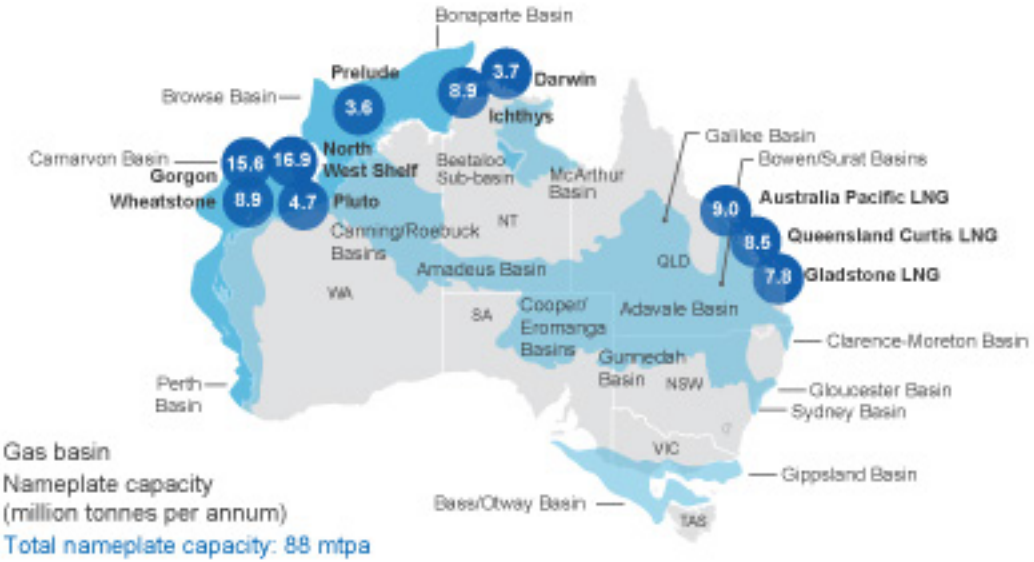
Gas

Australia's LNG projects and gas basins



Gas facts

- LNG is produced by **cooling natural gas to -161°C**
- **LNG shrinks** to 1/600th the volume of natural gas
- **LNG accounted for 12%** of global gas demand in 2020
- **Over 70%** of global LNG demand came from Asia in 2021

Global gas use by sector

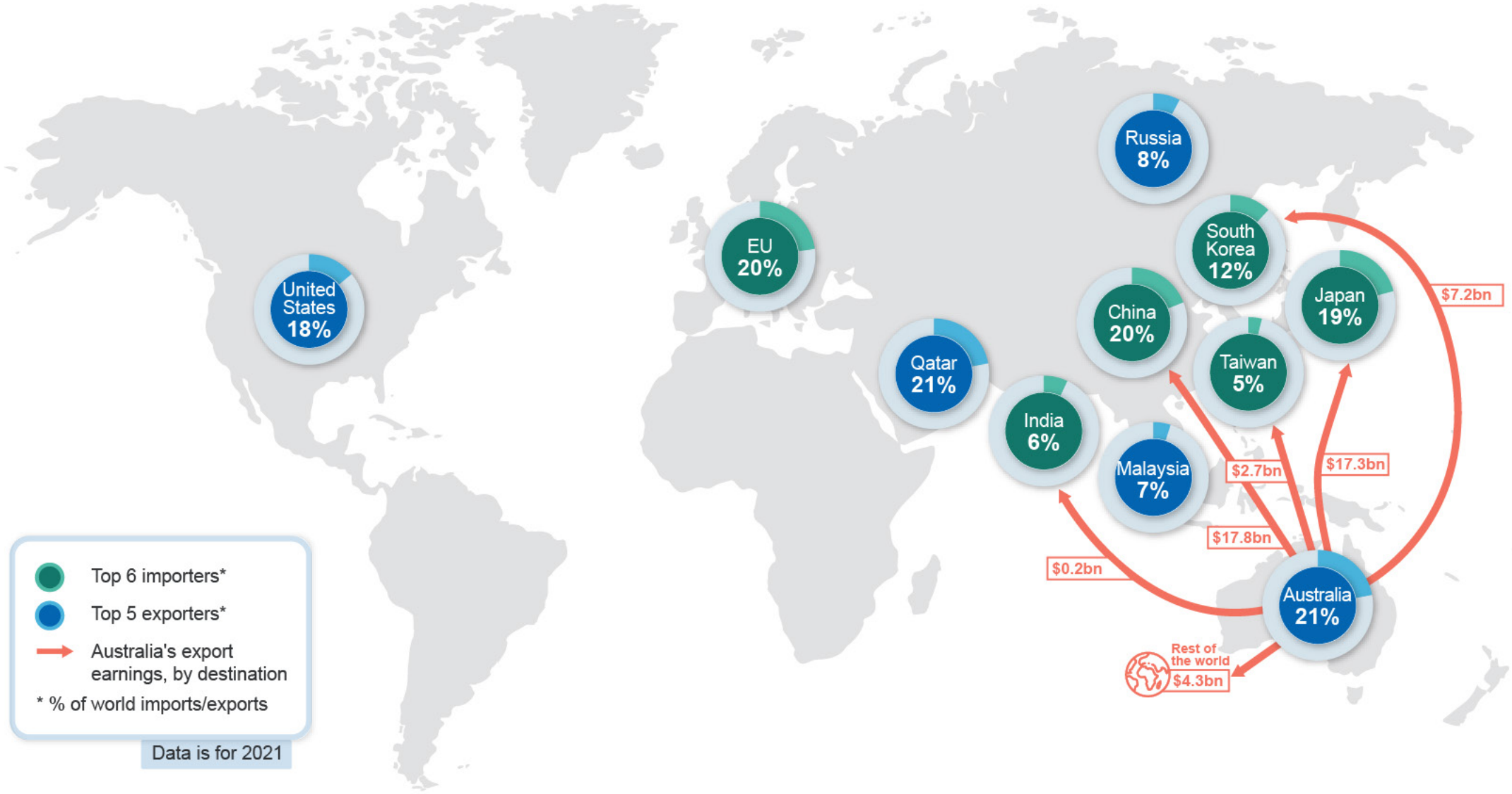
- **20%** Industry
- **19%** Transport
- **22%** Residential
- **40%** Electricity

Australia's LNG

- **81m tonnes exported** in 2021, valued at **$50bn**
- Total **LNG nameplate capacity** is **88m tonnes** per annum
- Around **3/4** sold on **long-term contracts**

LNG

Trade map | March 2022



7.1 Summary

- Asian LNG spot prices and oil-linked contract prices are expected to remain high throughout 2022 and 2023, before declining back to more typical levels in the latter half of the outlook.
- Australian export volumes are forecast to increase to 82 million tonnes in 2021–22, as technical issues offset higher capacity utilisation at other plants. Volumes should then fluctuate between 79 and 81 million tonnes over the outlook.
- Australia's LNG exports earnings are forecast to rise from $30 billion in 2020–21 to $70 billion in 2021–22, and $82 billion in 2022–23 as oil-price linked contract prices surge. Export earnings are forecast return to around $52 billion by the end of the outlook period.
- Analysis in this chapter is based on a base case scenario of the impacts of Russia's invasion of Ukraine. For more information, please see Box 8.1 for a scenario-based analysis.

7.2 World trade

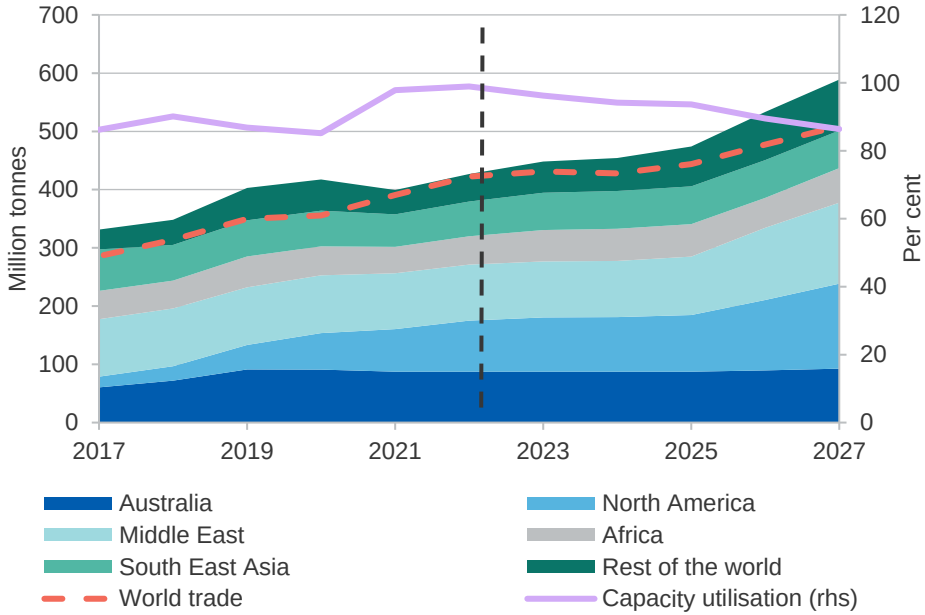
LNG market expected to be tight through to 2025

Global LNG trade reached 391 million tonnes in 2021, an increase of 9.8%, as the global economy showed a strong recovery from the COVID-19 pandemic. A number of extreme weather events raised demand, as the Northern Hemisphere built inventories after a bitter winter, followed by a hot Asian summer and sustained droughts in South America (that affected hydro generation). Asia remained the key driver of import growth, with growth of 9% in 2021, largely driven by Chinese demand. While elevated spot prices weighed on consumption in some emerging Asian economies, overall Asian demand remained high.

Export growth was dominated by North America, which accounted for over 60% of all supply growth in 2021. There has been mixed export performance from other regions; exports from the Asia-Pacific have largely been flat, and the Middle East has seen only moderate growth.

Global LNG trade is expected to increase in 2022, growing by about 4.3% a year. The slower growth rate is due to moderating demand from Asia

Figure 7.1: LNG demand and world supply capacity



Source: Nexant (2022) World Gas Model; Department of Industry, Science, Energy and Resources (2022)

and the reversal of demand from South America as hydro generation resumes. Between 2023 and 2027, trade is assumed to expand at a slower rate, as the post COVID-19 economic rebound effect fades, with growth projected at an average annual rate of 4.6%.

Overall, the market is expected to be tight through to 2025, as demand growth is evenly matched by supply growth, sans any extreme weather events (Figure 7.1). From 2026, a number of sizeable projects are expected to come online in both the US and Qatar, which is expected to result in the market being over-supplied.

World imports

China the world's largest LNG importer in 2021

China imported 80 million tonnes of LNG in 2021, an increase of 20% from 2020, making it the world's largest importer, a title it is expected to hold throughout the forecast period as strong growth in demand continues. China was the largest buyer of spot and short-term LNG in 2021.

China's LNG imports were higher in the December quarter 2021, up 4.6% year-on-year, as consumption recovered from a marked slowdown in the September quarter, when high gas prices led to demand destruction in some sectors. Coal shortages and a cold start to winter boosted consumption in the December quarter.

In 2021, Australia accounted for the largest share of China's LNG imports, at around 39%, down slightly on 2020 in percentage terms, but up in terms of absolute volumes (Figure 7.2). Throughout 2021, China has sought to diversify its LNG sources, signing new supply contracts with the US and Qatar, and seeking other suppliers on the spot market.

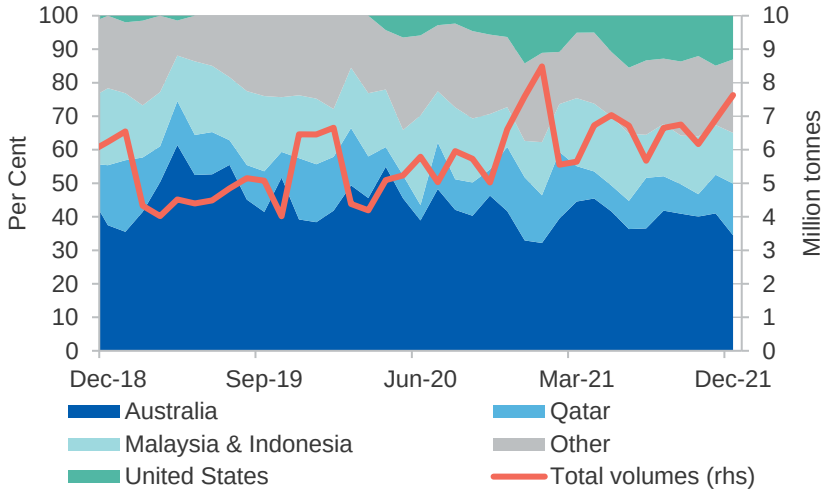
Gas demand growth is expected to moderate in 2022, as extreme weather events normalise and economic growth slows. In addition, there is expected to be a ramp-up of pipeline gas imports as the Power of Siberia pipeline between Russia and China takes increased volumes. China is expected to import 86 million tonnes of LNG in 2022, a slower rate of growth but still the largest import increase globally.

China's demand for gas is expected to increase by around 41% in total over the outlook period — driven by the industrial and residential sectors and ongoing coal-to-gas switching. The Chinese Government's 14th Five Year Plan indicates that gas will play an important role in the energy transition to meet its 'carbon-neutral by 2060' pledge. Whilst growth is expected across all supply sources — domestic production, pipeline imports and LNG imports — it is likely that the pace of growth of domestic production and pipeline imports will outstrip LNG. LNG demand growth is expected to average 5% between 2022 and 2027.

Japanese LNG demand to slow in pursuit of net-zero

Japan imported 73.9 million tonnes of LNG in 2021 — marginally lower year-on-year. LNG demand in Japan generally remains on a downward trend, with Japan losing its position as the top global LNG importer to China during 2021 (Figure 7.3).

Figure 7.2: China's gas supply by source



Source: Bloomberg (2022); National Bureau of Statistics of China (2022) General Administration of Customs

Following the announcement of a net zero by 2050 target in October 2020, the Japanese Government approved the 6th Strategic Energy Plan in October 2021, which details provisional power generation mix targets for 2030. The draft plan incorporates a pivot towards nuclear and renewables generation, with the share of gas proposed to decline from 37% to 20%.

Japan's LNG imports are forecast to decline further to 72 million tonnes in 2022, as the country moves toward the implementation of its energy plan. LNG imports are expected to fall to 70 million tonnes by 2027.

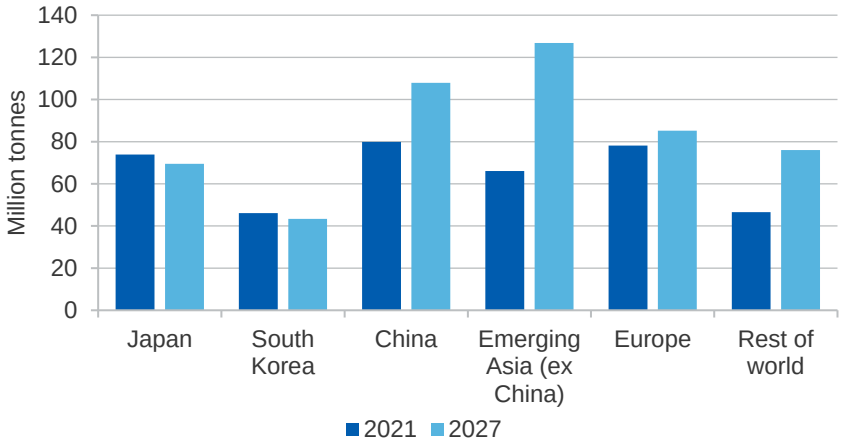
South Korea's LNG demand to increase late in outlook period

South Korea's LNG usage recovered to record levels in 2021, at 46 million tonnes, up 13% year-on-year. Growth has been driven by the ongoing economic recovery and the continued trend of coal-to-gas switching.

Growth in LNG imports is expected to be relatively modest, or even negative, in 2022 and 2023. This follows new nuclear and coal capacity putting downward pressure on LNG usage in the power sector, and more moderate weather is expected, lowering demand from the highs of 2021.

Following the announcement of a 'net zero by 2050' target in late 2020, the South Korean Government has released a number of detailed strategies — including the 14th Natural Gas Plan — which outline the country's move to net-zero through an increase in renewables and a move away from both nuclear and coal-fired power generation and highlighting gas as a transition fuel. These policies are expected to directly support LNG imports through to 2034, with LNG imports expected to show strong growth from 2024 through to the end of the outlook period.

Figure 7.3: World LNG import forecasts



Notes: Emerging Asia includes India.
Source: Nexant (2022) World Gas Model; Department of Industry, Science, Energy and Resources (2022)

Taiwan's LNG demand dependent on new import terminals

Taiwan imported 19.6 million tonnes of LNG in 2021. Gas-fired power generation is expected to continue to grow through the outlook period, as the government pursues a policy which would see all nuclear power phased out by 2025. Gas is expected to make up 50% of the electricity mix by 2025, up from 35% in 2020, although this is highly dependent on infrastructure constraints.

Taiwanese LNG imports are forecasto to be fairly stable at 18million tonnes a year until 2024. Taiwan's existing LNG import terminals are both operating at full capacity. The government has announced three new import terminals are now in the project pipeline, which are expected to come online between 2024 and 2026. Taiwan is expected to import around 22 million tonnes by 2027.

Indian LNG demand remains volatile and price sensitive

India's LNG imports were 8.6% lower in 2021 than 2020, with demand noticeably impacted by the high spot prices later in the year. Indian LNG buyers are highly price sensitive, and cut LNG imports as spot prices reached record highs. There was evidence of switching from gas to liquid fuels as prices rose, in both the refining sector and in power generation.

Looking forward, India's LNG demand growth depends on a number of factors. In the near term, domestic gas output will continue to surge, which provides a significantly cheaper source than current LNG prices. Demand for LNG is expected to rise strongly in 2022, after a weak 2021. Demand is likely to continue to grow out to 2027, averaging 6% annual growth. High prices for LNG remain the key downside risk to India's LNG demand growth, and any escalation in prices may result in demand destruction.

European imports down as cargoes diverted to Asia

European LNG imports were down 4% year-on-year, to 78 million tonnes, in 2021, despite the backdrop of an energy crisis that saw coal fired generation increase 11% on the previous year. A number of factors contributed to Europe's energy crisis in 2021, on both the supply and demand sides. Energy demand has surged, as the economy recovers from

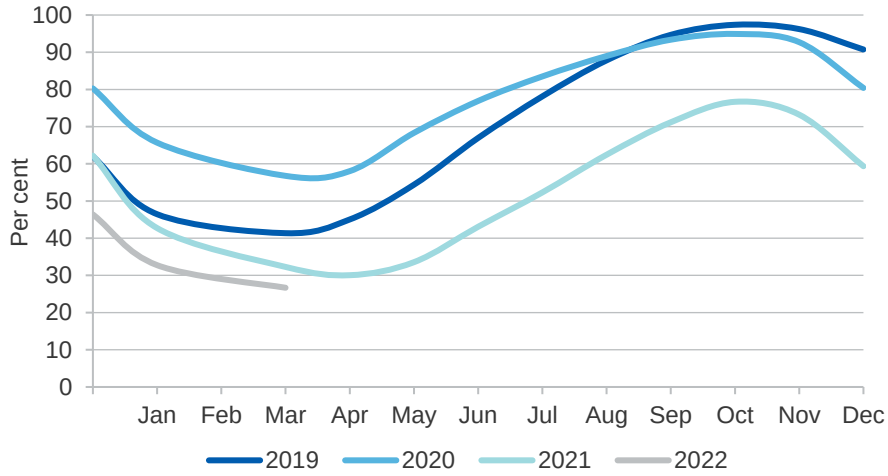
the COVID-19 pandemic amidst a relaxing of restrictions. Extreme weather events — including a colder-than-average winter in 2020–21 — have further added to demand. On the supply side, lower than expected renewable generation has coincided with supply disruptions, including lower Russian pipeline gas flows and low domestic production in Europe. As a result, European gas prices have soared, with average TTF prices increasing over 400% year-on-year.

For the first three quarters of 2021, there was a significant decline in LNG imports, down 17% year-on-year, even as demand soared. As Asian economies, especially Japan, Korea and China, endeavoured to replenish gas stockpiles over 2021, there was increased competition for spot LNG cargoes, and Europe was routinely priced out. However, in the December quarter 2021, Europe's LNG imports rose by 40% year-on-year, as a mild winter and well-stocked inventories slowed demand in Asia and allowed more cargoes to divert to Europe. The US was the largest supplier into Europe over 2021, and accounted for 40% of the increase in supplies in the December quarter, followed by Qatar and Egypt. Import terminals have been operating near capacity in the first 2 months of the March quarter.

LNG demand is likely to remain elevated in 2022, despite declining gas consumption overall. Regardless of the extent of the conflict between Russia and the Ukraine, Europe will need to restock their heavily depleted storage. At the time of writing, European storage was only 26% full, 38 percentage points below the 5 year average (Figure 7.4). There will also be increasing pressure to diversify gas supplies, as they seek firmer guarantees of energy security amidst declining domestic production. Historically, Europe has been heavily reliant on Russia for supplies of gas, with Russia supplying 32% of its gas imports in 2021. However, with the Nord Stream 2 pipeline unlikely to progress in the current environment due to the German government halting the certification process, there will be further pressure to shore up supplies from other sources.

Against this backdrop, LNG imports into Europe are expected to remain higher than 2020 levels until at least 2023, when they are likely to start declining in line with overall gas demand. Towards the end of the outlook, LNG imports are likely to increase as domestic production declines.

Figure 7.4: European gas storage levels



Source: Bloomberg (2022)

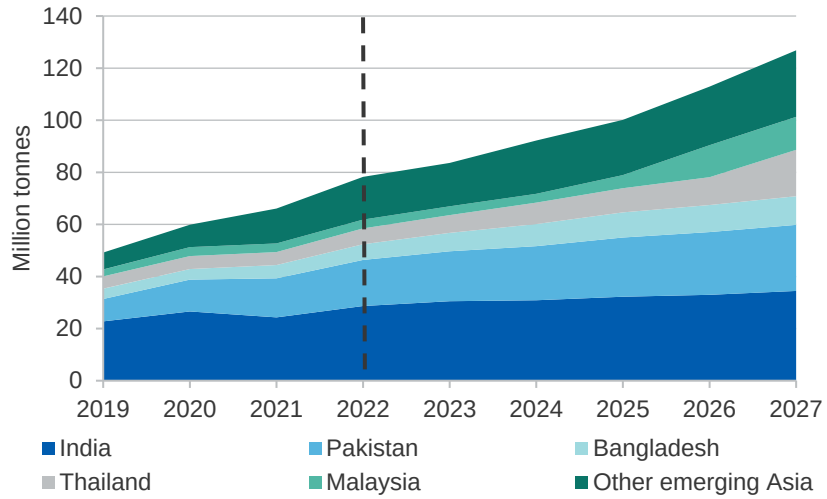
Emerging Asia to significantly increase LNG imports

Other South and South-East Asian economies were a major source of demand growth in 2021. Unlike India, both Bangladesh and Pakistan's LNG imports have been resilient to high prices and COVID-19 disruptions this year. Pakistan's LNG imports are estimated to have grown by 14% in 2021, compensating for domestic gas decline and growing industrial demand in the wake of the recovery from the COVID-19 pandemic. Bangladesh's LNG imports are estimated to have grown by 22% in 2021, led by the industrial and energy sectors. In the short term, re-gasification capacity is hindering further growth, however, both nations have set plans to add further capacity.

Over the outlook period, imports by emerging Asian economies are expected to increase, due to declining domestic gas production, the expansion of gas-fired power generation and new LNG infrastructure developments. Individually, these nations are relatively small importers of LNG, but collectively are expected to account for a noticeably larger share

of global LNG demand. The region (including India) is forecast to import 78 million tonnes of LNG in 2022; 18% higher than 2021 (Figure 7.5).

Figure 7.5: Emerging Asia LNG imports



Source: Nexant (2022) World Gas Model; Department of Industry, Science, Energy and Resources (2022)

7.3 World exports

Outlook for investment in new supply looks promising

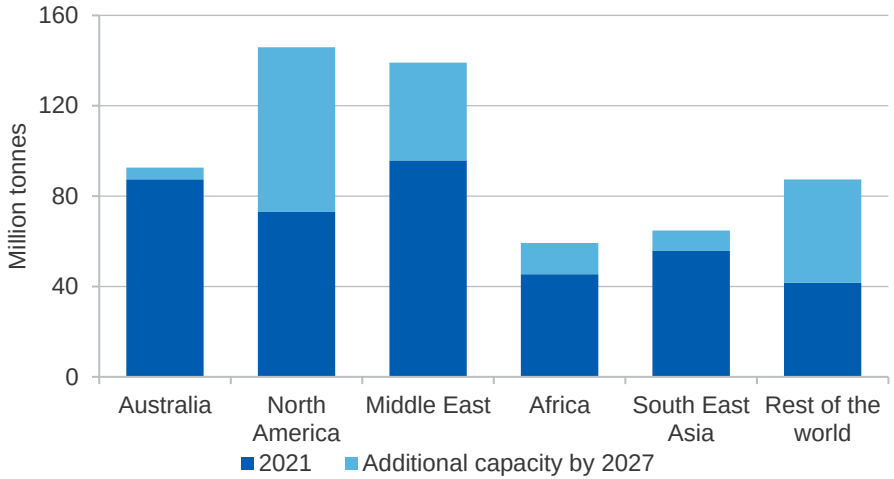
After minimal investment in 2020, 2021 saw some improvement in the investment outlook for LNG, with 51 mtpa (million tonnes per annum) of new capacity sanctioned. A FID was made on Qatar Petroleum's 33 mtpa North Field East project, worth US$29 billion and potentially the world's largest LNG project by capacity. Woodside made a FID on the $16.5 billion Scarborough and Pluto Train 2 project in late November.

There is a significant pipeline of projects expected to make FID in 2022, including Qatar's North Field South project and Plaquemines and Corpus Christi Stage 3 in the US. Up to 55 million tonnes of capacity could be sanctioned in 2022.

At the end of 2021, nominal global LNG capacity was at 457 mtpa.

Nominal global LNG capacity could be as high 618 mtpa by 2027, however, this is highly dependent on a conducive investment environment (Figure 7.6). A majority of capacity will come online after 2025.

Figure 7.6: Global LNG supply capacity forecasts



Source: Nexant (2022) World Gas Model; Department of Industry, Science, Energy and Resources (2022)

US expected to be the largest LNG exporter

The US drove the increase in global LNG supply in 2021, contributing over 60% of the global increase. US LNG exports increased 49% year-on-year to 75 Mt in 2021, on the back of already sizeable growth in 2020. The rapid increase in exports has been encouraged by the large price differences between the domestic Henry Hub prices and the spot prices in European and Asian markets. However, the increasing export volumes have put upward pressure on Henry Hub prices in the latter half of 2021.

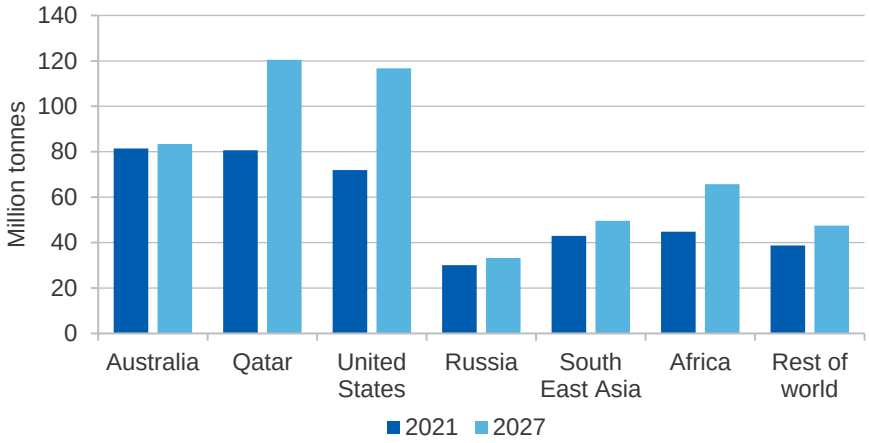
US supplied 59% to the spot market in 2021, making it the largest supplier of spot cargoes. The US benefits from its location on the Atlantic basin and being able to be a flexible provider into both Asian and European markets.

The US is expected to be the world's largest LNG exporter in 2022, a position it is expected to hold throughout the outlook period. In the last

month of 2021, the US was the largest exporter. The EIA has nominal US LNG export capacity at 73 mtpa in November 2021, and is expecting that to grow to 87 mtpa by the end of 2022. Sabine Pass Train 6 produced its first cargo of LNG in December 2021 and Calcasieu Pass is also ramping up in early 2022.

Beyond 2022, the US has a significant pipeline of LNG projects coming online, including the 24 mtpa which is currently under construction, and a number of projects in Pre-FID stage. US exports are forecast to reach 80 Mt in 2022, and grow 65% through to 2027.

Figure 7.7: Outlook for global LNG exports



Source: Nexant (2022) World Gas Model; Department of Industry, Science, Energy and Resources (2022)

Qatar exporting at maximum capacity until North Field East comes online

Qatar exported above nameplate capacity in 2021, exporting around 81 Mt of LNG, stable on 2020 volumes. Amidst the energy crisis and strong global demand for LNG, the Qatari Government has stated that the nation is operating at maximum capacity and is unable to raise exports to boost global supply.

Significant investments have been made to expand Qatar's LNG capacity over the forecast period, most notably the $US29 billion North Field East project — scheduled for completion in late 2025. This project could lift Qatar's export capacity from 79 million tonnes to about 110 million tonnes.

The North Field South project – the second phase of the North Field development – is expected to reach FID in the first half of 2022, with first production targeted for 2027. If this project goes ahead, Qatar's nameplate capacity would be 126 mtpa by the end of the forecast period.

Qatar's annual LNG exports are forecast to be relatively steady at about 80 million tonnes between 2022 and 2025. Output then rises as North Field East ramps up and hits full capacity some time in 2027 (Figure 7.7).

7.4 Prices

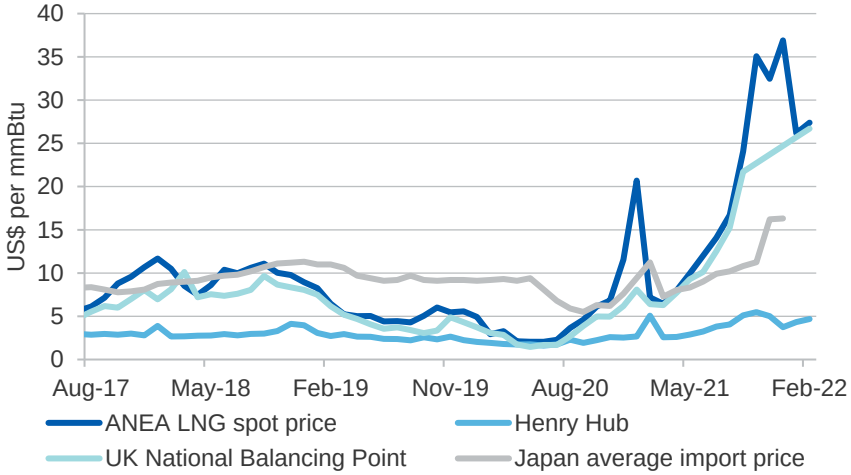
LNG spot prices have continued to show extreme volatility

Asian LNG spot prices were highly volatile throughout 2021 (Figure 7.8). Low inventories left the market vulnerable to supply problems and stronger than expected demand. After averaging US$9.95 a mmBtu in May, the price rose steadily to average US$36.9 a mmBtu in December. On 22 December, prices spiked to reach US$44.98 a mmBtu, the highest price on record, as the Northern Hemisphere winter deepened.

The steady increase in North East Asian spot prices in 2020 was driven by a number of factors, including the 'energy crisis' that has been occurring throughout Europe and parts of Asia, and a rebound in economic activity from the COVID-19 pandemic. A colder-than-average Northern Hemisphere winter of 2020–21 left both Asia and Europe with heavily depleted gas storage levels, leading to increased competition in the spot market as both major importing regions sought to complement contracted cargoes. Against this backdrop, in Europe lower renewable generation, lower levels of domestic gas supply and interruptions to Russian pipeline supply have all pushed TTF and NBP prices to extremely high levels. The Asian LNG spot price has tracked closely to the TTF price over this period, as arbitrage plays kicked in. Against this backdrop, there were also significant supply disruptions to the global LNG market, which peaked in May-June 2021.

North-East Asian spot prices are expected to average US$31.0 a mmBtu in the March quarter 2021. Prices initially came down off the highs of late 2021 as the Northern Hemisphere experienced a more moderate winter and supply steadily increased, before rebounding on the escalation of the Russia-Ukraine conflict. Prices reached US$54.4 a mmBtu on 8 March – the highest price on record. Prices are expected to remain elevated significantly above the long-run averages through to 2025, with tight supply as Europe diversifies and demand continues to grow in Asia. As significant volumes of supply come online in 2025, prices are expected to ease, settling back to about US$14 a mmBtu for 2026 and 2027, picking up each year in line with Northern Hemisphere winter (Figure 7.9).

Figure 7.8: Global gas and LNG prices, monthly



Notes: ANEA is the Argus Northeast Asia spot price. LNG prices are DES (Delivered Ex Ship), which include shipping and insurance.

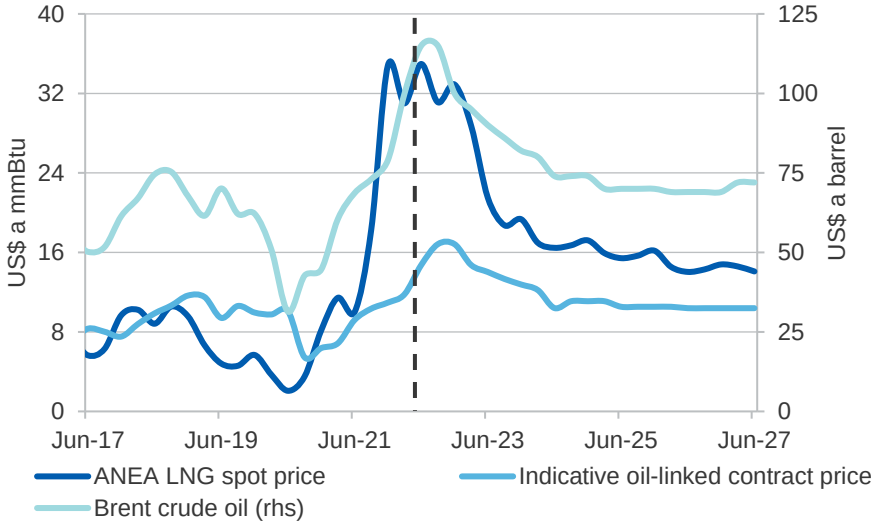
Source: Argus (2022); Bloomberg (2022)

Oil-linked prices forecast to remain high for some time

Almost 70% of the LNG traded in Asia is sold via long-term contracts which link the price of LNG to the price of oil (commonly the Japanese customs-cleared crude price), typically with a lag of around three to six months — depending on contractual arrangements.

Oil prices were elevated in late 2021, averaging US$80 a barrel in the December quarter. Given the lag of 3-6 months, these prices will flow through to contracts in the second half of 2021–22, raising export values.

Figure 7.9: ANEA LNG spot and contract prices, quarterly



Notes: ANEA is the Argus Northeast Asia spot price. LNG prices are DES (Delivered Ex Ship), which include shipping and insurance. The long-term oil-linked contract price is indicative, and is estimated at 14% of the 3-month lagged JCC oil price plus shipping.

Source: Argus (2022); Bloomberg (2022); Department of Industry, Science, Energy and Resources (2022)

Contract prices are anticipated to have increased further in the March quarter 2022, reflecting ongoing oil price gains. In the first three months of 2022, oil prices were sitting consistently above US$80 a barrel, and sitting above US$100 a barrel for significant periods in March. In the March quarter 2022, oil prices are expected to average about US$100 a barrel and average US$108 a barrel over 2022 (see *Oil chapter*).

Over the outlook period, oil-linked contract LNG prices are expected to peak in 2023, before falling as oil prices settle. Oil prices are forecast to settle at around US$74 a barrel from 2024, and remain there for the remainder of the outlook period.

7.5 Australia

Australia's LNG export volumes at record highs

Australia's LNG export volumes reached a record high in 2021, at 81.2 million tonnes, up 4.1% on 2020. This is an average capacity utilisation of 93%. The strong result comes off the back of the resolution of technical issues from 2020 at Gorgon and Prelude, as well as suppliers responding to higher prices.

In the December quarter 2021, Australia's LNG exports were the highest quarterly result on record, totalling 21.5 million tonnes, up 1% quarter-on-quarter and 4.7% year-on-year, a significant result given volumes were once again impacted by unplanned maintenance at both Gorgon and Prelude. Overall, capacity utilisation in the December quarter was 99%, with 6 plants operating above 105% of nameplate capacity.

Following a strong September quarter, Gorgon faced some unplanned maintenance in the December and March quarters, with a gas leak shutting down Train 1 in mid-November, and subsequent investigations taking Trains 2 and 3 offline. Production in the December quarter was still up 1.3% quarter-on-quarter, and up 46% year-on-year.

At the time of writing, Prelude is undergoing a complete shut-down while investigations and repairs are conducted, following an electrical fire in early December that resulted in the vessel being evacuated. Production is expected to resume in late March. Production in the December quarter was down 55% on the September quarter 2021.

Australia's export earnings recovering off the back of strong oil prices

In the December quarter 2021, Australia's LNG export earnings increased to $18.4 billion, up 30% quarter-on-quarter and 150% year-on-year (compared to the December quarter 2020). Export earnings were supported by both high LNG spot prices, averaging US$34.8 a mmBtu in the December quarter (See *Prices* section) and recovering oil prices.

Around 80% of Australian LNG is sold via long-term contracts that link the price of LNG to the price of oil with a lag of around three to six months, depending on contractual arrangements. LNG contract prices in the December quarter reflect Brent oil prices from the June (US$69 a barrel) and September (US$80 a barrel) quarters, which are considerably higher than corresponding quarters in 2020.

LNG export volumes to peak in 2021-22, until new capacity comes online

Export volumes are expected to recover in 2021–22 to exceed pre-COVID-19 levels, off the back of strong performance in the first half of the financial year and on-going incentives from high prices. However, several of Australia's LNG facilities are facing field decline – most notably Darwin and the North-West Shelf, which will result in declining export volumes in the outlook period.

The Bayu-Undan field, which supplies Darwin LNG, is in decline. Santos announced a FID for an infill drilling program in early 2021. Production commenced in late July 2021, with initial outcomes better than expected. This program will likely extend output at the Darwin LNG facility until 2023. Santos announced a FID for Barossa, which will backfill Darwin, on 30 March 2021, and is expecting initial gas production in the first half of 2025. There is likely to be a 12 or more month lag between the depletion of Bayu-Undan and first gas from Barossa.

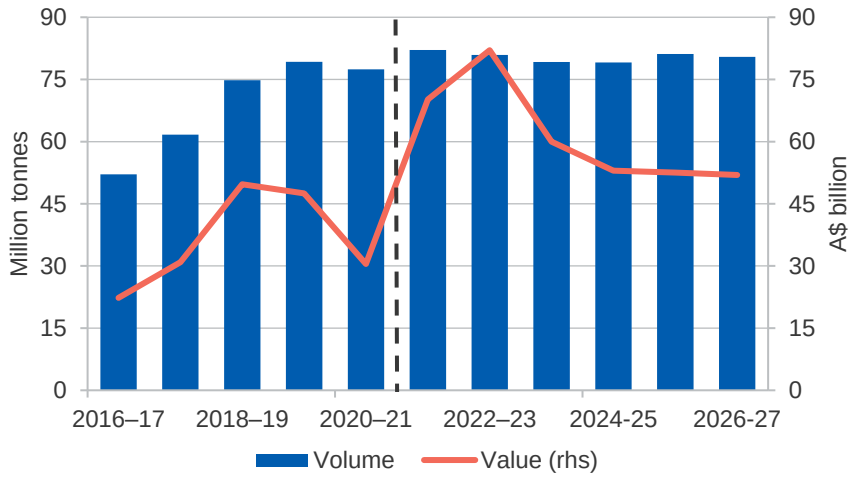
According to Woodside, capacity utilisation at the North West Shelf (NWS) is expected to decline in 2022, as reserves at existing fields are depleted. NWS has secured short-term infill from Pluto (for the period 2022–2025) and Waitsia (for the period 2023–2028), which both have shorter lead times.

Beach Energy will also process 3.45 million tonnes of LNG through the NWS facility over a 5 year period, commencing in 2023. However, large scale backfill projects are required for the longer term. Browse is earmarked as backfill to the NWS, but FID for this project has been deferred until at least 2023, citing weak market conditions.

Woodside announced a FID on the Scarborough and Pluto Train 2 project on 22 November 2021.The Scarborough to Pluto LNG expansion — where a second gas processing train would be constructed, adding capacity of 5 mtpa — is the only substantial expansion to Australia's LNG capacity in

the investment pipeline. At $16.5 billion, this is the largest investment in Australia's upstream LNG capacity in over a decade. First gas is expected by 2026, with LNG export capacity ramping up quickly over 2026–27.

Figure 7.10: Australia's LNG exports



Source: ABS (2022) International Trade in Goods and Services, 5368.0; Department of Industry, Science, Energy and Resources (2022)

After a strong first half, LNG exports are forecast to rebound to around 82.1 million tonnes in 2021–22. Export volumes are expected to slowly decline to just under 80 million tonnes in 2025, as backfill projects fail to meet the short fall. Export volumes will boost in 2026, as the Scarborough/Pluto project comes online.

Higher prices expected to lift Australia's LNG export earnings

Australia's LNG export earnings fell sharply in 2020–21, down to $30 billion from $48 billion in 2019–20 (Figure 7.10). The majority of this decline was due to weak contract prices, particularly in the September and December quarters of 2020. In 2021, export earnings showed strong signs of recovery, up 37% to $49.7 billion.

LNG export earnings are forecast to increase to $70 billion in 2021–22 and $82 billion in 2022-23. Oil-linked contract prices are expected to be higher than pre-COVID-19 levels, and earnings will also be boosted by high Asian LNG spot prices. Over the remainder of the outlook period, export values are expected to decline to $52 billion, as oil and gas prices return to longer term averages.

Revisions to the outlook

Australia's nominal LNG export earnings have been revised up by $7.3 billion in 2021–22, and by $26.8 billion in 2022–23, from the December 2021 report, reflecting higher assumed LNG spot prices and oil-linked contract prices.

Australia's nominal LNG export earnings for 2025-26 have been revised up by $2.7 billion from the March 2021 REQ, due to higher spot and oil linked contract prices.

Table 7.1: Gas outlook

World	Unit	2021	2022[f]	2023[f]	2024[f]	2025[z]	2026[z]	2027[z]	CAGR[r]
JCC oil price[a]									
– nominal	US$/bbl	68.7	107.5	88.3	74.0	70.0	69.0	72.0	0.8
– real[h]	US$/bbl	71.1	107.5	86.0	70.3	64.8	62.5	63.7	-1.8
Asian LNG spot price [g]									
– nominal	US$/MMbtu	18.3	32.5	22.1	16.8	15.8	14.4	14.0	-4.3
– real[h]	US$/MMbtu	18.9	32.5	21.5	16.0	14.6	13.0	12.4	-6.8
Gas production[s]	Bcm	4,122	4,220	4,282	4,362	4,451	4,531	4,612	1.9
Gas consumption[s]	Bcm	4,159	4,221	4,282	4,363	4,456	4,540	4,610	1.7
LNG trade[ds]	Mt	390.7	407.7	413.0	417.1	436.7	477.1	511.7	4.6
Australia	**Unit**	**2020–21**	**2021–22[f]**	**2022–23[f]**	**2023–24[f]**	**2024–25[z]**	**2025–26[z]**	**2026–27[z]**	**CAGR[r]**
Production[b]	Bcm	150	157	157	157	159	160	157	0.7
– Eastern market	Bcm	57	55	54	54	54	57	61	1.1
– Western market	Bcm	81	86	90	88	90	84	76	-1.0
– Northern market[c]	Bcm	14	16	14	15	15	19	20	6.4
LNG export volume[d]	Mt	77	82	81	79	79	81	80	0.6
– nominal value	A$m	30,477	70,155	82,045	59,968	52,993	52,528	51,942	9.3
– real value[e]	A$m	31,507	70,155	79,561	56,643	48,815	47,206	45,541	6.3
LNG export unit value[g]									
– nominal value	A$/GJ	7.5	16.2	19.2	14.3	12.7	12.3	12.2	8.6
– real value[e]	A$/GJ	7.7	16.2	18.6	13.5	11.7	11.0	10.7	5.7
– nominal value	US$/MMBtu	5.9	12.4	15.3	11.6	10.2	9.8	9.7	8.7
– real value[e]	US$/MMBtu	6.1	12.4	14.8	10.9	9.4	8.8	8.5	5.7

Notes: **a** JCC stands for Japan Customs-cleared Crude; **b** Production includes both sales gas and gas used in the production process (i.e. plant use) and ethane. Historical gas production data was revised in the June quarter 2017 to align with Australian Petroleum Statistics; **c** Gas production from Bayu-Undan Joint Production Development Area is not included in Australian production. Browse basin production associated with the Ichthys project is classified as Northern market; **d** 1 million tonnes of LNG is equivalent to approximately 1.36 billion cubic metres of gas; **e** In 2021–22 Australian dollars; **f** Forecast; **g** 1 MMBtu is equivalent to 1.055 GJ; **h** In 2022 US dollars**; r** Average annual growth between 2021 and 2027 or 2020–21 and 2026–27; **z** Projection.
Source: ABS (2022) International Trade in Goods and Services, 5368.0; Department of Industry, Science, Energy and Resources (2022); Company reports; Nexant (2022) World Gas Model.