

Review of the Integrated System Plan Framework Project Team

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Australian Energy Market Commission

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Dear Project Team,

Windlab's submission on the Review of the Integrated System Plan Framework

Windlab welcomes the opportunity to provide feedback on the Review of the Integrated System Plan (ISP) Framework Discussion Paper published in July 2026.

About Windlab

Windlab is an Australian clean energy company, operating exclusively in the Australian market. Born from the CSIRO, Windlab has over 20 years of experience in developing renewable energy projects in Australia and is a member of the Clean Energy Council (CEC) and the Clean Energy Investor Group (CEIG).

Using the best tool for the job

As a wind developer, the ISP is valuable to us as a common, credible reference point for financiers and consultants. It provides a guiding light on a central set of assumptions, which supports bankable revenue forecasting, and lowers barriers to independent modelling through publication of the underlying PLEXOS model.

Broadening the ISP would introduce greater computational complexity for little additional benefit by deploying the wrong tool to solve problems that are not inherently optimisable. In particular:

- Consumer and distributed energy resources should remain forecast inputs as their deployment is a function of investment decisions that are: a) based on retail or commercial electricity prices which are significantly disconnected from wholesale prices represented in the ISP, and b) not purely economically rational in any event (see Appendix A, Question 2 response for further detail).
- Additional sub-transmission network projects should only be introduced where there is credible developer interest already established. The increased social license and land use complexity in these areas limits feasible commercial generation projects.

The economic rationale needed to protect consumers during a system in transition is distinctly different to that of a system in equilibrium. Transition-specific considerations such as regret costs, supply chains, workforce constraints and project synergies are more important than expanding the number of resources co-optimised and would be a better target of reform or additional resourcing for AEMO. Other than MarinusLink Stage 1 and 2, no other transmission project considers any significant pathway synergies and discounts. This approach has resulted in the under-sizing of the South-West Renewable Energy Zone (SW REZ) and immense regret cost with only 3.5 out of 19 GW worth of prospective projects granted access rights and few wind projects reaching financial close in the rest of NSW.

We encourage further co-optimisation of gas and electricity infrastructure planning. Gas infrastructure development is well suited to capacity expansion modelling, and the co-optimisation of gas and electricity infrastructure would establish whether gas can credibly be relied on to provide the necessary firming to a high renewable penetration system. This approach would ensure a full accounting of costs when considering

the trade-offs between storage, transmission and gas supply – which can all play a similar role in firming renewable energy.

Bring jurisdictions back on board

The ISP should remain a cohesive national trigger. However, combined with the Regulatory Investment Test for Transmission (RIT-T) process, it must not constrain project-specific assessment through rigid scenario and assumption alignment or create project delays. Transmission Network Service Providers (TNSPs) should have greater flexibility to use current engineering information and expertise, project-specific evidence and jurisdictional considerations in their cost-benefit assessments (CBA), with the Australian Energy Regulator (AER) scrutinising the validity of that modelling with a focus on methodology and where chosen assumptions may disadvantage consumers (rather than alignment with the ISP). This would help to ameliorate differing regret cost tolerances across jurisdictions, as well as differing views on the commitments of neighbouring jurisdictions.

We support a RIT-T process that:

- accelerates and improves the RIT-T process;
- materially de-links TNSP cost-benefit analysis from ISP scenarios;
- considers synergies and optionality benefits with other anticipated or future projects that may or may not have entered RIT-T themselves;
- allows project proponents to make use of current information; and
- establishes an ISP trigger date after which a jurisdiction could approve a project if the RIT-T remained incomplete and the TNSP wishes to proceed.

Windlab recognises aspects of this proposal would require changes to the National Electricity Rules and may be outside the scope of the review.

Unlock private capital through better intelligence

The ISP could provide even more value to unregulated investors by publishing outputs that map more directly to project economics, especially:

- Economic and technical curtailment by REZ, including time-of-day profiles.
- Marginal loss factor forecasts by REZ and scenario.

Additionally, AEMO is still unable to consider on-the-ground intelligence about the resource quality in REZs from private developers and the ISP continues to use wind capacity factors often far below what Windlab, and others, have measured on site.

Thank you for the opportunity to help shape the ISP review process. Detailed responses to the discussion paper questions are set out at **Attachment A**. If you have any questions on our submission, please do not hesitate to reach out directly.

Kind regards,

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Attachment A – Responses to key questions for stakeholders

Question 1: The ongoing role of the ISP

1. Are there additional benefits provided by the ISP that are not explored in this chapter?

To secure project finance, developers commission bankable forecasts of project revenues, curtailment and loss factors from third-party consultants. Many of these consultancies rely on the ISP process to provide a guiding light on key assumptions around demand, transmission development, and REZ capacity (among many other inputs). In the absence of the ISP, it would be difficult to agree what constitutes a central and bankable set of assumptions (noting the more ambitious ISP scenarios are usually disregarded for this purpose). The open sharing of the ISP PLEXOS model is also valuable as it reduces the barrier to entry for undertaking internal modelling and the establishment of competing consultancy firms.

Question 2: Key changes to the environment in which the ISP operates

1. Have changes in the sector, such as the increasing role of distributed energy resources and consumer energy resources, affected the value of the ISP in its current form?

No. CER and DER are often driven by non-economic signals and should continue to be forecast out-of-model utilising more suitable methodologies so that the ISP framework can focus on what it does best.

Consumers often purchase distributed energy resources for non-economic purposes such as energy independence, perception of lower immediate bill costs, fear-of-missing-out on subsidies and environmental sustainability. Other consumers are locked out from consumer energy resources due to building type or property ownership status. Similarly, large commercial tenancies have had significant challenges expanding into consumer resources. CER adopters often experience a rebound effect as well, with demand increasing post adoption. It has not been clearly articulated how any of this would be handled in a capacity expansion modelling framework, or the net benefit compared to existing exogenous methods. Even for purely economic adopters of CER, there is limited alignment between prices represented in the ISP – which in themselves are a fairly crude forecast of future wholesale price outcomes – and residential and commercial tariffs which comprise larger other costs (such as transmission and distribution charges) and a significant time lag due to retailer contracting.

While we recognise there is a degree of spare capacity within the distribution and sub-transmission networks, or additional capacity that could be unlocked through modest augmentations, development of infrastructure in more populated areas, with more complex existing land use, comes with its own challenges that are often not economically quantifiable.

Introducing additional build options to the capacity expansion modelling, as well as additional distribution level transmission augmentations would increase the complexity of the ODP selection process for little clear additional benefit. As seen recently with the construction of the Hunter Central Coast REZ on the sub-transmission network, there has been little private appetite for significant wind or solar projects there. While there has been some interest in the development of BESS at the distribution level it is not clear the benefit or need to expand the modelling to this network level to capture these dynamics.

2. Where do national and jurisdictional planning and delivery frameworks complement one another, and where do they create coordination challenges for planning and investment decisions?

No comment.

3. *What features of the future energy system should the Commission consider when assessing whether and how the ISP framework should be changed to remain effective and resilient across a range of potential futures?*

The Commission should have front of mind that the economic principles that need to underpin a system in transition are significantly different to those of a system in equilibrium. Regret cost, synergies, supply chains and workforce need to be front of mind in the modelling framework.

Question 3: The choice of future comes down to the plan and actionability

1. *Do you agree that the plan and the actionability mechanism are the right way to frame the choice of possible purposes for the ISP in the future energy system?*

No comment.

2. *Are there other parts of the ISP framework that should be considered alongside the plan and the actionability mechanism in shaping its future purpose?*

Another key component of the ISP framework is the Inputs, Assumptions and Scenarios Report (IASR) development process. This is where CER and DER are best considered. This is distinct from the ISP's analytical output.

3. *Does the ISP provide sufficient guidance and information to support decisions by parties beyond regulated asset owners? If not: what are the key gaps; and what improvements would enhance its value for these users, particularly unregulated investors?*

Financial models used in project financing are highly reliant on forecasts of revenue, curtailment and losses. If the ISP framework could consider more detailed outputs of economic and technical curtailment and marginal loss factors, this would improve it as a project prospecting tool. For example, annual or 5-year forecasts of MLF by REZ and scenario, and time-of-day technical and economic curtailment profiles, would be very useful to industry.

Windlab has found that our own wind forecasting activities reach divergent results to those provided in the IASR. Optimisation models are very sensitive to small differences in input assumptions which has historically seen, for example, the South-West NSW REZ wind value underestimated (still assumed to be around 37% by AEMO before curtailment losses) whereas we have measured capacity factors in excess of 40%, pre-curtailment losses. Strong oversubscription of this REZ shows the dire consequences of the miscalculation and the impact of the restrictions on AEMO around incorporating developer information.

Question 4: Strawpeople are used to illustrate possible futures

1. *Do the purpose statements for SP1-SP4 appropriately describe potential roles for the ISP in the future energy system? If not, how should the purpose be articulated differently?*

No comment.

2. *Which of the strawpeople (SP1, SP2, SP3 or SP4) best supports the future energy system and why?*

Windlab supports SP5 or SP2 but does not see the need or benefit for SP3 or SP4. Highly intermittent gas usage, which depends on gas storage and pipeline capacity, will be required to backstop a high VRE NEM as the transition continues and coal plants shut down. The costs and availability of getting this gas to market is best considered concurrently in the optimisation of electricity expansion. We strongly support any process to accelerate and improve the RIT-T process.

3. *Are there elements of more than one strawperson, or an alternative combination of choices on the plan and actionability mechanism, that you would support? Please explain.*

No comment.

4. *What broader design features of the ISP framework (across the planning, delivery and governance workstreams) would need to change to give effect to your preferred strawperson? In responding, stakeholders may wish to consider the scale of change required, implementation considerations, and sequencing.*

Gas data tends to come with strong confidentiality requirements which will conflict with AEMO's role in publishing the ISP 2026 model. This is something that will need to be overcome through some agreement with the relevant stakeholders rather than anonymising the data in the published model, as doing so would severely impact the usefulness of the published model for any stakeholders who wish to run it themselves (including for RIT-T processes).

Question 5: Framework for choosing the future purpose of the ISP

1. *Do you agree with the Commission's approach to forming an initial preference between the strawpeople?*

No comment.

2. *Do you agree with the four factors and the two judgements on their relative weight that underpin our initial preference for SP3? Where you disagree, what evidence supports a different direction?*

We agree that a faster and better-aligned national pathway is more beneficial than tighter linkage between the ISP and project assessment. We recommend loosening the linkage between the ISP and RIT-T framework to give TNSPs more flexibility in undertaking cost benefit analysis (CBA) process. They are the subject matter experts for their respective projects and should be able to deploy up-to-date engineering assessments, while taking into account jurisdictional considerations. The ISP is useful as a cohesive trigger, but should not hamstring project proponents when arguing their cases to the AER.

3. *To test the Commission's hypothesis that a broader plan would materially improve the ODP, we are seeking evidence on:*
 - a. *where the current treatment of small distribution, CER and demand-side resources as inputs risks distorting the ODP*
 - b. *which resources would be most material to co-optimize, and which would risk adding complexity without commensurate benefit*
 - c. *what modelling capability, data and governance arrangements would be needed to support broader co-optimisation*
 - d. *the risks a broader plan may create for ODP stability, transparency and accountability, and how these risks could be managed.*

No comment.

4. *To test the Commission's hypothesis that a more effective national delivery pathway would materially improve delivery outcomes, we are seeking evidence on:*
 - a. *where the current interaction between the ISP and the RIT-T creates duplication, delay or unnecessary process complexity*
 - b. *what specific reforms could be considered to materially improve the timeliness and efficiency of the RIT-T while preserving appropriate scrutiny*
 - c. *the extent to which a faster and more predictable national pathway would retain more projects within the national framework, rather than moving to jurisdictional pathways*
 - d. *any implementation risks or trade-offs associated with reforming the RIT-T and related processes.*

Substantial de-linking of the ISP scenarios from TNSP CBA would allow jurisdictions to prosecute their preferred visions of the future. The validity of the modelling could then be interrogated by the AER, in consultation with the relevant jurisdictions. Finally, the ISP should set a trigger date by which, if the RIT-T process is not yet complete, the relevant jurisdiction would have the necessary authority to wave through project approval.

5. *Are there features of jurisdictional planning and delivery frameworks that the Commission should consider incorporating into the national framework to strengthen its role alongside jurisdictional pathways?*

No comment.

Question 6: We will consider potential benefits of extending the ISP to gas

1. *What benefits would extending the ISP's purpose to co-optimize across both electricity and gas infrastructure investment bring? What risks would it introduce?*

Extending the ISP to gas would help to support confidence in the deliverability, potential risks, and costs associated with the significant forecast firming role of gas in the transition. Electricity storage, transmission, and gas developments all have cost trade-offs but broadly fill a similar role so should be modelled coherently.

The 2026 ISP Step Change scenario reinforces the importance of getting gas right. By 2049-50, gas powered generation (GPG) capacity is forecast to grow to 17 GW (from 12 GW now), generating almost 9 TWh in that year (similar to current levels). However, the same scenario also shows GPG generation dipping as low as 0.5 TWh in 2031-32. This illustrates the changing role for the gas fleet, which will be employed at a very low capacity factor in some years but will still see significant gas usage as coal retires, particularly in concentrated periods associated with low renewable generation. Ensuring the gas system is capable of delivering such large volumes of gas into small periods of time will be costly. Therefore, careful consideration of storage, transportation, regasification, and new sources (if necessary) is essential and worthy of co-optimisation in the ISP.

The AusTIMES modelling lays the groundwork for this by considering fuel switching and broad gas demand across the economy. The latest ISP has also begun to consider the necessary pathway of transportation and storage to meet those higher demand days. While storage for liquid fuels can assist in particularly concentrated periods these come at a very high cost.

Whilst the move to a gas RIT-T type process is potentially premature at this stage (and difficult given the less regulated nature of gas infrastructure relative to electricity transmission), a recommended infrastructure pathway can help to inform long-term government planning and would form a critical part of balancing residential and commercial gas usage winding down, with ongoing needs to supply gas to GPG.

To take this to the next step, in an SP5 world, we recommend that:

- AEMO collect, and ideally publish, information related to the capital and operating costs of: developing new gas sources, transportation, storage and regasification infrastructure, transportation costs, and extraction costs.
- To reduce the additional computational complexity, complete the initial screening of transmission projects as usual, and only co-optimize gas infrastructure against a manageable subset of final candidates that are potential ODPs.
- AEMO recommend an ODP for gas infrastructure and supply.

Much of this work has already been started by AEMO.

2. *If the ISP's purpose were to extend to gas, what evidence or considerations would be relevant in determining the scope of any associated actionability mechanism?*

No Comment

Question 7: Evidence of material issues with the planning framework and potential solutions

1. *Does the ISP's existing modelling approach reduce the credibility of the ODP? If so, how?*

No comment.

2. *How would more comprehensive modelling change the outcomes of the ODP?*

Improved costing and representation of the trade-offs of firming technologies could materially impact future transmission requirements.

3. *What further prescription in the NER or guidelines would help the ISP better support 3. investment and policy decisions?*

No comment.

Question 8: Evidence of material issues with the delivery framework and potential solutions

1. *What are examples of how the existing requirement for RIT-Ts to maintain alignment with the ISP would lead to poorer outcomes for consumers? Should flexibility be improved to better enable proponents to efficiently respond to project-specific circumstances and emerging information?*

No comment.

2. *Does the reassessment of actionable ISP projects have material consequences for investment certainty? If so, what is an appropriate alternative approach that ensures consumers are protected from inefficient expenditure?*

Yes. Most recently the case of the Northern Transmission Project moving in and out of the actionable category has not been helpful for investment certainty. Wind project development is a lengthy process that occurs over multiple ISP rounds. There is an inherent cost to consumers by making this process less certain.

3. *Do TNSPs consider there is any duplication between the ISP and RIT-T which materially impacts the timely delivery of projects? If so, how should this duplication be removed?*

No comment.

4. *Is there a lack of clarity between treatment of projects that move between, or interact across, the RIT-T and jurisdictional planning pathways that impacts the value of the ISP, and how can clarity be improved?*

No comment.

Question 9: Evidence of material issues with the governance arrangements and potential solutions

1. *How do existing accessibility and transparency issues materially impact the value of the ISP? How can elements of the ISP be more accessible and engaging for different stakeholder groups to materially improve the value of the ISP to stakeholders?*

No comment.

2. *Can the ISP Consumer Panel effectively input into the ISP process? How could the Panel be better supported?*

No comment.

3. *Do network businesses and AEMO consider there are material issues with the existing flexibility of joint planning and information sharing arrangements? If so, what further prescription would improve early collaboration between AEMO and relevant stakeholders?*

No comment.

4. *Does the inflexibility of the ISP cycle or ISP update framework to capture new information in a timely way, materially impact the ODP and investment decisions? What are examples of this and how can the framework be more flexible?*

Given the scale of work to be undertaken, the 2-year cycle remains fit-for-purpose. More flexibility on TNSP CBA would ensure this is not an issue. However, the IASR should increasingly be aiming to become a 'living document' style of publication so that industry participants can see how major changes will be considered in upcoming publications. This would be particularly useful for significant announcements such as coal-fired generation retirements or transmission projects that would have material impacts across PLEXOS models (by changing group or REZ constraints, generator coefficients and so on).

5. *Is there sufficient clarity over how projects are represented in the ISP? How can clarity be improved?*

No comment

Question 10: Other issues for the Review

1. *Do stakeholders agree the Review should not further consider the identified issues?*

No comment

2. *Are there any additional issues, that are not outlined in this discussion paper, that materially reduce the ISP's value, and we should consider in the next stage of the Review?*

No comment.