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THE CENTRE FOR INDEPENDENT STUDIES

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Mr Daniel Westerman
Chief Executive Officer
Australian Energy Market Operator
Lodged by email: forecasting.planning@aemo.com.au

RE: Submission to Draft 2025 Inputs, Assumptions and Scenarios Report Stage 2

Dear Mr Westerman

The Centre for Independent Studies (CIS) appreciates the opportunity to provide a submission to the Australian Energy Market Operator (AEMO) on its Draft 2025 IASR Stage 2.

The CIS is a leading independent public policy think tank in Australia. It has been a strong advocate for free markets and limited government for more than 40 years. The CIS is independent and non-partisan in both its funding and research, does no commissioned research nor takes any government money to support its public policy work.

This submission adds to the concerns expressed in our submission to Stage 1 regarding the IASR's faith in government policy being achieved, and other assumptions.

Further optimistic and questionable assumptions have been made in Stage 2.

- The sensitivity analyses proposed do not go far enough to test against likely eventualities, such as coal extensions, policy failure or change, and cost blowouts, and therefore fail to sufficiently ward against the risk of overinvestment in transmission.
- The carbon budgets binding the scenarios are too narrow to allow the model to appropriately trade off costs in likely future scenarios.
- Consumer Energy Resource projections, such as those for BEVs, are overly optimistic. Installation cost escalation estimates have been underestimated.
- The *Progressive Change Scenario* relies too heavily on reduced future demand to meet binding carbon constraints.
- The reliance on a future ultra-flexible hydrogen industry emerging despite numerous cancellations and suspensions of recent projects is one of the most critical flaws in the IASR.

It is also disappointing that AEMO did not extend the deadline for submissions until after the CSIRO's multi-sectoral modelling was published. This report is an input to many parts of the IASR and excluding it from stakeholder consideration reduces the transparency of the IASR's consultation process.

We urge AEMO to address the flaws in the IASR's assumptions as outlined in both our submissions, and to give stakeholders timely access to all reports used as inputs in future.

Yours sincerely
Aidan Morrison
Director
Centre for Independent Studies Energy Program

1. Sensitivities

Do you have any further views on the proposed sensitivities? What additional uncertainties are valuable to explore with sensitivity analysis?

AEMO has not clarified whether the 'Alternative coal retirement schedules' sensitivity will include delayed retirements. It is critical that the impact of delays is incorporated in the model. Rather than just a sensitivity, a scenario should be included that depicts a future in which coal retirements are delayed until the end of each plant's technical life, with the carbon budget restraints lifted accordingly. A sensitivity should then test the effect of coal plant retirements being delayed until the plant has achieved a 50-year lifespan. This is necessary because recent experience has shown that coal plant extensions are far more likely to occur than retirements being brought forward, as in the case of the NSW Government recently securing a 2-year extension for Eraring.[1] Likewise in the case of Liddell, a coal plant with an expected lifespan of 25 years[2] ended up being in operation for 52 years.[3] If new generation is not brought on to replace coal at the rate assumed by the ISP, more announcements of extensions will likely follow and should be included in the scenario collection.

As outlined in our submission to the Draft 2025 IASR Stage 1, the IASR ignores policy uncertainty, making the scenario collection too narrow to be useful for depicting realistic futures that may occur. If policy uncertainty is to be ignored in the scenario collection, it should at least be addressed in sensitivity testing by including a sensitivity in which government targets are missed. This sensitivity should take into account the slow rollout of renewables in recent years and delays to transmission and storage projects, such as Snowy 2.0.

The current 'Constrained supply chains' sensitivity is insufficient for this purpose. It assumes a gradual easement of supply chains by 2035.[4] This is unrealistic for lithium-ion batteries, with chronic lithium shortages expected post-2030 and an acute supply gap projected by 2035.[5] Other, more expensive battery technologies may be used for grid storage, but the added costs must be taken into account. The 'Constrained supply chains' sensitivity assumes cost increases of only 30% for storage, despite Snowy 2.0 having blown out by 600%, with further cost increases possible.[6] It also assumes up to 50% cost increases for transmission projects despite many of these projects having already blown out 100-500% in the span of four years.[7] This sensitivity needs to explore more significant cost blowouts and longer delays. However, ideally this should be dealt with in a scenario, given the high likelihood of cost blowouts and delays arising from workforce shortage risks AEMO identified in its workforce report.[8]

AEMO should also include — ideally as a scenario, but at least as a sensitivity — a nuclear rollout; given there is a possibility this may become government policy in a few months' time. This is important to include if the risk of over-investment is to be adequately

addressed, given it would likely involve a significant reduction in the investment required for state interconnectors.

While testing low CER uptake in a sensitivity is better than not testing it at all, it does not go far enough. CER should be co-optimised with large-scale generation, as explained in our submission to Stage 1. Without doing this, the ISP cannot be said to be 'lowest cost'. In testing the effects of low CER uptake, the effects on transport electrification from reduced EV uptake (and larger vehicles) needs to be taken into account in the model, given the large contribution of the transport sector to electrification.

Another sensitivity that should be included is a technology-neutral WACC and discount rate sensitivity. As outlined in our submission to Stage 1, AEMO's proposal to use technology-specific WACCs and discount rates will bias the model towards building projects that are less risky for investors and riskier for consumers. Ideally, technology-specific WACCs and discount rates should not be used; but if they are, a technology-neutral sensitivity should be included to ensure any biases in the modelling are identified.

2. Alignment with the IPCC's Relative Concentration Pathways

Do you consider the proposed carbon budgets to be appropriate?

The range of 2025 emissions trajectories has been narrowed even further compared to the 2023 range. This further exacerbates the problem of the scenario collection not being sufficiently broad or distinctive to test for the risk of over-investment, as outlined in our submission to Stage 1. There is also doubt about whether these emissions trajectories are plausible, given the lack of progress in total Australian emissions reduction in recent years and projections that suggest the 42% below 2005 levels by 2030 target will not be hit without additional measures to those being implemented by state and federal governments currently.[9] A broader range of emissions trajectories and carbon budgets should be included in the scenario collection to provide an indication of the trade-offs between cost and emissions reduction, instead of every scenario being bound to government targets regardless of whether they are achievable. Ideally, a baseline scenario should be included as a comparison which does not enforce a carbon budget on the model.

3. Multi-sectoral modelling influences to demand forecasts

Are the key assumptions and outcomes described in Table 15 suitably aligned with scenario definitions?

In *Progressive Change*, weaker economic growth is expected to curtail investment in electrification, particularly residential, which reduces overall demand. However, energy efficiency is still assumed to contribute significantly to decarbonisation. These reductions in demand will allow carbon targets to be met with a slower renewables rollout. However, there is no scenario in which these reductions do not occur at the scale suggested and instead demand remains high with a slower renewables rollout. Such a scenario must be

included to ensure the scenario collection is broad enough, and would likely mean carbon budgets would not be met. This highlights the importance of including at least one scenario that is not bound by all government targets to ensure a sufficient range of likely futures is accounted for.

4. Consumer energy resources

Is the projected long-term trend of PHEV reasonable?

BEVs' fleet share is assumed to grow an order of magnitude, with its sale share exceeding 90% by 2036. This unrealistic considering the distribution network upgrades and charging infrastructure that would be necessary to support such an expansion. Recent data does not demonstrate widespread growth in BEV demand, with BEV market share being the lowest in Q3 2024 than it has been since 2022.[10] The relatively high growth in Hybrid and PHEVs suggests these vehicle types are more likely to outpace BEV sales in future years. The current forecasts are therefore unrealistic and the BEV sales projections should be substantially reduced compared to ICE and Hybrid vehicles sales in the forward outlook.

5. Energy efficiency forecast

Are SPR's results sufficiently aligned with the role of energy efficiency in optimised decarbonisation pathways (as revealed by CSIRO's multi-sectoral modelling approach)?

AEMO should have ensured stakeholders had access to the CSIRO's updated multi-sectoral modelling underpinning much of the current IASR while drafting submissions. It is disappointing that this has not been published prior to the close of submissions for Stage 2, as this reduces the transparency and accountability of the IASR development process.

6. Impacts of planning, environmental and supply chain considerations

Do you consider the installation cost escalation forecasts for each technology to be reasonable?

The installation cost escalation forecasts should account for the cost of decarbonising materials, given this is assumed as part of the scenario narratives. These increased costs will affect inputs such as steel, concrete and freight. Neglecting to include the increased costs of green steel, green cement and hydrogen-powered trucks reduces the accuracy of the cost estimates and leads to the scenarios being inconsistent.

For wind and solar projects, increased costs due to less ideal siting should be included. As the proposal for the Hills of Gold wind farm states, "Many of the 'easiest' i.e. most favourable sites in NSW have already been developed. Hence the pipeline of remaining sites all have less than ideal conditions in one or more respect".[11] This can include more difficult

terrain that may requiring more clearing than previous sites, which causes costs of subsequent projects to escalate over time.

7. Production cost and capabilities

Do you agree with the assumed minimum electrolyser utilisation factors?

As outlined in our submission to Stage 1, the IASR scenarios should not rely on a green hydrogen industry materialising. To date, 99% of the announced capacity of hydrogen projects has not progressed beyond the concept or approval stage and less than 300,000 tonnes a year has reached a final investment decision or started construction.[12] As listed in Table 1, many major hydrogen projects have been cancelled or suspended despite government subsidies. Recent experience therefore suggests that green hydrogen production remains uneconomical and therefore should be relegated to a sensitivity test if included as an assumption at all.

Table 1. List of cancelled or suspended hydrogen projects.

Cancelled or Suspended Projects	Location	Status	Source
Central Queensland Hydrogen Project (CQ-H2)	Gladstone, QLD	Cancelled; investors withdrew	Courier Mail
Hunter Valley Hydrogen Hub	Hunter Valley, NSW	Cancelled; Origin Energy withdrew	Reuters
Hydrogen Energy Supply Chain (HESC) Project	Latrobe Valley, VIC	Suspended; construction delays	Reuters
South Australian Government Hydrogen Facility	Whyalla, SA	Cancelled; funding redirected	InDaily
Crystal Brook Energy Park	Port Pirie, SA	Archived; no longer active	InDaily
Port Pirie Green Hydrogen Project	Port Pirie, SA	Cancelled due to costs	The Australian
Torrens Island Green Hydrogen Hub	Torrens Island, SA	Archived; regulatory challenges	InDaily
HyEnergy Project	Gascoyne region, WA	Suspended; challenges faced	Gilbert + Tobin
ATCO's Hydrogen Electrolyzer Project	Western Australia	Cancelled; policy constraints	Michael West Media
Kwinana Green Fuels Project	Kwinana, WA	Paused; financial and market concerns	FuelCellsWorks
H2Tas Green Hydrogen Project	Bell Bay, TAS	Cancelled; renewable energy shortfalls	PV Magazine Australia

AEMO's proposal to apply an initial minimum utilisation factor of 70% for electrolyser operations then reduce this linearly to 35% by 2058 is too optimistic. Given the number of projects that have been cancelled by private investors – indicating the economics do not stack up – it is unreasonable to assume that electrolysers would be able to operate with the assumed flexibility. The assumption of large seasonal fluctuations in hydrogen production is also unreasonable, given this would require large amounts of hydrogen storage to ensure a steady supply for ammonia and green iron production, which would greatly add to costs.

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[1] NSW Government. 2024. 'NSW Government secures 2-year extension to Eraring Power Station to manage reliability and price risks'. https://www.environment.nsw.gov.au/news/nsw-government-secures-2-year-extension-to-eraring-power-station.

[2] 350 Australia. 'Why Liddell power station is such a lightning rod'. https://350.org.au/why-liddell-power-station-is-such-a-lightning-rod/.

[3] AGL. 2023. 'AGL's Liddell Power Station closes after 52 years of operation'. https://www.agl.com.au/about-agl/news-centre/2023/april/agls-liddell-power-station-closes-after-52-years-of-operation.

[4] AEMO. 2024. 'Appendix 6. Cost-Benefit Analysis'. p 112. https://aemo.com.au/-/media/files/major-publications/isp/2024/appendices/a6-cost-benefit-analysis.pdf.

[5] Wurzbacher, Christine, Marc Gilbert, Michael McAdoo, Nathan Niese, Arturs Smilkstins, and Erik Reed. 2022. 'The Lithium Supply Crunch Doesn't Have to Stall Electric Cars'. https://www.bcg.com/publications/2022/the-lithium-supply-crunch-doesnt-have-to-stall-electric-cars.

[6] Macdonald-Smith, Angela & Jenny Wiggins. 2025. 'Snowy 2.0 dig shut down after shrapnel flies from fan'. Australian Financial Review. https://www.afr.com/companies/energy/snowy-2-0-dig-shut-down-after-shrapnel-flies-from-fan-20250227-p5lfls.

[7] Frontier Economics. 2024. 'Report 1 – Developing a base case to assess the relative costs of nuclear power in the NEM'. p 42. https://www.frontier-economics.com.au/wp-content/uploads/2024/11/Report-1-Base-case-report-Nov-14-2024_v2.pdf.

[8] Rutovitz, Jay. 2024. 'Electricity sector workforce projections for the 2024 Integrated System Plan and for Australia'. https://www.racefor2030.com.au/project/australian-electricity-workforce-for-the-2024-integrated-system-plan/.

[9] DCCEEW. 'Australia's emissions projections 2023'. p 4. https://www.dcceew.gov.au/sites/default/files/documents/australias-emissions-projections-2023.pdf.

[10] Australian Automobile Association. 2024. 'Electric Vehicle Index September Quarter 2024'. https://www.aaa.asn.au/library/electric-vehcile-index-q3-2024/.

[11] Independent Expert Advisory Panel for Energy Transition. 2024. 'Hills of Gold Wind Farm Proposal'.

[12] Williams, Perry. 'Green hydrogen hopes up in smoke'. The Australian. https://www.theaustralian.com.au/business/green-hydrogen-hopes-up-in-smoke/news-story/f3b69233bb8ee730083f87e73764a232.