2018 and 2017 there were no Mexican Government contributions.

c. Legal reserve

Under Mexican law, each of the Subsidiary Companies is required to allocate a certain percentage of its net income to a legal reserve fund until the fund reaches an amount equal to a certain percentage of each Subsidiary Company's capital stock.

As of December 31, 2018 and 2017, there were no changes to the legal reserve.

d. Accumulated deficit from prior years

PEMEX has recorded negative earnings in the past several years. However, the *Ley de Concursos Mercantiles* ("Commercial Bankruptcy Law of Mexico") is not applicable to Petróleos Mexicanos and the Subsidiary Entities. Furthermore, the financing agreements to which PEMEX is a party do not provide for financial covenants that would be breached or events of default that would be triggered as a consequence of negative equity.

e. Uncertainty related to Going concern

The consolidated financial statements have been prepared on a going concern basis, which assumes that PEMEX can meet its payment obligations

Facts and conditions

PEMEX has recognized continuous net losses during 2018, 2017 and 2016 of Ps. 180,419,837 Ps. 280,850,619 and Ps. 191,144,342, respectively. Additionally, PEMEX had a negative equity of Ps. 1,459,405,432 and Ps. 1,502,352,385 as of December 31, 2018 and 2017, respectively, mainly due to continuous net losses; and a negative working capital of Ps. 54,666,333 and Ps. 25,600,895, as of December 31, 2018 and 2017, respectively.

PEMEX also has important debt, contracted mainly to finance investments needed to carry out its operations. Due to its heavy fiscal burden resulting from the payment of hydrocarbon extraction duties and other taxes, the cash flow derived from PEMEX's operations in recent years has not been sufficient to fund its operating and investment costs and other expenses, so that its indebtedness has increased significantly, and its working capital has decreased in part as a result of the drop in oil prices that began at the end of 2014 and the subsequent oil price fluctuation.

Additionally, at the beginning of 2019, some rating agencies downgraded PEMEX's credit rating, which could have an impact on the cost and terms of PEMEX's new debt, as well as contract renegotiations during 2019.

All these matters show the existence of substantial doubt about PEMEX's ability to continue as a going concern.

PEMEX has budget autonomy, and is subject to the financial balance, which represents the difference between its income and its total budgeted expenditures, including the financial cost of its debt, which, is proposed by the SHCP and approved by the Mexican Congress in the Federal Budget for 2019.

The Federal Budget for 2019 estimates that PEMEX's budgeted expenditures of Ps. 589,736,649 will exceed budgeted revenues of Ps. 524,291,649 by Ps. 65,445,000. The Federal Budget for 2019 also authorized PEMEX a net indebtedness up to Ps. 112,800,000 to cover its negative financial balance, which is considered as public debt by the Mexican Government.

On February 26, 2019, the Board of Directors of Petróleos Mexicanos authorized the Annual Operational and Financial Work Program (POFAT), which detailed the operational variables in the drilling, extraction and industrial transformation segments, as well as its projection of financial results based on the budget for Petróleos Mexicanos and its productive state-owned subsidiaries, through the Federal Annual Budget for Fiscal Year 2019. The credit profile of Petróleos Mexicanos and its Subsidiary Productive Companies was authorized on the same date.

PEMEX, in collaboration with the Mexican Government intends to meet its working capital needs and debt payment obligations by implementing a new business strategy focused on the financial strengthening of PEMEX through internal measures such as cost control austerity policies, debt reduction, crude oil hedges and the fight against fuel theft, as well as external measures, through the *Programa de Fortalecimiento de Petróleos Mexicanos* (Strengthening Program for Petroleos Mexicanos or the "Strengthening Program), through which the Mexican Government is expected to support PEMEX through capitalizations, a stable price policy, fiscal support, prepayment of promissory notes to PEMEX previously issued by the Mexican Government and additional support in the fight against fuel theft.

On February 15, 2019, the Mexican Government announced, as part of its Strengthening Program for Petróleos Mexicanos, a support program to help improve PEMEX's financial position and increase PEMEX's production and, in turn, its profitability. This first stage includes contributions to PEMEX, which will be obtained, among others, as follows:

- Ps. 25,000,000 through a capitalization already contemplated in the capital expenditures budget for 2019, which will be received in five payments during 2019, and of which a total of Ps. 15,000,000 has been received as of the date of the issuance of these consolidated financial statements (see Note 30);
- an advance of payment of promissory notes during 2019 in the amount of Ps. 34,887,250, related to pensions and retirement plans of Petróleos Mexicanos and its productive state-owned subsidiaries, for which Ps. 28,063,511 have been received as of the date of these consolidated financial statements (see Note 30); and
- a gradual reduction of the tax burden starting in 2019 and up to 2024 through assignment and migration contracts and a subsequent increase in the limit for deduction and reimbursements of costs, expenses and investments related to extraction and exploration projects.

Petróleos Mexicanos and its Subsidiary Entities are not subject to the Ley de Concursos Mercantiles (the Bankruptcy Law) and none of PEMEX's existing financing agreements include any clause that could lead to the demand for immediate payment of debt due to having negative equity or as a result of non-compliance with financial ratios.

f. Non-controlling interest

Effective July 1, 2005, PEMEX entered into an option agreement with BNP Private Bank & Trust Cayman Limited; the option was not exercised and was terminated on July 20, 2015. On July 1, 2015, PEMEX also entered into a new option agreement with SML Trustees Limited to acquire 100% of the shares of Pemex Finance, Ltd, which allows PEMEX to have control over Pemex Finance Ltd. because of the potential voting rights. As of the date of these consolidated financial statements the option agreement has been exercised.

Until November 30, 2018, the financial results of Pemex Finance, Ltd. were included in the consolidated financial statements of PEMEX. Under IFRS, variations in income and equity from Pemex Finance, Ltd. were presented in the consolidated statements of changes in equity (deficit), net as “non-controlling interest”, and as net income and comprehensive income for the year, attributable to non-controlling interest, in the consolidated statements of comprehensive income, due to the fact that PEMEX did not own any of the shares of Pemex Finance, Ltd.

On December 17, 2018, PEMEX exercised its option to purchase all shares of Pemex Finance Ltd., and as of December 31, 2018, this company is no longer presented as a “non-controlling interest”.

Similarly, because PEMEX does not currently own all of the shares of PMI CIM, HJ BARRERAS and COMESA, variations in income and equity from these entities are also presented in the consolidated statements of changes in equity (deficit) as “non-controlling interest.”

As of December 31, 2018 and 2017, non-controlling interest represented gains of Ps. 477,118 and Ps.965,107, respectively, in PEMEX’s equity (deficit).

NOTE 25. COST AND EXPENSES BY NATURE

Cost and expenses by nature for each of the years ended December 31, 2018, 2017 and 2016, was as follows:

	<u>2018</u>	<u>2017</u>	<u>2016</u>
Purchases	Ps. 756,867,203	Ps. 581,355,161	Ps. 430,813,337
Depreciation and amortization	153,382,040	156,704,513	150,439,491
Net periodic cost of employee benefits	114,621,614	108,073,075	109,738,416
Personnel services	104,284,007	94,470,130	84,414,593
Exploration and Extraction Hydrocarbons Duty and taxes	88,145,519	63,900,374	48,424,861
Maintenance	42,075,043	40,224,754	45,390,282
Non-operating losses ⁽¹⁾	39,439,107	22,945,447	9,091,870
Auxiliary services with third-parties	23,675,019	21,924,327	25,471,260
Raw materials and spare parts	16,850,075	19,165,103	6,970,433
Other operating costs and expenses	16,672,534	1,755,170	25,102,485
Unsuccessful wells	15,443,086	6,164,624	29,106,084
Exploration expenses	13,048,078	6,562,463	4,585,859
Other operation taxes and duties	12,248,474	9,900,726	10,066,528
Integrated Contracts	8,015,606	15,378,544	4,551,876
Leases	6,487,493	7,786,282	6,482,902
Insurance	5,647,101	4,948,610	4,759,016
Freight	3,525,843	10,317,132	14,452,296
Inventory variations	(62,237,591)	(25,542,431)	(6,154,595)
Total cost of sales and general expenses	<u>Ps. 1,358,190,251</u>	<u>Ps. 1,146,034,004</u>	<u>Ps. 1,003,706,994</u>

⁽¹⁾ In accordance with Resolution RES / 179/2017, issued by the ERC, non-operating losses are losses outside the scope of the contemplated operating costs as a result of various illicit actions, including the theft of and illicit market in fuels.

Pemex Logistics is responsible for distributing hydrocarbons through the pipelines, preserving their quality and delivering them from the point of reception to the user at the point of destination. Pemex Logistics determines the volume of missing hydrocarbons through monthly calculations.

NOTE 26. OTHER REVENUES AND EXPENSES-NET

Other revenues and expenses-net for each of the years ended December 31, 2018, 2017 and 2016, was as follows:

	2018	2017	2016
Participation rights ⁽¹⁾	Ps. 14,165,042	Ps. —	Ps. —
Other	7,525,714	4,277,207	14,228,801
Claims recovery	3,979,698	16,386,250	3,695,217
Revenues from reinsurance premiums	3,615,907	1,986,568	3,694,026
Other income for services	3,786,253	4,720,546	4,266,854
Sale of fixed assets by bidding ⁽²⁾	3,301,653	—	—
Gain on sale of fixed assets	1,850,052	—	2,687,652
Price of sale share	1,262,987	3,139,103	22,684,736
Franchise fees	1,125,339	917,934	1,059,333
Bidding terms, sanctions, penalties and other	630,365	825,956	3,223,437
Cash distributions	274,621	—	—
Fiscal support (Profit-sharing duty) ⁽³⁾	—	—	28,439,379
Assets value transferred to CENAGAS	—	—	7,450,931
Total other revenues	Ps. 41,517,631	Ps. 32,253,564	Ps. 91,430,366
Transportation and distribution of natural gas	Ps. (12,600,191)	Ps. (8,447,031)	Ps. (2,140,943)
Other	(5,348,666)	(7,927,150)	(3,581,036)
Claims	(474,299)	(3,640,036)	(4,757,116)
Transportation and distribution of natural gas	(41,964)	(6,652,878)	(8,830,967)
Loss in the sale of associates	—	(412,393)	(7,473,698)
Loss in the Assets value transferred to CENAGAS	—	—	(35,333,411)
Impairment of goodwill	—	—	(4,007,018)
Services provided	—	—	(2,656,571)
Total other expenses	Ps. (18,465,120)	Ps. (27,079,488)	Ps. (68,780,760)
Total other revenues and expenses, net	Ps. 23,052,511	Ps. 5,174,076	Ps. 22,649,606

⁽¹⁾ Relates to rights receivable of EECs, for which the operators of the EECs guarantee their participation in such contracts.

⁽²⁾ Relates mainly to exploration and production fixed assets.

⁽³⁾ Fiscal incentive from the Mexican Government to mitigate the impact of international oil prices during 2016.

NOTE 27. RELATED PARTIES

The balances and transactions with related parties are mainly due to: (i) the sale and purchase of products, (ii) the billing of administrative services, and (iii) financial loans between related parties. The transactions between PEMEX entities were carried out in prices and market conditions.

Directors and employees of Petróleos Mexicanos and the Subsidiary Entities are subject to regulations related conflict of interest such as the Petróleos Mexicanos Law, *Ley Federal de Responsabilidades Administrativas de los Servidores Públicos* (Federal Law of Administrative Responsibilities of Public Officials) and the *Políticas y Lineamientos Anticorrupción para Petróleos Mexicanos, sus Empresas Productivas Subsidiarias y, en su caso, Empresas Filiales* (Anticorruption Policies and Guidelines for Petróleos Mexicanos, its Subsidiary Productive Companies and, where applicable, Subsidiary Companies). Under these provisions, PEMEX's directors and employees are obligated to "recuse themselves from intervening in any way in the attention to, processing or resolution of matters in which they might have personal, family or business interest, including those where some benefit can result for themselves, their spouse, blood or affinity relatives up to

the fourth degree, or civil relatives, or for third parties with which they have professional, labor or business relations, or for partners or partnerships where the public officials or the persons referred above are or have been members thereof.”

Related parties include individuals and companies that do not form part of PEMEX, but that could take advantage of being in a privileged position as a result of their relation with PEMEX. Also included are situations in which PEMEX could take advantage of a special relationship in order to benefit its financial position or results of operations.

Mr. Manuel Bartlett Díaz, Chief Executive Officer of CFE, was appointed member of the Board of Directors of Petróleos Mexicanos in December 2018. CFE has executed several purchase agreements with Pemex Industrial Transformation. During 2018, CFE acquired the following products from Pemex Industrial Transformation:

Product	2018
Heavy fuel oil	Ps. (38,499,999)
Commercial condition	135,667
Industrial diesel	(6,148,283)
Freights	(154,115)
Natural Gas	(3,760,115)
87 octane gasoline	(707)
Total	Ps. (48,427,552)

As of December 31, 2018, CFE owed Pemex Industrial Transformation a total amount of Ps. 4,635,514.

a. Compensation of Directors and Officers

For the years ended December 31, 2018, 2017 and 2016, the aggregate compensation of executive officers of Petróleos Mexicanos and the Subsidiary Entities paid or accrued in that year for services in all capacities was approximately Ps. 51,188, Ps. 50,749 and Ps. 49,165, respectively. Retirement and former employee benefits are granted as described in Note 20. Except in the case of the professional members, with respect to the previous Board of Directors of Petróleos Mexicanos and the boards of directors of the existing Subsidiary Entities, and the independent members, with respect to the new Board of Directors of Petróleos Mexicanos, members of the Boards of Directors of Petróleos Mexicanos and the Subsidiary Entities do not receive compensation for their services.

The compensation paid or accrued during 2018, 2017 and 2016 to the professional members of the previous Board of Directors of Petróleos Mexicanos and boards of directors of the existing Subsidiary Entities was approximately Ps. 8,878, Ps. 7,525, and Ps. 8,339, respectively.

b. Salary Advances

As an employee benefit, PEMEX offers salary advances to all of its eligible Petroleum Workers’ Union and non-union workers, including executive officers, pursuant to the programs set forth in the collective bargaining agreement and in the *Reglamento de Trabajo del Personal de Confianza de Petróleos Mexicanos y Empresas Productivas Subsidiarias* (Employment Regulation of White Collar Employees of Petróleos Mexicanos and Subsidiary Entities), respectively. The salary advances, which are non-interest bearing, are offered to each eligible employee in an amount up to a maximum of four months’ salary and are repaid through salary deductions in equal installments over a period of either one or two years, as elected by the employee. Most employees take advantage of this benefit. The amount of salary advances outstanding to executive officers at December 31, 2018 was Ps. 2,069 and at December 31, 2017 was Ps. 3,466. The amount of salary advances outstanding to executive officers at March 31, 2019 was Ps. 283.

NOTE 28. COMMITMENTS

- a. PMI CIM has entered into several contracts for the sale of crude oil on the international market to foreign companies. The terms and conditions of these contracts are specific to each client, and their durations may be indefinite (evergreen contracts) or they may contain a minimum obligatory period (long-term contracts).

- b. PEMEX has entered into a nitrogen supply contract for the pressure maintenance program at the Cantarell complex. During 2007, an additional contract was entered into with the purpose of supplying nitrogen to the Ku-Maloob-Zap complex and extending the original contract until 2027. At December 31, 2018 and 2017, the value of the nitrogen to be supplied during the term of the contract was approximately Ps42,295,796 and Ps. 46,877,149, respectively. In the event of the annulment of the contract and depending on the circumstances, PEMEX has the right or the obligation to acquire the vendor's nitrogen plant under the terms of the contract.

Estimated future payments under this contract for upcoming fiscal years are as follows:

2019	Ps. 4,691,340
2020	4,956,568
2021	4,988,985
2022	4,999,063
2023	5,017,388
2024 and thereafter	17,642,452
Total	Ps. 42,295,796

- c. As of December 31, 2018, PEMEX had entered into FPWCs by means of which the contractor manages and is responsible for financing performance of the work to be undertaken.

As of December 31, 2018 and 2017, the estimated value of these contracts was as follows:

<u>Maturity</u>	<u>2018</u>	<u>2017</u>
Up to 1 year	Ps. 4,461,048	Ps. 5,533,174
1 to 3 years	1,525,043	1,891,557
4 to 5 years	1,496,380	1,856,006
More than 5 years	2,518,017	3,123,173
Total	Ps. 10,000,488	Ps. 12,403,910

- d. As of December 31, 2018 and 2017, the estimated value of the contracts that PEMEX has entered into with several contractors for the development of various infrastructure and services works was as follows:

<u>Maturity</u>	<u>2018</u>	<u>2017</u>
Up to 1 year	Ps. 105,856,669	Ps. 229,738,368
1 to 3 years	192,105,937	196,335,411
4 to 5 years	15,811,930	123,159,215
More than 5 years	65,810,305	149,672,236
Total	Ps. 379,584,841	Ps. 698,905,230

- e. Estimated future payments for leases are:

<u>Maturity</u>	<u>Payments</u>
Up to 1 year	Ps. 4,180,192
1 to 3 years	19,485,821
More than 5 years	39,057,896
Total	Ps. 62,723,909

NOTE 29. CONTINGENCIES

In the ordinary course of business, PEMEX is named in a number of lawsuits of various types. PEMEX evaluates the merit of each claim and assesses the likely outcome. PEMEX has not recorded provisions related to ongoing legal proceedings due to the fact that an unfavorable resolution is not expected in such proceedings, with the exception of the proceeding described in further detail in this Note.

PEMEX is involved in various civil, tax, criminal, administrative, labor and commercial lawsuits and arbitration proceedings. The results of these proceedings are uncertain as of the date of these consolidated financial statements. As of December 31, 2018, and December 31, 2017, PEMEX had accrued a reserve of Ps. 6,483,078, and Ps. 7,812,689, respectively, for these contingent liabilities.

As of December 31, 2018, the current status of the principal lawsuits in which PEMEX is involved is as follows:

- On April 4, 2011, Pemex Exploration and Production was summoned before the Séptima Sala Regional Metropolitana (“Seventh Regional Metropolitan Court”) of the Tribunal Federal de Justicia Fiscal y Administrativa (“Tax and Administrative Federal Court”) in connection with an administrative claim (No. 4957/1117071) filed by EMS Energy Services de México, S. de R.L. de C.V. and Energy Maintenance Services Group I. LLC requesting that Pemex Exploration and Production’s termination of the public works contract be declared null and void. In a concurrent proceeding, the plaintiffs also filed an administrative claim (No. 13620/15-17-06) against Pemex Exploration and Production before the Sexta Sala Regional Metropolitana (“Sixth Regional Metropolitan Court”) of the Tax and Administrative Federal Court in Mexico City seeking damages totaling U.S. \$193,713 related to the above-mentioned contract. Pemex Exploration and Production filed a response requesting the two administrative claims be joined in a single proceeding, which was granted on May 10, 2016 by the Seventh Regional Metropolitan Court. On May 3, 2017, the proceeding was closed for a judgment to be issued. As of the date of these financial statements, a resolution from the Second Section of the Superior Court of the Tax and Administrative Federal Court is still pending.
- On June 11, 2015, the Segunda Sala Regional del Noreste (“Second Regional Northeast Court”) notified Pemex Industrial Transformation of an administrative claim (file no. 2383/15-06-02-4) filed by Severo Granados Mendoza, Luciano Machorro Olvera and Hilario Martínez Cerda, as President, Secretary and Treasurer of the Ejido Tepehuaje, seeking Ps. 2,094,232 in damages due to a hydrocarbon spill on their land. Pemex Industrial Transformation filed a response to this claim and the plaintiffs were given time to amend their claim. The defendant filed a motion against this. Each party filed its expert’s environmental opinion and Second Regional Northeast Court appointed an independent expert, who issued his opinion on June 6, 2018 stating that no damages were caused. On June 22, 2018, the pleadings stage was opened. On August 31, 2018, pleadings were filed. On September 11, 2018, the proceeding was closed and the file was sent to the Superior Court and, on October 11, 2018, it was accepted for a judgment to be issued.
- On July 8, 2011, Pemex Exploration and Production was summoned in connection with an administrative claim (no. 4334/1111026) filed by Compañía Petrolera La Norma, S.A., against the Chief Executive Officer of Petróleos Mexicanos and the Chief Executive Officer of Pemex-Exploration and Production before the Segunda Sala Regional Hidalgo-México (“Hidalgo-Mexico Second Regional Court”) of the Tax Administrative Federal Court in Tlalnepantla, Estado de México. The plaintiff is seeking compensation for the cancellation of its alleged petroleum rights concessions and damages for up to Ps.1,552,730. On August 20, 2014, the proceeding was sent to the Segunda Sección de la Sala Superior (“Second Section of The Superior Court”) of the Tax and Administrative Federal Court (4334/11-11-02-6/1337/14-s2-07-04). On September 7, 2017, a motion was filed questioning a signature’s authenticity. On December 4 and 5, 2017, a documentary expert’s opinion was filed by the plaintiff and a new expert was designated by Pemex Exploration and Production to issue his opinion. On April 18, 2018, each party filed its pleadings and the claim was sent to the Second Section of the Superior Court. On September 20, 2018, the Superior Court ruled that the plaintiff did not provide evidence to support its claim. The plaintiff filed an amparo against this resolution and Pemex Exploration and Production filed its response. As of the date of these financial statements, a final resolution is still pending.
- On December 12, 2017, Pemex Exploration and Production was summoned in connection with an arbitration claim (no. 23217/JPA) filed by SUBSEA 7 de México, S. de R. L. de C.V. (“SUBSEA 7”) seeking U.S.\$153,000 related to additional expenses in connection with a pipelines construction contracts (No. 420832856 and 420833820). On January 5, 2018 Pemex Exploration and Production filed a response to this claim. The appointment of the chairperson of the arbitration trial is still pending. On September 14, 2018, the defendant received the claim briefs including documentation and related evidence and the amount sought under this claim was increased to U.S.\$ 310,484. On January 4, 2019 a response was filed by the defendant. As of the date of these financial statements a final resolution is still pending.

- On August 1, 2017, Pemex Exploration and Production was summoned in connection with an administrative claim (no. 11590/17-17-06-2) filed by Proyectos y Cementaciones Industriales, S.A. de C.V. before the Sixth Regional Metropolitan Court seeking Ps. 800,000 and U.S.\$ 12.82 and to have the settlement certificate dated March 22, 2017 related to services agreement declared null and void. On September 25, 2017 Pemex Exploration and Production filed a response to this claim. On September 4, 2018, the parties filed their pleadings. The claim was submitted to the Superior Court. As of the date of these financial statements, a final judgment is still pending.
- In March 2018, Pemex Drilling and Services was summoned before the International Centre for Dispute Resolution of the American Arbitration Association in connection with an arbitration claim (No. 01-18-0001-1499) filed by Loadmaster Universal Rigs, Inc., Loadmaster Drilling Technologies, LLC, Ulterra Drilling Technologies Mexico, S.A. de C.V. and Kennedy Fabricating, LLC seeking U.S. \$139,870 in connection with the construction and acquisition of modular drilling equipment. On June 6, 2018, the plaintiffs responded to the counterclaim filed by Pemex Drilling and Services. On September 28, 2018, Pemex Drilling and Services filed a motion rejecting the arbitration jurisdiction. On December 19, 2018, the parties exchanged documentation. As of the date of these financial statements, the appointment of the chairperson of the arbitration court is still pending. Once the arbitration court is formed, the schedule for the proceeding will be determined.

The results of these proceedings are uncertain until their final resolutions are issued by the appropriate authorities. PEMEX has recorded liabilities for loss contingencies when it is probable that a liability has been incurred and the amount thereof can be reasonably estimated. When a reasonable estimation could not be made, qualitative disclosure was provided in the notes to these consolidated financial statements. PEMEX does not disclose amounts accrued for each individual claim because such disclosure could adversely affect PEMEX's legal strategy, as well as the outcome of the related litigation.

Pursuant to an ordinary session held by the Board of Directors on August 23, 2013, Petróleos Mexicanos established policies for the granting of mutual guarantees, loans or any type of credit in favor of the Subsidiary Entities and Subsidiary Companies; in accordance with these policies, the Corporate Finance Department issues an opinion with its risk analysis, financial valuation, budget sufficiency, accounting treatment and conclusions.

Additionally, Pemex Logistics has granted the following corporate guarantees in connection with the exploration and extraction contracts entered into Pemex Exploration and Production, as required by the NHC:

- Exploration and extraction of hydrocarbons under the deep-water license modality, Trión field (Tender CNH-A1-TRION / 2016), of US \$ 4,000,000.
- Exploration and extraction of the contract area 3 Cinturón plegado perdido (Tender CNHR01- L04 / 2015), of US \$ 3,333,000.
- Extraction of hydrocarbons under shared production contract of the Ek-Balam fields, of U.S. \$5,000,000.
- Extraction of hydrocarbons in contractual area Santuario and El Golpe 3 field, of U.S. \$320,000.
- Exploration and extraction of hydrocarbons under shared production contract, contractual area 2 Tampico-Misantla, of U.S. \$ 1,750,000.
- Exploration and extraction of hydrocarbons under shared production contract, contractual area 8 Cuencas del Sureste, of U.S. \$ 1,250,000.
- Exploration and extraction of hydrocarbons shared production contract, assignment AE-0398-Mission of U.S. \$ 255,000.
- Extraction of hydrocarbons under license agreement, Ogarrio field of U.S. \$ 250,000.
- Extraction of hydrocarbons under license agreement, Cárdenas and Mora fields, of U.S. \$250,000.
- Exploration and extraction of hydrocarbons under the deep-water license modality, contractual area 2 Perdido, of U.S.\$ 2,500,000.

- Exploration and extraction of hydrocarbons under the deep-water license modality, contractual area 5 Perdido, of U.S.\$ 5,000,000.
- Exploration and extraction of hydrocarbons under the deep-water license modality, contractual area 18 Cordilleras Mexicanas, of U.S.\$ 5,000,000.
- Exploration and extraction of hydrocarbons under shared production contract contractual area 22 Cuenca Salina, of U.S. \$ 1,375,000.
- Contractual area 16 Tampico-Misantla, Veracruz, of U.S.\$ 1,000,000.
- Contractual area 17 Tampico-Misantla, Veracruz, of U.S.\$ 1,000,000.
- Contractual area 18 Tampico-Misantla, Veracruz, of U.S.\$ 2,000,000.
- Contractual area 29 Cuencas del Sureste, of U.S.\$ 2,500,000.
- Contractual area 32 Cuencas del Sureste, of U.S.\$ 1,250,000.
- Contractual area 33 Cuencas del Sureste, of U.S.\$ 1,250,000.
- Contractual area 35 Cuencas del Sureste, of U.S.\$ 1,250,000.
- Contractual area Ébano, of U.S.\$ 225,000.
- Contractual area AE-0388-M-Miquetla (for conventional and non-conventional on-shore license en zonas) of U.S.\$ 245,000.
- Contractual area AE-0392-M-Pánuco (shared-production) by U.S.\$ 225,000.

Certain other Subsidiary Entities have also granted guarantees and other contingencies.

Total guarantees granted to Pemex Exploration and Production amounted to U.S.\$ 41,228,000, equivalent to Ps. 811,486,601 as of December 31, 2018.

PEMEX considers the probability it needs to make a disbursement of cash, for the guarantees granted and in effect as of December 31, 2018 remote.

NOTE 30. SUBSEQUENT EVENTS

At the beginning of 2019, some rating agencies downgraded PEMEX's credit rating, which could have an impact on the cost and terms of PEMEX's new debt, as well as contract renegotiations during 2019.

Between January 1 to April 17, 2019, PMI HHS obtained U.S. \$4,275,000 and repaid U.S. \$4,933,000 in financing from its revolving credit lines. As of January 1, 2019, the outstanding amount was U.S. \$ 700,000. As of April 17, 2019, the outstanding amount under these revolving credit lines was U.S. \$ 42,000.

As of April 17, 2019, the Mexican peso-U.S. dollar exchange rate was Ps. 18.8489 per U.S. dollar, which represents a 4.24% appreciation of the value of the peso in U.S. dollar terms as compared to the exchange rate as of December 31, 2018, which was Ps. 19.6829 per U.S. dollar.

As of April 17, 2019, the weighted average price of the crude oil exported by PEMEX was U.S. \$ 63.03 per barrel. This represents a price increase of approximately 41.04% as compared to the average price as of December 31, 2018, which was U.S. \$44.69 per barrel.

As of April 17, 2019, PEMEX received in advance five promissory notes issued by the Mexican Government as part of the payment obligation related to pensions and retirements plans for a total amount of Ps.28,063,511. This amount is part of Strengthening Program to PEMEX, announced by the Mexican Government on February 15, 2019.

<u>Date</u>	<u>Number of promissory note</u>	<u>Amount</u>	<u>Original maturity</u>
January 25, 2019	25	Ps. 5,550,217	March, 2041
January 25, 2019	26A	3,836,615	March 2042
February 20, 2019	24	5,912,165	March 2040
March 20, 2019	23	6,232,546	March 2039
April 17, 2019	22	6,531,968	March 2038

On January 31, 2019 the Board of Directors of Petróleos Mexicanos was notified of the payments from the Mexican Government through the Ministry of Energy related to the Strengthening Program in the amount of Ps. 25,000,000.

As of April 22, 2019, PEMEX received the payments as follows:

<u>Date</u>	<u>Amount</u>
March 8, 2019	Ps. 10,000,000
April 11, 2019	5,000,000

On April 2, 2019, PEMEX received payment of promissory note No. 3, with maturity on March 31, 2019 of Ps. 3,815,055.

The Board of Directors of Petróleos Mexicanos, at its meeting held on March 26, 2019, approved, among others, the following resolutions:

- Instructed Petróleos Mexicanos, Pemex Exploration and Production and Pemex Industrial Transformation management to present to the Board of Directors of Petróleos Mexicanos for its authorization, proposals for the merger of Pemex Drilling and Services into Pemex Exploration and Production and of Pemex Ethylene into Pemex Industrial Transformation.
- Presented, for authorization of the Board of Directors of Petróleos Mexicanos, modifications to the creation resolutions of Pemex Exploration and Production and Pemex Industrial Transformation, as well as the declarations of extinction of Pemex Drilling and Services and Pemex Ethylene.
- Authorized the modifications to the basic organic structures of Petróleos Mexicanos, Pemex Exploration and Production, Pemex Industrial Transformation and Pemex Logistics, which will become effective at the same time as the corresponding organic statute, which will be approved by their respective Boards of Directors. The deputy directions that will assume the activities of Pemex Drilling and Services and of Pemex Ethylene, respectively in the basic organic structures of Pemex Exploration and Production and Pemex Industrial Transformation, will become effective once the corresponding mergers take effect.

On February 6, 2019, the Sala Regional del Golfo Norte (North Gulf Regional Court) of Federal Court of Justice for Tax and Administrative Matters summoned Pemex Drilling and Services in connection with a claim (752/17-18-01-7) filed by Micro Smart System of Mexico, S. de R.L. de C.V., challenging a settlement statement dated March 14, 2017 related to a works contract number 424049831 dated December 9, 2009, seeking the payment of: U.S.\$ 240,448 for work performed and U.S.\$284 for work estimates. On February 22, 2019, Pemex Drilling and Services filed a motion against the resolution that admitted this claim. On March 13, 2019, two resolutions were notified: 1) On February 19, 2019, a judgment issued on November 15, 2018 related to an amparo filed was issued (No. 179/2018); and 2) on February 26, 2019, a complaint motion filed by Pemex Drilling and Services was admitted against the resolution admitting this claim, which was notified to the plaintiff on March 19, 2019. On March 28, 2019, through the jurisdictional bulletin, a statement dated March 27, 2019 was released notifying the parties that a response to this claim was filed by the defendant. However, it was not admitted since the complaint motion was filed. A resolution is pending until such motion is solved.

NOTE 31. NEW STANDARDS RECENTLY ISSUED

The IASB issued amendments and new IFRS that are not effective as of the issuance date of these consolidated financial statements but could have an impact on PEMEX's future financial information.

The new standards will be effective for periods beginning in 2019.

a) IFRS 16, "Leases" ("IFRS 16")

In January 2016, the IASB published a new accounting standard IFRS 16 "Leases" ("IFRS 16), which replaces IAS 17, "Leases and Guide interpretations."

PEMEX is required to adopt IFRS 16 beginning January 1, 2019. PEMEX has assessed the estimated impact that initial application of IFRS 16 will have on its consolidated financial statements, as described below. The expected impact of adopting the standard on January 1, 2019 may change due to the fact that:

- PEMEX is still determining the effects of the adoption, as well as the design and evaluation of controls; and
- The new accounting policies are subject to change until PEMEX presents its first financial statements that include the date of initial application.

PEMEX considers the significant impacts due to adoption are the following:

- The recognition of new right-of-use assets and lease liabilities on the balance sheet for its operating leases;
- Providing significant new disclosures about its leasing activities.

IFRS 16 introduces a single, on-balance sheet lease accounting model for lessees. A lessee recognizes a right-of-use asset representing its right to use the underlying asset and a lease liability representing its obligation to make lease payments. There are recognition exemptions for short-term leases and leases of low-value assets. Lessor accounting remains similar to the current standard – i.e. lessors continue to classify leases as finance or operating leases.

IFRS 16 replaces existing leases guidance, including IAS 17 Leases (IAS 17), IFRIC 4 Determining whether an Arrangement contains a Lease (IFRIC 4), SIC-15 Operating Leases – Incentives (SIC-15) and SIC-27 Evaluating the Substance of Transactions Involving the Legal Form of a Lease (SIC 27).

i. Leases in which PEMEX is a lessee

PEMEX will recognize new assets and liabilities for its operating leases mainly of transportation and railway equipment, docks, hydrogen supply plants, electric power and steam gas storage. The nature of expenses related to those leases will change because PEMEX will recognize a depreciation charge for right-of-use assets and interest expense on lease liabilities.

Previously, PEMEX recognized operating lease expense on a straight-line basis over the term of the lease, and recognized assets and liabilities only to the extent that there was a timing difference between actual lease payments and the expense recognized.

Based on the information currently available, PEMEX estimates that it will recognize additional lease liabilities as of January 1, 2019 corresponding to the right-of-use of assets based on the present value of the remaining minimum rental payments under the current leasing standards for existing operating leases. PEMEX does not expect the adoption of IFRS 16 will impact its ability to comply with rights contained in loans because there are no covenants derived from these type of operations.

ii. Transition

PEMEX will apply IFRS 16 initially on January 1, 2019, using the modified retrospective approach. Therefore, the cumulative effect of adopting IFRS 16 will be recognized as an adjustment to the opening balance of retained earnings at January 1, 2019, with no restatement of comparative information.

PEMEX will apply the option of recognizing the right-of-use asset of each lease to an amount equal to its liability, without considering other elements within the asset measurement by right-of-use, such as direct initial costs and payments made before or after at the beginning of the lease.

PEMEX will apply the practical expedient to adopt the definition of lease at the time of transition. This means that it will apply IFRS 16 to all contracts entered into before January 1, 2019 and identified as leases in accordance with IAS 17 and IFRIC 4.

PEMEX will apply the short-term lease recognition exemption for all leases with a remaining lease term at the date of initial application of 12 months or less. PEMEX also currently expects to elect the practical expedient to not separate lease and non-lease components for leases where the non-lease component is not significant.

b) IFRIC 23 – Uncertainty over Income Tax Treatments

In June 2017, the IASB published a new accounting interpretation to be applied to the determination of taxable profit (tax loss), tax bases, unused tax losses, unused tax credits and tax rates, when there is uncertainty over income tax treatments under IAS 12.

In order to make these tax assessments, an entity must consider whether it is probable that the relevant taxing authority will accept each tax treatment, or group of tax treatments, that the entity has used or plans to use in its next income tax filing:

- If the entity concludes that it is probable that a particular tax treatment will be accepted by the relevant taxing authority, that entity must determine taxable profit (tax loss), tax bases, unused tax losses, unused tax credits or tax rates consistently with the tax treatment included in its income tax filings.
- If the entity concludes that it is not probable that a particular tax treatment is accepted by the relevant taxing authority, the entity must use the most likely amount or the expected value of the tax treatment when determining taxable profit (tax loss), tax bases, unused tax losses, unused tax credits and tax rates. That calculation should be based on which method provides better predictions of the resolution of the uncertainty.

IFRIC 23 is effective for annual reporting periods beginning on or after January 1, 2019. Earlier application is permitted.

PEMEX does not anticipate being impacted by IFRIC 23 because all tax positions are discussed and agreed with SHCP prior to releasing quarterly or annual financial statements.

c) Annual improvements – 2015-2017 Cycle

In December 2017, the IASB published “the Annual Improvements to the IFRS of the 2015-2017 Cycle” through which it clarifies the following IFRS:

- IFRS 3 Business Combinations and IFRS 11 Joint ventures

IFRS 3 Business Combinations clarifies how an entity should recognize an increase of its interest in a joint operation:

- When a party to a joint arrangement obtains control of a business that was a part of that joint arrangement, and where that party had assumed a portion of the rights to the assets and obligations to the liabilities of that business prior to the acquisition date, the acquisition will be considered a business combination that is achieved in stages. The acquiring entity must therefore apply the requirements for a business combination achieved in stages, including by measuring its previously held interest in the joint arrangement.
 - When a party participates in, but does not share in the control of a joint operation, and subsequently takes joint control of that joint operation, this will constitute the acquisition of a business and previously held interest in the joint operation are not measured.
- IAS 12 Income Tax

All income tax consequence of dividends (including payments on financial instruments classified as equity) are recognized consistently with the transactions that generated the distributable profits (i.e., in profit or loss, OCI or equity basis).

- IAS 23 Borrowing Costs

With respect to the treatment of costs for loans subject to capitalization:

- To the extent that an entity borrows funds generally and uses them for the purpose of obtaining a qualifying asset, that entity shall determine the amount of borrowing costs eligible for capitalization by applying a capitalization rate to the expenditures on that asset. The capitalization rate shall be the weighted average of the borrowing costs applicable to all borrowings of the entity that are outstanding during the period.
- However, an entity shall exclude from this calculation borrowing cost applicable to borrowing made specifically for the purpose of obtaining a qualifying asset until substantially all the activities necessary to prepare that asset for its intended use or sale are complete.

The amount of borrowing costs that an entity capitalizes during a period shall not exceed the amount of borrowing costs it incurred during that period.

The amendments are effective for annual periods beginning on or after January 1, 2019.

PEMEX is in the process of evaluating the impact that these amendments will have on its consolidated financial statements.

The new standards will be effective for periods beginning in 2020.

- d) Amendments to definition of business in IFRS 3

In October 2018, the IASB issued amendments to the definition of a business in IFRS 3. The amendments are intended to assist entities to determine whether a transaction should be accounted for as a business combination or as an assets acquisition.

The amendments:

- (a) mean that, to be considered a business, an acquired set of activities and assets must include, at a minimum, an input and a substantive process that together significantly contribute to the ability to create outputs.
- (b) removed the assessment of whether market participants can replace any missing inputs or processes and continuing to produce outputs.
- (c) add guidance and illustrative examples to assist entities to assess whether a substantial process has been acquired.
- (d) narrowed the definition of business and of outputs by focusing on goods and services provided to customers. The reference to an ability to reduce costs is removed
- (e) introduced an optional concentration test that permits a simplified assessment of whether an acquired set of activities and assets is not a business.

The amendments to IFRS 3 must be applied to transactions that are either a business combination or asset acquisition for which the acquisition date is on or after the beginning of the first annual reporting period beginning on or after January 1, 2020. Consequently, entities do not have to revisit such transactions that occurred on prior periods. Earlier application is permitted and must be disclosed.

- e) Definition of material – amendments to IAS 1 Presentation of financial statements (IAS 1) and IAS 8 Accounting policies, changes in accounting estimates and errors (IAS 8).

The IASB observed that the inappropriate application of “materiality” is one of the factors that affects disclosures to financial statements, causing entities to disclose irrelevant information, omit or obscure important information, reducing the usefulness of financial statements. Therefore, in October 2018, the IASB issued amendments to IAS 1 and IAS 8 (the amendments) to align the definition of material across the standards and clarify aspects of definition.

New definition of material

The new definition states that “information is material if omitting, misstating or obscuring it could reasonably be expected to influence decisions that the primary users of general-purpose financial statements make on the basis of those financial statements, which provide financial information about a specific reporting entity.”

The amendments clarify that materiality will depend on the nature or magnitude of information. An entity will need to assess whether the information, either individually or in combination with other information, is material in the context of the financial statements. A misstatement of information is material if it could reasonably be expected to influence decisions made by the primary users. The amendments clarify that, in assessing whether an information could reasonably be expected to influence decisions of the primary users, an entity must consider the characteristics of those users as well as its own circumstances.

Obscuring information

The information is obscured if it is communicated in a way that would have a similar effect as omitting or misstating the information. The following are examples of circumstances that may result in material information being obscured:

- Material information may be obscured if information regarding a material item, transaction or other event is scattered throughout the financial statements or disclosed using language that is vague or unclear.
- Material information can also be obscured if dissimilar items, transactions or other events are inappropriately aggregated, or conversely, if similar items are inappropriately disaggregated. In addition, the understandability of the financial statements is reduced if material information is hidden because of immaterial information.

Primary users of the financial statements

The current definition refers to ‘users’ but does not specify their characteristics, which can be interpreted to imply that an entity is required to consider all possible users of the financial statements when deciding what information to disclose. Consequently, the IASB decided to refer to primary users in the new definition to help respond to concerns that the term users may be interpreted too widely.

The amendments explain that many existing and potential investors, lenders and other creditors cannot require reporting entities to provide them with information directly and, as such, they rely on general purpose financial statements for much of the financial information they need. Therefore, these groups are the primary users to whom general purpose financial statements are directed.

Effective date and transition

The amendments to IAS 1 and IAS 8 are required to be applied for annual periods beginning on or after January 1, 2020. The amendments must be applied prospectively and earlier application is permitted.

NOTE 32. SUBSIDIARY GUARANTOR INFORMATION

The following consolidating information presents: (i) condensed consolidated statements of financial position at December 31, 2018 and 2017 and condensed consolidated statements of comprehensive income and cash flows for the years ended December 31, 2018, 2017 and 2016 of Petróleos Mexicanos, the Subsidiary Guarantors and the Non-Guarantor Subsidiaries (as defined below).

These condensed consolidated statements were prepared in conformity with IFRS, with one exception: for the purposes of the presentation of the subsidiary guarantor information, the Subsidiary Entities and Subsidiary Companies have been accounted for as investments under the equity method by Petróleos Mexicanos. Earnings of subsidiaries are therefore reflected in Petróleos Mexicanos' investment account and earnings. The principal elimination entries eliminate Petróleos Mexicanos' investment in subsidiaries and inter-company balances and transactions. Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services (in the case of Pemex Cogeneration and Services, until July 27, 2018 (see Note 1)) (collectively, the "Subsidiary Guarantors") and Pemex Ethylene and Pemex Fertilizers are 100%-owned subsidiaries of the Mexican Government. The guaranties by the Subsidiary Guarantors of Petróleos Mexicanos' payment obligations under this indebtedness are full, unconditional, joint and several. Pemex Ethylene, Pemex Fertilizers, Pemex Finance, Ltd. and the Subsidiary Companies collectively comprise the non-guarantor subsidiaries (the "Non-Guarantor Subsidiaries").

The Pemex Project Funding Master Trust (the "Master Trust"), which was a trust formed for the purpose of financing PEMEX's projects, was dissolved effective December 20, 2011 and is no longer consolidated in the financial statements of PEMEX as of December 31, 2011 and thereafter.

The following table sets forth, as of December 31, 2018, the principal amount outstanding of the registered debt securities originally issued by the Master Trust. As noted above, Petróleos Mexicanos has assumed, as primary obligor, all of the obligations of the Master Trust under these debt securities. The obligations of Petróleos Mexicanos are guaranteed by the Subsidiary Guarantors:

Table 1: Registered Debt Securities originally issued by the Master Trust and Assumed by Petróleos Mexicanos

<u>Security</u>	<u>Primary obligor</u>	<u>Guarantors</u>	<u>Principal amount outstanding (U.S. \$)</u>
6.625% Guaranteed Bonds due 2035	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	1,750,000
6.625% Guaranteed Bonds due 2038	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	491,175
8.625% Bonds due 2022	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	160,245
8.625% Guaranteed Bonds due 2023	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	106,507
9.50% Guaranteed Bonds due 2027	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	219,217

The following table sets forth, as of December 31, 2018, the principal amount outstanding of the registered debt securities issued by Petróleos Mexicanos, and guaranteed by Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services (in the case of Pemex Cogeneration and Services, until July 27, 2018 (see Note 1)).

Table 2: Registered Debt Securities originally issued by Petróleos Mexicanos

<u>Security</u>	<u>Issuer</u>	<u>Guarantors</u>	<u>Principal amount outstanding (U.S. \$)</u>
8.00% Notes due 2019	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	1,220,195
9.50% Global Guaranteed Bonds due 2027	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	102,149
6.000% Notes due 2020	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	813,073
5.50% Notes due 2021	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	2,962,047
3.500% Notes due 2023	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	2,099,730
4.875% Notes due 2024	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	1,499,136
6.625% Notes due 2035	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	999,000

<u>Security</u>	<u>Issuer</u>	<u>Guarantors</u>	<u>Principal amount outstanding (U.S. \$)</u>
6.500% Bonds due 2041	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	3,000,000
4.875% Bonds 2022	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	2,097,055
3.125% Notes due 2019	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	187,595
3.500% Notes due 2020	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	678,722
5.50% Bonds due 2044	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	1,703,456
6.375% Bonds due en 2045	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	2,999,980
5.625% Bonds due 2046	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	1,975,199
4.500% Notes due 2026	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	1,497,918
4.250% Notes due 2025	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	999,030

<u>Security</u>	<u>Issuer</u>	<u>Guarantors</u>	<u>Principal amount outstanding (U.S. \$)</u>
6.375% Notes due 2021	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	1,247,668
6.875% Notes due 2026	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	2,970,334
4.625% Notes due 2023	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	2,055,845
6.750% Notes due 2047	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	5,997,558
5.350% Bonds due 2028	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	2,479,583
6.350% Bonds due 2048	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	3,323,470
6.500% Bonds due 2029	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	1,977,163
5.375% Notes due 2022	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Logistics and Pemex Cogeneration and Services	1,490,682
Floating Rate Notes 2022	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	986,171
6.250% Notes due 2027	Petróleos Mexicanos	Pemex Exploration and Production, Pemex Industrial Transformation, Pemex Drilling and Services, Pemex Logistics and Pemex Cogeneration and Services	5,145,205

Petróleos Mexicanos is the only PEMEX entity that had debt securities registered with the SEC outstanding as of December 31, 2018 and as of the date of these consolidated financial statements, and all guaranteed debt is issued by Petróleos Mexicanos. The guaranties of the Subsidiary Guarantors are full and unconditional and joint and several. PEMEX's management has not presented separate financial statements for the Subsidiary Guarantors, because it has determined that such information is not material to investors.

SUPPLEMENTAL CONDENSED CONSOLIDATING FINANCIAL INFORMATION

STATEMENT OF FINANCIAL POSITION
As of December 31, 2018

	Petróleos Mexicanos	Subsidiary guarantors	Non-guarantor subsidiaries	Eliminations	PEMEX consolidated
Assets					
Current assets					
Cash and cash equivalents	Ps. 25,187,488	Ps. 16,471,298	Ps. 40,253,622	Ps. —	Ps. 81,912,409
Accounts receivable and other, net, and derivative financial instruments	63,513,279	111,325,430	52,837,198	—	227,675,907
Accounts receivable—inter-company	573,128,107	1,190,513,209	90,294,160	(1,853,935,476)	—
Inventories	418,497	55,152,479	26,451,592	—	82,022,568
Equity instruments	—	—	245,440	—	245,440
Available-for-sale financial assets	—	1,253,638	—	—	1,253,638
Total current assets	662,247,371	1,374,716,054	210,082,012	(1,853,935,476)	393,109,961
Long-term receivables—intercompany	1,833,526,496	285	5,409,802	(1,838,936,583)	—
Investments in joint ventures and associates	(423,086,576)	135,726	16,693,715	423,098,680	16,841,545
Wells, pipelines, properties, plant and equipment-net	10,857,719	1,344,851,372	46,776,993	—	1,402,486,084
Long-term notes receivables	118,834,477	994,121	—	—	119,828,598
Deferred taxes	59,010,975	61,009,660	2,764,095	—	122,784,730
Intangible assets	318,342	11,865,660	1,536,538	—	13,720,540
Other assets	54,272	3,174,097	3,197,441	—	6,425,810
Total assets	Ps. 2,261,763,076	Ps. 2,796,746,975	Ps. 286,460,596	Ps. (3,269,773,379)	Ps. 2,075,197,268
Liabilities					
Current liabilities					
Current portion of long-term debt	Ps. 171,880,315	Ps. 4,289,361	Ps. 15,626,033	Ps. —	Ps. 191,795,709
Accounts payable—inter-company	1,439,442,811	325,901,335	88,582,648	(1,853,926,794)	—
Other current liabilities	20,837,163	194,303,145	40,840,277	—	255,980,585
Total current liabilities	1,632,160,289	524,493,841	145,048,958	(1,853,926,794)	447,776,294
Long-term debt	1,835,071,170	36,863,242	18,555,994	—	1,890,490,407
Long-term payables—inter-company	—	1,838,285,585	659,680	(1,838,945,265)	—
Employee benefits, provisions for sundry creditors, other liabilities and deferred taxes	254,041,839	929,431,425	12,862,735	—	1,196,335,999
Total liabilities	3,721,273,298	3,329,074,093	177,127,368	(3,692,872,059)	3,534,602,700
Equity (deficit), net	(1,459,510,222)	(532,327,118)	109,333,228	423,098,680	(1,459,405,432)
Total liabilities and equity	Ps. 2,261,763,076	Ps. 2,796,746,975	Ps. 286,460,596	Ps. (3,269,773,379)	Ps. 2,075,197,268

SUPPLEMENTAL CONDENSED CONSOLIDATING FINANCIAL INFORMATION

STATEMENT OF FINANCIAL POSITION
As of December 31, 2017

	Petróleos Mexicanos	Subsidiary guarantors	Non-guarantor subsidiaries	Eliminations	PEMEX consolidated
Assets					
Current assets					
Cash and cash equivalents	Ps. 46,959,103	Ps. 18,815,345	Ps. 32,077,306	Ps. —	Ps. 97,851,754
Accounts receivable and other, net, and derivative financial instruments	83,119,394	38,105,354	79,533,940	—	200,758,688
Accounts receivable—inter-company	311,148,593	1,380,100,592	86,354,837	(1,777,604,022)	—
Inventories	509,375	32,357,125	30,992,430	—	63,858,930
Available-for-sale financial assets	—	—	1,056,918	—	1,056,918
Total current assets	441,736,465	1,469,378,416	230,015,431	(1,777,604,022)	363,526,290
Long-term receivables—intercompany	1,823,276,758	285	3,597,880	(1,826,874,923)	—
Investments in joint ventures and associates	(465,832,399)	82,668	16,611,681	465,845,414	16,707,364
Wells, pipelines, properties, plant and equipment-net	12,444,376	1,370,974,060	53,090,890	—	1,436,509,326
Long-term notes receivables	147,286,367	1,206,542	—	—	148,492,909
Deferred taxes	59,691,528	84,443,897	2,057,060	—	146,192,485
Intangible assets	—	9,088,563	—	—	9,088,563
Other assets	2,209,579	4,846,078	4,429,520	—	11,485,177
Total assets	Ps. 2,020,812,674	Ps. 2,940,020,509	Ps. 309,802,462	Ps. (3,138,633,531)	Ps. 2,132,002,114
Liabilities					
Current liabilities					
Current portion of long-term debt	Ps. 137,947,110	Ps. 5,386,564	Ps. 13,875,793	Ps. —	Ps. 157,209,467
Accounts payable—inter-company	1,240,490,891	434,556,688	93,140,905	(1,768,188,484)	—
Other current liabilities	23,435,614	157,589,107	50,892,997	—	231,917,718
Total current liabilities	1,401,873,615	597,532,359	157,909,695	(1,768,188,484)	389,127,185
Long-term debt	1,824,829,579	40,262,391	15,573,634	—	1,880,665,604
Long-term payables—inter-company	—	1,830,150,615	6,139,845	(1,836,290,460)	—
Employee benefits, provisions for sundry creditors, other liabilities and deferred taxes	297,028,436	1,057,191,286	10,341,988	—	1,364,561,710
Total liabilities	3,523,731,630	3,525,136,651	189,965,162	(3,604,478,944)	3,634,354,499
Equity (deficit), net	(1,502,918,956)	(585,116,142)	119,837,300	465,845,413	(1,502,352,385)
Total liabilities and equity	Ps. 2,020,812,674	Ps. 2,940,020,509	Ps. 309,802,462	Ps. (3,138,633,531)	Ps. 2,132,002,114

SUPPLEMENTAL CONDENSED CONSOLIDATING FINANCIAL INFORMATION

STATEMENT OF COMPREHENSIVE INCOME
For the year ended December 31, 2018

	Petróleos Mexicanos	Subsidiary guarantors	Non-guarantor subsidiaries	Eliminations	PEMEX consolidated
Net sales	Ps. —	Ps. 1,941,467,663	Ps. 912,726,857	Ps. (1,181,748,372)	Ps. 1,672,446,148
Services income	75,979,835	113,113,024	5,960,807	(186,380,664)	8,673,002
Total sales revenues	75,979,835	2,054,580,687	918,687,664	(1,368,129,036)	1,681,119,150
(Reversal) impairment of wells, pipelines, properties, plant and equipment	—	(25,384,888)	3,965,891	—	(21,418,997)
Cost of sales	1,905,865	1,536,120,030	910,525,715	(1,249,040,049)	1,199,511,561
Gross income	74,073,970	543,845,545	4,196,058	(119,088,987)	503,026,586
Other revenues (expenses), net	73,183	(26,020,067)	8,710,216	40,289,179	23,052,511
General expenses:					
Transportation, distribution and sale expenses	—	26,805,854	1,013,719	(3,462,364)	24,357,209
Administrative expenses	69,479,218	132,159,683	9,234,320	(76,551,740)	134,321,481
Total general expenses	69,479,218	158,965,537	10,248,039	(80,014,104)	158,678,690
Operating income	4,667,935	358,859,941	2,658,235	1,214,296	367,400,407
Financing income	140,114,346	103,186,750	3,100,917	(214,844,891)	31,557,122
Financing cost	(200,842,909)	(130,246,541)	(3,959,079)	214,321,507	(120,727,022)
Derivative financial instruments income (cost), net	(3,497,813)	(19,143,363)	382,563	—	(22,258,613)
Foreign exchange income, net	(3,832,933)	26,526,563	965,850	—	23,659,480
Profit (loss) sharing in joint ventures and associates	(125,246,527)	53,058	2,164,868	124,555,613	1,527,012
Income (loss) before taxes, duties and other	(188,637,901)	339,236,408	5,313,354	125,246,525	281,158,386
Total taxes, duties and other	(8,272,851)	466,788,123	3,062,951	—	461,578,223
Net (loss) income for the year	(180,365,050)	(127,551,715)	2,250,403	125,246,525	(180,419,837)
Total other comprehensive result	47,357,316	176,174,564	(140,133)	—	223,391,747
Total comprehensive result for the year	Ps. (133,007,734)	Ps. 48,622,849	Ps. 2,110,270	Ps. 125,246,525	Ps. 42,971,910

SUPPLEMENTAL CONDENSED CONSOLIDATING FINANCIAL INFORMATION

STATEMENT OF COMPREHENSIVE INCOME
For the year ended December 31, 2017

	Petróleos Mexicanos	Subsidiary guarantors	Non-guarantor subsidiaries	Eliminations	PEMEX consolidated
Net sales	Ps. —	Ps. 1,713,914,703	Ps. 1,096,752,930	Ps. (1,424,768,483)	Ps. 1,385,899,150
Services income	50,399,983	140,934,022	2,646,144	(182,849,580)	11,130,569
Total sales revenues	50,399,983	1,854,848,725	1,099,399,074	(1,607,618,063)	1,397,029,719
Impairment of wells, pipelines, properties, plant and equipment	—	145,302,407	6,142,153	—	151,444,560
Cost of sales	2,007,814	1,447,640,131	1,083,297,610	(1,528,740,675)	1,004,204,880
Gross income	48,392,169	261,906,187	9,959,311	(78,877,388)	241,380,279
Other revenues (expenses), net	(341,521)	(12,443,660)	(4,664,096)	22,623,353	5,174,076
General expenses:					
Transportation, distribution and sale expenses	—	26,136,674	1,297,558	(5,544,562)	21,889,670
Administrative expenses	59,141,391	105,920,390	5,883,200	(51,005,527)	119,939,454
Total general expenses	59,141,391	132,057,064	7,180,758	(56,550,089)	141,829,124
Operating income	(11,090,743)	117,405,463	(1,885,543)	296,054	104,725,231
Financing income	143,676,367	134,401,598	3,185,195	(265,097,307)	16,165,853
Financing cost	(236,929,035)	(141,900,236)	(3,616,530)	264,801,253	(117,644,548)
Derivative financial instruments income (cost), net	27,670,991	(1,608,039)	(724,628)	—	25,338,324
Foreign exchange income, net	6,837,171	15,807,988	538,963	—	23,184,122
Profit (loss) sharing in joint ventures and associates	(211,567,169)	409,955	(49,515)	211,567,169	360,440
Income (loss) before taxes, duties and other	(281,402,418)	124,516,729	(2,552,058)	211,567,169	52,129,422
Total taxes, duties and other	(557,520)	331,001,261	2,536,300	—	332,980,041
Net (loss) income for the year	(280,844,898)	(206,484,532)	(5,088,358)	211,567,169	(280,850,619)
Total other comprehensive result	4,728,640	6,841,586	(63,845)	—	11,506,381
Total comprehensive result for the year	Ps. (276,116,258)	Ps. (199,642,946)	Ps. (5,152,203)	Ps. 211,567,169	Ps. (269,344,238)

SUPPLEMENTAL CONDENSED CONSOLIDATING FINANCIAL INFORMATION

STATEMENT OF COMPREHENSIVE INCOME
For the year ended December 31, 2016

	Petróleos Mexicanos	Subsidiary guarantors	Non-guarantor subsidiaries	Eliminations	PEMEX consolidated
Net sales	Ps. —	Ps. 1,361,538,624	Ps. 828,143,332	Ps. (1,124,563,366)	Ps. 1,065,118,590
Services income	46,330,245	98,959,131	1,970,055	(138,284,789)	8,974,642
Total sales revenues	46,330,245	1,460,497,755	830,113,387	(1,262,848,155)	1,074,093,232
(Reversal) Impairment of wells, pipelines, properties, plant and equipment	—	(330,037,834)	(1,276,509)	—	(331,314,343)
Cost of sales	1,236,921	1,244,388,072	809,156,778	(1,188,959,550)	865,822,221
Gross income	45,093,324	546,147,517	22,233,118	(73,888,605)	539,585,354
Other revenues (expenses), net	(312,611)	20,713,184	2,915,837	(666,804)	22,649,606
General expenses:					
Transportation, distribution and sale expenses	—	50,948,771	945,489	(26,663,020)	25,231,240
Administrative expenses	57,437,455	96,884,031	7,050,271	(48,718,224)	112,653,533
Total general expenses	57,437,455	147,832,802	7,995,760	(75,381,244)	137,884,773
Operating income	(12,656,742)	419,027,899	17,153,195	825,835	424,350,187
Financing income	123,266,281	67,542,768	3,526,378	(180,586,172)	13,749,255
Financing cost	(160,824,632)	(114,271,762)	(3,602,868)	179,854,798	(98,844,464)
Derivative financial instruments (cost) income, net	(12,052,200)	3,172	(1,951,959)	—	(14,000,987)
Foreign exchange loss, net	(20,531,005)	(232,714,446)	(767,292)	—	(254,012,743)
Profit (loss) sharing in joint ventures and associates	(117,347,803)	628,357	1,507,488	117,347,803	2,135,845
Income (loss) before taxes, duties and other	(200,146,101)	140,215,988	15,864,942	117,442,264	73,377,093
Total taxes, duties and other	(8,834,626)	266,155,181	7,200,880	—	264,521,435
Net (loss) income for the year	(191,311,475)	(125,939,193)	8,664,062	117,442,264	(191,144,342)
Total other comprehensive result	10,126,560	96,032,433	21,713,488	—	127,872,481
Total comprehensive result for the year	Ps. (181,184,915)	Ps. (29,906,760)	Ps. 30,377,550	Ps. 117,442,264	Ps. (63,271,861)

SUPPLEMENTAL CONDENSED CONSOLIDATING FINANCIAL INFORMATION

STATEMENT OF CASH FLOWS
For the year ended December 31, 2018

	Petróleos Mexicanos	Subsidiary guarantors	Non-guarantor subsidiaries	Eliminations	PEMEX consolidated
Operating activities:					
Net (loss) income for the year	Ps.(180,365,050)	Ps.(127,551,718)	Ps. 2,305,189	Ps. 125,191,742	Ps.(180,419,837)
Adjustments to reconcile net loss to cash provided by operating activities:					
Depreciation and amortization	1,274,179	149,747,232	2,360,629	—	153,382,040
Amortization of intangible assets	2,446,445	86,332	110,549	—	2,643,326
Impairment of wells, pipelines, properties, plant and equipment	—	(25,384,888)	3,965,891	—	(21,418,997)
Unsuccessful wells	—	15,443,086	—	—	15,443,086
Exploration costs	—	(2,171,218)	—	—	(2,171,218)
Disposal of wells, pipelines, properties, plant and equipment	872,527	12,226,128	3,786,609	—	16,885,264
Gain on sale of share in joint ventures and associates	—	(10,257)	(690,914)	—	(701,171)
Effects of net present value of reserve for well abandonment	—	(6,953,200)	—	—	(6,953,200)
Profit (loss) sharing in investments	125,246,527	(538,281)	(1,473,955)	(124,761,303)	(1,527,012)
Unrealized foreign exchange loss (gain)	(19,726,271)	446,523	(482,460)	—	(19,762,208)
Interest expense	109,697,028	9,577,370	1,452,624	—	120,727,022
Interest income	(9,520,962)	—	—	—	(9,520,962)
Funds (used in) from operating activities:					
Accounts receivable, accounts payable, derivative financial instruments and accrued liabilities	51,460,407	(70,278,499)	26,118,293	—	7,300,201
Taxes	(8,881,300)	38,071,896	(157,861)	—	29,032,735
Other assets and other liabilities	559,449	(12,071,857)	(3,244,955)	—	(14,757,363)
Employee benefits	10,519,603	44,858,697	(1,773,416)	—	53,604,884
Inter-company charges and deductions	(14,527,177)	81,240,429	(21,516,287)	(45,196,965)	—
Cash flows (used in) from operating activities	69,055,405	106,737,775	10,759,936	(44,766,526)	141,786,590
Investing activities:					
Acquisition of wells, pipelines, properties, plant and equipment and intangible assets	(1,162,685)	(103,408,759)	(4,389,245)	—	(108,960,689)
Proceeds from sale of assets	—	14,568	4,063,776	—	4,078,344
Other assets	3,586,010	212,421	—	—	3,798,431
(Increase) decrease due to Inter-company investing	(47,454,385)	—	—	47,454,385	—
Cash flows used in investing activities	(45,031,060)	(103,181,770)	(325,469)	47,454,385	(101,083,914)
Financing activities:					
Loans obtained from financial institutions	510,871,366	—	388,897,646	—	899,769,012
Debt payments, principal only	(450,353,531)	(6,662,318)	(384,017,543)	—	(841,033,392)
Interest paid	(106,313,795)	(7,857,926)	(1,117,668)	—	(115,289,389)
Inter-company increase (decrease) financing	—	8,620,192	(5,932,333)	(2,687,859)	—
Cash flows provided by financing activities:	(45,795,960)	(5,900,052)	(2,169,898)	(2,687,859)	(56,553,769)
Net (decrease) increase in cash and cash equivalents	(21,771,615)	(2,344,047)	8,264,569	—	(15,851,093)
Effects of change in cash value	—	—	(88,252)	—	(88,252)
Cash and cash equivalents at the beginning of the year	46,959,103	18,815,345	32,077,306	—	97,851,754
Cash and cash equivalents at the end of the year	Ps. 25,187,488	Ps. 16,471,298	Ps. 40,253,623	Ps. —	Ps. 81,912,409

SUPPLEMENTAL CONDENSED CONSOLIDATING FINANCIAL INFORMATION

**STATEMENT OF CASH FLOWS
For the year ended December 31, 2017**

	Petróleos Mexicanos	Subsidiary guarantors	Non-guarantor subsidiaries	Eliminations	PEMEX consolidated
Operating activities:					
Net (loss) income for the year	Ps.(280,844,898)	Ps.(206,484,532)	Ps. (5,082,639)	Ps. 211,561,450	Ps.(280,850,619)
Adjustments to reconcile net loss to cash provided by operating activities:					
Depreciation and amortization	1,155,881	152,607,943	2,940,689	—	156,704,513
Impairment of wells, pipelines, properties, plant and equipment	—	145,302,407	6,142,153	—	151,444,560
Unsuccessful wells	—	6,164,624	—	—	6,164,624
Exploration costs	—	(1,447,761)	—	—	(1,447,761)
Disposal of wells, pipelines, properties, plant and equipment	433,391	14,687,229	1,943,051	—	17,063,671
Gain on sale of share in joint ventures and associates	—	(3,139,103)	—	—	(3,139,103)
Disposal of held—for—sale current non—financial assets	—	2,808,360	—	—	2,808,360
Dividends	—	—	(180,675)	—	(180,675)
Effects of net present value of reserve for well abandonment	—	7,774,000	—	—	7,774,000
Profit (loss) sharing in investments	211,567,169	(409,955)	49,515	(211,567,169)	(360,440)
Decrease on available—for-sale financial assets	—	—	1,360,205	—	1,360,205
Net loss on available-for-sale financial assets	—	—	3,523,748	—	3,523,748
Unrealized foreign exchange loss (gain)	(13,526,153)	(1,585,910)	(1,573,376)	—	(16,685,439)
Interest expense	100,545,114	15,736,420	1,363,014	—	117,644,548
Funds (used in) from operating activities:					
Accounts receivable, accounts payable and derivative financial instruments	(88,496,967)	(14,214,566)	(20,789,692)	—	(123,501,225)
Inventories	(62,421)	(3,086,181)	(14,818,268)	—	(17,966,870)
Other assets	(7,091,867)	(483,389)	551,233	—	(7,024,023)
Employee benefits	18,829,768	31,489,785	(254,157)	—	50,065,396
Inter-company charges and deductions	<u>7,284,124</u>	<u>(114,968,213)</u>	<u>514,270</u>	<u>107,169,819</u>	<u>—</u>
Cash flows (used in) from operating activities	(50,206,859)	30,751,158	(24,310,929)	107,164,100	63,397,470
Investing activities:					
Acquisition of wells, pipelines, properties, plant and equipment	(1,436,926)	(87,274,561)	(3,147,978)	—	(91,859,465)
Resources from sale available-for-sale financial assets	—	—	8,026,836	—	8,026,836
Proceeds from the sale of assets	—	3,863,072	(721,362)	—	3,141,710
(Increase) decrease due to Inter-company investing	<u>25,611,359</u>	<u>—</u>	<u>—</u>	<u>(25,611,359)</u>	<u>—</u>
Cash flows used in investing activities	24,174,433	(83,411,489)	4,157,496	(25,611,359)	(80,690,919)
Financing activities:					
Loans obtained from financial institutions	401,947,349	—	302,768,119	—	704,715,468
Debt payments, principal only	(327,703,729)	(7,981,937)	(306,374,153)	—	(642,059,819)
Interest paid	(93,755,698)	(13,991,633)	(1,163,086)	—	(108,910,417)
Inter-company increase (decrease) financing	<u>—</u>	<u>83,716,743</u>	<u>(2,164,002)</u>	<u>(81,552,741)</u>	<u>—</u>
Cash flows provided by financing activities:	(19,512,078)	61,743,173	(6,933,122)	(81,552,741)	(46,254,768)
Net (decrease) increase in cash and cash equivalents	(45,544,504)	9,082,842	(27,086,555)	—	(63,548,217)
Effects of change in cash value	—	—	(2,132,542)	—	(2,132,542)
Cash and cash equivalents at the beginning of the year	<u>92,503,607</u>	<u>9,732,503</u>	<u>61,296,403</u>	<u>—</u>	<u>163,532,513</u>
Cash and cash equivalents at the end of the year	<u>Ps. 46,959,103</u>	<u>Ps. 18,815,345</u>	<u>Ps. 32,077,306</u>	<u>Ps. —</u>	<u>Ps. 97,851,754</u>

SUPPLEMENTAL CONDENSED CONSOLIDATING FINANCIAL INFORMATION

STATEMENT OF CASH FLOWS
For the year ended December 31, 2016

	Petróleos Mexicanos	Subsidiary guarantors	Non-guarantor subsidiaries	Eliminations	PEMEX consolidated
Operating activities:					
Net (loss) income for the year	Ps.(191,311,476)	Ps.(139,410,398)	Ps. 22,160,755	Ps. 117,416,777	Ps.(191,144,342)
Adjustments to reconcile net loss to cash provided by operating activities:					
Depreciation and amortization	1,066,033	146,545,307	2,828,151	—	150,439,491
(Reversal) Impairment of wells, pipelines, properties, plant and equipment	—	(330,037,834)	(1,276,509)	—	(331,314,343)
Unsuccessful wells	—	29,106,084	—	—	29,106,084
Exploration costs	—	(2,022,826)	—	—	(2,022,826)
Disposal of wells, pipelines, properties, plant and equipment	320,599	2,658,625	792,063	—	3,771,287
Loss in sale of fixed assets	—	27,882,480	—	—	27,882,480
Gain on sale of share in joint ventures and associates	—	(15,211,039)	—	—	(15,211,039)
Profit (loss) sharing in joint ventures and associates	117,249,643	(628,356)	(1,507,489)	(117,249,643)	(2,135,845)
Impairment of goodwill	—	—	4,007,018	—	4,007,018
Dividends	—	—	(293,397)	—	(293,397)
Effects of net present value of reserve for well abandonment	—	11,968,966	—	—	11,968,966
Unrealized foreign exchange loss (gain)	231,191,646	6,754,046	5,237,072	—	243,182,764
Interest expense	91,044,541	5,687,502	2,112,421	—	98,844,464
Funds (used in) from operating activities:					
Accounts receivable, accounts payable and derivative financial instruments	23,636,331	(158,449,370)	45,028,534	—	(89,784,505)
Inventories	83,317	3,508,494	(4,950,690)	—	(1,358,879)
Other assets	(2,405,412)	(22,600,504)	(122,614)	—	(25,128,530)
Employee benefits	2,591,000	136,354,337	(91,652,268)	—	47,293,069
Inter-company charges and deductions	(393,835,932)	(83,049,125)	48,435,633	428,449,424	—
Cash flows (used in) from operating activities	(120,369,710)	(380,943,611)	30,798,680	428,616,558	(41,898,083)
Investing activities:					
Acquisition of wells, pipelines, properties, plant and equipment	(2,172,586)	(147,786,686)	(1,449,208)	—	(151,408,480)
Proceeds from the sale of assets	—	23,611,009	(365,608)	—	23,245,401
Business acquisition	—	—	(4,329,769)	—	(4,329,769)
(Increase) decrease due to Inter-company investing	(39,612,699)	—	—	39,612,699	—
Cash flows used in investing activities	(41,785,285)	(124,175,677)	(6,144,585)	39,612,699	(132,492,848)
Financing activities:					
Increase in equity due to Certificates of Contributions "A"	73,500,000	—	—	—	73,500,000
Loans obtained from financial institutions	571,944,209	34,483,348	235,564,210	—	841,991,767
Debt payments, principal only	(372,809,166)	(6,414,441)	(235,763,722)	—	(614,987,329)
Interest paid	(82,008,347)	(4,706,946)	(2,038,848)	—	(88,754,141)
Inter-company increase (decrease) financing	—	464,488,030	3,741,227	(468,229,257)	—
Cash flows provided by financing activities:	190,626,696	487,849,991	1,502,867	(468,229,257)	211,750,297
Net (decrease) increase in cash and cash equivalents	28,471,701	(17,269,297)	26,156,962	—	37,359,366
Effects of change in cash value	5,570,892	20,371,126	(9,137,751)	—	16,804,267
Cash and cash equivalents at the beginning of the year	58,461,014	6,630,674	44,277,192	—	109,368,880
Cash and cash equivalents at the end of the year	Ps. 92,503,607	Ps. 9,732,503	Ps. 61,296,403	Ps. —	Ps. 163,532,513

NOTE 33. SUPPLEMENTARY INFORMATION ON OIL AND GAS EXPLORATION AND PRODUCTION ACTIVITIES (UNAUDITED)

Under the Mexican Constitution, all crude oil and other hydrocarbon reserves located in the subsoil of Mexico are owned by the Mexican nation and not by PEMEX. In August 2014, through the Round Zero process, the Mexican Government granted PEMEX the right to extract, but not own, certain petroleum and other hydrocarbon reserves in Mexico through assignment deeds.

This note provides supplementary information on the oil and gas exploration, development and production activities of Pemex Exploration and Production in compliance with the U.S. Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) Topic 932 10-5 “Extractive Activities—Oil and Gas” (“ASC Topic 932”) and Accounting Standards Update 2010-03 (see Note 3-G).

As of the date of these consolidated financial statements, all exploration and production activities of Pemex Exploration and Production are conducted in Mexico. The supplemental data presented herein reflect information for all of Pemex Exploration and Production’s oil and gas producing activities.

A. Capitalized costs for oil and gas producing activities (unaudited):

	As of December 31,		
	2018	2017	2016
Proved reserves	Ps. 2,505,307,260	Ps. 2,363,336,481	Ps. 2,476,535,503
Construction in progress	51,033,968	35,381,089	60,720,261
Accumulated depreciation and amortization	(1,572,649,381)	(1,444,962,317)	(1,355,402,150)
Net capitalized costs	<u>Ps. 983,691,846</u>	<u>Ps. 953,755,253</u>	<u>Ps. 1,181,853,614</u>

B. Costs incurred for oil and gas property exploration and development activities (unaudited):

	As of December 31,	
	2018	2017
Exploration	Ps.36,208,481	Ps.32,480,801
Development	56,040,685	53,460,364
Total costs incurred	<u>Ps.92,249,166</u>	<u>Ps.85,941,165</u>

There are no property acquisition costs because PEMEX exploits oil reserves owned by the Mexican nation.

Exploration costs include costs for geological and geophysical studies of fields amounting to Ps. 15,510,327 and Ps. 8,828,809, for 2018 and 2017, respectively, that, in accordance with the successful efforts method of accounting, are accounted for as geological and geophysical exploration expenses.

Development costs include costs incurred in obtaining access to proved reserves and providing facilities for extracting, treating, gathering and storing oil and gas.

C. Results of operations for oil and gas producing activities (unaudited):

	2018	2017	2016
Revenues from sale of oil and gas	Ps.910,433,244	Ps. 762,637,362	Ps. 616,380,608
Hydrocarbon duties	443,491,451	375,156,405	304,299,019
Production costs (excluding taxes)	273,695,691	248,957,950	171,194,337
Other revenue and expenses	(10,109,114)	(3,954,222)	61,359,271
Exploration expenses	30,953,413	14,993,433	39,693,273
Depreciation, depletion, amortization and accretion	28,845,604	240,672,906	(150,891,739)
	<u>766,877,047</u>	<u>875,826,472</u>	<u>425,654,161</u>
Results of operations for oil and gas producing activities	<u>Ps.143,556,198</u>	<u>Ps.(113,189,111)</u>	<u>Ps. 190,726,447</u>

Note: Numbers may not total due to rounding.

D. Sales prices (unaudited)

The following table summarizes average sales prices in U.S. dollars for each of the years ended December 31 (excluding production taxes):

	2018	2017	2016
Weighted average sales price per barrel of oil equivalent (boe) ⁽¹⁾	US\$50.89	US\$38.63	US\$29.18
Crude oil, per barrel	62.99	48.71	36.55
Natural gas, per thousand cubic feet	5.57	4.32	3.01

⁽¹⁾ To convert dry gas to barrels of oil equivalent, a factor of 5.201 thousand cubic feet of dry gas per barrel of oil equivalent is used.

E. Crude oil and natural gas reserves (unaudited)

Under the Mexican Constitution, all oil and other hydrocarbon reserves located in the subsoil of Mexico are owned by the Mexican nation and not by PEMEX. Under the Petróleos Mexicanos Law, Pemex Exploration and Production has the right to extract, but not own, these reserves, and to sell the resulting production. The exploration and development activities of Petróleos Mexicanos and the Subsidiary Entities are limited to reserves located in Mexico.

Proved oil and natural gas reserves are those estimated quantities of crude oil, natural gas and natural gas liquids which geological and engineering data demonstrate with reasonable certainty to be economically producible from a given date forward, from known reservoirs and under existing economic conditions, operating methods and government regulations.

Proved reserves estimates as of December 31, 2018 were prepared by the exploration and production segment and were reviewed by the Independent Engineering Firms (as defined below), which audit its estimates of its hydrocarbon reserves. As of the date of these consolidated financial statements, the proved reserves estimates as of December 31, 2018 have not been approved by the NHC.

Pemex Exploration and Production estimates reserves based on generally accepted petroleum engineering and evaluation methods and procedures, which are based primarily on applicable SEC regulations and, as necessary, the SPE's publication entitled Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserves Information, dated February 19, 2007 and other SPE publications, including the SPE's publication entitled Petroleum Resources Management System, as well as other technical sources, including Estimation and

Classification of Reserves of Crude Oil, Natural Gas, and Condensate, by Chapman Cronquist, and Determination of Oil and Gas Reserves, Petroleum Society Monograph Number 1, published by the Canadian Institute of Mining and Metallurgy & Petroleum. The choice of method or combination of methods employed in the analysis of each reservoir is determined by:

- Experience in the area
- Stage of development
- Quality and completeness of basic data
- Production and pressure histories

Reserves data set forth herein represents only estimates. Reserves valuation is a subjective process of estimating underground accumulations of crude oil and natural gas that cannot be measured in an exact manner. The accuracy of any reserves estimate depends on the quality of available data, engineering and geological interpretation and professional judgment. As a result, estimates of different engineers may vary. In addition, the results of drilling, testing and producing subsequent to the date of an estimate may lead to the revision of an estimate.

During 2018, PEMEX did not record any material increase in PEMEX's hydrocarbons reserves as a result of the use of new technologies.

In order to ensure the reliability of PEMEX's reserves estimation efforts, it has undertaken the internal certification of its estimates of reserves since 1996. PEMEX has established certain internal controls in connection with the preparation of its proved reserves estimates. Initially, teams of geoscientists from Pemex Exploration and Production's exploration and exploitation business units (with each of these units covering several projects) prepare the reserves estimates, using distinct estimation processes for valuations relating to new discoveries and developed fields, respectively. Subsequently, the regional reserves offices collect these reserves estimates from the units and request that the Gerencia de Recursos y Certificación de Reservas (Office of Resources and Reserves Certification), the central hydrocarbon reserves management body of Pemex Exploration and Production, review and certify such valuations and the booking of the related reserves. This internal certification process is undertaken in accordance with internal guidelines for estimating and classifying hydrocarbon reserves, which are based on the SEC's rules and definitions. The Office of Resources and Reserves Certification, which additionally oversees and conducts an internal audit of the above process, consists entirely of professionals with geological, geophysical, petrophysical and reservoir engineering backgrounds. The engineers who participate in PEMEX's reserves estimation process are experienced in the following areas: reservoir numerical simulation; well drilling and completion; pressure, volume and temperature (PVT) analysis; analytical tools used in forecasting the performance of the various elements comprising the production system; and design strategies in petroleum field development. Furthermore, all of PEMEX's personnel have been certified by the Secretaría de Educación Pública (Ministry of Public Education), most have earned master's degrees in areas of study such as petroleum engineering, geology and geophysical engineering and they possess an average of over fifteen years of professional experience.

In addition to this internal review process, Pemex Exploration and Production's final reserves estimates are audited by independent engineering firms. Three independent engineering firms audited Pemex Exploration and Production's estimates of proved reserves as of December 31, 2018: DeGolyer and MacNaughton ("DeGolyer"), Netherland, Sewell International, S. de R.L. de C.V. ("Netherland Sewell") and GLJ Petroleum Consultants LTD. ("GLJ"), the "Independent Engineering Firms". The reserves estimates reviewed by the Independent Engineering Firms totaled 97.0% of PEMEX's estimated proved reserves. The remaining 3.0% of PEMEX's estimated proved reserves consisted of reserves located in certain areas which have been shared with third parties. Under such agreements, the corresponding third party is responsible of assessing the volume of reserves.

Netherland Sewell audited the reserves in the Cantarell, Ku-Maloob-Zaap, Cinco Presidentes and Macuspana-Muspac business units, DeGolyer audited the reserves in the Aceite Terciario de Golfo, Poza Rica-Altamira, Abkatún-Pol-Chuc and Litoral de Tabasco business units and GLJ audited the reserves in the Burgos, Veracruz, Bellota-Jujo and Samaria-Luna business units. The audits conducted by the Independent Engineering Firms consisted primarily of: (1) analysis of historical static and dynamic reservoir data provided by Pemex-Exploration and Production; (2) construction or updating of the Independent Engineering Firms' own static and dynamic reservoir characterization models of some of the fields; (3) economic analysis of the fields; and (4) review of Pemex Exploration and Production's production forecasts and reserves estimates.

Since reserves estimates are, by definition, only estimates, they cannot be reviewed for the purpose of verifying exactness. Instead, the Independent Engineering Firms conducted a detailed review of Pemex Exploration and Production's reserves estimates so that they could express an opinion as to whether, in the aggregate, the reserves estimates that Pemex Exploration and Production furnished were reasonable and had been estimated and presented in conformity with generally accepted petroleum engineering and evaluation methods and procedures.

All questions, including any suggested modifications to proved reserves estimates, that arose during the Independent Engineering Firms' review process were resolved by Pemex Exploration and Production to the satisfaction of the Independent Engineering Firms. The Independent Engineering Firms have concluded that PEMEX's estimated total proved oil and natural gas reserve volumes set forth in this report are, in the aggregate, reasonable and have been prepared in accordance with Rule 4-10(a) are consistent with international reserves reporting practice and are in accordance with the revised oil and gas reserves disclosure provisions of ASC Topic 932.

PEMEX's total proved developed and undeveloped reserves of crude oil, condensates and liquefiable hydrocarbons recoverable from field processing plants decreased by 10.0% in 2018, from 6,427 million barrels at December 31, 2017 to 5,787 million barrels at December 31, 2018. PEMEX's proved developed reserves of crude oil, condensates and liquefiable hydrocarbons recoverable from processing plants decreased by 14.0% in 2018, from 4,166 million barrels at December 31, 2017 to 3,588 million barrels at December 31, 2018. These decreases were principally due to oil production in 2018, a decrease in field development activities and field behavior and the transfer to third parties, who were awarded with contracts, of certain fields such as Cardenas-Mora and Ogarrio, Misión, Miquetla and Ebano, of which PEMEX is assigned approximately 50% of their reserves. The amount of crude oil, condensate and liquefiable hydrocarbon reserves added in 2018 was insufficient to offset the level of production in 2018, which amounted to 743 million barrels of crude oil, condensates and liquefiable hydrocarbons.

PEMEX's proved developed and undeveloped dry gas reserves decreased by 3% in 2018, from 6,593 billion cubic feet at December 31, 2017 to 6,370 billion cubic feet at December 31, 2018. PEMEX's proved developed dry gas reserves decreased by 25 % in 2018, from 4,513 billion cubic feet at December 31, 2017 to 3,380 billion cubic feet at December 31, 2018. These decreases were principally due to oil production in 2018, a decrease in field development activities and field behavior and the transfer to third parties, who were awarded with contracts, of certain fields such as Cardenas-Mora and Ogarrio, Misión, Miquetla and Ebano, of which PEMEX is assigned approximately 50% of their reserves. The amount of dry gas reserves added in 2018 was insufficient to offset the level of production in 2018, which amounted to 887 billion cubic feet of dry gas. PEMEX's proved undeveloped dry gas reserves increased by 16% in 2018, from 2,567 billion cubic feet at December 31, 2017 to 2,990 billion cubic feet at December 31, 2018.

During 2018, our exploratory activity in the deep and shallow waters of the Gulf of Mexico and onshore regions resulted in new discoveries of gas and condensate in the deep water and crude oil discoveries in the offshore fields. These discoveries, together with the successful delineation of the deep water Doctus field with light crude oil and the onshore Ixachi field, led to the incorporation of approximately 1,100 million barrels of oil equivalent in three fields.

The following three tables of crude oil and dry gas reserves set forth PEMEX's estimates of its proved reserves determined in accordance with Rule 4-10(a).

**Summary of oil and gas ⁽¹⁾ proved reserves as of December 31, 2018
based on average fiscal year prices**

	Crude oil and Condensates ⁽²⁾ (in millions of barrels)	Dry Gas ⁽³⁾ (in billions of cubic feet)
Proved developed and un-developed reserves:		
Proved developed reserves	3,488	3,380
Proved undeveloped reserves	2,198	2,990
Total proved reserves	<u>5,787</u>	<u>6,370</u>

Note: Numbers may not total due to rounding.

- (1) PEMEX does not currently produce synthetic oil or synthetic gas, or other natural resources from which synthetic oil or synthetic gas can be produced.
- (2) Crude oil and condensate reserves include the fraction of liquefiable hydrocarbons recoverable in natural gas processing plants located at fields.
- (3) Reserve volumes reported in this table are volumes of dry gas, although natural gas production reported in other tables refers to sour wet gas. There is a shrinkage in volume when natural gas liquids and impurities are extracted to obtain dry gas. Therefore, reported natural gas volumes are greater than dry gas volumes.

Source: Pemex Exploration and Production.

**Crude oil and condensate reserves
(including natural gas liquids) ⁽¹⁾**

	2018	2017	2016
	(in millions of barrels)		
Proved developed and undeveloped reserves:			
At December 31	6,427	7,219	7,977
Revisions ⁽²⁾	22	(95)	189
Extensions and discoveries	140	147	(55)
Production	(743)	(805)	(891)
Farm outs & transfer of fields due to NHC bidding process	(59)	(38)	—
At December 31	<u>5,787</u>	<u>6,427</u>	<u>7,219</u>
Proved developed reserves at December 31	3,488	4,166	4,886
Proved undeveloped reserves at December 31	2,198	2,261	2,333

Note: Numbers may not total due to rounding.

- (1) Crude oil and condensate reserves include the fraction of liquefiable hydrocarbons recoverable in natural gas processing plants located at fields.
- (2) Revisions include positive and negative changes due to new data from well drilling, revisions made when actual reservoir performance differs from expected performance and changes in hydrocarbon prices.

Source: Pemex Exploration and Production.

Dry gas reserves

	2018	2017	2016
	(in billions of cubic feet)		
Proved developed and undeveloped reserves:			
At December 31	6,593	6,984	8,610
Revisions ⁽¹⁾	3	169	(183)
Extensions and discoveries	809	468	(308)
Production ⁽²⁾	(887)	(999)	(1,134)
Farm outs & transfer of fields due to NHC bidding process	(148)	(29)	—
At December 31	<u>6,370</u>	<u>6,593</u>	<u>6,984</u>
Proved developed reserves at December 31	3,380	4,026	4,513
Proved undeveloped reserves at December 31	2,990	2,567	2,471

Note: Numbers may not total due to rounding.

- (1) Revisions include positive and negative changes due to new data from well drilling, revisions made when actual reservoir performance differs from expected performance and changes in hydrocarbon prices.

(2) Production refers here to dry gas, although natural gas production reported in other tables refers to sour wet gas. There is a shrinkage in volume when natural gas liquids and impurities are extracted to obtain dry gas. Therefore, reported natural gas volumes are greater than dry gas volumes. Source: Pemex Exploration and Production.

Pemex Exploration and Production's reserve-replacement ratio, or RRR, for a given period is calculated by dividing the sum of proved reserves additions due to discoveries, developments, delineations and revisions by that period's total production. During 2018, we obtained an increase of 318 million barrels of oil equivalent of proved reserves as aggregated from discoveries, revisions, delimitations and development and production, which represents a RRR of 35%. PEMEX's 2018 RRR is an improvement as compared to 2017, when the RRR was 17%. PEMEX expects continued improvements in its RRR in subsequent years.

PEMEX's reserves production ratio, which is presented in terms of years, is calculated by dividing the estimated remaining reserves at the end of the relevant year by the total production of hydrocarbons for that year. As of December 31, 2018, this ratio stayed constant with 2017 levels and was equal to 7.7 years for proved reserves.

F. Standardized measure of discounted future net cash flows related to proved oil and gas reserves (unaudited)

The standardized measure tables presented below relate to proved oil and gas reserves excluding proved reserves scheduled to be produced after the year 2042. This measure is presented in accordance with ASC Topic 932.

Estimated future cash inflows from production are computed by applying average prices of oil and gas on the first day of each month of 2018. Future development and production costs are those estimated future expenditures needed to develop and produce the year-end estimated proved reserves after a net cash flows discount factor of 10%, assuming constant year-end economic conditions.

Future tax expenses are computed by applying the appropriate year-end statutory tax rates with consideration of the tax rates of the new fiscal regime for Pemex Exploration and Production already legislated for 2018 to the future pre-tax net cash flows related to PEMEX's proved oil and gas reserves.

The estimated future payment of taxes was calculated based on fiscal regime applicable by decree to Pemex Exploration and Production effective January 1, 2015 and by the tax benefits published in the Official Gazette of the Federation on April 18, 2016.

The standardized measure provided below represents a comparative benchmark value rather than an estimate of expected future cash flows or fair market value of PEMEX's production rights. There are numerous uncertainties inherent in estimating quantities of proved reserves and in projecting future rates of production and timing of development expenditures, including many factors beyond the control of the producer. Accordingly, reserve estimates may be materially different from the quantities of crude oil and natural gas that are ultimately recovered.

Standardized measure of discounted future net cash flows as of December 31

	2018	2017	2016
		(in millions of U.S. dollars)	
Future cash inflows	US\$ 321,065	US\$ 269,489	US\$ 228,196
Future production costs (excluding profit taxes)	(103,498)	(114,369)	(87,942)
Future development costs	(22,224)	(26,229)	(25,515)
Future cash flows before tax	195,343	128,891	114,738
Future production and excess gains taxes	(156,691)	(129,377)	(108,960)
Future net cash flows	38,652	(487)	5,779
Effect of discounting net cash flows by 10%	(12,434)	(4,600)	(937)
Standardized measure of discounted future net cash flows	<u>US\$ 26,218</u>	<u>US\$ 4,113</u>	<u>US\$ 4,841</u>

Note: Table amounts may not total due to rounding.

To comply with ASC Topic 932, the following table presents the aggregate standardized measure changes for each of the last three years and significant sources of variance:

Changes in standardized measure of discounted future net cash flows

	<u>2018</u>	<u>2017</u>	<u>2016</u>
		(in millions of U.S. dollars)	
Sales of oil and gas produced, net of production costs	US\$(31,279)	US\$(25,076)	US\$(19,411)
Net changes in prices and production costs	62,902	26,355	(53,278)
Extensions and discoveries	4,323	3,639	1,105
Development cost incurred during the year	2,984	2,699	4,124
Changes in estimated development costs	(2,146)	2,744	1,763
Reserves revisions and timing changes	1,511	(1,353)	6,366
Accretion of discount of pre-tax net cash flows	6,628	5,891	11,094
Net changes in production and excess gains taxes	<u>(22,817)</u>	<u>(15,628)</u>	<u>37,537</u>
Aggregate change in standardized measure of discounted future net cash flows	<u>US\$ 22,105</u>	<u>US\$ (728)</u>	<u>US\$(10,700)</u>
Standardized measure:			
As of January 1	US\$ 4,113	US\$ 4,841	US\$ 15,541
As of December 31	26,218	4,113	4,841
Change	<u>US\$ 22,105</u>	<u>US\$ (728)</u>	<u>US\$(10,700)</u>

Note: Table amounts may not total due to rounding.

In computing the amounts under each factor of change, the effects of variances in prices and costs are computed before the effects of changes in quantities. Consequently, changes in reserves are calculated at December 31 prices and costs.

The change in computed taxes includes taxes effectively incurred during the year and the change in future tax expense.

ANNEX Resolution CA-111/2018

DECLARATION OF LIQUIDATION AND DISSOLUTION OF THE STATE-OWNED SUBSIDIARY PRODUCTION COMPANY OF PETRÓLEOS MEXICANOS, KNOWN AS PEMEX COGENERACIÓN Y SERVICIOS, ISSUED BY THE BOARD OF DIRECTORS OF PETRÓLEOS MEXICANOS, IN ACCORDANCE WITH ARTICLES 13, PARTS XXVI AND XXIX AND 66 OF THE PETRÓLEOS MEXICANOS LAW.

BACKGROUND

Article 25 of the Mexican Constitution establishes, among other things, that the public sector shall have sole control over the strategic areas listed in Article 28, paragraph four of the Constitution, and that the Federal Government should, at all times, maintain ownership and control of any State-owned production companies and organizations that may be created. Article 25 also provides that the law shall establish, among other things, the rules for the administration, organization and operation of said companies.

Transitional Article Twenty, part III, of the Decree reforming and adding several provisions of the Constitution of the United Mexican States on Energy Matters, published in the Federal Official Gazette on 20 December 2013, provides that the legal framework for regulating State-owned Production Companies shall, at a minimum, establish that their organization, administration and corporate structure must be in line with international best practices, ensuring their technical and management autonomy, in addition to a special contracting system designed to obtain the best results from their activities, such that the governing bodies have the necessary authority to determine their institutional arrangement.

On 11 August 2014, the Decree issuing the Petróleos Mexicanos Law, among other things, was published in the Federal Official Gazette.

Under Articles 59 and 60 of said law, Petróleos Mexicanos may have subsidiary production companies, which shall have their own legal personality and assets, which shall be organized and operate in accordance with the provisions of said Law and any that may be derived from it, subject to the leadership, direction and coordination of Petróleos Mexicanos; they shall engage in such activities as the Board of Directors of Petróleos Mexicanos may determine, and operate subject to the special regime provided in said Law.

Article 62 of the Law of Petróleos Mexicanos establishes that the creation, merger or spin-off of subsidiary production companies shall be authorized by the Board of Directors of Petróleos Mexicanos, at the request of its Director General, by adopting the respective Resolution, which shall serve as the instrument establishing them, which must be published in the Federal Official Gazette and which shall establish, at a minimum, what is provided in said provision.

[seal: SECRETARY OF THE BOARD OF DIRECTORS
PEMEX
PETRÓLEOS MEXICANOS]

ANNEX Resolution CA-111/2018

On 18 November 2015, via Resolution CA-128/2014, the Board of Directors of Petróleos Mexicanos approved the first corporate reorganization of said company, which included the creation of its subsidiary production companies.

In said Resolution, the Board of Directors of Petróleos Mexicanos approved the transformation of the subsidiary organization known as Pemex-Exploración y Producción to create a subsidiary production company known as Pemex Exploración y Producción, the reorganization of the subsidiary organizations known as Pemex-Refinación, Pemex Gas y Petroquímica Básica and Pemex Petroquímica to create a subsidiary production company called Pemex Transformación Industrial, in addition to creating five subsidiary production companies to integrate the functions of Cogeneration and Services, among others.

Under Transitional Provision Eight, Paragraph A, part III of the Petróleos Mexicanos Law, the Board of Directors of Petróleos Mexicanos issued the Resolutions to create the new subsidiary production companies, which were published in the Federal Official Gazette on 28 April 2015, and the Declaration of entrance into effect of the Resolution creating Pemex Cogeneración y Servicios was published in the same publication on 29 May 2015.

The corporate purpose of Pemex Cogeneración y Servicios was to generate, supply and sell electric and thermal power, including that produced at electric power generation and cogeneration plants, in addition to providing technical and administrative services associated with said activities to Petróleos Mexicanos, its subsidiary production companies, affiliates and third parties, either directly or through companies in which it holds direct or indirect interest.

However, under current market conditions, it was determined that the profit from Pemex Cogeneración y Servicios was not generating economic value or profit for the Mexican government. It was also determined that, for purposes of optimizing profits, Petróleos Mexicanos required a corporate reorganization that would maintain the continuity of the cogeneration strategy without the need to maintain and operate said subsidiary production company.

Article 66 of the Petróleos Mexicanos Law establishes that the liquidation of subsidiary production companies requires a resolution adopted by the Board of Directors of Petróleos Mexicanos at the proposal of its Director General, and the respective process shall take place in accordance with the guidelines set forth therein.

Thus, the Board of Directors of Petróleos Mexicanos, in Extraordinary Meeting No. 922 held on 5 October 2017, adopted Resolution CA-098/2017, authorizing the Corporate Reorganization of Petróleos Mexicanos as a result of strategic change in the lines of business, including the transfer of the functions, rights and obligations of the subsidiary production company Pemex Cogeneración y Servicios to the subsidiary production company Pemex Transformación Industrial, and consequently the liquidation of Pemex

[seal: SECRETARY OF THE BOARD OF DIRECTORS
PEMEX
PETRÓLEOS MEXICANOS]

ANNEX Resolution CA-111/2018

Cogeneración y Servicios in accordance with the Guidelines issued by said governing body.

Upon the completion of the liquidation process, the Board of Directors of Petróleos Mexicanos, in Ordinary Meeting 929 held on 13 July 2018, in Resolution CA-111/2018, approved the Final Report on the process of Liquidation of the Petróleos Mexicanos State-owned Subsidiary Production Company called Pemex Cogeneración y Servicios, including the company's financial statements audited by an external auditor, from 5 October 2017 to 31 December 2017 and 18 June 2018, approved by the Board of Directors of Pemex Cogeneración y Servicios at its Closing Meeting.

Based on all of the foregoing, we issue this Declaration of Liquidation and Dissolution of the Petróleos Mexicanos State-owned subsidiary production company known as Pemex Cogeneración y Servicios.

DECLARATION OF LIQUIDATION AND DISSOLUTION OF THE PETRÓLEOS MEXICANOS STATE-OWNED SUBSIDIARY PRODUCTION COMPANY KNOWN AS PEMEX COGENERACIÓN Y SERVICIOS

ONE.- Under Article 66 of the Law of Petróleos Mexicanos, the Board of Directors of Petróleos Mexicanos issues this Declaration of Liquidation and Dissolution of the Petróleos Mexicanos State-owned Subsidiary Production Company known as Pemex Cogeneración y Servicios.

TRANSITIONAL PROVISIONS

One. This Declaration of Liquidation and Dissolution shall enter into effect on the day after it is published in the Federal Official Gazette.

Two. As a result of the Dissolution of Pemex Cogeneración y Servicios, the Board of Directors of said company is also dissolved.

Three: The subsidiary production company known as Pemex Transformación Industrial is subrogated to any obligation or right previously acquired in Mexico or abroad by the subsidiary production company Pemex Cogeneración y Servicios that is in effect on the date this Declaration enters into effect.

Four. The appointments, powers of attorney, agency agreements, and any and all other powers of representation or authority granted by Pemex Cogeneración y Servicios are hereby revoked and have no legal value or effect whatsoever.

Five. This Declaration of Liquidation and Dissolution must be published in the Federal Official Gazette through the Petróleos Mexicanos Legal Department.

Mexico City, 13 July 2018

[seal: SECRETARY OF THE BOARD OF DIRECTORS
PEMEX
PETRÓLEOS MEXICANOS]



April 25, 2019

Project 1192066

Ing. Octavio Romero Oropeza
Director General
Petróleos Mexicanos
Avenida Marina Nacional No. 329
Torre Ejecutiva, Piso 44
Colonia Verónica Anzures
11300 Ciudad de México, México

Dear Ing. Octavio Romero Oropeza:

We hereby consent to all references to our firm as set forth in the Annual Report on Form 20-F of Petróleos Mexicanos (“Pemex”) for the year ending December 31, 2018 (the “Form 20-F”), under the heading “Exploration and Production (Reserves),” and to the filing of our audit letter dated April 15, 2019, as an exhibit to the Form 20-F. We have audited the estimates of Pemex’s proved oil, condensate, natural gas, and oil equivalent reserves, as of December 31, 2018, for 37 fields located in the Veracruz business units in the Northern region of Mexico. These estimates were prepared by Pemex Exploración y Producción in accordance with the reserves definitions of Regulation S-X Rule 4-10(a) of the U.S. Securities and Exchange Commission.

Sincerely,

GLJ PETROLEUM CONSULTANTS LTD.

/s/ CHAD P. LEMKE, P. ENG.

Chad P. Lemke, P. Eng.

Vice President

CPL/jem
Attachments



April 25, 2019

Project 1192058

Ing. Octavio Romero Oropeza
Director General
Petróleos Mexicanos
Avenida Marina Nacional No. 329
Torre Ejecutiva, Piso 44
Colonia Verónica Anzures
11300 Ciudad de México, México

Dear Ing. Octavio Romero Oropeza:

We hereby consent to all references to our firm as set forth in the Annual Report on Form 20-F of Petróleos Mexicanos (“Pemex”) for the year ending December 31, 2018 (the “Form 20-F”), under the heading “Exploration and Production (Reserves),” and to the filing of our audit letter dated April 15, 2019, as an exhibit to the Form 20-F. We have audited the estimates of Pemex’s proved oil, condensate, natural gas, and oil equivalent reserves, as of December 31, 2018, for 105 fields located in the Burgos business units in the Northern region of Mexico. These estimates were prepared by Pemex Exploración y Producción in accordance with the reserves definitions of Regulation S-X Rule 4-10(a) of the U.S. Securities and Exchange Commission.

Sincerely,

GLJ PETROLEUM CONSULTANTS LTD.

/s/ CHAD P. LEMKE, P. ENG.

Chad P. Lemke, P. Eng.

Vice President

CPL/jem
Attachments



April 25, 2019

Project 1192030

Ing. Octavio Romero Oropeza
Director General
Petróleos Mexicanos
Avenida Marina Nacional No. 329
Torre Ejecutiva, Piso 44
Colonia Verónica Anzures
11300 Ciudad de México, México

Dear Ing. Octavio Romero Oropeza:

We hereby consent to all references to our firm as set forth in the Annual Report on Form 20-F of Petróleos Mexicanos (“Pemex”) for the year ending December 31, 2018 (the “Form 20-F”), under the heading “Exploration and Production (Reserves),” and to the filing of our audit letter dated April 15, 2019, as an exhibit to the Form 20-F. We have audited the estimates of Pemex’s proved oil, condensate, natural gas, and oil equivalent reserves, as of December 31, 2018, for 39 fields located in the Samaria-Luna and Bellota-Jujo business units in the Southern region of Mexico. These estimates were prepared by Pemex Exploración y Producción in accordance with the reserves definitions of Regulation S-X Rule 4-10(a) of the U.S. Securities and Exchange Commission.

Sincerely,

GLJ PETROLEUM CONSULTANTS LTD.

/s/ LEONARD L. HERCHEN, P. ENG.

Leonard L. Herchen, P. Eng.
Vice President

LLH/jem
Attachments

PEMEX EXPLORACIÓN Y PRODUCCIÓN
RESERVES AUDIT OF
MEXICAN OIL AND GAS PROPERTIES
ACTIVO INTEGRAL DE PRODUCCIÓN BLOQUE N03

PROVED RESERVES
(SEC RESERVES DEFINITIONS)

Effective December 31, 2018

Prepared by
Chad P. Lemke, P. Eng.

1192066

PROVED RESERVES AUDIT - SEC

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April 15, 2019

Project 1192066

Ing. Octavio Romero Oropeza Director General
Petróleos Mexicanos
Avenida Marina Nacional No. 329
Torre Ejecutiva, Piso 44
Colonia Verónica Anzures
11300 Ciudad de México, México

Dear Ing. Octavio Romero Oropeza:

**Re: Pemex Exploración y Producción
Proved Reserves Audit – SEC Reserves Definitions
Activo Integral de Producción Bloque N03
Effective December 31, 2018**

At the request of Pemex Exploración y Producción (the “Company”), a wholly owned subsidiary of Petróleos Mexicanos (Pemex), GLJ Petroleum Consultants Ltd. (GLJ) has conducted a reserves audit of the proved reserves estimates of certain oil and gas properties owned by the United Mexican States. The effective date of the proved reserves is December 31, 2018 and the reserves audit was completed on April 1, 2019. The Company has represented that these properties account for 6.4 percent on a net oil equivalent barrel basis of Company’s net total proved reserves as of the effective date. There are 37 fields associated with the properties reviewed by GLJ, and they are located in the Veracruz business units in the Northern region of Mexico.

The estimates audited by GLJ were prepared by the Company in accordance with the reserves definitions of Regulation S-X Rule 4-10(a) of the U.S. Securities and Exchange Commission (SEC). GLJ’s third party reserves audit was prepared for public disclosure by Pemex in filings made with the SEC in accordance with the disclosure requirements set forth in the SEC regulations.

According to the Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserves Information (SPE auditing standards) published by the Society of Petroleum Engineers (2007), “An audit is an examination of Reserves Information that is conducted for the purpose of expressing an opinion as to whether such Reserves Information, in the aggregate, is reasonable and has been estimated by qualified individuals and presented in conformity

with generally accepted petroleum engineering and evaluation principles and in compliance with the relevant reserves definitions”.

Reserves are estimated remaining quantities of oil and gas and related substances anticipated to be economically producible, as of a given date, by application of development projects to known accumulations. All reserve estimates involve some degree of uncertainty. The uncertainty depends chiefly on the amount of reliable geologic and engineering data available at the time of the estimate and the interpretation of these data. The relative degree of uncertainty may be conveyed by placing reserves into one of two principal classifications, either proved or unproved. Unproved reserves are less certain to be recovered than proved reserves and may be further sub-classified as probable and possible reserves to denote progressively increasing uncertainty in their recoverability. At Company’s request, this report addresses only the proved reserves attributable to the properties reviewed herein.

The company provided a table with their reserves estimates by field and all pertinent well and reservoir data such as geological maps, well logs, production and injection history, drill stem tests, workovers, pressure surveys, production tests, fluid analysis, and planned development activities. The proved reserves prepared by the Company for the properties that GLJ reviewed were estimated based on volumetric calculations, decline analysis or material balance methods or by any combination of the aforementioned methods depending on the available data and the significance of the property within the overall corporate portfolio.

The economic parameters such as operating costs, capital costs, process losses, liquid yields, abandonment cost and product pricing provided by the company were accepted by GLJ without review or verification. Prices, operating and capital costs, including maintenance capital, were provided by the Company in 2019 dollars with no future escalation.

While the oil and gas industry may be subject to regulatory changes from time to time that could affect an industry participant’s ability to recover its reserves, we are not aware of any such governmental actions which would restrict the recovery of the effective date estimated reserves.

GLJ has used all assumptions, data, procedures, and methods that it considers necessary and appropriate to prepare this report. For significant properties with performance-based assignments, GLJ reviewed the volumetric recovery to address the reasonableness of the assignment and development activity considered by the Company. In fields with significant performance and pressure data, the Company maps and geological models were accepted, but in cases where volumetric analysis formed the primary basis for the Company’s reserves estimate, GLJ audited Company maps in more detail, including a review of associated geophysical interpretations.

Based on our review, including the data, technical processes and interpretations presented by the Company, it is our opinion that the overall procedures and methodologies utilized by the Company in preparing their estimates of the proved reserves as of December 31, 2018 comply with the current SEC regulations, and that the overall proved reserves for the reviewed properties as estimated by the Company are, in the aggregate, reasonable within the established audit tolerance guidelines of 10 percent set forth in the SPE auditing standards. As in all aspects of oil and gas evaluation, there are uncertainties inherent in the interpretation of engineering and geoscience data; therefore, our conclusions necessarily represent only informed professional judgment.

It is trusted that this audit meets your current requirements. Should you have any questions regarding this analysis, please contact the undersigned.

Yours very truly,

GLJ PETROLEUM CONSULTANTS LTD.

/s/ CHAD P. LEMKE, P. ENG.

Chad P. Lemke, P. Eng.

Vice President

CPL/jem
Attachments

INTRODUCTION

GLJ Petroleum Consultants Ltd (GLJ) was commissioned by Pemex Exploración y Producción (the “Company”), a subsidiary of Petroleos Mexicanos, to prepare a reserves audit of the gross (100 percent) proved reserves and net gas reserves in 37 fields in Activo Integral de Producción Bloque N03 Veracruz. The effective date of the proved reserves is December 31, 2018 and the reserves audit was completed on April 1, 2019. The Political Constitution of the United Mexican States provides that the Mexican nation owns all petroleum and other hydrocarbon reserves for these fields; however, these fields have been assigned to and are currently operated by the Company.

The estimates audited by GLJ were prepared by the Company based on the definitions and disclosure guidelines of the United States Securities and Exchange Commission contained in the Title 17, Code of Federal Regulations, Modernization of Oil and Gas Reporting, Final Rule released January 14, 2009, in the Federal Register (SEC regulations). GLJ’s third party reserves audit was prepared for public disclosure by Pemex in filings made with the SEC in accordance with the disclosure requirements set forth in the SEC regulations.

According to the Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserves Information (SPE auditing standards) published by the Society of Petroleum Engineers (2007), “Reserves Audit is the process of reviewing certain of the pertinent facts interpreted and assumptions made that have resulted in an estimate of reserves and/or Reserves Information prepared by others and the rendering of an opinion about (1) the appropriateness of the methodologies employed, (2) the adequacy and quality of the data relied upon, (3) the depth and thoroughness of the reserves estimation process, (4) the classification of reserves appropriate to the relevant definitions used, and (5) the reasonableness of the estimated reserves quantities and/or the Reserves Information” (section 2.2 (f)). Reserves Information may consist of various estimates pertaining to the extent and value of petroleum properties.

Based on our review, including the data, technical processes and interpretations presented by the Company, it is our opinion that the overall procedures and methodologies utilized by the Company in preparing their estimates of the proved reserves as of December 31, 2018 comply with the current SEC regulations, and that the overall proved reserves for the reviewed properties as estimated by the Company are, in the aggregate, reasonable within the established audit tolerance guidelines of 10 percent set forth in the SPE auditing standards.

For the reserves and income projections, the Company stated they used unweighted arithmetic average prices in effect at the first day of the month during the 12-month period prior to December 31, 2018 (the effective date), unless prices were defined by contractual arrangements, as required by the SEC regulations. Reserves were estimated by the Company to the economic limit of production. The following table sets forth the total proved net after royalty reserves under constant prices and costs as estimated by the Company attributable to the properties that GLJ reviewed are summarized below:

SEC PARAMETERS
 Estimated Net Proved Reserves Audited by GLJ Petroleum Consultants
 Attributable to Certain Properties-Activo Integral de Producción Bloque N03, Veracruz
 As of December 31, 2018

Category	Oil ⁽¹⁾ (MMbbl)	Gross Gas ⁽²⁾ (MMMcf)	Plant Inlet Gas ⁽³⁾ (MMMcf)	Condensate ⁽⁴⁾ (MMbbl)	Plant Liquids ⁽⁵⁾ (MMbbl)	Dry Gas ⁽⁶⁾ (MMboe)	BOE ⁽⁷⁾ (MMboe)
Proved Developed Producing	25.9	232.6	223.7	0.3	0.7	42.7	69.6
Proved Developed Non-producing	15.5	98.3	97.6	0.0	0.0	18.8	34.2
Proved Undeveloped	141.5	1069.4	1069.0	0.0	0.0	205.5	347.0
Total Proved	182.8	1400.3	1390.4	0.3	0.7	267.0	450.9

- (1) Oil is produced oil and liquids separated from gas in the field
- (2) Gross Gas is gas produced before any losses for fuel use, venting, transporting or plant shrinkage, net of re-injection
- (3) Plant Inlet Gas is gas volumes measured at plant inlet, that is, gas in the reservoirs to be produced after shrinkage resulting from field separation and flaring, net of re-injection
- (4) Condensate is condensate extracted during processing within a gas plant
- (5) Plant Liquids are liquids other than condensate extracted during processing within a gas plant
- (6) Dry Gas is gas after sweetening and removal of condensate and plant liquids and adjustment for re-injection and fuel losses. Units in barrels of oil equivalent using gas conversion factors provided by the Company
- (7) Barrels of oil equivalent were estimated assuming property specific ratio based on sales gas heating values provided by the Company

Liquid hydrocarbons are expressed in millions of barrels (MMbbl) and gas volumes are expressed in billions of cubic feet (MMMcf) at the official temperature and pressure bases of the areas in which the gas reserves are located. The net remaining reserves are also shown herein on an equivalent unit (BOE) basis wherein natural gas is converted to oil equivalent barrels using a specific factor for each field. MMboe represents million barrels of oil equivalent.

GLJ notes that the Company has represented that its management of the of the produced fluids ends at the inlet of the gas processing plants. The reserves estimates include estimates of oil, plant condensate, plant inlet gas, sales gas, natural gas liquids and oil equivalent totals.

As the Company has also represented that all subsurface hydrocarbons belong to the United Mexican States, and given that the Company has also represented that it has been assigned a 100 percent interest in the audit properties by the United Mexican States, gross and net reserves are equal.

The Audit Procedure section outlines general procedures used in preparing this audit.

SEC RESERVES DEFINITIONS

The following definitions are excerpts from Regulation S-X 210.4-10. Portions of these definitions within square parentheses, [], have been transposed from other sections of Regulation S-X 210.4-10 to improve readability.

Resources

Resources are quantities of oil and gas estimated to exist in naturally occurring accumulations. A portion of the resources may be estimated to be recoverable, and another portion may be considered to be unrecoverable. Resources include both discovered and undiscovered accumulations.

Reserves

Reserves are estimated remaining quantities of oil and gas and related substances anticipated to be economically producible, as of a given date, by application of development projects to known accumulations. In addition, there must exist, or there must be a reasonable expectation that there will exist, the legal right to produce or a revenue interest in the production, installed means of delivering oil and gas or related substances to market, and all permits and financing required to implement the project.

Note: Reserves should not be assigned to adjacent reservoirs isolated by major, potentially sealing, faults until those reservoirs are penetrated and evaluated as economically producible. Reserves should not be assigned to areas that are clearly separated from a known accumulation by a non-productive reservoir (i.e. , absence of reservoir, structurally low reservoir, or negative test results). Such areas may contain prospective resources (i.e., potentially recoverable resources from undiscovered accumulations).

Proved Oil and Gas Reserves

Proved oil and gas reserves are those quantities of oil and gas, which, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be economically producible—from a given date forward, from known reservoirs, and under existing economic conditions, operating methods, and government regulations—prior to the time at which contracts providing the right to operate expire, unless evidence indicates that renewal is reasonably certain, regardless of whether deterministic or probabilistic methods are used for the estimation. The project to extract the hydrocarbons must have commenced or the operator must be reasonably certain that it will commence the project within a reasonable time.

- (i) The area of the reservoir considered as proved includes:
 - (A) The area identified by drilling and limited by fluid contacts, if any, and
 - (B) Adjacent undrilled portions of the reservoir that can, with reasonable certainty, be judged to be continuous with it and to contain economically producible oil or gas on the basis of available geoscience and engineering data.
- (ii) In the absence of data on fluid contacts, proved quantities in a reservoir are limited by the lowest known hydrocarbons (LKH) as seen in a well penetration unless geoscience, engineering, or performance data and reliable technology establishes a lower contact with reasonable certainty.
- (iii) Where direct observation from well penetrations has defined a highest known oil (HKO) elevation and the potential exists for an associated gas cap, proved oil reserves may be assigned in the structurally higher portions of the reservoir only if geoscience, engineering, or performance data and reliable technology establish the higher contact with reasonable certainty.

- (iv) Reserves which can be produced economically through application of improved recovery techniques (including, but not limited to, fluid injection) are included in the proved classification when:
 - (A) Successful testing by a pilot project in an area of the reservoir with properties no more favorable than in the reservoir as a whole, the operation of an installed program in the reservoir or an analogous reservoir, or other evidence using reliable technology establishes the reasonable certainty of the engineering analysis on which the project or program was based; and
 - (B) The project has been approved for development by all necessary parties and entities, including governmental entities.
- (v) Existing economic conditions include prices and costs at which economic producibility from a reservoir is to be determined. The price shall be the average price during the 12-month period prior to the ending date of the period covered by the report, determined as an unweighted arithmetic average of the first-day-of-the-month price for each month within such period, unless prices are defined by contractual arrangements, excluding escalations based upon future conditions.

Developed Oil and Gas Reserves

Developed oil and gas reserves are reserves of any category that can be expected to be recovered:

- (i) Through existing wells with existing equipment and operating methods or in which the cost of the required equipment is relatively minor compared to the cost of a new well; and
- (ii) Through installed extraction equipment and infrastructure operational at the time of the reserves estimate if the extraction is by means not involving a well.

Undeveloped Oil and Gas Reserves

Undeveloped oil and gas reserves are reserves of any category that are expected to be recovered from new wells on undrilled acreage, or from existing wells where a relatively major expenditure is required for recompletion.

- (i) Reserves on undrilled acreage shall be limited to those directly offsetting development spacing areas that are reasonably certain of production when drilled, unless evidence using reliable technology exists that establishes reasonable certainty of economic producibility at greater distances.
- (ii) Undrilled locations can be classified as having undeveloped reserves only if a development plan has been adopted indicating that they are scheduled to be drilled within five years, unless the specific circumstances, justify a longer time.
- (iii) Under no circumstances shall estimates for undeveloped reserves be attributable to any acreage for which an application of fluid injection or other improved recovery technique is contemplated, unless such techniques have been proved effective by actual projects in the same reservoir or an analogous reservoir [see Other Definitions below], or by other evidence using reliable technology establishing reasonable certainty.

Other Pertinent Definitions

Analogous Reservoir

Analogous reservoirs, as used in resources assessments, have similar rock and fluid properties, reservoir conditions (depth, temperature, and pressure) and drive mechanisms, but are typically at a more advanced stage of development than the reservoir of interest and thus may provide concepts to assist in the interpretation of more limited data and estimation of recovery. When used to support proved reserves, an “analogous reservoir” refers to a reservoir that shares the following characteristics with the reservoir of interest:

- (i) Same geological formation (but not necessarily in pressure communication with the reservoir of interest);
- (ii) Same environment of deposition;
- (iii) Similar geological structure; and
- (iv) Same drive mechanism.

Reasonable Certainty

If deterministic methods are used, reasonable certainty means a high degree of confidence that the quantities will be recovered. If probabilistic methods are used, there should be at least a 90% probability that the quantities actually recovered will equal or exceed the estimate. A high degree of confidence exists if the quantity is much more likely to be achieved than not, and, as changes due to increased availability of geoscience (geological, geophysical, and geochemical), engineering, and economic data are made to estimated ultimate recovery (EUR) with time, reasonably certain EUR is much more likely to increase or remain constant than to decrease.

Reliable Technology

Reliable technology is a grouping of one or more technologies (including computational methods) that has been field tested and has been demonstrated to provide reasonably certain results with consistency and repeatability in the formation being evaluated or in an analogous formation.

Reservoir

A porous and permeable underground formation containing a natural accumulation of producible oil and/or gas that is confined by impermeable rock or water barriers and is individual and separate from other reservoirs.

EVALUATION PROCEDURE

The following outlines the methodology employed by GLJ Petroleum Consultants (GLJ) in conducting the audit of the Company's oil and gas proved reserves comprising the properties mentioned above. This audit has been prepared in accordance with definitions and standards under the U.S. Financial Accounting Standard Board (FASB) policies and legal requirements of the U.S. Securities and Exchange Commission (SEC).

INTEREST DESCRIPTIONS

The Company provided GLJ with current land interest information.

The Company has represented that all subsurface hydrocarbons belong to the United Mexican States, and that the Company has been assigned a 100 percent interest in the audited properties by the United Mexican States; therefore, gross and net reserves are equal. The cash flow and production forecasts were limited by economic limits not by a lease expiry.

DATA PROVIDED

The company provided a table with their reserves estimates by field. Additionally, all pertinent well, reservoir and economic data such as geological maps, well logs, production and injection history, drill stem tests, workovers, pressure surveys, production tests, fluid analysis, planned development activities, operating expenses, capital costs, abandonment cost, process losses, liquid yields, etc., were provided by the Company.

TECHNICAL REVIEW

GLJ performs a bottoms-up analysis where individual properties are audited. Auditors review historical production, well activity, mapping, pressure data -and development plans as well as the evaluation approach used by the Company. Meetings with the Company were held to determine the Company's view of the reservoirs and technical justification for future development.

The proved reserves prepared by the Company for the properties that GLJ reviewed were estimated based on volumetric calculations, decline analysis or material balance methods or by any combination of the aforementioned methods depending on the available data and the significance of the property within the overall corporate portfolio. Where possible, performance based reserve assignments were made by the Company. For significant properties with performance based assignments, GLJ reviewed the volumetric recovery to address the reasonableness of the assignment and development activity considered by the Company. In fields with significant performance and pressure data, the Company maps and geological models were accepted, but in cases where volumetric analysis formed the primary basis for the Company's reserves estimate, GLJ audited Company maps in more detail, including a review of associated geophysical interpretations.

Data used in the audit were obtained from Company personnel and Company files. In the preparation of our report GLJ accepted as presented, and have relied, without independent verification, upon a variety of information furnished by the Company such as interests and burdens, production, product transportation and marketing and sales agreements, capital costs, operating expense data, and capital cost estimates. If in the course of the audit, the validity or sufficiency of any material information was brought into question, GLJ did not rely on such information until such concerns were satisfactorily resolved.

The economic parameters such as operating costs, capital costs, process losses, liquid yields, abandonment cost and product pricing provided by the company were accepted by GLJ without review or verification. Prices, operating and capital costs, including maintenance capital, were provided by the Company in 2019 dollars with no future escalation.

Reserves were estimated by the Company to the economic limit of production.

MARKETABLE PRODUCTS

Recoverable reserves were estimated by the Company to the following products:

Oil	Produced oil and liquids separated from gas in the field
Condensate	Condensate extracted during processing within a gas plant
Plant Liquids	Liquids other than condensate extracted during processing within a gas plant
Plant Inlet Gas	Gas volumes measured at plant inlet, that is, gas in the reservoirs to be produced after shrinkage resulting from field separation and flaring, net of re-injection
Dry Gas	Gas after sweetening and removal of condensate and plant liquids and adjustment for re-injection and fuel losses

GLJ note that the Company has represented to GLJ that its management of the produced fluids ends at the inlet of the gas processing plants. In the economic forecasts, the gas prices presented is the well head price in terms of sales gas. As the gas price received is assumed to include value for plant liquids, no additional revenue is forecast for plant liquids.

The Company also presented quantities of hydrocarbons in barrels of oil equivalent (boe) using its conversion factors.

LIST OF ABBREVIATIONS

AOF	absolute open flow
bbbl	barrels
Bcf	billion cubic feet of gas at standard conditions
BIIP	bitumen initially-in-place
boe	barrel of oil equivalent, in this evaluation determined using 6 Mcf/boe for gas, 1 bbl/boe for all liquids, and 0 boe for sulphur
bopd	barrels of oil per day
Btu	British thermal units
bwpd	barrels of water per day
DSU	drilling spacing unit
GCA	gas cost allowance
GIIP	gas initially-in-place
GOC	gas-oil contact
GOR	gas-oil ratio
GORR	gross overriding royalty
GWC	gas-water contact
Mbbl	thousand barrels
Mboe	thousand boe
Mcf	thousand cubic feet of gas at standard conditions
Mcfe	thousand cubic feet of gas equivalent
Mlt	thousand long tons
M\$	thousand dollars
MM\$	million dollars
MMbbl	million barrels
MMboe	million boe
MMBtu	million British thermal units
MMcf	million cubic feet of gas at standard conditions
MRL	maximum rate limitation
Mstb	thousand stock tank barrels
MMstb	million stock tank barrels
NGL	natural gas liquids (ethane, propane, butane and condensate)
NPI	net profits interest
OIIP	oil initially-in-place
ORRI	overriding royalty interest
OWC	oil-water contact
P&NG	petroleum and natural gas
PIIP	petroleum initially-in-place
psia	pounds per square inch absolute
psig	pounds per square inch gauge
PVT	pressure-volume-temperature
RLI	reserves life index, calculated by dividing reserves by the forecast of first year production
scf	standard cubic feet
sge	sales gas equivalent – if presented in this evaluation, determined using 1 barrel of oil or natural gas liquid = 6 Mcfe; 0 for sulphur
stb	stock tank barrel
WI	working interest
WTI	West Texas Intermediate

PRODUCT PRICE AND MARKET FORECASTS
December 31, 2018

The Company provided prices for products on a field basis. The table below summarizes the volume weighted average price for the aggregate properties in the “Activo Integral de Producción Bloque N03”, Veracruz. The volume weighted average prices for 2018 are:

Oil	64.97/bbl
Condensate	62.47/bbl
Plant Inlet Gas	3.728/mcf



APPENDIX I
CERTIFICATES OF QUALIFICATION

Chad P. Lemke



CERTIFICATION OF QUALIFICATION

I, Chad P. Lemke, Professional Engineer, 4100, 400 - 3rd Avenue S.W., Calgary, Alberta, Canada

hereby certify:

1. That I am an employee of GLJ Petroleum Consultants Ltd., which company did prepare a detailed analysis of certain Mexican oil and gas properties of Pemex Exploración y Producción (the “Company”). The effective date of this evaluation is December 31, 2018.
2. That I do not have, nor do I expect to receive any direct or indirect interest in the securities of the Company or its affiliated companies.
3. That I attended the University of Calgary where I graduated with a Bachelor of Science Degree in Mechanical Engineering in 2004; that I am a Registered Professional Engineer in the Province of Alberta; and, that I have in excess of fifteen years of experience in engineering studies relating to oil and gas fields.
4. That a personal field inspection of the properties was not made; however, such an inspection was not considered necessary in view of the information available from public information and records, the files of the Company, and the appropriate provincial regulatory authorities.



PEMEX EXPLORACIÓN Y PRODUCCIÓN
RESERVES AUDIT OF
MEXICAN OIL AND GAS PROPERTIES
ACTIVO INTEGRAL DE PRODUCCIÓN BLOQUE N01

PROVED RESERVES
(SEC RESERVES DEFINITIONS)

Effective December 31, 2018

Prepared by
Chad P. Lemke, P. Eng.

1192058

PROVED RESERVES AUDIT - SEC

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April 15, 2019

Project 1192058

Ing. Octavio Romero Oropeza
Director General
Petróleos Mexicanos
Avenida Marina Nacional No. 329
Torre Ejecutiva, Piso 44
Colonia Verónica Anzures
11300 Ciudad de México, México

Dear Ing. Octavio Romero Oropeza:

**Re: Pemex Exploración y Producción
Proved Reserves Audit – SEC Reserves Definitions
Activo Integral de Producción Bloque N01
Effective December 31, 2018**

At the request of Pemex Exploración y Producción (the “Company”), a wholly owned subsidiary of Petróleos Mexicanos (Pemex), GLJ Petroleum Consultants Ltd. (GLJ) has conducted a reserves audit of the proved reserves estimates of certain oil and gas properties owned by the United Mexican States. The effective date of the proved reserves is December 31, 2018 and the reserves audit was completed on April 1, 2019. The Company has represented that these properties account for 2.2 percent on a net oil equivalent barrel basis of Company’s net total proved reserves as of the effective date. There are 105 fields associated with the properties reviewed by GLJ, and they are located in the Burgos business units in the Northern region of Mexico.

The estimates audited by GLJ were prepared by the Company in accordance with the reserves definitions of Regulation S-X Rule 4-10(a) of the U.S. Securities and Exchange Commission (SEC). GLJ’s third party reserves audit was prepared for public disclosure by Pemex in filings made with the SEC in accordance with the disclosure requirements set forth in the SEC regulations.

According to the Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserves Information (SPE auditing standards) published by the Society of Petroleum Engineers (2007), “An audit is an examination of Reserves Information that is conducted for the purpose of expressing an opinion as to whether such Reserves Information, in the aggregate, is reasonable and has been estimated by qualified individuals and presented in conformity with generally accepted petroleum engineering and evaluation principles and in compliance with the relevant reserves definitions”.

Reserves are estimated remaining quantities of oil and gas and related substances anticipated to be economically producible, as of a given date, by application of development projects to known accumulations. All reserve estimates involve some degree of uncertainty. The uncertainty depends chiefly on the amount of reliable geologic and engineering data available at the time of the estimate and the interpretation of these data. The relative degree of uncertainty may be conveyed by placing reserves into one of two principal classifications, either proved or unproved. Unproved reserves are less certain to be recovered than proved reserves and may be further sub-classified as probable and possible reserves to denote progressively increasing uncertainty in their recoverability. At Company's request, this report addresses only the proved reserves attributable to the properties reviewed herein.

The company provided a table with their reserves estimates by field and all pertinent well and reservoir data such as geological maps, well logs, production and injection history, drill stem tests, workovers, pressure surveys, production tests, fluid analysis, and planned development activities. The proved reserves prepared by the Company for the properties that GLJ reviewed were estimated based on volumetric calculations, decline analysis or material balance methods or by any combination of the aforementioned methods depending on the available data and the significance of the property within the overall corporate portfolio.

The economic parameters such as operating costs, capital costs, process losses, liquid yields, abandonment cost and product pricing provided by the company were accepted by GLJ without review or verification. Prices, operating and capital costs, including maintenance capital, were provided by the Company in 2019 dollars with no future escalation.

While the oil and gas industry may be subject to regulatory changes from time to time that could affect an industry participant's ability to recover its reserves, we are not aware of any such governmental actions which would restrict the recovery of the effective date estimated reserves.

GLJ has used all assumptions, data, procedures, and methods that it considers necessary and appropriate to prepare this report. For significant properties with performance-based assignments, GLJ reviewed the volumetric recovery to address the reasonableness of the assignment and development activity considered by the Company. In fields with significant performance and pressure data, the Company maps and geological models were accepted, but in cases where volumetric analysis formed the primary basis for the Company's reserves estimate, GLJ audited Company maps in more detail, including a review of associated geophysical interpretations.

Based on our review, including the data, technical processes and interpretations presented by the Company, it is our opinion that the overall procedures and methodologies utilized by the Company in preparing their estimates of the proved reserves as of December 31, 2018 comply with the current SEC regulations, and that the overall proved reserves for the reviewed properties as estimated by the Company are, in the aggregate, reasonable within the established audit tolerance guidelines of 10 percent set forth in the SPE auditing standards. As in all aspects of oil and gas evaluation, there are uncertainties inherent in the interpretation of engineering and geoscience data; therefore, our conclusions necessarily represent only informed professional judgment.

It is trusted that this audit meets your current requirements. Should you have any questions regarding this analysis, please contact the undersigned.

Yours very truly,

GLJ PETROLEUM CONSULTANTS LTD.

/s/ CHAD P. LEMKE

Chad P. Lemke, P. Eng.

Vice President

CPL/jem
Attachments

INTRODUCTION

GLJ Petroleum Consultants Ltd (GLJ) was commissioned by Pemex Exploración y Producción (the “Company”), a subsidiary of Petroleos Mexicanos, to prepare a reserves audit of the gross (100 percent) proved reserves and net gas reserves in 105 fields in Activo Integral de Producción Bloque N01 Burgos. The effective date of the proved reserves is December 31, 2018 and the reserves audit was completed on April 1, 2019. The Political Constitution of the United Mexican States provides that the Mexican nation owns all petroleum and other hydrocarbon reserves for these fields; however, these fields have been assigned to and are currently operated by the Company.

The estimates audited by GLJ were prepared by the Company based on the definitions and disclosure guidelines of the United States Securities and Exchange Commission contained in the Title 17, Code of Federal Regulations, Modernization of Oil and Gas Reporting, Final Rule released January 14, 2009, in the Federal Register (SEC regulations). GLJ’s third party reserves audit was prepared for public disclosure by Pemex in filings made with the SEC in accordance with the disclosure requirements set forth in the SEC regulations.

According to the Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserves Information (SPE auditing standards) published by the Society of Petroleum Engineers (2007), “Reserves Audit is the process of reviewing certain of the pertinent facts interpreted and assumptions made that have resulted in an estimate of reserves and/or Reserves Information prepared by others and the rendering of an opinion about (1) the appropriateness of the methodologies employed, (2) the adequacy and quality of the data relied upon, (3) the depth and thoroughness of the reserves estimation process, (4) the classification of reserves appropriate to the relevant definitions used, and (5) the reasonableness of the estimated reserves quantities and/or the Reserves Information” (section 2.2 (f)). Reserves Information may consist of various estimates pertaining to the extent and value of petroleum properties.

Based on our review, including the data, technical processes and interpretations presented by the Company, it is our opinion that the overall procedures and methodologies utilized by the Company in preparing their estimates of the proved reserves as of December 31, 2018 comply with the current SEC regulations, and that the overall proved reserves for the reviewed properties as estimated by the Company are, in the aggregate, reasonable within the established audit tolerance guidelines of 10 percent set forth in the SPE auditing standards.

For the reserves and income projections, the Company stated they used unweighted arithmetic average prices in effect at the first day of the month during the 12-month period prior to December 31, 2018 (the effective date), unless prices were defined by contractual arrangements, as required by the SEC regulations. Reserves were estimated by the Company to the economic limit of production. The following table sets forth the total proved net after royalty reserves under constant prices and costs as estimated by the Company attributable to the properties that GLJ reviewed are summarized below:

SEC PARAMETERS
 Estimated Net Proved Reserves Audited by GLJ Petroleum Consultants
 Attributable to Certain Properties—Activo Integral de Producción Bloque N01, Burgos
 As of December 31, 2018

Category	Oil ⁽¹⁾ (MMbbl)	Gross Gas ⁽²⁾ (MMMcf)	Plant Inlet Gas ⁽³⁾ (MMMcf)	Condensate ⁽⁴⁾ (MMbbl)	Plant Liquids ⁽⁵⁾ (MMbbl)	Dry Gas ⁽⁶⁾ (MMboe)	BOE ⁽⁷⁾ (MMboe)
Proved Developed Producing	0.0	446.1	344.8	4.5	4.7	64.9	74.2
Proved Developed Non-producing	0.0	183.9	142.5	2.0	2.9	26.6	31.5
Proved Undeveloped	0.0	280.6	224.4	4.0	4.9	41.7	50.6
Total Proved	0.0	910.6	711.7	10.5	12.5	133.2	156.3

- (1) Oil is produced oil and liquids separated from gas in the field
- (2) Gross Gas is gas produced before any losses for fuel use, venting, transporting or plant shrinkage, net of re-injection
- (3) Plant Inlet Gas is gas volumes measured at plant inlet, that is, gas in the reservoirs to be produced after shrinkage resulting from field separation and flaring, net of re-injection
- (4) Condensate is condensate extracted during processing within a gas plant
- (5) Plant Liquids are liquids other than condensate extracted during processing within a gas plant
- (6) Dry Gas is gas after sweetening and removal of condensate and plant liquids and adjustment for re-injection and fuel losses. Units in barrels of oil equivalent using gas conversion factors provided by the Company
- (7) Barrels of oil equivalent were estimated assuming property specific ratio based on sales gas heating values provided by the Company

Liquid hydrocarbons are expressed in millions of barrels (MMbbl) and gas volumes are expressed in billions of cubic feet (MMMcf) at the official temperature and pressure bases of the areas in which the gas reserves are located. The net remaining reserves are also shown herein on an equivalent unit (BOE) basis wherein natural gas is converted to oil equivalent barrels using a specific factor for each field. MMboe represents million barrels of oil equivalent.

GLJ notes that the Company has represented that its management of the of the produced fluids ends at the inlet of the gas processing plants. The reserves estimates include estimates of oil, plant condensate, plant inlet gas, sales gas, natural gas liquids and oil equivalent totals.

As the Company has also represented that all subsurface hydrocarbons belong to the United Mexican States, and given that the Company has also represented that it has been assigned a 100 percent interest in the audit properties by the United Mexican States, gross and net reserves are equal.

The Audit Procedure section outlines general procedures used in preparing this audit.

SEC RESERVES DEFINITIONS

The following definitions are excerpts from Regulation S-X 210.4-10. Portions of these definitions within square parentheses, [], have been transposed from other sections of Regulation S-X 210.4-10 to improve readability.

Resources

Resources are quantities of oil and gas estimated to exist in naturally occurring accumulations. A portion of the resources may be estimated to be recoverable, and another portion may be considered to be unrecoverable. Resources include both discovered and undiscovered accumulations.

Reserves

Reserves are estimated remaining quantities of oil and gas and related substances anticipated to be economically producible, as of a given date, by application of development projects to known accumulations. In addition, there must exist, or there must be a reasonable expectation that there will exist, the legal right to produce or a revenue interest in the production, installed means of delivering oil and gas or related substances to market, and all permits and financing required to implement the project.

Note: Reserves should not be assigned to adjacent reservoirs isolated by major, potentially sealing, faults until those reservoirs are penetrated and evaluated as economically producible. Reserves should not be assigned to areas that are clearly separated from a known accumulation by a non-productive reservoir (i.e. , absence of reservoir, structurally low reservoir, or negative test results). Such areas may contain prospective resources (i.e., potentially recoverable resources from undiscovered accumulations).

Proved Oil and Gas Reserves

Proved oil and gas reserves are those quantities of oil and gas, which, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be economically producible—from a given date forward, from known reservoirs, and under existing economic conditions, operating methods, and government regulations—prior to the time at which contracts providing the right to operate expire, unless evidence indicates that renewal is reasonably certain, regardless of whether deterministic or probabilistic methods are used for the estimation. The project to extract the hydrocarbons must have commenced or the operator must be reasonably certain that it will commence the project within a reasonable time.

- (i) The area of the reservoir considered as proved includes:
 - (A) The area identified by drilling and limited by fluid contacts, if any, and
 - (B) Adjacent undrilled portions of the reservoir that can, with reasonable certainty, be judged to be continuous with it and to contain economically producible oil or gas on the basis of available geoscience and engineering data.
- (ii) In the absence of data on fluid contacts, proved quantities in a reservoir are limited by the lowest known hydrocarbons (LKH) as seen in a well penetration unless geoscience, engineering, or performance data and reliable technology establishes a lower contact with reasonable certainty.
- (iii) Where direct observation from well penetrations has defined a highest known oil (HKO) elevation and the potential exists for an associated gas cap, proved oil reserves may be assigned in the structurally higher portions of the reservoir only if geoscience, engineering, or performance data and reliable technology establish the higher contact with reasonable certainty.

- (iv) Reserves which can be produced economically through application of improved recovery techniques (including, but not limited to, fluid injection) are included in the proved classification when:
 - (A) Successful testing by a pilot project in an area of the reservoir with properties no more favorable than in the reservoir as a whole, the operation of an installed program in the reservoir or an analogous reservoir, or other evidence using reliable technology establishes the reasonable certainty of the engineering analysis on which the project or program was based; and
 - (B) The project has been approved for development by all necessary parties and entities, including governmental entities.
- (v) Existing economic conditions include prices and costs at which economic producibility from a reservoir is to be determined. The price shall be the average price during the 12-month period prior to the ending date of the period covered by the report, determined as an unweighted arithmetic average of the first-day-of-the-month price for each month within such period, unless prices are defined by contractual arrangements, excluding escalations based upon future conditions.

Developed Oil and Gas Reserves

Developed oil and gas reserves are reserves of any category that can be expected to be recovered:

- (i) Through existing wells with existing equipment and operating methods or in which the cost of the required equipment is relatively minor compared to the cost of a new well; and
- (ii) Through installed extraction equipment and infrastructure operational at the time of the reserves estimate if the extraction is by means not involving a well.

Undeveloped Oil and Gas Reserves

Undeveloped oil and gas reserves are reserves of any category that are expected to be recovered from new wells on undrilled acreage, or from existing wells where a relatively major expenditure is required for recompletion.

- (i) Reserves on undrilled acreage shall be limited to those directly offsetting development spacing areas that are reasonably certain of production when drilled, unless evidence using reliable technology exists that establishes reasonable certainty of economic producibility at greater distances.
- (ii) Undrilled locations can be classified as having undeveloped reserves only if a development plan has been adopted indicating that they are scheduled to be drilled within five years, unless the specific circumstances, justify a longer time.
- (iii) Under no circumstances shall estimates for undeveloped reserves be attributable to any acreage for which an application of fluid injection or other improved recovery technique is contemplated, unless such techniques have been proved effective by actual projects in the same reservoir or an analogous reservoir [see Other Definitions below], or by other evidence using reliable technology establishing reasonable certainty.

Other Pertinent Definitions

Analogous Reservoir

Analogous reservoirs, as used in resources assessments, have similar rock and fluid properties, reservoir conditions (depth, temperature, and pressure) and drive mechanisms, but are typically at a more advanced stage of development than the reservoir of interest and thus may provide concepts to assist in the interpretation of more limited data and estimation of recovery. When used to support proved reserves, an “analogous reservoir” refers to a reservoir that shares the following characteristics with the reservoir of interest:

- (i) Same geological formation (but not necessarily in pressure communication with the reservoir of interest);
- (ii) Same environment of deposition;
- (iii) Similar geological structure; and
- (iv) Same drive mechanism.

Reasonable Certainty

If deterministic methods are used, reasonable certainty means a high degree of confidence that the quantities will be recovered. If probabilistic methods are used, there should be at least a 90% probability that the quantities actually recovered will equal or exceed the estimate. A high degree of confidence exists if the quantity is much more likely to be achieved than not, and, as changes due to increased availability of geoscience (geological, geophysical, and geochemical), engineering, and economic data are made to estimated ultimate recovery (EUR) with time, reasonably certain EUR is much more likely to increase or remain constant than to decrease.

Reliable Technology

Reliable technology is a grouping of one or more technologies (including computational methods) that has been field tested and has been demonstrated to provide reasonably certain results with consistency and repeatability in the formation being evaluated or in an analogous formation.

Reservoir

A porous and permeable underground formation containing a natural accumulation of producible oil and/or gas that is confined by impermeable rock or water barriers and is individual and separate from other reservoirs.

EVALUATION PROCEDURE

The following outlines the methodology employed by GLJ Petroleum Consultants (GLJ) in conducting the audit of the Company's oil and gas proved reserves comprising the properties mentioned above. This audit has been prepared in accordance with definitions and standards under the U.S. Financial Accounting Standard Board (FASB) policies and legal requirements of the U.S. Securities and Exchange Commission (SEC).

INTEREST DESCRIPTIONS

The Company provided GLJ with current land interest information.

The Company has represented that all subsurface hydrocarbons belong to the United Mexican States, and that the Company has been assigned a 100 percent interest in the audited properties by the United Mexican States; therefore, gross and net reserves are equal. The cash flow and production forecasts were limited by economic limits not by a lease expiry.

DATA PROVIDED

The company provided a table with their reserves estimates by field. Additionally, all pertinent well, reservoir and economic data such as geological maps, well logs, production and injection history, drill stem tests, workovers, pressure surveys, production tests, fluid analysis, planned development activities, operating expenses, capital costs, abandonment cost, process losses, liquid yields, etc., were provided by the Company.

TECHNICAL REVIEW

GLJ performs a bottoms-up analysis where individual properties are audited. Auditors review historical production, well activity, mapping, pressure data -and development plans as well as the evaluation approach used by the Company. Meetings with the Company were held to determine the Company's view of the reservoirs and technical justification for future development.

The proved reserves prepared by the Company for the properties that GLJ reviewed were estimated based on volumetric calculations, decline analysis or material balance methods or by any combination of the aforementioned methods depending on the available data and the significance of the property within the overall corporate portfolio. Where possible, performance based reserve assignments were made by the Company. For significant properties with performance based assignments, GLJ reviewed the volumetric recovery to address the reasonableness of the assignment and development activity considered by the Company. In fields with significant performance and pressure data, the Company maps and geological models were accepted, but in cases where volumetric analysis formed the primary basis for the Company's reserves estimate, GLJ audited Company maps in more detail, including a review of associated geophysical interpretations.

Data used in the audit were obtained from Company personnel and Company files. In the preparation of our report GLJ accepted as presented, and have relied, without independent verification, upon a variety of information furnished by the Company such as interests and burdens, production, product transportation and marketing and sales agreements, capital costs, operating expense data, and capital cost estimates. If in the course of the audit, the validity or sufficiency of any material information was brought into question, GLJ did not rely on such information until such concerns were satisfactorily resolved.

The economic parameters such as operating costs, capital costs, process losses, liquid yields, abandonment cost and product pricing provided by the company were accepted by GLJ without review or verification. Prices, operating and capital costs, including maintenance capital, were provided by the Company in 2019 dollars with no future escalation.

Reserves were estimated by the Company to the economic limit of production.

MARKETABLE PRODUCTS

Recoverable reserves were estimated by the Company to the following products:

Oil	Produced oil and liquids separated from gas in the field
Condensate	Condensate extracted during processing within a gas plant
Plant Liquids	Liquids other than condensate extracted during processing within a gas plant
Plant Inlet Gas	Gas volumes measured at plant inlet, that is, gas in the reservoirs to be produced after shrinkage resulting from field separation and flaring, net of re-injection
Dry Gas	Gas after sweetening and removal of condensate and plant liquids and adjustment for re-injection and fuel losses

GLJ note that the Company has represented to GLJ that its management of the produced fluids ends at the inlet of the gas processing plants. In the economic forecasts, the gas prices presented is the well head price in terms of sales gas. As the gas price received is assumed to include value for plant liquids, no additional revenue is forecast for plant liquids.

The Company also presented quantities of hydrocarbons in barrels of oil equivalent (boe) using its conversion factors.

LIST OF ABBREVIATIONS

AOF	absolute open flow
bbl	barrels
Bcf	billion cubic feet of gas at standard conditions
BIIP	bitumen initially-in-place
boe	barrel of oil equivalent, in this evaluation determined using 6 Mcf/boe for gas, 1 bbl/boe for all liquids, and 0 boe for sulphur
bopd	barrels of oil per day
Btu	British thermal units
bwpd	barrels of water per day
DSU	drilling spacing unit
GCA	gas cost allowance
GIIP	gas initially-in-place
GOC	gas-oil contact
GOR	gas-oil ratio
GORR	gross overriding royalty
GWC	gas-water contact
Mbbl	thousand barrels
Mboe	thousand boe
Mcf	thousand cubic feet of gas at standard conditions
Mcfe	thousand cubic feet of gas equivalent
Mlt	thousand long tons
M\$	thousand dollars
MM\$	million dollars
MMbbl	million barrels
MMboe	million boe
MMBtu	million British thermal units
MMcf	million cubic feet of gas at standard conditions
MRL	maximum rate limitation
Mstb	thousand stock tank barrels
MMstb	million stock tank barrels
NGL	natural gas liquids (ethane, propane, butane and condensate)
NPI	net profits interest
OIIP	oil initially-in-place
ORRI	overriding royalty interest
OWC	oil-water contact
P&NG	petroleum and natural gas
PIIP	petroleum initially-in-place
psia	pounds per square inch absolute
psig	pounds per square inch gauge
PVT	pressure-volume-temperature
RLI	reserves life index, calculated by dividing reserves by the forecast of first year production
scf	standard cubic feet
sgc	sales gas equivalent – if presented in this evaluation, determined using 1 barrel of oil or natural gas liquid = 6 Mcfe; 0 for sulphur
stb	stock tank barrel
WI	working interest
WTI	West Texas Intermediate

PRODUCT PRICE AND MARKET FORECASTS
December 31, 2018

The Company provided prices for products on a field basis. The table below summarizes the volume weighted average price for the aggregate properties in the “Activo Integral de Producción Bloque N01”, Burgos. The volume weighted average prices for 2018 are:

Condensate	62.47/bbl
Plant Inlet Gas	3.74/mcf



APPENDIX I
CERTIFICATES OF QUALIFICATION

Chad P. Lemke



CERTIFICATION OF QUALIFICATION

I, Chad P. Lemke, Professional Engineer, 4100, 400 - 3rd Avenue S.W., Calgary, Alberta, Canada hereby certify:

1. That I am an employee of GLJ Petroleum Consultants Ltd., which company did prepare a detailed analysis of certain Mexican oil and gas properties of Pemex Exploración y Producción (the “Company”). The effective date of this evaluation is December 31, 2018.
2. That I do not have, nor do I expect to receive any direct or indirect interest in the securities of the Company or its affiliated companies.
3. That I attended the University of Calgary where I graduated with a Bachelor of Science Degree in Mechanical Engineering in 2004; that I am a Registered Professional Engineer in the Province of Alberta; and, that I have in excess of fifteen years of experience in engineering studies relating to oil and gas fields.
4. That a personal field inspection of the properties was not made; however, such an inspection was not considered necessary in view of the information available from public information and records, the files of the Company, and the appropriate provincial regulatory authorities.



PEMEX EXPLORACIÓN Y PRODUCCIÓN
RESERVES AUDIT OF
MEXICAN OIL AND GAS PROPERTIES
ACTIVOS INTEGRALES DE PRODUCCIÓN BLOQUES S02 & S03

PROVED RESERVES
(SEC RESERVES DEFINITIONS)

Effective December 31, 2018

Prepared by
Leonard L. Herchen, P. Eng.

1192030

PROVED RESERVES AUDIT - SEC

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April 15, 2019

Project 1192030

Ing. Octavio Romero Oropeza
Director General
Petróleos Mexicanos
Avenida Marina Nacional No. 329
Torre Ejecutiva, Piso 44
Colonia Verónica Anzures
11300 Ciudad de México, México

Dear Ing. Octavio Romero Oropeza:

**Re: Pemex Exploración y Producción
Proved Reserves Audit – SEC Reserves Definitions
Activo Integral de Producción Bloques S02 & S03
Effective December 31, 2018**

At the request of Pemex Exploración y Producción (the “Company”), a wholly owned subsidiary of Petróleos Mexicanos (Pemex), GLJ Petroleum Consultants Ltd. (GLJ) has conducted a reserves audit of the proved reserves estimates of certain oil and gas properties owned by the United Mexican States. The effective date of the proved reserves is December 31, 2018 and the reserves audit was completed on April 1, 2019. The Company has represented that these properties account for 9.4 percent on a net oil equivalent barrel basis of Company’s net total proved reserves as of the effective date. There are 39 fields associated with the properties reviewed by GLJ, and they are located in the Samaria-Luna and Bellota-Jujo business units in the Southern region of Mexico.

The estimates audited by GLJ were prepared by the Company in accordance with the reserves definitions of Regulation S-X Rule 4-10(a) of the U.S. Securities and Exchange Commission (SEC). GLJ’s third party reserves audit was prepared for public disclosure by Pemex in filings made with the SEC in accordance with the disclosure requirements set forth in the SEC regulations.

According to the Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserves Information (SPE auditing standards) published by the Society of Petroleum Engineers (2007), “An audit is an examination of Reserves Information that is conducted for the purpose of expressing an opinion as to whether such Reserves

Information, in the aggregate, is reasonable and has been estimated by qualified individuals and presented in conformity with generally accepted petroleum engineering and evaluation principles and in compliance with the relevant reserves definitions”.

Reserves are estimated remaining quantities of oil and gas and related substances anticipated to be economically producible, as of a given date, by application of development projects to known accumulations. All reserve estimates involve some degree of uncertainty. The uncertainty depends chiefly on the amount of reliable geologic and engineering data available at the time of the estimate and the interpretation of these data. The relative degree of uncertainty may be conveyed by placing reserves into one of two principal classifications, either proved or unproved. Unproved reserves are less certain to be recovered than proved reserves and may be further sub-classified as probable and possible reserves to denote progressively increasing uncertainty in their recoverability. At Company’s request, this report addresses only the proved reserves attributable to the properties reviewed herein.

The company provided a table with their reserves estimates by field and all pertinent well and reservoir data such as geological maps, well logs, production and injection history, drill stem tests, workovers, pressure surveys, production tests, fluid analysis, and planned development activities. The proved reserves prepared by the Company for the properties that GLJ reviewed were estimated based on volumetric calculations, decline analysis or material balance methods or by any combination of the aforementioned methods depending on the available data and the significance of the property within the overall corporate portfolio.

The economic parameters such as operating costs, capital costs, process losses, liquid yields, abandonment cost and product pricing provided by the company were accepted by GLJ without review or verification. Prices, operating and capital costs, including maintenance capital, were provided by the Company in 2019 dollars with no future escalation.

While the oil and gas industry may be subject to regulatory changes from time to time that could affect an industry participant’s ability to recover its reserves, we are not aware of any such governmental actions which would restrict the recovery of the effective date estimated reserves.

GLJ has used all assumptions, data, procedures, and methods that it considers necessary and appropriate to prepare this report. For significant properties with performance-based assignments, GLJ reviewed the volumetric recovery to address the reasonableness of the assignment and development activity considered by the Company. In fields with significant performance and pressure data, the Company maps and geological models were accepted, but in cases where volumetric analysis formed the primary basis for the Company’s reserves estimate, GLJ audited Company maps in more detail, including a review of associated geophysical interpretations.

Based on our review, including the data, technical processes and interpretations presented by the Company, it is our opinion that the overall procedures and methodologies utilized by the Company in preparing their estimates of the proved reserves as of December 31, 2018 comply with the current SEC regulations, and that the overall proved reserves for the reviewed properties as estimated by the Company are, in the aggregate, reasonable within the established audit tolerance guidelines of 10 percent set forth in the SPE auditing standards. As in all aspects of oil and gas evaluation, there are uncertainties inherent in the interpretation of engineering and geoscience data; therefore, our conclusions necessarily represent only informed professional judgment.

It is trusted that this audit meets your current requirements. Should you have any questions regarding this analysis, please contact the undersigned.

Yours very truly,

GLJ PETROLEUM CONSULTANTS LTD.

/s/ LEONARD L. HERCHEN, P. ENG.

Leonard L. Herchen, P. Eng.

Vice President

LLH/jem
Attachments

INTRODUCTION

GLJ Petroleum Consultants Ltd (GLJ) was commissioned by Pemex Exploración y Producción (the “Company”), a subsidiary of Petroleos Mexicanos, to prepare a reserves audit of the gross (100 percent) proved reserves and net gas reserves in 39 fields in the Activos Integrales de Producción Bloques S02 & S03. The effective date of the proved reserves is December 31, 2018 and the reserves audit was completed on April 1, 2019. The Political Constitution of the United Mexican States provides that the Mexican nation owns all petroleum and other hydrocarbon reserves for these fields; however, these fields have been assigned to and are currently operated by the Company.

The estimates audited by GLJ were prepared by the Company based on the definitions and disclosure guidelines of the United States Securities and Exchange Commission contained in the Title 17, Code of Federal Regulations, Modernization of Oil and Gas Reporting, Final Rule released January 14, 2009, in the Federal Register (SEC regulations). GLJ’s third party reserves audit was prepared for public disclosure by Pemex in filings made with the SEC in accordance with the disclosure requirements set forth in the SEC regulations.

According to the Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserves Information (SPE auditing standards) published by the Society of Petroleum Engineers (2007), “Reserves Audit is the process of reviewing certain of the pertinent facts interpreted and assumptions made that have resulted in an estimate of reserves and/or Reserves Information prepared by others and the rendering of an opinion about (1) the appropriateness of the methodologies employed, (2) the adequacy and quality of the data relied upon, (3) the depth and thoroughness of the reserves estimation process, (4) the classification of reserves appropriate to the relevant definitions used, and (5) the reasonableness of the estimated reserves quantities and/or the Reserves Information” (section 2.2 (f)). Reserves Information may consist of various estimates pertaining to the extent and value of petroleum properties.

Based on our review, including the data, technical processes and interpretations presented by the Company, it is our opinion that the overall procedures and methodologies utilized by the Company in preparing their estimates of the proved reserves as of December 31, 2018 comply with the current SEC regulations, and that the overall proved reserves for the reviewed properties as estimated by the Company are, in the aggregate, reasonable within the established audit tolerance guidelines of 10 percent set forth in the SPE auditing standards.

For the reserves and income projections, the Company stated they used unweighted arithmetic average prices in effect at the first day of the month during the 12-month period prior to December 31, 2018 (the effective date), unless prices were defined by contractual arrangements, as required by the SEC regulations. Reserves were estimated by the Company to the economic limit of production. The following table sets forth the total proved net after royalty reserves under constant prices and costs as estimated by the Company attributable to the properties that GLJ reviewed are summarized below:

SEC PARAMETERS

Estimated Net Proved Reserves Audited by GLJ Petroleum Consultants

Attributable to Certain Properties—Activos Integrales de Producción Bloques S02 Samaria Luna & S03 Bellota-Jujo

As of December 31, 2018

Category	Oil ⁽¹⁾ (MMbbl)	Gross Gas ⁽²⁾ (MMMcf)	Plant Inlet Gas ⁽³⁾ (MMMcf)	Condensate ⁽⁴⁾ (MMbbl)	Plant Liquids ⁽⁵⁾ (MMbbl)	Dry Gas ⁽⁶⁾ (MMboe)	BOE ⁽⁷⁾ (MMboe)
Proved Developed Producing	164.1	436.5	431.6	1.8	34.6	65.5	266.0
Proved Developed Non-producing	94.1	314.1	308.7	1.5	24.8	46.8	167.2
Proved Undeveloped	130.9	414.3	409.8	1.9	32.9	62.2	227.9
Total Proved	389.1	1164.9	1150.1	5.2	92.4	174.5	661.1

- (1) Oil is produced oil and liquids separated from gas in the field
- (2) Gross Gas is gas produced before any losses for fuel use, venting, transporting or plant shrinkage, net of re-injection
- (3) Plant Inlet Gas is gas volumes measured at plant inlet, that is, gas in the reservoirs to be produced after shrinkage resulting from field separation and flaring, net of re-injection
- (4) Condensate is condensate extracted during processing within a gas plant
- (5) Plant Liquids are liquids other than condensate extracted during processing within a gas plant
- (6) Dry Gas is gas after sweetening and removal of condensate and plant liquids and adjustment for re-injection and fuel losses. Units in barrels of oil equivalent using gas conversion factors provided by the Company
- (7) Barrels of oil equivalent were estimated assuming property specific ratio based on sales gas heating values provided by the Company

Liquid hydrocarbons are expressed in millions of barrels (MMbbl) and gas volumes are expressed in billions of cubic feet (MMMcf) at the official temperature and pressure bases of the areas in which the gas reserves are located. The net remaining reserves are also shown herein on an equivalent unit (BOE) basis wherein natural gas is converted to oil equivalent barrels using a specific factor for each field. MMboe represents million barrels of oil equivalent.

GLJ notes that the Company has represented that its management of the of the produced fluids ends at the inlet of the gas processing plants. The reserves estimates include estimates of oil, plant condensate, plant inlet gas, sales gas, natural gas liquids and oil equivalent totals.

As the Company has also represented that all subsurface hydrocarbons belong to the United Mexican States, and given that the Company has also represented that it has been assigned a 100 percent interest in the audit properties by the United Mexican States, gross and net reserves are equal.

The Audit Procedure section outlines general procedures used in preparing this audit.

SEC RESERVES DEFINITIONS

The following definitions are excerpts from Regulation S-X 210.4-10. Portions of these definitions within square parentheses, [], have been transposed from other sections of Regulation S-X 210.4-10 to improve readability.

Resources

Resources are quantities of oil and gas estimated to exist in naturally occurring accumulations. A portion of the resources may be estimated to be recoverable, and another portion may be considered to be unrecoverable. Resources include both discovered and undiscovered accumulations.

Reserves

Reserves are estimated remaining quantities of oil and gas and related substances anticipated to be economically producible, as of a given date, by application of development projects to known accumulations. In addition, there must exist, or there must be a reasonable expectation that there will exist, the legal right to produce or a revenue interest in the production, installed means of delivering oil and gas or related substances to market, and all permits and financing required to implement the project.

Note: Reserves should not be assigned to adjacent reservoirs isolated by major, potentially sealing, faults until those reservoirs are penetrated and evaluated as economically producible. Reserves should not be assigned to areas that are clearly separated from a known accumulation by a non-productive reservoir (i.e. , absence of reservoir, structurally low reservoir, or negative test results). Such areas may contain prospective resources (i.e., potentially recoverable resources from undiscovered accumulations).

Proved Oil and Gas Reserves

Proved oil and gas reserves are those quantities of oil and gas, which, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be economically producible—from a given date forward, from known reservoirs, and under existing economic conditions, operating methods, and government regulations—prior to the time at which contracts providing the right to operate expire, unless evidence indicates that renewal is reasonably certain, regardless of whether deterministic or probabilistic methods are used for the estimation. The project to extract the hydrocarbons must have commenced or the operator must be reasonably certain that it will commence the project within a reasonable time.

- (i) The area of the reservoir considered as proved includes:
 - (A) The area identified by drilling and limited by fluid contacts, if any, and
 - (B) Adjacent undrilled portions of the reservoir that can, with reasonable certainty, be judged to be continuous with it and to contain economically producible oil or gas on the basis of available geoscience and engineering data.
- (ii) In the absence of data on fluid contacts, proved quantities in a reservoir are limited by the lowest known hydrocarbons (LKH) as seen in a well penetration unless geoscience, engineering, or performance data and reliable technology establishes a lower contact with reasonable certainty.
- (iii) Where direct observation from well penetrations has defined a highest known oil (HKO) elevation and the potential exists for an associated gas cap, proved oil reserves may be assigned in the structurally higher portions of the reservoir only if geoscience, engineering, or performance data and reliable technology establish the higher contact with reasonable certainty.

- (iv) Reserves which can be produced economically through application of improved recovery techniques (including, but not limited to, fluid injection) are included in the proved classification when:
 - (A) Successful testing by a pilot project in an area of the reservoir with properties no more favorable than in the reservoir as a whole, the operation of an installed program in the reservoir or an analogous reservoir, or other evidence using reliable technology establishes the reasonable certainty of the engineering analysis on which the project or program was based; and
 - (B) The project has been approved for development by all necessary parties and entities, including governmental entities.
- (v) Existing economic conditions include prices and costs at which economic producibility from a reservoir is to be determined. The price shall be the average price during the 12-month period prior to the ending date of the period covered by the report, determined as an unweighted arithmetic average of the first-day-of-the-month price for each month within such period, unless prices are defined by contractual arrangements, excluding escalations based upon future conditions.

Developed Oil and Gas Reserves

Developed oil and gas reserves are reserves of any category that can be expected to be recovered:

- (i) Through existing wells with existing equipment and operating methods or in which the cost of the required equipment is relatively minor compared to the cost of a new well; and
- (ii) Through installed extraction equipment and infrastructure operational at the time of the reserves estimate if the extraction is by means not involving a well.

Undeveloped Oil and Gas Reserves

Undeveloped oil and gas reserves are reserves of any category that are expected to be recovered from new wells on undrilled acreage, or from existing wells where a relatively major expenditure is required for recompletion.

- (i) Reserves on undrilled acreage shall be limited to those directly offsetting development spacing areas that are reasonably certain of production when drilled, unless evidence using reliable technology exists that establishes reasonable certainty of economic producibility at greater distances.
- (ii) Undrilled locations can be classified as having undeveloped reserves only if a development plan has been adopted indicating that they are scheduled to be drilled within five years, unless the specific circumstances, justify a longer time.
- (iii) Under no circumstances shall estimates for undeveloped reserves be attributable to any acreage for which an application of fluid injection or other improved recovery technique is contemplated, unless such techniques have been proved effective by actual projects in the same reservoir or an analogous reservoir [see Other Definitions below], or by other evidence using reliable technology establishing reasonable certainty.

Other Pertinent Definitions

Analogous Reservoir

Analogous reservoirs, as used in resources assessments, have similar rock and fluid properties, reservoir conditions (depth, temperature, and pressure) and drive mechanisms, but are typically at a more advanced stage of development than the reservoir of interest and thus may provide concepts to assist in the interpretation of more limited data and estimation of recovery. When used to support proved reserves, an “analogous reservoir” refers to a reservoir that shares the following characteristics with the reservoir of interest:

- (i) Same geological formation (but not necessarily in pressure communication with the reservoir of interest);
- (ii) Same environment of deposition;
- (iii) Similar geological structure; and
- (iv) Same drive mechanism.

Reasonable Certainty

If deterministic methods are used, reasonable certainty means a high degree of confidence that the quantities will be recovered. If probabilistic methods are used, there should be at least a 90% probability that the quantities actually recovered will equal or exceed the estimate. A high degree of confidence exists if the quantity is much more likely to be achieved than not, and, as changes due to increased availability of geoscience (geological, geophysical, and geochemical), engineering, and economic data are made to estimated ultimate recovery (EUR) with time, reasonably certain EUR is much more likely to increase or remain constant than to decrease.

Reliable Technology

Reliable technology is a grouping of one or more technologies (including computational methods) that has been field tested and has been demonstrated to provide reasonably certain results with consistency and repeatability in the formation being evaluated or in an analogous formation.

Reservoir

A porous and permeable underground formation containing a natural accumulation of producible oil and/or gas that is confined by impermeable rock or water barriers and is individual and separate from other reservoirs.

AUDIT PROCEDURE

The following outlines the methodology employed by GLJ Petroleum Consultants (GLJ) in conducting the audit of the Company's oil and gas proved reserves comprising the properties mentioned above. This audit has been prepared in accordance with definitions and standards under the U.S. Financial Accounting Standard Board (FASB) policies and legal requirements of the U.S. Securities and Exchange Commission (SEC).

INTEREST DESCRIPTIONS

The Company provided GLJ with current land interest information.

The Company has represented that all subsurface hydrocarbons belong to the United Mexican States, and that the Company has been assigned a 100 percent interest in the audited properties by the United Mexican States; therefore, gross and net reserves are equal. The cash flow and production forecasts were limited by economic limits not by a lease expiry.

DATA PROVIDED

The company provided a table with their reserves estimates by field. Additionally, all pertinent well, reservoir and economic data such as geological maps, well logs, production and injection history, drill stem tests, workovers, pressure surveys, production tests, fluid analysis, planned development activities, operating expenses, capital costs, abandonment cost, process losses, liquid yields, etc., were provided by the Company.

TECHNICAL REVIEW

GLJ performs a bottoms-up analysis where individual properties are audited. Auditors review historical production, well activity, mapping, pressure data -and development plans as well as the evaluation approach used by the Company. Meetings with the Company were held to determine the Company's view of the reservoirs and technical justification for future development.

The proved reserves prepared by the Company for the properties that GLJ reviewed were estimated based on volumetric calculations, decline analysis or material balance methods or by any combination of the aforementioned methods depending on the available data and the significance of the property within the overall corporate portfolio. Where possible, performance based reserve assignments were made by the Company. For significant properties with performance based assignments, GLJ reviewed the volumetric recovery to address the reasonableness of the assignment and development activity considered by the Company. In fields with significant performance and pressure data, the Company maps and geological models were accepted, but in cases where volumetric analysis formed the primary basis for the Company's reserves estimate, GLJ audited Company maps in more detail, including a review of associated geophysical interpretations.

Data used in the audit were obtained from Company personnel and Company files. In the preparation of our report GLJ accepted as presented, and have relied, without independent verification, upon a variety of information furnished by the Company such as interests and burdens, production, product transportation and marketing and sales agreements, capital costs, operating expense data, and capital cost estimates. If in the course of the audit, the validity or sufficiency of any material information was brought into question, GLJ did not rely on such information until such concerns were satisfactorily resolved.

The economic parameters such as operating costs, capital costs, process losses, liquid yields, abandonment cost and product pricing provided by the company were accepted by GLJ without review or verification. Prices, operating and capital costs, including maintenance capital, were provided by the Company in 2019 dollars with no future escalation.

Reserves were estimated by the Company to the economic limit of production.

MARKETABLE PRODUCTS

Recoverable reserves were estimated by the Company to the following products:

Oil	Produced oil and liquids separated from gas in the field
Condensate	Condensate extracted during processing within a gas plant
Plant Liquids	Liquids other than condensate extracted during processing within a gas plant
Plant Inlet Gas	Gas volumes measured at plant inlet, that is, gas in the reservoirs to be produced after shrinkage resulting from field separation and flaring, net of re-injection
Dry Gas	Gas after sweetening and removal of condensate and plant liquids and adjustment for re-injection and fuel losses

GLJ note that the Company has represented to GLJ that its management of the produced fluids ends at the inlet of the gas processing plants. In the economic forecasts, the gas prices presented is the well head price in terms of sales gas. As the gas price received is assumed to include value for plant liquids, no additional revenue is forecast for plant liquids.

The Company also presented quantities of hydrocarbons in barrels of oil equivalent (boe) using its conversion factors.

LIST OF ABBREVIATIONS

AOF	absolute open flow
bbbl	barrels
Bcf	billion cubic feet of gas at standard conditions
BIIP	bitumen initially-in-place
boe	barrel of oil equivalent, in this evaluation determined using 6 Mcf/boe for gas, 1 bbl/boe for all liquids, and 0 boe for sulphur
bopd	barrels of oil per day
Btu	British thermal units
bwpd	barrels of water per day
DSU	drilling spacing unit
GCA	gas cost allowance
GIIP	gas initially-in-place
GOC	gas-oil contact
GOR	gas-oil ratio
GORR	gross overriding royalty
GWC	gas-water contact
Mbbl	thousand barrels
Mboe	thousand boe
Mcf	thousand cubic feet of gas at standard conditions
Mcfe	thousand cubic feet of gas equivalent
Mlt	thousand long tons
M\$	thousand dollars
MM\$	million dollars
MMbbl	million barrels
MMboe	million boe
MMBtu	million British thermal units
MMcf	million cubic feet of gas at standard conditions
MRL	maximum rate limitation
Mstb	thousand stock tank barrels
MMstb	million stock tank barrels
NGL	natural gas liquids (ethane, propane, butane and condensate)
NPI	net profits interest
OIIP	oil initially-in-place
ORRI	overriding royalty interest
OWC	oil-water contact
P&NG	petroleum and natural gas
PIIP	petroleum initially-in-place
psia	pounds per square inch absolute
psig	pounds per square inch gauge
PVT	pressure-volume-temperature
RLI	reserves life index, calculated by dividing reserves by the forecast of first year production
scf	standard cubic feet
sge	sales gas equivalent – if presented in this evaluation, determined using 1 barrel of oil or natural gas liquid = 6 Mcfe; 0 for sulphur
stb	stock tank barrel
WI	working interest
WTI	West Texas Intermediate

PRODUCT PRICE AND MARKET FORECASTS
December 31, 2018

The Company provided prices for products on a field basis. The table below summarizes the volume weighted average price for the aggregate properties in the “Activos Integrales de Producción Bloques S02 & S03”. The volume weighted average prices for 2018 are:

Oil	67.18/bbl
Condensate	39.79/bbl
Plant Inlet Gas	5.53/mcf



APPENDIX I
CERTIFICATES OF QUALIFICATION

Leonard L. Herchen



CERTIFICATION OF QUALIFICATION

I, Leonard L. Herchen, Professional Engineer, 4100, 400—3rd Avenue S.W., Calgary, Alberta, Canada hereby certify:

1. That I am an employee of GLJ Petroleum Consultants Ltd., which company did prepare a detailed analysis of certain Mexican oil and gas properties of Pemex Exploración y Producción (the “Company”). The effective date of this evaluation is December 31, 2018.
2. That I do not have, nor do I expect to receive any direct or indirect interest in the securities of the Company or its affiliated companies.
3. That I attended Queen’s University and that I graduated with a Bachelor of Science Degree in Engineering Physics in 1989; that I am a Registered Professional Engineer in the Province of Alberta; and, that I have in excess of twenty-nine years experience in engineering studies relating to oil and gas fields.
4. That a personal field inspection of the properties was not made; however, such an inspection was not considered necessary in view of the information available from public information and records, the files of the Company, and the appropriate provincial regulatory authorities.





PRESIDENT. ROBERT C. BARG

VICE PRESIDENTS

ALLEN E. EVANS, JR.

RANDOLPH K. GREEN

JOHN G. HATTNER

C. H (SCOTT) REES III

DANNY D. SIMMONS

DAN PAUL SMITH

ERIC J. STEVENS

April 25, 2019

Ing. Octavio Romero Oropeza
Petroleos Mexicanos
Avenida Marina Nacional 329
Torre Ejecutiva, Piso 44
Colonia Veronica Anzures
11300 Ciudad de México, México

Dear Ing. Octavio Romero Oropeza:

We hereby consent to all references to our firm as set forth in the Annual Report on Form 20-F of Petróleos Mexicanos (“Pemex”) for the year ending December 31, 2018 (the “Form 20-F”), under the heading “Exploration and Production (Reserves),” and to the filing of our audit letter dated April 16, 2019, as an exhibit to the Form 20-F. We have audited the estimates of Pemex’s proved oil, condensate, natural gas, and oil equivalent reserves, as of January 1, 2019, for 18 fields located in the Cantarell and Ku Maloob Zaap business units in the Marine regions of Mexico. These estimates were prepared by Pemex Exploración y Produccion in accordance with the reserves definitions of Regulation S-X Rule 4-10(a) of the U.S. Securities and Exchange Commission.

Sincerely,

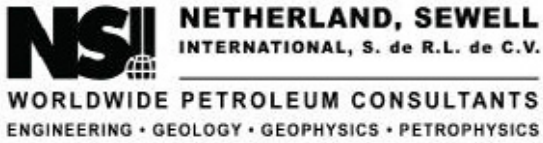
**NETHERLAND, SEWELL INTERNATIONAL, S. DE
R.L. DE C.V.**

By: /s/ ROBERT C. BARG, P.E.

Robert C. Barg, P.E.

President

RCB:LMS



PRESIDENT. ROBERT C. BARG

VICE PRESIDENTS

ALLEN E. EVANS, JR.

RANDOLPH K. GREEN

JOHN G. HATTNER

C. H. (SCOTT) REES III

DANNY D. SIMMONS

DAN PAUL SMITH

ERIC J. STEVENS

April 25, 2019

Ing. Octavio Romero Oropeza
Petroleos Mexicanos
Avenida Marina Nacional 329
Torre Ejecutiva, Piso 44
Colonia Veronica Anzures
11300 Ciudad de México, México

Dear Ing. Octavio Romero Oropeza:

We hereby consent to all references to our firm as set forth in the Annual Report on Form 20-F of Petroleos Mexicanos (“Pemex”) for the year ending December 31, 2018 (the “Form 20-F”), under the heading “Exploration and Production (Reserves),” and to the filing of our audit letter dated April 16, 2019, as an exhibit to the Form 20-F. We have audited the estimates of Pemex’s proved oil, condensate, natural gas, and oil equivalent reserves, as of January 1, 2019, for 46 fields located in the Cinco Presidentes and Macuspana Muspac business units in the Southern region of Mexico. These estimates were prepared by Pemex Exploración y Producción in accordance with the reserves definitions of Regulation S-X Rule 4-10(a) of the U.S. Securities and Exchange Commission.

Sincerely,

**NETHERLAND, SEWELL INTERNATIONAL, S. DE
R.L. DE C.V.**

By: /s/ ROBERT C. BARG, P.E.

Robert C. Barg, P.E.

President

RCB:LMS

2100 ROSS AVENUE. SUITE 2200 • DALLAS, TEXAS 75201-2737 • PH: 214-969-5401 • FAX: 214-969-5411



PRESIDENT-ROBERT C. BARG

VICE PRESIDENTS

ALLEN E. EVANS, JR.

RANDOLPH K. GREEN

JOHN G. HATTNER

C. H. (SCOTT) REES III

DANNY D. SIMMONS

DAN PAUL SMITH

ERIC J. STEVENS

April 16, 2019

Dr. Ulises Hernández Romano
S.P.A. de la Dirección General
Pemex Exploración y Producción
Avenida Marina Nacional 329
Torre Ejecutiva, Piso 41
Col. Verónica Anzures, C.P. 11300
Del. Miguel Hidalgo, Ciudad de México
México

Dear Dr. Hernández:

In accordance with your request, we have audited the estimates prepared by Pemex Exploración y Producción (PEP), as of January 1, 2019, of the gross (100 percent) proved reserves and net gas reserves in 18 fields located in Activo Integral de Producción Bloques (AIPB) AS01-01 and AS01-02 in Subdirección AS01 located in the Bay of Campeche, offshore west of the Yucatan Peninsula of Mexico. PEP is a subsidiary entity of Petróleos Mexicanos. The scope of our work did not include auditing the future net revenue associated with these reserves. The Political Constitution of the United Mexican States provides that the Mexican nation owns all petroleum and other hydrocarbon reserves for these fields; however, these fields have been assigned to and are currently operated by PEP. In accordance with the Energy Reform of 2014, the estimates in this report represent the gross (100 percent) proved reserves to be produced within the economic life of the properties. We have examined the estimates with respect to reserves quantities, reserves categorization, future producing rates, and economic producibility, using the definitions set forth in U.S. Securities and Exchange Commission (SEC) Regulation S-X Rule 4-10(a). Economic analysis was performed by PEP only to confirm economic producibility and determine economic limits for the properties. The estimates of reserves have been prepared in accordance with the definitions and regulations of the SEC and conform to the FASB Accounting Standards Codification Topic 932, Extractive Activities—Oil and Gas. We completed our audit on February 15, 2019. PEP has represented that these properties account for 51.2 percent on a net oil equivalent barrel basis of PEP's net proved reserves as of January 1, 2019. This report has been prepared for PEP's and Petróleos Mexicanos' use internally and in filings with the appropriate regulatory agencies. In our opinion the assumptions, data, methods, and procedures used in the preparation of this report are appropriate for such purpose; there is no guarantee or warranty, implied or expressed, by Netherland, Sewell International, S. de R.L. de C.V. (NSI) for any other use of this report.

The following table sets forth PEP's estimates of the gross (100 percent) reserves and net gas reserves to the combined interest of PEP and the Mexican State, as of January 1, 2019, for the audited AIPB AS01-01 and AS01-02 properties:

2100 ROSS AVENUE, SUITE 2200 DALLAS, TEXAS 75201-2737 PH: 214-969-5411 -FAX: 214-969-5411

Category	Gross (100%) Reserves						
	Wellhead Oil ⁽¹⁾ (MMBBL)	Liquid Components and Dry Gas			BOE ⁽⁵⁾ (MMBBL)	Wellhead Gas ⁽⁶⁾ (BCF)	Net Gas ⁽⁷⁾ (BCF)
		Condensate ⁽²⁾ (MMBBL)	Plant Liquids ⁽³⁾ (MMBBL)	Dry Gas ⁽⁴⁾ (MMBOE)			
Proved Developed Producing	1,294.9	6.9	50.3	79.7	1,431.8	727.4	545.9
Proved Developed Non-Producing	1,043.6	4.4	61.3	97.0	1,206.3	884.0	664.7
Proved Undeveloped	914.8	2.0	13.5	21.4	951.8	196.3	147.0
Total Proved	3,253.3	13.3	125.2	198.1	3,589.9	1,807.7	1,357.5

Totals may not add because of rounding.

- (1) Oil reserves include oil plus liquids from the produced gas stream separated in the field.
- (2) Condensate reserves are the liquids volumes recovered from the produced gas stream during the compression and dehydration stages of processing.
- (3) Plant liquids reserves are the liquids volumes recovered from the gas stream through the processing plants.
- (4) Dry gas reserves are the dry gas available for sale by Pemex Transformacion Industrial (PTRI) at the tailgate of the processing plants.
- (5) BOE includes wellhead oil, condensate, plant liquids, and dry gas.
- (6) Gas reserves are the measured wellhead gas before shrinkage from fuel usage, flare, and processing.
- (7) Net gas reserves are the volume of wet gas available for sale to PTRI at the inlet of the processing plants.

Oil, condensate, plant liquids, and barrels of oil equivalent (BOE) volumes are expressed in millions of barrels (MMBBL); a barrel is equivalent to 42 United States gallons. Dry gas volumes are expressed in millions of barrels of oil equivalent (MMBOE), determined using dry gas conversion factors provided by PEP. Gas volumes are expressed in billions of cubic feet (BCF) at standard temperature and pressure bases.

When compared on a field-by-field basis, some of the estimates of PEP are greater and some are less than the estimates of NSI. However, in our opinion the estimates of reserves prepared by PEP shown herein are reasonable when aggregated at the total proved level and have been prepared in accordance with the Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserves Information promulgated by the Society of Petroleum Engineers (SPE Standards). Additionally, these estimates are within the recommended 10 percent tolerance threshold set forth in the SPE Standards. We are satisfied with the methods and procedures used by PEP in preparing the January 1, 2019, estimates of reserves, and we saw nothing of an unusual nature that would cause us to take exception with the estimates, in the aggregate, as prepared by PEP.

Reserves categorization conveys the relative degree of certainty; reserves subcategorization is based on development and production status. The estimates of reserves included herein have not been adjusted for risk. PEP's estimates do not include probable or possible reserves that exist for these properties.

Oil and gas prices were used only to confirm economic producibility and determine economic limits for the properties. It is our understanding that prices used by PEP are representative of the 12-month average for the period January through December 2018. NSI accepted the prices provided without independent review or verification. All prices are held constant throughout the lives of the properties.

Costs were used only to confirm economic producibility and determine economic limits for the properties. It is our understanding that operating costs used by PEP are representative of the 12-month average for the period January through December 2018. These costs include district and regional overhead expenses along with costs to be incurred at the field level. Operating costs for certain undeveloped fields are based on PEP's analogy to a

similar type of producing field. Operating costs have been divided into field-level costs, per-well costs, and per-unit-of-production costs. No headquarters general and administrative overhead expenses are included. Capital costs used by PEP are based on authorizations for expenditure and actual costs from recent activity. Capital costs are included as required for workovers, new development wells, and production equipment. Abandonment costs used are PEP's estimates of the costs to abandon the wells, platforms, and production facilities, net of any salvage value. NSI accepted the operating cost parameters and the capital and abandonment costs provided without independent review or verification. Operating, capital, and abandonment costs are not escalated for inflation.

The reserves shown in this report are estimates only and should not be construed as exact quantities. Proved reserves are those quantities of oil and gas which, by analysis of engineering and geoscience data, can be estimated with reasonable certainty to be economically producible; probable and possible reserves are those additional reserves which are sequentially less certain to be recovered than proved reserves. Estimates of reserves may increase or decrease as a result of market conditions, future operations, changes in regulations, or actual reservoir performance. In addition to the primary economic assumptions discussed herein, estimates of PEP and NSI are based on certain assumptions including, but not limited to, that the properties will be developed consistent with current development plans as provided to us by PEP, that the properties will be operated in a prudent manner, that no governmental regulations or controls will be put in place that would impact the ability of PEP to produce and recover the reserves, and that projections of future production will prove consistent with actual performance. If the reserves are recovered, the revenues therefrom and the costs related thereto could be more or less than the estimated amounts used to confirm economic producibility and determine economic limits for the properties. Because of governmental policies and uncertainties of supply and demand, the sales rates, prices received for the reserves, and costs incurred in recovering such reserves may vary from assumptions made while preparing these estimates.

It should be understood that our audit does not constitute a complete reserves study of the audited oil and gas properties. Our audit consisted primarily of substantive testing, wherein we conducted a detailed review of all properties making up the total proved reserves. In the conduct of our audit, we have not independently verified the accuracy and completeness of information and data furnished by PEP with respect to oil and gas production, well test data, historical costs of operation and development, product prices, or any agreements relating to current and future operations of the properties and sales of production. Our audit did not include a review of PEP's overall reserves management processes and practices.


We used standard engineering and geoscience methods, or a combination of methods, including performance analysis, volumetric analysis, analogy, and reservoir modeling, that we considered to be appropriate and necessary to establish the conclusions set forth herein. As in all aspects of oil and gas evaluation, there are uncertainties inherent in the interpretation of engineering and geoscience data; therefore, our conclusions necessarily represent only informed professional judgment.

Supporting data documenting this audit, along with data provided by PEP, are on file in our office. The technical persons primarily responsible for conducting this audit meet the requirements regarding qualifications, independence, objectivity, and confidentiality set forth in the SPE Standards. Eric J. Stevens, a Licensed Professional Engineer in the State of Texas, has been practicing consulting petroleum engineering at Netherland, Sewell & Associates, Inc. (NSAI), of which NSI is a subsidiary, since 2007 and has 5 years of prior industry experience. Ruurdjan (Rudi) de Zoeten, a Licensed Professional Geoscientist in the State of Texas, has been practicing consulting petroleum geoscience at NSAI since 2008 and has 18 years of prior industry experience. We are independent petroleum engineers, geologists, geophysicists, and petrophysicists; we do not own an interest in these properties nor are we employed on a contingent basis.

Sincerely,

**NETHERLAND, SEWELL
INTERNATIONAL, S. DE R.L. DE C.V.**

By: /s/ ROBERT C. BARG, P.E.
Robert C. Barg, P.E.
President

By: *Eric J. Stevens*
Eric J. Stevens, P.E. 102415
Vice President


Date Signed: April 16, 2019

By: *Ruurdjan de Zoeten*
Ruurdjan (Rudi) de Zoeten, P.G. 3179
Geoscientist


Date Signed: April 16, 2019

EJS:LMS



PRESIDENT. ROBERT C. BARG

VICE PRESIDENT

ALLEN E. EVANS, JR.

RANDOLPH K. GREEN

JOHN G. HATTNER

C. H. (SCOTT) REES III

DANNY D. SIMMONS

DAN PAUL SMITH

ERIC J. STEVENS

April 16, 2019

Dr. Ulises Hernández Romano
S.P.A. de la Dirección General
Pemex Exploración y Producción
Avenida Marina Nacional 329
Torre Ejecutiva, Piso 41
Col. Verónica Anzures, C.P. 11300
Del. Miguel Hidalgo, Ciudad de México
México

Dear Dr. Hernández:

In accordance with your request, we have audited the estimates prepared by Pemex Exploración y Producción (PEP), as of January 1, 2019, of the gross (100 percent) proved reserves and net gas reserves in 46 fields in Activo Integral de Producción Bloques (AIPB) S01 and S04 in Subdirección de Producción Bloques Sur located in the states of Chiapas, Tabasco, and Veracruz, in southern Mexico. PEP is a subsidiary entity of Petróleos Mexicanos. The scope of our work did not include auditing the future net revenue associated with these reserves. The Political Constitution of the United Mexican States provides that the Mexican nation owns all petroleum and other hydrocarbon reserves for these fields; however, these fields have been assigned to and are currently operated by PEP. In accordance with the Energy Reform of 2014, the estimates in this report represent the gross (100 percent) proved reserves to be produced within the economic life of the properties. We have examined the estimates with respect to reserves quantities, reserves categorization, future producing rates, and economic producibility, using the definitions set forth in U.S. Securities and Exchange Commission (SEC) Regulation S-X Rule 4-10(a). Economic analysis was performed by PEP only to confirm economic producibility and determine economic limits for the properties. The estimates of reserves have been prepared in accordance with the definitions and regulations of the SEC and conform to the FASB Accounting Standards Codification Topic 932, Extractive Activities—Oil and Gas. We completed our audit on February 15, 2019. PEP has represented that these properties account for 3.9 percent on a net oil equivalent barrel basis of PEP's net proved reserves as of January 1, 2019. This report has been prepared for PEP's and Petróleos Mexicanos' use internally and in filings with the appropriate regulatory agencies. In our opinion the assumptions, data, methods, and procedures used in the preparation of this report are appropriate for such purpose; there is no guarantee or warranty, implied or expressed, by Netherland, Sewell International, S. de R.L. de C.V. (NSI) for any other use of this report.

The following table sets forth PEP's estimates of the gross (100 percent) reserves and net gas reserves to the combined interest of PEP and the Mexican State, as of January 1, 2019, for the audited AIPB S01 and S04 properties:

2100 ROSS AVENUE, SUITE 2200 • DALLAS, TEXAS 75201-2737 • PH: 214-969-5401 • FAX:214-969-5411

Category	Gross (100%) Reserves						
	Wellhead Oil ⁽¹⁾ (MMBBL)	Liquid Components and Dry Gas			BOE ⁽⁵⁾ (MMBBL)	Wellhead Gas ⁽⁶⁾ (BCF)	Net Gas ⁽⁷⁾ (BCF)
		Condensate ⁽²⁾ (MMBBL)	Plant Liquids ⁽³⁾ (MMBBL)	Dry Gas ⁽⁴⁾ (MMBOE)			
Proved Developed Producing	60.9	2.8	24.9	49.1	137.7	349.2	316.7
Proved Developed Non-Producing	50.1	1.6	11.1	21.3	84.1	168.5	135.1
Proved Undeveloped	20.3	0.7	10.9	20.2	52.1	143.3	132.5
Total Proved	131.3	5.1	46.9	90.5	273.9	661.0	584.3

Totals may not add because of rounding.

- (1) Oil reserves include oil plus liquids from the produced gas stream separated in the field.
- (2) Condensate reserves are the liquids volumes recovered from the produced gas stream during the compression and dehydration stages of processing.
- (3) Plant liquids reserves are the liquids volumes recovered from the gas stream through the processing plants.
- (4) Dry gas reserves are the dry gas available for sale by Pemex Transformacion Industrial (PTRI) at the tailgate of the processing plants.
- (5) BOE includes wellhead oil, condensate, plant liquids, and dry gas.
- (6) Gas reserves are the measured wellhead gas before shrinkage from fuel usage, flare, and processing.
- (7) Net gas reserves are the volume of wet gas available for sale to PTRI at the inlet of the processing plants.

Oil, condensate, plant liquids, and barrels of oil equivalent (BOE) volumes are expressed in millions of barrels (MMBBL); a barrel is equivalent to 42 United States gallons. Dry gas volumes are expressed in millions of barrels of oil equivalent (MMBOE), determined using dry gas conversion factors provided by PEP. Gas volumes are expressed in billions of cubic feet (BCF) at standard temperature and pressure bases.

When compared on a field-by-field basis, some of the estimates of PEP are greater and some are less than the estimates of NSI. However, in our opinion the estimates of reserves prepared by PEP shown herein are reasonable when aggregated at the total proved level and have been prepared in accordance with the Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserves Information promulgated by the Society of Petroleum Engineers (SPE Standards). Additionally, these estimates are within the recommended 10 percent tolerance threshold set forth in the SPE Standards. We are satisfied with the methods and procedures used by PEP in preparing the January 1, 2019, estimates of reserves, and we saw nothing of an unusual nature that would cause us to take exception with the estimates, in the aggregate, as prepared by PEP.

Reserves categorization conveys the relative degree of certainty; reserves subcategorization is based on development and production status. The estimates of reserves included herein have not been adjusted for risk. PEP's estimates do not include probable or possible reserves that exist for these properties.

Oil and gas prices were used only to confirm economic producibility and determine economic limits for the properties. It is our understanding that prices used by PEP are representative of the 12-month average for the period January through December 2018. NSI accepted the prices provided without independent review or verification. All prices are held constant throughout the lives of the properties.

Costs were used only to confirm economic producibility and determine economic limits for the properties. It is our understanding that operating costs used by PEP are representative of the 12-month average for the period January through December 2018. These costs include district and regional overhead expenses along with costs to be incurred at the field level. Operating costs for certain undeveloped fields are based on PEP's analogy to a

similar type of producing field. Operating costs have been divided into field-level costs, per-well costs, and per-unit-of-production costs. No headquarters general and administrative overhead expenses are included. Capital costs used by PEP are based on authorizations for expenditure and actual costs from recent activity. Capital costs are included as required for workovers, new development wells, and production equipment. Abandonment costs used are PEP's estimates of the costs to abandon the wells and production facilities, net of any salvage value. NSI accepted the operating cost parameters and the capital and abandonment costs provided without independent review or verification. Operating, capital, and abandonment costs are not escalated for inflation.

The reserves shown in this report are estimates only and should not be construed as exact quantities. Proved reserves are those quantities of oil and gas which, by analysis of engineering and geoscience data, can be estimated with reasonable certainty to be economically producible; probable and possible reserves are those additional reserves which are sequentially less certain to be recovered than proved reserves. Estimates of reserves may increase or decrease as a result of market conditions, future operations, changes in regulations, or actual reservoir performance. In addition to the primary economic assumptions discussed herein, estimates of PEP and NSI are based on certain assumptions including, but not limited to, that the properties will be developed consistent with current development plans as provided to us by PEP, that the properties will be operated in a prudent manner, that no governmental regulations or controls will be put in place that would impact the ability of PEP to produce and recover the reserves, and that projections of future production will prove consistent with actual performance. If the reserves are recovered, the revenues therefrom and the costs related thereto could be more or less than the estimated amounts used to confirm economic producibility and determine economic limits for the properties. Because of governmental policies and uncertainties of supply and demand, the sales rates, prices received for the reserves, and costs incurred in recovering such reserves may vary from assumptions made while preparing these estimates.

It should be understood that our audit does not constitute a complete reserves study of the audited oil and gas properties. Our audit consisted primarily of substantive testing, wherein we conducted a detailed review of all properties making up the total proved reserves. In the conduct of our audit, we have not independently verified the accuracy and completeness of information and data furnished by PEP with respect to oil and gas production, well test data, historical costs of operation and development, product prices, or any agreements relating to current and future operations of the properties and sales of production. Our audit did not include a review of PEP's overall reserves management processes and practices.

We used standard engineering and geoscience methods, or a combination of methods, including performance analysis, volumetric analysis, and analogy, that we considered to be appropriate and necessary to establish the conclusions set forth herein. As in all aspects of oil and gas evaluation, there are uncertainties inherent in the interpretation of engineering and geoscience data; therefore, our conclusions necessarily represent only informed professional judgment.

Supporting data documenting this audit, along with data provided by PEP, are on file in our office. The technical persons primarily responsible for conducting this audit meet the requirements regarding qualifications, independence, objectivity, and confidentiality set forth in the SPE Standards. Joseph M. Wolfe, a Licensed Professional Engineer in the State of Texas, has been practicing consulting petroleum engineering at Netherland, Sewell & Associates, Inc. (NSAI), of which NSI is a subsidiary, since 2013 and has over 5 years of prior industry experience. Dana D. Coryell, a Licensed Professional Geoscientist in the State of Texas, has been practicing consulting petroleum geoscience at NSAI since 1999 and has over 12 years


of prior industry experience. We are independent petroleum engineers, geologists, geophysicists, and petrophysicists; we do not own an interest in these properties nor are we employed on a contingent basis.

Sincerely,

**NETHERLAND, SEWELL
INTERNATIONAL, S. DE R.L. DE C.V.**

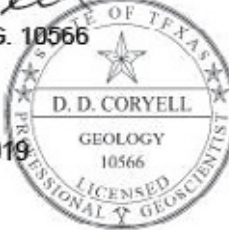
By: /s/ ROBERT C. BARG, P.E.
Robert C. Barg, P.E.
President

By: *Joseph Wolfe*
Joseph M. Wolfe, P.E. 116170
Petroleum Engineer



Date Signed: April 16, 2019

By: *Dana D. Coryell*
Dana D. Coryell, P.G. 10566
Geoscientist



Date Signed: April 16, 2019

JMW:DAS

DeGolyer and MacNaughton
5001 Spring Valley Road
Suite 800 East
Dallas, Texas 75244

April 26, 2019

Ing. Octavio Romero Oropeza
Director General
Petróleos Mexicanos
Avenida Marina Nacional No. 329
Torre Ejecutiva, Piso 44
Colonia Verónica Anzures
11300 Ciudad de México, México

Dear Ing. Octavio Romero Oropeza:

We hereby consent to the references to DeGolyer and MacNaughton as set forth under the headings “Presentation of Information Concerning Reserves,” “Item 4. Information on the Company – Infrastructure of PEMEX – Exploration and Production – Reserves,” and “Item 19. Exhibits. Documents filed as exhibits to this Form 20-F” in the Annual Report on Form 20-F of Petróleos Mexicanos (PEMEX) for the year ended December 31, 2018 (the Form 20-F), and to the filing as Exhibit 10.6 to the Form 20-F of our report of third party dated April 15, 2019, describing our independent reserves evaluation of the estimated proved natural gas quantities and oil, condensate, sales gas, plant liquids, dry gas equivalent to liquids, and oil equivalent reserves that PEMEX has represented are owned by the United Mexican States (México) as of January 1, 2019, for certain fields located in the Activo Integral de Producción AS02-03, AS02-04, and BN02, which include reserves that PEMEX has represented that it has the right to extract and sell. PEMEX has represented that the Activo Integral de Producción BN02 is located in the Aceite Terciario de Golfo and Poza Rica-Altamira business units in the Northern region of México and the Activo Integral de Producción AS02-03 and AS02-04 are located in the Abkatún-Pol-Chuc and Litoral de Tabasco business units in the Marine regions of México. These estimates were prepared in accordance with the reserves definitions of Rules 4-10(a) (1)-(32) of Regulation S-X of the United States Securities and Exchange Commission.

Very truly yours,

/s/ DEGOLYER AND MACNAUGHTON

DeGOLYER and MacNAUGHTON
Texas Registered Engineering Firm F-716

DEGOLYER AND MACNAUGHTON
5001 SPRING VALLEY ROAD
SUITE 800 EAST
DALLAS, TEXAS 75244

This is a digital representation of a DeGolyer and MacNaughton report.

This file is intended to be a manifestation of certain data in the subject report and as such are subject to the same conditions thereof. The information and data contained in this file may be subject to misinterpretation; therefore, the signed and bound copy of this report should be considered the only authoritative source of such information.



DEGOLYER AND MACNAUGHTON
5001 SPRING VALLEY ROAD SUITE 800 EAST
DALLAS, TEXAS 75244

April 15, 2019

Dr. Ulises Hernández Romano
S.P.A. de la Dirección General de Pemex Exploración y Producción
Avenida Marina Nacional 329
Torre Ejecutiva, Piso 41
Col. Verónica Anzures, C.P. 11300
Del. Miguel Hidalgo, Ciudad de México
México

Dear Dr. Hernández Romano,

Pursuant to your request, this report of third party presents an independent evaluation, as of January 1, 2019, of the estimated net proved oil, gas, condensate, and oil equivalent reserves of certain properties in which Pemex Exploración y Producción (PEP) has represented are owned by the United Mexican States located in the Activo Integral de Producción AS02-03, AS02-04, and BN02 onshore and offshore Mexico. This evaluation was completed on April 15, 2019. PEP has represented that these properties account for 24.6 percent on a net oil equivalent barrel basis of PEP's net proved reserves as of January 1, 2019, and that the net proved reserves estimates were prepared in accordance with the reserves definitions of Rules 4–10(a) (1)–(32) of Regulation S–X of the Securities and Exchange Commission (SEC) of the United States. We have reviewed information provided by PEP that it represents to be PEP's estimates of the net reserves, as of January 1, 2019, for the same properties as those which we evaluated. This report was prepared in accordance with guidelines specified in Item 1202 (a)(8) of Regulation S–K and is to be used for inclusion in certain SEC filings by PEP.

PEP has represented that all subsurface hydrocarbons belong to the United Mexican States as stated in the Mexican Hydrocarbon Law. At the request of PEP, this report also includes estimates prepared by PEP of its natural gas liquids (plant liquids) reserves; however, PEP has represented that PEP's management of the properties stops at the inlet of the gas processing plants; therefore, PEP has no right to those quantities presented herein.

Reserves estimates included herein are expressed as net reserves as represented by PEP. Gross reserves are defined as the total estimated petroleum remaining to be produced from these properties after December 31, 2018. Net reserves are defined as that portion of the gross reserves attributable to the interests owned by the United Mexican States and held by PEP after deducting all interests held by others, without consideration of royalties and other fiscal or contractual terms.

Estimates of reserves should be regarded only as estimates that may change as further production history and additional information become available. Not only are such reserves estimates based on that information which is currently available, but such estimates are also subject to the uncertainties inherent in the application of judgmental factors in interpreting such information.

Information used in the preparation of this report was obtained from PEP. In the preparation of this report we have relied, without independent verification, upon information furnished by PEP with respect to the property interests being evaluated, production from such properties, current costs of operation and development, current prices for production, agreements relating to current and future operations and sale of production, and various other information and data that were accepted as represented. A field examination of the properties was not considered necessary for the purposes of this report.

Definition of Reserves

Petroleum reserves included in this report are classified as proved. Only proved reserves have been evaluated for this report. Reserves classifications used in this report are in accordance with the reserves definitions of Rules 4–10(a) (1)–(32) of Regulation S–X of the SEC. Reserves are judged to be economically producible in future years from known reservoirs under existing economic and operating conditions and assuming continuation of current regulatory practices using conventional production methods and equipment. In the analyses of production-decline curves, reserves were estimated only to the limit of economic rates of production under existing economic and operating conditions using prices and costs consistent with the effective date of this report, including consideration of changes in existing prices provided only by contractual arrangements but not including escalations based upon future conditions. The petroleum reserves are classified as follows:

Proved oil and gas reserves – Proved oil and gas reserves are those quantities of oil and gas, which, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be economically producible—from a given date forward, from known reservoirs, and under existing economic conditions, operating methods, and government regulations—prior to the time at which contracts providing the right to operate expire, unless evidence indicates that renewal is reasonably certain, regardless of whether deterministic or probabilistic methods are used for the estimation. The project to extract the hydrocarbons must have commenced or the operator must be reasonably certain that it will commence the project within a reasonable time.

(i) The area of the reservoir considered as proved includes: (A) The area identified by drilling and limited by fluid contacts, if any, and (B) Adjacent undrilled portions of the reservoir that can, with reasonable certainty, be judged to be continuous with it and to contain economically producible oil or gas on the basis of available geoscience and engineering data.

(ii) In the absence of data on fluid contacts, proved quantities in a reservoir are limited by the lowest known hydrocarbons (LKH) as seen in a well penetration unless geoscience, engineering, or performance data and reliable technology establishes a lower contact with reasonable certainty.

(iii) Where direct observation from well penetrations has defined a highest known oil (HKO) elevation and the potential exists for an associated gas cap, proved oil reserves may be assigned in the structurally higher portions of the reservoir only if geoscience, engineering, or performance data and reliable technology establish the higher contact with reasonable certainty.

(iv) Reserves which can be produced economically through application of improved recovery techniques (including, but not limited to, fluid injection) are included in the proved classification when:

(A) Successful testing by a pilot project in an area of the reservoir with properties no more favorable than in the reservoir as a whole, the operation of an installed program in the reservoir or an analogous reservoir, or other evidence using reliable technology establishes the

reasonable certainty of the engineering analysis on which the project or program was based; and (B) The project has been approved for development by all necessary parties and entities, including governmental entities.

(v) Existing economic conditions include prices and costs at which economic producibility from a reservoir is to be determined. The price shall be the average price during the 12-month period prior to the ending date of the period covered by the report, determined as an unweighted arithmetic average of the first-day-of-the-month price for each month within such period, unless prices are defined by contractual arrangements, excluding escalations based upon future conditions.

Developed oil and gas reserves – Developed oil and gas reserves are reserves of any category that can be expected to be recovered:

(i) Through existing wells with existing equipment and operating methods or in which the cost of the required equipment is relatively minor compared to the cost of a new well; and

(ii) Through installed extraction equipment and infrastructure operational at the time of the reserves estimate if the extraction is by means not involving a well.

Undeveloped oil and gas reserves – Undeveloped oil and gas reserves are reserves of any category that are expected to be recovered from new wells on undrilled acreage, or from existing wells where a relatively major expenditure is required for recompletion.

(i) Reserves on undrilled acreage shall be limited to those directly offsetting development spacing areas that are reasonably certain of production when drilled, unless evidence using reliable technology exists that establishes reasonable certainty of economic producibility at greater distances.

(ii) Undrilled locations can be classified as having undeveloped reserves only if a development plan has been adopted indicating that they are scheduled to be drilled within five years, unless the specific circumstances justify a longer time.

(iii) Under no circumstances shall estimates for undeveloped reserves be attributable to any acreage for which an application of fluid injection or other improved recovery technique is contemplated, unless such techniques have been proved effective by actual projects in the same reservoir or an analogous reservoir, as defined in [section 210.4–10 (a) Definitions], or by other evidence using reliable technology establishing reasonable certainty.

Methodology and Procedures

Estimates of reserves were prepared by the use of appropriate geologic, petroleum engineering, and evaluation principles and techniques that are in accordance with practices generally recognized by the petroleum industry, which are presented in the PRMS and Monograph 3 and Monograph 4 published by the Society of Petroleum Evaluation Engineers. The method or combination of methods used in the analysis of each reservoir was tempered by experience with similar reservoirs, stage of development, quality and completeness of basic data, and production history.

Based on the current stage of field development, production performance, the development plans provided by PEP, and analyses of areas offsetting existing wells with test or production data, reserves were classified as proved.

PEP has represented that its senior management is committed to the development plan provided by PEP and that PEP has the financial capability to execute the development plan, including the drilling and completion of wells and the installation of equipment and facilities.

When applicable, the volumetric method was used to estimate the original oil in place (OOIP) and original gas in place (OGIP). Structure and isopach maps were prepared to aid in evaluating reservoir volumes. Electric logs, radioactive logs, core analyses, bottomhole pressure, and other available data were used to prepare maps as well as to estimate representative values for porosity and water saturation. When adequate data were available and when circumstances justified, material-balance methods were used to estimate OOIP or OGIP.

Estimates of ultimate recovery were obtained after applying recovery factors to OOIP and OGIP. These recovery factors were based on consideration of the type of energy inherent in the reservoirs, analyses of the petroleum, the structural positions of the properties, and the production histories. When applicable, material balance and other engineering methods were used to estimate recovery factors based on an analysis of reservoir performance, including production rate, reservoir pressure, and reservoir fluid properties.

For depletion-type reservoirs or those whose performance disclosed a reliable decline in producing-rate trends or other diagnostic characteristics, reserves were estimated by the application of appropriate decline curves or other performance relationships.

A performance-based methodology integrating the appropriate geology and petroleum engineering data was utilized for the evaluation of all reserves categories in unconventional reservoirs. Performance-based methodology primarily includes (1) production diagnostics, (2) decline-curve analysis, and (3) model-based analysis (if necessary, based on availability of data). Production diagnostics include data quality control, identification of flow regimes, and characteristic well performance behavior. Analysis was performed for all well groupings (or type-curve areas).

In certain cases, reserves were estimated by incorporating elements of analogy with similar wells or reservoirs for which more complete data were available.

In the evaluation of undeveloped reserves, type-well analysis was performed using well data from analogous reservoirs for which more complete historical performance data were available.

For cases where history-matched dynamic models were available and applicable, model results were used to estimate recovery factors and reserves production forecasts. In certain cases, a simplified multi-cell, three-dimensional, black-oil simulation model was developed to support the analyses of recovery factors and production forecasts.

Data provided by PEP from wells drilled through December 31, 2018, and made available for this evaluation were used to prepare the reserves estimates herein. These reserves estimates were based on consideration of monthly production data available for certain properties only through August or December 2018. Estimated cumulative production, as of December 31, 2018, was deducted from the estimated gross ultimate recovery to estimate gross reserves. This required that production be estimated for up to 4 months.

Oil and condensate reserves estimated herein are to be recovered by normal field separation. Plant liquids reserves estimated herein include propane, butane, and C5+. Plant liquids reserves are the result of low-temperature plant processing. Oil, condensate, and plant liquids reserves reported herein are expressed in millions of barrels (106bbl). In these estimates, 1 barrel equals 42 United States gallons.

Gas quantities estimated herein are expressed as natural gas and sales gas. Natural gas is the total gas produced from the reservoir prior to processing or separation and includes all nonhydrocarbon components. Sales gas is defined as the total gas to be produced from the reservoirs, measured at the inlet to the processing plant, after reduction for injection, fuel usage, flare, and shrinkage resulting from field separation. Gas reserves estimated herein are reported as sales gas. Gas quantities estimated herein are expressed at a temperature base of 20 degrees Celsius (°C) and at a pressure base of 1 atmosphere (atm). Gas quantities presented in this report are expressed in billions of cubic feet (109ft³).

Gas quantities are identified by the type of reservoir from which the gas will be produced. Nonassociated gas is gas at initial reservoir conditions with no crude oil present in the reservoir. Associated gas includes both gas-cap gas and solution gas. Gas-cap gas is gas at initial reservoir conditions and is in communication with an underlying crude oil zone. Solution gas is gas dissolved in crude oil at initial reservoir conditions. Gas quantities estimated herein include both associated and nonassociated gas.

Condensate, sales gas, and plant liquids reserves were estimated by applying yields and shrinkages, provided by PEP, to estimates of natural gas quantities.

At the request of PEP, estimated dry gas quantities, defined as the total gas to be produced from the reservoirs, measured at the tailgate of the processing plant, after reduction for injection, fuel usage, flare, and shrinkage resulting from field separation and plant processing, were converted to dry gas equivalent to liquids on a field-by-field basis using an energy equivalent factor based on the dry gas composition of each field, as provided by PEP. In addition, natural gas quantities estimated herein were converted to oil equivalent on a field-by-field basis using an energy equivalent factor reflecting the yields and shrinkages of each field, as provided by PEP.

Primary Economic Assumptions

This report has been prepared using initial prices, expenses, and costs provided by PEP in United States dollars (U.S.\$). Future prices were estimated using guidelines established by the SEC and the Financial Accounting Standards Board (FASB). The following economic assumptions were used for estimating the reserves reported herein:

Oil and Condensate Prices

PEP has represented that the oil and condensate prices were based on a reference price, calculated as the unweighted arithmetic average of the first-day-of-the-month price for each month within the 12-month period prior to the end of the reporting period. As represented by PEP, the reference price utilized is the Mexican Mix reference price, which is composed of the Istmo, Maya, and Olmeca reference prices and is calculated based on a formula that includes the West Texas Sour, Light Louisiana Sweet, Brent, Oman, and Dubai reference prices. PEP supplied differentials by field to an average Mexican Mix reference price of U.S.\$71.21 per barrel and the prices were held constant thereafter. The volume-weighted average adjusted prices attributable to estimated proved reserves for the fields that were evaluated were U.S.\$63.60 per barrel for oil and U.S.\$39.59 per barrel for condensate. These prices were not escalated for inflation.

Gas Prices

PEP has represented that the gas prices were based on a 12-month average price, calculated as the unweighted arithmetic average of the first-day-of-the-month price for each month within the 12-month period prior to the end of the reporting period, unless prices are defined by contractual arrangements. Each field's calorific value, which includes plant liquids, was used to determine each field's gas price. The volume-weighted average adjusted price for the fields that were evaluated was U.S.\$5.01 per thousand cubic feet. These prices were not escalated for inflation.

Operating Expenses, Capital Costs, and Abandonment Costs

Operating expenses and capital costs were based on information provided by PEP and were used in estimating future costs required to operate the properties and in estimating costs for future development. In certain cases, future expenditures, either higher or lower than current expenditures, may have been used because of anticipated changes in operating conditions, but no general escalation that might result from inflation was applied. Abandonment costs, which are those costs associated with the removal of equipment, plugging of wells, and reclamation and restoration associated with the abandonment, were provided by PEP. Estimates of operating expenses, capital costs, and abandonment costs were considered in determining the economic viability of the undeveloped reserves estimated herein.

In our opinion, the information relating to estimated proved reserves of oil, condensate, NGL, and gas contained in this report has been prepared in accordance with Paragraphs 932-235-50-4, 932-235-50-6, 932-235-50-7, and 932-235-50-9 of the Accounting Standards Update 932-235-50, *Extractive Industries – Oil and Gas (Topic 932): Oil and Gas Reserve Estimation and Disclosures* (January 2010) of the FASB and Rules 4–10(a)(1)–(32) of Regulation S–X and Rules 302(b), 1201, and 1202(a) (1), (2), (3), (4), (8), and 1203(a) of Regulation S–K of the SEC; provided, however, that estimates of proved developed and proved undeveloped reserves are not presented at the beginning of the year.

To the extent the above-enumerated rules, regulations, and statements require determinations of an accounting or legal nature, we, as engineers, are necessarily unable to express an opinion as to whether the above-described information is in accordance therewith or sufficient therefor.

Summary of Conclusions

PEP has represented that its estimated net proved reserves attributable to the evaluated properties were based on the definition of proved reserves of the SEC. PEP's estimates of the net proved quantities and reserves, as of January 1, 2019, attributable to these properties, which represent 24.6 percent of PEP's reserves on a net oil equivalent basis, are summarized as follows, expressed in millions of barrels (106bbl), billions of cubic feet (109ft3), and millions of barrels of oil equivalent (106boe):

	Estimated by PEP as of January 1, 2019						
	Net Proved Reserves						
Properties Evaluated by DeGolyer and MacNaughton	Net Natural Gas Quantities (10 ⁹ ft ³)	Oil (10 ⁶ bbl)	Condensate (10 ⁶ bbl)	Sales Gas (10 ⁹ ft ³)	Plant Liquids (10 ⁶ bbl)	Dry Gas Equivalent to Liquids (10 ⁶ boe)	Oil Equivalent (10 ⁶ boe)
Proved Developed	1,112.95	474.92	17.63	789.19	54.75	124.41	671.71
Proved Undeveloped	1,604.64	786.22	9.92	1,207.13	47.36	208.89	1,052.40
Total Proved	2,717.59	1,261.14	27.55	1,996.32	102.11	333.30	1,724.11

Notes:

1. Reserves were estimated to the economic limit and did not consider the expiration of the contracts.
2. Oil equivalent was calculated based on oil and natural gas quantities.
3. Natural gas quantities estimated herein were converted to oil equivalent on a field-by-field basis using an energy equivalent factor reflecting the yields and shrinkages of each field, as provided by PEP.
4. Dry gas equivalent to liquids was calculated based on dry gas quantities on a field-by-field basis using an energy equivalent factor reflecting the dry gas composition of each field, as provided by PEP.

In comparing the detailed net proved reserves estimates prepared by DeGolyer and MacNaughton and by PEP, differences have been found, both positive and negative, resulting in an aggregate difference of 8.1 percent when compared on the basis of net oil equivalent barrels. It is DeGolyer and MacNaughton's opinion that the net proved reserves estimates prepared by PEP on the properties evaluated and referred to above, when compared on the basis of net equivalent barrels, in aggregate, are reasonable.

While the oil and gas industry may be subject to regulatory changes from time to time that could affect an industry participant's ability to recover its reserves, we are not aware of any such governmental actions which would restrict the recovery of the January 1, 2019, estimated reserves.

DEGOLYER AND MACNAUGHTON

DeGolyer and MacNaughton is an independent petroleum engineering consulting firm that has been providing petroleum consulting services throughout the world since 1936. DeGolyer and MacNaughton does not have any financial interest, including stock ownership, in PEP. Our fees were not contingent on the results of our evaluation. This report has been prepared at the request of PEP. DeGolyer and MacNaughton has used all assumptions, data, procedures, and methods that it considers necessary and appropriate to prepare this report.

Submitted,

/s/ DeGOLYER and MacNAUGHTON
DeGOLYER and MacNAUGHTON
Texas Registered Engineering Firm F-716



/s/ THOMAS C. PENCE, P.E.
Thomas C. Pence, P.E.
Senior Vice President
DeGolyer and MacNaughton

CERTIFICATE of QUALIFICATION

I, Thomas C. Pence, Petroleum Engineer with DeGolyer and MacNaughton, 5001 Spring Valley Road, Suite 800 East, Dallas, Texas, 75244 U.S.A, hereby certify:

1. That I am a Senior Vice President of DeGolyer and MacNaughton, which firm did prepare the report of third party addressed to PEP dated April 15, 2019, and that I, as Senior Vice President, was responsible for the preparation of this report of third party.
2. That I attended Texas A&M University, and that I graduated with a degree in Petroleum Engineering in the year 1982; that I am a Registered Professional Engineer in the State of Texas; that I am a member of the Society of Petroleum Engineers; and that I have in excess of 36 years of experience in oil and gas reservoir studies and reserves evaluations.



/s/ THOMAS C. PENCE, P.E.

THOMAS C. PENCE, P.E.

Senior Vice President

DeGolyer and MacNaughton

CERTIFICATION

I, Octavio Romero Oropeza, certify that:

1. I have reviewed this annual report on Form 20-F of Petróleos Mexicanos;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the company as of, and for, the periods presented in this report;
4. The company's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the company's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting; and
5. The company's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the company's auditors and the audit committee of the company's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the company's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the company's internal control over financial reporting.

Date: April 30, 2019

By: /s/ OCTAVIO ROMERO OROPEZA
Name: Octavio Romero Oropeza
Title: Chief Executive Officer/Director General

CERTIFICATION

I, Alberto Velázquez García, certify that:

1. I have reviewed this annual report on Form 20-F of Petróleos Mexicanos;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the company as of, and for, the periods presented in this report;
4. The company's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the company's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting; and
5. The company's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the company's auditors and the audit committee of the company's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the company's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the company's internal control over financial reporting.

Date: April 30, 2019

By: /s/ ALBERTO VELÁZQUEZ GARCÍA

Name: Alberto Velázquez García

Title: Chief Financial Officer/Corporate
Director of Finance

Certification
Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
(Subsections (a) and (b) of Section 1350, Chapter 63 of Title 18, United States Code)

Pursuant to section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of section 1350, chapter 63 of title 18, United States Code), each of the undersigned officers of Petróleos Mexicanos, a productive state-owned company of the Federal Government of the United Mexican States (the "Company"), does hereby certify, to such officer's knowledge, that:

The Annual Report on Form 20-F for the year ended December 31, 2018 (the "Form 20-F") of the Company fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934 and information contained in the Form 20-F fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: April 30, 2019

By: /S/ OCTAVIO ROMERO OROPEZA
Name: Octavio Romero Oropeza
Title: Chief Executive Officer/Director General

Date: April 30, 2019

By: /S/ ALBERTO VELÁZQUEZ GARCÍA
Name: Alberto Velázquez García
Title: Chief Financial Officer/Corporate
Director of Finance

April 30, 2019

Securities and Exchange Commission
100 F Street, NE
Washington, D.C. 20549

BDO Mexico was previously the independent registered public accounting firm for Petroleos Mexicanos Productive State-Owned Subsidiaries and Subsidiary Companies (the “Company”). On July 20, our appointment as principal auditors was terminated.

We have read the Company’s statements included in its Annual Report on Form 20-F for the fiscal year ended December 31, 2018, and we agree with such statements, except that we are not in a position to agree or disagree with the Company’s stated reason for changing its principal auditors or its statement that the newly engaged accountants were not consulted during the fiscal years ended December 31, 2017 and 2016.

Very truly yours,

/s/ BDO MEXICO
C.P.C. José Luis Villalobos Zuazua