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| **THE GLOBAL LIQUEFIED NATURAL GAS (LNG) MARKET** |

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| Global LNG trade | * Global LNG trade in 2019 was 354.7 million tonnes, a 13.0 per cent (or 40.9 million tonne) increase from 2018. * Since 2000, global LNG trade has grown at an average annual rate of 6.8 per cent. * Most LNG trade is made through long and medium‑term contracts (contracts with a duration of longer than four years). In 2019, long and medium‑term contracts accounted for 66 per cent (235.8 million tonnes) of global LNG trade. * The share of LNG trade made through spot and short‑term contracts is growing, accounting for 34 per cent (119.0 million tonnes) of total LNG trade in 2019, the highest share on record. | | |
| Source: International Group of LNG importers (GIIGNL) |
| LNG exports: 2019 | * Australia was the second largest LNG exporter in 2019, accounting for 21 per cent of global LNG exports. * Western Australia by itself accounted for 12 per cent of global LNG exports and 59 per cent of Australia’s LNG exports in 2019. * Qatar was the largest LNG exporter in 2019, accounting for 22 per cent of global LNG exports. Qatar has been the world’s largest LNG exporter since 2006. * The USA accounted for 10 per cent of global LNG exports in 2019. The USA’s share of global LNG exports will increase over the next few years as new projects become operational. | |
| Source: International Group of LNG Importers (GIIGNL); WA Department of Jobs, Tourism, Science and Innovation (JTSI) estimates. |
| LNG imports: 2019 | * Asia accounted for 69 per cent (246.2 million tonnes) of global LNG imports in 2019. The five largest LNG importers in 2019 – Japan, China, South Korea, India and Taiwan – are all in Asia. * Europe (24 per cent), the Americas (4 per cent) and the Middle East and Africa (2 per cent) made up the balance of global LNG imports in 2019. * Japan was the largest LNG importer in 2019 at 76.9 million tonnes. Japan’s LNG imports peaked in 2014 at 89.2 million tones. * China was the second largest LNG importer in 2019 at 61.7 million tonnes. China’s LNG imports grew by 14 per cent in 2019. |
| Source: International Group of LNG Importers (GIIGNL). |

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| **WESTERN AUSTRALIA’S COMPETITIVENESS** |

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| Western Australia’s LNG export capacity | * 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. * High gas prices in the 2000s prompted major investment in Western Australia’s LNG industry. Western Australia currently has five operating LNG export projects: the North West Shelf, Pluto, Gorgon, Wheatstone and Prelude. The State’s total LNG export capacity is 50 million tonnes a year. * Western Australia’s LNG projects are located relatively close to Asia, comparing favourably to the shipping distances from Qatar (with the exception of India). Shipping from Western Australia to Asia takes less than half the time of shipping from the US Gulf Coast to Asia. |
| Note – Additions to LNG export capacity reflect the start-up of LNG trains during a particular year.  Source: JTSI estimates based on public company announcements. |

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| Natural gas reserves and resources | * Western Australia’s current 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 per cent of their LNG exports. |
| |  |  |  | | --- | --- | --- | | Basin | Reserves  (petajoules) | Contingent resources  (petajoules) | | Carnarvon | 45,699 | 39,515 | | Browse | 16,830 | 19,943 | | Bonaparte | 734 | 18,974 | | Perth | 848 | 1,000 |   Note –.Reserves and resources are categorised by probability or likelihood of recovery. In the table above, reserves refer to 2P reserves (that are proved (90%) and probable (50%)); while contingent resources refer to 2C resources (best estimate contingent resources).  Bonaparte Basin figures refer to Australia’s share of reserves and resources.  Source: EnergyQuest EnergyQuarterly (May 2020) |
| LNG/pipeline gas prices | * Western Australia’s LNG projects have low operating costs, giving them the capacity to maintain continuity of supply as prices vary. * Most long‑term LNG contracts for supply to Asia have prices linked to the oil price, so LNG prices in Asia generally move with the oil price (with a timing lag of a few months). This differs from gas prices in the USA and Europe which respond to the regional gas market. * The average price of Japan’s LNG imports in June 2020 was US$10.1 per mmBtu, down 0.3 per cent on June 2019. * The average price of Japan’s LNG imports in 2019‑20 was US$10.1 per mmBtu, down 9 per cent on 2018‑19. |
| mmBtu = millions of British thermal units bbl = barrel  Source: World Bank |

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| **WESTERN AUSTRALIA’S SUPPLY** |
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| Western Australia’s LNG sales | * The volume of Western Australia’s LNG sales rose 1 per cent to 44.1 million tonnes in 2019. * The value of Western Australia’s LNG sales rose 2 per cent to $27.4 billion in 2019. * In 2019, LNG accounted for 16 per cent of Western Australia’s total minerals and petroleum sales ($167.3 billon). * Western Australia’s LNG projects also produce condensate and liquefied petroleum gas (LPG), mostly for export markets. * Western Australia’s LNG projects also supply the majority of Western Australia’s domestic gas. |
| ^ Other petroleum sales include condensate, crude oil, LPG and domestic natural gas.  *Source: WA Department of Mines, Industry Regulation and Safety.* |
| WA’s LNG sales by destination | * Japan was Western Australia’s first LNG customer in 1989 and remains the State’s largest customer. Western Australia accounted for 29 per cent of Japan’s LNG imports in 2019. * In 2006, Western Australia became the first jurisdiction in the world to export LNG to China via the North West Shelf’s sales contract with Guangdong Dapeng LNG. Western Australia accounted for around 20 per cent of China’s LNG imports in 2019. * Of Western Australia’s total LNG exports in 2019‑20: * Japan accounted for 48 per cent * China accounted for 29 per cent * South Korea accounted for 10 per cent * Taiwan accounted for 5 per cent * Singapore accounted for 4 per cent * India and Thailand accounted for 2 per cent each. |
| ^ Others include Malaysia, Mexico and the UAE for 2019-20; and Australia, Indonesia, Pakistan and the UAE for 2018‑19.  Source: EnergyQuest LNG Report |
| WA’s LNG production by company: 2019 | * In 2019, Chevron (34 per cent), Woodside (17 per cent) and Shell (15 per cent) accounted for the largest shares of Western Australia’s LNG production by company. * Chevron has a one sixth share of the North West Shelf project and is the operator and largest stakeholder in the Gorgon and Wheatstone projects. * Woodside has a one sixth share of the North West Shelf project and a 90 per cent share of the Pluto project and is the operator of these projects. * Shell has a one sixth share of the North West Shelf project, a 25 per cent share of the Gorgon project and is the operator and largest stakeholder of the Prelude floating LNG project. |
| ^ Includes Kufpec, CNOOC, PE Wheatstone, Tokyo Gas, Kansai Electric, Osaka Gas, Kyushu Electric, Jera, Inpex, Kogas and CPC.  Source: EnergyQuest EnergyQuarterly. |

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| WA LNG PROJECT LIST (including associated infrastructure and developments) – as at 31 July 2020 | |

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| **Project** | **Stakeholders** | **Capex** (A$b) | **Capacity**  (mtpa)\* | **Start-up** | **Other Project Information** |
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| **North West Shelf**  *Trains 1-5* | Woodside (16.67%)  BHP (16.67%) BP (16.67%)  Chevron (16.67%) MIMI (16.67%)  Shell (16.67%) | 34.0 | 16.9 | 1989 | Trains 1 and 2 began in 1989.  Train 3 began in 1992.  Train 4 began in 2004.  Train 5 began in 2008. |
| **Pluto**  *Train 1* | Woodside (90%)  Tokyo Gas (5%) Kansai Electric (5%) | 15.0 | 4.9 | 2012 | Pluto exported its first LNG cargo in May 2012.  Xena 1 field commenced production in June 2015.  Woodside plans to backfill and expand the Pluto LNG facilities with additional gas sourced from the Scarborough fields, with FID targeted for the second half of 2021. |
| **North Rankin** *Redevelopment* | see North West Shelf | 5.0 | n/a | 2013 | North Rankin Platform B recovers about 5 trillion cubic feet of gas from the North Rankin and Perseus fields. |
| **Greater Western Flank (Phase 1)**  *Development* | see North West Shelf | 2.5 | n/a | Dec 2015 | Phase 1 recovers 1.1 trillion cubic feet of gas to maintain North West Shelf output, via subsea tie-back to the existing Goodwyn A platform.  Target fields in Phase 1 include Goodwyn GH and Tidepole. |
| **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 | Mar 2016 | Gorgon exported its first LNG cargo in March 2016.  Train 2 began production in October 2016.  Train 3 began production in March 2017.  Chevron is increasing Gorgon capacity by debottlenecking existing trains. |
| **Julimar-Brunello** *Development* | Woodside (65%)  KUFPEC (35%) | 1.4 | n/a | Oct 2016 | The Julimar and Brunello fields feed 2.1 trillion cubic feet of gas to the Wheatstone LNG project.  Phase two of the project to tie-back the Julimar field to the existing Brunello subsea infrastructure was sanctioned in December 2019, with startup expected in the first half of 2022. |
| **Persephone** *Development* | see North West Shelf | 1.1 | n/a | Jul 2017 | The Persephone Development maintains Karratha Gas Plant output via subsea tie-back to the existing North Rankin complex. |
| **Wheatstone**  *Train 1 & 2* | Chevron (64.14%)  KUFPEC (13.4%)  Woodside (13%)  PE Wheatstone (8%)  Kyushu Electric (1.46%) | 40.0^ | 8.9 | Oct 2017 | Train 1 commenced LNG production in October 2017.  Train 2 commenced LNG production in June 2018.  Chevron is increasing Wheatstone capacity by debottlenecking existing trains. |
| **Ichthys**  Train 1 & 2 | Inpex (66.245%)  Total (26%)  CPC (2.625%)  Tokyo Gas (1.575%)  Osaka Gas (1.2%)  Kansai Electric (1.2%)  JERA (0.735%)  Toho Gas (0.42%) | 27.2^ | n/a | Oct 2018 | The Ichthys gas field is located in the Browse Basin, offshore Western Australia.  The project has two LNG trains at Darwin with a total capacity of 8.9 mtpa.  All LNG production from Ichthys is attributed to the Northern Territory, although condensate is exported from a floating production, storage and offloading facility located offshore Western Australia.  Western Australia’s share of the project’s total capital expenditure is around 50 per cent. |
| **Greater Western Flank (Phase 2)**  *Development* | see North West Shelf | 2.8 | n/a | Oct 2018 | Phase 2 recovers 1.6 trillion cubic feet of gas to maintain North West Shelf output, via subsea tie-back to the Goodwyn A platform. Target fields in Phase 2 include Dockrell, Kreast, Lady Nora, Pemberton and Sculptor‑Rankin. |
| **Prelude**  *FLNG vessel* | Shell (67.5%)  Inpex (17.5%)  KOGAS (10%)  CPC (5%) | 19.6^ | 3.6 | Jun 2019 | The floating LNG vessel exported its first LNG cargo in June 2019.  In addition to LNG, Prelude will produce 1.3 mtpa of condensate and 0.4 mtpa of LPG. The vessel will operate at the Prelude gas field for 25 years. |
| **Gorgon Stage 2** | see Gorgon | 5.1 | n/a | 2022 | In April 2018, Chevron announced investment in the second stage of the Gorgon project, which will help maintain gas supply to the project for the next 30 years. Drilling started in May 2019. |
| Capex = capital expenditure; mtpa = million tonnes per annum (export capacity addition); FEED = front-end engineering and design: FID = final investment decision; FLNG = Floating LNG; n/a = not applicable.  Notes: \* Capacity refers to the production capacity of LNG facilities in Western Australia.  ^ JTSI estimate of capital expenditure in Australian dollar terms, taking into account the profile of capital expenditure and movements in the exchange rate across the construction period. For Ichthys, the estimate is the capital expenditure in Western Australia.  *Sources: Deloitte Access Economics ‘Investment Monitor’, EnergyQuest ‘ Energy Quarterly’, project proponent websites, reports, presentations and media.* | | | | | |