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Gas Infrastructure Options Report

APA Submission

June 2025

APA Group comprises of two registered investment schemes: APA Infrastructure Trust, ARSN 091 678 778, APA Investment Trust, ARSN 115 585 441. The securities are stapled together and form: APA Group Limited, ACN 091 344 704 to which is the responsible entity of those trusts. The registered office is: Level 25, 580 George Street, Sydney NSW 2000.

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25 June 2025

Andrew Turley
Group Manager – Forecasting
Australian Energy Market Operator (AEMO)

Submitted via email: isp@aemo.com.au

Dear Mr Turley,

Thank you for the opportunity to comment on AEMO's Gas Infrastructure Options Report (GIOR). We appreciate the opportunity to contribute to the important issues raised in the GIOR.

APA is an ASX listed owner, operator, and developer of energy infrastructure assets across Australia. Through a diverse portfolio of assets, we provide energy to customers in every state and territory. As well as an extensive network of natural gas pipelines, we own or have interests in gas storage and generation facilities, electricity transmission networks, renewable generation and battery storage infrastructure.

Gas and electricity markets are becoming more closely connected, given the vital role gas-powered generation (GPG) plays in supporting renewables during the energy transition. Integrating gas into the Integrated System Plan (ISP) provides greater opportunities for AEMO to model, and plan for, the least cost pathway to net zero.

The ISP is relied on by a wide range of stakeholders, and therefore it is critical that the ISP is based on accurate information and reliable cost estimates across the gas value chain. This will ensure that scarce resources are allocated efficiently, and that the energy market develops at least cost to consumers.

Our submission below provides views on many of the issues outlined in the draft GIOR. If you have any questions about our submission, please contact Jack Rowe, Markets Manager on 0421 734 319 or marketsmanager@apa.com.au.

Yours sincerely,

Melinda Buchanan

General Manager Market Services

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OBJ OBJ

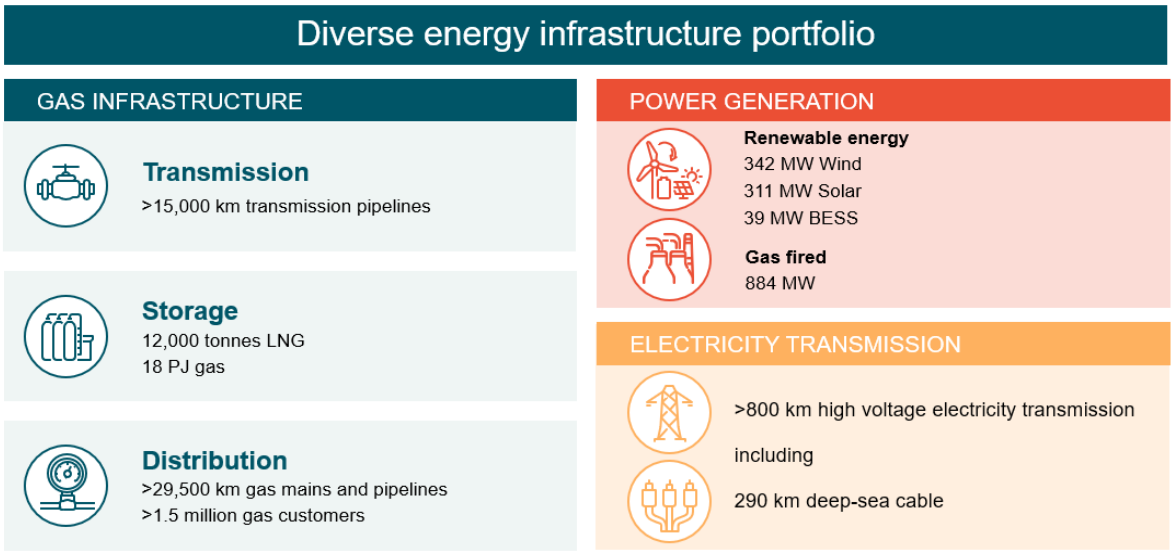
Key points

- The estimation methodology and cost estimates used in the GHD report should be refined for greater accuracy.
- Infrastructure data must be consistent, complete and consider alternative solutions.
- GPG supply is critical to managing supply shortfalls in the ISP.
- Gas storage is an efficient investment to remove infrastructure constraints and support energy security

1.1 APA as a partner of choice in Australia's energy transition

APA is a leading Australian Securities Exchange (ASX) listed energy infrastructure business. Consistent with our purpose of securing Australia's energy future, our diverse portfolio of energy infrastructure delivers energy to customers in every Australian state and territory. For decades we have owned, operated, and maintained some of Australia's most important energy infrastructure.

Figure 1: APA's portfolio



Our 15,000 kilometres of natural gas pipelines connect sources of supply and markets across mainland Australia. We operate and maintain networks connecting 1.5 million Australian homes and businesses to the benefits of natural gas. We also own or have interests in gas storage facilities and GPG.

We operate and have interests in 692 MW of renewable generation and battery storage infrastructure, while our high voltage electricity transmission assets connect Victoria with South Australia, New South Wales with Queensland and Tasmania with Victoria.

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APA supports the transition to a lower carbon future. In September 2024, we published our FY24 Climate Report, detailing our progress against our Climate Transition plan. This plan outlines out commitments to support Australia's energy transition and pathway to net zero operations emissions by 2050.

With our extensive portfolio of assets and expertise across gas, electricity and renewables, APA is well-placed to support the energy transition towards net zero.

1.2 APA's market-driven investments in the east coast market

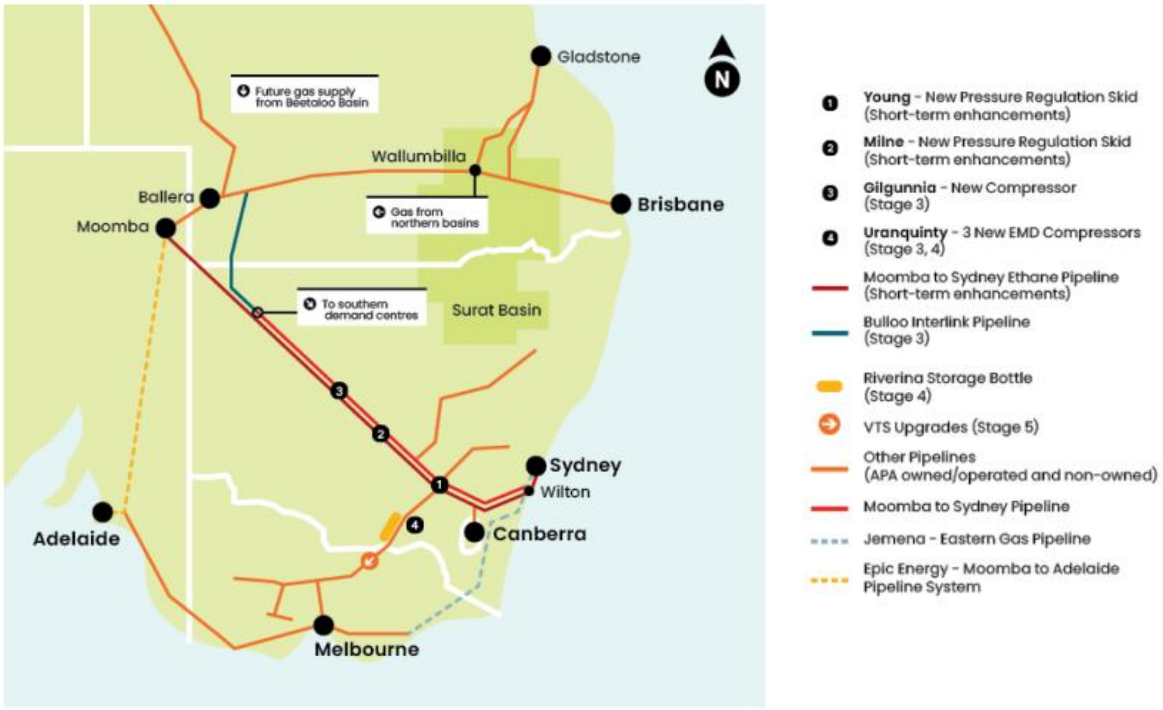
Gas infrastructure operators have a strong track record of delivering the necessary infrastructure to ensure customers have sufficient gas in the locations they need it. Customer needs drive the amount, location and type of investment that takes place. This ensures that only prudent investment is undertaken and results in the efficient allocation of risk between parties. Investment only occurs based on what the market demands and for the cost and risk profile that the market accepts.

In 2024 APA completed the second of the first two stages of East Coast Gas Grid (ECGG) expansion, which delivered 25% additional capacity to the grid. In February 2025, APA announced a five-year ECGG Expansion Plan to deliver an additional ~24% increase in north-to-south gas transport capacity and new southern markets storage to help ensure lower cost and lower emissions domestic gas is available to meet East Coast gas demand and to support the delivery of new gas-powered generation.

The ECGG Plan (see Figure 2 below) outlines Stages 3-5 of the plan, starting with near term projects which have already reached FID and will add new north-to-south gas transport capacity in 2025 and 2026:

- In Q4 2025, the east coast grid expansion will see APA invest ~$25 million to deliver the Moomba to Sydney Ethane Pipeline (MSEP) conversion project to provide an additional ~20 TJ/day from Moomba to Victoria or ~25 TJ/day to Sydney. After conversion to natural gas, the incremental MSEP capacity will increase the total southbound capacity from Moomba to Sydney from 565 TJ/day to 590 TJ/day.
- In 2026, APA will deliver two pressure regulation skids to increase capacity in summer months when specific sections of pipeline maintenance is being undertaken, increasing MSP summer capacity by between 80-120 TJ/day, supporting storage refill ahead of peak winter months.

Figure 2: APA's East Coast Grid expansion plan



The medium-term projects that are progressing with early works will add material further north-to-south gas transport capacity and storage:

- Stage three of the expansion focuses on building capacity to move ~24% more gas between northern basins and southern markets. This includes the proposed delivery of the Bulloo Interlink, a new 380km, 28-inch pipeline connecting the South West Queensland Pipeline (SWQP) to the Moomba to Sydney Pipeline (MSP), and two new compressors on the MSP.
- Stage four of the expansion focuses on the delivery of new storage capacity in winter 2028 and 2029, to support AEMO's forecast need for peaking gas-powered generation, as more variable renewable energy is added to the National Electricity Market
- Stage five of the expansion adds flexibility and amplifies the investments made in stage three and four, delivering capacity upgrades to the Victorian Transmission System.

As it becomes clear that further investment in gas infrastructure is needed, market signals and bilateral contracting will help support the continued expansion of the East Coast gas network. Importantly, these expansions are responding to increases in peak demand in southern markets. This demonstrates that peak demand and system resilience can be addressed by a range of alternative infrastructure and supply options provided by other parties, including storage or gas swaps, and not just by the business case of a single asset.

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1.3 The estimation methodology and cost estimates used in the GIOR should be refined for greater accuracy

Consultation questions

1. Do you have any feedback on the gas infrastructure base costs, adjustment factors and escalation indices provided by GHD?

2. Do you have any feedback on the methodology for the gas infrastructure base costs and forecasts provided by GHD?

3. Do you agree with the proposed forecasting approach of applying a single set of cost escalation indices for gas infrastructure components across all ISP scenarios?

The ISP's purpose is to provide a whole-of-system plan that provides an integrated roadmap for the efficient development of the NEM over the next 20 years and beyond.

Section 2.6 of GHD's Gas Infrastructure Costs report (GHD report) refers to the Capital Expenditure (capex) costs of LNG import terminals and notes that there would be additional capex and Operational Expenditure (opex) costs associated with these projects. GHD's Gas Master Cost Database excludes opex from scope for LNG import facilities despite those costs being a relatively larger portion of the cost base, particularly for Floating Storage Regasification Unit (FSRU) facilities.

The most significant operating cost is the charter cost of the FSRU itself. Estimates of charter fees range from $80k to $120k USD per day (more than AUD $55m per annum) and are subject to extreme price volatility, with the global fleet being limited in size. For example, reported charter costs were in excess of USD $250k per day due geopolitical factors.[11]

Cost forecasts for relatively recent FSRU projects range from ~AUD $850 million to ~AUD $1.75 billion, with a significant portion of this variation attributable to whether the FSRU is leased (10 year cost) or purchased outright.

There are other, less significant, but material operating costs more akin to traditional gas infrastructure that have also been excluded from the GHD Report. These include, but are not limited to:

- personnel to run facilities;
- licensing;
- port fees;
- energy requirements for facilities and;
- gas handling costs (i.e. nitrogen balancing)

When taken in aggregate with the charter costs, these exclusions represent a greater percentage of capex than other gas infrastructure options considered. Their exclusion also risks skewing the results of any analysis contained in the GIOR. Similarly, exclusion of these

[1] https://www.reuters.com/business/finland-agrees-10-year-charter-fsru-us-firm-excelerate-2022-05-20/
https://www.reuters.com/business/energy/snam-invest-1-bln-euros-ravenna-offshore-lng-terminal-2023-11-14/

costs underweights the impact of currency exchange in the escalation indices for LNG import terminals given they are primarily USD denominated costs.

We consider it essential that these costs are taken into consideration when considering gas infrastructure expenditure. This will help the ISP achieve its objective of designing the lowest cost, secure and reliable energy system capable of meeting any emissions trajectory determined by policy makers at an acceptable level of risk.

Section 2.2 of the GHD report refers to the capex costs of pipeline expansions and new builds. The base costs of pipeline expenditure are generally accurate. This is not surprising, given that pipeline capex and opex is regularly reviewed as part of five-yearly access arrangement processes by the relevant regulator.

The GHD Report does, however, assert locational factors (table 5) that appear to be the inverse of those factors in APA's experience. For example, in APA's experience the capital cost of works in urban environments requires a much larger adjustment factor than developments in regional locations.

There is no worked example provided to explain the rationale behind the location adjustment factors. APA recommends that this locational factor be reviewed and or corrected prior to inclusion in the 2026 ISP to avoid additional distortion of pipeline costs.

1.4 Infrastructure data must be consistent, complete and consider alternative solutions.

Consultation questions

4. Do you have any feedback on AEMO's use of GHD's component costs in costing gas infrastructure options?

5. AEMO has proposed to limit sources of new natural gas supply to known contingent (2C) resources provided via the Gas BB and GSOO surveys. Should other sources of new gas be included?

6. Of the list of gas infrastructure options mentioned in Section 3.2.2 and provided in Appendix A2, are there any options that should not be included, or any further options that should be considered?

The GHD Report does not fully interrogate all options available. While the GHD Report does investigate the costs of a range of natural gas projects, it fails to do so in the same detail when looking at upgrades to existing infrastructure.

Section 4.2.1 of GHD's report highlights the expected cost of capacity upgrades to buried pipelines but uses a constrained data source that makes several assumptions. While the earlier sections of the report interrogate compression facilities in more detail, pipeline looping is not interrogated in the same way. The base assumption of additional 17% of construction costs is dated and makes assumptions based on a single project.

1.5 GPG supply is critical to managing supply shortfalls in the ISP.

GPG is expected to play a key role in navigating an orderly and secure energy transition, as well as helping Australia meet its net zero ambition targets.

This is already being played out in South Australia, which closed its last coal power station in 2016. As recent experience has shown, periods of low wind and solar availability require significant volumes of long duration dispatchable resources to be available to support the reliability and security of the system.

Despite the introduction of synchronous condensers in South Australia, GPG remains critical in ensuring sufficient electricity supply, including system strength and long duration firming, and during periods of low wind and solar generation.. In the last week of April and first week of May this year, AEMO directed one of the largest gas power generators in South Australia to continue operating, despite wind and solar producing around 100% of South Australia's generating needs. AEMO advised that it was intervening to "maintain the power system in a secure operating state" and ensure that there was sufficient voltage control in the market.[2]

GPG also provides critical backup to renewables and aging coal powered generation. On 9 June 2025, Yallourn Power Station in Victoria went offline after a collapse of an air duct. This coincided with temperatures in Victoria dropping to 0 degrees Celsius, and low output from wind across southern states. GPG ramped up quickly, provided much needed backup when coal unexpectedly went offline. As was reported widely, this confluence of events resulted in Victoria using 13% of forecasted gas use for the year in three days.[3]

APA's ECG expansions have helped to shore up gas supply to NSW as Victorian gas supplies decline, allowing remaining Victorian production to be directed to meeting Victorian peak gas demand. However, even with APA completing Stage 1 and 2 of our ECG expansion project pipeline, more is needed. AEMO forecasts this north-south transportation of gas will be increasingly relied on to meet southern gas demand, including for GPG.

The ISP should continually consider possible scenarios until there is no constrained GPG supply. In attachment 1 (confidential) we outline possible scenarios in which additional capacity can be achieved through expansions of existing infrastructure.

1.6 Gas storage is an efficient investment to remove infrastructure constraints and support energy security

GPG plays a critical role in managing supply and demand for both the NEM and ECGG. During periods of market instability GPG becomes a critical asset to manage the security of Australia's east cost energy systems.

As coal power stations become less reliable, GPG will be continually relied upon to maintain system security. To ensure GPG will be able to do this without impacting the wholesale market, gas storage bottles will become critical infrastructure to manage the east coast gas supply.

The Gencost report 2023-24 from the CSIRO indicates in 2030, lithium-ion battery costs could reduce by ~40% from today's price to ~$300,000 per MWh. Our internal modelling suggests that even when adjusting for GPG efficiency factors on-site connected to GPG gas storage could be 10 times cheaper than the equivalent level of battery storage capacity in 2030.[4]

In our confidential attachment we outline an indicative design and some expectant capex costs for a gas storage for GPG solution.

2 AEMO, Market notices 126735, 126747, 126782, 126810, 126839

3 Cold winter leads to 13pc of gas budget used in three days amidst Victoria's energy shortage

4 CSIRO Research Publications Repository - Publication

Gas Storage	Energy Equivalence in GWh	Indicative Technical Solution
100TJ	10GWh (assumes a 35% efficiency for an open-cycle gas turbine unit)	Inlet compressor 42” diameter pipeline 34KM pipeline length

With the growing need for storage as security of supply in both the NEM and ECGG there is sufficient information to point to GPG storage as an efficient investment to address security of supply to both systems.

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