

Business Review



Gas



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Gas

In 2022, we took significant strides in our Gas business, positioning natural gas as a critical transitional fuel in response to the ever-increasing energy prices and the global shift towards lower carbon energy sources. Adhering to PETRONAS' strategy and the Net Zero Carbon Emissions by 2050 (NZCE 2050) Pathway, we bolstered our position as a one-stop centre for lower carbon energy solutions and as a trustworthy provider of natural gas by prioritising the needs of our customers.

We remained steadfast in our commitment to reduce GHG emissions throughout our natural gas value chain, implementing various initiatives and projects to achieve our carbon reduction targets. We continued to harness the potential of digitalisation and took a proactive approach in reshaping our global LNG portfolio to cater to the escalating demand for lower carbon energy solutions both domestically and internationally, given the pressing need for energy security.

Our unwavering progress was made possible by the passion and dedication of our employees, who never lost sight of our objectives. Moving forward, we are poised to embrace new opportunities and broaden our portfolio to offer more accessible and reliable lower carbon energy solutions in a just and equitable manner.





Liquefied Natural Gas (LNG)

focuses on exports of lower carbon energy internationally.



Gas and Power (G&P)

provides processed gas to customers across Malaysia and Thailand.



Achieved OEE of **96.6%** across all business segments under Gas business.



Achieved gross LNG sales of **34.2** MMT.



Delivered **405** LNG cargoes from PLC to customers across the globe.



Delivered **43** LNG cargoes from PFLNG SATU and PFLNG DUA.



Completed **2,619** Virtual Pipeline System and LNG bunkering deliveries across Malaysia.



Secured **136** MMscfd of natural gas deals.

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Creating Stakeholder Value

| Stakeholder | Expectations | Value Created |
|---|---|---|
| <p>C</p> <p>Customers</p> | <p>Provide reliable, affordable and customer-centric solutions that support the energy transition toward a lower carbon future.</p> | <ul style="list-style-type: none"> ➤ Delivered more than 12,400 LNG cargoes cumulatively to date to customers around the world from the PETRONAS LNG Complex (PLC) since the first cargo delivery in 1983. ➤ Delivered customer-centric solutions such as Virtual Pipeline Services (VPS) and ISO tanks to off-grid customers in Malaysia and China. ➤ Delivered the 100th cargo from PETRONAS Floating LNG facilities. ➤ Delivered carbon-neutral LNG as part of cleaner LNG solutions to help customers achieve their sustainability aspirations. ➤ First in Southeast Asia to offer LNG as a cleaner marine fuel via an LNG bunkering solution. |
| <p>IPG</p> <p>Government and Regulators</p> | <p>Ensure safe and reliable gas and power plant operations in the surrounding communities.</p> <p>Comply with the latest industry occupational health and safety standards and processes.</p> | <ul style="list-style-type: none"> ➤ Ensured continuous secure and reliable delivery of natural gas throughout Peninsular Malaysia with zero domestic gas supply interruptions. ➤ Achieved full compliance to industry regulations with mitigations in place such as Occupational Safety and Health Assessment (OSHA), Environmental Quality Act (EQA) and Factories and Machinery Act (FMA) across all operating units. |
| <p>CN</p> <p>Communities</p> | <p>Introduce initiatives that positively impact the environment and community at large.</p> | <ul style="list-style-type: none"> ➤ Installed solar systems and lighting to off-grid <i>Orang Asli</i> communities via Rays of Hope, a Gas business Signature Social Impact project which saw 156 Orang Asli homes across six villages gain access to energy. This initiative has resulted in an additional six hours of light per night as well as a total savings of approximately RM400,000 by switching from diesel to solar. ➤ Conducted social outreach initiatives focusing on education, environment, and community outreach, including: <ul style="list-style-type: none"> – Community outreach programmes under PETRONAS Sentuhan Kasih. – Mangrove conservation and replanting at Sungai Latoh, Pasir Gudang, Johor. |
| <p>IE</p> <p>Employees</p> | <p>Embed sustainable practices into the culture and practices of the organisation.</p> | <ul style="list-style-type: none"> ➤ Scaled up the implementation of Zero Single-Use of Plastic Programme, to encourage usage of sustainable materials such as recyclable food packaging and glass bottles to replace plastic food packaging. |

Key Focus Areas and Results

Core Business – More Energy, Less Emissions

What We Did in 2022

Results

Sustained world-class operational excellence and grew core business through new LNG supply deals.

- Achieved a high OEE of 96.6 per cent across all business segments under Gas business.
- Achieved Gross LNG sales of 34.2 MMT.

Provided reliable LNG supply and optimised global portfolio to mitigate production shortfalls.

- Delivered 405 LNG cargoes from PLC in Bintulu to customers across the globe.
- Delivered 43 LNG cargoes from PFLNG SATU and PFLNG DUA.
- Mitigated production shortfalls from the Force Majeure declaration on Sabah-Sarawak Gas Pipeline (SSGP) with no supply disruptions faced by impacted customers.

Advocated for greater natural gas use and grew domestic gas sales.

- Secured 136 MMscfd of natural gas deals with non-power customers across Malaysia.

Innovated customised solutions to meet customers' energy demands while pursuing small-scale solutions in Southeast Asia to enhance accessibility to natural gas.

- Completed 2,619 VPS and LNG bunkering deliveries across Malaysia.
- Delivered LNG to smaller-scale and off-grid customers in China via LNG in ISO tanks.

Scaled up Digital Transformation (DX) programmes to enable remote digital operations and improvements in operational efficiencies and safety.

- Launched the Segamat Unified Operation Centre (UOC) to support remote digital operations at Regasification Terminal in Sungai Udang (RGTSU), Regasification Terminal Pengerang (RGTP) and Gas Transmission (GT).
- The first in Malaysia to receive Beyond Visual Line of Sight (BVLOS) permit approval for use of nested drones to deter intrusion and encroachment of Peninsular Gas Utilisation (PGU) right of way.
- Implemented four Machine Learning models through the UP-GREAT strategic initiative that improved plant operations and process safety.
- Rolled out Malaysia's first 5G pervasive network at RGTSU, enabling reliable and stable high-speed connectivity for the Segamat UOC.
- Obtained greater visibility across the entire integrated value chain via continuous improvement of the Gas Business Operations Dashboard (GO Dashboard).

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Key Focus Areas and Results

NZCE – Pathway to Zero

What We Did in 2022

Progressed efforts to reduce carbon footprint of assets through electrification and decarbonisation projects.

Prioritised sustainability across operations by taking responsible, tangible actions.

Results

- Malaysia LNG Sdn Bhd signed a Power Purchase Agreement with Syarikat SESCO Bhd, a subsidiary of Sarawak Energy, for 90 MW of hydroelectric power import to PLC in Bintulu. The import of renewable energy will reduce approximately 0.5 Million tCO₂e of GHG emissions per year by 2025.
- Reduced a total of 189 ktCO₂e of GHG emissions via operational efficiency efforts such as utilities real time optimiser, ship vapour recovery and gas turbine efficiency efforts.
- Achieved more than 0.3 Million tCO₂e cumulative GHG reductions as at 31 December 2022, with more than 0.8 Million tCO₂e further planned until 2027. These collaborative efforts with PETRONAS Delivery and Technology will explore enhancements in environmental compliance and operational efficiency efforts such as steam optimisation and activator upgrades.

Performance Highlights

Overall LNG Sales
(MMT)



Overall OEE for Gas
(%)



Risks and Challenges

Risks and Challenges

Supply Risk

Sustainability of feedstock supply coupled with unreliable plant performance impacting LNG production.

Demand Risk

Difficulty in balancing the complexity of Peninsular Malaysia’s gas demands and higher gas costs which impacted Gas business profitability.

Growth Risk

Challenges to expand supply nodes and entry into new markets.

Mitigation Strategies

- Strategic level discussions and continuous collaborations internally and at enterprise level to expedite gas supply.
- Stakeholder and customer management to maintain good reputation and relationship (courtesy call and management visits).
- Enhancement of maintenance plan to increase LNG plant reliability and productivity.
- Increased rigour and frequency of inspection and rectification plan at the LNG plant.
- Continuous optimisation of marketing efforts.

- Actively manage feedgas demand, especially from Power sector customers.
- Optimisation of gas supply from the Gas Processing Plant in Kerteh.
- Continuous contract negotiations on price and volume offtake with all customers.
- Continuous engagement with the government to advocate for market parity price for Power sector.

- Proper due diligence process and evaluation of risk appetite prior to investment.
- Exploration of attractive commercial terms, while continuously monitoring key exposures to ensure revenue certainty.



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Growth Opportunities

Opportunities

Our Approach

Growing global demand for LNG in line with the energy transition towards lower carbon energy sources

Grow global supply portfolio and production capacity through new LNG projects:

- Signed a Sales and Purchase Agreement (SPA) with Venture Global LNG for 1 MTPA of LNG supply for 20 years.
- FID for Southeast Asia's first nearshore LNG facility located in Sabah, in December 2022. Upon completion, the facility adds another 2.0 MTPA of LNG supply to our production portfolio.
- Achieved FID for a 52 MW power plant to supply power to Sabah's first nearshore LNG facility in Sipitang via a 20 year power supply agreement.
- Signed an MoU with Argentina's largest integrated oil and gas company, YPF S.A, to pursue collaboration in Argentina in an integrated LNG project and other areas, including upstream oil, petrochemicals and clean energy solutions. The integrated LNG project would encompass upstream gas production, dedicated pipeline and infrastructure development, LNG production as well as marketing and shipping.

Increased focus on energy security and GHG emissions reduction

Establish strategic partnerships with key partners with continued focus on decarbonising our LNG value chain:

- Signed a Memorandum of Cooperation (MoC) with Japan's Ministry of Economy Trade & Industry (METI) to strengthen energy security in Asia and develop a cooperative LNG framework that covers investments, reduction in GHG emissions and promote the development of a flexible and liquid LNG market to manage market disruptions.
- Pursue the use of renewable energy and electrification of our LNG assets to reduce GHG emissions.
- Advocate for LNG as a cleaner marine fuel through LNG Bunkering solutions in support of IMO 2020 regulations.

Rising demand for natural gas in Malaysia with the phasing out of coal-fired plants for electricity and power generation

Strengthen the business' position to meet growing domestic demand for lower carbon energy:

- Pursue power generation opportunities in Peninsular Malaysia, Sabah and the region; integrated utilities solutions for power and utilities at new industrial zones in Malaysia through PETRONAS Gas Berhad (PGB).



Outlook

Short Term (2022-2027)

In response to the continuing elevated prices and the energy trilemma, we will continue to sharpen our focus on strengthening our position as a one-stop centre for lower carbon energy solutions across our value chain, embracing innovation and new technology solutions.

Our short term key focus areas include:

- **Maximise value from our existing assets**
 - We strive to consistently be in the top quartile operational performance to gain intrinsic value via asset optimisation and extrinsic value through dynamic hedging, while strengthening our focus on HSSE.
- **Expand our supply nodes**
 - We continue to grow our LNG portfolio by ensuring successful delivery of growth projects such as nearshore LNG facility in Sabah and LNG Canada.
- **Expand market reach through customised solutions**
 - We continue to explore new business opportunities by creating solutions that meet our customers’ needs.

Medium to Long Term

Gas and LNG demand are sustained in most energy transition scenarios supported by robust prices which underpin new investments and future growth. Natural gas and LNG are set to see resilient demand as countries continue to pursue their industrialisation agendas, especially for the chemical and industrial sectors. Oil and gas companies are also expected to continue expanding their gas portfolios, given the increase in gas consumption and strict emission goals in the future.

Our medium and long term focus are:

- **Maximise and grow LNG portfolio globally**
 - With the expected increase in global demand for LNG, we seek to maintain market leadership by leveraging our global LNG portfolio, world-class operations and customer-centric solutions. We will also pursue expansion of our supply nodes to meet growing demand especially in Asia and Europe.
- **Optimise and sustain position in domestic gas sales**
 - As Malaysia’s leading gas infrastructure and centralised utilities company, we play a vital role in the nation’s energy security. We are committed in ensuring our assets are available, reliable and operating at optimum levels, ready to serve the needs of the nation and continue to advocate for gas and power market liberalisation.
- **Extend into adjacent gas value pools**
 - With rapid growth in gas to power generation within Malaysia and regionally, we continue to look for opportunities to grow our power generation business. Beyond that, we will explore step-out opportunities brought forth by the energy transition.
- **Explore solutions to reduce emissions**
 - To future-proof our business, we have already taken steps to decarbonise our operations through various abatement solutions.

