11 February 2025

Submission: 2025 Inputs, Assumptions and Scenarios – Stage 1

The Australian Pipelines and Gas Association (APGA) welcomes the opportunity to comment on AEMO's consultation on Stage 1 of the 2025 Inputs, Assumptions and Scenarios Report. As has been emphasised by the Energy and Climate Ministers Council and through the ISP Review, it is critically important that the assumptions for the ISP are both factual and realistic. APGA welcomes the amendments to the IASR process following the ISP Review, particularly the treatment of gas and gas infrastructure.

The majority of these assumptions will be detailed in Stage 2. APGA looks forward to reviewing these factors, but provides below comments on aspects of Stage 1.

Scenarios

Are the scenarios, and the scenario collection, suitable for use in AEMO's planning publications including the 2026 ISP? Does the scenario collection support the exploration of a diverse range of possible futures that could occur over the planning horizon?

- The scenario collection presents a reasonable evolution and refinement of the scenarios considered for previous ISPs.
- APGA agrees with the moderation of *Step Change* and *Progressive Change* to reflect a more likely future where consumers are less engaged with CER.
- APGA also agrees the projected offshoring of major industrial loads in *Progressive Change* reflects a more realistic future in this scenario. The risk to these industries of high energy prices or lack of reasonable decarbonisation pathways is significant.

Which of the two described scenario variants for the Green Energy scenario is the more appropriate variant for application as the scenario in AEMO's 2025 IASR scenario collection?

- Of the two *Green Energy* variants, *Green Energy Industries* is a more desirable scenario from the perspective of the pipeline industry. A domestic focus on green hydrogen development enables adaptive reuse of Australia's considerable pipeline asset base, while enabling decarbonisation of existing gas use.
- This requires enabling of a gas decarbonisation pathway *alongside* an electrification pathway. To date, state and Federal governments' policy decisions have not specifically prioritised a dual decarbonisation pathway and policies enabling the development of renewable gas industries, although there is progress with the passage of the GO Scheme and the Hydrogen Production Tax Incentive.

Are the scenarios parameters, and parameter values, clear and suitably aligned with their respective narratives?

- The scenario parameter values are aligned with the settings of their respective narratives.
- APGA notes renewable gas blending in gas distribution network in all scenarios is restricted to 10% hydrogen (unlimited for biomethane). This remains the same as in the 2023 IASR, despite indications that a much higher blends are possible with minor modifications to infrastructure.
- APGA has previously addressed why this is inappropriate, given that trial hydrogen injection facilities such as AGIG's Adelaide, Murray Valley and Gladstone injection projects and ATCO's south Perth injection project are already targeting 10% blends in the short term.
- AEMO should reconsider this ceiling on hydrogen blending remaining at 10% for the duration of the ISP forecast period.

Biomethane

- We have previously noted the incorrect assumptions around the cost of biomethane in the ClimateWorks AusTIMES model, which affects how this model treats biomethane and renewable gas investment generally.
- APGA is pleased to see that AEMO has engaged ACIL Allen to forecast biomethane production cost and available volumes by feedstock type, state, and scenario.
- These forecasts include costs for biomethane produced using anaerobic digestion, rather than just from gasification as in ClimateWorks. This will reflect a much more accurate, and considerably lower, cost gradient for biomethane as well as more accurate supply curves.
- APGA looks forward to reviewing the biomethane production forecasts per scenario in Stage 2 of the Draft 2025 IASR, and to reviewing how the biomethane production costs have been fed back into the ClimateWorks modelling to provide a more accurate picture of the development of the industry.

Consumer energy resources

Are the CER forecasts suitable for their respective scenarios? What strategic factors do you consider may influence CER projections?

- The ECMC has requested AEMO undertake additional consideration of the uptake of CER and distributed resources. This is appropriate given that, as noted in the ECMC response to the ISP review, "the investment decisions taken… by households and businesses are impacted by a range of factors that extend beyond consideration of whole-of-system efficiency alone."[1] That is, households don't necessarily consider the energy system that extends beyond their fence line.
- Recent domestic economic trends, including rising energy prices and inflation, may prompt some homeowners to invest in CER. It may prompt others to delay investment in CER, where the costs of that technology are prohibitive.

[1] Energy and Climate Ministerial Council, 2024, *Response to the Review of the Integrated System Plan*, https://www.energy.gov.au/sites/default/files/2024-04/ecmc-response-to-isp-review.pdf

- Recent decisions to reduce solar feed-in tariffs[2] or permit the introduction of two-way tariffs ('solar soaking')[3] may act to discourage households to invest in new CER, where household battery systems that would offset the impact of such policies remain financially unviable. Policies to support, or otherwise incentivise engagement with VPP may not be sufficient to overcome poor consumer perceptions.[4]
- APGA considers AEMO's speculative approach to weighting these factors across scenarios appropriate, particularly the significant moderation of aggregated VPP capacity in *Step Change*.

Liquefied natural gas

- The LNG industry in Queensland is a large draw on the NEM. As decarbonisation policies such as the Safeguard Mechanism begin to enforce declining emissions baselines for large emitters, this is likely to increase regardless of LNG demand forecasts.
- LNG production is a considerable contributor to Australia's greenhouse gas emissions. Scope 1 emissions of LNG production for 2019-20 across Australia were approximately 38 Mt CO_2e, with a significant proportion of this from the liquefaction process.[5]
- Hence there will be considerable incentive for LNG producers to reduce the emissions intensity of their compression trains. This may be achieved in some cases through use of renewable gases. Electrification of those trains is a more likely pathway, which will place considerable additional demand on the NEM.
- The impact of this on electricity demand should be considered in more detail in the IASR.

Energy storage

Existing gas storage

- APGA anticipates that Stage 2 of the IASR will cover the contribution of gas storage – in pipelines in the form of linepack, and underground storage facilities such as Iona.
- APGA has previously engaged with AEMO and DCCEEW on the lack of this data contributing to energy storage calculations and forecasts in previous ISPs.
- For example, the 2024 ISP indicates the need for substantial energy storage uplift. The NEM is forecast to need 36 GW/522 GWh of storage capacity in 2034-35, rising to 56 GW/660 GWh of storage capacity in 2049-50. In terms of installed capacity, much of this demand is expected to be met by passive and coordinated consumer energy resources (CER), but it is the shallow, medium and deep grid-connected storage which will be key to maintaining energy system reliability.

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[2] Essential Services Commission, 2025, *Minimum feed-in tariff review 2025-26*, https://www.esc.vic.gov.au/electricity-and-gas/prices-tariffs-and-benchmarks/minimum-feed-tariff/minimum-feed-tariff-review-2025-26

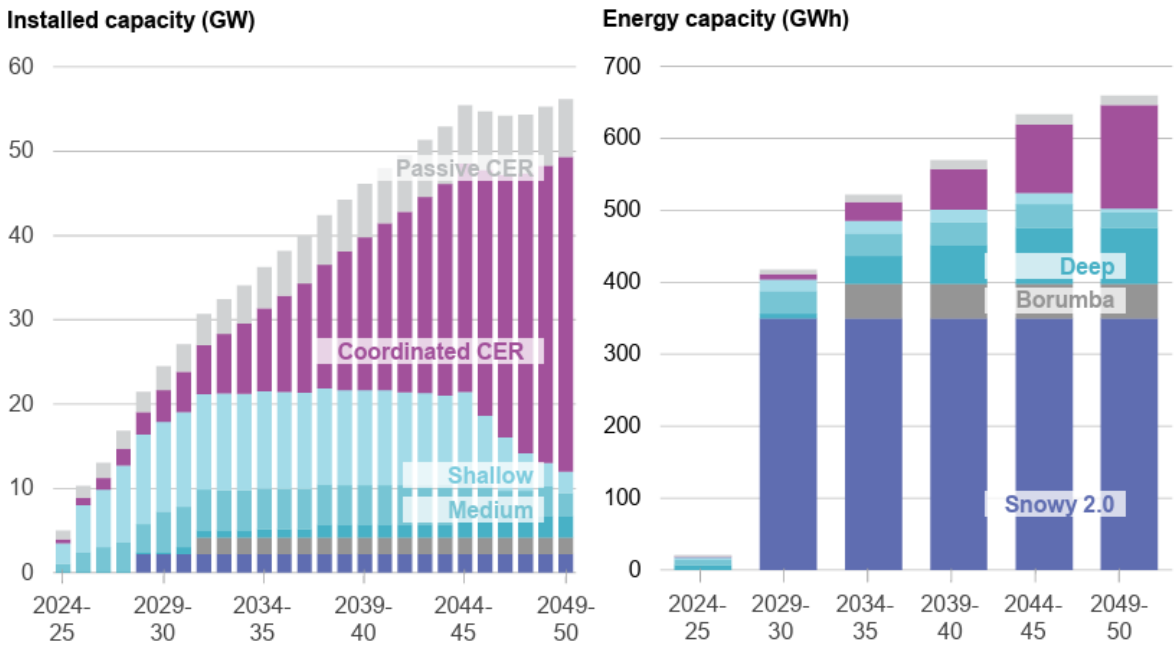
[3] AEMC, 2021, *Access, pricing and incentive arrangements for distributed energy resources*, https://www.aemc.gov.au/rule-changes/access-pricing-and-incentive-arrangements-distributed-energy-resources

[4] ABC News, 2024, *Energex remotely cuts power to 170,000 air conditioners six times in a month*, https://www.abc.net.au/news/2024-01-31/energex-ergon-peaksmart-air-con-cuts-during-hot-weather/103385474

[5] CSIRO, 2022, *Greenhouse gas emissions from the liquified natural gas industry in Australia*, https://agit.org.au/wp-content/uploads/2023/05/Greenhouse-gas-emissions-from-LNG-CSIRO-final.pdf

- The ISP details expected installed capacity and energy storage capacity to 2050. These figures are conspicuous for what is missing: current gas storage capacity.

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



- AEMO identified this scale of gas storage capacity in its submission to the Victorian Gas Substitution Roadmap consultation in 2021.[6] As seen in Table 1 from its submission below, AEMO identifies that the Iona Underground Gas Storage facility, just one of several underground storage facilities available in the east coast gas market, has an energy storage capacity of 6,371 GWh - over three days' worth of total NEM demand.
- When used in gas power generation, energy stored in Iona can provide over 2,100 GWh of electricity.

Facility / technology	Energy storage (MWh)
Tesla Powerpack 2	0.20
Toyota Mirai hydrogen tank	0.22
Hornsdale Power Reserve Battery (and expansion)	129 (up to 193.5)
Victorian Geelong Big Battery (under construction)	450
Dandenong LNG tank	182,000
Victorian Gas Declared Transmission System	233,000
Snowy Hydro 2.0 (planned)	350,000
Iona Underground Gas Storage	6,371,000

[6] AEMO, 2021, *Victoria's Gas Substitution Roadmap*, https://engage.vic.gov.au/download/document/17466

- The Victorian Declared Transmission System – the gas pipelines which connect Iona to Victorian gas customers – includes 233 GWh of linepack storage in and of itself, comparable to Snowy 2.0 with 350 GWh.
- In not considering gas storage accessed through GPG, the ISP may risk substantial overinvestment in energy storage and transmission infrastructure.

Future hydrogen storage

- Where the IASR makes assumptions about the future of grid-scale and distributed battery storage systems, it should also include consideration of underground hydrogen energy storage systems (HESS).
- In 2024, Frontier Economics undertook an economic analysis of the value of underground hydrogen storage in the context of the NEM, to support Lochard Energy feasibility study into the commercial and technical viability of storing renewable hydrogen underground in existing gas reservoirs in southwest Victoria.[7]
- This ARENA-funded report makes clear that underground HESS is an important part of a least cost hydrogen supply chain and will enable lower cost hydrogen production. Underground HESS will reduce the need for firmed electricity generation, changing the energy storage capacity mix and reducing reliance on very expensive BESS systems.
- APGA recommends that AEMO's consideration of storage capacity options include HESS, both to contribute to energy storage forecasts and to contribute to projections for the development of the hydrogen industry.

To discuss any of the above feedback further, please contact me on +61 409 489 814 or crafael@apga.org.au.

Yours sincerely,

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[7] Frontier Economics, 2024, *The value of hydrogen storage*, https://arena.gov.au/assets/2024/12/Lochard-Energy-H2RESTORE-Feasibility-Study-Public-Report.pdf