2017–2018 Minerals Yearbook

THAILAND [ADVANCE RELEASE]

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The Mineral Industry of Thailand

By Ji Won Moon

Note: In this chapter, information for 2017 is followed by information for 2018.

In 2017, Thailand was one of the world's leading producers of feldspar (ranking fifth in world production with 5.6% of the world total), gypsum (fifth-ranked producer with 6.0% of the world total), and rare earths (sixth-ranked producer with about 1% of the world total). Thailand's mining industries produced such metallic minerals as manganese, tin, and tungsten. The mining production of gold and silver were suspended in 2017 owing to negative environmental and health effects. In addition, Thailand produced a variety of industrial minerals, such as calcite, cement, clay, fluorspar, perlite, phosphate rock, quartz, salt, sand and gravel (construction and industrial), and stone (crushed and dimension) (table 1; Chandran, 2018; Crangle, 2019; Gambogi, 2019; Tanner, 2019).

Minerals in the National Economy

In 2017, the growth rate of Thailand's real gross domestic product (GDP) was 4.1%, which was supported by increased exports and growth of the global economy. The growth rate of the mining and quarrying sector decreased by 6%, however, owing to the suspension of gold and silver mine operations in 2017. The nominal GDP in 2017 was $456 billion[1] (BHT 15.5 trillion). The net inflow of foreign direct investment (FDI) to Thailand increased to $8.2 billion in 2017 from $2.8 billion in 2016. The mining and quarrying industry received 1.2% of the country's net inflow of FDI in 2017. Japan accounted for 35% of the total FDI followed by Singapore, 15%; China (including Hong Kong), 9.3%; and the United States and the Netherlands, 6.6% each. Approximately 64,500 people, equivalent to about 0.17% of the total labor force, were employed in the mining and quarrying sector in 2017, which was a decrease of 3% compared with that of 2016 (Bank of Thailand, 2019a, e, f; 2020a, b).

Government Policies and Programs

Thailand made major changes in its mining legislation with the enactment of the Minerals Act, B.E. 2560 (2017) (Minerals Act) on August 29. The Minerals Act consolidated the Minerals Act, B.E. 2510 (1967), which was last amended in 2002, and the Mineral Royalty Rates Act, B.E. 2509 (1966), which was last amended in 1979, into one law. The Minerals Act is intended to achieve optimal economic, social, and environmental benefits from mineral management through such measures as the suspension of gold mining and the restrictions on agricultural land use. The Minerals Act decentralized the authority to issue exploration licenses depending on the type, period, and specified area, and it significantly increased fees for exploration licenses, which vary depending on the type of license (Prior and Summacarava, 2017; Poonsombudlert, Wechsuwanarux, and Gulthawatvichai, 2019).

Production

In 2017, the most significant changes in metal production were that production of tin (mined, Sb content) was nearly six times that of 2016; that of tungsten (mined, W content) nearly doubled; and that of raw steel increased by 17%. Production of zinc (mined, Zn content) decreased by 96%; that of zinc smelter and alloys, by 59% each; rare earths (mined, oxide equivalent), by 19%; and manganese (mined, Mn content), by 11%. No mine production of antimony, gold, or silver was reported (table 1).

In the industrial mineral and mineral fuel sectors, production of quartz was more than three times that of 2016, and production of sand and gravel (industrial) increased by 59%; marble (dimension), by 38%; feldspar, by 19%; and ball clay, by 15%. The production of fluorspar (metallurgical grade) decreased by 73% followed by perlite, 63%; nonbeneficiated kaolin and barite, 52% each; pyrophyllite, 44%; fluorspar (acid grade), 32%; travertine, 24%; crushed marble (including fragments), 22%; shale for cement and crude petroleum, 14% each; and gypsum and kerosene, 11% each (table 1).

Structure of the Mineral Industry

Most of the nonfuel mineral mining and processing companies in Thailand were privately owned and operated. The Government-owned Electricity Generating Authority of Thailand (EGAT) operated domestic coal mines. Since depletion of their domestic coal reserves, privately owned coal companies Banpu Public Co. Ltd. and Lanna Resources Public Co. Ltd. had imported coal from mines in Indonesia that were owned by their subsidiaries or joint ventures (Banpu Public Co. Ltd., 2020; Lanna Resources Public Co. Ltd., 2020). PTT Exploration and Production Public Co. Ltd. (PTTEP), which was a subsidiary of Government-owned Petroleum Authority of Thailand (PTT), its joint ventures, and some foreign and Thailand-based international oil companies owned most of the country's petroleum and natural gas exploration projects and extraction businesses. Table 2 is a list of major mineral industry facilities in Thailand.

Mineral Trade

The value of Thailand's total exports increased by 9.9% to $237 billion in 2017 from $215 billion in 2016 owing to the significant increase in merchandise sales and tourism and the growth of the agricultural sector, which recovered from a severe drought in 2015–16. In 2017, exports of steel and other metals accounted for 4.4% of Thailand's total exports and were valued at $10.5 billion; petroleum products, 3.2% and

[1] Where necessary, values have been converted from Thai bahts (THB) to U.S. dollars (US$) at the annual average exchange rate of BHT32.31=US$1.00 for 2018 and BHT33.94=US$1.00 for 2017.

$7.5 billion, respectively; and mining products, including crude petroleum and minerals, 0.5% and $1.1 billion, respectively. The export values of these products in 2017 increased by 14.3%, 32.5%, and 22.7%, respectively, compared with those of 2016. Thailand's main export partners in 2017 were China (including Hong Kong), which received 17.7% of Thailand's total exports, by value; the United States, 11.2%; and Japan, 9.3% (Ariyapruchya and others, 2018, p. 3; Bank of Thailand, 2019b, d).

In 2017, the value of total imports increased by 14% to $222 billion from $194 billion in 2016. Fuels, including coal, coke, crude petroleum, natural gas, and petroleum products, accounted for 13.1% of Thailand's total imports. The total value of fuel imports increased by 26% to approximately $29 billion from $23 billion in 2016. Thailand's main import partners in 2017 were China (including Hong Kong), which supplied 21.3% of Thailand's total imports, by value; Japan, 14.5%; the United States, 6.7%; and Malaysia, 5.2% (Bank of Thailand, 2019b, c).

In 2017, the value of imported base metal materials totaled $18.8 billion (8.5% of total imports), which was an increase of 83% from that of 2016. Thailand imported 3.0 million metric tons (Mt) of steel ingots and semifinished products and was the world's sixth-ranked importer in 2017. Leading steel producers included G-Steel Plc., Sahaviriya Steel Industries Plc., and Tata Steel (Thailand) Plc. Imported steel had supported from 81% to 94% of the country's apparent consumption since 2009 (International Trade Administration, 2017, p. 1; Bank of Thailand, 2019c; World Steel Association, 2019, p. 59–61).

Commodity Review

Metals

Gold.—Kingsgate Consolidated Ltd. (Kingsgate) operated the Chatree Mining Complex through its local unit Akara Resources Public Co. Ltd. On December 13, 2016, the National Council for Peace and Order issued Order No. 72/2559, which called for the suspension of all gold-mining operations and related activities effective as of January 1, 2017. In August, the Government lifted the temporary suspension, allowing for the application for a renewal of the mine's metallurgical processing license to proceed, although it was not approved by yearend. No monetary compensation for the losses the company suffered as a result of the closure and expropriation of Chatree was announced, and there was no indication of whether or when Kingsgate would be able to restart operations. Kingsgate was unable to reach a settlement after months of negotiation with the Government regarding the suspension order that terminated approximately 1,000 workers. Kingsgate commenced arbitration before an international tribunal in an attempt to recover the substantial losses under the Thailand-Australia Free Trade Agreement enacted in 2005, which contained provisions related to investment protection and the right to seek impartial resolution of disputes with the Government. In 2016, the Chatree Mine had produced 65% of Thailand's total gold production, or 2,795 kilograms (kg), and 70% of the country's total silver production, or 25,134 kg (Kebui, 2017; Kingsgate Consolidated Ltd., 2017, p. 2, 4).

Zinc.—Padaeng Industry Public Co. Ltd. (PDI) started operations at its zinc smelting plant for the production of zinc ingot in Tak Province in 1985; the plant was located 96 kilometers from the sole zinc mine in Thailand, the Mae Sot Mine. PDI stopped the extraction of ore from the Mae Sot Mine owing to depletion of ore in June 2016. In 2017, PDI's zinc smelting plant used the last remaining zinc ore from the Mae Sot Mine to produce 30,018 metric tons (t) of zinc metal. All core refining processes ceased in the second quarter, causing the complete halt in operations by the end of October. After the mine closed, PDI continued with the environmental restoration efforts that had begun in 1993. PDI's zinc smelting plant produced more than 3 Mt of zinc metal throughout the duration of its 33 years of operation (Padaeng Industry Public Co. Ltd., 2017, p. 11; 2018, p. 26, 30, 34).

Industrial Minerals

Cement.—In 2017, seven cement companies operating 12 plants in Thailand had a combined production capacity of 60.7 million metric tons per year. In 2017, Thailand reported total production of 33.6 Mt of cement, which was 4% less than the 34.9 Mt produced in 2016. The total production of cement fully satisfied the domestic consumption of 28.9 Mt in 2017. Global cement exports were 166.6 Mt in total in 2017, and Thailand was one of the leading exporters, along with China, Japan, Turkey, and Vietnam (tables 1, 2; Cemnet.com, 2018; GlobalCement.com, 2018).

Quartz.—The Ministry of Industry was in the process of facilitating the development of quartz mining to supply raw material for manufacturing solar panels. As of December 2016, the high-quality quartz reserves were estimated to be 25 Mt, which could be used to manufacture about 6 Mt of solar-cell-grade silicon for the production of solar panels. The production of quartz in 2017 more than tripled compared with that of 2016 (table 1; Nation Thailand, The, 2016).

Mineral Fuels

Coal, Natural Gas, and Petroleum.—Total energy consumption was from natural gas, 42%; petroleum products, 38%; coal, 18%; and hydroelectric and imported electricity combined, 2%. In 2017, total domestic output of condensate, natural gas, and petroleum decreased to 284.8 million barrels of crude petroleum equivalent, or by 4.7% compared with that of 2016 (Ministry of Energy, 2018, p. 6–7, 39–42).

MINERAL INDUSTRY HIGHLIGHTS IN 2018

Minerals in the National Economy

In 2018, Thailand's GDP continued to grow, increasing by 4.2%, which was higher than the global growth rate of 3.1%. The growth in Thailand's GDP was supported by a strong uptake in domestic expenditures. Mining and quarrying as a percentage of the GDP decreased by 3.0% as a result of the continued ban on gold mining. The nominal GDP in 2018 was $507 billion (BHT 16.4 trillion). FDI outflow totaled $302 million in 2018, and the country's net inflow increased by 61% to $13.2 billion. Approximately 73,500 people, or about

0.19% of the total labor force, were employed in the mining and quarrying sector in 2018 (Bank of Thailand, 2019a, e; 2020a, b; World Bank Group, 2019, p. 11).

Thailand's total export value increased by 6.9% to $253 billion in 2018. Metal and steel accounted for 4.7% of Thailand's total exports, or $11.9 billion; petroleum products, 3.8%, or $9.7 billion; and mining products (including crude petroleum and minerals), 0.5%, or $1.3 billion. In comparison with those of 2017, the values of these product groups increased by 13.2%, 30.0% and 20.2%, respectively. In 2018, total imports increased by 12.0% to $248 billion. Fuels (including coal, coke, crude petroleum, natural gas, and petroleum products), materials of base metals, and minerals accounted for 16.0%, 8.8%, and 1.6% of Thailand's total imports, respectively. Fuel imports totaled approximately $39.7 billion, which was a 36.9% increase from those of 2017, and base metals totaled $22 billion, which was a 16.6% increase (Bank of Thailand, 2019c, d).

Production

In 2018, the significant production increases included that of ball clay by 269%; marl for cement, 250%; fluorspar (metallurgical grade and acid grade), 204% and 68%, respectively; marble (including fragments), 53%; cement clay and ceramic clay, 36% each; granite (crushed), 25%; and dolomite, 15%. In contrast, the production of tin concentrate (Sn content) decreased by 86%, followed by granite (dimension), 76%; marble (dimension), 54%; travertine (dimension), 52%; manganese (Mn content), 51%; rare earth concentrates (gross weight), 23%; feldspar, 19%; and sand and gravel (industrial), 11% (table 1).

Structure of the Mineral Industry

In January, Metal Tiger Plc. of the United Kingdom divested its remaining 5% stake in the Chatree gold mine after failing to reach an agreement with the Government of Thailand. In December, Metal Tiger was able to complete the licensing and lease application for the Boh Yai lead-zinc-silver mine (Kemco project) and continued to explore legal options for implementation of exploration plans at the Boh Yai Mine (Hamer, 2018; Metal Tiger Plc., 2019, p. 14).

In December, PTTEP won the concession contracts for the offshore Erawan and Bongkot Blocks with a combined production of approximately 22 billion cubic meters of natural gas per year, effective as of 2022 and 2023, respectively. In 2018, PTTEP operated the Bongkot gas block and had a 2.7% stake in the Erawan Block, which was operated by Chevron Thailand Exploration and Production Ltd. (Praiwan and Sangwongwanich, 2018).

Commodity Review

Metals

Gold.—In May, Kingsgate filed for international arbitration after Kingsgate and the Government of Thailand failed to reach a resolution after suspension in 2017 of all gold-mining activities by Order No. 72/2559. Under the pending arbitration, neither party was permitted to release any data on operation, damages, and potential compensation. Another company, Tungkum Co. Ltd., which had operated a gold mine in Loei Province since 2006, had ongoing disputes with local residents about the environmental effects of the mine and was declared bankrupt by a Bangkok court in February 2018 (Chandran, 2018; Phoonphongphiphat, 2018).

Tin.—Thailand Smelting & Refining Co. Ltd. (Thaisarco)—a subsidiary of Amalgamated Metal Corp. Plc. (AMC) of the United Kingdom—was a leading manufacturer of tin, specialty tin alloys, and other tin-related products. In 2018, a new furnace was under construction and was expected to be commissioned in the first half of 2019; the new furnace would expand the smelter's capacity and improve efficiencies, which were expected to restore profitability for the smelting business. Higher energy costs and wages had increased operating costs, and the competitive market made the basic smelting operations of Thaisarco unprofitable in 2018 (Amalgamated Metal Corp. Plc, 2019, p. 10, 18).

Industrial Minerals

Potash.—In 2018, Asean Potash Chaiyaphum Plc. (APOT) was in talks with financial institutions to revive the APOT project. In 1991, Thailand had proposed building the potash mining and processing plant in Bamnet Narong District in Chaiyaphum Province to produce affordable and high-quality potash fertilizer for farmers in the Association of Southeast Asian Nations (ASEAN) member countries. APOT expected to produce 800,000 t of potassium fertilizer in 2019; the potash reserve was 430 Mt (Wipatayotin, 2017; Apisitniran, 2018).

Outlook

Thailand's GDP is expected to grow by 3.9% in 2019 and 3.7% in 2020 because of slowing global growth and trade conflicts. In addition, Thailand is expected to be slow in developing untapped mineral deposits in the Mekong area owing to the risk of political uprising and delays, cancellation of infrastructure projects, and resource nationalism sentiment. The future of gold mines remains uncertain as a result of the Government's resolution to forbid all gold-mining activities as of January 1, 2017 (Ariyapruchya and others, 2018, p. 3; Mining.com, 2018; Asian Development Bank, 2019, p. 298–302).

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TABLE 1

THAILAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons, gross weight, unless otherwise specified)

Commodity[2]		2014	2015	2016	2017	2018
METALS						
Antimony:						
Mine, ore, Sb content		--	--	32	--	--
Refinery		706	700 [e]	700 [e]	700 [e]	700 [e]
Copper, refinery		229	--	--	--	--
Gold, mine, Au content	kilograms	4,514	3,305	4,293	--	--
Iron ore, mine:						
Gross weight		347,918	16,483	--	135	--
Fe content		216,000	10,200	--	84	--
Iron and steel, raw steel	thousand metric tons	4,095	3,720	3,824	4,471	4,315
Lead, refinery, secondary, lead alloys		79,250	86,000	86,000 [r]	88,000	85,000
Manganese, mine:						
Gross weight		14,330	9,000	9,150	8,020	4,000
Mn content[e]		6,900	4,300	4,400	3,900	1,900
Rare earths, mine, concentrates[e, 3]						
Gross weight[4]		3,200	1,300	2,600	2,200	1,700
Rare-earth-oxide equivalent		1,900	760	1,600	1,300	520
Silver, mine, Ag content	kilograms	31,046	21,047	35,954	--	--
Tin:						
Mine, concentrates, Sn content		156	72	92	541	75
Smelter, primary		16,494 [r]	10,616 [r]	10,807 [r]	10,588	10,721
Tungsten, mine, concentrates:						
Gross weight		173	61	57	114	127
W content[e]		99 [r]	35 [r]	33 [r]	65	69
Zinc:						
Mine, ore:						
Gross weight		226,893	181,025	175,632	7,877	--
Zn content		39,140	34,738 [r]	34,500 [r]	1,460	--
Smelter, primary		70,100	74,121	72,813	30,018	--
Alloys, Zn content		21,000 [r]	22,200	21,800 [r]	9,010	--
INDUSTRIAL MINERALS						
Barite		81,996 [r]	72,000 [r,]	140,000 [r,]	67,000 [e]	13,149
Calcite		991,981	1,281,765	1,452,235	1,456,747	1,467,822
Cement, hydraulic	thousand metric tons	36,150 [r]	36,216	34,860 [r]	33,587	35,750
Clay:						
Ball clay		123,082	81,245	136,646 [r]	157,093	579,565
Cement clay		4,124,016	4,792,683	4,506,878	4,301,793	5,837,807
Ceramic clay		312,963	514,044	371,686	357,982	485,853
Kaolin:						
Beneficiated		123,621 [r]	102,763	101,618 [r]	102,659	96,666
Nonbeneficiated		755,913	655,196	830,393 [r]	401,450	403,225
Diatomite[5]		194 [r]	188 [r]	833 [r]	800 [e]	649
Feldspar		1,413,428	1,331,916	1,167,147	1,385,925	1,117,803
Fluorspar:						
Metallurgical grade		4,590	15,095	20,100	5,500	16,700
Acid grade[e]		33,000	34,000	37,000	25,000	42,000
Gypsum, mine	thousand metric tons	12,445	11,267	10,407 [r]	9,254	9,680
Lime[e]		800,000	780,000	780,000	820,000	810,000
Perlite		54,100	17,200	15,690	5,800	5,600
Phosphate rock:						
Gross weight		500	--	--	8,000	--
P_2O_5 content		150	--	--	2,400	--
Quartz		194,831	188,650	50,160	176,083	67,802
Salt		1,381,067	1,385,911	1,390,548	1,497,233	1,487,364

See footnotes at end of the table.

TABLE 1—Continued

THAILAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons, gross weight, unless otherwise specified)

Commodity[2]		2014	2015	2016	2017	2018
INDUSTRIAL MINERALS—Continued						
Sand and gravel, industrial, unspecified		1,133,906 r	1,191,612	1,102,699	1,756,308	1,557,218
Stone, sand, and gravel, construction:						
Stone:						
Crushed:						
Dolomite, for ceramic		2,471,486	2,432,853	3,034,860	2,988,336	3,440,193
Granite	thousand metric tons	7,591	8,075	9,459	9,036	11,281
Limestone	do.	94,710 r	103,388 r	106,923 r	108,480	116,292
Marble, including fragment		1,636,503 r	2,629,588 r	2,568,888 r	1,995,310	3,060,329
Marl, for cement		1,200	--	--	8,200	28,707
Shale, for cement	thousand metric tons	5,409	6,277	7,590 r	6,506	6,716
Dimension:						
Granite		8,005	13,878	14,860	14,437	3,535
Marble		28,475	31,619	30,986	42,639	19,663
Travertine		5,103	1,350	2,600	1,969	949
Talc and related materials:						
Pyrophyllite		49,100	45,500	96,800 r	54,000	50,920
Talc		8,208	6,768	7,126	7,436	7,756
MINERAL FUELS AND RELATED MATERIALS						
Coal, lignite	thousand metric tons	17,982 r	15,151	16,979	16,259	14,852
Natural gas	million cubic meters	42,071 r	39,769 r	39,014 r	37,394	36,432
Petroleum:						
Condensate	thousand 42-gallon barrels	34,430	34,905 r	34,583 r	35,979	36,139
Crude	do.	50,560 r	55,621 r	59,687 r	51,556	47,158
Refinery:						
Diesel	do.	151,384	170,700	161,625	169,233	174,176
Fuel oil	do.	35,647	35,953	35,634	36,971	37,609
Gasoline	do.	62,184	70,141	76,285	79,431	82,812
Jet fuel	do.	41,525	44,298	44,145	46,760	51,163
Kerosene	do.	6,906	8,520	13,983	12,390	13,483
Liquefied petroleum gas	do.	64,135	64,209	66,607	70,538	72,762
Total	do.	362,000	394,000	398,000	415,000	432,000

[e]Estimated. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through September 26, 2019. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]In addition to the commodities listed, gemstones, kaolin filler, silicon, and tantalum may have been produced in Thailand, but available information was inadequate to make reliable estimates of output.

[3]Estimated based on trade data.

[4]Monazite concentrates.

[5]Production estimated by reported exports; domestic mined amount could be higher.

TABLE 2
THAILAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Antimony	metric tons	Amco Thai Mining Co. (Hibino Metal Industry)	Antimony smelter, Ban Pin, Phrae Province	500
Barite		Asian Mineral Resources Co. Ltd.	Amphoe Chalermprakiat, Saraburi Province	60
Do.		Kia Energy Co. Ltd.	Crushing plants in Saraburi Province	25
Do.		P&S Barite Mining Co. Ltd. (Pands Group)	Chaing Mai, Kanchanaburi, Nakhon Si Thammarat, and Tak Provinces	70
Cement		Asia Cement Public Co. Ltd.	Pukrang plant, Pra Buddhabat, Saraburi Province	5,000
Do.		Globe Cement Co. Ltd.	Plant in Chaloem Phrakiat, Saraburi Province	820
Do.		Jalaprathan Cement Plc. (Asia Cement Public Co. Ltd., 88.84%)	Takli plant, Takli District, Nakhon Sawan Province	1,200
Do.		do.	Cha-Am plant, Cha-Am District, Petchaburi	1,200
Do.		Siam Cement (Kaeng Khoi) Co. Ltd. (SCG Cement-Building Materials Co. Ltd.)	Plant in Kaeng Khoi District, Saraburi Province	7,300
Do.		Siam Cement (Lampang) Co. Ltd. (SCG Cement-Building Materials Co. Ltd.)	Plant in Chaehom District, Lampang Province	2,100
Do.		Siam Cement (Ta Luang) Co. Ltd. (SCG Cement-Building Materials Co. Ltd.)	Ta Luang plant, Ban Mo District, Saraburi Province	3,100
Do.		do.	Khao Wong plant, Saraburi Province	3,840
Do.		Siam Cement (Thung Song) Co. Ltd. (SCG Cement-Building Materials Co. Ltd.)	Plant in Thung Song District, Nakorn Sri Thammarat Province	6,900
Do.		Siam City Cement Public Co. Ltd. (Sunrise Ecology Co., Ltd., 34.81%; Jardine Cycle & Carriage Ltd., 25%; Ratanarak Group, 9.43%)	Kaeng Koei District, Saraburi Province	14,800
Do.		Thai Pride Cement Co. Ltd.	Saraburi plant, Kaeng Khoi, Saraburi Province	1,000
Do.		TPI Polene Public Co. Ltd.	Kaeng Koei District, Saraburi Province	13,500
Coal, lignite		Electricity Generating Authority of Thailand (EGAT) (Government, 100%)	Mae Moh Mine, Lampang Province	16,000
Copper, metal		Thai Copper Industries Public Co. Ltd. (PM Group)	Rayong Industrial Park, Rayong Province	165 [1]
Feldspar		Asia Mineral Processing Co. Ltd.	Nakhon Si Thammarat Province	1,500
Fluorspar		Asian Mineral Resources Ltd.	Mae Hong Son Province	14
Do.		S.C. Mining	Ban Pin, Phrae Province	12
Gas, natural	million cubic meters	Chevron Thailand Exploration and Production Ltd. (35% to 80% depending on operating areas)	35 operating areas in Pattani Basin and Malay Basin, all in the Gulf of Thailand	10.3
Do.	do.	Esso (Thailand) Public Co. Ltd. (Exxon Mobil Corp.), operating jointly with PTT Exploration and Production Public Co. Ltd. (Petroleum Public Co. Ltd.)	Namphong gas production plant, Namphong District, Khon Kaen Province	1.5
Do.	do.	PTT Exploration and Production Public Co. Ltd. (PTTEP) (Government, 65.3%; Thai NVDR Co. Ltd., 8%; State Street Europe Ltd., 2.2%)	Nam Phong and Phu Horm gasfields, Gulf of Thailand	13.4
Do.	do.	TOTAL Exploration and Production (Thailand), 33.3%	Bongkot gas field (33%), Gulf of Thailand	18.4
Gold:				
Mine, Au content	kilograms	Akara Resources Public Co. Ltd. (Kingsgate Consolidated Ltd., 100%)	Chatree Mining Complex, Phichit Province	5,000 [2]
Do.		Tungkum Co. Ltd.	Wang Saphung District, Loei Province	NA [2]
Refined, secondary		Umicore Precious Metals Thailand, Ltd. (Umicore Group, 91.21%)	Refinery in Dokmai Subdistrict, Pravet District, Bangkok Province	NA
Gypsum, mine		General Mining and Trading Co. Ltd.	Talad, Muang, Surat Thani Province	NA
Do.		Lotus Mines Co. Ltd.	Nakornsawan Province	180
Do.		Vanich Gypsum Co. Ltd.	Mai Riang and Thoong Yai, Nakhon Si Thammarat Province and Khlong Prab, Surat Thani Province	8,500
Iron ore, gross weight		P.T.K. Mining Co. Ltd. (Siam Iron and Steel Co., Ltd.)	Phu Ang, Loei Province	720 [3]

See footnotes at end of table.

TABLE 2—Continued
THAILAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Iron and steel:				
Raw steel		Bangkok Iron and Steel Works Co. Ltd. (Chiew Xanh Group)	Phrapradaeng, Samutprakarn Province	500
Do.		Bangkok Steel Industry Plc.	Phrapradaeng, Samutprakarn Province	360
Do.		Chow Steel Industries Plc.	Kabinburi Industrial Estate, Prachinburi	750
Do.		N.T.S. Steel Group Public Co. Ltd. [Tata Steel (Thailand) Public Co. Ltd. (TSTPCL), 99.76%]	Hemaraj Chonburi Industrial Estate, Sriracha	550
Do.		Siam Construction Steel Co. Ltd. [Tata Steel (Thailand) Public Co. Ltd. (TSTPCL), 99.99%]	Ta Phut Industrial Estate, Rayong	550
Do.		Siam Iron and Steel Co. Ltd. [Tata Steel (Thailand) Public Co. Ltd. (TSTPCL), 99.99%]	Tambon Bang Khamode, Saraburi	300
Do.		TBS Steel Co. Ltd.	Sri Maha Pho District, Prachinburi Province	350
Do.		UMC Metals Ltd.	Muang District, Chonburi Province	550
Products		Asian Wire Products Co. Ltd. (Bangkok Steel Industry Group)	Muang, Nakornrachasima Province	466
Do.		Bangkok Steel Industry Plc.	Phrapradaeng, Samutprakarn Province	735
Do.		Bangsaphan Barmill Plc.	Bang Saphan District, Prachuapkhirikhan	720
Do.		GJ-Steel Plc (G-Steel Plc)	Sriracha, Chonburi Province	1,500
Do.		G-Steel Plc (formerly Siam Ystrip Mill Plc)	Bann Khai, Rayong Province	1,800
Do.		LPN Plate Mill Plc.	Pra Samut Jedi District, Samutprakarn	500
Do.		MillCon Steel Plc. (Sittichai Leeswadtrakul, 37.3%, and General Engineering Public Co. Ltd., 18%)	Bang Khun Thian District, Bangkok; and Nikhom Pattana, Rayong Province	600
Do.		Namheng Steel Co. Ltd.	Lopburi Province	300
Do.		NS-Siam United Steel Co. Ltd. (Nippon Steel & Sumitomo Metal Corp. Group)	Map Ta Phut, Muang, Rayong Province	1,360
Do.		Primes Steel Ltd.	Pluak Daeng District, Rayong Province	840
Do.		Ractchasima Steel Works Co. Ltd. (Bangkok Steel Industry Group)	Muang, Nakornrachasima Province	710
Do.		Sahaviriya Plate Mill Plc. (SPM)	Bankpakong District, Chachoengsao Province	1,000
Do.		Sahaviriya Steel Industries Plc. (SSI)	Bangsaphan, Prachuap Khiri Khan Province	4,000
Do.		Siam Yamato Steel Co. Ltd.	Map Ta Phut, Rayong Province	1,100
Do.		Tata Steel (Thailand) Plc (Tata Steel Global Holding PTE Ltd., 67.9%)	Map Ta Phut, Rayong Province; Sriracha, Chonburi Province; Ban Mon, Saraburi Province	1,700
Do.		TY Steel Co. [Tycoons Worldwide Group (Thailand) Public Co. Ltd.]	Wire rod and rebar plant located in Rayong Province	180
Lead, refined, lead alloys		T.K Metal Trading Ltd. Partnership	Nakornprathom Province	15
Lime		Chemicals Public Co. Ltd.	Kaeng Khoi factory in Saraburi Province	456
Do.		do.	Phra Phutthana factory in Saraburi Province	365
Do.		Golden Lime Plc.	Lopburi Province	170
Petroleum:				
Crude, including condensate	thousand 42-gallon barrels	Chevron Thailand Exploration and Production Co., Ltd. (Chevron Corp.)	Pattani Basin and Malay Basin in the Gulf of Thailand	43,300
Do.	do.	Ophir Energy	Bualuang field in the Gulf of Thailand	3,300
Do.	do.	Mubadala Petroleum (Mubadala Investment Co., 100%, owned by the Government of Abu Dhabi)	Jasmine, Manora, and Nong Yao fields in the Gulf of Thailand	11,700
Do.	do.	TOTAL Exploration and Production (Thailand)	Bongkot, offshore in the Gulf of Thailand	3,300
Do.	do.	PTT Exploration and Production Public Co. Ltd. (PTTEP) (Government, 65.3%; Thai NVDR Co. Ltd., 8%; State Street Europe Ltd., 2.2%)	Arthit, Songkhla, Gulf of Thailand	32,100

See footnotes at end of table.

TABLE 2—Continued
THAILAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum:—Continued				
Refinery	thousand 42-gallon barrels	Bangchak Corporation Public Co. Ltd.	Refinery in Phra Khanong, Bangkok	43,800
Do.	do.	Esso (Thailand) Public Co. Ltd. (Exxon Mobil Corp.), operating jointly with PTT Exploration and Production Public Co. Ltd. (Petroleum Public Co. Ltd.)	The complex refinery in Sriracha, Chonburi Province	63,500
Do.	do.	IRPC Public Co. Ltd.	Refinery in Rayong Complex, Rayong Province	78,500
Do.	do.	PTT Global Chemical Public Co. Ltd.	Refinery in Map Ta Phut Industrial Estate, Rayong Province	102,000
Do.	do.	Star Petroleum Refining Co. Ltd. (Chevron South Asia Holdings Pte. Ltd., 60.6%, and public, 39.4%)	do.	63,900
Do.	do.	Thai Oil Public Co. Ltd. [PTT Public Co. Ltd., 48.0%; State Street Europe Ltd., 3.5%; South East Asia UK (Type C) Nominees Ltd., 2.9%]	Refinery in Tungsukla, Sriracha, Chonburi Province	75,500
Potash		Asean Potash Chaiyaphum Plc. (ASEAN members, 29%; Ministry of Finance Thailand, 20%; private sector, 51%)	Mine and processing plant in Bamnet Narong District, Chaiyaphum Province	1,100
Silicon, metal		G.S. Energy Co., Ltd.	Ratchaburi silicon plant	45
Silver, mine, Ag content	kilograms	Akara Resources Mining Ltd. (Kingsgate Consolidated Ltd., 100%)	Chatree Mining Complex, Phichit Province	31,000 [2]
Tantalum, metal powder and oxides	metric tons	JX Metals Deutschland GmBH (JX Nippon Mining & Metal Corp.)	Map Ta Phut, Rayong Province	250
Tin:				
Concentrate, Sn content	do.	Numerous small companies	Nakhon Si Thammarat, Phangnga, Phuket, and Rayong Provinces	1,000 [e]
Smelter, primary		Thailand Smelting & Refining Co. Ltd. (Thaisarco) (Amalgamated Metal Corp. Plc., 77.1%)	Phuket, Phuket Province	30
Tungsten	metric tons	SC Mining Co. Ltd. (Som Chai family, 100%)	Ban Pin, Phrae Province	150
Zinc:				
Ore, Zn content		Padaeng Industry Public Co. Ltd. (Bali Ventures Ltd., 21.7%; Thai Ministry of Finance, 13.81%; RAK Minerals & Metals Investments, 12.5%; others, 52%)	Mae Sot District, Tak Province	30 [4]
Refined		do.	Smelter and refinery (leaching and cell house) plants in Tak Province; roaster plant in Rayong Province	110 [5]

Do., do. Ditto. NA Not available.
[1]Facility inactive since 2015.
[2]All gold-mining operations were banned on January 1, 2017.
[3]Not active in 2018.
[4]Closed in 2016.
[5]Closed in 2017.