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Overview of the current energy market

Malaysia is a federation and has federal laws and policies that apply throughout the country, and state laws and policies that only apply to individual states. The regulatory framework governing the Malaysian energy market follows this federal structure.

Malaysia's energy market is characterised by integrated participation across the energy value chain, supported by a mature infrastructure network and a strategic policy framework aimed at balancing fossil fuel reliance with a progressive energy transition.

Participation in the energy value chain

Production

Malaysia's energy market is historically anchored in hydrocarbons, complemented by a growing renewable segment under the National Energy Transition Roadmap ("**NETR**"). Oil and natural gas dominate upstream production, with Petroliam Nasional Berhad ("**PETRONAS**"), the national oil and gas company of Malaysia, as the principal player and liquefied natural gas ("**LNG**") exports positioning Malaysia among the world's top-five exporters.[1] More recently, Petroleum Sarawak Berhad ("**PETROS**"), the wholly owned company of the state of Sarawak, has been playing an increasing role in the oil and gas sector in the state.

Processing and refining

Midstream infrastructure in Peninsular Malaysia is owned by PETRONAS and includes the Peninsular Gas Utilisation ("**PGU**") pipeline network and two LNG regasification terminals,[2] with a third under development to enhance supply security.[3] In Sarawak, midstream infrastructure includes a pipeline network and a PETRONAS LNG Complex, whereas there are two floating PETRONAS LNG platforms in Sabah offshore[4] and a third floating PETRONAS LNG project being developed nearshore in Sabah.[5]

Downstream, Malaysia has a refining capacity of approximately 997,000 barrels per day as at 2023, anchored by the Pengerang Integrated Complex, Melaka, and Port Dickson refineries,[6] with planned total refining capacity to reach 1 million barrels per day by 2037.[7] The Pengerang Integrated Complex and the refinery in Melaka are owned by PETRONAS, while the refinery in Port Dickson is owned by Hengyuan Refining Company Bhd.

Consumption

Since 2017, the industrial sector has overtaken the power sector as the largest consumer of energy, mainly natural gas, in Malaysia and has maintained this position consistently.[8] This shift is largely attributable to the expansion of the manufacturing base, supported by the extensive natural gas pipeline network, particularly the PGU system.

Primary energy sources by sector

Power generation

Electricity supply is organised into three systems: Peninsular Malaysia; Sabah; and Sarawak. Installed capacity in Peninsular Malaysia is approximately 27.7 GW,[9] with renewable energy accounting for 20.2% of generation as at 2021[10] and solar as the fastest-growing renewable source. In East Malaysia, the state of Sabah derives approximately 79.3% of its electricity from natural gas, reflecting its continued reliance on thermal generation.[11] In contrast, Sarawak's energy mix is predominantly hydro-based, with hydropower contributing around 74% of total generation capacity.[12]

Heat

Industrial heating, for industry use such as manufacturing, food processing, pharmaceuticals, chemicals, and electronics, is primarily powered by natural gas, electricity and coal (approximately 87.5%), with limited penetration of renewables (approximately 0.3%).[13] Bioenergy is used in niche applications but remains marginal.[14] In contrast, residential and commercial sectors in Malaysia do not use energy for space heating.[15] Energy use in these sectors is dominated by cooling (air conditioning), lighting, and appliances.[16]

Transportation

The second-largest consumer of energy is the transportation sector. Petroleum products dominate (approximately 94.2%),[17] with gasoline/petrol and diesel forming the bulk of consumption. Hydrogen, biodiesel and sustainable aviation fuel are expected to scale post-2028, supported by biorefinery development and policy incentives.[18]

Overview of energy policy

Malaysia's energy policy is undergoing a significant transformation as the country works to balance its economic development objectives with growing climate responsibilities. Anchored in strategic frameworks such as the National Energy Policy ("**NEP**"), the Malaysia Renewable Energy Roadmap ("**MyRER**"), and the NETR, Malaysia's policy direction reflects a firm commitment to energy security, decarbonisation, and socio-economic inclusion. These initiatives are aligned with Malaysia's international obligations, particularly under the Paris Agreement, where it has pledged to reduce greenhouse gas ("**GHG**") emissions intensity by 45% by 2030, with a longer-term target of achieving net-zero emissions by 2050.[19] While Malaysia is not a signatory to the Energy Charter Treaty, it remains committed to regional initiatives like the ASEAN Power Grid, which promotes electricity interconnection and market integration.[20]

In terms of resilience and energy security, Malaysia recognises the need to modernise its energy infrastructure while reducing dependence on fossil fuels. Malaysia is on track to meet its renewable energy target, with renewable energy already accounting for 30% of installed capacity by 2025, with a pathway towards 40% by 2035.[21] To support this, major investments are underway, including a RM43 billion grid upgrade aimed at enhancing system flexibility, integrating variable renewables, and meeting growing demand from digital and transport sectors.[22] A key component of this upgrade is the deployment of Battery Energy Storage Systems ("**BESS**"), which will improve grid stability and enable higher penetration of intermittent renewable sources.[23] The MyBeST initiative, Malaysia's inaugural BESS tender, targets

400 MW of battery capacity with 1,600 MWh of energy storage, slated for full operation by 2026/2027.[24] Legislative updates, such as the recently passed Electricity Supply (Amendment) Bill 2025, have strengthened the regulatory framework by granting the Energy Commission authority over cross-border electricity trade, while ensuring that domestic demand is prioritised.[25] These developments are vital in preparing Malaysia for climate-related disruptions and volatile global energy markets.

Another critical component of this policy transition is the introduction of carbon pricing mechanisms. Malaysia plans to implement a carbon tax by 2026, initially targeting high-emission sectors such as energy, steel, and cement.[26] Discussions are also ongoing regarding the development of an Emissions Trading Scheme ("**ETS**"), with industry stakeholders showing preference for the flexibility and cost-effectiveness of market-based instruments.[27] In parallel, Malaysia has launched voluntary carbon markets, including the Bursa Carbon Exchange ("**BCX**") and a growing market for Renewable Energy Certificates ("**RECs**").[28] However, key design questions remain: how will these mechanisms interact with existing fossil fuel subsidies, how will revenues be allocated, and how will disproportionate burdens on vulnerable groups be prevented? These concerns are especially pressing as Malaysia moves to rationalise long-standing fuel subsidies while ensuring social protection.

Complementing these efforts is the growing emphasis on Carbon Capture, Utilisation and Storage ("**CCUS**") as a strategic technology in Malaysia's decarbonisation pathway. Recognised in the NETR Phase 2, CCUS is seen as critical for decarbonising hard-to-abate industries and natural gas processing, particularly in regions like Sabah and Sarawak, where geological storage potential is significant.[29] The government has enacted the CCUS Act, establishing a comprehensive regulatory framework that includes licensing for storage operators and long-term liability management.[30] Pilot projects are underway, with PETRONAS leading investments into CCUS hubs targeting both domestic and regional carbon storage markets.[31] Despite its potential, challenges persist – including high costs, uncertain liability regimes, and the need for regional cooperation to develop cross-border transport and storage networks.

The policy framework also gives significant attention to energy access and affordability, recognising energy as a fundamental right.[32] Despite rising global fuel costs, the government continues to shield households and small businesses from volatility through a targeted electricity subsidy regime.[33] The recently introduced Regulatory Period 4 ("**RP4**") tariff structure segments electricity bills into energy, capacity, network, and retail components, and introduces an Automatic Fuel Adjustment mechanism to reflect real-time market dynamics.[34] Crucially, households consuming under 600 kWh per month are exempt from surcharge adjustments, maintaining affordability for low-income users.[35] Additionally, rebates and efficiency programmes – such as appliance grants and tax exemptions – are in place to promote responsible energy consumption.[36]

Parallel to pricing reform, Malaysia is integrating Environmental, Social, and Governance ("**ESG**") considerations more deeply into its energy transition. Community-focused policies like the Corporate Renewable Energy Aggregation Mechanism ("**CREAM**") enable households and local groups to collectively invest in and benefit from renewable energy projects.[37] Investment incentives, including the Green Investment Tax Allowance ("**GITA**") and Green Income Tax Exemption ("**GITE**"), are structured to attract private capital into the clean energy sector.[38] Nonetheless, the social dimension of the transition poses ongoing challenges. Fossil fuel-dependent communities, especially in rural and Indigenous areas, face risks of economic displacement. Similarly, land use and ecological impacts from large-scale solar, hydro, and biomass projects have prompted calls for stricter environmental and social safeguards.

Finally, Malaysia's policy evolution is being shaped by its broader international climate and sustainability commitments. In addition to its Nationally Determined Contributions ("**NDCs**"), the government is in the process of drafting a Climate Change Act, a National Carbon Policy, a Long-Term Low Emissions Development Strategy ("**LT-LEDS**"), and a National Adaptation Plan.[39] These initiatives aim to institutionalise climate governance and enhance transparency, aligning Malaysia's domestic policies with global

expectations and investor standards. The country is also integrating the Sustainable Development Goals ("**SDGs**") – particularly SDG 7 on affordable and clean energy – into its planning framework.[40] However, translating these commitments into actionable and equitable outcomes will require strong implementation capacity, inclusive stakeholder engagement, and mechanisms to ensure a just transition for all segments of society.

In summary, Malaysia's energy policy reflects strong ambition to decarbonise while ensuring energy security affordability and global alignment. However, significant policy and institutional challenges remain, particularly in operationalising carbon pricing, integrating renewables, and safeguarding vulnerable communities during the energy transition.

Oil and gas sector

Malaysia's oil and gas sector remains a cornerstone of its economy, contributing approximately 20% to national gross domestic product ("**GDP**").[41] The country is endowed with substantial hydrocarbon resources, with the country's remaining reserves estimated at over 17 billion barrels of oil equivalent from more than 400 fields, with gas making up three-fourths of the mix.[42] Malaysia is Southeast Asia's second-largest producer of petroleum liquids and ranks fifth globally in LNG exports.[43] Its export profile includes crude oil, LNG, and refined products, while refined petroleum and gas are imported to meet domestic demand.[44] Infrastructure supporting the sector is extensive, comprising over 10,000km of pipelines,[45] seven refining facilities with a combined capacity of 997,000 barrels per day, and major terminals such as the Pengerang Deepwater Terminal.[46] Offshore infrastructure continues to expand, particularly in Sarawak and Sabah.[47] Key players in the sector include PETRONAS (the national oil company), PETROS, Shell, Dialog Group, ConocoPhillips, Hibiscus Petroleum, and Hess, alongside newer entrants such as INPEX, Pertamina, and Jadestone Energy.[48]

The legal and regulatory framework governing Malaysia's oil and gas sector is anchored in the Petroleum Development Act 1974, which vests exclusive ownership and control of petroleum resources in PETRONAS.[49] All upstream activities are conducted under Petroleum Arrangement Contracts ("**PACs**") issued by Malaysia Petroleum Management ("**MPM**"), a unit within PETRONAS.[50] The vast majority of the PACs applicable today are in the form of the Production Sharing Contract ("**PSC**") model,[51] with fiscal terms premised on a Revenue Over Cost structure with profit tranches based on the ratio of revenue against cost incurred and additional clawback functions built in.[52] Environmental and operational regulations are governed by the Environmental Quality Act 1974, which mandates Environmental Impact Assessments for prescribed activities and imposes standards for emissions, effluents, and hazardous waste management.[53]

Institutionally, the Ministry of Economy oversees energy policy and transition planning.[54] PETRONAS, through MPM, regulates upstream activities, while an agency under the Ministry of Energy Transition and Water Transformation ("**PETRA**"), i.e. the Energy Commission, oversees downstream gas supply and electricity.[55] In Sarawak, PETROS serves as the state-owned entity managing upstream and downstream interests.[56] The Malaysia Petroleum Resources Corporation ("**MPRC**") plays an advisory role, focusing on oil and gas services and equipment ("**OGSE**") sector development and energy transition strategies.[57]

Investment and policy trends reflect Malaysia's dual priorities of energy security and transition. Annual Malaysia Bid Rounds ("**MBR**") continue to attract international interest, with MBR 2025 offering five exploration blocks and three discovered resource clusters.[58] Recent discoveries in Sarawak and Sabah are expected to add over 1 billion barrels of oil equivalent.[59] PETRONAS is actively investing in biorefineries,[60] carbon capture, and LNG infrastructure,[61] while MPRC promotes OGSE sector diversification towards clean energy.[62] These developments underscore Malaysia's strategic intent to maintain its competitiveness in hydrocarbons while aligning with global decarbonisation imperatives.

Power sector

Malaysia's power sector is moderately liberalised and continues to evolve in response to rising demand, decarbonisation imperatives, and digitalisation. As of 2025, total installed generation capacity exceeds 27 GW,[63] with the generation mix comprising coal, natural gas, hydropower and solar where renewable energy accounts for 20.2% of generation as at 2021.[64] Demand growth is driven primarily by industrial and commercial sectors, with manufacturing accounting for the largest share of electricity consumption.[65]

Malaysia's power system is run by three power utilities: (i) Tenaga Nasional Berhad ("**TNB**"), which dominates generation and transmission in Peninsular Malaysia; (ii) Sarawak Energy Berhad in Sarawak; and (iii) Sabah Electricity Sdn Bhd in Sabah. Peninsular Malaysia runs a partially liberalised power market, where nearly all the power produced by TNB and Independent Power Producers ("**IPPs**") goes through Single Buyer, a ring-fenced department of TNB.[66] However, some commercial and industrial consumers can procure solar energy directly from third-party generators. Power markets in the Borneo states of Sarawak and Sabah also use a single buyer model, with their utilities acting as the sole power procurer, transmitter, distributor and retailer.[67] Sarawak Energy is also the only power producer in its state to date, though it is actively encouraging the participation of IPPs particularly in the renewable energy sector, while generation in Sabah is offered by both Sabah Electricity and IPPs.[68] Private sector participation is growing, particularly in solar and hybrid projects, with notable players including Cypark Resources Berhad, Solarvest Holdings Berhad, Samaiden Group Berhad and Leader Energy Group Berhad.[69]

The power sector in Peninsular Malaysia is governed primarily by the Electricity Supply Act 1990, the Energy Commission Act 2001, and subsidiary regulations. As the sector transitions from a vertically integrated model to a more competitive market structure, there has been an increase in new regulations supporting third-party access and allowing non-discriminatory use of transmission and distribution infrastructure.[70] Grid access and connection rules are being refined to accommodate distributed generation, corporate power purchase agreements, and cross-border electricity trade. As discussed above, the RP4 tariff structure, introduced in 2025, segments electricity bills into energy, capacity, network, and retail components, and includes an Automatic Fuel Adjustment mechanism to reflect real-time market dynamics.[71] These reforms aim to improve transparency, cost-reflectiveness, and investment certainty.

The Energy Commission is the primary regulator, responsible for licensing, tariff setting, and compliance for electricity and piped gas supply in Peninsular Malaysia.[72] The Grid System Operator manages real-time operations and planning for Peninsular Malaysia's grid, including interconnections with Thailand and Singapore.[73] The Single Buyer entity procures electricity from generators and manages dispatch.[74] In East Malaysia, Sarawak Energy and Sabah Electricity operate under distinct regulatory frameworks.[75,76,77]

The power sector in Peninsular Malaysia is guided by strategic frameworks including the MyRER[78] and the NETR,[79] while Sabah follows the Sabah Energy Roadmap and Master Plan 2040 ("**SE-RAMP 2040**"),[80] and Sarawak is steered by the Sarawak Energy Transition Policy ("**SET-P**")[81] anchored on renewable energy, hydrogen and CCUS development. The government targets a 31% renewable energy share by 2025, rising to 40% by 2035, and 70% by 2050.[82] Support schemes include large-scale solar auctions,[83] the Corporate Green Power Programme ("**CGPP**") and the Corporate Renewable Energy Supply Scheme ("**CRESS**").[84] Investment is also directed towards BESS, with the MyBeST initiative targeting 400 MW of capacity and 1,600 MWh of energy storage by 2027.[85] Grid digitisation, smart metering, and AI-enabled system optimisation are being deployed to enhance system flexibility and reliability.[86] These measures are designed to support electrification of transport and industry, improve resilience, and enable higher penetration of variable renewables.

Overview of recent developments (including judicial decisions) impacting the energy market and future energy policy

Malaysia's energy landscape is undergoing notable shifts driven by new upstream discoveries, subsidy

reforms, and strategic policy pivots that are reshaping market dynamics and accelerating the transition towards a low-carbon economy.

Upstream oil and gas discoveries and expansion

Malaysia recorded 19 new oil and gas discoveries in 2023, primarily in Sarawak and Sabah, potentially adding over 1 billion barrels of oil equivalent to its reserves.[87] In 2024, PETRONAS and its partners announced nine additional discoveries and one appraisal success, contributing another 600 million barrels of oil equivalent to the national resource base.[88] These discoveries reinforce Malaysia's position as a competitive upstream investment hub and are expected to sustain production at around 2 million barrels of oil equivalent per day through 2027.[89]

Global oil price volatility and trade dynamics

Malaysia's oil and gas sector is facing pressure from declining global oil prices, with Brent crude averaging USD66.53 per barrel in April 2025, down 25.3% year-on-year.[90] This is attributed to increased production from non-OPEC+ countries and potential Iranian supply re-entry. The volatility has affected earnings across the sector and may accelerate Malaysia's pivot towards renewables and clean fuels, especially as fuel subsidy reforms take effect.

Energy access and affordability

Malaysia continues to uphold energy affordability as a core policy objective. Under the BUDI95 subsidy programme, all Malaysians are now entitled to subsidised RON95 petrol at RM1.99 per litre (compared to the market rate of RM2.60–RM2.75), removing previously proposed income-based eligibility criteria.[91] The subsidy is capped at 300 litres per month, verified via national identity cards, and implemented at fuel stations and mobile apps. This universal approach complements targeted electricity subsidies and progressive tariff reforms under RP4, ensuring broad protection against fuel price volatility while supporting inclusive energy access.

Renewable energy export liberalisation

Malaysia has lifted its ban on renewable energy exports, originally imposed in 2021, to stimulate domestic generation capacity and meet rising regional demand.[92] This policy shift is expected to attract foreign investment and accelerate deployment of solar, hydro, and bioenergy projects.

Strategic infrastructure and LNG expansion

Malaysia continues to expand its LNG infrastructure, with new projects such as the Jerun gas field and Shell's Timi project in Sarawak, both expected to reach peak production by 2030. The ZFLNG floating LNG facility off Sabah is scheduled for completion by 2027.[93] These developments enhance Malaysia's role in regional gas supply and support its energy security objectives.

Energy transition and ESG alignment

The shift towards clean energy and ESG-aligned investments is gaining momentum, driven by policy reforms, subsidy rationalisation, and global investor expectations. The NETR and the MyRER outline ambitious targets, including 70% renewable capacity by 2050, backed by an estimated USD143 billion in investment needs.[94] More recently, there have also been discussions on introducing nuclear power plants in Malaysia for the purpose of energy diversification, transition and security.[95]

Conclusion

Malaysia's energy transition is guided by a clear strategic outlook that balances decarbonisation, energy security, and inclusive growth. The government has laid out a comprehensive reform agenda to support

this shift, including the operationalisation of carbon pricing mechanisms – namely the carbon tax and ETS – and the liberalisation of electricity markets through third-party access and cross-border trade frameworks. Legal reforms are also underway to strengthen regulatory clarity in areas such as renewable energy exports, CCUS deployment, and environmental safeguards for large-scale energy projects. These initiatives are embedded within broader policy instruments like the NETR, and are designed to attract private investment, enhance system flexibility, and ensure a just transition. As Malaysia positions itself as a regional clean energy hub, its evolving legal and institutional architecture will play a pivotal role in translating ambition into sustained, equitable outcomes.

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