Country Analysis Brief: Malaysia

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Overview

Table 1. Malaysia Energy Indicators, 2022

	Petroleum and other liquids	Natural gas	Coal	Nuclear	Hydro	Other renewables	Total
Primary energy production (quads)	1.1	2.8	0.1	0.0		0.2	4.2
Primary energy production (percentage)	27%	67%	2%	0%		4%	100%
Primary energy consumption (quads)	1.4	1.6	0.9	0.0		0.2	4.1
Primary energy consumption (percentage)	35%	40%	21%	0%		4%	100%
Generation (billion kWh)	32.7	63.5	93.6	0.0	32.7	3.3	225.9
Generation (percentage)	14%	28%	41%	0%	14%	1%	100%

Data source: U.S. Energy Information Adminstration, *International Energy Statistics* and *estimates.*

Note: Generation does not include biomass & waste. Total may not equal 100% due to independent rounding.

Quads=quadrillion British thermal units, kWh=kilowatthours.

- Malaysia is the second-highest producer of petroleum and other liquids in Southeast Asia and the fifth-highest exporter of liquefied natural gas (LNG) globally in 2023. Malaysia is strategically located in the South China Sea and borders the Malacca Strait, both of which are important maritime routes for energy trade.[1]
- Malaysia's oil and natural gas production is expected to peak at 2 million barrels of oil equivalent per day (BOE/d) in 2024, according to national oil company Petronas.[2] This would be an increase of just over 200,000 BOE/d from the 1.79 million BOE/d produced in 2023.[3]
- Malaysia's national oil company Pertonas, with Enilive and Euglena, will build Petronas's first biorefinery. The biorefinery, which will be located at the Pengerang Integrated Complex, will produce 12,500 barrels per day (b/d) of sustainable aviation fuel and biodiesel. Construction will begin at the end of 2024, and commercial operation is slated to start in 2028.[4]
- According to Malaysia's National Energy Transition Roadmap, Malaysia plans to achieve a 70% share of installed electricity generation capacity for renewable energy by 2050. The government estimates it will need $143 billion in investments to meet its target. To help develop its renewable sector, Malaysia lifted its ban on renewable energy exports that it initiated in 2021.[5] The increase in demand for renewable energy from foreign markets will prompt development of domestic renewable generation capacity on a larger scale to meet the higher demand.

Map 1. Malaysia

Data source: U.S. Energy Information Administration and World Bank

Petroleum and Other Liquids

- In 2023, Malaysia had proved oil reserves of 2.7 billion barrels—the second-largest oil reserve in the Southeast Asia.[6] Although reserves have declined since 2022, there were 19 new discoveries in 2023, which could add over 1 billion barrels of oil equivalent, according to Petronas. Of these discoveries, 16 are located in the Sarawak state, and 3 are in the Sabah state (Figure 2).[7]
- Following the Malaysia Bid Round 2023 (MBR 2023), six production sharing contracts and one discovered resource opportunity (DRO) were awarded. A DRO is an opportunity where a company can obtain the rights to an undeveloped discovery from a government to invest in its development. All offshore blocks for MBR 2023 in Sarawak and Northwest Sabah Basins are now licensed as a result of this bid round (Table 2).[8]

Map 2. States of Malaysia

Data source: U.S. Energy Information Administration, World Bank, and MB-Research GmbH

- In the *12th Malaysia Plan* (2021–2025), the government outlined its plan to reduce carbon intensity economy-wide by 45% from 2005 levels against gross domestic product (GDP) and to achieve net-zero greenhouse gas emissions by 2050. To support these goals, Petronas plans to cap operational emissions at 49.5 million metric tons of CO_2 equivalent in its Malaysian operations by the end of 2024. Petronas and its subsidies has also targeted a 50% reduction from 2019 levels in methane emissions from its natural gas value chain by 2025.[9]

Table 2. Malaysia Bid Round 2023 block awards

Block name	Company
Block PM342	Petronas; E&P Malaysia Venture
Block PM428	Jadestone Energy; Petronas

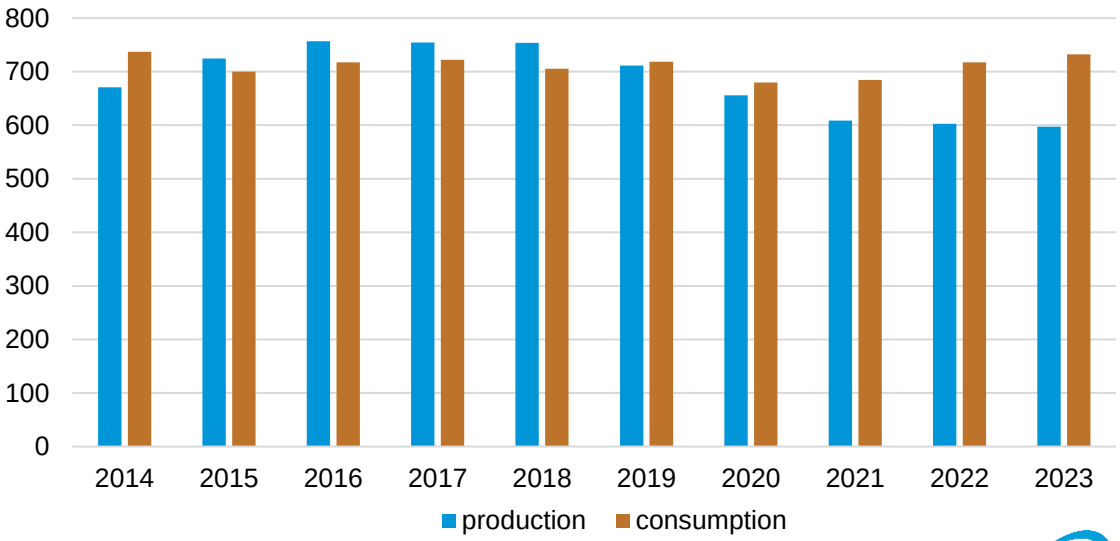
Block SK330	Petronas; E&P Malaysia Venture; Petroleum Sarawak E&P
Block SK510	Petronas; INPEX Malaysia E&P; Pertamina; Petroleum Sarawak E&P
Block 5E	Shell; Petronas; Petroleum Sarawak E&P
Block SB403	Petronas; E&P Malaysia Venture; SMJ Energy
Bamabazon Cluster	E&P O&M Services

Data source: World Oil

- From 2024 through 2026, Petronas expects more than 25 wells (oil and natural gas) to be drilled per year. The Penisular Malaysia and Sarawak will be the focus of shallow water wells, and deepwater wells will be in Sabah.[10]
- Malaysia's petroleum and other liquids production declined from 2017 to 2023—to 597,000 barrels per day (b/d)—due to maturing fields (Figure 1).[11]
- After a dip in 2020, Malaysia's petroleum and other liquids consumption returned to pre-pandemic levels in 2022, driven mainly by a rebound increased gasoline demand (Figure 3).[12]

Figure 1. Malaysia petroleum and other liquids production and consumption, 2014-2023

thousand barrels per day

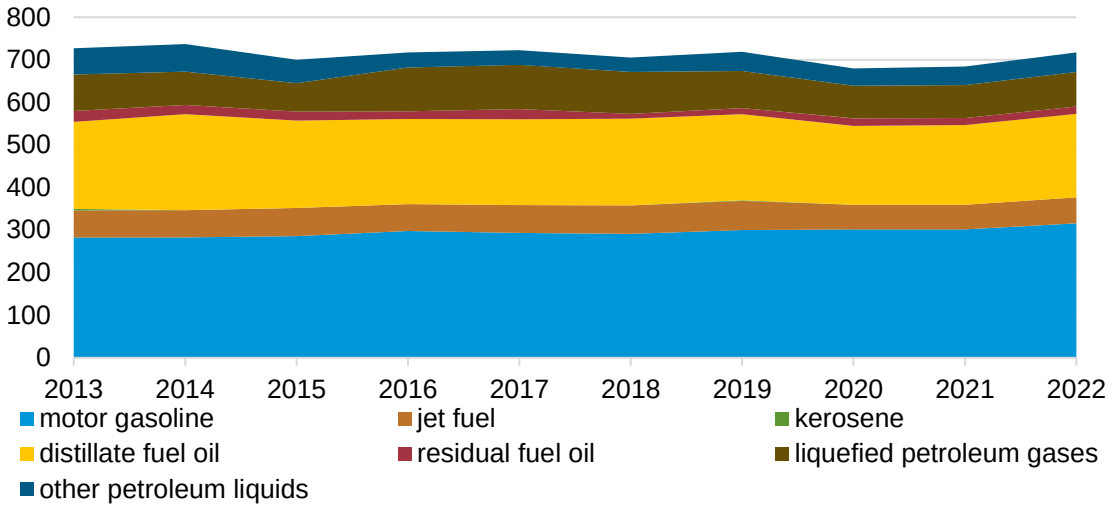


Data source: U.S. Energy Information Adminstration, *Internation Energy Statistics* and estimates

- In 2022, gasoline accounted for 44% of total petroleum product use, followed by distillate fuel oil (27%), and liquefied petroleum gas (11%) (Figure 2). COVID-19 restrictions were lifted in 2021, which led to more driving and passenger vehicle sales.[13]

Figure 2. Malaysia's refined petroleum products consumption, 2013–2022

thousand barrels per day



Data source: U.S. Energy Information Administration, *International Energy Statistics*

- Malaysia had a refining capacity of 997,000 b/d in 2023 (Table 3).[14] By 2034, proposed projects could add an additional 181,000 b/d of capacity.[15]

Table 3. Operating refineries in Malaysia, 2023

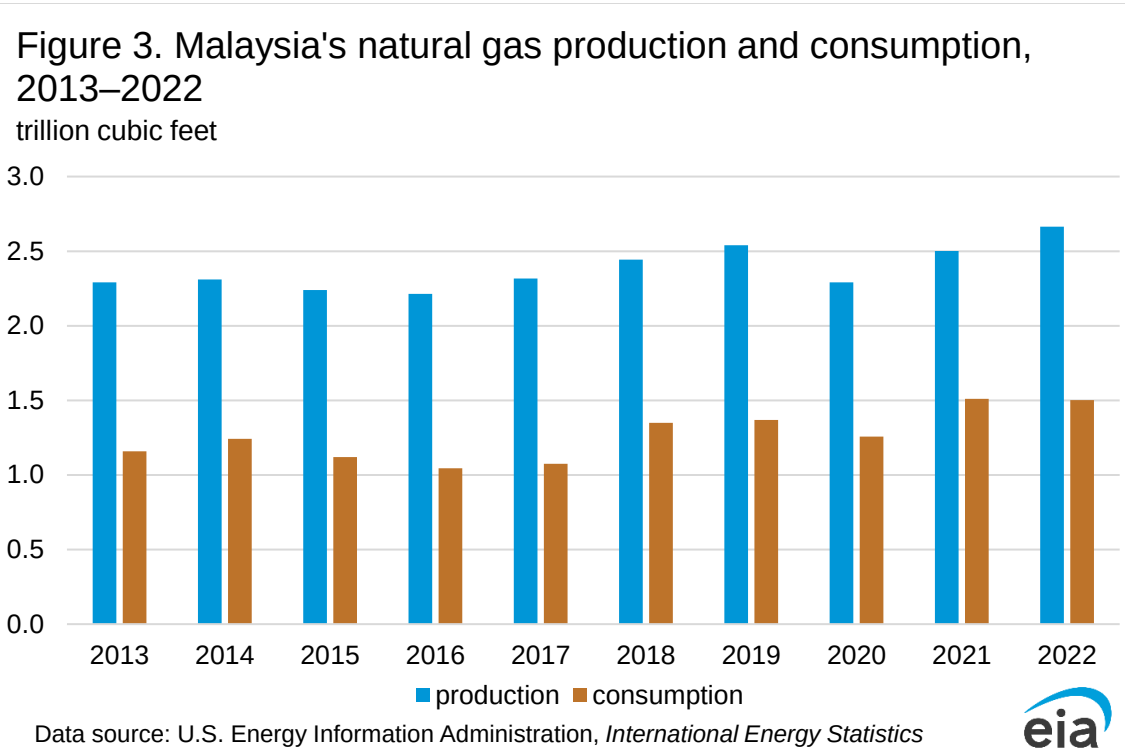
Name of site	Company	Crude oil refining capacity (thousand barrels per day)
Kemaman	Kemaman Bitumen	30
Port Dickson	Hengyuan Refining Company	156
Kerteh	Petronas	121
Melaka (PSR-1)	Petronas	100
Melaka (PSR-2)	Petronas	170
Pengerang	Petronas	300
Port Dickson	San Miguel/Petron	85
Total		**997**

Data source: FACTS Global Energy, Asia Pacific Databook 2: Refinery Configuration, Spring 2024

Natural Gas

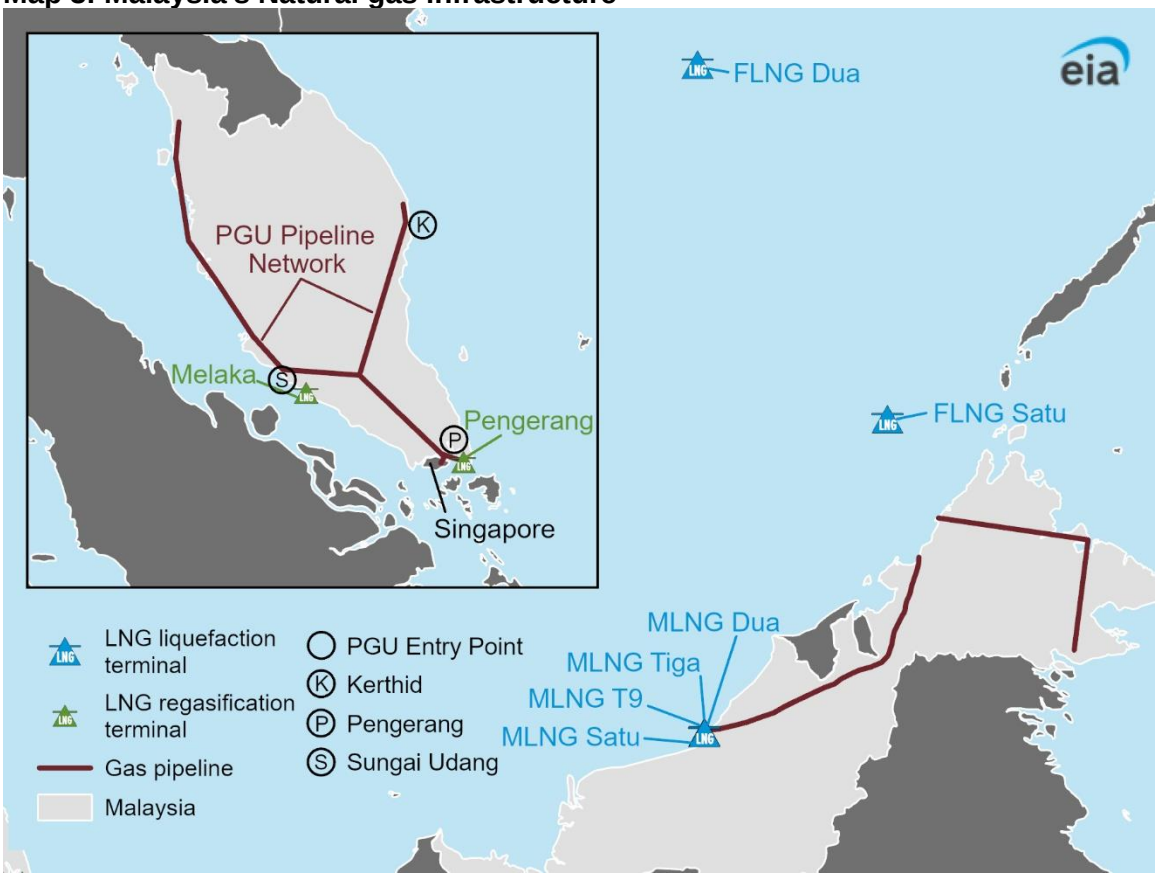
- At the end of 2023, Malaysia had proved natural gas reserves of 32 trillion cubic feet (Tcf).[16] Although lower than the 2014 peak of 101 Tcf, reserves have increased since 2018 as a result of new discoveries.[17]
- Malaysia's natural gas production increased in 2022 to an all-time high of 2.7 Tcf,[18] which was the result of developing both brownfield and greenfield projects (Figure 3).[19]

Figure 3. Malaysia's natural gas production and consumption, 2013–2022



Data source: U.S. Energy Information Administration, *International Energy Statistics*

Map 3: Malaysia's Natural gas infrastructure



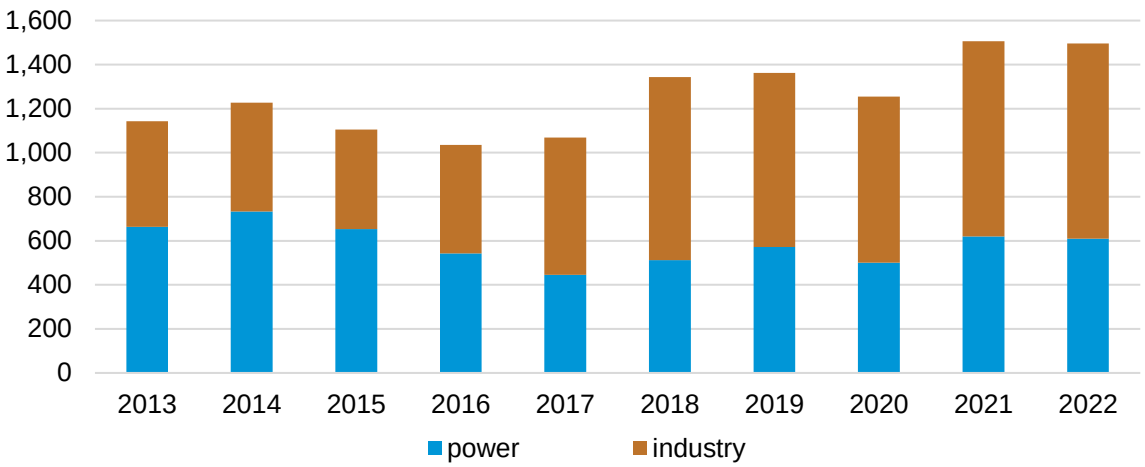
Data source: U.S. Energy Information Administration; World Bank; and Global Energy Monitor, *Global Gas Infrastructure Tracker*

Note: LNG=liquefied natural gas; FLNG=floating liquefied natural gas storage; MLNG=Malaysia LNG

- The Jerun gas field, located off the shore of Sarawak, northwest of Bintulu, was brought online by SapuraOMV in 2024. According to SampuraOMV, the project will reach peak production in 2030 at 550 million cubic feet per day (MMcf/d) of natural gas and 15,000 b/d of condensate. The project will supply the Petronas LNG complex in Bintulu via a 50-mile pipeline.[20] The complex consists of MLNG Satu, MLNG Dua, MLNG Tiga, and MLNG T9.
- Shell operates the Timi natural gas project, which is located in Sarawak. Shell expects the project to produce 300 MMcf/d at peak production. The natural gas will support a production hub, located off the shore of Sarawak, via a 50-mile pipeline. Commercial production is slated to start in 2025.[21]

- The Malaysia-Thailand Joint Development Area is located in the Gulf of Thailand and overseen by the Malaysia-Thailand Joint Authority; each country has 50% ownership of the area's resources. The area produced natural gas for both Malaysia and Thailand and is linked to Malaysia via the Peninsular Gas Utilization (PGU) pipeline network.[22]

Figure 4. Malaysia's natural gas consumption by sector, 2013–2022



Data source: FACTS Global Gas Databook Malaysia - 2024
Note: Transport, residential, and commercial sectors consume small amounts of natural gas but are to small to be seen in the graph.

- The industrial sector's natural gas consumption share surpassed the power sector's share in 2017 and has remained the top natural gas-consuming sector since that year (Figure 4). The Malaysia natural gas pipeline network, which has helped the manufacturing sector grow, is a major supplier for industrial natural gas consumption. Residential, commercial, and transportation sectors together have accounted for less than 1.5% of natural gas consumption per year from 2013 to 2022.[23]
- Malaysia has one of the most extensive natural gas pipeline networks in Asia. Much of the natural gas pipeline network is located in Peninsular Malaysia and is known as the Peninsular Gas Utilization (PGU) pipeline network. The PGU is 1,630 miles long and can transport 3,500 MMcf/d. The network transports processed natural gas to the power sector and to non-power end-use sectors and exports natural gas to Singapore. The four entry points into the PGU are in Kertih, Pengerang, Sungai Udang, and Thailand.[24]
- A floating liquefied natural gas (FLNG) vessel called ZFLNG is under development off the shore of Sabah. The facility's liquefaction capacity is 2 million metric tons per year, and its completion is set for 2027.[25]

Table 4. Malaysia's LNG liquefaction terminals, 2023

Project name	Owners	Capacity (billion cubic feet per year)	Start year
MLNG Satu T1-T3	Petronas (90%); Mitsubishi Corp(5%); Sarawak State (5%)	403	1982
MLNG Dua T4-T6	Petronas (80%); Mitsubishi Corp(10%); Sarawak State (10%)	461	1995
MLNG Tiga T7-T8	Petronas (60%); Sarawak State (25%); JX Nippon Oil and Gas (10%); Mitsubishi Corp (5%)	370	2003
MLNG T9	Petronas (80%); JX Nippon Oil and Gas (10%); Sarawak State (10%)	173	2017
Petronas FLNG Satu (PFLNG1)	Petronas	58	2017
Petronas FLNG Rotan (PFLNG2)	Petronas	72	2021
Total		**1,536**	

Data source: International Gas Union, *2024 World LNG Report*
Note: LNG=liquefied natural gas, FLNG=floating liquefied natural gas, MLNG=Malaysia LNG

Table 5. Malaysia's LNG regasification terminals

Project name	Owners	Capacity (billion cubic feet per year)	Start year
Melaka LNG	Petronas	183	2013
Pengerang LNG	Petronas (65%); Dialog Group (25%); Johor Government (10%)	168	2017
Total		**351**	

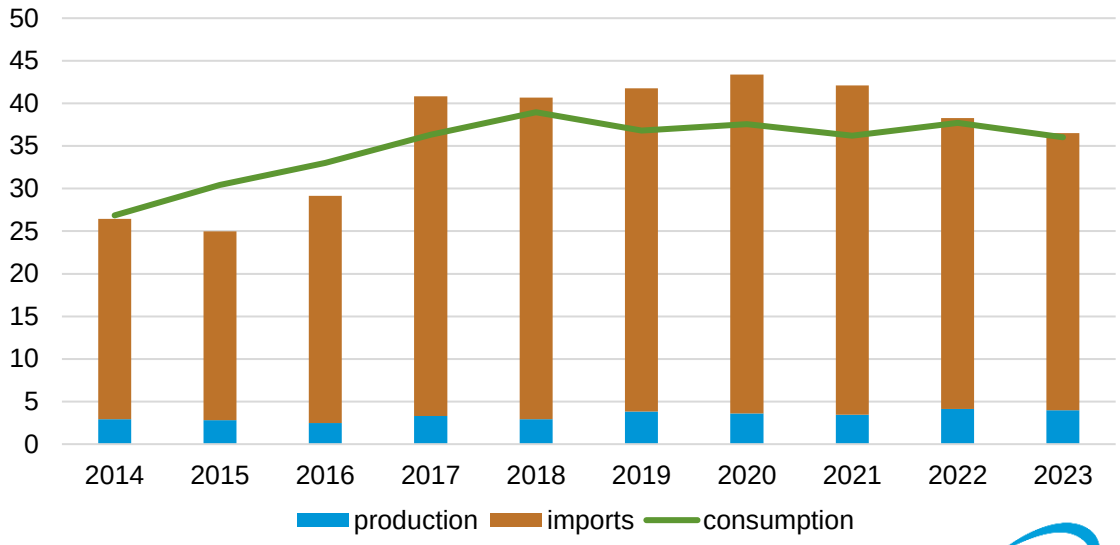
Data source: International Gas Union, *2024 World LNG Report*
Note: LNG=liquefied natural gas

- Petronas and MISC Group signed an agreement in October 2023 that will convert a 4.9-million-cubic-foot LNG shipping vessel into floating storage for the Pengerang LNG terminal. The conversion is scheduled to be completed by 2025.[26]

Coal

- Malaysia has limited coal resources. Its reserves were 249 million short tons in 2022.[27] Nearly 99% of the reserves are located in Sarawak, and the remainder is in Sabah.[28]
- In 2022, coal made up 21% of Malaysia's primary energy consumption.[29] Under the National Energy Policy 2022–2040, Malaysia's goal is to reduce coal's share of primary energy supply to 17% by 2040.[30]
- Malaysia's coal production decreased 4% in 2023. This came after an increase of almost 20% the previous year, from 3.4 million short tons in 2021 to a record 4 million short tons in 2022(Figure 5).[31]

Figure 5. Malaysia's coal production, consumption, and imports, 2014–2023

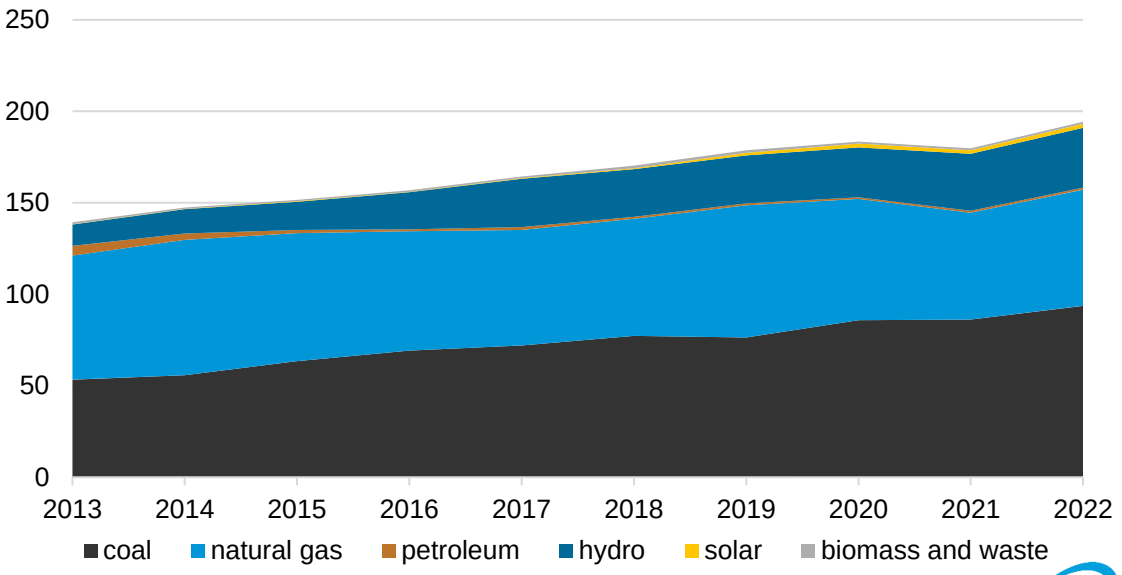


Data source: U.S. Energy Information Administration, *International Energy Statistics* and estimates

Electricity

- Malaysia's electricity generation increased 8% from 2021 to 194 terawatthours in 2022 (Figure 8). Fossil fuels made up 81% of all electricity generated in 2022, and non-hydroelectric renewables made up less than 2%. Although total generation increased in 2022, the increase was dispersed evenly across most generation sources (Figure 6).[32]
- In 2022, Malaysia pledged not to build any new coal power plants after 2040. In 2021, they created a phase-out plan to reduce existing coal capacity by 50% by 2035 and completely by 2044.[33] Currently, 5 coal-fired power plant projects are under development, which are slated to come online by 2031 and will add 11.7 gigawatts (GW) of capacity.[34]
- In April 2024, Malaysia's government announced its intention to create the Energy Exchange Malaysia (ENEGEM) to export electricity from renewable sources to other Southeast Asian countries. ENEGEM aligns with the Association of Southeast Asian Nations (ASEAN) goals of an integrated power grid among Southeast Asian countries.[35]

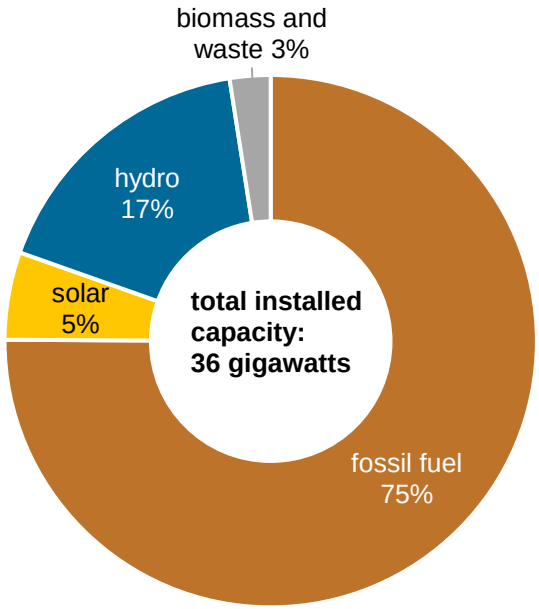
Figure 6. Malaysia's generation by source, 2013–2022



Data source: U.S. Energy Information Administration, *International Energy Statistics*

- Malaysia's installed electricity capacity remained relatively flat in 2022; it increased less than 1% from 2021 levels (Figure 7). All added capacity came from growth in solar installations.[36]

Figure 7. Malaysia's installed electricity generating capacity by type, 2022



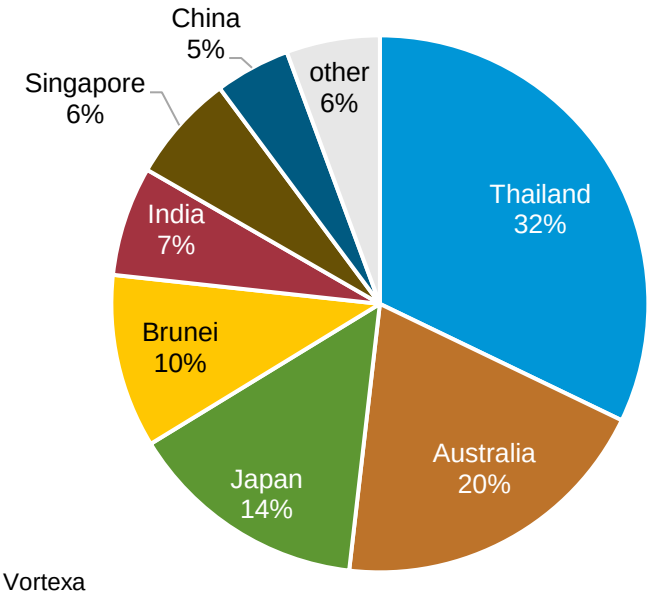
Data source: U.S. Energy Information Administration, *International Energy Statistics*
Note: Numbers may not equal 100% due to independent rounding

Energy Trade

Petroleum and other liquids

- Malaysia's crude oil and condensate exports decreased by 14% in 2023 from 2022. The largest declines by importing countries were China and India, which represent a combined decrease of 29,000 b/d.[37]
- Virtually all of Malaysia's crude oil and condensate exports in 2023 went to the Asia Pacific region. Southeast Asia was responsible for 52% of imports (Figure 8).[38]

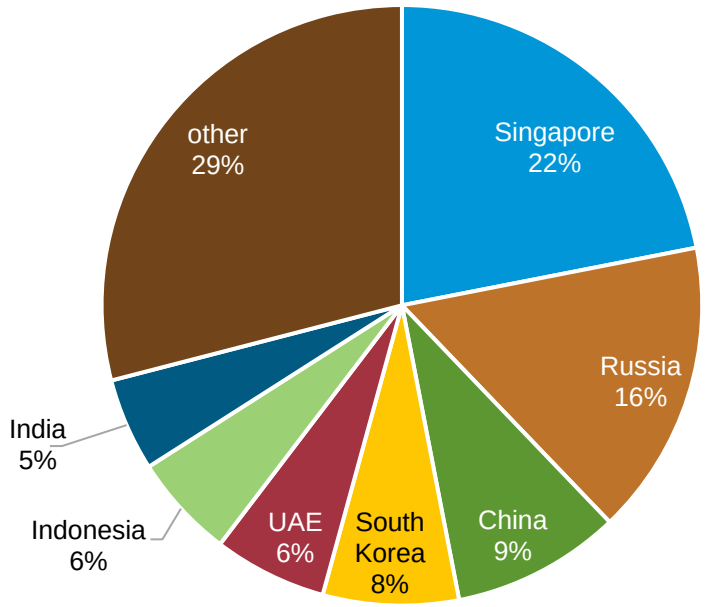
Figure 8. Malaysia's crude oil and condensate exports by destination, 2023



Data source: Vortexa

- Malaysia imported almost 1.2 million b/d of petroleum product imports in 2023, a 3% increase from the previous year. Asia was the source for 58% of all petroleum product imports (Figure 9).[39]
- Fuel oil (28%) accounted for the largest share of petroleum product imports in 2023, followed by diesel (25%) and gasoline (20%).[40]

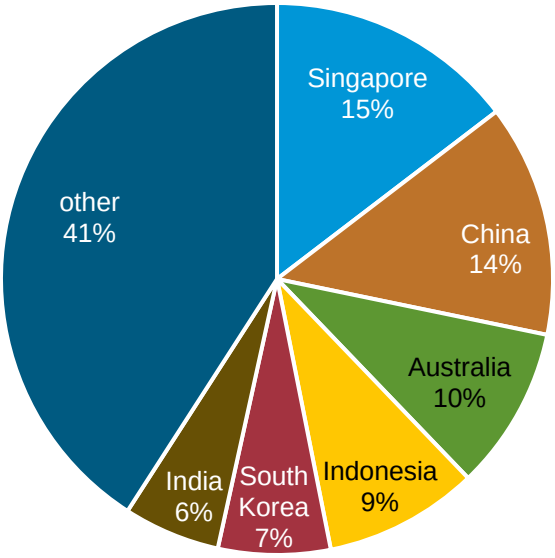
Figure 9. Malaysia's petroleum product imports by source, 2023



Data source: Vortexa
Note: Total may not equal 100% due to independent rounding. UAE=United Arab Emirates

- Malaysia also exported 1.3 million b/d of petroleum products in 2023, a 7% increase from the previous year. The Asia Pacific region was the destination for 79% of all petroleum product exports (Figure 10). [41]
- Diesel (24%) accounted for the largest share of exports in 2023, followed by fuel oil (20%) and biodiesel (19%).[42]

Figure 10. Malaysia's petroleum product exports by destination, 2023

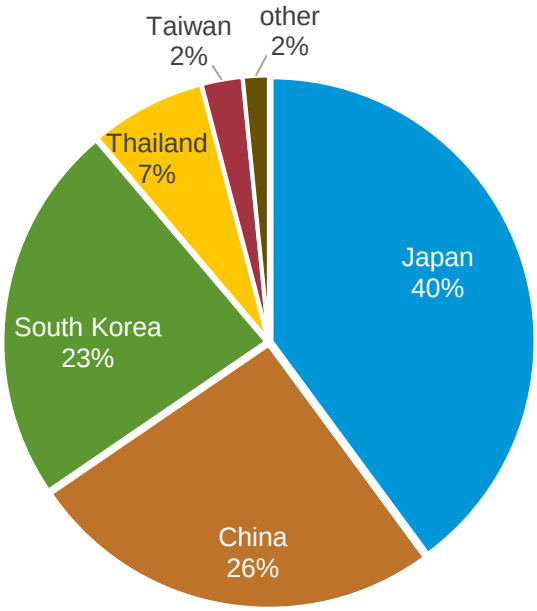


Data source: Vortexa
Note: Total may not equal 100% due to independent rounding.

Natural gas

- In 2023, Malaysia exported 85 billion cubic feet (Bcf) of natural gas to Singapore via pipeline.[43]
- Malaysia's LNG exports declined 7% from 2022 to 1.3 Tcf in 2023. Although Japan still receives the largest share of Malaysia LNG exports, in 2023, Japan imported approximately 90 Bcf less than in 2022 (Figure 11).[44]

Figure 11. Malaysia's LNG exports by destination, 2023



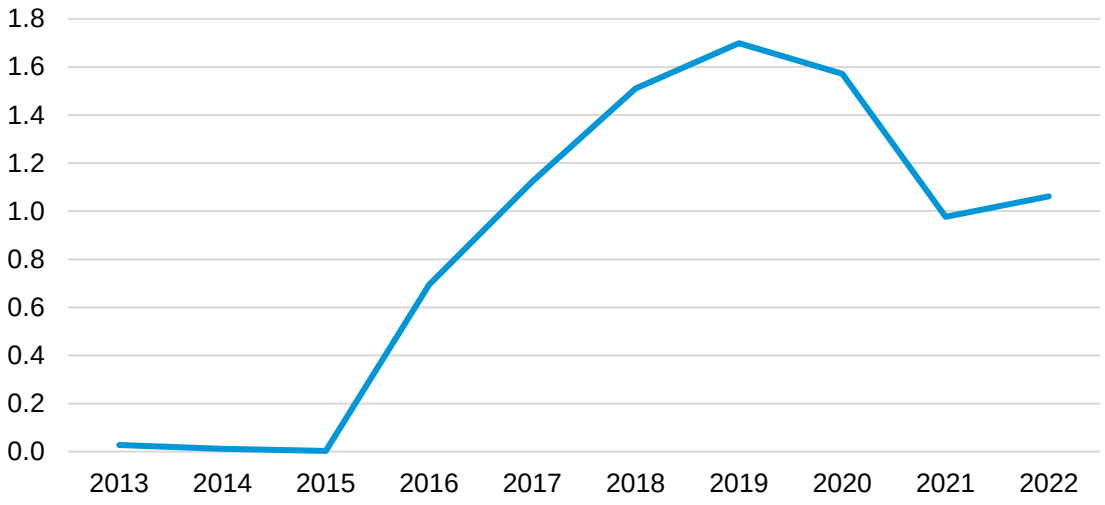
Data source: Vortexa
Note: LNG=liquefied natural gas

Electricity

- Malaysia's electricity exports significantly increased after 2016. (Figure 12). The increase was driven by a power trading project established in 2016, between Sarawak Energy Berhad and Indonesia's state utility Perusahaan Listrik Negara. The power is exported through the 275 kV Sarawak-West Kalimatan Interconnection. In October 2021, Malaysia banned the export of renewable energy which may account for some of the decrease in exports in 2021 and 2022. The ban was lifted in May 2023 to attract more development in its renewable sector.[45]

Figure 12. Malaysia's exports of electricity generation, 2013–2022

gigawatt hours

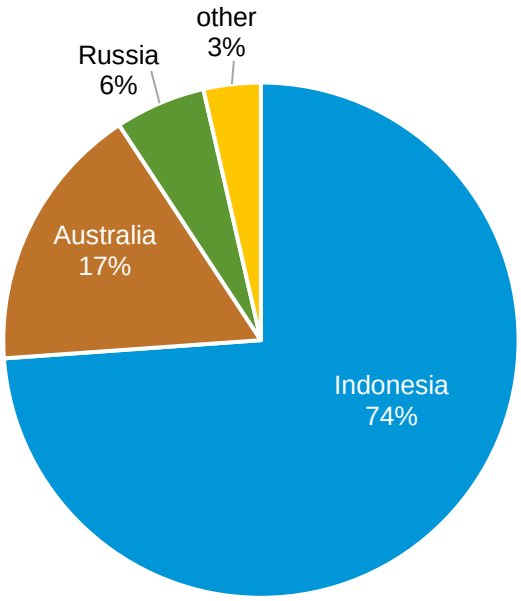


Data source: U.S. Energy Information Administration, *International Energy Statistics*

Coal

- In 2023, Malaysia's coal imports increased almost 10% from 2022 to 42 million short tons. Most imports came from the Asia Pacific region (91%). Malaysia increased its imports of Indonesia's coal to 31 million short ton in 2023, up approximately 3 million short tons from 2022 (Figure 13).[46]

Figure 13. Malaysia's coal imports by source, 2023



Data source: Global Trade Tracker
Note: Numbers may not equal 100% due to independent rounding.

[1] U.S. Energy Information Administration, International Energy Statistics; International Gas Union, 2024 World LNG Report, page 24.
[2] "Malaysia's Petronas Sees Domestic Oil, Gas Output Peaking by 2024 | Reuters." Reuters, June 28, 2023.
[3] U.S. Energy Information Administration, International Energy Statistics and estimates.
[4] "Petronas Moves Ahead with First Biorefinery Project." Energy Intelligence, July 26, 2024.
[5] "Malaysia Sets New Target to Reach 70% of Renewables in the Power Mix by 2050." Enerdata, May 11, 2023.
[6] Oil and Gas Journal, "Worldwide Look at Reserves and Production", December 2023
[7] Oil and Gas Journal, "Worldwide Look at Reserves and Production", December 2023; Malaysia Oil & Gas Report Q3 2024, BMI-A Fitch Solutions Company, June 14,
[8] "Petronas, Shell Win Big at Malaysian Offshore Exploration Bid Round." World Oil - Upstream News, January 25, 2024.
[9] Petronas, Petronas Activity Outlook 2024-2026 IN THE SPOTLIGHT, Page 33; Petronas, Methane Guiding Principles Signatory Reporting, Page 2.
[10] Petronas, Petronas Activity Outlook 2024-2026 IN THE SPOTLIGHT, Page 15.
[11] U.S. Energy Information Administration, International Energy Statistics.
[12] U.S. Energy Information Administration, International Energy Statistics; FACTS Global Energy, *Asia Pacific Petroleum Databook 1: Supply and Demand*, Spring 2023, page 23.
[13] FACTS Global Energy, *Asia Pacific Petroleum Databook 1: Supply and Demand*, Spring 2023, page 23.
[14] FACTS Global Energy, *Asia Pacific Petroleum Databook 2: Refinery Configuration*, Fall 2024

[15] FACTS Global Energy, *Asia Pacific Petroleum Databook 2: Refinery Configuration & Construction*, Fall 2024, page 34.
[16] Oil and Gas Journal, "Worldwide Look at Reserves and Production", December 2022.
[17] Fitch Solutions Group, "Malaysia Oil & Gas Report Q1 2023.", page 27.
[18] U.S. Energy Information Administration, International Energy Statistics.
[19] Fitch Solutions Group, "Malaysia Oil & Gas Report Q1 2023.", page 26.
[20] "SapuraOMV Launches Key Gas Field off Malaysia | Newsbase." n.d. Newsbase.com. Accessed July 25, 2024.
[21] "Shell Delivers First Gas from the Timi Platform in Malaysia | Shell Global." n.d. Www.shell.com; Fitch Solutions Group, "Malaysia Oil & Gas Report Q1 2023.", page 26.
[22] Fitch Solutions Group, "Malaysia Oil & Gas Report Q1 2023.", page 28.
[23] FACTS Global Energy, *Malaysia Natural Gas Outlook*, September 2023, page 11.
[24] "Gas Transportation." PETRONAS Gas Berhad (PGB). Accessed July 25, 2024.
[25] International Group of Liquefied Natural Gas Importers, GIIGNL Annual Report 2024, page 33.
[26] International Group of Liquefied Natural Gas Importers, GIIGNL Annual Report 2024, page 42.
[27] U.S. Energy Information Administration, International Energy Statistics.
[28] Malaysia Energy Commission, Malaysia Energy Information Hub database, accessed July 21, 2024.
[29] U.S. Energy Information Administration, International Energy Statistics.
[30] "Malaysia - an Energy Snapshot." Asia Natural Gas & Energy Association. Accessed July 21, 2024.
[31] U.S. Energy Information Administration, International Energy Statistics.
[32] U.S. Energy Information Administration, International Energy Statistics.
[33] Yun, Tan Zhai. "Fadillah: Malaysia Aims for Complete Retirement of Coal-Fired Power Plants by 2044." The Edge Malaysia, June 25, 2024.
[34] "Malaysia - an Energy Snapshot." Asia Natural Gas & Energy Association. Accessed July 21, 2024.
[35] Lim, Mark, Kim Hock Ang, and Faez Abdul Razak. "Malaysia: Energy Exchange Update." Global Compliance News, April 25, 2024; Fitch Solutions Group, "Malaysia Power Report Q3 2024.", page 16.
[36] U.S. Energy Information Administration, International Energy Statistics.
[37] Vortexa (accessed June 2024)
[38] Vortexa (accessed June 2024)
[39] Vortexa (accessed June 2024)
[40] Vortexa (accessed June 2024)
[41] Vortexa (accessed August 2024)
[42] Vortexa (accessed August 2024)
[43] Global Trade Tracker (accessed July 2024)
[44] Vortexa (accessed August 2024
[45] Fitch Solutions Group, "Malaysia Power Report Q3 2023.", pages 19, 28.
[46] Global Trade Tracker (accessed June 2024)