Australian National University

ISP Review
Stakeholder Consultation Paper

SUBJECT	**ANU Response to ISP Review Stakeholder Consultation Paper**
TO	The Department of Climate Change, Energy, the Environment and Water (DCCEEW)
FROM	The Australian National University
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We thank the review for the opportunity to provide feedback on the following questions.

Supporting emissions reduction

1. *What should be the role for the ISP in supporting emissions reduction?*

The ISP should provide a trajectory for national emissions reduction through planning for:

i. Decarbonisation of the electricity sector
ii. Phasing out natural gas energy use (as opposed to feedstock use)
iii. Enhancing electrification of energy use in all sectors of the domestic economy
iv. Supporting the development of new export industries based on the use of vast quantities of renewable energy, some of which may be grid-connected.

The ISP should map out a range of options to achieve the National Energy Objectives, including emissions reduction, and undertake planning of the expansion and operation of the transmission system to achieve this goal. Currently the ISP projects an optimal

pathway, based on techno-economic analysis of the scenario (within a small set of scenarios) that is viewed as most likely by a wide range of stakeholders.

We suggest that a broader analysis be undertaken based on recognition of the socio-techno-economic nature of the energy system. One way to achieve this would be to model an optimal space rather than an optimal pathway. Paths within the optimal space would be technically feasible and have similar cost, allow for greater choice based on social objectives.

2. *Are the changes to the National Energy Objectives to include an emissions reduction component (and the associated proposed changes to the National Electricity Rules and National Gas Rules) sufficient to enable the ISP to appropriately consider emissions reduction?*

The changes to the NEO are a necessary but not sufficient driver to appropriately consider emissions reduction. An holistic whole-of-economy approach to planning is needed that considers drivers for emissions reduction in sectors currently not covered by the NER and NGR where energy use will become fully electrified e.g. complex energy use processes in heavy industry.

Renewable generation, distribution and energy storage

1. Should the ISP be more explicit about where generation and storage developments are needed, and the technology types required, to optimise transmission investments and maximise system benefits? What impact might this have on market participants?

The ISP emphasises the capacity of each technology required under a range of different scenarios. While this is helpful for system planning, it can also be misleading if the energy contribution of each technology is not also included. This is particularly the case for energy storage, where we can expect to see a trend towards longer duration storage i.e. GWh required may increase faster than required GW. The 2022 ISP has illustrated the contribution of the different storage technologies (categorised by duration) in Figure 23 of the document, and this illustrates starkly the very different roles the storage technologies play in providing required power (for relatively short durations) and energy (for much longer durations). However, given the importance of encouraging a range of storage technologies, this should be brought to the forefront of the analysis. Further, information should be provided regarding the extent to which deep storage can be centralised or needs to be more distributed, given the limitations on the transmission system. This is important given the long timeframe required for deep storage projects.

Current experience shows that transmission planning bottlenecks are a significant impediment to the decarbonisation of the NEM. Not only would greater indicative planning for where generation and storage developments are needed (e.g. in Renewable Energy Zones) help provide certainty to de-risk transmission investments, it could also help fast track the planning process for transmission projects to enable them to happen more quickly. Conversely, greater certainty surrounding the completion of the necessary

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transmission would also help de-risk investment in generation and storage, and encourage market participation.

Integrating gas and electricity planning

1. *Do you think there would be benefits if the ISP is expanded to consider gas and electricity together? What do you consider to be the key benefits or problems with this approach?*

Because electrification of all energy use is a key requirement for decarbonisation, it makes sense to consider planning for the gas and electricity networks simultaneously. There is a risk that rapid consumer electrification of gas use could provoke a 'gas death spiral' so planning for such an eventuality will be crucial. There appears to be no downside for parallel planning.

2. *How could a 'supercharged ISP' best support energy investment decisions across gas and electricity? What information should it include?*

Developing trajectory scenarios for electrification of gas use could significantly inform investment decisions in both sectors, and would be especially helpful to indicate where gas infrastructure investment could result in stranded assets.

3. *What role would you like to see AEMO have in gas infrastructure planning?*

The ISP could play a crucial role in gas infrastructure planning by indicating trajectories for the 200-300% renewable electricity scenarios that would enable electrification of much of gas energy use.

Energy demand

1. *Could the demand-side analysis that is currently undertaken for the ISP development process be improved? What should be the focus areas for enhanced assessment in this regard?*

The current process for demand side analysis could place greater emphasis on decarbonisation scenarios for non-electricity energy use in other sectors as they increasingly electrify. In particular, decarbonisation of complex industrial processes such as in the metal refining and chemical industries – often involving the production and use of renewable hydrogen – warrant analysis in great detail.

Further, the prospective growth of new export industries based on the use of vast quantities of renewable energy, some of which may be grid-connected, also needs to be built into a range prospective ISP scenarios. If Australia is to continue its current role as a

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global energy provider and as a major participant in the supply chain for iron and aluminium, then even if in the future this represents a small fraction of Australia's current global supplier status, this could still dwarf domestic energy consumption. Understanding how much (or how little) of the electricity required will be grid-connected – and how the grid-connected component could vary temporally in response to price signals and availability of renewables – will become increasingly important.

Distribution

1. How can distribution be more effectively considered in the ISP? What might be the impact on the market if the ISP gave greater consideration to distribution?

Distribution will become increasingly important as prosumers play a greater role in the market. Demand management, rooftop solar export/self-consumption, battery storage, vehicle-to-grid, virtual power plants and other developments will increase in importance, and will dictate whether the distribution network becomes a limiting or facilitating factor in supporting decarbonisation. Further, the performance of the distribution network in this process will also play a role in the need for additional transmission, storage and other services. So greater understanding of the capacity for distribution networks to facilitate the transition will increasingly inform the ISP and provide information for market participants.

Jurisdictional policy interactions

1. How should the ISP consider energy and climate policies and projects that have been announced, but for which limited detail is available regarding implementation? Is it appropriate to maintain a degree of caution about such inclusions?

Inclusion of such influencing factors through a range of scenarios would help inform planning e.g. as undertaken by the IEA under its 'current policy' and 'new policy' scenarios.

Barriers to the planning and construction of ISP projects

1. How might the ISP be improved to enhance the likelihood that actionable projects proceed in accordance with the timing identified in the Optimal Development Path?

By investing more in communication and community engagement to create the required social capital.

2. Are there improvements that could be made to the ISP to better support building community acceptance for actionable ISP projects?

A key impediment to realising the ISP is lack of progress in transmission investment, which in turn is strongly dependent on social license. A greater emphasis on communicating the importance of the ISP in addressing climate change may assist in developing the social capital needed.

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General questions

1. What are the things that the ISP does well? Are there other matters that the review should consider?

The ISP is an excellent tool for providing indicative pathways for generation and transmission infrastructure that assists in de-risking investment. The ISP should expand to include the co-design of future planning for the parallel decarbonisation of the gas and electricity sector, the electrification (with hydrogen use) of heavy industry, and the (potentially much larger) future grid-connected, renewable energy-based export sector.

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