# WESTERN AUSTRALIA LNG PROFILE – August 2022

**Global LNG trade: calendar years**



Mt = Million tonnes.

Source: International Group of LNG importers (GIIGNL) (Annual).

* Global liquefied natural gas (LNG) trade rose 4.5% (16.2 million tonnes) to 372.3 million tonnes in 2021.
* Global LNG trade grew by a compound annual rate of 4.5% over the 10 years to 2021.
* Most LNG trade is through long and medium‑term contracts (contracts with a duration of longer than four years).
* In 2021, long and medium‑term contracts accounted for 63% (236.0 million tonnes) of global LNG trade while spot and short‑term contracts accounted for 37% (136.3 million tonnes) of global LNG trade.

**Major global LNG exporters: 2021 calendar year**



Mt = Million tonnes.

Source: International Group of LNG importers (GIIGNL) (Annual); and WA Department of Jobs, Tourism, Science and Innovation.

* Australia was the largest global LNG exporter in 2021, accounting for 21.1% of global LNG exports. Australia’s LNG exports increased slightly from 77.8 million tonnes in 2020 to 78.5 million tonnes in 2021.
* Western Australia accounted for 12% of global LNG exports and 56% of Australia’s LNG exports in 2021.
* Qatar was the second largest global LNG exporter in 2021, accounting for 20.7% of global LNG exports. After more than doubling its LNG export capacity between 2008 and 2011, Qatar’s annual LNG exports have ranged from 75 to 80 million tonnes since 2012.
* The United States accounted for 18% of global LNG exports in 2021. LNG exports from the United States increased from less than 3 million tonnes in 2016 to 67.0 million tonnes in 2021 as a number of new projects became operational.

**Major global LNG importers: 2021 calendar year**



Mt = Million tonnes.

Note: LNG import volumes are net of any re‑exports of LNG.

Source: International Group of LNG importers (GIIGNL) (Annual).

* In 2021, Asia accounted for 73% (272.1 million tonnes) of global LNG imports. The five largest LNG importers in 2021 were all from Asia.
* Europe (20%), the Americas (5%) and the Middle East and Africa (2%) made up the balance of global LNG imports in 2021.
* China became the world’s largest LNG importer in 2021, with its LNG imports increasing from 68.9 million tonnes in 2020 to 79.3 million tonnes in 2021.
* Japan was the second largest LNG importer in 2021 with imports of 74.4 million tonnes, slightly lower than in 2020. Japan’s LNG imports peaked at 89.2 million tonnes in 2014.
* LNG demand is growing in a number of emerging markets in Asia, including Pakistan, Bangladesh and Thailand.
* There is also growing interest in LNG imports in Europe, as a number of countries seek to reduce their reliance on pipeline gas imports.

**China, Japan and South Korea LNG imports: 12‑month rolling total**



Mt = Million tonnes.

Source: WA Department of Jobs, Tourism, Science and Innovation estimates based on data from CEIC China Premium Database; Japanese Ministry of Finance; and Korean Customs Service.

* China’s LNG demand increased strongly between 2016 and 2021 as part of its strategy to increase the share of natural gas in its energy mix. However, China’s LNG imports have fallen in the first half of 2022. In the first seven months of 2022, China’s LNG imports were 21% lower compared to the first seven months of 2021.
* In the 12 months to July 2022, China’s LNG imports were 70 million tonnes, 8% lower than in the 12 months to July 2021.
* Japan imported 73 million tonnes of LNG in the 12 months to July 2022, 5% lower than in the 12 months to July 2021. Japan’s LNG demand has fallen in recent years in line with the fall in its overall energy demand.
* South Korea imported 45 million tonnes of LNG in the 12 months to July 2022, 3% higher than in the 12 months to July 2021.

**Asia LNG prices: months**



mmBTU = Million British thermal units.

Note – The North Asia LNG spot price is the front month price at the end of the reference month. The chart shows the Sling North Asia price to October 2019 and the JKM price from November 2019.

Source: World Bank, Commodity Markets (Monthly); EnergyQuest, LNG Report (July 2017 to July 2022).

* Average LNG prices in Asia generally move with the oil price (with a lag of three to four months) as most of Asia’s long‑term LNG supply contracts have prices linked to the oil price.
* The increase in the oil price during 2021 and early 2022 has led to higher average LNG prices. The average LNG import price to Japan was US$16.4 per mmBTU in July 2022, 59% higher than in July 2021.
* LNG spot trade is used to alleviate short‑term deviations from expected demand and supply. As such, the LNG spot price is subject to volatility.
* LNG spot prices have been particularly high over the past few months. Restricted natural gas supply to Europe has led to higher demand for LNG, which has flowed through to higher LNG spot prices in Asia.
* At the end of July 2022, the JKM front month price was US$45.5 per mmBTU, almost three times the price at the end of July 2021.

**Australia’s LNG exports: months**



Source: Based on data from ABS 5368.0 International Trade in Goods and Services, Australia (Monthly).

* Australia’s LNG exports increased to 7.4 million tonnes in June 2022, which was a record high monthly total.
* In the 12 months to June 2022, the volume of Australia’s LNG exports was 83.4 million tonnes, 7.7% higher than in the 12 months to June 2021.
* The record export volume and high average price led to another record high monthly value for Australia’s LNG exports in June 2022 of $6.69 billion. This surpassed the previous record high of $6.60 billion in May 2022.
* In the 12 months to June 2022, the value of Australia’s LNG exports was $70 billion, 130% higher than in the 12 months to June 2021.

**Western Australia’s LNG export capacity**



Note: Pluto Train 2 is expected to be operational in 2026.

Source: WA Department of Jobs, Tourism, Science and Innovation based on company investor information (announcements, reports and presentations).

* Western Australia has an established and reliable LNG export industry. The State’s first LNG project, the North West Shelf, marked 30 years of LNG exports in 2019.
* Western Australia currently has five operating LNG export projects. The North West Shelf, Pluto, Gorgon and Wheatstone projects all source gas from the Carnarvon Basin and have onshore LNG trains in Western Australia’s Pilbara region. The Prelude project is a floating LNG vessel located in the Browse Basin offshore Western Australia.
* Western Australia’s current total LNG export capacity is 50 million tonnes a year.
* In November 2021, a final investment decision was made for a second LNG train for the Pluto project with a capacity of 5 million tonnes a year. Pluto Train 2 is expected to begin exporting LNG in 2026.

**Western Australia’s natural gas reserves and resources as at May 2022**

|  |  |  |
| --- | --- | --- |
| Basin | Reserves (petajoules) | Contingent resources (petajoules) |
| Carnarvon | 50,982 | 27,531 |
| Browse | 15,701 | 19,943 |
| Bonaparte | 4,803 | 13,568 |
| Perth | 1,466 | 961 |

Note: Reserves and resources are categorised by probability or likelihood of recovery. Reserves refer to 2P reserves that are proved (90%) and probable (50%) while contingent resources refer to 2C resources (best estimate of contingent resources). Bonaparte Basin figures refer to Australia’s share of reserves and resources.

Source: EnergyQuest, Energy Quarterly May 2022).

* Western Australia’s LNG projects are underpinned by large, conventional gas reserves in the Carnarvon and Browse Basins, which provide LNG buyers with security of supply.
* Western Australia also has onshore shale and tight gas resources in the Canning, Carnarvon and Perth basins.
* The WA Domestic Gas Policy requires LNG exporters to make gas available to Western Australian consumers equivalent to 15% of their LNG exports.

**LNG shipping duration: days**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | China  (Shanghai) | Japan  (Tokyo) | Korea  (Incheon) | India  (Gujarat) |
| Western Australia  (Pilbara) | 8 | 7 | 8 | 9 |
| Queensland  (Gladstone) | 8 | 9 | 9 | 14 |
| Qatar  (Ras Laffan) | 14 | 12 | 13 | 2 |
| United States  (Gulf Coast) | 20 | 22 | 21 | 21 |
| Southeast Asia  (Singapore) | 6 | 5 | 6 | 6 |
| Nigeria  (Bonny Island) | 23 | 22 | 23 | 15 |

Note: Days shipping is based on a vessel at maximum speeds of 19.5 knots.

Source: WA Department of Jobs, Tourism, Science and Innovation based on information from Shipscene and the International Group of LNG Importers (GIIGNL).

* Western Australia’s LNG projects are located relatively close to Asia, comparing favourably to the shipping distances from Qatar (with the exception of India).
* The shipping distance from Western Australia’s projects to Japan is around 3,400 nautical miles or about 8 days travel, with similar shipping distances to South Korea, China, Taiwan and India.
* The expansion of the Panama Canal, completed in late June 2016, provides for a shorter trade route for LNG exports from the USA to Asia. However, shipping to Asia from the US Gulf Coast still takes more than twice the time of shipping from Western Australia.

**Western Australia’s LNG sales: calendar years**



Mt = Million tonnes. ^ Includes condensate, crude oil, LPG and domestic gas.

Source: WA Department of Mines, Industry Regulation and Safety, Resource Data Files (Bi-Annual).

* The volume of Western Australia’s LNG sales in 2021 was 44.3 million tonnes.
* The value of Western Australia’s LNG sales rose 44% to $27.8 billion in 2021. The rise was due to higher average LNG prices during 2021.
* In 2021, LNG accounted for 12% of Western Australia’s total sales of minerals and petroleum ($229.9 billion).
* Western Australia’s LNG projects also produce condensate and liquefied petroleum gas (LPG), mostly for export markets, and supply the majority of Western Australia’s domestic gas.

**Western Australia’s LNG sales by market: financial years**



Mt = Million tonnes. ^ Includes India in both 2020‑21 and 2021‑22 and Malaysia, Kuwait and Indonesia in 2021‑22 only.

Source: EnergyQuest, LNG Report (July 2020 to June 2022)

* Japan was Western Australia’s first LNG customer in 1989 and remains the state’s largest customer. Western Australia accounted for 28% of Japan’s LNG imports in 2021-22.
* In 2006, Western Australia became the first jurisdiction in the world to export LNG to China via the North West Shelf’s contract with Guangdong Dapeng LNG. Western Australia accounted for 17% of China’s LNG imports in 2021-22.
* Of Western Australia’s total LNG exports in 2021-22:
  + Japan accounted for 44%.
  + China accounted for 26%.
  + South Korea accounted for 13%.
  + Taiwan accounted for 10%.
  + Singapore accounted for 3%
  + Thailand accounted for 3%.

**Western Australia’s LNG production by company:**

**2021 calendar year**



Note: The merger of Woodside with BHP’s oil and gas portfolio took effect from 1 June 2022. As the chart shows production by company for the 2021 calendar year, Woodside and BHP production is shown separately.

Mt = Million tonnes.^ Includes Kufpec, CNOOC, PE Wheatstone, Tokyo Gas, Kansai Electric, Inpex, Osaka Gas, Kyushu Electric, Kogas, Jera and CPC.

Source: EnergyQuest, Energy Quarterly (March 2022)

* In 2021, Chevron (33%), Woodside (17%) and Shell (16%) accounted for the largest shares of Western Australia’s LNG production.
* Chevron has a 1/6th share of the North West Shelf project and is the operator and largest stakeholder in the Gorgon and Wheatstone projects.
* Woodside is the operator of the North West Shelf project. Woodside’s share of the North West Shelf project increased from 1/6 to 1/3 following its merger with BHP’s oil and gas portfolio. Woodside also has a 90% share and is the operator of the Pluto project, and has a 13% share of the Wheatstone project.
* Shell has a 1/6th share of the North West Shelf project, a 25% share of the Gorgon project and is the operator and largest stakeholder of the Prelude floating LNG project.

**Western Australia’s LNG projects and associated developments1: as at 31 August 2022**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Project | Stakeholders | Capex2  ($b): | Capacity (Mtpa) | Start of  operations | Details |
| North West Shelf  Trains 1-5 | Woodside (33.33%)  BP (16.67%)  Chevron (16.67%)  MIMI (16.67%)  Shell (16.67%) | 34.0 | 16.9 | September 1989 | The North West Shelf is a five‑train LNG project located within the Burrup Strategic Industrial Area in Western Australia’s Pilbara region. Trains 1 and 2 began in 1989, Train 3 in 1992, Train 4 in 2004 and Train 5 in 2008.  In March 2022, the start-up of the Pluto-Karratha Gas Plant Interconnector pipeline occurred, enabling processing of third-party gas at the North West Shelf’s LNG production facility. |
| Pluto  Train 1 | Woodside (90%)  Tokyo Gas (5%)  Kansai Electric (5%) | 15.0 | 4.9 | April 2012 | Pluto is currently a single train LNG project located within the Burrup Strategic Industrial Area in Western Australia’s Pilbara region.  In November 2021, a final investment decision was made to backfill and expand the Pluto LNG project with gas from the Scarborough fields (see Scarborough and Pluto Train 2 below). |
| Gorgon  Trains 1-3 | Chevron (47.3%)  ExxonMobil (25%)  Shell (25%)  Osaka Gas (1.25%)  Tokyo Gas (1%)  JERA (0.417%) | 55.0 | 15.6 | March 2016 | Gorgon is a three‑train LNG project located on Barrow Island in Western Australia’s Pilbara region. Gorgon exported its first LNG cargo in March 2016. Train 2 began production in October 2016 and Train 3 began production in March 2017. |
| Wheatstone  Trains 1-2 | Chevron (64.14%)  KUFPEC (13.4%)  Woodside (13%)  PE Wheatstone (8%)  Kyushu Electric (1.46%) | 40.0 | 8.9 | October 2017 | Wheatstone is a two‑train LNG project located within the Ashburton North Strategic Industrial Area in Western Australia’s Pilbara region. Train 1 began production in October 2017 and Train 2 began production in June 2018. |
| Ichthys  Trains 1-2 | Inpex (66.245%)  Total (26%)  CPC (2.625%)  Other\* (5.13%) | 27.2^ | n.a. | October 2018 | Ichthys is a two‑train LNG project located in Darwin, sourcing gas from the Browse Basin offshore Western Australia. Western Australia’s share of the Ichthys project’s total capital expenditure is around 50%.  Ichthys exports condensate directly from a floating production, storage and offloading facility located offshore Western Australia. |
| Prelude  Floating LNG vessel | Shell (67.5%)  Inpex (17.5%)  KOGAS (10%)  CPC (5%) | 19.6 | 3.6 | June 2019 | Prelude is a floating LNG project located in the Browse Basin offshore Western Australia. Prelude also produces up to 1.3 million tonnes of condensate a year and 0.4 million tonnes of LPG a year. The vessel will operate at the Prelude gas field for 25 years. Operations at Prelude resumed at the end of August 2022 after 76 days of industrial action. |
| Gorgon Stage 2  Development | See Gorgon | 5.1 | n.a. | 2022 | In April 2018, Chevron announced Gorgon Stage 2, which will help maintain gas supply to the project. Stage 2, nearing completion, is the drilling and connection of eleven additional wells to the Gorgon and Jansz‑lo fields. |
| Julimar-Brunello Phase 2  Development | Woodside (65%)  KUFPEC (35%) | 2.7 | n.a. | 2022 | The Julimar and Brunello fields will feed 2.1 trillion cubic feet of gas to the Wheatstone LNG plant. Phase 2, a tie-back of the Julimar field to the Brunello subsea infrastructure, achieved steady state operations in April 2022. |
| Greater Western Flank Phase 3 / Lambert Deep  Development | See North West Shelf | 1.0 | n.a. | 2022 | The Greater Western Flank Phase 3 and Lambert Deep gas projects involve the drilling and subsea tieback of new production wells to the North West Shelf. Ready for start‑up status was achieved in April 2022. |
| Waitsia Stage 2  Development | Mitsui E&P (50%)  Beach Energy (50%) | 0.8 | n.a. | 2023 | Waitsia Stage 2 involves further development of the Waitsia gas field, with more wells and a production facility capable of producing 250 terajoules of gas a day. The Waitsia Joint Venture has an agreement to enable Waistia gas to be tolled and processed through the North West Shelf facilities to produce up to 7 million tonnes of LNG between the second half of 2023 and the end of 2028. |
| Jansz-lo Compression | See Gorgon | 6.0 | n.a | 2026 | In July 2021, Chevron announced it would build and install a 27,000 tonne floating field-control station, a 6,500 tonne subsea compression infrastructure and a 135‑kilometre submarine power cable from the Jansz‑lo gas field to the Gorgon project’s three LNG trains and gas plant on Barrow island. |
| Scarborough and Pluto Train 2 | *Scarborough Gas Fields*  Woodside (100%) | 16.0 | 5.0 | 2026 | The Scarborough development involves a resource of 11.1 trillion cubic feet of gas with an offshore floating production unit capable of providing feed gas to produce 8 million tonnes a year of LNG plus domestic gas.  The onshore development involves a new LNG train, modifications to Pluto Train 1 to allow it to process up to 3 million tonnes a year of LNG from Scarborough gas and a new domestic gas plant capable of producing 225 terajoules of gas a day.  Construction commenced on Pluto Train 2 in August 2022. |
| *Pluto Train 2*  Woodside (51%)  Global Infrastructure Partners (49%) |
| Crux | Shell (82%)  Seven Group (15%)  Osaka Gas (3%) | 3.5 | n.a. | 2027 | In May 2022, Shell announced it would proceed with the development of the Crux gas field in the Browse Basin offshore Western Australia. The Crux gas field will be connected to the Prelude FLNG vessel via a 160 kilometre pipeline. |

Mtpa = million tonnes per annum. n.a. – not available or not applicable. FEED = front-end engineering and design: FID = final investment decision. \* Comprises the following companies: Tokyo Gas (1.575%), Osaka Gas (1.2%), Kansai Electric (1.2%), JERA (0.735%) and Toho Gas (0.42%). ^ Western Australia’s share of total capital expenditure.1 Major projects under construction or committed only. 2 Capital expenditure.

Source: EnergyQuest, Energy Quarterly; WA Department of Jobs, Tourism, Science and Innovation; and company investor information (announcements, reports and presentations).