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No shortage of solutions to short-term gas supply issues

- *Gas use in eastern Australia has been declining over the past 10 years, particularly for electricity generation, and this trend is likely to continue.*
- *About 80% of eastern Australia's gas supply is used for exports, backed by proven and probable (2P) reserves, reducing the need for new gas supplies.*
- *Reducing gas demand further through measures such as all-electric homes, would address supply gaps and benefit households.*
- *Queensland's gas output has plateaued, meaning any new supplies would be more expensive to develop and pipe to Victoria, driving energy costs up further.*

The Australian Energy Market Operator has (AEMO) flagged a potential gas supply shortfall due to the drought in Tasmania and the cold snap in southern Australia. The warning follows the gas industry's call for more supply after a near halving of supplies from Victoria's largest gas producer this financial year and low wind-power output. It is a familiar refrain from the gas industry.

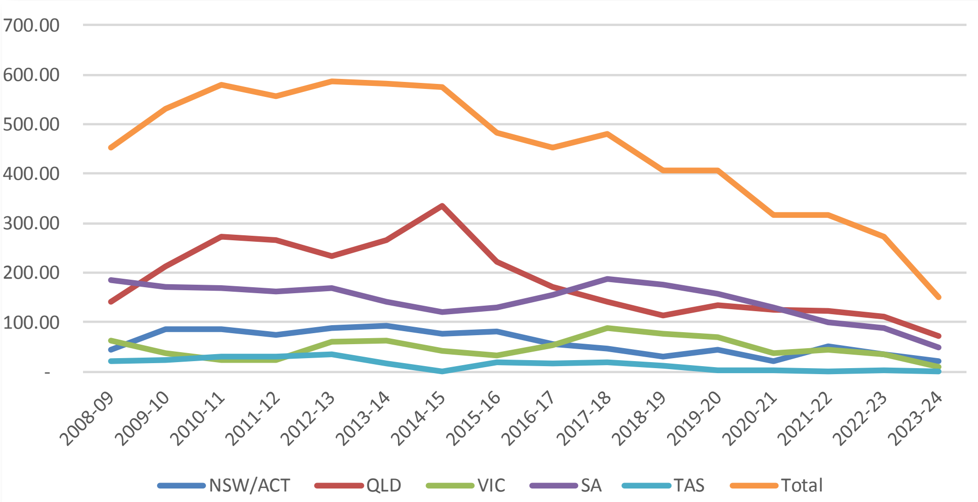
AEMO warned shortages could occur on peak demand days until the end of September as storage levels in eastern Australia are drained, which in turn contributes to tight gas market conditions during the peak winter heating demand season. AEMO recently called for new gas supplies to address supply gap risks.

However, IEEFA analysis shows that new gas supplies are not needed in the long term as more can be done on demand side measures to further reduce domestic gas consumption. Further, about 80% of eastern Australia's gas production is exported via the three LNG plants at Gladstone in Queensland, but the contractual demand for these three ventures is underpinned by existing proven and probable gas reserves.

The remaining 20% reflects domestic demand, which has been declining over the past 10 years (Figure 1).

Gas losing power in electricity generation

Figure 1: Eastern Australia gas-fired power demand



Source: [Australian Energy Regulator (AER). Average daily gas used for gas powered generation.]
Note: 2023-24 data is for the nine months to 31 March 2024.

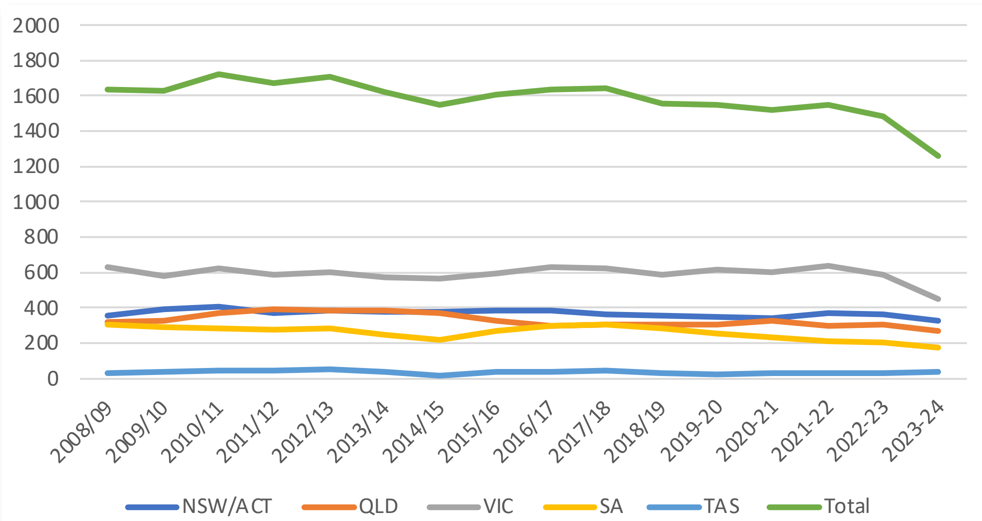
Gas use in power generation is falling, and has dropped 53% from an average of 586.25 terajoules per day (TJ/d) in the 2012-13 fiscal year to 272.25TJ/d in FY2022-23, and has fallen further to an average of 200.33TJ/d in the first nine months of FY2023-24 year. This represents a decline in the share of gas as a fuel source for electricity generation from 12.1% in FY2012-13 to 5.6% in 2022-23 and 4.4% in the first nine months of FY2023-24.

The decline has been triggered by higher gas prices following the start-up of the three LNG plants in Gladstone, Queensland, and more electricity generated from renewable sources, whose share of the power generation mix has risen from 13.6% in FY2012-13 to 36.7% in 2022-23 and to 39% so far in FY2023-24.

The falling use of gas for power generation has dragged overall gas consumption in eastern Australia down over the same period (Figure 2).

Total eastern Australian gas use is sliding

Figure 2: Eastern Australia gas consumption



Source: AER Average daily regional demand.

Average daily gas consumption on the east coast dropped 13% from FY2012-13 to FY2022-23 (to 1,483TJ/d), and has fallen further in the first nine months of FY2023-24 (to 1,257TJ/d).

Majority of eastern Australian gas demand backed by proven reserves

While AEMO forecast supply gaps, in reality there is no shortage of gas on the east coast given that about 80% of gas produced in eastern Australia is either exported via the LNG plants in Queensland or used to freeze that gas for export.

Further, most of the LNG produced in eastern Australia is supplied under long-term LNG export contracts, which are set to expire by the mid-2030s.

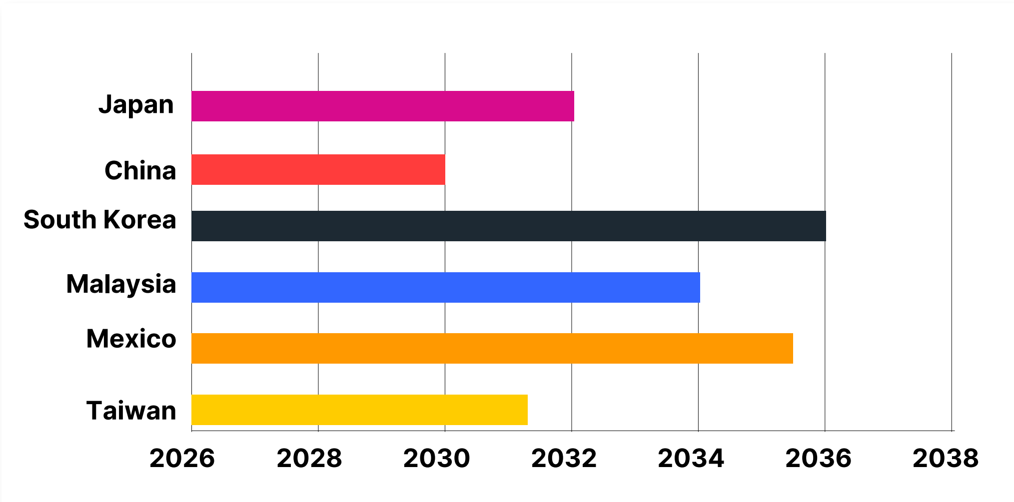
The Santos-operated Gladstone LNG (GLNG) venture, which has struggled to produce consistently above 6 million tonnes a year (mtpa), has contracts with South Korea's Kogas (due to expire in 2031) and Malaysia's state-controlled Petronas (due to expire in 2036). Santos has sufficient 2P reserves to cover most of these contracts as well as contingent resources in the Surat Basin in Queensland, which it intends to turn into commercial reserves before the Petronas contract expires.

Santos's share of 2P reserves at GLNG was 1,423PJ at the end of 2023. As 30% owner of GLNG, this implies total 2P reserves of 4,743PJ. Santos's share of gas supply from GLNG was 285.7PJ in 2023. Santos has 423PJ of 2P reserves from other gas fields in eastern Australia. This gives Santos at least 16 years of 2P reserves in total for the GLNG venture. The GLNG venture also receives gas from Origin under a supply agreement signed in 2012.

The three LNG contracts tied to the 9mtpa Australia Pacific LNG (APLNG) project at Gladstone end in 2035 (total 7.6mtpa) and 2036 (1mtpa). The APLNG venture partners held a total of 10,949PJ at 30 June 2023. The venture supplied 674PJ to the APLNG plant in FY2022-23, which equates to about 16 years of production at this rate.

Most of Australia's LNG contracts expire around 2036. This includes the third plant at Gladstone, the Shell-operated Queensland Curtis LNG (QCLNG) plant (Figure 3).

Figure 3: Average end date of Australian contracts by trading partner



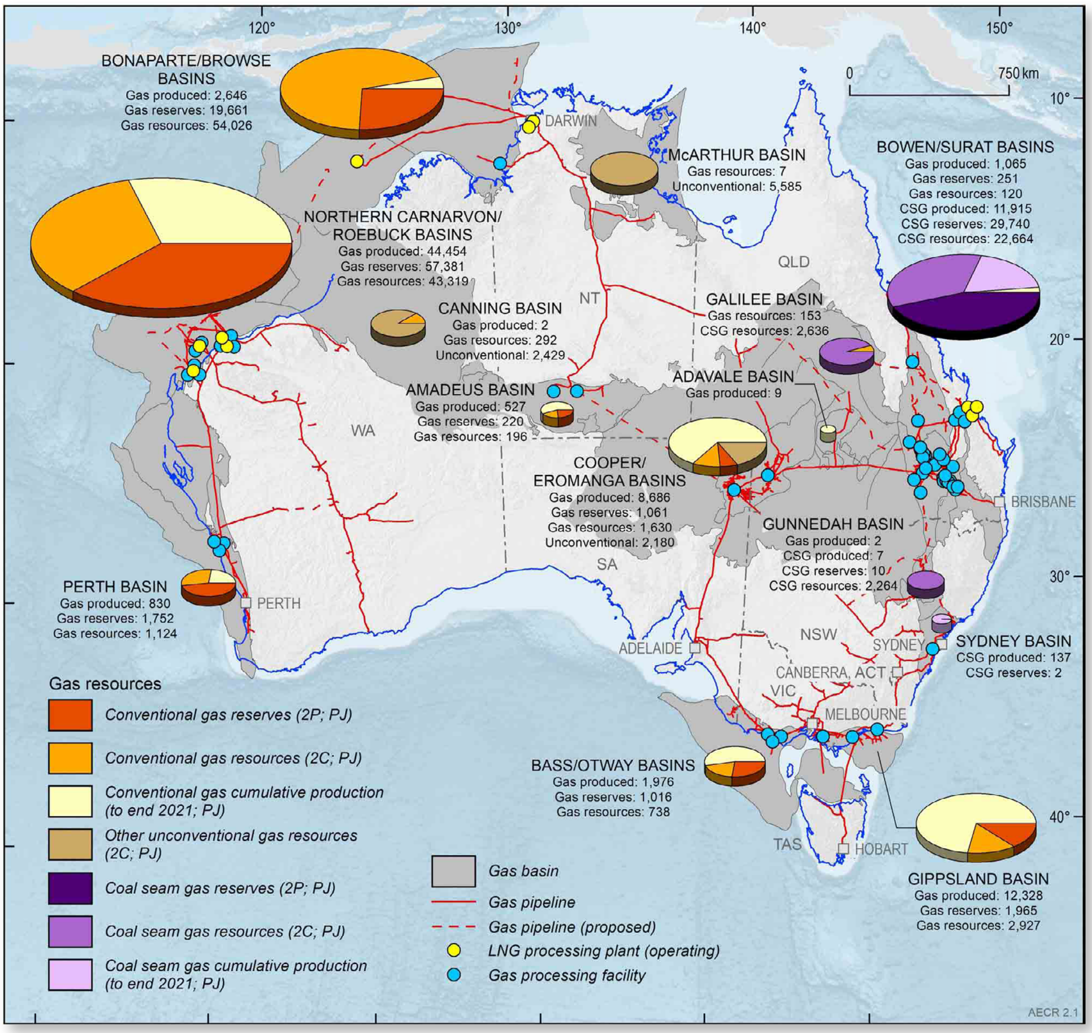
Source: Future Gas Strategy, Analytical report May 2024.
Note: Only includes contracts that are publicly known.

Australian government agency Geoscience Australia also estimates that [2P reserves](#) at Queensland's coal-seam gas (CSG) fields are sufficient to cover the existing LNG contracts for the three Gladstone plants. It estimates CSG 2P reserves were 29,740PJ at the end of 2021, which equated to 18.5 years based on annual production of 1,607PJ. These reserves also would underpin existing LNG production volumes at Gladstone until almost 2040, when operators such as Santos aim to be net zero in their upstream operations.

Geoscience Australia estimates that less than a quarter of the total CSG resources have been produced as at the end of 2021 (Figure 4). However, the opposite is true for the Gippsland Basin, the largest gas supply source for Victoria. Geoscience Australia estimates that the cumulative production of 2P reserves is about three-quarters of the basin's total gas resource (Figure 4).

Declining southern gas production explains the tightness in eastern Australia's gas market given most domestic demand is in Victoria. Tight market conditions have been exacerbated by unplanned maintenance this year at the Longford gas plant, which processes gas from the Gippsland Basin.

Figure 4: Australia's gas reserves and cumulative production in 2021 (PJ)



Source: Geoscience Australia Gas. Pipeline routes from the GPinfo petroleum database.
Note: LNG=liquefied natural gas, PJ=petajoules

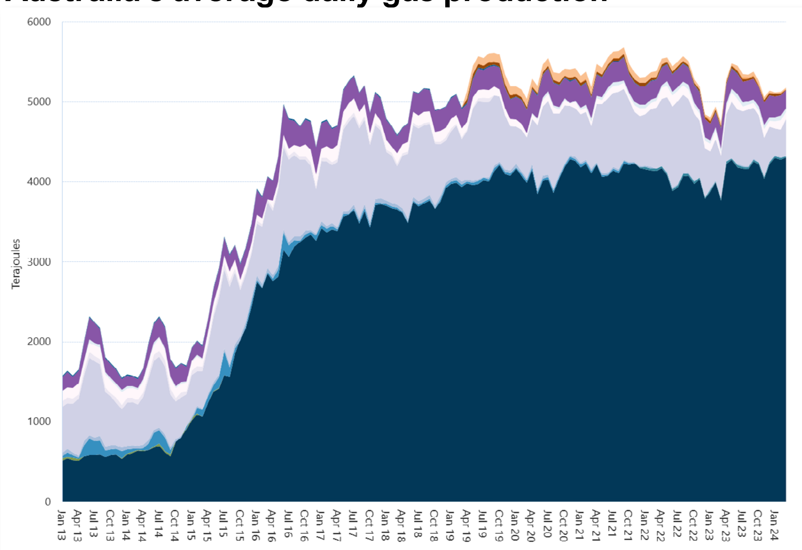
Queensland gas output from 3 of 5 largest fields on decline

Queensland has emerged as a major gas supply source over the past decade due to development of the CSG fields. However, gas production in Queensland is starting to plateau (Figure 5).

Queensland's onshore CSG rose 1.9% in 2023 (to an average of 4,116TJ/d) after slipping 3% in 2022 to 4,038TJ/d from an all-time peak of 4,165 TJ/d in 2021. Apart from the decline in 2022, average daily gas production has risen by 2% or less in three of the past four years, after a sixfold increase from 2013 to 2018.

Furthermore, average daily production at three of Queensland's five largest CSG fields fell by 20% or more between 2019 and 2023. Production varies at the five fields: Combabula, Fairview, Jordan, Ruby Jo and Woleebee Creek. Combabula had record daily output in 2022, whereas Fairview is down 34% from its peak of 469TJ/d in 2017 to last year's average of 309TJ/d. The Jordan field was down 24% in 2023 from its peak in 2020, and the Ruby Jo field was down 20% in 2023 from its peak in 2019. The exception is Woleebee Creek, the state's largest CSG-producing field, which reported record output in 2023.

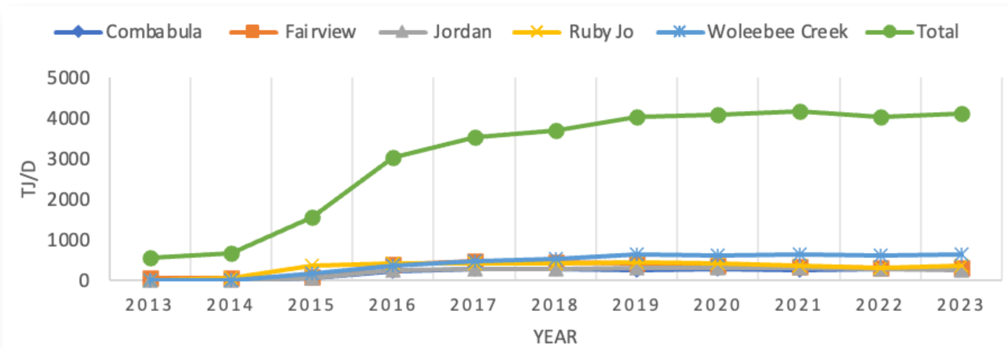
Figure 5: Eastern Australia's average daily gas production



Source: AER Average daily production for production points.

The five top CSG fields accounted for about 44% of Queensland's total CSG production in 2023 compared with more than 50% in 2019 and almost 55% in 2016.

Figure 6: Queensland coal seam gas field output



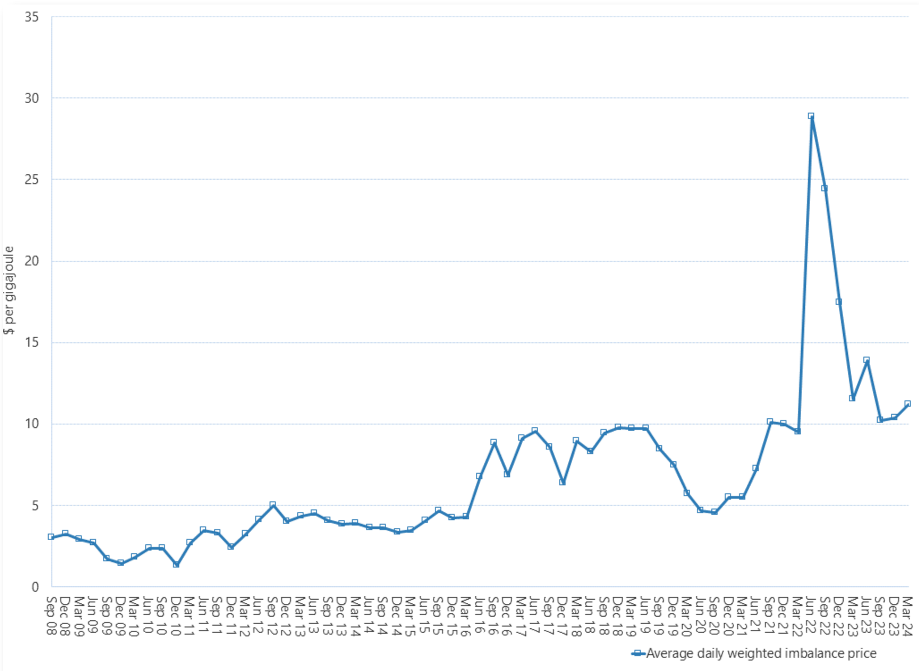
Source: AER Average daily production points in Roma region.

Cost of new gas supplies in eastern Australia higher

The decline in three of Queensland's largest CSG fields means new supply is unlikely to be as prolific as the most profitable fields tend to be developed first, followed by the less economic fields.

The Australian government estimates that new supplies from undeveloped CSG fields in the Surat Basin would cost A$11.64/GJ delivered to Melbourne. This is well above historical price levels for gas sold both under gas supply agreements and in the Victorian Declared Wholesale gas market (Figure 7).

Figure 7: Victorian gas market average daily weighted prices by quarter



Source: AER Victorian gas market average daily weighted prices by quarter.

Other areas hailed as potential new sources of gas by the industry will be even more expensive. Gas from the undeveloped Narrabri fields in the Gunnedah Basin of northern NSW would cost an estimated A$13.50/GJ delivered to Melbourne, and A$14.97/GJ from the Northern Territory's undeveloped fields.

These new sources of gas will push up gas prices, further contributing to already challenging market conditions for commercial and industrial gas users. At these price levels, we are likely to see further demand destruction and offshoring of Australian manufacturing.

More focus on demand measures takes pressure off supply

Instead of looking at developing more expensive gas sources, which will only increase energy costs, more work needs to be done to address demand.

IEEFA analysis found that there are profitable opportunities to reduce gas demand and address the risks of annual or peak day supply gaps.

These measures, which focus on electrification and energy efficiency upgrades, and many of which the Victorian government has outlined in its updated Gas Substitution Roadmap, have the added benefit of reducing household energy bills.

IEEFA analysis has shown that Victorian households stand to save an average of A$1,200 on their annual energy bills by going all-electric, with some households saving even more. Further, reducing residential and industrial gas demand as part of a managed wind-down of gas networks is in the best interests of the energy system as a whole.

About IEEFA

The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

About the Author

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Prior to joining IEEFA, Kevin worked for more than 30 years as a financial journalist for Reuters, Sydney Morning Herald, the Financial Times (FT) and Argus Media. Half of this working period was covering the energy and resources sector both in Australia and the UK. kmorrison@ieefa.org