



18 July 2024

Submission: Better integrating gas into the ISP (ERC0395)

The Australian Pipelines and Gas Association (APGA) represents the owners, operators, designers, constructors and service providers of Australia's pipeline infrastructure, connecting natural and renewable gas production to demand centres in cities and other locations across Australia. Offering a wide range of services to gas users, retailers and producers, APGA members ensure the safe and reliable delivery of 28 per cent of the end-use energy consumed in Australia and are at the forefront of Australia's renewable gas industry, helping achieve net-zero as quickly and affordably as possible.

APGA welcomes the opportunity to provide comments to the AEMC rule change request to explicitly require AEMO to consider broader gas market conditions in the development of the Integrated Systems Plan (ISP). This rule change request, alongside two others, gives effect to recommendations resulting from the ISP review. APGA provided feedback to the ISP Review Directions Paper,¹ as well as the 2024 Draft ISP.²

As detailed below, APGA considers that the proposed Rule Change Request will improve the integration of AEMO gas market analysis within the ISP. The proposed changes support AEMO to consider the whole energy system in the ISP, enable AEMO to describe the gas market rather than prescribe the gas market, and provide the opportunity for AEMO to avoid inefficient overinvestment in the NEM by enhancing gas demand analysis in future.

APGA looks forward to the implementation of the proposed rule changes in the near future in support of stronger gas market analysis within a more robust ISP.

To discuss any of the above feedback further, please contact me on +61 422 057 856 or jmccollum@apga.org.au.

Yours sincerely,

A handwritten signature in dark ink, appearing to read "JM", is positioned above the typed name of the sender.

JORDAN MCCOLLUM
National Policy Manager
Australian Pipelines and Gas Association

¹ APGA, 2023, *Submission: Integrated Systems Plan Review – Directions Paper*, <https://apga.org.au/submissions/integrated-system-plan-review-directions-paper>

² APGA, 2024, *Submission: Draft 2024 Integrated Systems Plan*, <https://apga.org.au/submissions/draft-2024-integrated-services-plan>

Supporting AEMO to consider the whole energy system in the ISP

Under the National Electricity Rules (NER) AEMO has limited remit to consider gas supply chains in the preparation of the ISP. Consideration of gas is still focused on the perspective of the electricity sector and largely considers gas as it supports gas-powered generation of electricity, rather than considering gas and electricity supply chains separately and equally.

This is not surprising, given the purpose of the ISP as specified in the NER (clause 5.22.2) is to establish a plan for “*the long term interests of the consumers of electricity*” – not consumers of gas.

This has resulted in a clear focus on electricity systems since the first ISP in 2018. As Australia’s energy systems have become increasingly interlinked, however, it has become apparent that a more cohesive view of those energy systems is required.

AEMO does consider some areas of the gas market in its Gas Statement of Opportunities (GSOO), which informs gas power generation forecasts in the ISP. But AEMO does not consider costs associated with gas infrastructure, investment likelihood or commercial feasibility of GPG projects, or availability of gas to service GPG in the quantities or prices modelled for the ISP. All of this will ultimately have impacts on the quality of gas market forecasts in the ISP.

Current forecasts exclude gas transport and storage

The ISP does not currently consider the contribution of gas infrastructure and gas storage. Without consideration of gas infrastructure throughput capacities, the ISP risks modelling higher levels of future GPG gas demand than existing infrastructure can carry.

Introducing rules to consider existing pipeline throughput capacity can help identify when additional capacity is required. The information provided in Gas Development Projections can support private sector investment in new pipeline capacity by identifying where additional throughput is required.

The gas pipeline industry in Australia largely operates under a contract carriage form of market (with notable exceptions, including the Victorian Transmission System). This contract carriage form of market permits the rapid investment in infrastructure when and where it is needed, in marked opposition to electricity transmission project progression under the ISP and its Optimal Development Pathway. Under this form of market, the gas pipeline industry has never failed to deliver the capacity necessary to connect supply and demand when and where it is needed.

Any information provided in the Gas Development Projections must be in support of the market to respond to infrastructure capacity requirements. It must not be used by policymakers to prescribe gas infrastructure development.

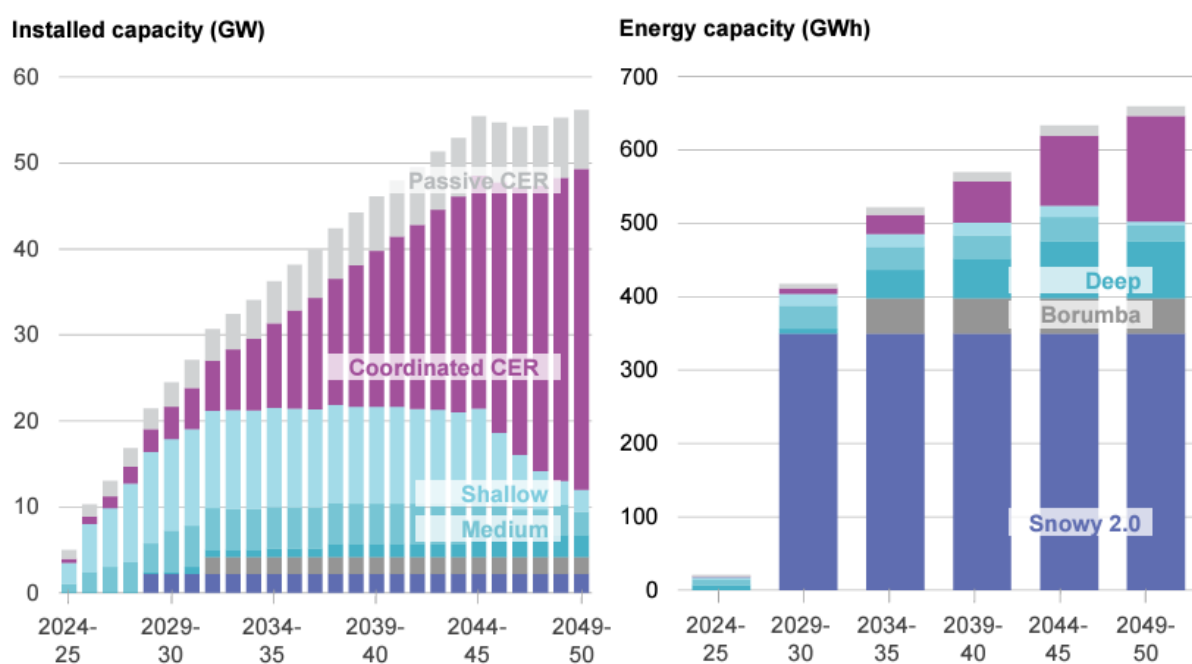
Beyond gas transport, the ISP also does not currently consider gas storage in pipelines or underground storage facilities. Gas storage in pipelines is an extremely cost-effective form of energy storage, with 4 hours of gas storage included for free in most firm pipeline haulage

contracts.³ Firm 24 hour storage is made available at tariffs below \$1 per gigajoule per day or \$3.60 per megawatt hour per day.⁴ Deep gas storage is also available in underground storage facilities costing in the order of 1.4c to 9.7c per gigajoule per day plus one-off injection and withdrawal charges.

All gas storage costs pale in comparison to equivalent electricity storage costs. Yet neither of the above forms of gas energy storage are currently considered in the ISP.

The ISP forecasts the NEM to need 36 GW/522 GWh of storage capacity in 2034-35, rising to 56 GW/660 GWh of storage capacity in 2049-50. Figure 20 of the ISP shows this storage is in the form of batteries, pumped hydro, and consumer energy resources.

Figure 20 Storage installed capacity and energy storage capacity, NEM (2024-25 to 2049-50, Step Change)



The Iona Underground Gas Storage facility in Victoria, just one of several underground storage facilities available in the east coast gas market, has an energy storage capacity of 6,371 GWh. When used in gas power generation, energy stored in Iona can provide over 2,100 GWh of electricity. This is over three days' worth of total NEM demand and three times the storage need identified in the ISP. By way of comparison, the Snowy 2.0 PHES project has an expected storage capacity of 350 GWh.

Noting both the substantial cost and scale disparity between forms of gas and electricity storage, an ISP which does not consider gas storage risks substantially overestimating the scale of electricity storage required in a net zero NEM. AEMO has been aware of this for

³ AEMC, 2024, *Gas pipeline register*, <https://www.aemc.gov.au/energy-system/gas/gas-pipeline-register>

⁴ ACCC, 2023, *Gas inquiry 2017–2030 Interim report January 2023*, https://www.accc.gov.au/system/files/Gas%20Inquiry%20-%20January%202023%20interim%20report%20-%20FINAL_0.pdf

some time but has not had the remit to include gas storage in ISP analysis.⁵ It is hoped that the changes proposed within this rule change request will address this.

Describe the gas market rather than prescribe the gas market

Proposed changes will require AEMO to develop 'gas development projections' to *inform* the Optimal Development Pathway for electricity, rather than developing a separate prescriptive pathway for gas. As APGA noted in previous comments on the ISP Review, a prescriptive approach to gas infrastructure planning would undermine the existing contract carriage gas transmission infrastructure market. Instead, the proposed approach requires AEMO to work with gas market stakeholders to set out how it expects the gas sector to develop. APGA strongly supports this approach.

As a part of this approach it is suggested that AEMO should aim to identify and publish information on where risk of demand shortfall arises as a result of infrastructure capacity. This would inform private investments to connect supply to demand.

The changes also require AEMO to consider gas market benefits and costs associated with gas production, transport, pipeline access availability and storage needs. APGA supports AEMO introducing additional pipeline and renewable gas supply related data into the Inputs, Assumptions and Scenarios Report (IASR) via CSIRO's annual GenCost Report or some form of adjacent report.

Positive step to use existing data

APGA supports the approach of providing AEMO the authority to use gas market information obtained under the NGR to develop the ISP. AEMO holds considerable information on the gas market, and as seen in the discrepancy described above with gas storage capacity. Simply enabling the use of this data rather than requiring duplicate reporting aligns with APGA advice, and limits the burden on gas market participants responding to duplicate information requests. APGA hopes that this is the start of a trend amongst Australian energy regulators and agencies.

Expansion to AEMO gas demand modelling approach is necessary

AEMO's responsibility in developing the ISP as specified in the National Electricity Law (NEL) is to act in *the long term interests of consumers of electricity* with respect to price, safety and decarbonisation⁶. Importantly, this does not require AEMO to act in the best interest of gas customers. As a result, the ISP has not prioritised modelling the least cost decarbonisation pathway for gas consumers. However, recent analyses of gas use decarbonisation indicates that the least cost decarbonisation pathway for Australian gas consumers requires a combination of electrification and renewable gas supply – in contrast to ISP assumptions.

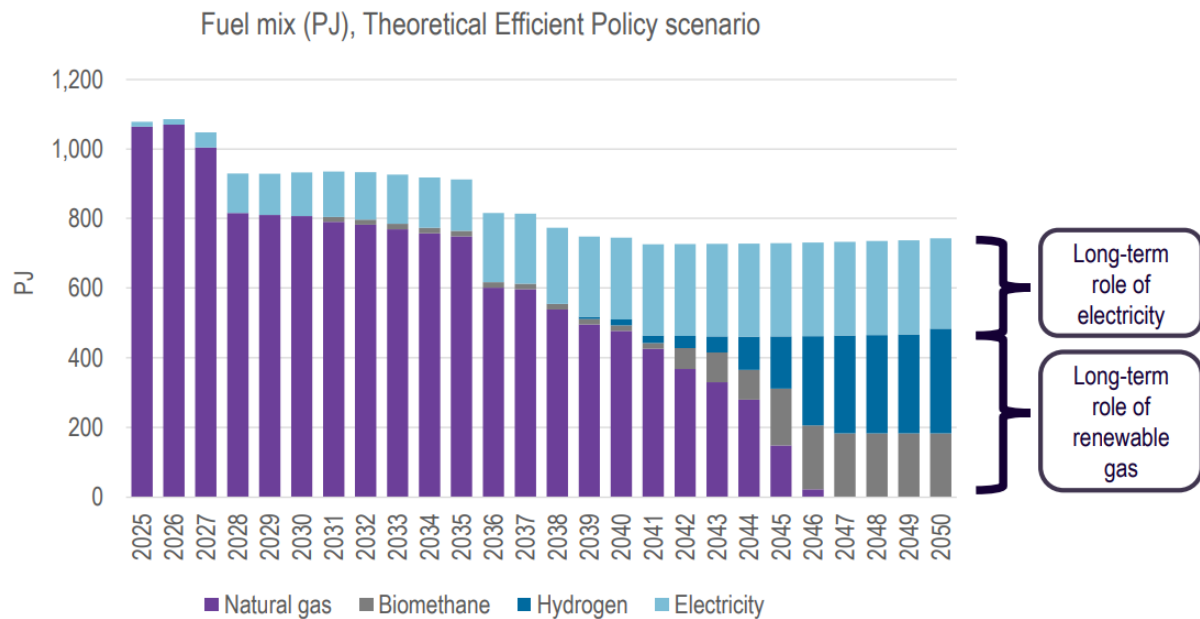
IASR scenarios used by the ISP currently reference gas electrification rates from CSIRO Climateworks Centre Multi-sector modelling. However, the core Climateworks scenarios

⁵ AEMO, 2021, *Victoria's Gas Substitution Roadmap*, p10, <https://engage.vic.gov.au/download/document/17466>

⁶ Government of South Australia, 2024, *National Electricity (South Australia) Act 1996*, [https://www.legislation.sa.gov.au/_/legislation/lz/c/a/national%20electricity%20\(south%20australia\)%20act%201996/current/1996.44.auth.pdf](https://www.legislation.sa.gov.au/_/legislation/lz/c/a/national%20electricity%20(south%20australia)%20act%201996/current/1996.44.auth.pdf)

exclude 100% hydrogen appliances and only consider very high cost biomethane produced through gasification⁷ (as opposed to anaerobic digestion considered in the Australian Bioenergy Roadmap⁸). These factors act to prevent core scenarios from considering a renewable gas alternative to electrification for most customers.

On the other hand, analysis by ACIL Allen takes 100% hydrogen appliances and reasonable biomethane cost into account in modelling of least cost gas use decarbonisation. This analysis finds that the least cost decarbonisation pathway for Australian gas consumers is achieved through a combination of electrification, hydrogen and biomethane uptake.⁹



This finding has implications for gas and electricity customers alike. ISP core scenarios currently assume mass electrification of residential and commercial gas customers based on assumptions which exclude alternatives (100% hydrogen) or introduce them at artificially high prices (biomethane). A more realistic approach would not artificially exclude or assume unnecessarily high prices for alternatives with the result of unnecessarily high electrification.

Including unnecessarily high electrification rates (hence unnecessarily high electricity demand) in the ISP risks inefficient overinvestment in the NEM. Higher than necessary electricity demand risks higher than necessary electricity transmission capacity upgrade recommendations from the ISP. This higher than necessary variable electricity demand also risks higher than necessary electricity storage capacity requirements from the ISP.

⁷ CSIRO Climateworks Centre, 2022, *Multi-sector energy modelling 2022: Methodology and results Final report*, https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2022/2023-inputs-assumptions-and-scenarios-consultation/supporting-materials-for-2023/csiro-climateworks-centre-2022-multisector-modelling-report.pdf

⁸ ENEA, 2021, *Australia's Bioenergy Roadmap*, <https://arena.gov.au/assets/2021/11/australia-bioenergy-roadmap-report.pdf>

⁹ ACIL Allen, 2024, *Renewable Gas Target - Delivering lower cost decarbonisation for gas customers and the Australian economy*, <https://apga.org.au/renewable-gas-target>

An ISP which recommends higher than necessary transmission and storage capacity upgrades in the NEM does not act in *the long term interests of consumers of electricity* with respect to price, safety and decarbonisation as AEMO is required by the NEO and NEL.

APGA hopes that the additional data made available to AEMO via this rule change, alongside AEMO's requirement to act in *the long term interests of consumers of electricity* with respect to price, safety and decarbonisation, will enable AEMO to undertake more robust analysis of least cost gas use and decarbonisation. In doing so, AEMO will avoid inefficient overinvestment in the NEM as a result of unnecessarily high electricity transmission and storage capacity projections in the ISP.



Consultation Questions

<p>1. Should greater gas market analysis be required under the ISP?</p> <p>a) Would requiring AEMO to include greater analysis of gas in the ISP provide benefits to electricity consumers? This includes information to inform the following: further analysis of future gas demand and pricing, developing projections about the future utilisation of gas infrastructure, collating pipeline closures or conversion dates, reflecting updated gas generator fuel costs.</p> <p>b) Should the rules be amended to enable AEMO to utilise gas information provided to it under other functions?</p>	<p>APGA agrees that greater gas market analysis should be required of AEMO. APGA does not agree with a prescriptive approach to gas market analysis and recommends that any Gas Development Projections be used to inform the market rather than prescribe infrastructure development.</p> <p>That AEMO is not able to consider the gas market in detail for the ISP affects the quality of both gas market projects, and the impact of this on its electricity market projections.</p> <p>For example, the ISP does not currently consider the contribution of gas infrastructure and gas storage. This risks both modelling higher levels of future GPG gas demand than existing infrastructure can carry, and modelling higher reliance on battery and hydro storage.</p> <p>APGA agrees with the proposal to amend the rules to allow AEMO to use the gas market information already provided to it for other functions to fulfil its functions under the NER.</p>
<p>2. Will the proposed solution support a more robust ISP by better integrating gas and electricity infrastructure developments?</p> <p>a) Will requiring AEMO to carry out further analysis of gas in the ISP improve the ISP analysis? Why or why not?</p> <p>b) Is it appropriate for AEMO to use gas information available to it under the NGR for the purpose of the ISP? Are there any risks that we should be aware of in extending the use of or publication of specific information?</p>	<p>Requiring AEMO to undertake further analysis of gas infrastructure and markets will materially improve the quality of analysis in the ISP as a whole. AEMO already has a good understanding of gas markets and collects a significant amount of information for the GSOO and for other purposes. Contributing this understanding to the development of the ISP will improve projections of GPG.</p> <p>AEMO should take care of information confidentiality when utilising information provided to it for other purposes, especially disclosures regarding specific pieces of infrastructure.</p>

<p>3. What are your views on the costs and benefits of requiring AEMO to undertake additional gas analysis in the ISP?</p> <p>a) What do you consider to be the benefits of the proposed solution? Is there anything that might erode the benefits of reduce the likelihood of the benefits being achieved?</p> <p>b) What do you consider to be the costs of the proposed solution?</p>	<p>Rules that enable AEMO to appropriately consider gas markets will allow it to fulfil the ultimate purpose of the ISP, which is to act the long term interests of consumers of electricity with respect to price, safety and decarbonisation.</p> <p>These rule changes will drive greater consideration of gas markets as a whole in both the ISP and the GSOO. APGA considers this to be for the benefit of all market participants.</p>
<p>4. What implementation considerations need to be considered?</p> <p>a) Do you have any concerns about sharing gas information received under the NGR for the purposes of developing the ISP? Is there sufficient clarity on what information should and should not be publicly disclosed?</p> <p>b) Are there any other implementation issues that should be considered?</p>	<p>AEMO should consider the confidentiality requirements of the information it already collects and consult with stakeholders over the specific information it may wish to access.</p> <p>Similarly to how it handles information provided to it for the electricity market, the commercial sensitivity of such information should be carefully considered.</p>
<p>5. Are there alternative ways in which further analysis can be included within the ISP instead of the proposed rule change?</p> <p>a) Would the development of a procedure or policy enable the same outcome?</p> <p>b) What level of prescription vs principle is appropriate when setting out the requirements for the ISP?</p>	<p>APGA has previously recommended that AEMO be resourced and given the appropriate capability to undertake multi-vector modelling that would consider electricity and gas supply chains separately and equally. This could be done through new modelling approaches, or adapting existing modelling, such as that done by the University of Melbourne. Researchers modelled the optimal greenfield integrated planning of electricity and hydrogen transmission and storage infrastructure.¹⁰ A similar approach could be followed in undertaking dual gas and electricity demand modelling.</p>

¹⁰ Mhanna S, Saedi I, Mancarella P, 2023, *Transport and Storage Options for Future Fuels: Hydrogen transport with linepack and underground storage*, University of Melbourne for the Future Fuels CRC, https://www.futurefuelscrc.com/wp-content/uploads/FFCRC-RP1.1-02B-RES-transport-options-Linepack-and-UHS_open-access.pdf