SUBMISSION

Submission to the Australian Energy Market Operator

Submission to the Draft Integrated System Plan (ISP)

13 February 2026

The Australian Academy of Technological Sciences and Engineering (ATSE) is a Learned Academy of independent, non-political experts helping Australians understand and use technology to solve complex problems. Bringing together Australia's leading thinkers in applied science, technology and engineering, ATSE provides impartial, practical and evidence-based advice on how to achieve sustainable solutions and advance prosperity.

Our energy system is vital to Australia's economic, social and environmental wellbeing. Australians need an energy system that is reliable, secure and produces low emissions. The proposed Draft 2026 Integrated System Plan (ISP) is a well-crafted plan for Australia's energy system that recognises the need to reduce the emissions profile of our energy system while maintaining an effective and reliable service. There are many challenges to this plan that will need to be addressed during implementation – issues with approvals, supply-chain constrains, community engagement challenges – but the plan is a realistic and broadly sound pathway for Australia's energy network. The growth of consumer energy resources (CERs) provides both challenges and opportunities for the grid, which, if well managed, can give customers more ownership over their energy while supporting the supply of reliable and affordable power across the nation. ATSE makes the following recommendations to AEMO to refine the ISP to plan for the future energy network:

Recommendation 1: Ensure the 2026 Integrated System Plan clearly articulates the significant risks caused by planning delays and a lack of social licence for clean energy projects.

Recommendation 2: Collaborate with and encourage state, territory and federal governments to act to speed up planning approval processes and support the clean energy sector to improve social licence.

Recommendation 3: Include alternative scenarios within the ISP that evaluate the feasibility of trajectories without being entirely constrained by current government policies.

Recommendation 4: Invest in digital monitoring and data infrastructure to validate assumptions and modelling underlying the 2026 ISP.

Recommendation 5: Highlight the need for investment in research and development for future energy technologies that will be necessary beyond the ISP's timeframe.

Recommendation 6: Provide consideration of the impact of changing liquid fuels use on the broader energy system within the ISP.

Recommendation 7: Work with energy providers to raise the profile of Virtual Power Plant (VPP) offerings by highlighting the benefits of VPPs for consumers.

Recommendation 8: Support energy providers to offer vehicle-to-grid options for consumers to allow them to better manage their Consumer Energy Resources.

Overcoming barriers to implementation

Delays to the deployment of new generation, storage and transmission capacity risk the overall reliability and resilience of the National Energy Market (NEM; NSW Chief Scientist & Engineer 2025). Renewable energy projects in Australia face two primary barriers to delivering projects at the scale and speed needed to reach the 82% renewable energy by 2030 target set by the Federal Government: approval delays and social licence. Approvals for onshore wind projects take on average 2.8 years, with a quarter taking between 3.9 and 7.8 years under the *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999* (Climate Change Authority 2025). Only one project received approval in 2025, despite the number of applications rising (Climate Change Authority 2025) with almost three quarters (74%) of renewable energy capacity in the development pipeline yet to receive planning approval (Johnston 21 May 2025). This rate of approvals is incompatible with reaching the Australia's stated net zero goals and has already resulted in the extension of coal-fired power station operations to maintain grid supply and stability[1]. Federally, changes have already been implemented to increase the speed of approvals, particularly through changes to the EPBC Act to allow for streamlined approvals processes for priority projects in the national interest. It will take time to determine the impact of these changes, but Federal approvals only represent one step in the approvals process.

Projects also must navigate state and territory approvals processes, which can differ markedly. Applications in New South Wales take three times as long to gain approve as those in Queensland and can cost 150 times more (Riley 2024). Increasing regulatory alignment across jurisdictions can allow projects to be placed in locations where they are the most efficient and economically beneficial, rather than where approvals are more likely, quicker or cheaper. Alternatively, establishing fast track approval processes

[1] Including the extension of Australia's largest coal-fired power station Eraring for an additional two years (Vince 20 January 2026).

Level 2, 28 National Circuit
Forrest ACT 2603
Australia

PO Box 4776
Kingston ACT 2604
Australia

+61 2 6185 3240
info@atse.org.au
atse.org.au

ABN 58 008 520 394
ACN 008 520 394

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across all jurisdictions for significant green energy projects would help accelerate the deployment of renewable energy to meet Australia's renewable energy target.

The other major constraint, social licence, requires a broader approach to community engagement with green energy projects and countering incorrect or purposefully misleading information about the impacts of renewable energy projects. As highlighted in Appendix 8 of the Draft ISP, social licence is critical for new energy infrastructure development. A significant number of projects have been delayed or modified due to community backlash to proposed energy projects, including offshore wind, large-scale solar and the required transmission. Developing a social licence to operate requires the identification of stakeholders (often the local community, businesses, land holders, Traditional Owners etc), identification of stakeholder issues, and early and continuous engagement with stakeholders to manage and resolve stakeholder issues. Ideally this management should go beyond informing stakeholders and instead collaborate and empower stakeholders (Hall 2014). For example, developers can seek opportunities for Traditional Owners to benefit from green energy projects through co-ownership and local employment[2]. AEMO has an important role to play by providing guidance to renewable energy project developers on improving social licence and providing resources to counter misinformation about common issues.

Recommendation 1: Ensure the 2026 Integrated System Plan clearly articulates the significant risks caused by planning delays and a lack of social licence for clean energy projects.

Recommendation 2: Collaborate with and encourage state, territory and federal governments to act to speed up planning approval processes and support the clean energy sector to improve social licence.

Ensuring projects account for real-world opportunities

The scenarios provided in the ISP are naturally based on assumptions reliant on external factors which change over time and are constrained by existing government policies at a national and stator/territory level. These government policies are not always long lasting and are often contested at elections. For example, the 2024 ISP assumed the retirement of Queensland coal-fired power stations in the 2030s, which has been delayed by a recent change in state government policy that now aims to keep coal-fired generation operating until 2049 (Queensland Treasury 2025). Similarly, the future of the nuclear moratorium has recently been debated. It would be beneficial to future planning if the ISP contained at least one alternative scenario for decarbonising electricity that is less constrained by current government policies. Instead, it would evaluate what trajectories might be feasible and the consequences of different policy choices on the NEM. This could be similar to the modelling in the World Energy Outlook projections produced by the International Energy Agency.

To improve the future accuracy of the ISP, validating assumptions with real data and evidence is necessary. Changing circumstances, like cost increases caused by growing approval delays or increased prioritisation of green energy exports[3], may impact the validity of the cost projections. Investments in digital monitoring infrastructure will help adapt cost modelling and support future projections. This digital infrastructure will allow the development of a dataset that can support real-time visibility and forecasting in an increasingly decentralised energy system (particularly as uptake of consumer energy resources continues to grow). It may also support the development of a probabilistic risk assessment framework[4] for Australian energy infrastructure that can support system reliability and reduce infrastructure costs (ATSE 2022).

[2] For example, the Bulabul Battery on Wiradjuri Country in New South Wales is being developed in collaboration with the Wellington Aboriginal Community, including providing the community with a 5% equity stake in the project (First Nations Clean Energy Network 2025).

[3] Green energy exports are likely to require more energy than is produced in the NEM. If even a fraction of these exports is connected to the NEM, it is likely to significantly affect the projections provided in the draft ISP

[4] For more on probabilistic risk assessment, please see ATSE's explainer *Explaining probabilistic risk assessment*.

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Recommendation 3: Include alternative scenarios within the ISP that evaluate the feasibility of trajectories without being entirely constrained by current government policies.

Recommendation 4: Invest in digital monitoring and data infrastructure to validate assumptions and modelling underlying the 2026 ISP.

Optimising the ISP with a technology neutral approach

The scale of the change Australia needs to make is so significant that no option should be off the table in tackling it. ATSE takes a technology neutral approach to emissions reduction, supporting the lowest-cost pathway to net zero emissions. ATSE has long supported the removal of legislative bans on nuclear generation, especially as small modular reactor technology begins to mature. While this technology is unlikely to be commercially viable within the ISP's 20-year horizon, removing legislative barriers now will allow it to be deployed in Australia once commercial viability is reached. Other technologies, like pumped hydro, could also be considered in more detail, with nearly 23,000 possible sites in Australia allowing for significant deep storage through pumped hydro (Blakers et al. 2017, n.d.).

Consideration of the impact of liquid fuels is also needed, due to the highly interconnected nature of the liquid fuel, electricity and gas markets. Liquid fuels are regularly used to ensure reliability and provide backup power, particularly in remote areas (NSW Chief Scientist & Engineer 2025). Changes in liquid fuel use patterns are therefore likely to both depend on electricity and gas supplies and affect their consumption. Australia is largely dependent on imports to supply liquid fuels and is a significant supply chain risk (NSW Chief Scientist & Engineer 2025). This introduces an unmitigated risk to the energy system if liquid fuel supplies were disrupted, which could cause increased reliance on the electrical and gas grids. Accounting for liquid fuels usage and risks within the ISP would therefore allow the ISP to better reflect the real-world usage and risks to the entire energy system.

Recommendation 5: Highlight the need for investment in research and development for future energy technologies that will be necessary beyond the ISP's timeframe.

Recommendation 6: Provide consideration of the impact of changing liquid fuels use on the broader energy system within the ISP.

Better utilising consumer energy resources

Consumer energy resources (CERs), including rooftop solar systems and home batteries, can play a vital role in managing Australia's energy system. The Draft ISP projects growth in small-scale solar to between 32-38 GW depending on the scenario and household storage to range from 8-14 GWh (AEMO 2025). As noted in ATSE's *Power to the people: Smarter energy use through demand side management explained*, significant amounts of consumer-driven generation is wasted during midday peaks when supply outstrips demand (ATSE 2025). Additionally, access to CERs is often limited by high initial installation costs that restrict the roll out of CERs to those with the means to afford this upfront cost. Better access and management of CERs would help to stabilise the grid by reducing peak demand and increasing minimum demand.

Technological solutions to this problem include coordination of CERs through virtual power plants (VPPs) and integrating high-capacity electric vehicle batteries into the energy storage network. Both VPPs and vehicle-to-grid capabilities are already being implemented across the NEM, but a broader roll out of these options would help to increase grid stability. The draft ISP assumes 53% of households would participate in VPPs by 2050 (under the step change scenario) and notes the benefit in reducing operational demand during peaks (AEMO 2025). Recent years has seen the offering of VPPs by energy providers expand, though the number of consumers in these programs remains comparatively low. Some programs provide greater consumer benefits than others – ranging from no bills for a specified period and free battery installations to small power bill credits monthly – which further complicates matters for consumers. Better articulating the benefits of these programs for both consumers and the energy network, and increasing lower tier benefits, can help raise the profile of VPPs and attract more customers to VPPs – particularly those who would otherwise be unable to afford CERs. Only 3 energy providers[5] currently allow for vehicle-to-grid connections nationally, leaving customers in the ACT, Queensland, Tasmania and Victoria unable to

[5] SA Power Networks, Essential Energy and Ausgrid (Fisk 2 July 2025)

Level 2, 28 National Circuit
Forrest ACT 2603
Australia

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+61 2 6185 3240
info@atse.org.au
atse.org.au

ABN 58 008 520 394
ACN 008 520 394

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access this technology. Supporting more energy providers to integrate vehicle-to-grid technologies and allow customers to make the most use of their CERs will benefit consumers while supporting grid stability.

Recommendation 7: Work with energy providers to raise the profile of Virtual Power Plant (VPP) offerings by highlighting the benefits of VPPs for consumers.

Recommendation 8: Support energy providers to offer vehicle-to-grid options for consumers to allow them to better manage their Consumer Energy Resources.

ATSE thanks the Australian Energy Market Operator for the opportunity to provide input into the 2026 Draft Integrated System Plan. For further information, please contact academypolicyteam@atse.org.au.

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