



Thursday, 3 September 2026

Australian Energy Market Commission
Level 15, 60 Castlereagh Street
Sydney NSW 2000

Submitted online at: [EPR0092 Review of the Integrated System Plan](#)

CEC submission to AEMC's discussion paper on review of the integrated system plan

Summary

The Clean Energy Council (CEC) is the peak body for the clean energy industry in Australia, representing nearly 1,000 leading businesses across renewable energy, energy storage, and renewable hydrogen. We are committed to accelerating Australia's transition to a clean energy future as rapidly as possible while maintaining a secure and reliable electricity supply for customers.

The CEC welcomes the opportunity to provide feedback to the AEMC on its discussion paper relating to the review of the integrated system plan (ISP). In relation to the five strawpeople set out in the discussion paper, the CEC supports a future ISP framework broadly aligned with strawperson three. In our view, the future ISP should evolve from its current transmission-focused planning framework into a more holistic whole-of-electricity-system planning framework that explicitly seeks to co-optimize transmission, generation, storage, consumer energy resources, distribution networks, and demand-side flexibility.

We continue to advocate on behalf of industry about the growing importance of rooftop solar, batteries, virtual power plants, EV integration and flexible demand, and that these resources should increasingly be treated as decision variables – not just inputs – in identifying the least-cost optimal development path in the ISP. In parallel, the CEC considers the ISP actionability framework should retain its focus on major transmission investment but be accompanied by reforms that improve the timeliness and efficiency of the national transmission assessment and delivery pathway. We think this strikes an appropriate balance between improving whole-of-system planning and avoiding the complexity of extending actionability across broader categories of regulated investment (as set out in strawperson four).

A key concern for the CEC is that the ISP's Optimal Development Path (ODP) continues to rely on significant volumes of gas-powered generation (GPG) in future decades, despite the rapid growth of renewable energy and storage technologies. While GPG is expected to play a role in maintaining system reliability during periods of low renewable output and extreme

demand, embedding substantial amounts of GPG within the ISP assumes that the necessary physical infrastructure, fuel supply arrangements, market incentives and investment signals will be available when required. While we appreciate the AEMC's consideration of strawperson five to address these concerns, it is probably a bridge too far for this review given the major institutional reform and legislative change required to achieve.

This submission also delves into some adjacent issues in addition to the consultation matters that the CEC encourages the AEMC to have regard to in determining the future purpose of the ISP and its planning outputs.

Deferral bias

One element of the existing ISP optimisation framework raised by CEC members that could benefit from an assessment as part of this review is the perceived "deferral bias" or "just-in-time investment bias". While we acknowledge this concern is largely a critique from stakeholders, rather than a recognised design objective of the ISP, or an obligation under the National Electricity Rules (NER), it can be seen to reduce the credibility of the ODP.

By "deferral bias" we mean that the ODP under the ISP is designed to identify the least-cost development pathway by optimizing the timing, location, and scale of investments over a long planning horizon. That is, the modelling underpinning the ODP explicitly seeks the lowest net present cost solution rather than the earliest possible build-out of the assets (both network and large-scale generation) required under the ODP. Because costs are discounted in net present value terms, there is an inherent economic incentive in the optimisation model to:

- defer expenditure where possible,
- avoid building assets before they are needed,
- only bring investment forward when the economic benefits exceed the cost of carrying the asset earlier than required.

As a result, modelled solutions often tend towards "building at the last prudent moment". This perceived bias in the execution of the ISP has been identified by the CEC in previous ISP consultation processes. For example, we noted in our submission to the draft 2026 ISP "the ISP appears to represent a 'best-case snapshot' where all elements line up perfectly to deliver the least-cost outcome, and that the sensitivity analysis does not sufficiently bridge the gap between the modelled ODP and operational reality".¹ The submission subsequently called for greater testing of delivery delays, cost escalation and constraints.

This criticism is often noted with respect to delivery of the transmission required for the energy transition. That being, the economic model and hence the ODP benefits from delaying transmission because capital expenditure is avoided for longer. However, once a project is actually required, a new transmission line may take 8-15 years to develop and build. In this environment, a theoretically optimal "just-in-time" delivery schedule can become a "too-late" schedule once delivery risks materialise.

As such, a model that chooses the economically optimal timing can underestimate the value of optionality and resilience – that is, the ISP appears to optimise for net present value whereas industry is seeking a plan that optimises for robustness and deliverability.

¹ CEC | Submission to AEMO's Draft 2026 ISP, February 2026, p.3.

The CEC notes commentary in the AEMC discussion paper that in preparation of the final 2026 ISP, AEMO modelled the ODP against several sensitivities including:²

- different levels of CER coordination
- different levels of energy efficiency
- higher demand from industrial loads including data centres and
- constrained delivery of generation and transmission projects in the ODP.

While AEMO concluded that the ODP remained robust to these risks and would continue to deliver net benefits to consumers even where project costs increase and projects are delayed, the CEC considers that risks remain. We encourage the AEMC to consider how further prescription in the NER or guidelines could provide clearer guidance as part of the identification of the ODP on the reasonable expectation of the cutoff point in terms of time to prepare for any future state or sensitivity, that is, the 'last time to reasonably act' to enable the necessary infrastructure to be available when needed.

Interestingly, we consider the AEMC's preferred strawperson three would broaden co-optimisation to include distribution, CER and demand-side resources and is expected to create a more resilient ODP and more credible delivery pathway.

However, the CEC contends that the next iteration of the ISP should move beyond seeking the cheapest development pathway assuming perfect foresight and delivery occurs, to move towards identification of the least-cost pathway given the credible suite of possible futures to deliver the energy transition. That is, while remaining cognisant of the net present value of the whole-of-system development pathways – identifying those development pathways that systematically always deliver the necessary assets when needed – even if it is not the least cost pathway.

Precision versus robustness

Another adjacent matter that the CEC would like to bring to the attention of the AEMC as part of this review is the growing view among stakeholders that the ISP may have become too focused on calculating the "optimal" future and not focused enough on identifying a robust future. This section builds on the discussion outlined above in relation to the perceived deferral bias in the ISP framework.

We consider the distinction between precision and robustness to be important in the context of the ISP. Primarily, as the CEC considers, the current ISP framework is heavily orientated toward the concept of precision because the ODP is fundamentally a least-cost-optimisation modelling exercise. These concepts can be further defined as follows:

- **precise optimisation** seeks to identify the least-cost pathway under the central assumptions
- **robust planning** seeks to identify those pathways that perform reasonably well across many plausible futures, even if conditions change.

² AEMC | Review of the Integrated System Plan - Discussion paper, July 2026, p.49.

Precision school of thought

The argument for those stakeholders that consider the ISP should remain focused on the rigorous optimisation of a central set of scenarios with a single least-cost ODP are typically focused on:

- The ISP should remain an engineering-economic planning tool.
- Transmission, storage and generation investments are expensive and long-lived assets.
- Bringing assets forward "just in case" risks over investment.
- Consumers ultimately will pay for any unnecessary infrastructure.

That is, the purpose of the ISP for stakeholders with this school of thought is to identify the lowest-cost development path and not to embed subjective judgements about risks associated with delivery delays, cost escalation and constraints.

The framework underpinning the ISP should continue to support strong modelling, better data inputs and transparency, and more sophisticated sensitivity testing; however, it should not fundamentally shift away from the current least-cost optimisation approach.

Robustness school of thought

The CEC and its members are predominantly finding themselves in the robustness school of thought with respect to the ISP, as precision is becoming less valuable as a planning tool, because the future is becoming less predictable. This uncertainty and/or unpredictability can be seen in many facets of the energy transition, including:

- continued uncertainty around the closure timing of coal-fired generation
- rapidly changing battery economics
- explosive CER uptake – particularly behind the meter storage and EVs
- data centre demand uncertainty
- transmission delivery risks
- social licence constraints
- changing government policy settings.

It is against this backdrop that the ODP under the current ISP framework increasingly represents the cheapest future rather than the most credible future. Further, because the magnitude of uncertainty associated with any of the above elements with respect to the future state of the NEM is significant, the ISP can create an appearance of precision that exceeds the certainty of the underlying inputs. For example, a coal-fired generation forecast to close in 2034 may retire in either 2031 or 2038, data centre demand forecasts may be materially wrong, and transmission projects may be delayed by years.

As such, given uncertainties of this magnitude exist and will continue to persist, the CEC questions whether identifying a unique "optimal" development path remains the right objective for the ISP.

In line with the AEMC's preliminary preference in the ISP Framework Review for strawperson three, the CEC recommends a future ISP framework that results in a less precise model that explicitly optimises across transmission, distribution, CER and demand-side resources, as this may produce more useful long-term outcomes as opposed to a highly precise model optimising only grid-scale assets. That is, essentially moving from a model intended to seek

the cheapest future, to model that seeks a future that remains credible even if the major assumptions are wrong. In summary, an ISP framework that focuses on the following:

- More sensitivity analysis rather than more precision.
- Greater treatment of delivery constraints.
- More explicit testing of delayed transmission scenarios.
- Better incorporation of CER and demand-side flexibility.
- Greater focus on resilience and optionality.
- Recognising that robustness itself may have economic value.

How could this be achieved

The following sets out some options the AEMC may consider in improving the robustness of the resultant ISP outputs. The CEC notes that none of these options require abandoning the current least-cost planning regime. Rather, they would adjust how robustness, uncertainty and delivery risk are treated within the ISP framework.

- **explicitly incorporate project delivery risk into optimisation**, such as assigning a probability distribution for delivery of each major transmission project, scenarios incorporating delivery failure and delay probabilities, or the ODP optimise expected outcomes after accounting for delivery risk.
- **multi-scenario optimisation rather than central-scenario optimisation**, the current ISP already considers multiple scenarios, but the ODP is still largely derived from optimisation against the preferred development outlook. The AEMC could recommend optimisation across all credible scenarios simultaneously, minimum performance standards in each scenario and the identification of projects appearing in most future states. This would favour “no-regrets” investments, for example, projects appearing in 80-90% of future states become core, or actionable investments, while those with lower probability become contingent investments.
- **replace single-path optimisation with regret-based analysis** to reduce perceived “deferral bias” arising because net present value optimisation rewards delaying expenditure, the ISP could alternatively utilise expected costs, cost variance or regret metrics. Under this approach the preferred pathway may not be the absolute cheapest in any individual future but would avoid catastrophic outcomes if assumptions prove wrong.
- **adaptive trigger-based planning** rather than the ISP identifies that project X be built in 2034, it could alternatively identify build project X when one of several predefined triggers occur. These triggers could include, demand exceeds a defined threshold, a coal-fired generator closes, or storage penetration is less than forecast. The intent of this option is to make the ODP adaptive rather than deterministic, that is, if A happens, do X and alternatively if B happens, do Y.

The CEC considers together, consideration of these reforms has the potential to move the ISP from a framework focused on precision to one focussed on robustness, while remaining consistent with the NEO of promoting efficient investment in the long-term interests of consumers. This approach is also broadly consistent with the CEC’s long held views set out in submissions to the ISP consultation processes with AEMO that a “perfectly optimised” pathway may not be the most valuable reflection of the future state of the power system and energy transition if it proves difficult to deliver in practice.

The CEC welcomes further engagement with the AEMC as it progresses its review into the future purpose of the ISP. Further queries can be directed to James Eastcott at the following email address jeastcott@cleanenergycouncil.org.au.

Kind regards

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