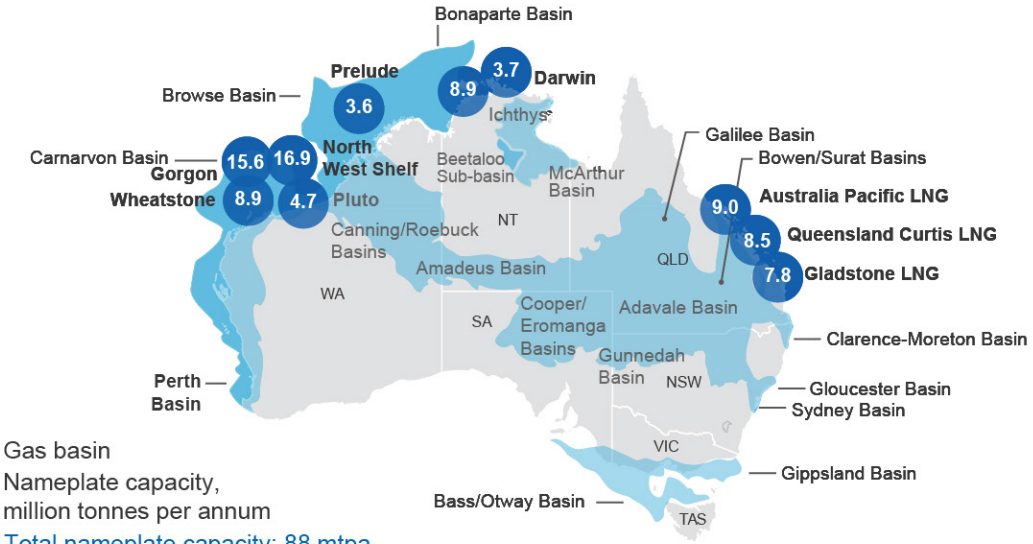
Gas

Australia's LNG projects and gas basins



Gas basin
Nameplate capacity, million tonnes per annum
Total nameplate capacity: 88 mtpa

Gas facts

- LNG is produced by **cooling natural gas to -161°C**
- **LNG shrinks** to 1/600th the volume of natural gas
- Natural gas accounted for **23%** of the 2020 global electricity generation mix
- **Over 73%** of global LNG demand came from Asia in 2021

Global gas use by sector

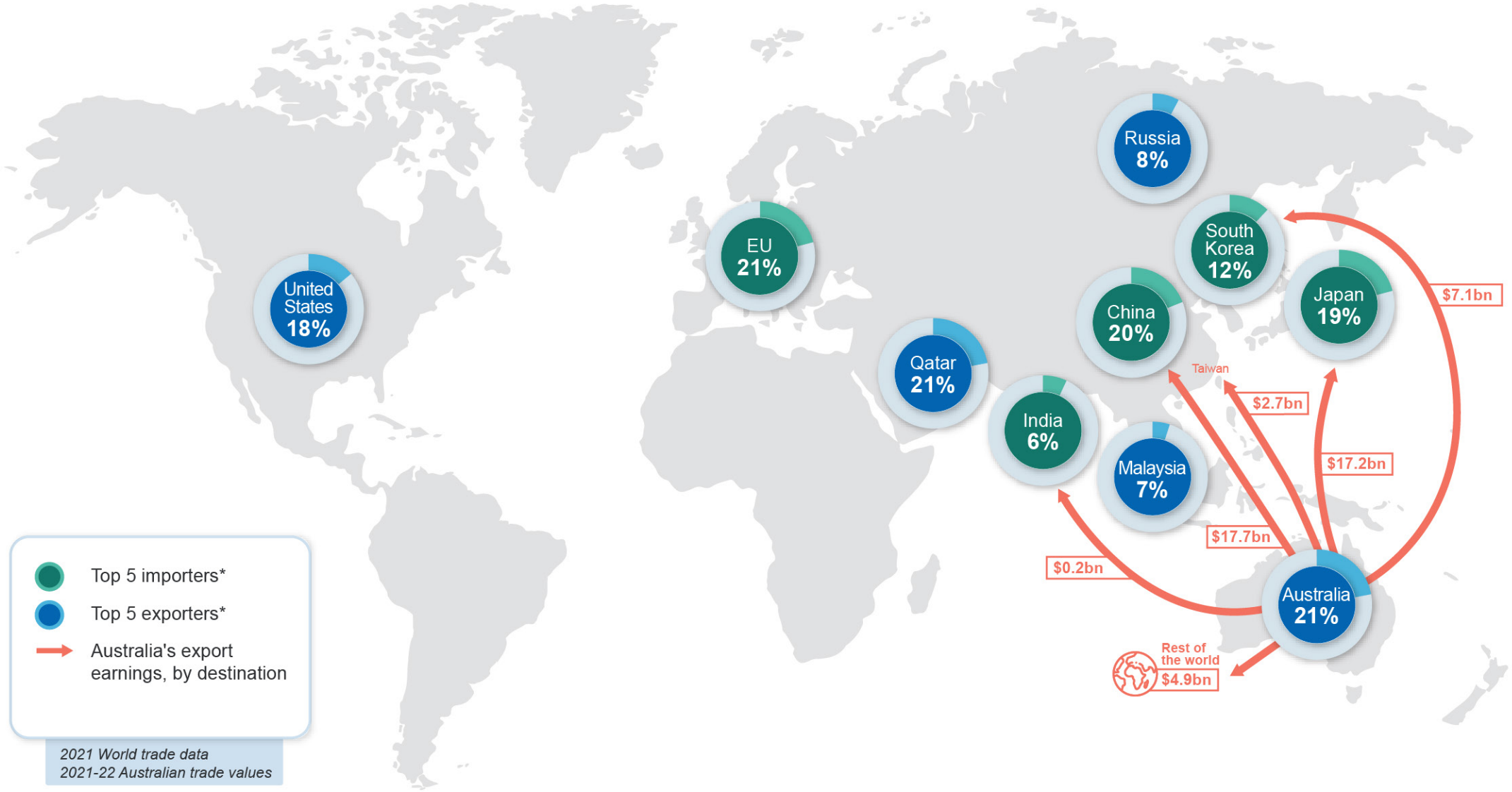
- **40%** Electricity
- **22%** Residential
- **20%** Industry
- **19%** Transport

Australia's LNG

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

LNG

Trade map | September 2022



7.1 Summary

- Australia's LNG export earnings are forecast to rise from $70 billion in 2021–22 to $90 billion in 2022–23, as the fallout from Russia's invasion of Ukraine continues to place upward pressure on LNG spot prices.
- Australia's LNG export volumes are forecast to ease and stabilise at around 81 million tonnes (Mt) through to 2024, after reaching 83 Mt in 2021–22.
- Spot prices for Asian LNG are expected to reach over US$ 49 per million British thermal units (MMBtu) in the December 2022 quarter as Europe attempts to replace pipeline gas curtailed by Russia. Prices are forecast to average US$ 45/MMBtu and US$ 44/MMBtu in 2023 and 2024.

7.2 World trade

LNG earnings rise as European gas crisis reverberates to Asia

Global LNG prices remain elevated (and highly volatile) as the fallout from Russia's invasion of Ukraine continues. The outlook for LNG markets remains highly uncertain, as geopolitical events have become the key driver behind global price formation.

Declining Russian pipeline gas exports to Europe, which have fallen dramatically since mid-June, are behind the worsening global outlook. Russian gas flows to Europe have fallen 78% year-on-year from 373 million cubic meters per day (mcm/d) in September 2021 to 81 mcm/d in September 2022. If the current flows are sustained for a year, Europe could lose roughly 78 Mt of LNG-equivalent gas. This figure is roughly equivalent to 21% of the global LNG trade in 2021 or 92% of Australia's total LNG exports in FY21 –22 (see section 7.3 – World imports).

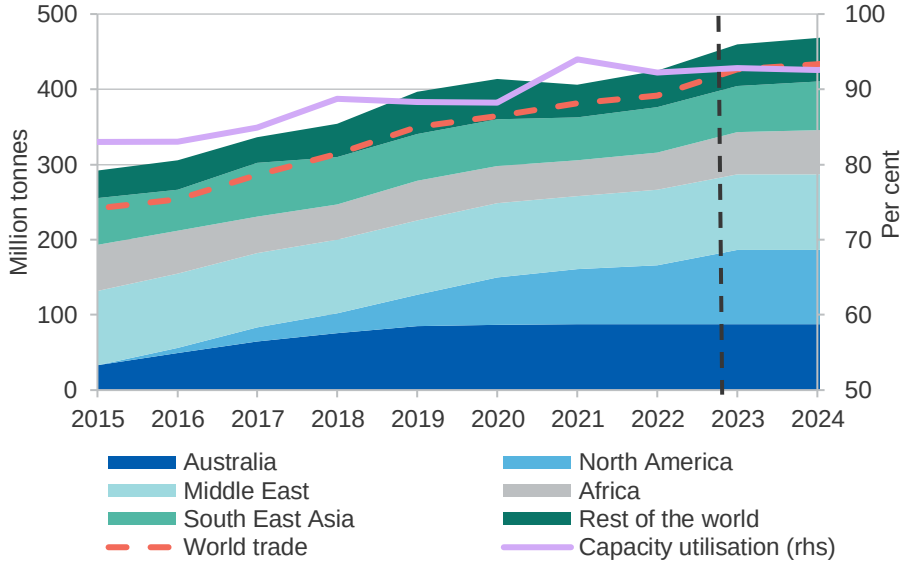
Crucially, Russia lacks the infrastructure needed to re-divert this gas to countries outside of Europe, and the global LNG trade is only expected to grow by 41 Mt between 2022 and 2024 (Figure 7.1). As a result, global gas markets are expected to be tight for the duration of the outlook period, with large-scale demand destruction inevitable if current conditions endure.

Fears of a gas shortage in Europe have sent buyers scrambling for the world's remaining uncontracted LNG cargoes. Amidst the rush, Asian customers now face the grim prospect of competing with desperate European importers (see section 7.4 – World exports).

Our forecast earnings remain heavily contingent on political developments in Europe. Australia's higher forecast earnings will be transient if Russia restores European gas flows. But should the flows continue to fall, earnings could rise higher.

There appear to be signs of a surge in US LNG investment beyond the outlook period. There are now enough proposed US LNG facilities to effectively triple the US's installed capacity to 240 Mt by the end of the decade (See section 7.4 – World exports). If viable, the proposed facilities could bring much-needed respite to global gas markets over the long-term.

Figure 7.1: Global LNG capacity and world trade, 2015-2024



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

7.3 World imports

High prices and lockdowns weigh on Chinese LNG imports

Chinese LNG imports fell 14.5 Mt in the June quarter 2022, down by 28% from June quarter 2021. While total Australian imports are down 3.1 Mt year-on-year, Australia's share of total Chinese LNG imports has remained steady at 38% (Figure 7.2).

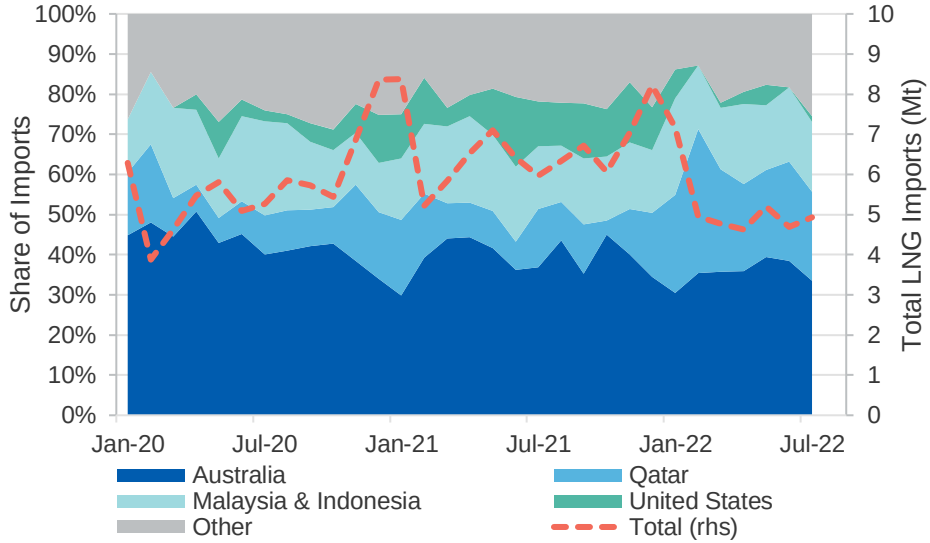
Falling Chinese LNG demand in the June quarter 2022 can be attributed to the combined impact of high LNG spot prices and COVID-19 lockdowns on industrial gas demand. But the re-emergence of Chinese LNG buying in the closing stages of 2022 could place global markets under further strain. Much depends on whether Chinese LNG buyers become more price sensitive than buyers from other parts of Asia.

China only obtains 25% of its gas from LNG imports. Most of China's gas supply is produced domestically (57%), and a sizable quantity is imported via pipelines from Russia and Central Asia (15%). Gas consumption in China is similarly diversified, with the electricity and industrial sectors each accounting for roughly 24% of China's gas demand. The residential sector makes up roughly 20% of gas consumption, with the remaining consumption occurring in the transport and commercial sectors.[1]

The diversity of China's gas consumers and gas supply sources could increase the price elasticity of Chinese LNG demand at such extreme prices. For example, China's industrial users may become more price sensitive due to their exposure to international competition, while the availability of alternative gas supply could also make industrial users reluctant to purchase uncontracted LNG cargoes. As a result, there is a possibility that Chinese demand for LNG will remain muted even as the nation emerges from lockdowns.

Over the long-term, persistently high LNG prices will erode the competitiveness of LNG relative to other natural gas sources — be it domestically produced or pipeline imports. As a result, Chinese LNG demand is forecast to fall by 19% to 67 Mt in 2022, with imports only modestly recovering to 79 Mt by 2024.

Figure 7.2: Chinese LNG imports by volume and source



Notes: July 2022 data as of the 8 August
Source: Kpler (2022)

Japanese imports rally amidst record temperatures

Japanese LNG imports in the June quarter 2022 were up by 8.5% year-on-year to reach 17.6 Mt (and compared with 15.8 Mt in the March quarter 2021). Australian LNG exports to Japan rose 32% over the same period, reaching 7.8 Mt in the June quarter 2022 (compared with 5.9 Mt the year before). Rising Australian exports helped offset falling LNG imports from the US and Qatar, which collectively fell by 54% year-on-year, from 3.1Mt to 1.4Mt in the June quarter 2022.

[1]Nexant WGM

Increased Japanese LNG imports can be attributed to a severe heatwave, which kept daytime temperatures well above the seasonal averages in June.[2] Higher temperatures increased the reliance on gas-powered generators to provide electricity for cooling demand and even prompted Japan's Ministry of Economy, Trade and Industry (METI) to urge 37 million citizens to switch off unnecessary lighting.[3]

Unlike China, Japan obtains virtually all of its gas via LNG imports, and its gas consumption is heavily concentrated in the power generation sector, which accounts for roughly 70% of Japanese gas demand.[4] As a result, Japanese LNG imports are much more sensitive to weather-related changes in electricity demand and the competitiveness of gas relative to other types of power generators.

LNG imports are expected to fall to about 70 Mt in 2024 as the electricity sector shifts away from gas (Figure 7.3). According to METI, Japan plans to reduce gas' share of electricity generation from 38% in 2022 to 27% by 2030, while nuclear's share rises from 6% to 22% over the same period.

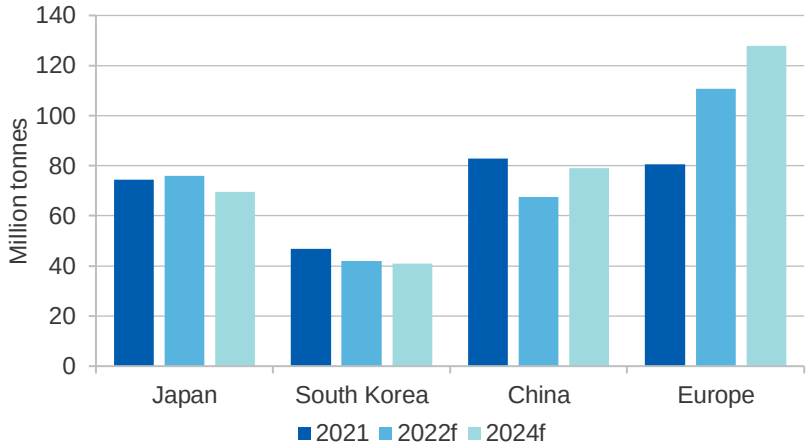
South Korean imports remain steady amidst high prices

At 9.5 Mt, South Korea's LNG imports in the June quarter 2022 were unchanged from the March quarter 2022, rising only 1.4% year-on-year. However, Australian exports to South Korea have risen 48% over the same period, reaching 2.3 Mt (up 0.7 Mt since the June quarter 2021). As with Japan, Australian LNG appears to be filling the gap left by lower US imports, which dropped by 0.7 Mt year-on-year in the June 2022 quarter.

Korea sources all of its gas from LNG imports, over half (55%) of which is consumed in the power sector to generate electricity. Of the remainder, 16% is used by the industrial sector (typically as a chemical feedstock or as a source of industrial heat), and 26% is used in the commercial and residential sectors.

To reduce the call on gas, the South Korean government suspended voluntary emission restrictions on coal-fired power generators. However, LNG demand has remained in line with seasonal trends, due to persistently higher demand for electricity during the summer season. High gas prices and the construction of new nuclear facilities will restrain growth in South Korean LNG imports. As a result, LNG imports are estimated to fall slightly to 41 Mt by 2024 (Figure 7.3).

Figure 7.3: World LNG demand forecasts



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

Europe on the brink of crisis as Russia cuts gas supply

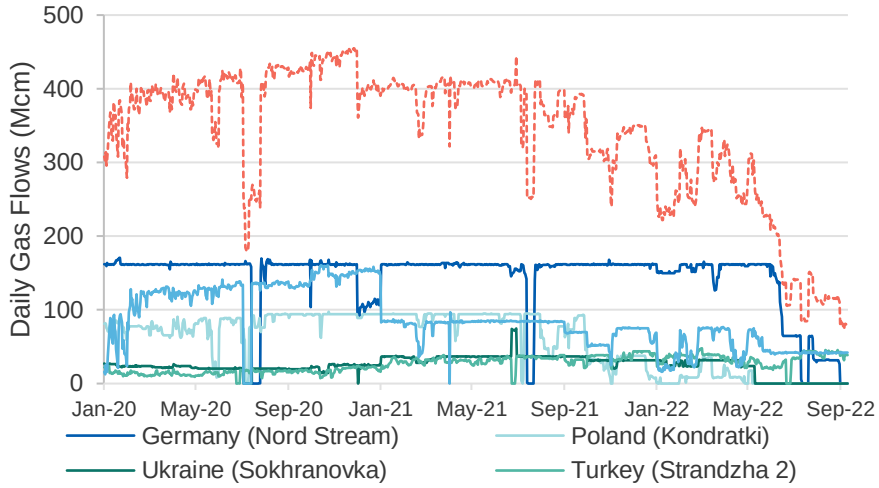
Europe's energy security has deteriorated significantly since the June *Resources and Energy Quarterly* report. In recent months, Europe has experienced a dramatic reduction in its pipeline imports from Russia (Figure 7.4) and a temporary disruption in LNG imports from the United States. The latter is due to issues encountered at the US Freeport LNG facility (see section 7.4 – World exports), and the former is due to deliberate disruptions of Russian gas exports via the Nord Stream and Yamal-Europe pipeline.

[2] Argus, Argus Global LNG- July 2022, pg. 8

[3] BBC, *Japan urges 37 million people to switch off lights,* 27 June 2022

[4] Nexant WGM

Figure 7.4: European pipeline imports from Russia, 2022

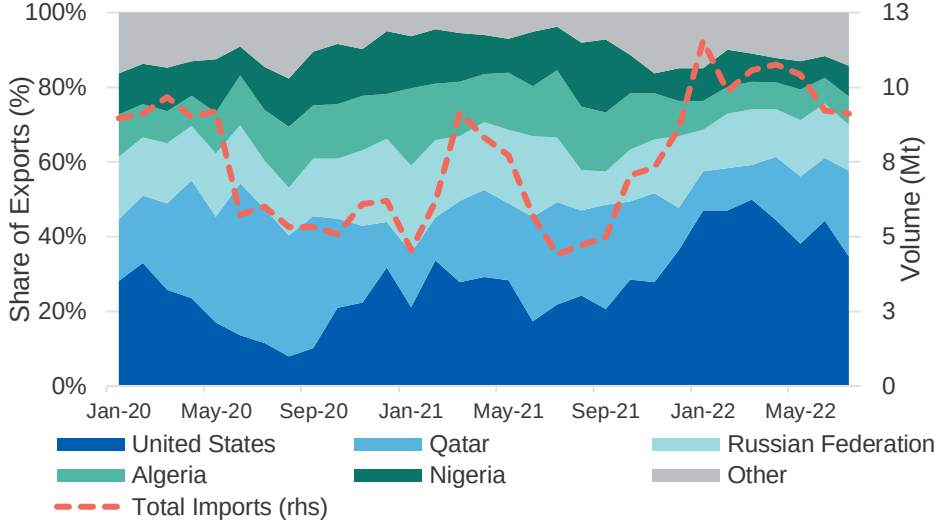


Note: Figure only includes major transmission pipelines for Russian gas exports to Europe. Flows from Strandzha 2 will include some non-Russian volumes.
Source: ENTSOG Transparency Platform

European pipeline imports from Russia declined considerably during the June quarter 2022. Total imports fell by almost 78% in September 2022 year-on-year, dropping from 373 to 81 million cubic meters per day (mcm/d). However, the recent reduction in German pipeline imports has been the most dramatic, with flows falling from 162 mcm/d on 1 June to zero by 1 September (Figure 7.4).

The rapid decline in pipeline imports can be attributed to several decisions made by either the Russian government or its state-owned company, Gazprom. First, in May, Russian authorities prohibited gas deliveries to Poland via the Yamal-Europe pipeline, to sanction Poland's pipeline operator, EuRoPol Gaz. Then, in early June, Gazprom claimed that "safety issues" at the compressor station powering Nord Stream 1 pipeline necessitated a reduction in gas flows to Germany. Gazprom had initially claimed that European sanctions had prevented the company from re-importing the gas turbine from Canada to power the compressor station.

Figure 7.5: European LNG imports by volume and source, 2020-22



Source: Kpler (2022)

However, after securing an exemption to the sanctions in July, Gazprom refused to re-import the turbine and halved the remaining flows along the pipeline citing additional "safety issues" with a second turbine. In late August, Gazprom shut down the last remaining turbine after uncovering an oil leak. However, spare capacity on other pipelines, such as the Sudzha and Sokhranovka pipeline in Ukraine is not being utilised to make up for the shortfall. The motivation for cuts is clearly political and thus makes these crucial exports totally dependent on the mood in the Kremlin.

While Europe has become increasingly dependent on US LNG in 2022 to replace Russian pipeline gas imports, production issues at the Freeport LNG facility have weighed on US exports in recent months (see section 7.4 – World exports). This saw European LNG imports in the June quarter fall 4.9% quarter-on-quarter to 30 Mt.

Despite European efforts to replace Russian pipeline gas with LNG, Russia remained Europe's third-largest LNG supplier in the June quarter 2022, accounting for 14% of Europe's total LNG supply. So far, Russian

LNG imports have remained consistent year-on-year, but the possibility of future Russian curtailments cannot be discounted (Figure 7.5).

This has all occurred amidst urgent efforts by Europe to fill its gas storage before the coming 2022–23 winter. As of 23 September, European storage inventories were approximately 87% full and had already exceeded the legislated target of 80% by November (Figure 7.6).

But given the huge disruptions to Germany's pipeline supply and infrastructure bottlenecks constraining the flow of gas from Western Europe to Central Europe, there is a possibility that full storage inventories will not guarantee Europe's energy security come winter.

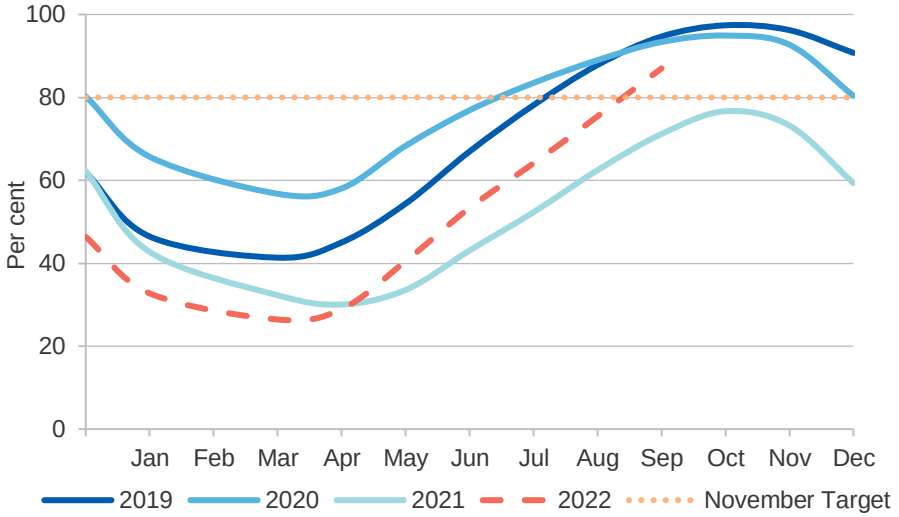
During a typical European winter, Russia supplies around 6,000 gigawatt hours of gas per day to Europe (GwH/d). Gas from underground storage provides about 4,000 GWh/d on average, which can be ramped up to 10,000 GWh/d to meet peak day demand.[5] So while storage inventories may be able to offset Russian imports initially, there may not be enough total storage capacity to sustain these offsetting flows for the entire winter.

The European Commission has outlined a proposal to reduce gas usage by 15-20% by next spring to help alleviate the coming shortage.[6] Meanwhile, Klaus Muller, head of Germany's Federal Network Agency, has explicitly stated, "If [Germany] fails to reach our [15%] target, then there is a serious risk that we will not have enough gas".[7]

However, the composition of European gas users will make it difficult for the EU to curtail its ex-industrial gas demand because half of Europe's gas is consumed in sectors where demand is highly price inelastic. Roughly 32% (188 bcm) of Europe's gas is consumed to generate electricity, and 26% (151 bcm) is consumed by the residential sector for space heating.

After the power and residential sectors, the third largest consumer is the Industrial sector, with roughly a 20% (118 bcm) share of consumption.[8]

Figure 7.6: European Storage Inventories, 2019-22



Source: Eurostat (2022)

Drought conditions in Europe have also significantly depleted reservoirs needed to power hydroelectric dams and have compromised coal transport along the upper section of the Rhine. It is conceivable that these two factors, if combined with an unusually cold winter, could increase the call on gas for space heating and power generation rather than reduce it.

In the event of a shortfall, EU regulations clearly state that households and gas-powered generators are to be given priority over other gas

[5] ENTSOG, *Winter Supply Review* 2020/2021, 8 October 2021, pg.23,32

[6] European Commission, Save gas for a Safe Winter, 20 July 2022, https://ec.europa.eu/commission/presscorner/detail/en/ip_22_4608

[7] Financial Times, *Germany must cut gas use by 20% to avoid winter rationing*, 14 August 2022,

[8] Nexant WGM: Note aggregate figures include Turkey

consumers. Industrial users are encouraged to reduce their consumption by taking demand-side measures to restore market balance.[9]

The combination of adverse shocks paints an increasingly bleak picture of the outlook for European gas security, particularly for industrial gas users in Central Europe who were heavily dependent on Russian volumes. As a result, European LNG imports are forecast to rise 43% year-on-year, reaching 111 Mt in 2022. Imports are expected to peak at 126 and 128 Mt in 2023 and 2024, respectively, as infrastructure bottlenecks begin to limit the continent's ability to absorb additional LNG imports.[10]

Taiwanese imports remain stable

Taiwanese LNG imports were stable at 4.9 Mt in the June quarter 2022, rising only 1% year-on-year. Australian LNG exports to Taiwan rose 25% (0.35 Mt) to 1.76 Mt over the same period. Unlike Korea and Japan, Australian LNG exports mainly displaced Russian and Malaysian LNG, as US exports to Taiwan held steady at 0.7Mt.[11]

All of Taiwan's gas is supplied via LNG facilities, and roughly 83% is consumed to generate electricity. After electricity, the next largest sector by gas consumption is industry (10%), with the commercial and residential sectors comprising the remainder.[12]

Taiwanese imports in the June quarter 2022 were supported by the need to rebuild storage inventories to prepare for peak summer cooling demand. Taiwanese LNG imports are expected to stabilise at around 20 Mt per annum over the outlook period.

India remains price sensitive

Hot weather and a scarcity of coal appear to have boosted recent Indian LNG demand. Indian LNG imports rose by an unseasonal 14% in the June quarter 2022, reaching 5.7 Mt despite record high LNG prices. Indian LNG imports are forecast to fall from 24 Mt in 2021 to 22 Mt by 2024, as high prices weigh on demand.

7.4 World exports

US LNG redirected to Europe amidst market reorganisation

US LNG exports reached 19.5 Mt in June quarter 2022. While this was 11% higher than the June quarter 2021, volumes were 4.4% lower than the March quarter 2022, due to issues at the Freeport LNG facility.[13]

In April 2022, Freeport LNG underwent planned maintenance that took out approximately 0.5 Mt of LNG capacity. Then on 8 June, a pipeline connecting Freeport's LNG storage tanks to the LNG docking facilities caught fire, leading to the complete suspension of exports for the facility. The facility is only expected to resume normal operations in mid-November, which will significantly weigh on US exports in H2 2022.[14]

In the June quarter 2022, 63% of all US LNG exports (or around 15 Mt) were destined for Europe (Figure 7.7), with the remainder exported to Asia (25%) and South America (12%). The result contrasted heavily with the June quarter 2021, when half of all US LNG exports were exported to Asia. The reversal in flows matches changing pricing dynamics for global LNG, as Europe begins to outbid Asian buyers for US LNG supply in the wake of Russia's invasion of Ukraine. (see section 7.5 – Prices)

[9] European Parliament, *Regulation 2017/1938 concerning measures to safeguard the security of gas supply*, Articles 23-25, http://data.europa.eu/eli/reg/2017/1938/oj

[10] Europe's total LNG import capacity is 184 Mtpa, but approximately 55 Mpta is located in the Iberian Peninsula where there are few interconnecting pipelines to continental Europe. An additional 35 Mpta is located in the UK, which must transit through heavily contracted pipelines in Belgium and the Netherlands to reach Central Europe.

[11] Kpler

[12] Nexant WGM

[13] Kpler

[14] gCaptin, Freeport LNG set to resort Production at Key LNG export Facility, 5/8/2022

The US is forecast to export 75 Mt of LNG in 2022,[15] with the fall in LNG production from Freeport LNG partially offset by new facilities at Calcasieu and Sabine Pass. The two facilities are expected to add 12 Mt to the United States' nominal liquefaction capacity over the outlook period. This will help lift US LNG production to 92 Mt in 2023 (Figure 7.8).

Meanwhile, two more facilities under construction (Golden Pass and Plaquemine's LNG phase one) are expected to boost US LNG capacity to 114 Mt per annum (Mtpa) by the end of 2024. However, it will likely take an additional year for the facilities to ramp up to full capacity.[16]

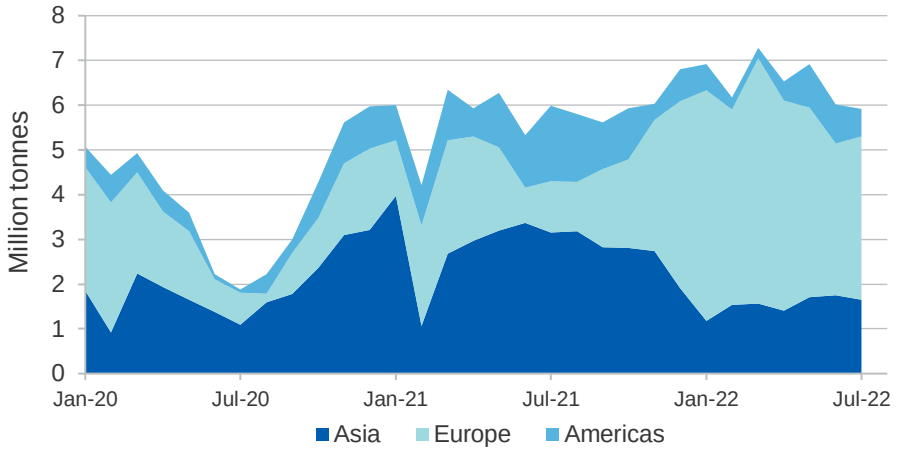
Several proposed US LNG projects could fundamentally alter the global LNG market beyond the outlook period. According to the US Energy Information Agency (EIA), there are now 14 proposed LNG facilities (pre-FID) that have a combined liquefaction capacity of over 172 Mtpa[17]. If successful, these facilities could almost triple the US's current LNG export capacity of 82 Mtpa.[18]

Qatar exports stabilise, but larger volumes are on the horizon

The volume of Qatari exports was stable at 20 Mt in the June quarter 2022. Exports to Asia and Europe remained largely unchanged from the September quarter 2021, with approximately 13.9 Mt exported to Asia and around 5.2 Mt to Europe. The Qatari Government has repeatedly stated that Qatar cannot materially boost its LNG supply in the short term despite high prices and strong global demand for LNG.

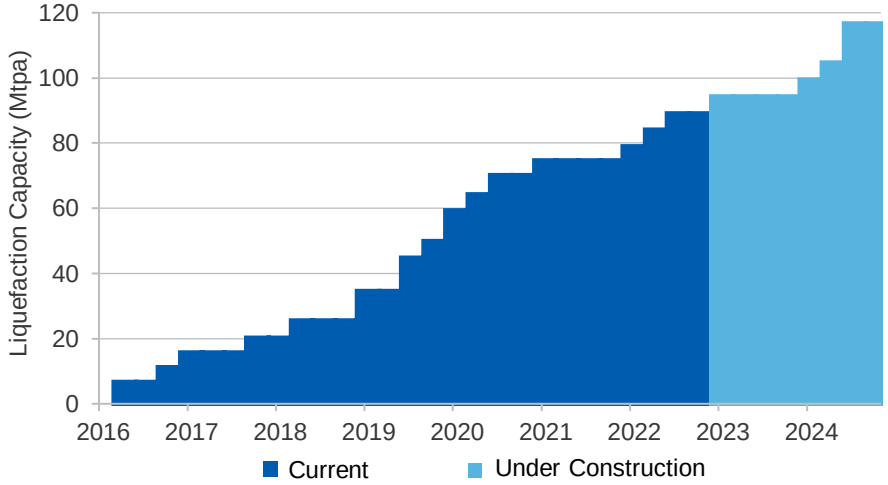
Qatar is projected to expand its LNG export capacity in the coming years. However, this is not expected to meaningfully increase export volumes in the outlook period. The expansion will be facilitated by its North Field South project — which reached FID in late 2021. The LNG project will be the second largest in the world by capacity and is expected to start commercial production in 2025. Qatar's LNG export capacity is expected to rise to around 107 Mtpa by 2026.

Figure 7.7: US LNG exports by destination, 2020



Source: Kpler (2022)

Figure 7.8: US LNG capacity projections, 2016-24



Source: US Energy Information Agency (2022)

[15] NexantWGM

[16] EIA, Database of US LNG export facilities, 8 June 2022

[17] EIA, Database of US LNG export facilities, 8 June 2022

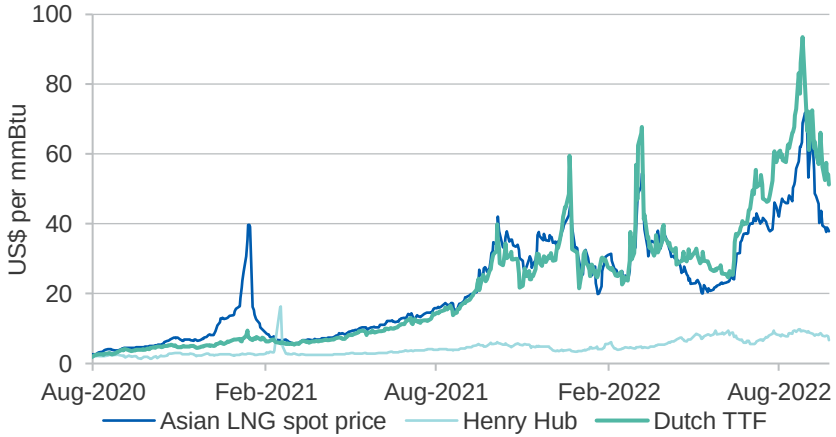
[18] IGU, 2022 world LNG Report, Pg.44

7.5 Prices

High prices spread across an interconnected global market

After reaching over US$ 50/MMBtu in March 2022, Asian LNG prices fell sharply at the start of April, hitting US$ 20/MMBtu in early May. However, prices began to rise dramatically from mid-June after the gradual suspension of gas flows along the Nord Stream pipeline (see section 7.3 – World imports) and the fire at the Freeport LNG facility. Both events had the effect of sharply constraining Europe's gas supply. Moreover, with Europe and Asia competing for the same supply of uncontracted LNG, prices in both markets have tended to track each other (Figure 7.9).

Figure 7.9: Global gas and LNG prices, 2020-22



Notes: ANEA is the Argus Northeast Asia LNG spot price DES (Delivered Ex Ship), which includes shipping and insurance. Dutch TTF is the Dutch Title Transfer Facility gas price.
Source: Argus (2022); Bloomberg (2022)

The status of gas flows along the Nord Stream pipeline will be the key factor shaping the outlook for global gas prices. The significance of Nord Stream to European — and thus global energy — security cannot be understated. One of the largest pipelines in Europe, Nord Stream can carry approximately 55 billion cubic meters (bcm) of gas per year or 150 million cubic meters (mcm) per day. But, as of September, daily flows along the pipeline have been completely suspended.

If Russia maintains its current level of gas exports to Europe indefinitely, the cumulative losses from the curtailed gas flows could reach 106 bcm by September 2023.[19] To put this figure into perspective, the total LNG trade in 2021 was estimated at 517 bcm, while total Australian gas production in 2021 was estimated at 160 bcm. In other words, given enough time, the gas curtailed by Russia could amount to 21% of the annual LNG trade — or 66% of Australia's annual gas production. The unambiguous effect of such a disruption will be to raise the value of uncontracted LNG until new US and Qatari supply comes online beyond the outlook period (Figure 7.10).

Prices to remain high for the remainder of the outlook period

Prices are forecast to remain well above long-run averages for the rest of the outlook period — assuming Russian flows are held constant — as LNG supply struggles to meet gas demand. Prices are expected to average US$ 47MMBtu and US$ 46/MMBtu in 2023 and 2024, respectively.

Several factors are driving the bullish outlook for prices in 2023 and 2024. Firstly, given that LNG facilities typically take three to four years to construct, any new facilities coming online from 2023 to 2024 will need to have reached FID during or just before the COVID-19 pandemic. As a result, only a modest amount of additional LNG production (around 41 Mt) is forecast to come online between 2023 and 2024.

Secondly, European supply conditions are likely to deteriorate further in 2023 if the current level of Russian pipeline imports is maintained. Relatively modest Russian flows in the first half of 2022 have supported healthy injections into Europe's storage inventories in preparation for winter (Figure 7.6). However, the current level of Russian flows will make it much more difficult for the Europeans to re-fill their storage inventories in preparation for the 2023–24 winter season.

[19] When compared with annualized daily flows from September 2021.

An assessment completed by the European Network of Transmission System Operators for Gas (ENTSOG) in July 2022 indicated that a complete disruption to Russian gas supplies would prevent most European countries from reaching their winter storage targets in 2023. According to ENTSOG's assessment, even if Europe has a mild 2022-23 winter, sources additional LNG imports, and successfully reduces gas demand by 15% with full cooperation amongst all members states, storage inventories may only reach 70% on average by 1 October 2023 (with inventories in Central and Southern Europe struggling to reach even 40% capacity).[20]

The threat of sustained prices has triggered calls for regulatory intervention in the European gas markets. On 9 September, EU officials met in Brussels to discuss several proposals to cap the price of natural gas. The proposed measures included an administered price cap in specific European markets, a price cap on Russian imports only and a price peg to Asian LNG markets.

EU policymakers face a delicate balancing act between lowering gas prices and incentivising LNG sales. If the price caps work and European hub prices fall, the lower prices could disincentivise LNG imports and exacerbate Europe's gas shortage. However, if Russia cuts its remaining gas exports in retaliation to a price cap, hub prices may need to rise even higher to incentivise further offsetting LNG imports. Meanwhile, a price-peg to Asian LNG markets could theoretically work, but European Hub prices are already de-facto pegged to Asian LNG prices (see Figure 7.9).

The outcome of the proposals is highly uncertain, and discussions are still in their preliminary stage at the time of writing. Moreover, each proposal carries both upside and downside risks to LNG prices, but none address the fundamental supply imbalance in European gas markets.

Soberingly, the European market could become much tighter and more dependent on LNG in 2023. This reinforced dependency on LNG will necessitate the purchase of uncontracted cargoes in 2023, supporting spot LNG prices over the outlook period.

[20]ENTSOG, *Yearly Supply Outlook 2022/2023,* July 2022, pg.18-20

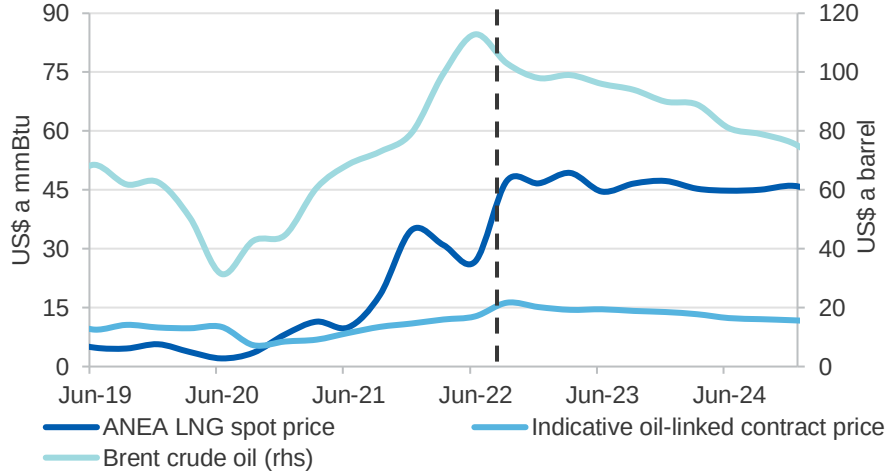
Spiking oil prices in Q1 2022 flow through to LNG contracts

High oil prices in the first half of 2022 have started to flow through to most of Australia's long-term LNG contracts. Around 80-90% of Australian LNG exports are sold under long-term contracts that link the price of LNG to the Japanese Customs Crude (JCC) oil price (with a three to six-month lag, depending on contractual arrangements).

Oil prices remained elevated in the June quarter 2022, following the fallout of Russia's invasion of Ukraine, peaking at US$ 134 a barrel on 8 March (see *Oil chapter*). In the September quarter, prices averaged US$ 109 a barrel in July, US$ 98 a barrel in August and US$ 91 a barrel in September (estimate) — with the quarter average up 34% y-o-y.

Over the outlook period, oil-linked LNG contract prices are expected to peak at levels consistent with oil at US$ 103 a barrel in 2022 before falling to US$ 95 in 2023 and US$ 80 a barrel in 2024 (Figure 7.10).

Figure 7.10: LNG spot and contract prices, 2019-24



Notes: ANEA is the Argus Northeast Asia spot price. LNG prices are DES (Delivered Ex Ship. The long-term oil-linked contract price is indicative only.
Source: Argus (2022); Bloomberg (2022); Department of Industry, Science and Resources (2022)

7.6 Australia

Australia's LNG earnings rise amidst deteriorating global outlook

The value of Australia's LNG exports in 2022–23 is now expected to reach around $90 billion, as global LNG spot prices rise and as high oil prices in the March and June quarters flow through to oil-price linked LNG contracts (Figure 7.11). Revenues are expected to drop to $81 billion in 2023–24 as oil prices ease and export volumes decline modestly.

Australia exported a record $70 billion of LNG in 2021–22, up from $30 billion in 2020–21 (and still high compared to $50 billion in 2018-19 and $48 billion in 2019-20). In the June quarter 2022 alone, Australian LNG export earnings reached $19.5 billion, up 123% compared to the June quarter 2021.

Given the significant deterioration in Europe's energy security outlook, forecasts for Australia's LNG revenues now bear close resemblance to the 'worst-case' global impact scenario modelled in the March 2022 *Resources and Energy Quarterly* report (see March 2022 REQ, pages 100-102).

Risks to the forecast for Australia's LNG export earnings include additional actions by Gazprom to alter Europe's gas supply, the severity and scope of the upcoming Northern hemisphere winter season and the price elasticity of Chinese LNG demand.

Australia's export volumes set to decline

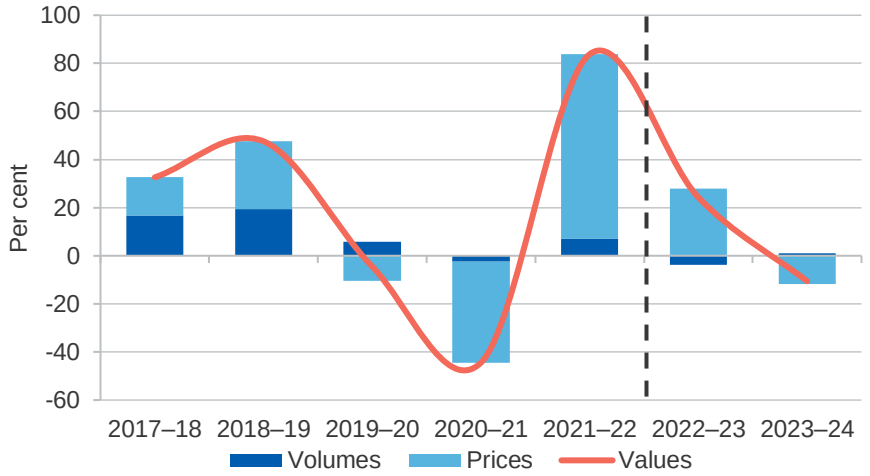
In the June quarter 2022, Australian LNG exports reached 21 Mt, up 4% quarter-on-quarter. This is the highest volume of LNG exports recorded for any June quarter and it marks the third-highest quarterly result on record. However, volumes are expected to cool off to 18.8 Mt in Q3 as several facilities experience planned and unplanned disruptions to production.

Australia exported 83 Mt of LNG in 2021–22, up by 4.7 Mt on 2020–21. Exports were largely driven by high LNG prices, which have incentivised many LNG facilities to operate at or above capacity for the last 12 months.

Higher production from the Gorgon LNG facility appears to have driven the result. The facility boosted LNG production from an estimated 11.3 Mt in 2020–21 to an estimated 16.6 Mt in 2021–22 (a 47% increase). Moreover, Gorgon's production in the June quarter 2022 was estimated at over 110% of the facility's nominal nameplate capacity. Similarly, Ichthys' LNG output reached an estimated 9.4 Mt in 2021–22, up 18% from 2020–21.

In 2022–23, Australia's LNG exports are forecast to ease to 80 Mt as several facilities undertake maintenance activity and as the depletion of gas basins reduces supply to other facilities, particularly Darwin LNG (Figure 7.12).

Figure 7.11: Price/volume contributions to LNG earnings, 2014-24



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

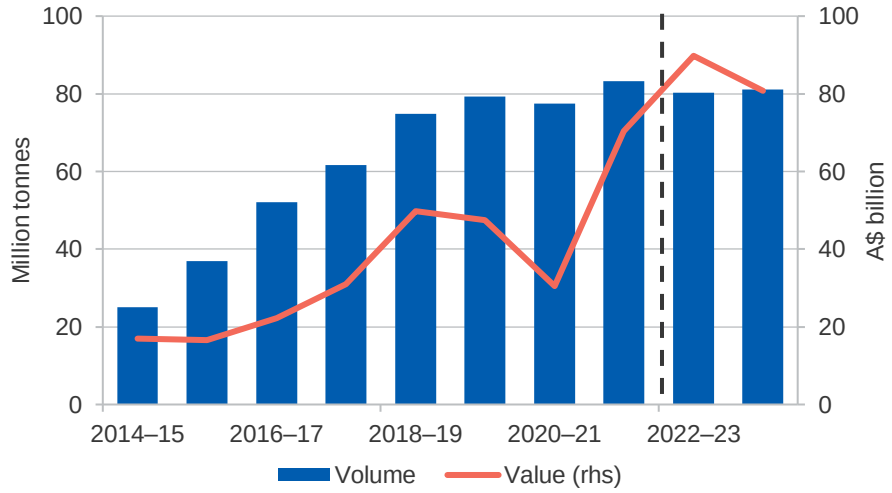
Ongoing industrial action on the Prelude Floating LNG facility will similarly constrain export volumes in the September quarter. In May 2022, union members working on the Prelude FLNG facility voted to strike after parties failed to resolve their disagreements during wage negotiations. Strike actions on Prelude commenced in July and are set to continue until 1 September. As a result, Shell has had to delay planned maintenance until at least 2023, which is expected to further weigh on the facility's output.

Prelude is now forecast to export less than 0.2 Mt in the September quarter.

The Queensland Curtis LNG Project (QCLNG) also underwent maintenance on half a train between 16 June and 18 July. The maintenance is likely to have reduced QCLNG's output by either 0.2 or 0.4 Mt. In addition, APLNG conducted maintenance on an entire train between 28 July and 26 August 2022, which will similarly drag production down by an estimated 0.3 Mt over the September quarter 2022. Due to ongoing field depletion issues, output from the Darwin LNG facility is expected to fall from 0.8 Mt in 2022–23 to zero in 2023-24.

After 2023–24, Australian LNG volumes are estimated to settle around 80 Mtpa. Volumes are not expected to rise meaningfully until 2026, when Woodside's Scarborough field and Pluto Train 2 projects come online. On 25 August, Bechtel commenced site preparation works on the new Pluto train.

Figure 7.12: Australia's LNG exports by value and volume, 2014-24



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

Revisions to the outlook

Australia's nominal export volumes for the June quarter 2022 were revised up by 1.4 Mt due to higher than expected production from the Gorgon, APLNG and Prelude FLNG facilities. Forecasts for 2022–23 have similarly been revised up by 0.4 Mt to account for the higher anticipated capacity utilisation in the aforementioned facilities.

Australia's nominal LNG export earnings for 2022–23 and 2023–24 have been revised up by $6 and $12 billion respectively, due to higher forecast Asian LNG spot prices.

Table 7.1: Gas outlook

						Annual Percentage Change		
World	**Unit**	**2021**	**2022 f**	**2023 f**	**2024 f**	**2022 f**	**2023 f**	**2024 f**
JCC oil price[a]								
– nominal	US$/bbl	69.1	99.8	94.8	79.8	99.8	94.8	79.8
– real[h]	US$/bbl	74.4	99.8	91.9	75.7	33.7	-7.6	-17.7
Asian LNG spot price								
– nominal	US$/MMbtu	18.6	38.6	48.5	46.8	107.4	25.6	– 3.7
– real[h]	US$/MMbtu	20.1	38.6	47.1	44.4	92.5	21.9	– 5.8
LNG trade	Mt c	371.9	380.5	403.5	421.5	2.3	6.1	4.4
Gas production	Bcm	4,159	4,208	4,265	4,353	1	1	2
Gas consumption	Bcm	4,211	4,205	4,243	4,351	0	1	3
Australia	**Unit**	**2020–21**	**2021–22**	**2022–23 f**	**2023–24 f**	**2021–22**	**2022–23 f**	**2023–24 f**
Production[d]	Bcm	151.1	159.8	159.8	159.0	5.8	– 0.0	– 0.5
– Eastern market	Bcm	57.6	57.7	56.0	54.9	0.1	– 2.9	– 1.9
– Western market	Bcm	79.6	85.6	92.8	92.8	7.6	8.4	– 0.0
– Northern market [k]	Bcm	13.9	16.3	14.1	15.2	17.6	– 13.7	8.1
LNG export volume	Mt c	77.4	83.3	80.4	80.5	7.5	– 3.5	0.1
– nominal value	A$m	30,477	70,451	89,779	80,763	131.2	27.4	– 10.0
– real value[e]	A$m	34,058	75,378	89,779	77,491	121.3	19.1	– 13.7
LNG export unit value[g]								
– nominal value	A$/GJ	7.5	16.0	22.9	19.6	114.9	43.1	– 14.6
– real value[e]	A$/GJ	8.3	17.1	22.9	18.8	105.8	33.7	– 18.1
– nominal value	US$/MMBtu	5.9	12.3	16.9	15.2	108.7	37.5	– 10.0
– real value[h]	US$/MMBtu	6.6	13.1	16.9	14.6	99.8	28.5	– 13.7

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 meters 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 2022 and 2024 or 2021–22 and 2023–24; **z** Projection.
Source: ABS (2022) International Trade in Goods and Services, 5368.0; Department of Industry, Science and Resources (2022); Company reports; Nexant (2022) World Gas Model.