

## COUNTRY ANALYSIS BRIEFS

# Malaysia

Last Updated: December 2010

### Background

**Malaysia is a significant oil and natural gas producer and is strategically located amid important routes for the seaborne energy trade.**

Malaysia's national oil and gas company, Petroleam Nasional Berhad (Petronas), holds exclusive ownership rights to all oil and gas exploration and production projects in Malaysia and is the single largest contributor of Malaysian government revenues, almost half in 2009, by way of dividends and taxes.

As Malaysia's oil fields are maturing, the government is focused on enhancing output from existing fields and from new offshore developments of both oil and gas, which are expected to increase aggregate production capacity in the near- to mid-term.

Malaysia's western coast runs alongside the Strait of Malacca, an important route for seaborne energy trade that links the Indian and Pacific Oceans. Malaysia's position in the South China Sea makes it a party to the various disputes among neighboring countries over competing claims to the sea's resources. Although Malaysia has bilaterally resolved competing claims with Vietnam, Brunei, and Thailand, a potential problem is the fact that China claims almost all of the [South China Sea](#), including the Spratly Islands, which are in proximity to oil and gas producing basins.

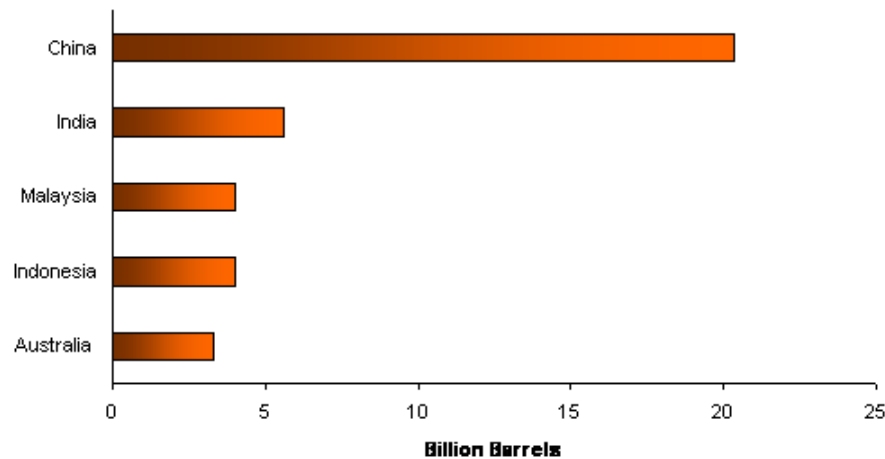


### Oil

**Malaysia's oil reserves are the third highest in the Asia-Pacific region.**

According to the *Oil & Gas Journal (OGJ)*, Malaysia held proven oil reserves of 4 billion barrels as of January 2010. Nearly all of Malaysia's oil comes from offshore fields. The continental shelf is divided into 3 producing basins: the Malay basin in the west and the Sarawak and Sabah basins in the east. Most of the country's oil reserves are located in the Malay basin and tend to be of high quality. Malaysia's benchmark crude oil, Tapis Blend, is very light and sweet with an API gravity of 44° and sulfur content of 0.08 percent by weight.

### Top 5 Asia-Pacific Proven Oil Reserve Holders, January 2010



Source: *Oil and Gas Journal*

### Sector Organization

Malaysia's national oil and gas company, Petroleam Nasional Berhad (Petronas), holds exclusive ownership rights to all oil and gas exploration and production projects in Malaysia, is responsible for all licensing procedures, and is subject to only the prime minister, who controls appointments to the company board. The company holds stakes in the majority of oil and gas blocks in Malaysia. It is the single largest contributor of Malaysian government revenues, almost half in 2009, by way of dividends and taxes. Since its incorporation, Petronas has grown to be an integrated international oil and gas company with business interests in 31 countries. It was ranked by *Fortune* as the 80th largest corporation in the world in 2009 and the 13th most profitable. All foreign and private companies must operate through production sharing contracts (PSCs) with Petronas. ExxonMobil is the largest foreign oil company by production volume and other major foreign oil producers operating in Malaysia via PSCs include Shell, Murphy Oil, and Talisman Energy.

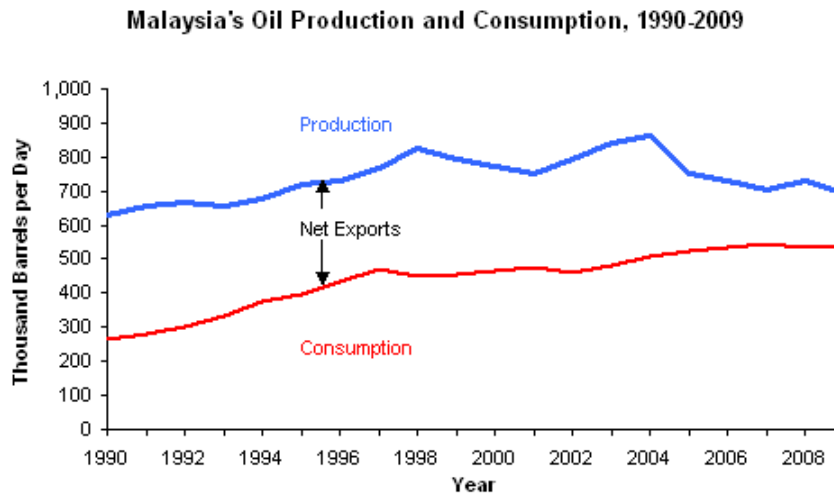
Energy policy in Malaysia is made and overseen by the Economic Planning Unit (EPU) and the Implementation and Coordination Unit (ICU), which report directly to the Prime Minister. Malaysia's oil and gas policy has historically focused on maintaining the reserve base to ensure long term supply security while providing affordable fuel supplies to its population. In July 2010, the government introduced subsidy reductions for gasoline, diesel, and liquid petroleum gas (LPG) with the aim of gradually rationalizing the fuel subsidy system to reduce expenditures. Further cuts in fuel subsidies are expected.

### Exploration and Production

Total oil production in 2009 was 693,000 barrels per day (bbl/d), of which 83 percent was crude oil. More than half of total Malaysian oil production currently comes from the Tapis field in the offshore Malay basin. Malaysian oil production has been gradually decreasing since reaching a peak of 862,000 bbl/d in 2004 due to its maturing offshore reservoirs. Malaysia consumes the majority of its production and domestic consumption has been rising as production has been falling. Exports in 2009 were 157,000 bbl/d. However, the government is focused on opening up new investment opportunities by enhancing output from existing fields and developing new fields in deepwater areas offshore Sarawak and Sabah.

Exxon-Mobil's enhanced oil recovery project at the Tapis field, which lies 118 miles off Terengganu in 210 feet of water, will start up in 2013, with an estimated gross investment of more than \$1 billion. Tapis is one of 7 mature fields offshore peninsular Malaysia that ExxonMobil and Petronas have agreed to develop as part of a 25-year production-sharing contract that was finalized in June 2009. Under the agreement, which includes provisions for the deployment of enhanced oil recovery and further drilling to boost output, work will be carried out on all 7 fields, including Seligi, Guntong, Tapis, Semangkok, Irong Barat, Tebu, and Palas.

The Commercial Arrangement Area (CAA) in the Malay Basin, which Malaysia shares with Vietnam, also contributes to the country's oil production. Talisman Energy (Canada) holds operating interests in the Northern and Southern oil fields in the CAA. While the Southern Fields are still under exploration, the Northern Fields development reportedly began producing at 25,000 bbl/d in August 2009, reportedly rising to 50,000 bbl/d in early 2010. Talisman holds a 41.4 percent interest, Petronas holds a 46 percent interest and PetroVietnam has 12.5 percent. Talisman is continuing to explore and develop fields in the area.



Source: EIA

The over-20-years dispute between Malaysia and Brunei over land and sea boundaries was ended when the two countries signed a boundary agreement in April 2009. Blocks L and M were ceded to Brunei while Limbang, a popular tourist site on the Sarawak-Brunei border, was ceded to Malaysia. In September 2010, Petronas and the Brunei government reportedly agreed to jointly develop the 2 blocks offshore Borneo Island, signing a 40-year production sharing agreement for newly named Block CA1; an agreement on Block CA2 is expected.

*Deepwater oil production projects under development are all offshore Sabah:*

The Kikeh oil field is currently Malaysia's only producing deepwater oil field. It is offshore Sabah in 4,400 feet of water and was discovered and is operated by Murphy Oil in partnership with Petronas. It came onstream in 2007 at an initial rate of 20,000 bbl/d; estimated production in 2010 is 68,000 bbl/d of oil and 62 mcf/d of gas. Murphy Oil is carrying out more developmental drilling in order to boost output to 120,000 bbl/d in the near term. The nearby Kakap and Siakap fields, discovered in mid-2009 in the same block, will be tied into Kikeh in 2011 and 2013, respectively, to maintain steady production through 2015.

The Gumusat/Kakap project, offshore Sabah in 3,900 feet of water, will include the region's first deepwater floating production system from 19 subsea wells. Gumusat/Kakap is expected to be onstream in 2012 with production of 150,000 bbl/d, using reinjected associated gas to maintain pressure. Shareholders are Shell, the operator, at 33 percent, ConocoPhillips at 33 percent, Petronas at 20 percent, and Murphy Oil at 14 percent. The system will be connected via pipelines to the new Sabah Oil and Gas Terminal being built in Kimanis, which is also expected to be completed by 2012.

Development is also underway at the Keababangan Northern Hub development project (KBB), to be brought online together with Gumusat/Kakap and Malikai between 2012 and 2014. KBB, about 87 miles northeast of Kimanis, will be the hub for the development of deepwater oil and gas assets offshore Sabah. The KBB platform will be located in 460 feet of water and has a design capacity of 825 Mmcf/d of gas and 22,000 bbl/d of condensate. It consists of 4 contiguous fields being developed by the Keababangan Petroleum Operating Company (KPOC), consisting of Petronas at 40 percent, ConocoPhillips at 30 percent, and Shell, the operator, at 30 percent.

The Malikai oil and gas field is located nearby and will be tied into the KBB via liquids and dry gas pipelines shortly after first gas comes from KBB. It will supply the Sabah Oil and Gas Terminal. The field was discovered in 2004 at 1,854 feet and field development began in 2009. Malakai is expected to come online by 2013 with production of up to 150,000 bbl/d. Shell is the operator at the Malikai oil field with 35 percent interest, in partnership with ConocoPhillips at 35 percent and Petronas with 30 percent.

**Oil Pipelines**

Malaysia's main oil pipelines connect oil fields offshore Peninsular Malaysia to onshore storage and terminal facilities. From the Tapis oil field runs the 124-mile Tapis pipeline, which terminates at the Kerteh plant in Terengganu, as does the 145-mile Jerneh condensate pipeline. The oil pipeline network connecting oil fields offshore Sabah with the coast is currently expanding following the launch of development projects including the Keababangan cluster, the Malikai, Gemusat/Kekap, and Kikeh oil fields. The majority of pipelines are operated by Petronas, although ExxonMobil also operates a number of pipelines connected with its significant upstream holdings located offshore Peninsular Malaysia.

An international oil products pipeline runs from the Dumai oil refinery in Indonesia to the Melaka oil

refinery in Melaka City, Malaysia. An interconnecting pipeline then runs from this refinery via Port Dickenson to the Klang Valley airport and to the Klang oil distribution center.

### Downstream Activities

According to *OGJ*, Malaysia had about 515,000 bbl/d of refining capacity at six facilities as of January 2010. Petronas operates 3 refineries (259,000 bbl/d total capacity), while Shell operates 2 (170,000 bbl/d total capacity), and ExxonMobil operates one (86,000 bbl/d). Malaysia invested heavily in refining activities during the last two decades and is now able to meet most of the country's demand for petroleum products domestically, after relying on the refining industry in Singapore for many years.

Petronas' refinery in Melaka is a joint venture with ConocoPhillips, which owns a 47 percent interest. The refinery produces a full range of refined petroleum products. An expansion project at Melaka is being completed in 2010 to increase crude oil, conversion, and treating unit capacities.

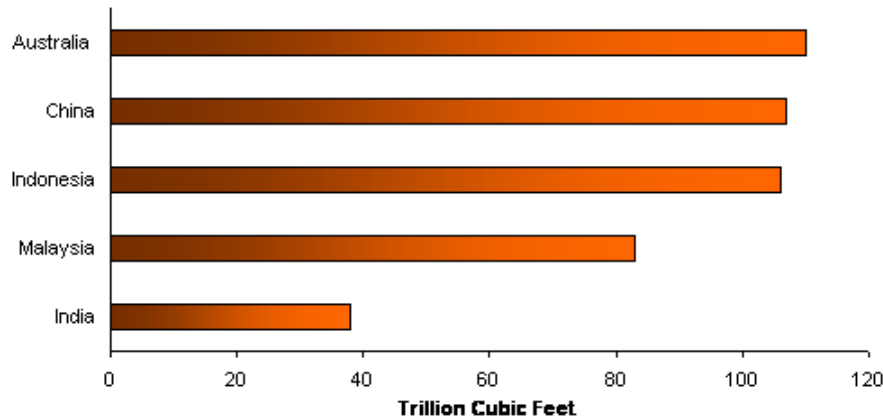
The Sabah Oil and Gas Terminal is under construction in Kimanis by Samsung Engineering, and is expected to be completed by end-2013. It will receive crude from offshore fields, process and distribute the products via a planned 310-mile onshore pipeline linking Sabah with Bintulu, Sarawak. The terminal will have a processing capacity of 300,000 bbl/d of crude and condensate, and 1.25 million cubic feet per day (Mmcf/d) of natural gas.

## Natural Gas

**Malaysia was the world's tenth largest holder of natural gas reserves in 2010 and the second largest exporter of liquefied natural gas after Qatar in 2009.**

According to the *Oil and Gas Journal*, Malaysia held 83 trillion cubic feet (Tcf) of proven natural gas reserves as of January 2010. Most of the country's natural gas reserves are in its eastern areas, predominantly offshore Sarawak.

**Top 5 Asia-Pacific Proven Natural Gas Reserve Holders, 2010**



Source: *Oil and Gas Journal*

### Sector Organization

As in the oil sector, Malaysia's state-owned Petronas dominates the natural gas sector. The company has a monopoly on all upstream natural gas developments, and also plays a leading role in downstream activities and the LNG trade. Most natural gas production comes from production sharing agreements operated by foreign companies in conjunction with Petronas.

### Exploration and Production

Natural gas production has been rising steadily, reaching 2.1 Tcf in 2009, while domestic natural gas consumption has also increased steadily, reaching 1.0 Tcf in 2009. There are several important ongoing projects that are expanding natural gas production in Malaysia over the near term. Exploration and development activities in Malaysia continue to focus on offshore Sarawak and Sabah.

#### *Malaysia-Thailand Joint Development Area*

One of the most active areas for natural gas exploration and production is the Malaysia-Thailand Joint Development Area (JDA), located in the lower part of the Gulf of Thailand. The JDA reportedly holds 9.5 Tcf of proved plus probable natural gas reserves. The area is divided into three blocks, Block A-18, Block B-17, and Block C-19, and is administered by the Malaysia-Thailand Joint Authority (MTJA), with each country owning 50 percent of the JDA's hydrocarbon resources ([map of the JDA](#)). The Carigali-Triton Operating Company (CTOC), a joint venture between Petronas Carigali and Hess, operates Block A-18, while Blocks B-17 and C-19 are operated by the Carigali-PTTEP Operating Company (CPOC), a joint venture of each country's

national oil company. Block B18 phase 1 came online in 2005, and in September 2009, production was reported to have reached 1 Bcf/d. Block B17 came online in 2009. In October 2010, B17 gas shipments reportedly reached 335 Mmcf/d, with half going to Thailand and half to Malaysia

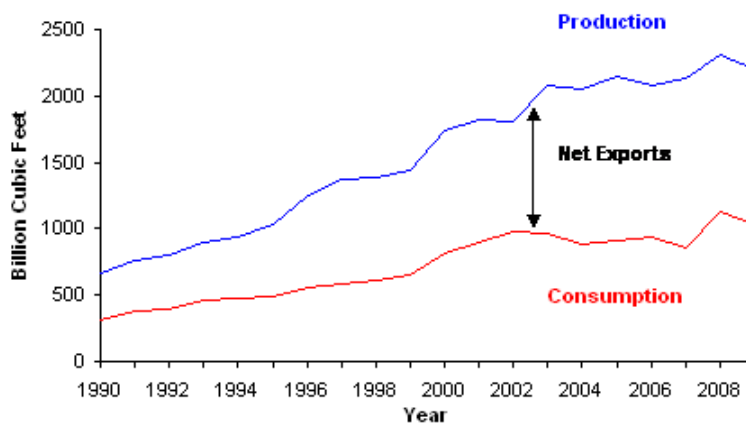
#### *New Sarawak Natural Gas Projects*

Murphy Oil announced in September 2009 the startup of several smaller new gas fields located in Blocks SK309 and SK311. The first phase of this project, located 137 miles offshore Sarawak, is to produce gas from the Golok, Golok Barat, Serampeng, and Merapuh gas fields, which are being developed in a cluster and will supply the Bintulu LNG Terminal. It was reported in fourth quarter 2010 that gross production had reached 250 Mmcf/d and is expected to remain at that level for 5 years. Murphy Oil holds an 85 percent interest and Petronas holds 15 percent. Murphy Oil projects that Phase 2 could produce 350 Mmcf/d for another 10-year period when additional fields in SK311 are brought online.

The Kumang Cluster in Block SK306, Central Luconia province, a major gas field offshore Sarawak, is being developed by Petronas. Phase 1 is expected to provide 500 Mmcf/d and 22,000 bbl/d of condensate to the Bintulu Terminal when it goes online at end-2010.

Three new gas fields in Block SK 308, 124 miles offshore Sarawak, are being jointly developed by Shell and Petronas. They are projected to produce first gas of 90 Mmcf/d in 2012.

**Malaysian Natural Gas Production and Consumption,  
1990-2009**



Source: EIA

#### **Pipelines**

Malaysia has one of the most extensive natural gas pipeline networks in Asia. The Peninsular Gas Utilization (PGU) project, completed in 1998, expanded the natural gas transmission infrastructure on Peninsular Malaysia. The PGU system spans more than 880 miles and has the capacity to transport 2 billion cubic feet per day (Bcf/d) of natural gas.

A number of pipelines link Sarawak's offshore gas fields to the Bintulu facility. Petronas is building the 310-mile Sabah-Sarawak Gas Pipeline between Kimanis, Sabah and Bintulu, Sarawak to transport gas from Sabah's offshore fields, such as Kota Kinabalu, to Bintulu for liquefaction and export. Some of the gas will be used for downstream projects in Sabah. This pipeline is expected to be completed by March 2011.

The Association of South East Asian Nations (ASEAN) is promoting the development of a trans-ASEAN gas pipeline system (TACP) aimed at linking 80 percent of ASEAN's major gas production and consumption centers. Because of Malaysia's extensive natural gas infrastructure and its location, the country is a natural candidate to serve as a hub in the ongoing TACP project. The first pipeline connected Malaysia with Singapore and was commissioned in 1991. This has been followed by gas pipeline links between West Natuna, Indonesia and Duyong, Malaysia, commissioned in 2002, and the Trans-Thailand-Malaysia gas pipeline, commissioned in 2005, which allows Malaysia to pipe natural gas from the Malaysia-Thailand JDA to its domestic pipeline system. Other links are under development.

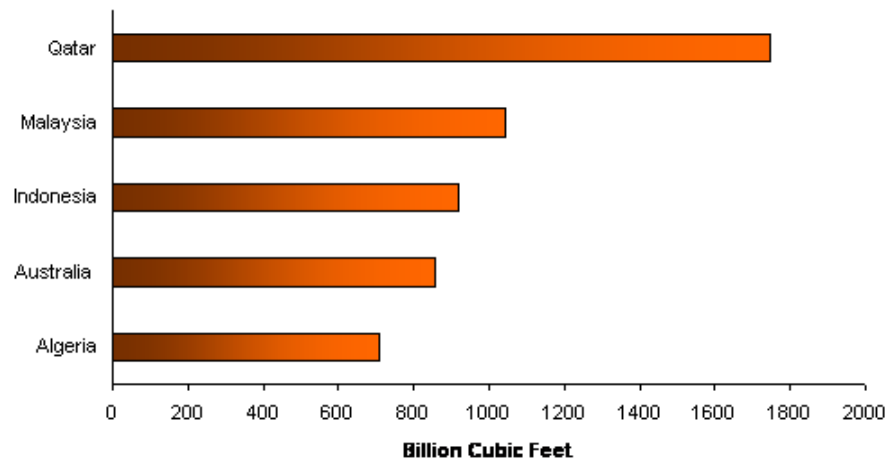
#### **Exports**

Malaysia was the second largest exporter of LNG in the world after Qatar in 2009, exporting over 1 Tcf of LNG, which accounted for 12 percent of total world LNG exports. Japan, South Korea, and Taiwan were the 3 primary purchasers. LNG is primarily transported by Malaysia International Shipping Corporation (MISC), which owns and operates 27 LNG tankers, the single largest LNG tanker fleet in the world by volume of LNG carried. MISC is 62-percent owned by Petronas.

The Bintulu LNG complex on Sarawak is the main hub for Malaysia's natural gas industry. Petronas owns majority interests in Malaysia's 3 LNG processing plants, all located at Bintulu, which are supplied by the offshore natural gas fields at Sarawak. The Bintulu facility is the largest LNG complex in the world, with 8 production trains and a total liquefaction capacity of 1.1 Tcf per year. A further increment through debottlenecking is expected by end-2010, raising overall capacity by 0.6 Tcf per year. Japanese financing has been critical to the development of Malaysia's LNG facilities.

Construction began on the Sabah Oil and Gas Terminal (SOGT) in February 2007 and it is expected to be completed by 2012. It will have handling capacity of 300,000 barrels of crude and 1 billion cubic feet of natural gas per day and will primarily serve Malaysia's export markets. The Sabah-Sarawak Gas Pipeline project is part of this development.

#### Top World LNG Exporters, 2009



## Profile

### Energy Overview

Proven Oil Reserves (January 1, 2010E)	4 billion barrels
Oil Production (2009E)	693,000 bbl/d, of which 83% was crude oil
Oil Consumption (2009E)	536,000 bbl/d
Crude Oil Distillation Capacity (January 1, 2010E)	514,832 bbl/d
Proven Natural Gas Reserves (January 1, 2010E)	83 trillion cubic feet
Natural Gas Production (2009E)	2.1 trillion cubic feet
Natural Gas Consumption (2009E)	1.0 trillion cubic feet
Recoverable Coal Reserves (2008E)	4.4 million short tons
Coal Production (2009E)	1.5 million short tons
Coal Consumption (2009E)	7.3 million short tons
Electricity Installed Capacity (2008E)	23 gigawatts
Electricity Production (2008E)	91.9 billion kilowatt hours
Electricity Consumption (2008E)	88.7 billion kilowatt hours
Total Energy Consumption (2008E)	2.45 quadrillion Btu*, of which Natural Gas (48%), Oil (44%), Coal (5%), Hydroelectricity (3%)
Total Per Capita Energy Consumption (Million Btu) (2008E)	97.0 million Btu per person
Energy Intensity (2008E)	6,786 Btu per \$2005-PPP**

### Environmental Overview

Energy-Related Carbon Dioxide Emissions (2008E)	162.4 million Metric tons, of which Oil (44%), Natural Gas (33%), Coal (23%)
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<b>Per-Capita, Energy-Related Carbon Dioxide Emissions ((Metric Tons of Carbon Dioxide) (2008E)</b>	6.4 Metric tons
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<b>Carbon Dioxide Intensity (2008E)</b>	0.45 Metric tons per thousand \$2005-PPP**
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## Oil and Gas Industry

<b>Organization</b>	Malaysia's state-owned Petroleam Nasional Berhad (Petronas) dominates all aspects of the country's oil and natural gas sector.
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<b>Major Oil/Gas Ports</b>	Kertih, Johor, Sepangar Bay, Bintulu, Kuching, Melaka, Penang, Port Dickson, Kelang, Kota Kinabalu, Kemaman
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<b>Foreign Company Involvement</b>	BHP Billiton, ConocoPhillips, Shell, ExxonMobil, Hess, Lundin Petroleum, Mitsubishi, Murphy Oil, Newfield Exploration, Nippon Oil, Talisman Energy
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<b>Major Oil Fields</b>	Bekok, Bokor, Erb West, Bunga Kekwa, Guntong, Kepong, Kinabalu, Samarang, Seligi, Semangkok, Tapis, Temana, Tiong
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<b>Major Natural Gas Fields</b>	Bedong, Bintang, Damar, Jerneh, Laho, Lawit, Noring, Pilog, Resak, Telok, Tujoh
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<b>Major Refineries (capacity, bbl/d)(January 1, 2010E)</b>	Shell: Port Dickson (125,000), Lutong (45,000); Petronas: Melaka I (92,832), Melaka II (126,000), Kertih (40,000); EssoMalaysia: Port Dickson (86,000)
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\* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power.

\*\*GDP figures from Global Insight estimates based on purchasing power parity (PPP) exchange rates.

## Links

### EIA Links

[EIA - Malaysia Country Energy Profile](#)

### U.S. Government

[CIA World Factbook](#)

[U.S. Department of State Consular Information Sheet-Malaysia](#)

### Foreign Government Agencies

[Malaysia Economic Planning Unit](#)

[Malaysia Energy Commission](#)

[Malaysia Implementation Coordination Unit](#)

[Malaysia-Thailand Joint Authority](#)

### Corporations

[ConocoPhillips](#)

[ExxonMobil Malaysia](#)

[Murphy Oil in Malaysia](#)

[PETRONAS](#)

[Shell Oil](#)

## Sources

Asia Pulse

Association of Southeast Asian Nations (ASEAN)

ConocoPhillips

Energy Compass

Energy Information Administration

Energy World Construction

ENP Newswire

ExxonMobil

Global Insight

Malaysia Business Times

Malaysia Oil and Gas Report

Malaysia-Thailand Joint Authority

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Petronas

Pipeliners

Platts Oilgram News

Reuters

Shell  
Straits Times  
Talisman Energy  
Tenders Info  
Upstream Online  
World Gas Intelligence

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