

2026 Integrated System Plan (ISP) Consumer Panel Response

September 2025

Final 2025 Inputs, Assumptions and Scenarios Report
– Panel response

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Acknowledgement of country

The 2026 Integrated System Plan Consumer Panel acknowledges the Traditional Custodians of the land, seas and waters across Australia. We honour the wisdom of Aboriginal and Torres Strait Islander Elders past and present and embrace future generations.

We acknowledge that, wherever we work, we do so on Aboriginal and Torres Strait Islander lands. We pay respect to the world's oldest continuing culture and First Nations peoples' deep and continuing connection to Country; and hope that our work can benefit both people and Country.

Executive summary

The Panel welcomes the final 2025 IASR and recognises the extraordinary amount of expertise, skill and perseverance that has gone into making it a very high quality undertaking. The document itself reflects a comprehensive data base that can now be used to develop the 2026 ISP, which itself is located in a context of rapid change and significant uncertainty in the energy market and beyond. The AEMO staff who have undertaken the work that is behind the Final IASR are exceptional.

The Final 2025 IASR is informed by 6 separate reports, compared to 2 for the 2023 IASR, These reports, in part, reflect reviews and rule changes specific to the ISP process that have been taken into account. The ISP process, for which the IASR is a substantial input, is becoming ever more complex, which in turn makes it more difficult for consumers and consumer groups to engage with, yet consumers best interests can't be served if their perspectives are not actively included in the ISP process. This is a dilemma. Given this dilemma, AEMO continues to improve its efforts to engage with consumers and the Final 2025 IASR has had more consumer and stakeholder input than previous ISP processes, a view shared by the AER in their recent statutory review of the IASR.

The Panel is generally satisfied with the Final 2025 IASR and have focussed on a couple of, what for us, are the more substantial issues:

- Scenarios: we think that the revisions to scenarios make good sense and follow from some excellent engagement with stakeholders, consumers and the Panel
- Batteries and back-up. We observe that the 2026 ISP reflects a lesser focus on major new transmission projects than previous ISPs with growing focus on the shaping and storage aspects of the energy system, including batteries, pumped hydro and other technologies and the back-up provided by gas powered generation. We provide considerable focus on grid-level batteries as well as community owned and mid-scale and aggregated customer 'behind the meter' batteries.
- Financial parameters: Panel has indicated its general support for AEMO's progressive enhancement of the roles and calculation of the WACC and the discount rate, including how the WACC and the discount rate serve different functions in the ISP analysis. We encourage AEMO to reconsider its proposal to use the same discount rate across the different scenarios.
- Social Licence: This is a recurring focus of ISP Consumer Panels and reflects the difficulties in gaining and maintaining what can be "elusive." There are substantial benefits that accrue to gaining social licence early in projects and more broadly in bringing the Australian community with the transition to net zero – which comes at a significant cost for some.

We also identify a series of themes, some of which we describe as:

- What question is the ISP seeking to answer?

- Framing and firming, noting that using consistent language across the energy sector is important for consumers.
- Growing complexity of the ISP, including more extensive consideration of gas generation for reliability of supply, opportunities and constraints in the distribution networks and greater consideration of demand side opportunities.
- The expanding list of government policies, roadmaps and plans that must be taken into account by the ISP, including new policies released after the IASR and whose impact on the ISP will need to be assessed and consulted on by AEMO, preferably as part of the Draft IASP.

This report also reflects on the realities for many consumers with household energy costs continuing to rise, along with other essential costs. A majority of Australians want a low carbon future but need the costs of transition to be borne fairly, largely through effective policy settings by governments.

AEMO's role in the narrative of the energy transition continues to be a topic explored by the Panel. In the context of the IASR, and the ISP, AEMO has a clear role in communication and public education and awareness raising, that goes beyond the 'engaged' stakeholder cohort. AEMO needs to better articulate – in the IASR and the ISP – the *why* as well as the *what* and *when* of the energy transition. This is not a role that AEMO alone can play, but AEMO can play a part.

The report concludes with brief comments about AEMO's Demand-Side Factors Statement (DSF), now required under the National Electricity Rules, with the first draft to be released with the draft 2026 ISP. This looks to be a significant enhancement to the ISP and will help strengthen the role that consumers play in aspects of the ISP and delivering a sustainable energy future.

The Panel deeply respects and appreciates the support and encouragement provided by AEMO staff and their commitment to a collegiate and constructive working relationship.

The Panel was assisted by Bridget Ryan and David Prins from AEMO Consumer and Community Reference Group with aspects of preparing this report, we thank them for their assistance.

As per requirements of the National Electricity Rules, Clause 2.22.7, sub clause e 2, the 2026 ISP Consumer Panel confirms that this is a consensus report (to the full extent possible) noting that member Jarra Hicks, was on leave from the Panel for much of the time in which this report was developed.

1 Contents

Executive summary	3
2 ISP Consumer Panel Recommendations	7
3 About the Consumer Panel	12
3.1 Our role and requirements	12
3.2 Audiences for this report	13
3.3 Involving Consumers and Stakeholders	13
3.3.1 The AER's Review Report - 2025 Inputs, Assumptions and Scenarios Report (August 2025)	15
3.4 What's happening for consumers	18
Discussion	24
3.5 Recommendations from previous ISP Consumer Panels	25
4 Key Themes (and Context)	26
4.1 What is the question that the ISP trying to answer?	26
4.2 Framing and Firming	30
4.3 Growing complexity of the ISP	32
4.4 ISP is increasingly beyond a transmission focussed plan	33
4.5 The Role of Battery Storage	37
4.6 Where should investment be?	38
4.7 Modelling capability for "humanness."	38
4.8 Social Licence	39
4.9 ISP reviews and expectations	39
4.10 Other reviews and processes impinging on the ISP	41
5 Responses to the Final 2025 IASR	43
5.1 Overview	43
5.2 Review of major updates between Draft IASR documents and the Final IASR	44
5.2.1 Key Changes between the Draft and Final IASR documents	44
Queensland Road Map	45
Victorian Transmission Plan – VTP. (Published August 2025)	45
Commonwealth Government 20235 Emissions reduction Target Range (62-70% reduction from 2005)	46
5.2.2 Scenario and Sensitivity Testing	47
Scenario Changes	47
Sensitivities	47
5.2.3 Financial and Technical Assumptions Updates	48
Cost of Capital and Discount rates	48
Technology and cost assumptions	49
5.3 Panel input to IASR process	49

5.3.1	Electricity Demand Forecasting Methodology	49
5.3.2	ISP Methodology	50
5.3.3	Draft IASR Part 1	51
5.3.4	Draft IASR Stage 2	51
5.3.5	Electricity Network Options Report (ENOR)	52
5.3.6	Gas Infrastructure Options Report	52
5.3.7	Multisectoral Modelling	53
5.4	Responses to Selected Topics from the Final IASR	53
5.4.1	Scenarios	54
5.4.2	Sensitivities	55
5.4.3	Existing Generator and Storage assumptions	58
	Demand firming	60
	Temporal diversity	60
	Flexibility	61
	Lead time and speed of deployment	61
6.3.4	Financial parameters	62
	Background	62
	Assessment of the WACC and the Discount Rate in the 2025 IASR	63
	(i) Oxford Economics Australia (OEA) considerations	63
	(ii) WACC and Discount Rates	64
	(iii) Single estimate opposed	64
	Weighted Average Cost of Capital (WACC)	65
	Discount Rate(s)	67
	Conclusions and Recommendations	69
5.4.4	Social Licence / social acceptance	70
	Social Licence in the Energy Transition	70
	How AEMO considers social licence	71
	Project-level social acceptance	72
	AEMO's role in considering and communicating social licence	74
	Distribution-grid connected mid-scale projects, orchestration and community acceptance	75
	Mid-scale renewables – updated assumptions	76
	Orchestration, social licence and 'mid-scale' assumptions	77
6	Demand-Side Factors Statement	79
7	Appendices	81
7.1	Appendix 1: National Electricity Rules (NER), clause 5.22.7 (of version 233).	81
7.2	Appendix 2: Language and explanations of key terms	82
7.3	Appendix 3: Notes from ISP Consumer Panel workshop with DER /CER Stakeholders	83

2 ISP Consumer Panel Recommendations

Note that recommendations regarding the 2026 ISP process and AEMO's role are listed in table 1 with reference numbers 1.xx while recommendations beyond the 2026 ISP are given in table 2 with reference numbers 2.xx.

Table 1 For 2026 ISP: Final 2025 IASR. Consumer Panel recommendations table

Reference	Topic	Recommendation
1.1	Language –	That AEMO changes their use of the word “firming” and adopt the NEM review panel term "shaping" instead. <i>(So the ‘tag-line from the 2024 ISP would become: "With coal retiring, renewable energy connected with transmission and distribution, shaped with storage and backed up by gas-powered generation...")</i>
1.2	Policy and the ISP	A workshop involving AEMO, DCCEEW and the Panel be convened to explore the role of policy and policy intentions, in the ISP, before 2026 ISP is finalised.
1.3	Policy updates	Given the significance of very recent policy developments, to the extent possible, AEMO update the Draft 2026 ISP with the recent budgeted changes in Queensland energy policy, the VTP information and the 2035 declared emissions targets from the Federal Government.
1.4	Scenario weighting	AEMO clearly explain the reasons for the changes in its approach and the methodology it has adopted to underpin any weighting of each scenario based on the assessment of the parameter values set out in each scenario.
1.5	Sensitivities	AEMO focus on testing the ISP using sensitivities that are likely to have the greatest impact on outcomes for consumers, including the future costs and benefits to consumers and the sustainability and reliability of the NEM system.

Reference	Topic	Recommendation
1.6	Sensitivities	In addition to the list of potential sensitivities set out in the IASR, AEMO include sensitivities on the costs of transmission expansion and distribution capacity enhancement in line with the risks currently associated with the costs (e.g., + or – 50% for some transmission assets).
1.7	Sensitivities	AEMO undertake testing of the more rapid displacement of natural gas generation by other firming and storage technologies including long-duration batteries.
1.8	Role of Batteries	The Panel also suggests that once the 2026 ISP cycle moves to the modelling phase, when exploring the counterfactual, modelling and subsequent description will need to be overt about how the role of batteries is optimised. While many of the functions and services of batteries lie outside of focus of the ISP, the impact of these other revenue streams should be considered in the costs and benefits attributed to batteries.
1.9	Role of Batteries	Given the role that grid scale batteries will play in in the future energy system, and the associated revenue streams that effect the investment case for batteries, it is crucial for the ISP to fully consider the costs and benefits of batteries.
1.10	Role of Batteries	That once the 2026 ISP cycle moves to the modelling phase, including when exploring the counterfactual, modelling and subsequent description will need to be overt about how the role of batteries is optimised.
1.11	Role of Batteries / Gas	The trade-offs between batteries, synchronous condensers and gas be more fully explored for the 2026 ISP.
1.12	Financial Parameters	AEMO adopt a scenario specific technology neutral discount rate as this better aligns with the individual scenario narratives and the CBA Guideline's discretionary criteria for the discount rate to reflect the systematic risk of the expected cash flows across the different development paths while being technology neutral.

Reference	Topic	Recommendation
1.13	Financial parameters	AEMO updates the economic and financial parameters in the analysis, such as risk-free interest rates and expected inflation for the calculation of both the WACCs and discount rates in the Draft and Final ISP.
1.14	Financial parameters	AEMO reconsiders OEA's approach to estimating the investment risks for some technology specific WACCs (e.g, for off-shore wind) by including consideration of potential government subsidies and off-take agreements.
1.15	Financial parameters	AEMO reviews and explains why it uses a discount rate of 5% in the ENOR in its analysis of the LRMC of additional distribution network capacity while adopting a 7% technology neutral central discount rate in the IASR.
1.16	Scenario Weighting	AEMO explains its reasons for the significant change it has made in the approach to scenario weighting and how it proposes to use the Scenario workshop data to support the weighting of the scenarios in the selection of the CDPs and ODP in line with the CBA Guideline directions.
1.17	Social Licence	Include recognition that AEMO's role extends to communication and awareness raising about the energy transition in public and through targeted stakeholder engagement and acknowledge this is broader than transmission planning.
1.18	Social Licence	Draft 2026 ISP to include discussion of community energy in mid-scale developments in the IASR and ISP, noting the significant project development potential at this scale and the wider potential value to community acceptance of the energy transition as a whole
1.19	Social Licence	Continue to leverage sentiment insights from jurisdictions, research institutes, industry, civil society and transmission / network planners and project developers to inform social licence assumptions in the IASR about REZ resource limits, land-use limits and broader opportunities

Reference	Topic	Recommendation
1.20	Social Licence	Identify savings in implementing ISP projects that accrue from social licence being established (eg. When done well, how much faster and cheaper can project delivery be?) As opposed to assuming social licence investment is always a cost.
1.21	Demand Side Factors Statement	The Modelling includes considerations of curtailment of CER as a variable in modelling. This will need to be carefully explained as some curtailment of CER is reflective of an efficient energy system.
1.22	Demand Side Factors Statement	That some DSF specific briefings and engagement with stakeholders and consumer groups be conducted as part of the engagement about the draft 2026 ISP.

Table 2 Beyond 2026 ISP: Final 2025 IASR. Consumer Panel recommendations table

Reference	Topic	Recommendation
2.1	Consumer engagement	AEMO and the 2026 ISP Consumer Panel explore further consumer engagement opportunities in the lead up to the 2028 ISP Consumer Panel being appointed.
2.2	Behavioural considerations	That AEMO engage Behaviour Economics expertise early in the 2028 ISP process and give them the task of identifying potential behavioural data for application to the 2028 ISP and beyond.
2.3	Reviews	We encourage governments and Industry bodies to take care in a proliferation of shorter term reviews of the ISP and in “piling on” evermore expectations or requirements for ISP’s beyond 2026. Where reviews are conducted and further responsibilities are added, then there needs to be clear strategic focus and direct communication with consumers about why the changes are unequivocally in the interests of consumers
2.4	Reviews	At the same time, there needs for a longer term plan for the ISP itself, as it transitions from a Transmission focussed plan to a broader whole of system plan.
2.5	Multi Sector Modelling	That future IASR processes include a separate discussion about Multi Sector Modelling so that combined impact on the IASR is clearer for stakeholders and consumers
2.6	2028 Consumer Panel	That the 2028 ISP Consumer Panel be appointed in the first half of the 2026 calendar year so that they can actively engage in scenarios considerations.

3 About the Consumer Panel

3.1 Our role and requirements

The ISP Consumer Panel is established for each ISP process in accordance with the National Electricity Rules (NER), clause 5.22.7 (of version 233). This clause is given as appendix 1 to this report.

The role of the ISP Consumer Panel is summarised on the AEMO website as being

“The role of the ISP Consumer Panel is to bring a consumer-focused perspective to the ISP development process. AEMO engages with the ISP Consumer Panel on a continuous and ongoing basis, seeking advice and input on matters of both substance and process. Such engagement supports the Panel’s timely consideration of issues and feedback to AEMO, allowing for AEMO’s approach to be adjusted where appropriate.”^[1]

AEMO appointed four members to the 2026 ISP Consumer Panel (the 2026 Panel) in May 2024:

- Bev Hughson, bringing over 30 years' experience in the Australian energy industry, working for a major energy business and for over a decade working with consumers.
- Craig Memery, Senior Energy Advisor with the Justice and Equity Centre’s Energy and Water Consumer Advocacy Program. Craig has advocated for energy consumers since 2009 and has over 20 years of energy sector experience
- Jarra Hicks, founding Director of Community Power Agency, a not-for-profit that works to foster a fair and fast transition to renewable. Her PhD focused on the outcomes of energy change in small regional communities.
- Mark Henley, advocate for vulnerable people and communities.

The 2022 ISP Consumer Panel (the 2022 Panel) described their approach to the long-term interests of consumers:

“...to ensure the ISP adequately accounts for the risks of over- or under-investment when the future, inevitably, doesn’t turn out the way it was modelled today. If there is over-investment, consumers will pay more than they need to for electricity, and we know the affordability of electricity is already a major issue for many consumers. If there is under-investment, there will be an increased risk of power outages due to reduced reliability or security of supply, or failure to meet emissions reductions targets due to an inability to connect new renewable generation.”^[2]

The 2026 Panel endorses this approach as did the 2024 Panel.

Under the NER, the Panel is required to publish two main reports:

- A report on the IASR by 1 October 2025
- A report on the Draft ISP by 15 February 2026.

AEMO must publish these reports on its website and have regard to them but is not obliged to give effect to any recommendations in these reports.^[3]

In addition to these two required reports, the Panel considers it has a role in the ongoing ISP development process and is supported by AEMO in this regard. The Panel engages closely with AEMO through formal and informal submissions and other activities.

3.2 Audiences for this report

The Panel has considered the audiences for this report and how it can most usefully present consumer and community interests. The NER is clear that the Panel is “to provide written reports to AEMO”. This report on the *Inputs, Assumptions and Scenarios Report* will be considered by AEMO in preparing the Draft ISP . The Draft 2026 ISP will be released in December 2025.

The Panel considers that the AER is also an audience for this report. The AER is required to report on the extent to which consumer / stakeholder views have been sought and heard in finalising the IASR. This report has considered the issues raised by the AER in their review of the Final IASR, their report being published in early September 2025.

We also consider that in addition to AEMO, there are other audiences who may use this report in different ways, including:

- Consumers and consumer groups
- Community energy groups
- Other ISP stakeholders
- Governments and government departments
- Academics and energy / climate research groups
- Other market bodies and regulators.

Section 3.3 is drafted with reference to the AER and specifically their “Transparency Review of the IASR,” while sections 4-6 are 2025 Final IASR specific with the main audience being AEMO. Section 7 “Beyond 2026 ISP” is drafted with a broader audience in mind.

3.3 Involving Consumers and Stakeholders

As a Consumer Panel, we are continually considering processes for consumer input through the development of the ISP process. In this section we summarise our understanding of approaches that enable consumer input. We suggest that a key energy sector-wide response to growing complexity and growing uncertainty need to be increased through ongoing and meaningful engagement with consumers.

The 2025 IASR is the most complex yet and so reflecting briefly on AEMO's engagement is important.

On 28th March 2025, AEMO published the latest version of its 2026 ISP Stakeholder Engagement Plan,^{[14](#)} a rolling plan that AEMO summarises as:

"AEMO welcomes feedback from interested stakeholders on our approach any time during the engagement program. AEMO will apply any learnings to engagement on the development of the 2026 ISP and future engagement processes."

The Panel provided advice to AEMO about the earlier draft of this plan, and it was a topic of regular discussion with the Panel. This version of the plan included results from three stakeholder surveys about engagement satisfaction results with the 2024 ISP engagement process conducted Sept – Oct 2023, March – April 2024 and June – July 2024. The overall satisfaction score rose with each survey with scores of 7.3, 8 and 8.6 (from a maximum score of 10) which suggest high levels of satisfaction with the process. This is not to suggest that all stakeholders agreed with all positions taken and decisions made by AEMO concern the ISP. Rather, it reflects a high level of general satisfaction with the process.

In developing the 2025 IASR, we suggest that there were four regular, ongoing processes that AEMO has utilised:

- The Forecasting Reference Group, which is a (roughly) monthly online forum of forecasting and demand focussed specialists, including major industrial energy users as well as some consumer group representatives. The group considers the annual electricity and gas statements of opportunity (ESOO and GSOO) as well as a full range of ISP topics.
- Consumer forums. These include regular meetings of the AEMO Consumer forum
- The Consumer and Community Reference Group (CCRG) which was able to consider some aspects of the IASR in detail. In addition to other involvement, two members of the CCRG provided specific advice to the Consumer Panel in producing this report. CCRG members are engaged on an 'as needs' basis, for specific engagements
- ISP Consumer Panel. We meet with key AEMO staff on a fortnightly basis and on other occasions as specific topics require. We are wholly focussed on the ISP and presenting consumer perspectives.

Alongside these ongoing processes, the following activities have also contributed to further focussed consumer input into the 2025 Final IASR:

- Public Webinars regarding ISP Methodology, IASR Stage 1 Report, IASR Stage 2 Report, Electricity Network Options Report, Gas Infrastructure Options Report.
- Consumer Group verbal submissions on each of the reports listed in the previous dot point.
- Bilateral meetings as requested, eg with individual NSP consumer advisory groups, on specific topics.

A full list of engagement activities is given as table 3 in the 2026 ISP Stakeholder Engagement Plan (March 2025). The Panel notes that AEMO also publishes separate reports that respond to issues raised by stakeholders in the major ISP related draft publications. This provides an opportunity for stakeholders to see how their concerns were addressed in the subsequent final publications.

The Panel also held a session with a group of community energy and consumer groups in Melbourne on 4th February 2025 to explore CER issues and the ISP. Notes from this discussion are attached as Appendix 3. The Panel has encouraged AEMO to engage more directly with community representatives as they develop the ISP, so that the range of perspectives from across Australian communities, about the transition, are captured in the ISP development process.

In general, the Panel considers AEMO receives broadly representative feedback when wider stakeholder input and AEMO forums are considered. However, there is still a limit to what AEMO can garner from experts and advocates. The Panel considers there is still a relatively narrow pool of input from consumer and community groups in comparison to the input from energy industry representatives (including network companies) and jurisdictions.

The challenge to proactively engage consumer and community voices in the increasingly complex, changing and fast paced ISP process is a continuing challenge

Recommendation 2.1

AEMO and the 2026 ISP Consumer Panel explore further consumer engagement opportunities in the lead up to the 2028 ISP Consumer Panel being appointed.

Notwithstanding the above, AEMO additionally refers to and is informed by sentiment tracking and surveys being undertaken or commissioned by others to sense check the insights they receive via research institutes, jurisdictions, network operators in relation to the energy transition, REZ regions and / or specific projects. They also refer to and draw insights from sentiment and market research by civil society and consumer advocacy groups. This is crucial and the Panel notes that AEMO has been increasingly open to including and drawing input from high quality external research and we are encouraged to see this informing the approach to stakeholder communication and narrative development around the IASR scenarios and the ISP.

3.3.1 The AER's Review Report - 2025 Inputs, Assumptions and Scenarios Report (August 2025)

The AER is required under the NER to conduct a "transparency review of the final IASR"¹ The AER describes their role in conducting this review as follows (AER, *IASR Review*, p. 1).

"The Australian Energy Regulator's (AER) role is to scrutinise ISP documents making certain that AEMO's processes are robust, credible and transparent", and

¹ "AER - Review report - 2025 Inputs, Assumptions and Scenarios Report (2).pdf, August 2025.

“Our role through the Transparency Review process is to focus on the adequacy of AEMO’s explanations of key inputs and assumptions and how these have contributed to the content of the IASR”.

In conducting this review, the AER draws on the requirements and considerations for the ISP that are set out in the AER’s Forecasting Best Practice (FBP) Guideline and the Cost Benefit Analysis (CBA) Guideline. In considering the AER’s review, the Panel also took account of the directions in the two Guidelines and in particular: (AER, IASR Review, p 1):

- Forecasts should be as accurate as possible and based on comprehensive information and prepared in an unbiased manner (FBP)
- The basic inputs, assumptions and methodology that underpin forecasts should be disclosed (FBP)
- Stakeholders should have as much opportunity to engage as is practicable, through effective consultation and access to documents and information (FBP).
- AEMO has identified in the IASR all the necessary inputs and assumptions to facilitate modelling an accurate and representative ISP.

The AER’s review notes there has been an improvement in the ‘accessibility’ and ‘quality’ of key explanations in the 2025 IASR. The AER also notes ‘the extensive and tailored consultation process’ that AEMO has conducted during the development of the IASR and that this is consistent with a ‘high general level’ of transparency.

The AER’s assessment highlighted three areas (AER, IASR Review, p.2):

- Parts of the report that fully explain new or complex subjects, providing improved transparency
- Identified issues where the IASR has not met the requirements in the Rules
- Areas where AEMO should focus to support transparency in the draft ISP.

There were four areas where the AER considered there was improved transparency. They were (AER, IASR Review, p. 3):

- The identification and explanation of ‘policy settings’
- The estimation and explanation of the financial parameters (weighted average cost of capital and the discount rate)
- The hydrogen production forecasts
- Multisectoral modelling.

The Panel agrees with the AER’s general observations on improvement in AEMO’s consultation and transparency. We note in this report, however, the need for further discussion on what should count as a policy setting in the IASR and the subsequent ISP. In addition, there is further work to do on multisectoral modelling particularly in the context of the Federal Government’s recent report on sectorial carbon emission abatements

targets. The AER report then identifies eight “outstanding issues” in the IASR where AEMO could improve the transparency of its decision making, and three ‘topics of focus’ for transparency in the Draft ISP.

With respect to the eight outstanding issues, the NER requires the AER “as soon as possible” to provide further explanatory information in an addendum to the 2025 IASR, and to consult on these issues in the Draft ISP. (See AER, *IASR Review*, p 3).

AER’s outstanding issues:

The Panel notes the following matters raised by the AER in its review which will form part of the addendum to the IASR and which are particularly important for AEMO’s consideration and consultation in the Draft ISP. They are (pp 3-4)

- *Policies affecting consumer demand:* We support the AER’s view that AEMO should more consistently explain which inputs and assumptions in the IASR are based on these policies and specifically how these policies impact on AEMO’s forecast of demand over the ISP transition period.
- *Data Centre forecasts:* The Panel notes the AER’s comments on the need for AEMO to more clearly explain its forecasts of data centre demand and to outline any opportunities for consultation regarding this input in the addendum to the IASR. The Panel is also very concerned to see greater transparency about the impact of the relatively rapid increase in the number and size of data centres and the associated increase in electricity (and water) demand. It is most important that the additional costs of any network expansion in the distribution and transmission systems, and risks to supply security, do not unfairly fall onto other electricity consumers.
- *Victorian Transmission Plan (VTP):* The AER highlights that the VTP was published on 17 August 2025, after the publication of the Final IASR. The AER expects the matters raised in the VTP be addressed in AEMO’s **addendum** to the 2025 IASR and for AEMO to outline any opportunities for consultation regarding this update (p. 4). The Panel supports these directions and notes that while the VTP assumes AEMO’s ‘committed’ and ‘anticipated’ transmission projects will proceed, the VTP defines further actions on generation development, REZ locations and additional transmission networks, all of which are likely to impact on the ISP. (see: <https://www.energy.vic.gov.au/renewable-energy/vicgrid/the-victorian-transmission-plan>)
- *Community battery forecasts:* The AER states that it expects AEMO to more clearly identify where the forecasts of community batteries are included in the IASR and how AEMO derived the forecasts (p. 5). The Panel has previously encouraged AEMO to engage more fully on the prospects and benefits of community batteries and we strongly endorse the AER’s concerns on this matter. It is vital to the future development of the ISP that AEMO investigates this sector in more detail, collecting and publishing data on the current state of this sector and identifying future opportunities to expand the sector.

Topics for focus in the Draft ISP identified by the AER review:

The three topics for focus in the Draft ISP to support transparency are:

- *Sensitivities*: The AER ‘encourages’ AEMO to have a specific focus in the Draft ISP on how the sensitivities have been selected and their significance to the ODP (p. 5). The Panel also regards this as an important issue for the Draft ISP, as they provide insights into the robustness of the ODP to changes in the inputs and assumptions and to the risks that consumers face arising from the selection of the ODP and the actions that follow from that. Along with the AER, the Panel looks forward to ongoing engagement with AEMO on this matter.
- *Scenario weighting*: The AER expects AEMO to provide rationale for its assessment of the likelihood of each scenario and if/how this may have changed since 2024. The Panel supports the AER’s expectations. We would add to this our concerns with how AEMO has arrived at the relative weightings of the scenarios given the changes in approach, namely AEMO’s focus on assessing individual scenario parameters rather than weighting the three scenarios directly as in the previous ISP process.
- *Demand-Side factors (DSF) Statement*: The AER makes clear that the DSF statement should transparently explain how events at the distribution level will ‘contribute to the efficient development of the power system’. (p. 6). The Demand-Side Factors Statement is a new report that AEMO will publish alongside the Draft ISP for consultation and the Final ISP.

The Panel strongly agrees with the AER on the importance of transparency in how AEMO’s forecasts and models address the complex issues raised in by the demand-side factors, and how these are represented in the ISP. We also add to this, the importance of AEMO being transparent about the quality of the data they rely on. For example, we note AEMO’s concerns with the quality of the data available from the distribution businesses in the current IASR on the capacity in the distribution networks to host demand-side investments such as PV. It is important that the AEMO is transparent about the quality of the data that underpins its 2026 forecasts and how this might limit the conclusions drawn on distribution hosting capacity.

We also highlight the AER’s specific proposals (discussed above) for AEMO to further consult with consumers both prior to the Draft ISP and as part of its consultation on the Draft ISP. The AER specifically requests AEMO to ‘outline any opportunities for consultation’ regarding the inputs on data centres and the VTP.

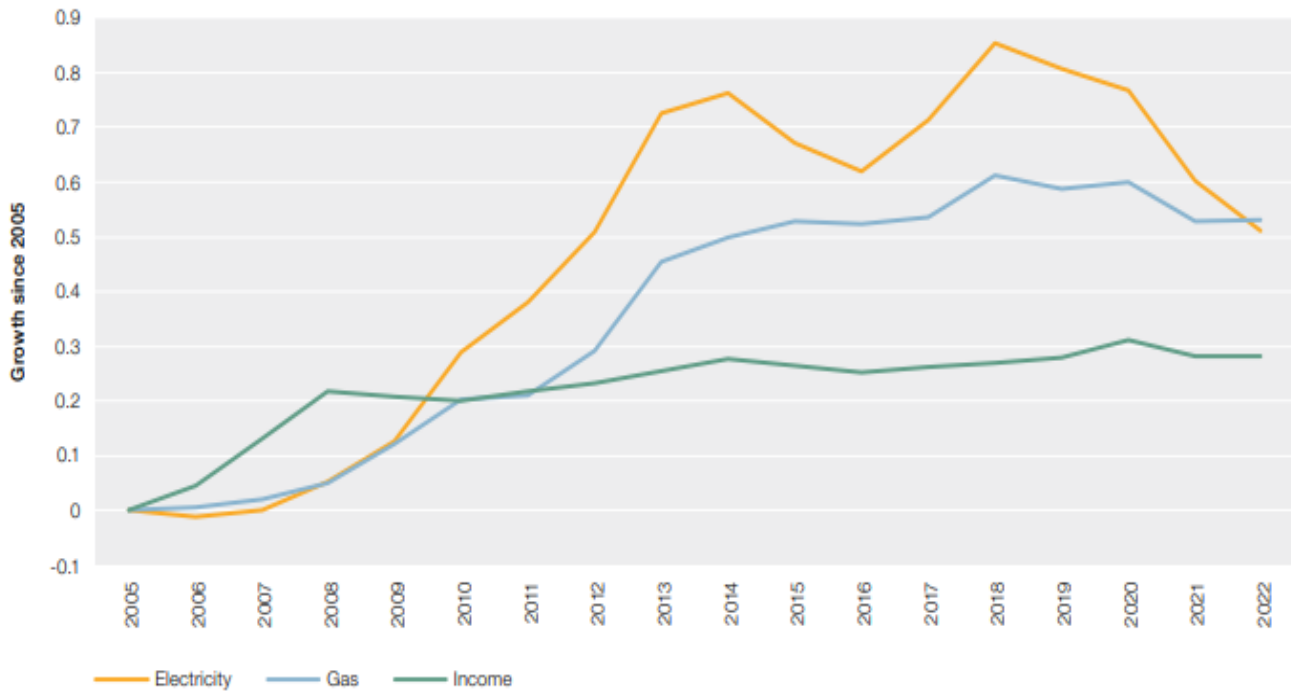
The Panel looks forward to further discussions with AEMO on these matters raised in the AER’s report.

3.4 What’s happening for consumers

As a consumer Panel, we are acutely aware of the diversity of consumers, their circumstances, issues and concerns. Different consumers and their communities will respond to the energy transition and consequently the ISP in different ways with differing needs, hopes, anxieties and expectations. Some of this is picked up in “social licence” (see section 6.4.4 of this report) consideration, but there is broader context too.

The Panel thinks it's useful to remind ourselves and readers of this report about some of the broad, current context for consumers and some implications for energy markets.

A useful starting point is the following graph from the AER's 2023 State of the Energy Market report². The graph shows that electricity and gas prices have risen at a much higher rate than incomes, since 2009 for electricity and 2011 for gas. We also reflect that electricity prices in some jurisdictions rose sharply in the early 2000's.



Note: Inflation adjusted.

Source: Electricity and gas index – ABS, Consumer Price Index, various years; income index – ABS, Household Income and Wealth, Australia, various years.

Figure 1 Energy prices and income

(NB, an updated version of this chart has been sought and will be inserted when available.)

The graph provides some context for the high levels of frustration that many consumers vent in response to energy processes, electricity in particular. Despite over two decades of ‘promises’ of cheaper electricity since the “competition policy” reforms of Hilmer and Parer led reviews and the creation of the National Electricity Market (NEM) with associated market bodies, energy prices continue to rise in real terms and in comparison, to income. At the same time, increasingly affordable solar and household battery systems offer people a perceived alternative to the energy market for some - even most - of their energy needs, giving them less incentive to bridge the gap in trust.

The Panel notes that figure 52 of the Final IASR provides residential retail price forecasts for all three 2026 ISP scenarios. Indexed prices are projected to show some volatility through to the early 2030s with *“NEM retail prices are expected to trend gradually upwards through the 2030s as traditional coal generation assets (near end of technical life) are replaced by new investments into VRE.”*, (page 116, Final IASR)

² <https://www.aer.gov.au/system/files/2025-07/State%20of%20the%20energy%20market%20%28SOTEM%29%202023.pdf>

The growing withdrawal of trust in energy markets, plans and promises is indicated in the Energy Consumers Australia 2024 consumer sentiment survey³.

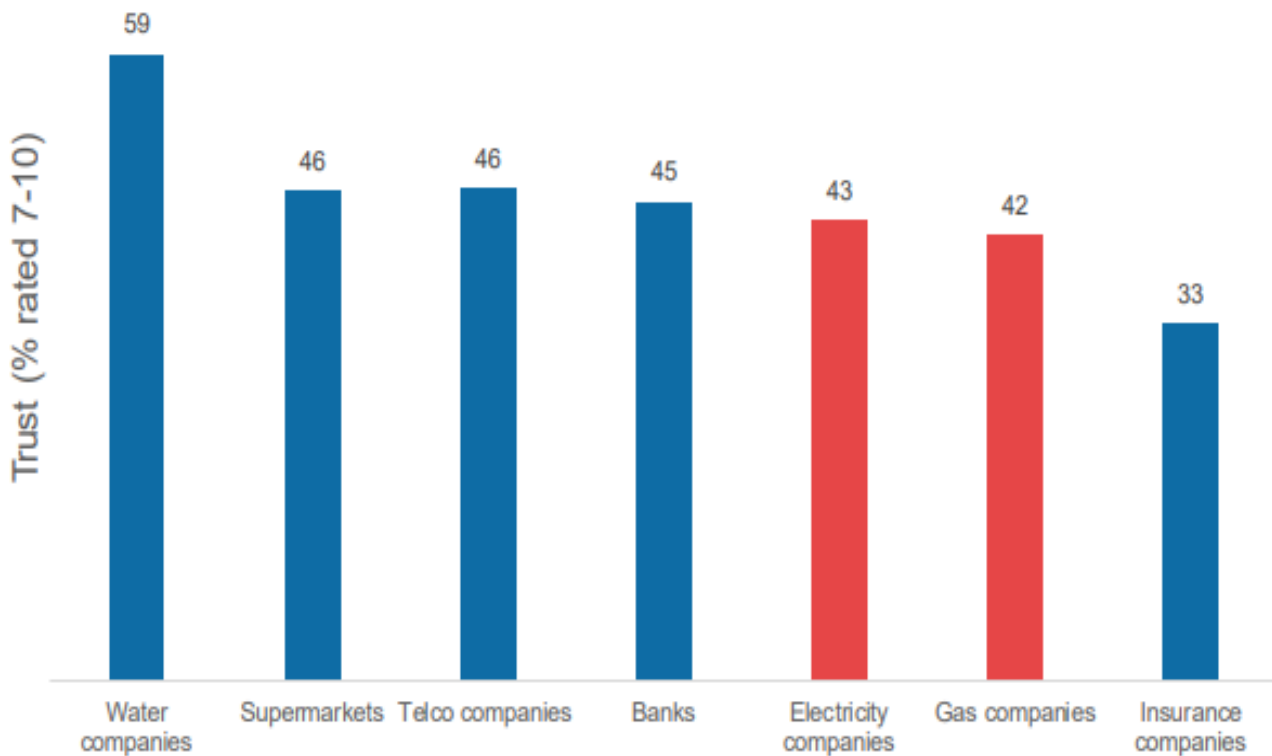


Figure 2 Trust to do the right thing by consumers (Energy Consumers Sentiment Survey June 2024 (ECA))

The Panel has little doubt that recent, accelerating cost of living pressures have contributed to frustrations with energy costs.

The following graph using ABS data shows aggregate cost of living changes, as indexes, for various income cohorts. The substantial percentage increases in costs over the last 4 years, 2021-24 stand out dramatically in the graph.

Noteworthy is that employees experienced both the highest levels of cost increases, as shown for June 2023 and also the most rapid change from negative 2.1% change in June 2020 to 9.6% increase in June 2023, a substantial change over three years, the “covid years.”

This helps to explain why cost of living matters have been at the forefront of Australian media over recent years, including energy costs.

³ <https://energyconsumersaustralia.com.au/sites/default/files/wp-documents/ecss-jun24-topline-results-report.pdf>

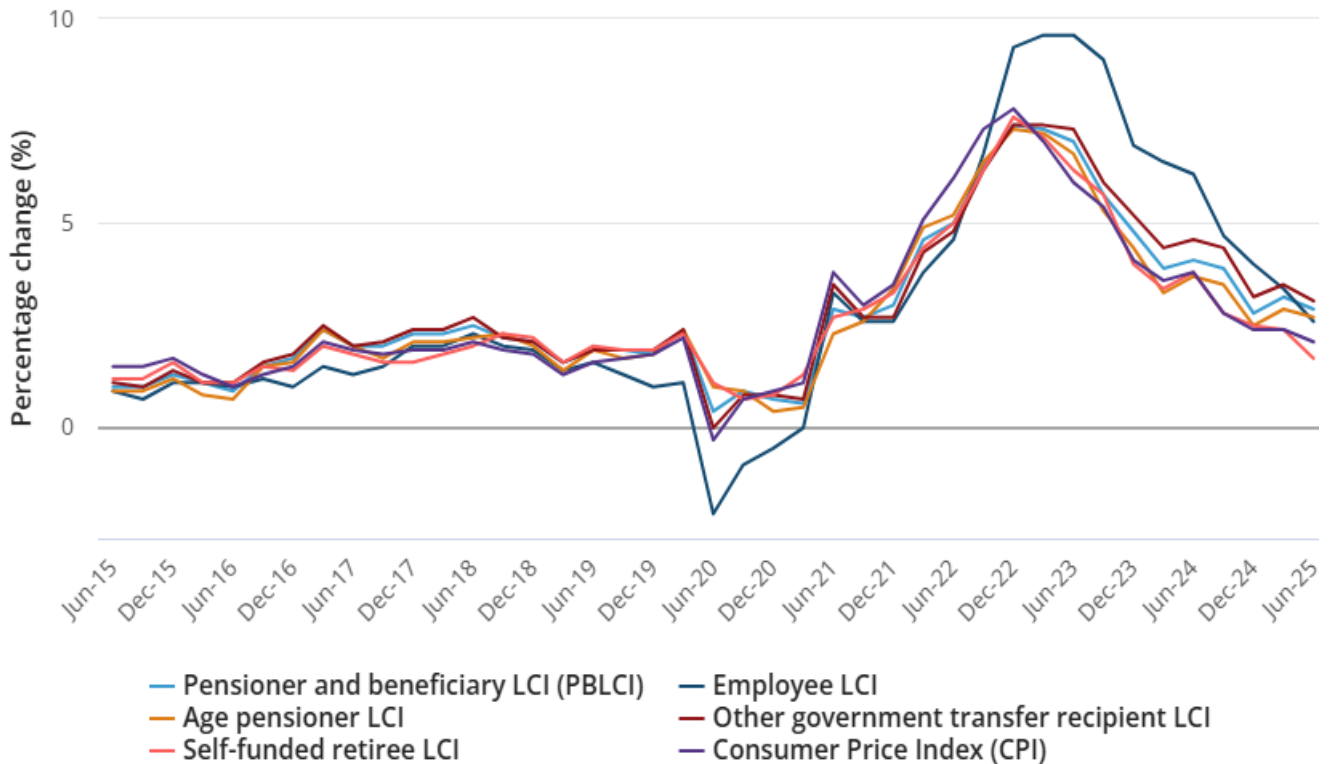


Figure 3 Selected Living Cost Indexes (LCIs) by household type and Consumer Price Index (CPI), Australia, annual movement (%) to June 2025⁴

Meanwhile, poverty levels stay stubbornly high. Using the austere measure of poverty being 50% of median income, ACOSS and collaborators state:

“One in eight adults and one in six children in Australia are living in poverty. That equals 3.32 million (13.4% of the population), including 761,000 or 16.6% of children.”⁵

Along with energy costs, housing costs have also been impacting household budgets, with housing costs being widely reported as beyond the reach of many households.

The following graph shows real (in \$2011) house price averages over the last 140 years, the dramatic and continuing increase in house prices since about 2000 is plain to see.

This dramatic increase in house costs flows through to rental costs also rising, generally at a higher rate than mortgagee housing costs.

⁴ <https://www.abs.gov.au/statistics/economy/price-indexes-and-inflation/selected-living-cost-indexes-australia/latest-release#annual-living-costs>

⁵ <https://www.bsl.org.au/bsl-drives-change/poverty-in-australia/>

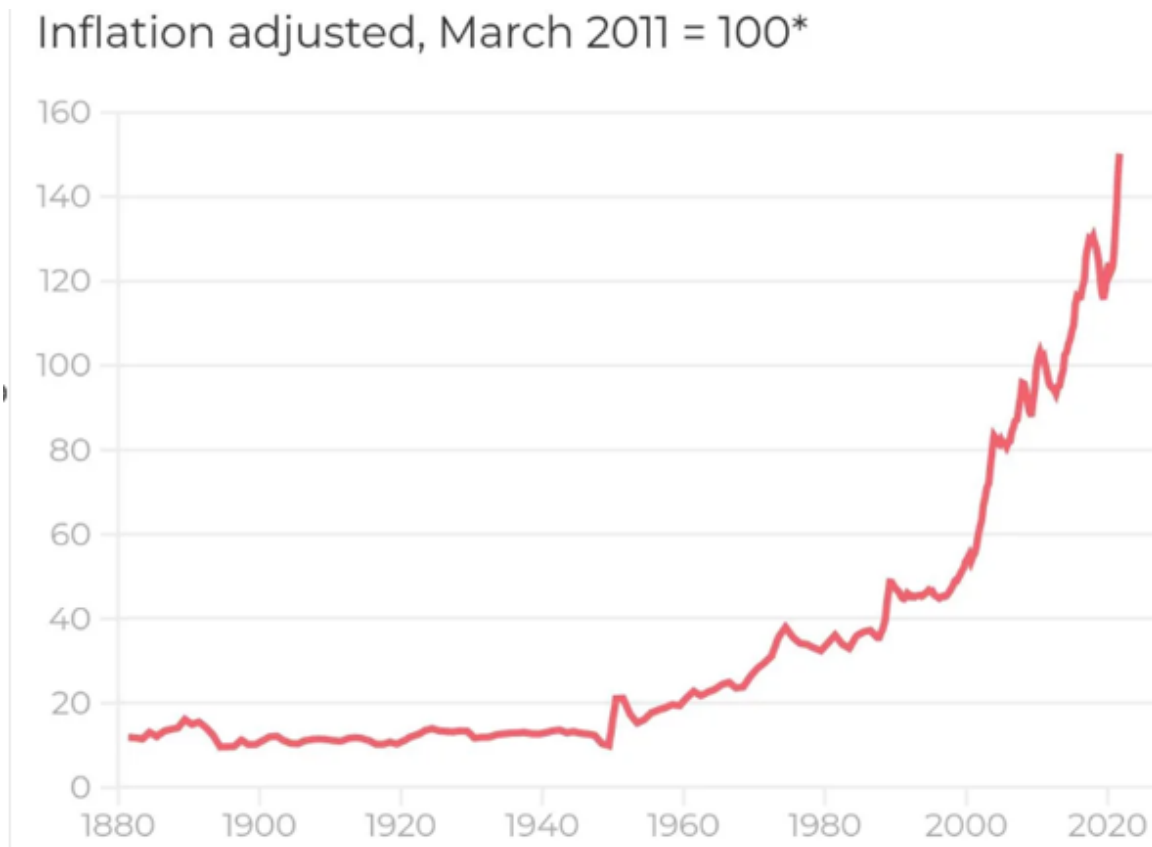


Figure 4 Growth of Australian House Prices over 140 Years⁶

A further relevant aspect of the housing market is the changing tenure mix. ABS data is showing that renting as at 2021 accounts for over 30% of all accommodation. We suggest that it is now a higher percentage, steadily increasing over the past 2 decades. While outright home ownership has fallen from about 42% to be roughly equal with renting in 2021.

We wish to focus on two energy related aspects for renters.

Firstly, a considerable amount of rental housing is of relatively poor quality. One measure being the likelihood of mould being found in the property; some estimates suggest that about 40% of rental properties contain mould.

Levels of mould in housing is given my tenure and jurisdiction in the chart below.⁷

⁶ https://www.reddit.com/r/AusFinance/comments/w2pplt/growth_of_australian_house_prices_over_140_years/

⁷ <https://www.abc.net.au/news/2023-05-16/why-rental-properties-are-more-likely-to-be-mouldy-stop-sickness/102348360>

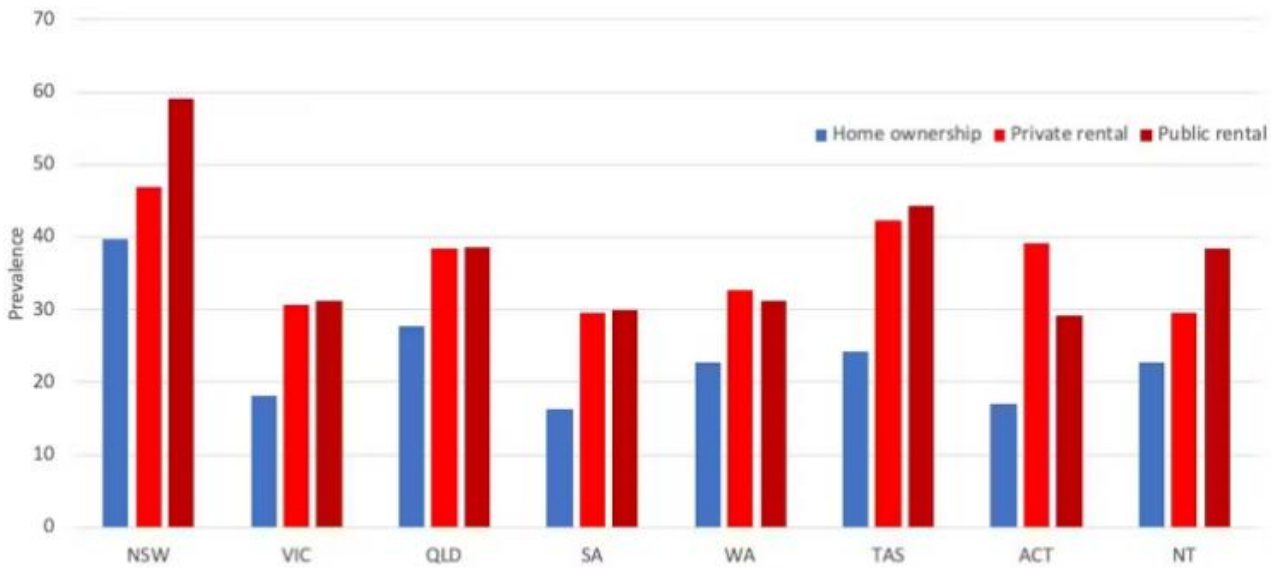


Figure 5 Charting mould in homes across Australia

Mould in housing is strongly associated with poorer health for the residents and is also an indicator of inability to afford the amount of energy needed to have the home warm (and ventilated) enough so that mould doesn't grow. Cold and mould reflect underutilisation of energy by impacted households. Rental housing is generally poorer building quality, also requiring higher energy requirements for adequate living conditions to be met.

A second implication of rising levels of renting is that only about 4% of rental housing includes PV (or any other form of CER) while "according to Australia's Clean Energy Regulator, as at the end of May 2025, a total of 4.136 million solar power systems have been installed on Australian homes and small businesses. With an estimated number of 10.8 million homes in Australia, this brings the total of all households in Australia that have solar panels to 38.11%." ⁸

As significant as CER is, about 30% of households (renters) are unable to access the direct benefits of CER (PV and home batteries in particular) as Landlord don't invest in them and renters also have limited ability to respond to price signals or reduce their energy use.

For the ISP, the different electricity and CER experiences for homeowners, including mortgagees, compared to renters is important, both as limits to aggregate CER potential under current policy settings and landlord practice and as a crucial aspect of enabling equity in the energy transition. Renters generally want renewable energy and net zero goals but can't afford to pay disproportionately for it.

The unavoidable impact of the ISP's transition plan on retail prices in the next decade matters and must be carefully managed by policy makers to ensure costs are borne equitably across consumer sectors. It's also important to highlight that renewables are the lowest cost form of generation and increasing penetration of

⁸ <https://solarcalculator.com.au/blog/solar-energy-facts-and-statistics/>

renewables replacing unreliable coal generators will drive electricity bills down over time. Policies and processes need to be established to ensure that all consumers, including renters and other lower income households, share these benefits,

When will energy bills go down?

Perhaps the greatest concern of Australian energy consumers is the question of when will energy (including) electricity bills go down, or at very least, what will it take for these prices to go down - in real terms.

We recognise that it is not AEMO's role to attempt to answer this question, but we do suggest that AEMO has two responsibilities pertaining to the question:

- a) Recognising that "least cost" is a fundamental consideration in developing the ISP's optimal development path and that cost need to be shared equitably, both intergenerationally and with respect to income and wealth differences, ie capacity to pay.
- b) Providing a public narrative that recognises two decades of promises of cheaper electricity even while electricity prices have grown more rapidly than incomes which has led to low levels of consumer trust in energy markets. The narrative of the 2026 ISP should, we suggest, recognise that there is a major transition underway and it needs to happen at the lowest efficient cost, but this doesn't mean that prices to come down anytime soon.

The question about when electricity bills really will really come down is an important consideration that should be under careful consideration by the political process, market bodies and commentators. It could also be mentioned in the (draft) 2026 ISP narrative.

Discussion

The Panel agrees that renewables are the lowest cost form of energy generation and the longer it takes to get to higher penetration of renewables, the worse for the reliability and of the system and the costs of energy - and the environment. Delays mean that the old unreliable coal fired plants that cause significant price spikes (impact on the DFO!) and new gas will be slow to come on in sufficient quantities to meet demand if less connected renewables. So, as a society, collectively, we must "get on with it", and continue to grow CER/DER efficiency.

In policy and social licence contexts, it is also crucial that the current and potential future inequities across the consumer base are recognised and that policy makers must better manage these inequities. For the ISP, the Panel highlights community-based energy provision and shared energy cost responses, including VPP's, as part of the solutions for better equity.

The Panel suggests that narratives associated with the ISP, from policy makers as well as AEMO will do well to acknowledge consumer angst about energy costs, recognise the risk of inequality in transition and commence processes to start to publicly answer the question of when will energy bills come down, with honesty and without shorter term promises that can't be met. To start the ball rolling the Panel's opening gambit is to suggest that household energy bills will come down when:

- There is an abundance of diversified minimal margin production cost renewable energy
- Storage, eg from batteries and including community owned batteries are well developed and distributed across the NEM, reducing volatility in wholesale markets and flowing through to consumers
- Periods of peak demand are reduced, and networks are used more productively
- The transition process is as ‘orderly’ as possible, allowing both consumers and investors to invest with confidence.
- All elements of energy supply chains price at efficient levels, indicating effective competitive and regulatory processes.
- Dwellings and appliances/equipment are energy efficient.
- Electric vehicles are commonplace (about a half of Australia’s total energy comes from liquid fuels: mainly petrol, diesel)

Overall, consumers need clarity on what the forecasts and assumptions in the IASR under each scenario will mean for them in terms of their electricity bills, when the current high costs will start to decline, and what are the challenges and risks to achieving this outcome in a reasonable time period.

3.5 Recommendations from previous ISP Consumer Panels

This report builds on thinking and recommendations from the two previous ISP Consumer Panels. A detailed table of recommendations tracked from 2022 and updated for 2024 is given the Final IASR report produced by the 2024 ISP Consumer Panel and can be found through the following link

^[1] <https://www.aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2026-integrated-system-plan-isp/2026-isp-consumer-panel>

^[2] 2022 Panel (2021b) ibid p.14.

^[3] NER (clause 5.22.7).

4 Key Themes (and Context)

The Panel has identified 10 key themes that we consider to be germane to the development of the draft 2026 ISP. The first 3-4 themes are the priorities / bigger picture topics which are frequently misunderstood by stakeholders not closely involved with the ISP. The remaining 6 themes are more specific to the 2026 ISP but overlap with other aspects of the ISP, so are not discrete in their own right.

(The earlier 'key themes' are longer, reflecting a depth of thinking by the Panel, and may contribute to framing aspects of the draft 2026 ISP narrative)

4.1 What is the question that the ISP trying to answer?

Is the central question "How to optimise total energy system in Australia as we transition to a net-zero economy in a way that is efficient and ensures the interests of consumers in the security, reliability and affordability are front of mind during this process.

Since the initial 2018 ISP, there has been a continual process of refinement of the data collection and modelling processes. The 2026 ISP has made major steps in the enhancement of both data and modelling. For example, following a review of the ISP in 2024, the ISP now brings in consideration of the availability and cost of gas to fulfil its 'firming' role over the transition period. The 2026 ISP also brings in additional considerations around the capacity of the demand side to lower overall costs and contribute to the transition.

The Panel acknowledges that the transition process can be disruptive and costly, an outcome that may not fall equitably across all consumers. The process also requires significant investments by both industry and consumers in the near term. The Finkel Review, "Independent Review into the Future Security of the National Electricity Market - Blueprint for the Future."⁹ Published in 2017, the Review discussed the energy tri-lemma, balancing affordability, security of supply and (environmental) sustainability. We ask whether we are now dealing in the ISP with a quadrilemma, these three aspects plus social licence.

The Panel notes that the ISP is not the only organisation dealing with this issue. Multiple state governments have or are in the process of developing their own state-based policies and processes for achieving their own jurisdictional based objectives. (see Section 5.2.1) Some are complementary to the ISP, others perhaps less so, raising the question of if and how these jurisdictional plans align with AEMO's plans in a way that minimises overall costs to NEM consumers.

Against this background, the ISP identifies the mix of generation, storage and network expansions to supply electricity to meet the NEM 'operational demand' at least cost, and given the prevailing technological, social and policy driven constraints - i.e., as simply as we can, the ISP is optimising the energy supply, storage and

⁹ <https://www.dcccew.gov.au/sites/default/files/documents/independent-review-future-nem-blueprint-for-the-future-2017.pdf>

transmission network expansions required to meet consumer demand in each sub-region¹⁰ at the level of transmission/distribution connections. In so doing the ISP begins with a forecast of underlying demand based on multiple inputs such as the growth in CER, EVs and electrification, partially offset by energy efficiency as illustrated in the 2024 ISP forecast of residential demand shown in the figure below (2024 Final ISP, p 26). Underlying demand is partly satisfied by consumers adopting behind-the-meter technologies such as PV as illustrated in the figure below and by generation embedded in the distribution network.

Simplistically, the ISP modelling is designed to determine the optimal mix and location of grid-scale generation, storage (such as grid-scale batteries) and transmission to meet this the operational demand at a sub-regional level and to do so at least cost within the economic and technical constraints identified above.

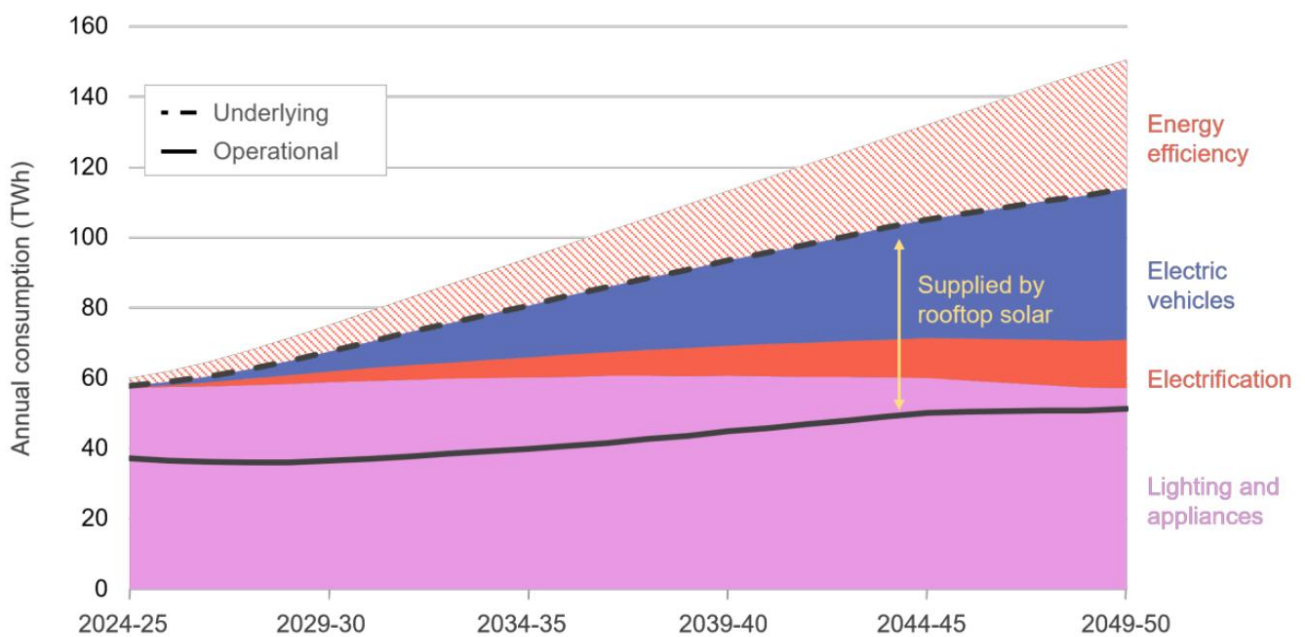


Figure 6 AEMO 2024 ISP, Figure 6, Page 26

Note: this figure is taken from the 2024 ISP and is provided for illustrative purposes. It does not reflect AEMO's current forecasts of demand.

AEMO's 2024 Final ISP describes this as follows: (p 44)

"ISP outputs: optimised generation, storage and network investments:

The optimal future generation, firming and transmission for the NEM form the ISP's optimal development path (ODP). The ODP aims to deliver reliable and affordable power to meet NEM needs for at least 20 years fulfil the NEM's security and reliability requirements, meet government policy settings and manage risk through the transition"

¹⁰ AEMO has broken the 5 NEM regions down to 15 sub-regions, 4 each in Queensland and NSW, 3 in Victoria, 3 in South Australia, and 1 in Tasmania with the aim of providing more granularity of diverse load patterns for optimisations. See Final IASR, Section 3.10.1 for details.

As its name suggests, the IASR provides the inputs and assumptions that underpin the ISP modelling and outputs. As more requirements are built into the ISP, such as those set out in the Energy Ministers' review of the ISP, the range of inputs and assumptions has also grown.

Enhanced forecasting of the factors impacting on demand has been an important outcome of the ISP review. An important example was the request of the Minister for Climate Change and Energy to the AEMC to amend the NER by directing AEMO to improve consideration of demand-side factors in the ISP. The AEMC made a final rule change in December 2024 that directed AEMO to publish a DSF statement in the ISP and mandates DNSPs to provide information to AEMO for inclusion in the statement. (see:

https://www.aemc.gov.au/sites/default/files/2024-12/erc0396_final_determination_-_improving_consideration_of_demand-side_factors_in_the_isp.pdf)

The focus on the demand-side in the 2026 ISP is a major step towards a more complete understanding of the total energy system, and the 'task' that grid scale generation, storage, and the associated expansion of the transmission network of ensuring a secure and reliable electricity supply to consumers. The improvements in understanding of the demand-side and distribution opportunities help fill the 'gap' between operational demand and underlying demand.

In addition to CER, energy efficiency and electrification and other distributed resources, AEMO now needs to consider distributed resources such as generation and mid-scale storage (including VPPs) that sit within the distribution networks, along with the capacity available in the distribution networks to host these facilities.

As the quality of the distribution data improves over time, it will allow AEMO to make explicit cost benefit trade-offs between constraining CER and embedded renewable outputs and the expansion of the distribution networks at the sub-regional level or lower (in some cases). By improvements in its understanding of developments 'downstream' of the transmission system, AEMO is better able to capture the upstream generation, storage and transmission requirements to supply each sub-region, thereby reducing the risks to consumers of under or over investment in transmission and grid-scale generation, causing respectively, lower levels of reliability in supply or sunk costs with underutilised assets.

As noted previously, AEMO's approach will consider trade-offs between CER, embedded generation and storage et al, with the costs of expanding the distribution network (which may be small if there is excess capacity in that part of the network, or high if additional capacity is required). The outcome of this 'optimisation' at the distribution network level will be estimated in the 2026 ISP.

However, the distribution 'supply/demand' balance will not be part of any overall system co-optimisation exercise. Rather, the output of the distribution demand and capacity modelling will define the operational demand (at the sub-region level). In response to stakeholders suggesting a broader co-optimisation, the AEMC states in its final determination on improving consideration of demand-side factors(p. 16):

"The final rule represents the first step in an incremental approach to making the ISP a more integrated and robust whole-of-system plan. Other challenges would need to be addressed if the ISP is to provide a more holistic view of the investment needs across the power system (at both transmission and distribution level). For example,

co-optimisation would require the development of a trigger for distribution assets, similar to actionable ISP projects for transmission. This would require significant amendments to the NER (DNSP economic frameworks, ISP scope) that would require careful consideration outside of this rule change process.”

The AEMC concludes that the Rule change requirements are about enhancing the quality and transparency of the inputs to the modelling and will therefore become an increasingly important part of the IASR forecasting process.

The AEMC’s rule changes also proposes that AEMO conduct sensitivity tests on these demand-side forecasts to identify risks and 'help guide policy responses and investment decisions'.

Similarly, at the direction of the Energy Ministers, AEMO must extend its consideration of issues around gas supply for gas generation in the 2026 ISP. However, the Ministers explicitly directed AEMO not to co-optimize the gas supply and gas generation as part of the ISP selection of the ODP.

The Ministers’ directions are driven by, and consistent with, the changing role of gas in ensuring the security and reliability of the NEM gas generation moves from mid-merit generation to flexible generation to support the security and reliability of the system during (for example) periods of renewable energy drought. This is demonstrated in the chart from AEMO’s 2024 ISP (AEMO, 2024 Final ISP, June 2024, Fig 3, p. 70) which illustrates the shift in the profile of gas generation since 2014-15, and the much greater flexibility required in the operation of gas generation between by 2039-40.

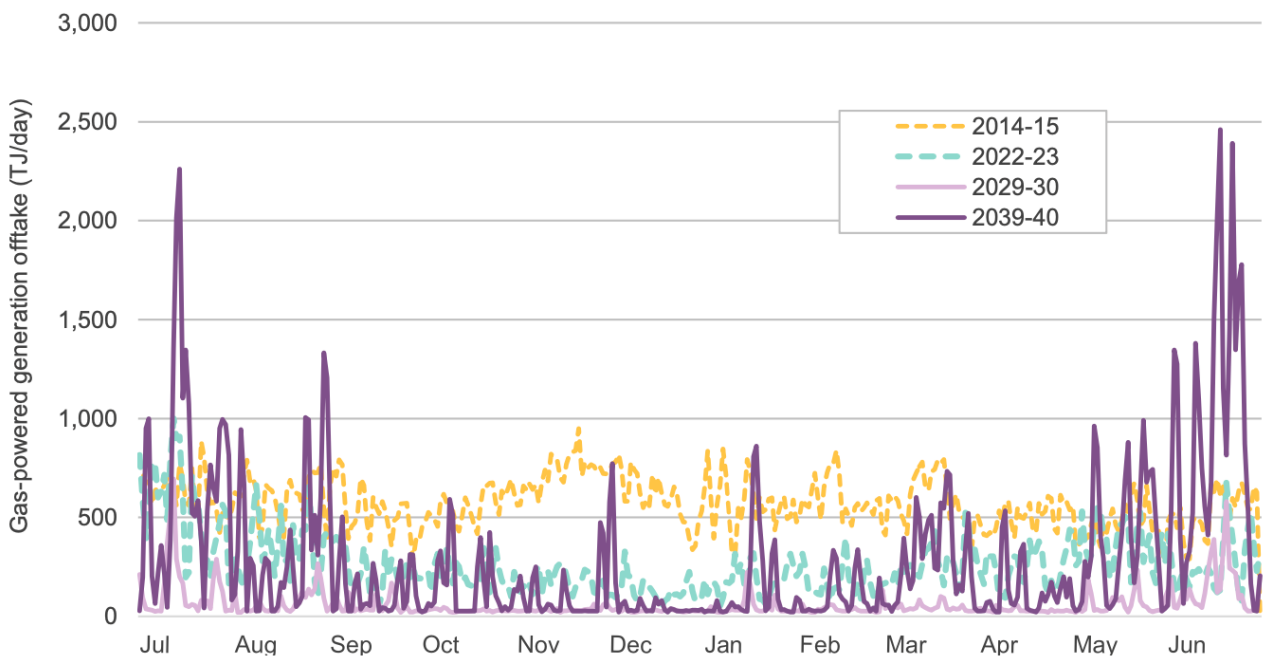


Figure 7 Actual and Forecast gas generation production

Note: the forecast gas to be used for generation is a residual after allowing for the demand for gas for other domestic uses, particularly for large industrial processes.

As a result of the direction from the Energy Ministers, AEMO has greatly expanded its analysis of the availability and costs of gas and gas transmission for gas generation (including the cost of well head gas, transportation and storage of gas as applicable).

We conclude that the question that the 2026 ISP is trying to answer is for the ISP to identify the least cost approach (mix of transmission, generation and market level storage) to supply electricity to meet 'operational demand' in the NEM at least cost given the economic, technical and policy constraints.

4.2 Framing and Firming

Framing the narrative for 2026 ISP

In seeking a starting point for developing our thinking about the 2026 ISP and consequently the data foci of the IASR, we commenced our thinking the following statement from the 2024 ISP (second paragraph of Executive Summary) as a useful starting point.

“With coal retiring, renewable energy connected with transmission and distribution, firmed with storage and backed up by gas-powered generation is the lowest-cost way to supply electricity to homes and businesses as Australia transitions to a net zero economy.”

The 2024 Panel Provided feedback on this framing and suggested improvements to better distinguish between the needs of an energy system in transition (which are broader than that framing) and the narrower task of the ISP (to which that framing is well suited).

The 2026 Panel also considered the contrast between this and the NEM Review’s framing of

- “Bulk energy”. The ISP Panel sees this as similar to AEMO’s “[retiring] coal and renewable energy”.
- “Shaping”. The ISP Panel sees this as similar to AEMO’s “firming” and agrees batteries will play a key role there.
- “Firming”. The ISP Panel sees this as similar to AEMO’s “back up”, and agrees gas will play a key role there.

Noting that the definition of ‘firming that is used by AEMO is:

“Grid-connected assets that can provide dispatchable capacity when variable renewable energy generation is limited by weather, for example storage (pumped-hydro and batteries) and gas-powered generation.”

The conflicting definitions of firming are emblematic of the confusion and ambiguity faced by anyone attempting to neatly categorise different energy services and technologies in the context of the energy system transition.

Noting the discussion further on the role of batteries, and that the role of energy storage is much more nuanced than just ‘firming renewables’, the Panel considers the NEM review’s “shaping” framing better reflects the role of energy storage as a crucial component of the future energy system.

The Panel considers the role of batteries (and storage more generally) warrants a greater focus of the 2026 ISP. The Panel recognises firstly, that there is a range of storage options available today to provide ‘shaping’ (and ‘back-up’) services, including grid scale batteries, household batteries with Virtual Power Plants (VPPs), community batteries, DNSP-owned batteries, and pumped hydro, along with experimental technologies that may in future prove commercially viable, such as molten salt and compressed air, Demand flexibility and peaking gas will both play a role in shaping.

We also consider that the future energy system needs to find a combination of supply and demand side opportunities to achieve the best balance between them and to describe describing how to achieve that balance (eg under the current rules, through a combination of network projects and development opportunities)’ co-optimised elements from both supply and demand sides.

We are of the view that, shaping through storage and back up gas generation needs to be a significant part of the 2026 ISP and, we expect, ever more important in future ISPs. Consequently, the Panel gives focus both to framing of energy services, and the nuanced role of storage, in considering the final IASR as input to the 2026 ISP

The Panel recommends finding common nomenclature and proposes that AEMO replace its use of the word firming in both the AEMO and NEM Review narratives.

- We consider AEMO's framing of "backed-up-by-gas" to be clear - and favourable to the NEM Review framing of 'firming' - to mean filling the reliability gaps.
- While the NEM Review wording of "shaping" is more apt to describe the role of storage (and other day-to-day balancing supply and demand services) than AEMO's word "firming".
- The problems with trying to find a place for the word "firming" in the above are that
 - firming describes a wider feature of both backup **and** shaping. So, using it to describe one of those things is limiting, and
 - there is more to both backup and shaping than just "firming".

On the basis of this, the Panel suggests that rather than proposing that AEMO redo their entire catch-phrase from 2024 ISP, we recommend AEMO changes just **one** word in their description to adopt the NEM review panel term "shaping" ie:

"With coal retiring, renewable energy connected with transmission and distribution, shaped with storage and backed up by gas-powered generation..."

(and we will separately recommend to the NEM Review that they adopt AEMO's term "back-up" instead of "firming". So they also change one work to have Bulk, Shaping, and Back-up.)

With this approach we achieve sensible, standardised language, with the fewest changes and with the neatest compromise between various, somewhat competing definitions

Recommendation 1.1

That AEMO changes their use of the word “firming” and adopt the NEM review panel term "shaping" instead.

(So the ‘tag-line from the 2024 ISP would become: "With coal retiring, renewable energy connected with transmission and distribution, **shaped** with storage and backed up by gas-powered generation...")

4.3 Growing complexity of the ISP

The Panel is aware of the very substantial increase in the complexity of the 2026 ISP compared to its predecessors and therefore the increased requirements for data collection and modelling frameworks. This increase in complexity arises not only from the increased demands of policy makers and other stakeholders. It also reflects the need to capture the rapid changes in factors that impact on electricity usage. We therefore commend AEMO in its efforts to adapt its approach to accommodate these changes in its forecasting and methodology.

A comparison of AEMO’s representation of the 2024 and 2026 ISP modelling methodology illustrates this fact.

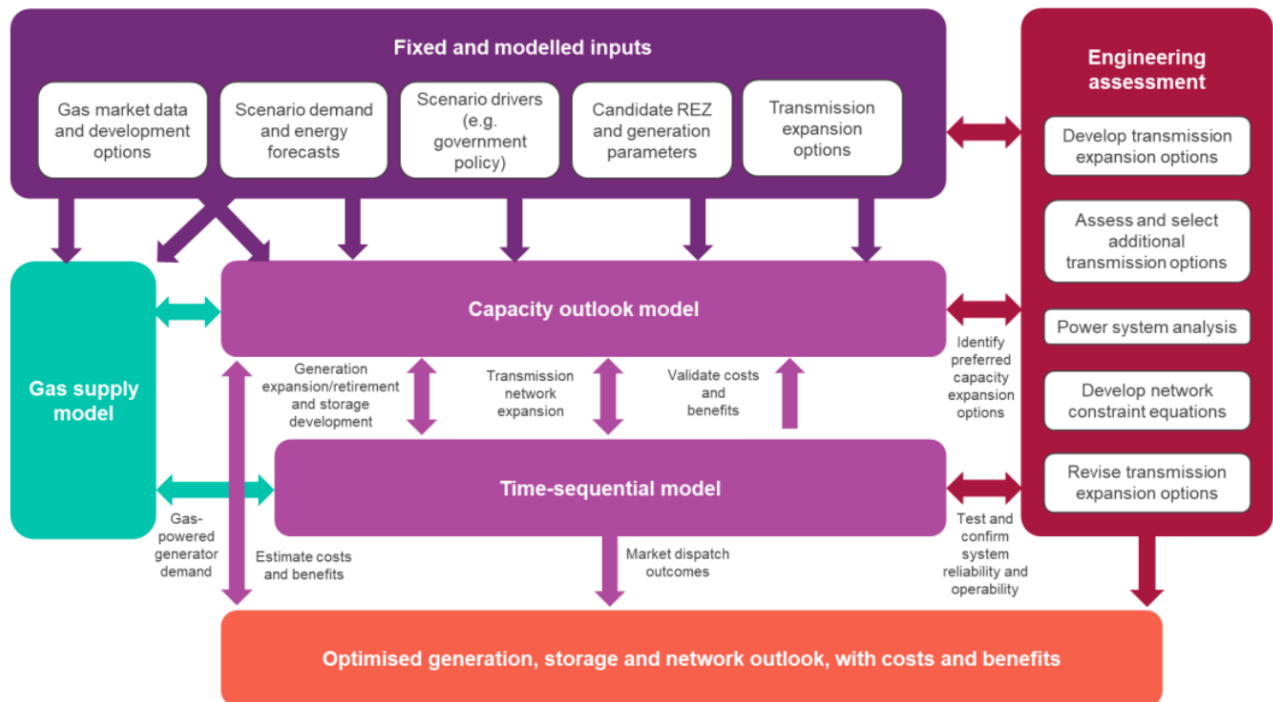


Figure 8 2024 ISP - Detailed ISP modelling methodology (2024 ISP, June 2024, Figure 14, p 45)

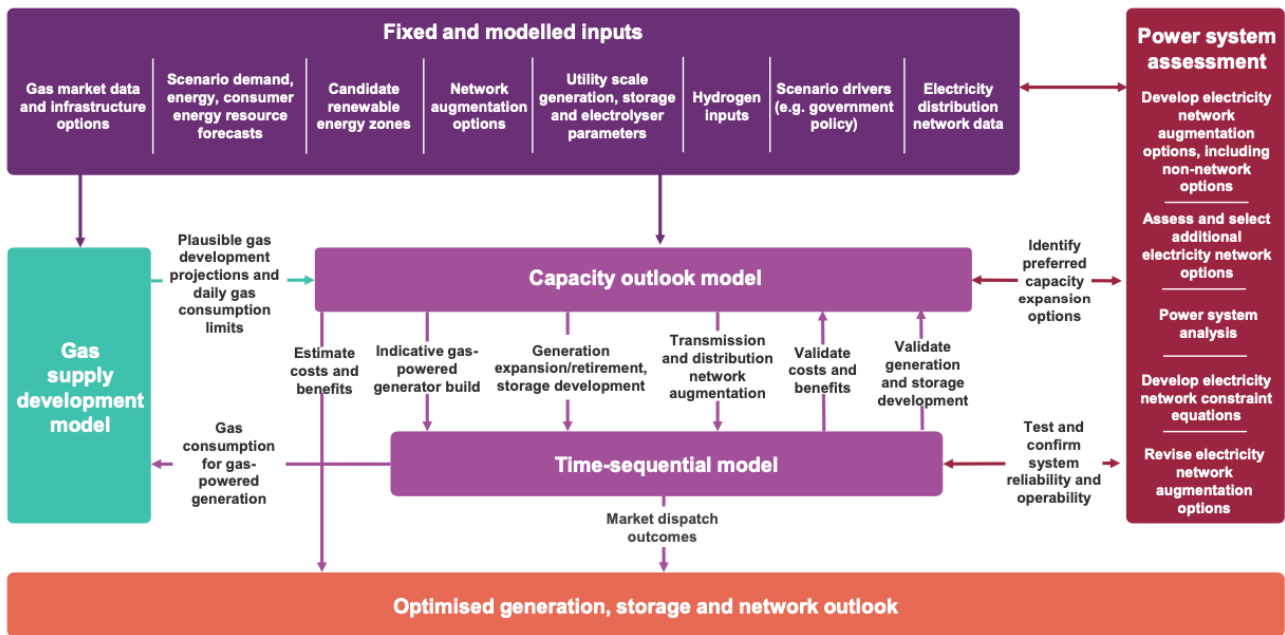


Figure 9 2026 ISP – Overview of ISP modelling methodology (ISP Methodology report, June 2025, Fig 1, p 7)

As constructive as AEMO’s work has been in responding to the growing complexity of the ISP development process, the growing complexity is also a dilemma for consumers and stakeholders and their capacity to engage with the ISP process. The IASR for the 2026 ISP has generated 4 substantial draft reports (IASR stage 1, IASR stage 2, ENOR, GIOR) where for the 2024 ISP there was a single draft IASR and a Transmission Expansion Options Report what was the pre-cursor to the ENOR.

Whilst it is understood that ISP will not become a simpler plan, the diminishing capacity for meaningful consumer and some stakeholder engagement needs to be addressed.

4.4 ISP is increasingly beyond a transmission focussed plan

The ISP plans to date have often been described as a ‘transmission plan’ reflecting that the only projects it directly plans are the actionable transmission projects. As illustrated in the diagram above, however, this description is now an over- simplification of the 2026 ISP and the forecasts and assumptions in the IASR.

For example, while the summary of the outputs of the 2024 and 2026 ISP process are similar (“an optimised generation, storage and network outlook”), the inputs are considerably more complex and include:

- An assessment of distribution network capacity outlook and its co-optimisation with CER and embedded generation and storage

- A gas supply development model that considers the feasibility of the models proposed gas generation, taking account of the costs of gas, demand for gas by other sectors, the location of gas fields and transmission requirements
- Greater consideration of demand-side factors and multi-sectorial modelling of the energy requirements across 4 sectors.

This is not to say that the transmission planning aspect of the ISP is no longer a major component of the output. As the National Transmission Planner, AEMO has a responsibility to initiate plans for the major NEM transmission projects ('actionable' projects). The TNSPs are required under the NEM rules to then initiate a RIT-T process and undertake a more detailed analysis of the AEMO's actionable transmission plans.

It is to say, however, that the 2026 ISP is moving closer to an approach which brings together elements of the demand side and the supply side of the NEM market. The extent of the data and forecasting requirements in the 2025 IASR are therefore significantly greater and more complex than the 2024 IASR and go well beyond the technical considerations of the transmission plans.

As discussed below, the Panel expects the 2028 ISP will expand this integration of demand and supply side as it becomes increasingly a 'whole of system' model. As the AEMC stated (and referred to previously), the Final Rule on demand-side factors *"represents the first step in an incremental approach to making the ISP a more integrated and robust whole-of-system plan"*.

The IASR will have to expand its assessment of the inputs, including new inputs, to the ISP modelling in line with these ambitions for the 2028 ISP and beyond.

Committed and anticipated ISP projects		In service timing advised by proponent	Full capacity timing advised by proponent ^A
Far North Queensland REZ		June 2024	June 2024
Project EnergyConnect		Stage 1: September 2024 Stage 2: May 2026	Stage 1: December 2024 Stage 2: July 2027
Western Renewables Link (uprated) ^B		July 2027	July 2027
Central West Orana REZ Network Infrastructure Project		January 2028	August 2028
CopperString 2032		June 2029	June 2029
Already actionable projects (confirmed in this ISP)	Actionable framework	In service timing advised by proponent	Full capacity timing advised by proponent ^A
HumeLink	ISP	Northern: July 2026 Southern: December 2026	Northern: July 2026 Southern: December 2026
Sydney Ring North (Hunter Transmission Project)	NSW ^C	December 2028	December 2028
New England REZ Network Infrastructure Project	NSW ^C	Part 1: June 2031 Part 2: June 2033	Part 1: June 2031 Part 2: June 2033
Victoria – New South Wales Interconnector West (VNI West)	ISP	December 2028	December 2029
Project Marinus ^D	ISP	Stage 1: June 2030 Stage 2: June 2032	Stage 1: December 2030 Stage 2: December 2032
Newly actionable projects (as identified in this ISP)	Actionable framework	Earliest feasible in service timing	Earliest feasible full capacity timing ^A
Hunter-Central Coast REZ Network Infrastructure project	NSW ^C	December 2027	December 2027
Sydney Ring South	ISP	September 2028	September 2028
Gladstone Grid Reinforcement	QLD ^E	March 2029	March 2029
Mid North South Australia REZ Expansion	ISP	July 2029	July 2029
Waddamana to Palmerston transfer capability upgrade	ISP	July 2029	July 2029
Queensland SuperGrid South	QLD ^E	September 2031	September 2031
Queensland – New South Wales Interconnector (QNI Connect)	ISP	April 2032	March 2033
Future ISP projects			
New South Wales	Central West Orana REZ Expansion, Cooma-Monaro REZ Expansion.		
Queensland	Darling Downs REZ Expansion, Facilitating Power to Central Queensland, North Queensland Energy Hub Expansion, Queensland SuperGrid North ^E .		
South Australia	Mid North South Australia REZ Extension.		
Tasmania	North West Tasmania REZ Expansion, Central Highlands REZ extension.		
Victoria	Western Victoria Grid Reinforcement, Eastern Victoria Grid Reinforcement, Gippsland Offshore Wind Connection.		

A. The capacity release and timing is conditional on availability of suitable market conditions and good test results.

B. The scope of this project, which will unlock renewable energy resources, reduce network congestion, and improve utilisation of existing assets in western parts of Victoria, was updated as an outcome of the VNI West options analysis, resulting in a higher capacity and harnessing 1,460 megawatts (MW) of renewable capacity rather than the original design of 600 MW.

C. These projects will progress under the *Electricity Infrastructure Investment Act 2020* (NSW) rather than the ISP framework.

D. Project Marinus is a single actionable ISP project without decision rules.

E. These projects will progress under the *Energy (Renewable Transformation and Jobs) Act 2024* (Qld) rather than the ISP framework.

Figure 10 Network projects in the 2024 ISP optimal development path

Importantly, consumer representatives including the Panel have been concerned at the previous limited recognition of, and assessment of, the factors affecting the demand side, such as the rapid expansion of and potential future growth in CER (PV, home batteries) and energy efficiency.

We consider that this concern has been addressed at least in part by the improvements AEMO has made in its data collection processes, forecasting and other methodology changes. We expect that there will be further improvements and transparency when AEMO publishes its first demand-side factors report alongside the Draft and Final ISP.

We have noted the “Overview of ISP modelling methodology” for the 2026 ISP in the previous ‘key theme.’ That methodology starts with the following set of “fixed and modelled inputs:

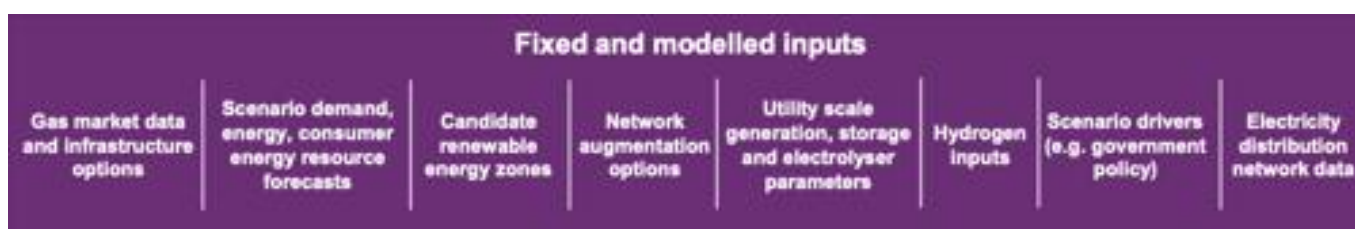


Figure 11 2026 ISP – Overview of ISP modelling methodology top ow (refer figure 9)

We observe that of the eight inputs, for ISP’s to date, “scenario demand, energy forecasts” from the second input, “Network augmentation options, the fourth input and “scenario drivers”, the seventh input have been the major foci of ISP development with the network augmentation options as transmission projects then being a substantial and more visible output.

We recognise that the focus has expanded in the 2026 ISP, and we expect it to continue to change significantly for the 2028 ISP and beyond.

In particular, the transmission projects listed in the table above is likely to cover most, if not all of the major new (from the start of the ISP) transmission projects; that is by the 2028 ISP, the largest transmission projects may move from ‘actionable’ to ‘committed and anticipated” status over the next 5-10 years – arguably some projects in the table will be reclassified in the 2026 ISP. Once a project is classified as ‘committed and anticipated’ in the ISP process, it is assumed to ‘go ahead’ and is no longer part of the ISP cost-benefit/ODP selection process.

In addition, many of the ‘actionable’ and ‘future’ transmission projects are identified and driven by state planning authorities, rather than through the ISP process – a trend that will increase given the Queensland roadmap and Victorian Transmission Plan, neither of which are fully represented in the 2024 table of transmission projects.

Overall, this means that the network augmentation input will take less of the future ISP focus while “consumer energy resources” from input 2, “candidate renewable energy zones, input 3 and “utility scale storage” from input five will receive greater attention.

The following table summarises the Panel’s observations about the changing ‘major foci’ for ISP development with the arrows indicating ‘input’ of major focus. Note, however, we do recognise the ongoing process of continuous improvement in AEMO’s data collection and analysis of each of these categories.

Table 3 ISP Inputs, changing focus over time

Inputs	Gas market data and infrastructure options	Scenario demand, energy, (A) consumer energy resources (B)	Candidate Renewable Energy Zones	Network Augmentation options. (eg Transmission)	Utility scale generation, storage and electrolyser parameters	Hydrogen inputs	Scenario Drivers (eg Govt policy)	Electricity distribution network data
ISPs 2018-24		(A) ↑		↑	↑	↑ mainly 2022 and 2024	↑	
2026 ISP	↑	↑					↑	↑
ISPs 2028 and beyond		(B) ↑	↑				↑	↑

Source: Table compiled by 2026 ISP Consumer Panel

In addition, we note that AEMO’s approach to scenario weighting has been modified. The 2025 approach to scenario weighting brings together a range of ‘subject-matter’ experts and industry and community representatives to review each of the scenario parameter forecasts. While the results of this new approach are not yet published, the Panel expects that this approach will add confidence to AEMO’s forecasts of demand-side options (amongst other things).

4.5 The Role of Battery Storage

The purpose of the ISP is to contribute to achieving the electricity sector emissions targets (2030, 2035, and 2050) while ensuring the benefits to consumers are delivered by an energy system that is reliable, secure and

affordable. The ISP provides a guide to policy makers and investors on the optimal mix of utility-scale generation and storage while also directing networks to initiate a RIT-T process that, subject to additional RIT-T cost-benefit analysis - will drive investment in network capacity to deliver the energy to consumers.

Given the role that grid scale batteries are already playing and will increasingly play in in the future energy system, and the associated revenue streams that effect the investment case for batteries, it is crucial for the ISP to fully consider the costs and benefits of batteries for both the 2026 ISP and beyond.

The role of batteries, both grid scale and aggregated ‘home batteries’ is rapidly growing in importance to the Australian electricity system and needs to be better understood, both:

- in the relationship between batteries, other energy storage technologies and gas for “firming and shaping”; and
- In how battery markets work and the considerations that potential battery investors are making about how they will recover costs and earn a profit.

4.6 Where should investment be?

The Panel notes AEMO’s capacity under the ISP rules to recommend ISP development opportunities, as it did in the 2022 ISP Appendix 2¹¹. The Panel encourages AEMO to use this tool to recommend opportunities other than transmission - and Governments enact these opportunities - to take the ISP closer to being a genuine whole of system plan.

4.7 Modelling capability for “humanness.”

At its core, the ISP is a monumental modelling exercise with the IASR producing a substantial data base for analysis that leads to candidate development paths and then the optimal path. This process is excellent for dealing with variables for which ‘hard’ data can be gathered and revised as needed with units like gigawatts, wind speed, connections and countless more.

These variables are only part of the energy story. There is also a range of behavioural factors including for consumers, markets, investors and policy makers that vary and impact demand and consequently planning. Arguably the greatest visibility of these ‘soft’ variables is exhibited through what has become referred to as “Social Licence” however the preferences of a heterogeneous consumer base, changing risk appetites and degrees of ‘trust,’ are also factors that are highly likely to add value to modelling, if data suitable for the modelling process (Plexos) could be developed and included as IASR variables and hence ISP factors.

We recognise that this incorporation of ‘soft’ data is very difficult and further that AEMO and Consumer Panels have made significant efforts to identify ways to deal with consumer risk preferences and other uncertainty factors, but we are not there yet.

The 2026 Consumer Panel encourages AEMO and the 2028 ISP Consumer Panel to consider to seek ‘soft’ data that can be included in future ISP development. On approach we suggest is for AEMO to engage Behaviour Economics expertise early in the 2028 ISP process and give them the task of identifying potential behavioural data for application to the 2028 ISP

Recommendation 2.2

That AEMO engage Behaviour Economics expertise early in the 2028 ISP process and give them the task of identifying potential behavioural data for application to the 2028 ISP and beyond.

This may include a plan to bring together existing consumer sentiment, consumer preferences work, including focus on people more directly impacted by ISP projects eg in regions / rural.

4.8 Social Licence

(all projects need to work with communities)

- a) IASR treatment of social licence matters – what it does, what it could do
- b) AEMO role – what it is, how it could (efficiently) evolve

4.9 ISP reviews and expectations

The Panel contributed to the DEECCW review of the ISP12 conducted over 2023 and with Ministerial response in early 2024. Key responses to that review for the 2026 ISP, and the 2025 IASR include the following action items from the Ministerial Council response to the Review (published 5/4/2025):

- Integrating gas into the ISP
- Enhanced demand forecasting
- Better data on industrial and consumer electrification
- Optimising for the demand-side
- Coal-fired generation shutdown scenarios
- Improving locational information

¹² <https://www.energy.gov.au/sites/default/files/2024-04/ecmc-response-to-isp-review.pdf>

- Enhanced analysis of system security
- Jurisdictional policy transparency
- Clarifying policy inclusions
- Improving the accessibility of the ISP
- Incorporating community sentiment
- Additional planning inputs

During 2024, the Australian Energy Market Commission (AEMC) considered the Commonwealth Minister's rule change request on Managing ISP project uncertainty through targeted ex post reviews.

A review of the ISP is soon to be conducted by the AEMC.

These are examples of the extensive level of review that the ISP process is subject to. There is a very fine line between appropriate levels of review and development of the ISP process and developing a process that is accessible to consumers, communities and their advocates.

The Panel suggests that there is a risk that the ISP becomes the (almost) only energy policy and planning process across the NEM. This provides some risks for the effectiveness of the ISP:

- The ISP is perceived to be the main policy and planning process across the NEM and so becomes bogged down in trying to bring together too many goals/targets and consequently any energy policy flow is sheeted back to the ISP as a failure of the ISP
- The ISP increasingly becomes a focus of lobby by vested interests and Jurisdictional schemes
- Consumer become crowded out by so much detail
- Policies and processes needed to enable ISP outcomes fail to receive the attention that they deserve, eg Orchestration, energy efficiency, functioning of submarkets, eg for firming and storage
- Key language becomes fractured and confused in meaning.

Recommendation 2.3

We encourage governments and Industry bodies to take care in a proliferation of shorter term reviews of the ISP and in "piling on" evermore expectations or requirements for ISP's beyond 2026. Where reviews are conducted and further responsibilities are added, then there needs to be clear strategic focus and direct communication with consumers about why the changes are unequivocally in the interests of consumers.

Recommendation 2.4

At the same time, there needs for a longer term plan for the ISP itself, as it transitions from a Transmission focussed plan to a broader whole of system plan.

4.10 Other reviews and processes impinging on the ISP

The environment in which the ISP is produced is rapidly changing and evolving. Some changes can easily be taken into the ISP such as changes in:

- Load forecasts
- Forecasts of uptake of various components of CER – including EVs (and V2X) and rooftop solar PV, BTM storage, as well as customers' propensity to engage with VPPs
- Expected closure dates of coal generations
- Gas reserves and gas availability: relevant to the need for GFG in the ISP
- Levels of investment and investment plans in regard to new generation facilities: renewable on-shore and off-shore wind; large scale solar
- Information on costs – from consultants to AEMO on the ISP, including CSIRO
- Estimates and forecasts of rates of return and discount rates
- Committed projects for transmission and expected costs and build times till commissioning.

AEMO's ISP consultations also influence changes in the ISP to the extent that they influence the methodology, scenario definitions and weightings, and what sensitivity analyses will be undertaken.

Some national and jurisdictional government policies impact directly on the ISP. Others impact indirectly through other input parameters.

Examples of policies that directly affect the ISP are policy targets for renewables and for emissions, and specifications for Renewable Energy Zones.

Government rebates and subsidies indirectly affect the ISP. For example:

- Subsidies and rebates (and renewable energy certificates) have driven much of the growth in solar PV (and premium feed-in tariffs initially)
- Subsidies now are driving behind the meter battery installation
- Tax benefits and subsidies help drive growth in EV take-up (as do fuel efficiency standards and targets).

The move of Victorian Transmission Planning from AEMO to VicGrid (the latter being a Victorian government owned) entity has capacity to affect the ISP.

The current National Electricity Market Wholesale Market Settings Review (aka the Nelson Review) being led by the federal government DCCEE, will have impact on the ISP. The review and associated reform recommendations will be completed by December 2025. The results of the review and the subsequent roadmap will influence market settings that are staged and implemented beyond 2027. While these dates are not likely to

be relevant to the 2026 ISP, the major changes expected in the wholesale market settings may well have implications for the 2028 ISP.

5 Responses to the Final 2025 IASR

5.1 Overview

AEMO has also considered the responses to the two 2025 Draft IASRs and made the following changes in the Final IASR: (2025 Final IASR, pp 14-15)

- Refined scenarios
- Updated cost and technology assumptions
- Updated REZ assumptions
- Updated CER assumptions
- Updated hydrogen assumptions
- Updated multi-sectorial modelling assumptions
- Updated policies.

Overall, the Panel supports these updates between the Draft and Final IASRs. We make comments as follows:

- The renaming of the scenarios, and the refinement of the narratives associated with each of the scenario are significant improvements in terms of the clarity of the scenarios and how they differ from each other.
- The inclusion of the Federal Government's Cheaper Home Batteries scheme is an important addition to a more realistic forecast of the growth in home batteries.
- The Panel anticipates that the Draft ISP will pick up in the recently published Victorian Transmission and the Queensland Energy Roadmap. We also anticipate that the Federal Government will have released its 2035 target although it may not be a legislated target and may be expressed as a range rather than a point target.

The ISP review conducted by DCCEE during 2023-24 and the Energy Minister's decisions following this review have added to the role of the ISP, along with the general progression of energy systems and policy responses. These factors have added expectations regarding topics considered in the 2026 ISP which mean that the IASR process has grown with a greater number of component parts than the previous ISPs. The 2026 Consumer Panel has responded to each of the public engagement processes that have been input to the Final 2025 IASR. We summarise key themes and our advice in this section.

5.2 Review of major updates between Draft IASR documents and the Final IASR

Following the publication of the Draft IASR stage 1 and stage 2 (in December 2024 and February 2025 respectively), AEMO has made several significant changes that are set out in the Final IASR.

In the interim, AEMO published Draft and Final ISP Methodology reports and a Draft Electricity Network Options Report and a Draft 2025 Gas Infrastructure Options Report.

Stakeholders, including the ISP Consumer Panel had the opportunity to engage in each of these draft reports and to participate in the Forecasting Reference Group sessions that included updates on the ISP process and content.

These additional reports and meetings provided AEMO with the opportunity to amend and expand on the Draft IASR reports, taking account of new information, more detailed modelling and stakeholder feedback.

In this section of our response to the Final IASR, the Panel discusses some of the changes AEMO has made between the Draft reports and the Final IASR.

We also note the AER's Transparency Review of the Final 2025 IASR which was published in September 2025. The AER's review, while generally positive about the process and content of the Final IASR, provided useful suggestions for AEMO to address as a supplementary report to the Final IASR. We provide some commentary on the AER's review in Section 3.3.1 of this report. However, our comments below do not include a response to any changes AEMO might make as part of its required response to the AER's review.

AEMO's response to the AER's IASR review will be included as a supplementary report and will be published either before or alongside the Draft ISP.

5.2.1 Key Changes between the Draft and Final IASR documents

Policy changes

The Final IASR does not change the criteria for AEMO's accepting of accepting 'policies' as inputs to the IASR and recognises new policies including the Federal Government Cheaper Home Batteries scheme (incorporated into all scenarios) in its revised forecasting.

The Final IASR also recognises Queensland energy policy will change under the new 5-year Queensland Energy Roadmap (Roadmap) which the Government suggests will be published later in 2025. The details of the Roadmap were therefore not available at the time of publication of the Final IASR. However, in the absence of the Roadmap, and based on public statements from the Queensland Government, AEMO has withdrawn all the previous renewable energy targets.

Similarly, the Victorian Transmission Plan (VTP), which sets out the Victorian plan for new REZs and additional transmission networks (supplementing AEMO's committed and anticipated transmission in Victoria), was published in August 2025, and therefore could not be included in the Final IASR.

The Commonwealth Government recently announced its 2035 carbon emissions target range of 62-70% reduction from the 2005 base line. It has also confirmed the 2030 target and announced a range of new policies to support the achievement of the 2035 target range.

Queensland Road Map

The Queensland government has allocated over 5 billion dollars in its recent 2025-26 state budget to facilitate some new renewable projects and to support additional maintenance expenditure to extend the life of existing coal fired generation plants and to develop new gas peaking plants. (see:

<https://www.treasury.qld.gov.au/newsroom/delivering-reliable-energy-system-and-home-ownership-dreams/>]

The Queensland Government has also previously cancelled a large hydro project (the Pioneer- Burdekin project) and wind project (the Moonlight Ridge wind farm) and introduced strict planning controls on new large solar and wind generation developments that may lead to delays and higher costs. It is possible that these changes cited in the budget could impact on the achievement of the NEM wide carbon abatement targets, although this could well be ameliorated by the more detailed plans set out in the Roadmap due later this year. (See for example, the assessment by Tony Wood of the Grattan Institute (<https://esdnews.com.au/queensland-government-cancelling-renewable-energy-projects/>))

While the Roadmap is due to be finalised in the next few months, the Panel notes the allocation of \$5B in the state budget for specific government financed projects does appear to meet AEMO's criteria for inclusion in the ISP. We suggest to AEMO that the relevant actions that are clearly specified in the Queensland Government's 2025-26 Budget Papers should be flagged in the draft 2026 IASR addendum (alongside the comments on the Victorian Transmission Plan mentioned in section 3) and/or in the Draft ISP, even before the more detailed plans in the Roadmap are published.

In the IASR we understand that AEMO has removed any interim targets for Queensland in accordance with announcements by the Government over the last six months. We emphasise that developments in Queensland energy policy, taken together, are of such significance to the ISP that AEMO should endeavour to go beyond its treatment in the IASR and adopt an approach of maximum transparency and opportunities for consultation on the impact of the changes in the Queensland policy (as known at that date) in the Draft ISP.

Victorian Transmission Plan – VTP. (Published August 2025)

The Final IASR has not included specific details on the VTP because of the timing of the VTP publication. The Panel notes that the VTP is focussed on defining renewable energy zones and associated transmission builds to meet the Victorian government's targets for renewable generation capacity. The renewable generation capacity includes 2040 targets for onshore and offshore wind, new utility-scale solar and new short and long duration storage capacity.

The VTP states that it applies 'over and above' ISP transmission projects already under development including Marinus Stage 1, VNI West, Western Renewable Link and infrastructure for the for 2 GW of offshore wind project in the Gippsland region

The VTP recognises the 2025 IASR already includes renewable energy targets as set out in the 2024 legislation. The Plan provides specific renewable and storage targets for 2040 in addition to the REZ definitions and transmission requirements. We expect the Draft 2026 ISP to include these more specific plans which refer to 6 proposed REZs and 7 transmission plans.

Commonwealth Government 2035 Emissions reduction Target Range (62-70% reduction from 2005)

In September 2025, the Federal Government announced a 2035 emissions reductions target range with specific plans for 6 sectors of the economy to achieve this outcome, including an “Electricity and Energy Sector Plan”. This Plan sets out 3 ‘shifts’ in the energy system to get to net zero: (see: <https://www.dcceew.gov.au/climate-change/emissions-reduction/net-zero/electricity-and-energy-sector-plan>)

- Use energy more efficiently
- Electrify and fuel switch
- Scale up clean energy supply

The Plan retains the 2030 emissions target of 82% renewable generation by 2030. The 2030-35 period, sees the expansion of electricity demand and efficiency savings through the transport, built environment and industry sectors, with this trend extending to the remaining sectors from 2035 to 2050.

The Panel considers the Federal government’s policy and plans for the six sectors will have significant implications for the electricity demand forecasts currently in the Final IASR and these will need to be addressed in the Draft 2026 ISP. We also consider this may require a review of AEMO’s current multi-sectorial modelling.

Therefore, although the target range for emissions reduction is unlikely to be legislated by the Federal Government in 2025, we believe the targets and the impact of the other sector plans on the energy system should be incorporated into the 2025 Draft ISP and will require additional stakeholder consultation in advance of that.

More generally, the Panel notes that the AEMC encourages AEMO to investigate the impact of policies on the energy sectors transition to net zero, and (to the extent possible) on the interim targets.

The Panel also strongly believes that the 2026 ISP can play an important role in helping to communicate the potential impacts of the recent policy developments on the transition process and energy costs to consumers, for example where policies and their broader considerations and impacts can be evaluated in the ISP modelling. This includes policies that have emerged since the Draft IASR, such as the Queensland Energy Roadmap, the Victorian Transmission Plan and the Federal Government’s updated emissions target range.

There is an increasingly fine line between what is ‘black letter’ policy this is set by Government and emergent policies that can usefully be evaluated by AEMO through ISP modelling. Perhaps a workshop involving AEMO, DCCEEW and the Panel to explore the role of policy in the ISP would be valuable.

Recommendation 1.2

A workshop involving AEMO, DCCEEW and the Panel be convened to explore the role of policy and policy intentions, in the ISP, before 2026 ISP is finalised.

Recommendation 1.3

Given the significance of very recent policy developments, to the extent possible, AEMO update the Draft 2026 ISP with the recent budgeted changes in Queensland energy policy, the VTP information and the 2035 declared emissions targets from the Federal Government.

5.2.2 Scenario and Sensitivity Testing

Scenario Changes

In the Final 2025 IASR, AEMO has changed the naming of the three scenarios and expanded the scenario narratives. This extended the changes already made in the Draft IASR which had posited replacing the scenario ‘Green Energy Exports’, with “Green Energy Industries”.

The Final IASR names are: Slower Growth, Step Change and Accelerated Transition. The Panel strongly supports this change and the associated narratives as they more clearly represent the alternative transition paths and the associated forecasts of the rate of decarbonisation, electricity demand and supply conditions, and the economic environment in which the transition occurs.

The Panel is not yet aware of the weighting process detail and so a concern with the new scenarios is AEMO’s approach to weighting the three scenarios. The AER’s 2024 Cost Benefit Analysis Guideline (CBA 2024 Guideline) requires AEMO to determine an optimal development path (ODP) using a weighting of the ‘likelihood’ of each scenario. The Guideline states: (pp. 34-35)

“Once the weights are assigned, the weighted average net economic benefit of each development path is calculated. For a given development path, this is done by multiplying the weight for each scenario by the net economic benefit under the scenario.”

To the Panel’s knowledge, AEMO has not provided an explanation of its new approach to weighting the ODP compared to the 2024 ISP approach, and the reasons for this change. The Panel strongly suggests AEMO include an explanation and its’ reasoning for this change in the Draft 2026 ISP.

Sensitivities

The Panel agrees that the ‘list’ of sensitivities proposed in the Final IASR is a ‘dynamic and recursive process’ that will be undertaken during the 2025 ISP modelling. The Panel expects there to be changes as AEMO progresses from the Draft to the Final 2025 IASR with the collection of new data and in the face of new opportunities, challenges and consumer priorities.

For example, with the exclusion of the revised 'Green Energy Export' scenario, the Final IASR proposes the impact of exporting hydrogen, or hydrogen-based products (eg 'green steel') on the energy system could be considered using sensitivity testing.

Similarly, with gas now identified as an important back-up for firming electricity supply over the transition period, it is appropriate to conduct sensitivity testing on the current IASR forecasts of the supply availability and cost of gas (including any gas transmission and storage options) for electricity generation.

Assumptions around the forecast growth in CER and other embedded storage and renewables have matured since the Draft IASR but remain conservative and should be subject to sensitivity tests. In the Panel's view it would be appropriate to use high central forecasts and low sensitivities. If AEMO prefers to maintain low central forecasts, they should be tested against high sensitivities. AEMO is required to produce a Demand-Side Factors report by December this year, and the Panel considers this report will further clarify areas for sensitivity testing, we consider this report briefly in section 6.

AEMO has also identified a higher level of uncertainty in its forecasts of new large industrial loads and data centre developments. While differences in the demand forecasts are to some extent captured in the updated Scenario narratives, their impact on demand, and potential challenge to supply reliability and security is sufficient to further explore using sensitivity testing.

The AEMC encourages AEMO to investigate the impact of policies on the transition to net zero (include source) The Panel also strongly believes that the 2026 ISP can play an important role in helping to communicate the potential impacts of the recent policy developments on the transition process and energy costs to consumers, for example where policies and their broader considerations and impacts can be evaluated in ISP modelling . This includes policies that have emerged since the Draft IASR, such as the Queensland Energy Roadmap, the Victorian Transmission Plan and the Federal Government's updated emissions target range.

There is a increasingly fine line between what is 'black letter' policy this is set by Government and emergent polices that can usefully be evaluated by AEMO through ISP modelling. Perhaps a workshop involving AEMO, DCCEEW and the Panel to explore the role of policy in the ISP would be valuable

(refer recommendation 1.2)

5.2.3 Financial and Technical Assumptions Updates

Cost of Capital and Discount rates

In the Final IASR, AEMO has adopted a major change to the financial measures used in its cost-benefit analysis of the alternative development paths. AEMO has clarified the distinction between the weighted average cost of capital (WACC) and the discount rate, with the WACC being used to calculate the total cost of building different generation, storage and transmission networks.

AEMO has now changed from using a single WACC and discount rate in the Draft IASR, to adopting a technology and scenario -specific WACC in the Final IASR. It does, however, retain the single discount rate.

The Panel supports this change to the calculation of the WACC(s) and asserts the need to apply a different discount rate to apply to each of the three scenarios as this better reflects the systematic risk captured in the scenario narratives.

Technology and cost assumptions

In response to new data, stakeholder and expert responses to the Draft IASR (and subsequent AEMO reports) and the requirements of the 2024 Energy Ministers' ISP review, AEMO has updated its technology and cost assumptions between the Draft and Final IASR. Many of these updates reflect the analyses presented in the Electricity Networks Options report and the Gas Infrastructure Options report published in May 2025, along with the most recent 2024 technical and cost reports from the CSIRO and Aurecon.

For example, in response to the ISP review, AEMO has updated gas and electricity infrastructure requirements, identified and preliminary modelling of distribution capacity for additional CER and VPP exports.

Other changes include updates to multi-sectorial modelling, locational cost factors, candidate technology costs, electrification and efficiency rates including updates from the multi-sectorial modelling, flow path augmentations, impact of additional sub-regions, supply chain constraints, transmission line unplanned outages, transmission projects reclassified to committed and anticipated projects and distributed battery capacity.

The Panel understands that some of these changes are a 'work in progress'. Nevertheless, we commend AEMO for its willingness to listen to stakeholders, experts and consumer representatives including the ISP Panel, and its recognition of areas where further work is required. The most recent policy developments (see above) will require further changes, many of which we hope will be reflected in the Draft ISP and involve further engagement with stakeholders.

One immediate observation, however, relates to the forecasts of distributed battery capacity. While AEMO forecasts that government subsidies for embedded batteries will have some impact on the growth in batteries in the Final IASR, we believe that the take-up has well exceeded the current short-term growth forecast which will now need to be 're-based'.

5.3 Panel input to IASR process

5.3.1 Electricity Demand Forecasting Methodology

The Panel's overview response to this consultation paper was:

"The Panel broadly agrees with the AEMO position for the consultation paper that the component based forecasting approach remains generally 'fit for purpose,' noting the importance of giving some consideration to interactions between the drivers, for example economic growth, the number of EV's, industrial demand."

With more specific comments including:

- Residential demand: The Panel does not consider that a single segment of “residential consumers” for forecasting remains reasonable. A significant number of residential customers are able to invest in CER while many are unable to, mainly for cost reasons, mainly as renters but also some lower income mortgagees are also cash strapped. Some residential properties are also unsuitable for PV, the main CER asset. The very different demand profiles for households with CER compared to those without CER access means that, we believe, there should be two household customer segments: Households with CER and households without CER.
- An aspect of residential consumption that is less evident in the current approach is measures that can reduce residential consumption, including energy efficiency and impact of the roll out of smart meters.
- CER: The Panel has expressed concerns with the current CER forecasts, most particularly, with the forecast of the level and rate of uptake of coordinated CER and VPP developments in general (along with DM). We would expect AEMO to build on the current research and policy developments, and if any gaps are identified, to progress investigation of those rather than initiate a whole new
- EV's: capturing the most up-to-date EV take up data is crucial, given the evolving nature of this market, the 2-yearly cycle of the IASR is an appropriate place for updated data.

5.3.2 ISP Methodology

The Panel responded to the ISP Methodology consultation paper, noting that a more detailed ISP methodology review occurs every 4 years and the current cycle is the cycle for the more detailed review. Key comments that we made included:

- DER /CER: Concern that potential for network cost savings from enhanced CER / DER not adequately considered and that there is too much focus on distribution businesses as the source of data.
- Distribution networks. In welcoming a greater focus on distribution networks, we highlighted the value for consumers where existing network is better utilised, compared to building more network.
- Importance of clear focus in considering expansion of the gas supply model to aspects with direct implications for the ISP
- Implementing solutions to imperfect foresight: The Panel recommended that AEMO:
 - abandons the idea of ‘headroom’ and explores more nuanced approaches to dealing with imperfect foresight for batteries for the 2026 ISP.
 - commits to developing/applying modelling approaches that robustly address the nuance of imperfect foresight for batteries for the 2028 ISP.
 - engages with battery owners and experts on this issue as a matter of priority rather than relying on inference and evidence from a sample of historical events.

5.3.3 Draft IASR Part 1

The Panel provided a substantial response to the draft IASR stage 1 with some of the areas of our focus being

- Scenarios: our submission continued thinking from the ongoing discussions that we are having with AEMO staff, including our view that the the “Green energy scenario needed to be more domestically focussed (than exports) and that the ‘progressive change’ name did not reflect that it ws the scenario with least carbon abatement and least longer term consumer benefit.
- Carbon Budgets. These are at least as important as the net zero by 2050 target, yet it tends to be the 2050 target that is most discussed in public settings
- Purposeful policy is paramount. Clear, stable and coordinated policies are required to achieve the transition as effectively as possible
- Trust before Tech. Communities are as important as individual customers, with their support for major energy projects crucial and the associated ‘social licence essential for successful implementation of ISP projects. Trust lays the foundation for social licence.
- People are investing themselves. Consumer Energy Resources and Distributed Energy Resources more generally are crucial to achieving the energy transition, which is why much of this submission is presented through a CER/DER prism.
- Forecasting is Fraught. There are many challenges in forecasting such a long way out in such uncertain times. The longer term the forecast, the greater the variability in potential outcomes. Forecasting remains important, but analysis of results needs to be cautious.

5.3.4 Draft IASR Stage 2¹³

Important themes that we considered, beyond those from stage 1 included:

- International alignment: We agree that the starting point of the narratives and forecasts should be reasonably aligned with the international frameworks including the IEA World Energy Outlook (WEO) scenarios, and the Inter-governmental Panel on Climate Change's Relative Concentration Pathways (RCPs) and recognise the increased detail in describing this alignment.
- Sensitivity testing: The role of sensitivity testing is crucial in developing the candidate development paths that emerge from the IASR data. Further discussion about which ‘sensitivities’ to model will be an important next phase of the 2026 ISP process.
- Policy: We observe that one of the ongoing discussions associated with the ISP is the relationship between national and jurisdictional policies and the extent to which they are factored into modelling and final ISP development.

¹³ https://www.aemo.com.au/-/media/files/major-publications/isp/2025/stage-2-submissions/2026-isp-consumer-panel-iasr-stage-2-submission.pdf?rev=27eda3e7db704d72bd556bd2d8c8cb2b&sc_lang=en

- Gas: The role and future of gas, including renewable gases, are crucial topics that continue to be hotly debated. The AEMO focus on data is critical and the Panel recognises the reduced focus on hydrogen, compared to the 2024 ISP, as being realistic.

5.3.5 Electricity Network Options Report (ENOR)

A main focus of the Panel's response to the NEOR was consideration of the role of batteries, where we listed some of the questions that we thought needed to be considered, including:

- How do battery investors make their money and how do investors consider battery investment, now and into the longer term?
- What are the likely revenue streams of batteries beyond just selling and consuming energy? (see our list above for some examples)
- How will the revenue for batteries firming activities change over time with wholesale price signals?
- How heterogeneous is the utility scale battery market: the section of the market operating in the wholesale market?
- How will batteries in the distribution system and behind the meter operate, and how will they be co-optimised with the energy system?
- Then how does this impact future electricity supply that batteries can provide and so we get the ISP, including how batteries will be considered in the final IASR and subsequently modelled?

We also gave focus to the Transmission Cost data base proposing that since all costs shown in the Transmission cost data base are rising, it is proposed that AEMO seek advice, from independent consultants about where future cost savings are plausible and how future networks can be more productive, at least to arrest declining total factor productivity: where are the options to use existing network more efficiently and what options may exist to reuse, restore and recycle?

5.3.6 Gas Infrastructure Options Report

The Panel proposed that the draft GIO report would be enhanced by explicitly considering the following questions about future gas use:

- Will GPG act to 'firm' electricity supply during periods of high electricity demand and/or supply interruptions including periods of low level of renewable generation such as occurred in recent solar/wind/hydro 'droughts'?
- Will GPG be more limited to operating as an emergency 'back up' supply for meeting short intraday peak periods very short period?
- Will GPG provide other frequency control and ancillary services to the electricity market,

- Will the role of GPG in the electricity supply market change over the ISP period to 2050, and if so, how?

We also asked how will GPG interact with grid scale batteries to provide firming and storage.

We also said that In applying a single set of cost escalation indices for gas infrastructure components across all ISP scenarios, the Panel accepts the current approach of applying a single set of cost escalation indices for gas infrastructure components across all ISP scenarios in the 2026 ISP, recognising that the quality of the data at this point in time, does not warrant further refinement of the cost analyses.

We consider that this gap should be addressed in the 2028 ISP.

The cost escalation approach does not take adequate account of the changing role of gas and GHG in the electricity supply mix between now and 2050, and how this changing role may impact on the location, size and cost of different gas infrastructure options.

5.3.7 Multisectoral Modelling

While not a separate paper for comment, Multisectoral modelling was an important component of the IASR Stage 2. The Panel said:

“This has been a significant input to developing the Stage 2 document and dealing with complex interactions between the broader economy and energy sectors. Some further discussion is needed, for example, with FRG and other groups to ‘wrestle’ with the MSM complexity and implications.”

The Panel also proposes that discussion about Multi-Sectoral Modelling is undertaken and key implications for the IASR would usefully be documented as a discrete statement, either as a section in both relevant draft IASR (Stage 20 for 2025 IASR) and in the Final IASR or is a separate report / appendix. The Panel is well aware of desires, including ours, to simplify the IASR and ISP documents wherever possible (see section 4.3) Noting this context we still regard some greater focus / amalgamation of MSM aspects to be documented together.

Recommendation 2.5

That future IASR processes include a separate discussion about Multi Sector Modelling so that combined impact on the IASR is clearer for stakeholders and consumers

These reports, in combination, provide further detail, as well as background to both the “key themes” that we consider earlier in this report as well as those Final IASR topics that we explore in the next section.

5.4 Responses to Selected Topics from the Final IASR

In this section we respond to some of the more specific aspects of the Final IASR report, in some instances providing further detail to the broader themes already outlined earlier in this report. The order of the topics is in line with the order in which these topics are presented in the Final IASR. There are a number of topics from the Final IASR that we do not consider in this section.

5.4.1 Scenarios

The Panel suggests to AEMO that there has been some lack of consistency in defining the role of scenarios in the ISP process. It is generally recognised that the scenarios describe different states of the future world. There is also agreement on the broad criteria for defining scenarios.

However, it is less clear whether the two non-central scenarios are there to ‘stress test’ the future state of the world by describing more extreme future states, or to focus each scenario on different but plausible states of the world. For example, in its review of the 2025 Final ISAR, the AER states (p 1):

“The scenarios ...are intended to serve as likely potential future states of the world for planning purposes. These scenarios should be informed by **reasonable assumptions** associated with future economic, technological and energy market developments” [emphasis added].

Similarly, in its 2024 Cost Benefit Analysis Guideline, the AER states the scenarios should (p 13):

“Represent a reasonable range of plausible future market environments. This is where a reasonable range should be informed by stakeholder consultation and should be stretching so as to cover a range of uncertainties but without being skewed by unrealistic events”.

The Panel interprets the AER’s guidance to mean that the scenarios, and the associated parameter forecasts, should not represent the more extreme states of the world.

In our view, the revised naming and updated narrative and parameter forecasts for each scenario are consistent with this. Moreover, the scenario narratives emphasise distinct, but nevertheless realistic outcomes of the future states of the world. We also observe greater clarity in the scenario narratives and more consistency within each of the scenario descriptions and forecasts.

While scenarios must be distinct in their narratives and parameter forecast values, and yet remain plausible (as discussed above), in a complex and changing world it is important to identify and capture the parameter measures that are most relevant to forecasting future demand and supply conditions for electricity.

For these reasons the Panel welcomes the changes AEMO has made to the scenarios and the forecast parameters associated with this.

Since the scenarios development phase of the ISP cycle is one of the first areas of work, the 2026 ISP Consumer Panel also recognises that we were the first consumer Panel to be appointed with time to actively explore scenarios for the 2026 ISP and greatly appreciate the opportunities to engage with AEMO staff. We consider that we have been able to constructively influence the 2026 ISP scenarios.

Consequently, we highlight the value of the 2028 ISP consumer Panel being appointed in the first half of 2026 so that they too can engage with scenario development for the 2028 ISP

Recommendation 2.6

That the 2028 ISP Consumer Panel be appointed in the first half of the 2026 calendar year so that they can actively engage in scenarios considerations.

The Panel, however, notes that AEMO proposes to introduce a change to the way in which the three scenarios are ‘weighted’ in the optimal development path modelling. In the past, the scenarios were weighted using a Delphi Panel approach where the Panel members allocated ‘probabilities’ to each of the scenarios which in turn produced a ‘weighted ODP’. This weighting process meant that the ODP better captured the likelihood of the future state of the energy system and the risks to investors and consumers of over or under investment in the ODP.

The approach adopted in the 2025 ISP tests the likelihood of the values expressed in the forecast parameters for each of the three scenarios rather than seeking views on the overall likelihood of each scenario.

At this stage, there is little clarity around the final output of AEMO’s new approach – will there be a risk weighted ODP for instance under this new approach and if so, how will it be calculated.

Recommendation 1.4

AEMO clearly explain the reasons for the changes in its approach and the methodology it has adopted to underpin any weighting of each scenario based on the assessment of the parameter values set out in each scenario.

5.4.2 Sensitivities

As discussed above, scenarios must be distinct in their narratives and parameter forecast values and must be plausible and internally consistent (as discussed above). Nevertheless, in a complex and changing world it is important to model ‘what ifs’.

For example, ‘what if’ CER does not grow in the way forecast in the IASR (either less or more). What impact will that have on operational demand, all other things being equal, and the associated generation, storage and network requirements? What does that mean for policy makers?

Sensitivity testing is the key to understanding the impact of individual parameter forecasts on the selection and/or the timing and costs of the ODP. The tests provide an opportunity to ‘stress-test’ these individual parameter forecasts, while holding other variables constant.

The Panel recognises the modelling and system constraints that limit the number of sensitivity tests that can be carried out. We expect AEMO to clarify and explain its priorities, and in doing so, recognises the level of uncertainty around the parameter forecasts and the concerns of consumers with these forecasts.

We also recognise that the ‘final’ set of sensitivity testing cannot be determined at this stage and it is important that AEMO can reprioritise sensitivities as it progresses through the Draft to the Final ISP.

The AER’s 2024 CBA Guideline requires AEMO to “test the robustness of alternative development paths to future uncertainties...” using sensitivities in addition to scenarios (p 2). While giving AEMO ‘flexibility’ in its selection of sensitivities, the AER’s Guideline suggests that sensitivity testing should, inter alia (pp 37-38):

- test ‘important inputs’ such as the discount rate and VCR

- test cost estimates against the lower and upper end of their ranges
- Illustrate ‘boundary values’ for particular inputs at which the optimal development path changes.

AEMO’s discussion on the role of sensitivities is consistent with the CBA Guideline (see Final 2025 IASR, pp 23 – 24) and emphasises for example that sensitivity testing allows “test the resilience of the [ISP] investments’ (p 23); “deeper and richer insights after examining the outcomes of the scenario modelling” (p 23), “enhanced insights on risks and opportunities” (p 24).

AEMO also states: (p 24)

“Sensitivities should continue to depict a future world that is plausible, distinctive, broad and useful and remain internally consistent after the assumption change”.

In other words, sensitivities should enrich the scenario narratives and forecasts, but not beyond what is feasible and realistic.

Given this, and AEMO sets out what it calls “potential sensitivity themes”, that may include but not limited to the following (AEMO 2025 IASR, p 24):

- The impact of gas system development
- Constrained supply chains
- Coal retirements
- Financial parameters
- Alternative demand-side investments, including energy efficiency, CER coordination and CER uptake
- prospective industrial loads and data centre developments
- Hydrogen for industry, and hydrogen exports.

The Panel provides its ‘preliminary’ support to AEMO’s suggestions and makes the following additional comments on AEMO’s list of potential sensitivities:

- We note AEMO’s inclusion off the impact of gas system development which, as AEMO acknowledges (p 24), is not a ‘traditional sensitivity analysis’. We agree with AEMO, however, that a sensitivity test on gas system development has the potential to test the robustness of the assumptions in the ISP optimal development path to different gas infrastructure development paths.
- The Panel places a high priority on AEMO considering the sensitivity of the ISP plan to the forecasts of consumer led actions such as CER (including PV and home batteries), CER co-ordination, efficiency and electrification. For example, we are interested in the impact of higher forecasts (and lower forecasts) on the need for additional capacity in the transmission and distribution networks. The Panel notes that the planned ‘Demand Side Factors Statement’, which will be published alongside the Draft and Final ISPs will provide further insights into the relative costs and feasibility of demand-side consumer led activity.

- The future electricity demand for large industrial and data centres is particularly uncertain, and may have a very significant influence on the volume and location of future demand for grid-scale electricity. We therefore agree that both should be included in the sensitivity testing of the development paths. We also observe that owners and investors in large scale data centres in the US (for instance) plan to build generation and storage facilities on the data centre on-sites for supply security or commercial purposes, making them a likely candidate for flexible demand and demand side participation. See for example: <https://www.latitudemedia.com/news/the-rise-of-on-site-generation-to-power-ai/>,
- There is currently a great deal of uncertainty about the future adoption of hydrogen as a direct fuel to replace natural gas in processing or oil in transport, or to replace electricity generation, with the trend away from the over-optimism of previous years. We agree it would be useful to submit the current forecasts of hydrogen demand for industry in the NEM to sensitivity testing in the Accelerated Transition scenario. At this stage, however, we do not see the value of conducting sensitivity testing of hydrogen ‘green exports’. If this market were to develop, it is likely that hydrogen conversion will be located outside the NEM and/or have dedicated separate connections. Moreover, we strongly object to NEM based consumers funding the infrastructure required for (a) delivering electricity to the processing station and (b) delivering the product to the export terminal.

The Panel also considers the following to be important sensitivities given their potential impact on the ISP and ultimately, the costs and benefits to consumers, and the impact on sustainability and reliability goals.

- The costs of transmission. The accuracy range of the current transmission costs, for example, are estimated at + or – 50% for some major components of transmission build.
- The more rapid displacement of natural gas generation for firming purposes by large-scale batteries as costs for the later continue to decline and technology options to lithium batteries open up.
- The impact of ‘policy’ settings which are currently fixed across all scenarios. This was suggested by the AEMC as a potential role for sensitivity testing¹⁴ and may be increasingly important as political and social consensus about the transition pathway appears to be weakening.

In summary, in a rapidly changing world, sensitivity testing of the inputs that influence the selection of the ODP is more important than ever. The Panel supports AEMO’s consideration of the potential sensitivities and we recognise that the IASR cannot be definitive about the most appropriate and useful sensitivity tests. We look forward to working with AEMO on the ‘final’ selection of the most appropriate sensitivity tests, noting that our focus is on the impacts of the ODP on the costs to consumers and the sustainability and reliability of the NEM electricity system.

Recommendation 1.5

¹⁴ AEMO, Rule determination, National Electricity Amendment (Improving consideration of demand-side factors in the ISP) Rule 2024, 19 December 2024. The Rule determination document makes multiple references to the ISP contributing understanding and transparency on the impact of policies on the achievement of net zero objective.

AEMO focus on testing the ISP using sensitivities that are likely to have the greatest impact on outcomes for consumers, including the future costs and benefits to consumers and the sustainability and reliability of the NEM system.

Recommendation 1.6

In addition to the list of potential sensitivities set out in the IASR, AEMO include sensitivities on the costs of transmission expansion and distribution capacity enhancement in line with the risks currently associated with the costs (e.g., + or – 50% for some transmission assets).

Recommendation 1.7

AEMO undertake testing of the more rapid displacement of natural gas generation by other firming and storage technologies including long-duration batteries.

5.4.3 Existing Generator and Storage assumptions

The 2025 IASR has a focus on defining the inputs to AEMO’s modelling of the optimal transition path. It includes analyses of both demand-side developments and supply-side developments. In this context there are rapid developments in the technology and market opportunities for large batteries (BESS), smaller commercial and domestic batteries and the emerging market of community and virtual power plants. The manner and extent to which batteries may displace network options in the optimal development path assessments, has material implications for the ISP’s conclusions.

The ISP’s emphasis on network capacity development made sense at a time when transmission projects were expected to be no-regrets, low-hanging fruit¹⁵. They were assumed to be relatively low cost, quick to build and uncontroversial, while alternatives such as wide scale deployment of battery energy storage systems (BESS) were more costly and less market-ready.

While those hopes and assumptions were once plausible, it is now clear that they are not.

- The costs of transmission have spiralled beyond even the least optimistic predictions - both through external factors and the systematic underestimation of project cost and complexity - and may prove higher still as more recent developments flow through to updated costs.
- Similar factors have revealed much longer lead times for project delivery than planned, delaying the realisation of benefits and slowing the transition. Between delays and the advent of ‘early works’ revenue, costs for some major transmission projects are landing on consumer bills five or more years before benefits from operation of the assets start to trickle through.

¹⁵ *The fact of transmission being around 10% household energy bills - compared to distribution at 3 or 4 times that – also seemed to give false assurance that transmission would add little cost to bills or that those increases would matter less.*

- Social licence related complications have added unforeseen costs and delays and may run the risk of undermining the efficacy of the transition as some poor project planning and implementation has exacerbated concerns of those impacted.

In short: network solutions have proven expensive and slow, and ‘low-hanging fruit’ has been picked.

Against this backdrop, viable alternatives (to further extensive network augmentation) such as BESS are steadily dropping in price¹⁶ and are being rolled out at a growing rate. They are funded mostly by private sector with some government support, and – unlike transmission solutions - consumers are only paying for the benefits they receive over the life of the battery, without carrying the cost or risk burden of regulated revenue for transmission projects irrespective of their utilisation over the 50+ life of the assets.

Utility scale BESS do not come with the same social licence issues of transmission, or the risk associated with 50-year plus asset lives. BESS can improve utilisation of transmission and sometimes defer or avoid the need for it to be built. BESS costs and lead time continues to drop, and every few months – or every few weeks – another battery comes online, improving competition, accelerating decarbonisation, and modernising the energy system.

Stakeholders, including the ISP Consumer Panel, have long been calling for the ISP to have regard for solutions beyond transmission. AEMO has made clear efforts to improve the consideration of BESS and other parts of future energy system, however while the ISP modelling seeks to optimise different parts of the energy system, the ISP itself, and the broader ISP framework, cannot make non-network, market-based options like utility BESS ‘actionable’, even in the case where those solutions would result in substantially lower overall costs. ,

In this context, the Panel notes the following questions remain:

- Continued investment in grid scale batteries is assumed for the ISP, but what is the manner of such investment into the longer term?
- What are the likely revenue streams of batteries beyond just selling and consuming energy? (see our list above for some examples)
- How will the revenue for batteries ‘shaping’ activities change over time with changing wholesale price signals?
- How heterogeneous is the utility scale battery market both in terms of investment decisions and operation in the wholesale market?
- How will batteries in the distribution system and behind the meter operate, and how will they be co-optimised with the energy system?

¹⁶ The panel notes IASR’s anticipated future reductions in battery cost appear conservative compared to other updated battery price forecasts in recent years, particularly in light of recent deep price reductions and the growing likelihood of breakthroughs in emerging battery chemistries.

- For distribution level batteries, eg VPPs, will these become more relevant as outputs (rather than inputs) given the Rules change to allow non-scheduled generators to participate in the wholesale market (under certain conditions)?
- The how does this impact future electricity supply that batteries can provide and so we get the ISP, including how batteries will be considered in the final IASR and subsequently modelled?

The 2024 ISP¹⁷ included this statement about the future direction of Australia’s energy system:

“With coal retiring, renewable energy connected with transmission and distribution, firmed with storage and backed up by gas-powered generation is the lowest-cost way to supply electricity to homes and businesses as Australia transitions to a net zero economy.” (Page 6)

Deconstructing this statement, the Panel observes that the *“renewable energy connected with transmission and distribution”* is well considered in ENOR and the 2026 ISP process more broadly and that *“backed up by gas-powered generation”* is considered in the separate Gas Infrastructure Options Report (GIOR) that was released concurrently with the ENOR and is responded to in a separate submission from the Panel. It is the *“firmed with storage”* that is under-represented in 2026 ISP considerations, including in the ENOR.

Focusing only on the renewables-firming attributes of batteries undervalues the dynamic critical and complex role they will play in the future energy system, in the process overestimating the component cost of using them for firming.

Batteries also provide a range of other important services for the grid that provide consumer benefit, including:

Demand firming

Batteries are as much loads as they are generators. Moreso, in fact: a typical BESS consumes about 1.2 MWh of energy for each MWh it produces. In addition to firming generation, batteries can help firm demand. Already in 2025, we are seeing AEMO put the capacity of batteries as a controllable load to ‘firm’ demand, in the response to Minimum System Load events. Directed batteries receive additional revenue for this activity.

Temporal diversity

Importantly, batteries provide temporal diversity, both in generation and load. As the energy system approaches 100% renewable, with commensurate increase in coincident generation and longer periods where demand is exceeding generation, the value of temporal diversity will continue to increase. Transmission on the other hand provides locational diversity. This is also valuable, however much

locational diversity has been achieved through the existing and planned transmission; adding more beyond that already committed and anticipated in previous ISPs has diminishing returns and is unlikely to be necessary.

¹⁷ [2024-integrated-system-plan-isp.pdf](#)

Flexibility

BESS systems are uniquely flexible. They can be generation and load. They can provide energy services and security services. They can provide backup power and be a source of reliability and resilience. They can assist in the control of voltage and frequency, and in future likely to be able to provide new ancillary services like synthetic inertia and system restart. They can be aggregated, or access so a single battery can be shared among service providers.

The physical attributes of BESS flexibility are less commonly acknowledged. Typically, inverters can be added to an existing battery unit to increase power output (with some modifications) and batteries can be added to increase energy storage capacity. And although it's not commonly done, BESSs can be removed and reinstalled at other locations. All these aspects help derisk battery investments, making it less critical to perfect the battery specifications at the design and build stages.

Lead time and speed of deployment

With far fewer barriers than transmission, battery systems can be rolled out in a matter of months, provided dependencies such as grid connection are confirmed.

Taking into account the costs and benefits of batteries and the challenges associated with transmission, it is reasonable to assume for the 2026 ISP:

- Specific battery projects (or groups of battery projects) will prove a more cost effective alternative to some transmission flow path augmentations
- Given their wider utility, BESS can be considered a more effective way to provide some security solutions such as synchronous condensers (syncons) - particularly in light of the escalating cost and limited availability of syncons – procured through market incentives such as ancillary services and non-network solution services, or required under conditions attached to connection and operation
- more robust assumptions around the cost benefits and functions of batteries should inform the costs of each candidate development path and scenario, to ensure the optimal development path represents an efficient co-optimisation of key elements of the energy system.

Recommendation 1.8

The Panel also suggests that once the 2026 ISP cycle moves to the modelling phase, when exploring the counterfactual, modelling and subsequent description will need to be overt about how the role of batteries is optimised. While many of the functions and services of batteries lie outside of focus of the ISP, the impact of these other revenue streams should be considered in the costs and benefits attributed to batteries.

Recommendation 1.9

Given the role that grid scale batteries will play in in the future energy system, and the associated revenue streams that effect the investment case for batteries, it is crucial for the ISP to fully consider the costs and benefits of batteries.

Finally, acknowledging that the 2026 ISP is too far progressed to make fundamental changes, the panel recommends AEMO and the other market bodies consider that in light of the opportunities for energy storage:

- ISPs up to and including the 2026 ISP will have provided sufficient guidance for the development of the future transmission system,
- From 2028, an ISP limited to actioning network projects is no longer fit for purpose to meet the needs of consumers and the climate as enshrined in the NEO and NGO, and
- it is essential future system planning guides a co-optimised plan for storage, generation, the demand side and networks, so
- the 2028 ISP needs to be refocussed as a genuine whole-of-system plan.

Recommendation 1.10

That once the 2026 ISP cycle moves to the modelling phase, including when exploring the counterfactual, modelling and subsequent description will need to be overt about how the role of batteries is optimised.

Recommendation 1.11

The trade-offs between batteries, synchronous condensers and gas be more fully explored for the 2026 ISP.

6.3.4 Financial parameters

Background

The financial parameters are key inputs into the assessment of the costs to investors of investment in the different asset classes identified in the ISP modelling, namely transmission, renewable and gas generation, batteries and pumped hydro. More recently, AEMO has also considered the costs of expanding the distribution network capacity to facilitate CER/ DER.

Since the 2022 ISP, AEMO has progressively updated and clarified its approach to the assessment of the key financial parameters used in the ISP's assessment of 'pathways' to the transition to net zero by 2050. These developments in the financial parameters have been driven, in the first instance, by the requirements set out in the AER's 'Cost Benefit Analysis and Regulatory Investment Test Guideline' (CBA Guideline, 2021 and 2024 update). AEMO has also responded to feedback from industry and consumer stakeholders over the successive ISPs.

The developments include:

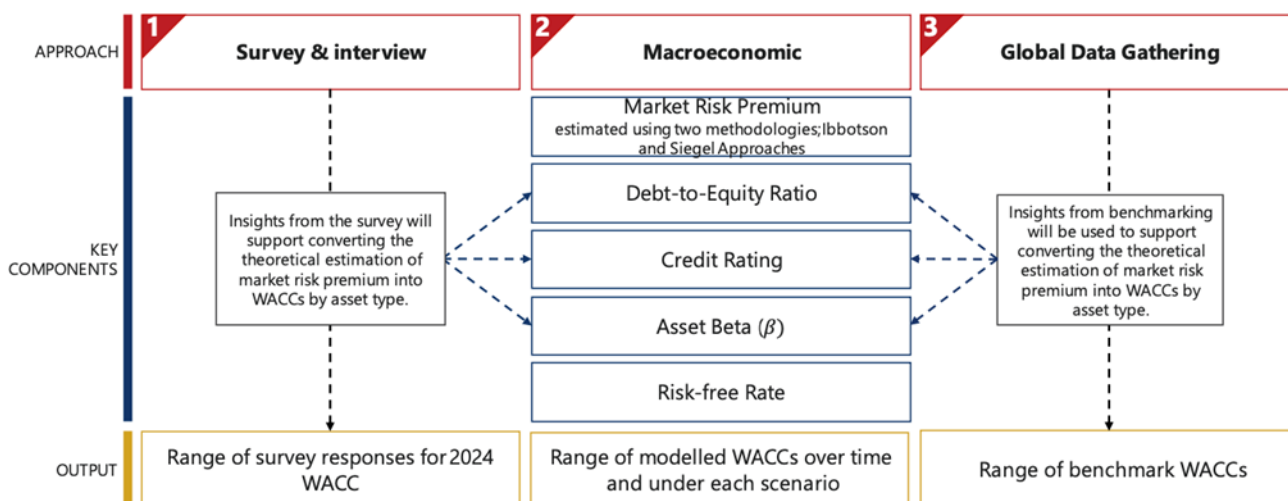
- Updating the macroeconomic approach to determining the cost of capital and discount rate.
- Supplementing the macroeconomic approach to assessing the financial parameters with industry surveys and interviews, and ‘global data gathering’.
- More clearly distinguishing between the role of the weighted average cost of capital (WACC) and the discount rate, with the WACC forming part of the cost of an asset, and the discount rate used to compare annualised costs for assets of different classes, life cycles and commencement dates.
- Change from a single estimate of the WACC for all scenarios and all asset classes to using ‘technology-specific’ WACCs. However, AEMO continues to propose a single discount rate across all technologies and all scenarios (referred to as a technology-neutral discount rate).

We comment below on these last three developments, noting that the decision to apply technology-specific and scenario-specific WACCs is an important new feature in the 2026 ISP. This change was signalled in the Draft 2025 IASR and is now included in the Final 2025 IASR.

Assessment of the WACC and the Discount Rate in the 2025 IASR

(i) Oxford Economics Australia (OEA) considerations

AEMO’s approach in the Final 2024 ISP, and in the 2025 IASR, draws on the analysis conducted by Oxford Economics Australia (OEA). OEA’s research framework is set out in the figure below.



Source: Oxford Economics

Figure 12 OEA analysis, July 2025, p. 11.

Despite the difficulties of surveying energy market stakeholders, and of using international comparison data, the Panel strongly supports OEA’s approach in its July 2025 report. We consider that the additional information is a useful supplement to the initial (2022) approach of applying macroeconomic analysis only. For the 2025 IASR, OEA conducted follow up interviews with industry stakeholders to provide further insights into the expectations

and concerns of investors, particularly with respect to the ‘risks’ that investors observed for different technology investments.

(ii) WACC and Discount Rates

In the 2022 and 2024 IASRs and ISPs, AEMO did not clearly distinguish between the role of the WACC and discount rate. AEMO considered that it should use a single ‘central’ figure for both the WACC and the discount rate, albeit drawing on the framework illustrated in the diagram above for the 2024 ISP.¹⁸

The 2025 IASR more clearly distinguishes between the WACC and the discount rate in the context of the 2026 ISP modelling. In brief, the WACC is defined as the cost to an investor of financing the project through equity and debt capital. As such, it is a key component of the overall cost of a project. For example, the cost of finance can make up over 50% of the total costs used by the AER when calculating the regulated revenue allowance for regulated transmission networks (see AER’s ‘State of the Energy Market 2025’ report, p. 88). The AER’s CBA Guideline does not constrain AEMO from using different costs of capital for different technologies.

In contrast, and as clarified by AEMO in the 2025 IASR, the discount rate reflects the time value of money based on the opportunity cost to the investor by converting a series of future cash flows (from a project) into present value terms. Importantly, therefore, the discount rate enables AEMO to compare on the same NPV basis, the costs and benefits of different projects that commence at different dates in the future and continue over different lengths of time. The discount rate is therefore a key input into AEMO’s cost-benefit assessment of the ISP’s candidate development paths (CDP) and the selection of the optimal development path (ODP).

(iii) Single estimate opposed

Stakeholders, including the 2024 ISP Consumer Panel, did not support the adoption of a single estimate for both the WACC and the discount rate across all the technologies in the ISP analysis and across the three scenarios.

For example, the 2024 Panel, and the 2026 Panel (in response to the Draft IASR) contended that investment in different asset classes posed different levels of financial and operational risk to the investor. In turn, this would impact on the overall project cost, credit status, and proportion of equity and debt finance for the project. AEMO recognised this issue in the 2025 draft IASR and expanded on it further in the Final 2025 IASR with respect to the estimate of WACC (but not the discount rate). For example, AEMO states in the Final IASR (p 157):

“As the financial risks of each technology will differ based on a variety of factors, the WACC is appropriate to also differ by technology in order to reflect the different rates of return that investors will require to compensate for that variable level of risk. As WACC reflects financing cost, it is a key influence on the overall project cost and therefore the overall system costs in the ISP’s CBA.”

The discussion below provides further details on the WACC and the Discount rates.

¹⁸ The central figure in 2024 was 7%. OEA provided a high and low estimate of 10% and 3% respectively, the latter being the most recent AER estimate of the cost of capital used in its network revenue determinations.

Weighted Average Cost of Capital (WACC)

OEA also provided AEMO with a table setting out the technology-specific WACCs relevant to each of AEMO's three scenarios. That is, OEA provided a different technology-specific WACC for each of the three scenarios, based on the economic narrative applied to each of the three scenarios. Specifically, OEA posits that there will be differences from the central (Step Change) scenario that are based on different economic/finance outcomes as described in each scenario narrative, such as the cost of equity, the risk-free rate, expected inflation and the relative debt risk premiums.

The Panel understands that AEMO intends to adopt the technology and scenario-specific WACCs in the 2026 ISP modelling.

As indicated above, the Panel supports AEMO's adoption of different technology- and scenario-specific WACCs in line with OEA's analysis. The figure below, taken from the Final IASR (Table 30, p 158), summarises the results of the OEA analysis, and includes the deviation of the lower and upper band from the central (Step Change) values.

Technology	Slower Growth	Step Change	Accelerated Transition	Lower bound (delta)	Upper bound (delta)
OCGT (small gas turbine)	8.0%	9.0%	10.0%	-1.9%	3.1%
OCGT (large gas turbine)	8.0%	9.0%	10.0%	-1.9%	3.1%
CCGT ^A	9.5%	10.5%	12.0%	-1.9%	3.1%
CCGT with CCS ^A	9.5%	10.5%	12.0%	-1.9%	3.1%
Biomass ^A	9.5%	10.5%	12.0%	-1.9%	3.1%
Large scale Solar PV	6.5%	7.0%	8.0%	-1.9%	3.1%
Solar Thermal (16hrs storage) ^A	9.5%	10.5%	12.0%	-1.9%	3.1%
Battery storage (1hr storage)	7.5%	8.0%	9.5%	-1.9%	3.1%
Battery storage (2hrs storage)	7.5%	8.0%	9.5%	-1.9%	3.1%
Battery storage (4hrs storage)	7.5%	8.0%	9.5%	-1.9%	3.1%
Battery storage (8hrs storage)	7.5%	8.0%	9.5%	-1.9%	3.1%
Pumped Hydro Energy Storage (10 hrs)	7.5%	8.5%	9.5%	-1.9%	3.1%
Pumped Hydro Energy Storage (24 hrs)	7.5%	8.5%	9.5%	-1.9%	3.1%
Pumped Hydro Energy Storage (48 hrs)	7.5%	8.5%	9.5%	-1.9%	3.1%
Wind - onshore	7.0%	7.5%	8.5%	-1.9%	3.1%
Wind - offshore (fixed)	7.0%	7.5%	8.5%	-1.9%	3.1%
Wind - offshore (floating)	7.0%	7.5%	8.5%	-1.9%	3.1%
Hydrogen Electrolysers	7.0%	8.0%	9.0%	-1.9%	3.1%
Electricity - Transmission and Distribution (Regulated)	3.0%	3.0%	3.5%	0.0%	1.5%
Electricity - Transmission and Distribution (Unregulated)	6.0%	6.5%	7.5%	-1.9%	3.1%
Gas - Transmission and Distribution (Regulated)	3.0%	3.0%	3.5%	0.0%	1.5%
Gas - Transmission and Distribution (Unregulated)	6.5%	7.0%	8.0%	-1.9%	3.1%

A. AEMO assumes that the WACC for CCGT, CCGT with CCS, Biomass and Solar Thermal (16 hrs storage) are the similar.

Figure 13 Technology-specific pre-tax WACCs by scenario

While supporting AEMO's updated approach to the WACC, the Panel raises two suggestions for AEMO's consideration based on the OEA July 2024 report. The are:

- OEA's suggested that the relevant time variant WACC economic parameters, such as expected inflation and risk-free interest rates, be updated when preparing the 2026 ISP. The Panel agrees with OEA's proposal and recommends AEMO to adopt this in the Draft and Final ISP WACC analyses.
- Further consideration be given to OEA's proposed technology-specific WACCs where OEA has assessed the WACC based on the potential for government subsidies, such as low-interest loans, and/or off-take agreements by both governments and private sectors.

For example, OEA's WACC analyses includes the following central (Step Change) values based on some exogenous additional support:

- A WACC of 7.5% for offshore wind (nearly the same as land-based wind), based on the assumption of some form of government support (OEA, July 2025, p 30)
- A WACC of 8.23% for BESS projects assumes there are contracted off-take agreements with governments or the private sector as these are deemed essential as a hedge to the merchant risk inherent in the revenue model for large-scale BESS. (OEA, July 2025, p 32)
- A WACC of 8.5% for pumped hydro storage that includes an 'implicit commercial assumption' that there would be support from long-term offtake agreements from government (OEA, July 2025, p 34).

The assumed government and private sector support for these projects are designed to 'de-risk' a project for the investor and it is claimed in the OEA report that this will influence the cost of capital (e.g., via a lower beta). Moreover, as suggested above, there may be little or no investment in such projects without these financial supports.

However, the Panel considers that it is not appropriate to include such 'allowances' (i.e., the proposed reductions in the WACC) when assessing technology-specific WACC costs.

Firstly, such agreements are generally project specific rather than asset class specific. Secondly, there is no certainty, ex ante, that there will be such agreements available for all the potential projects that emerge in that specific asset class. By understating the 'true' WACC, there is a risk that investment potential in this asset class will be overstated in the ISP model. Policy driven subsidies that apply to a whole asset class and have a high degree of certainty can be catered for in the input assumptions that constrain the model.

Discount Rate(s)

While the Panel supports AEMO's approach to adopting both technology-specific, and scenario-specific estimates of the WACC, we suggest AEMO should reconsider its approach to adopting a single value central discount rate to apply across all three scenarios.

In our view, it is reasonable to use a single technology-neutral discount rate, being the central WACC value of 7% (for the Step Change scenario), given the assumption that in this Step Change scenario narrative, investors share a common view on the future state of the world and the opportunity value of money.

However, when considering the narratives associated with each of the three scenarios, each scenario posits a different future state of the world. It is therefore more appropriate for AEMO to adopt the scenario-specific discount rates as provided by OEA.

That is, each scenario should have a single unique discount rate in line with the financial/economic assumptions in that scenario's narrative.

The Panel's view is therefore that AEMO should apply different discount rates to each of the scenarios as set out by OEA. OEA explains this outcome as follows (OEA, July 2025, p 41):

“The technology-neutral discount rate has been estimated using a scenario-consistent approach, adjusting key components of the WACC in line with AEMO’s 2025 IASR framework. Specifically, the cost of equity, risk-free rate, and expected inflation inputs are flexed using economic forecasts provided by Deloitte for each scenario.”

This is illustrated in the table below (see Figure 36, OEA July 2025, p 41).

	Progressive Change	Step Change	Green Energy Industries
Recommended Discount Rate	6.5%	7.0%	8.0%
Key components			
Inflation expectations	2.23%	2.28%	2.34%
Return on equity	9.2%	10.1%	11.5%
Return on debt	5.7%	5.9%	6.3%

Source: Oxford Economics

Figure 14 Technology-neutral discount rate by scenario and key components

OEA further explains why the high and low scenarios differ from the central scenario as follows (OEA July 2025, p 42):

“While inflation expectations are also elevated in this scenario (Green Energy Industries) and slightly offset the upward pressure on real discount rate, the competitive capital environment and robust investor sentiment maintain a structurally higher technology-neutral discount rate, primarily driven by a higher long-run risk free rate consistent with greater economic dynamism and risk appetite.

In contrast, the Progressive Change scenario is characterised by subdued economic activity and weaker investment momentum. The risk-free rate is lower, in line with softer long-term growth and inflation expectations, leading to a more conservative discount rate of 6.5%”

The Panel considers OEA’s proposed scenario-specific discount rates are both plausible and more consistent with the individual scenario narratives when compared to the current assumption of a single discount rate across all scenarios. The use of a single discount rate ignores the fundamental differences in the states of the future world described in the narratives attached to each scenario.

In addition, varying the discount rate across the three scenarios does not violate the AER’s CBA Guideline directions. For example, a separate discount rate for each scenario best satisfies the Guidelines ‘discretionary guidance’ on the selection of ‘discount rate(s)’ (see AER CBA Guideline, November 2024, pp 11-12) for the following reasons:

- It is competitively neutral between network and non-network options in a development path, as all technologies incur the same discount rate **within** that scenario.
- A common discount rate is applied across all benefit classes and costs **within** a scenario

- It better satisfies the CBA Guideline’s guidance to “select a discount rate(s) that reflects the **systematic risk**¹⁹ associated with the expected cost and market benefit cash flows streams over the life of the development path” (p 11).

Finally, the Panel has identified a potential inconsistency between AEMO’s Draft 2025 Electricity Network Options Report (ENOR) and the 2025 Final IASR. In the ENOR, AEMO includes an important discussion on distribution network opportunities including what it calls ‘investment’ opportunities. AEMO then states on at least two occasions that the “annualised LRMC [long-run marginal cost] figures were standardised to a common year assuming a 40-year asset life and a 5% discount rate”. (See Draft ENOR, pp 185 and 187, footnotes)

The Panel expects AEMO to explain the difference in the discount rate used in the ENOR and the Final IASR (5% versus 7%), noting that the 7% discount in the 2025 IASR will be applied to all the relevant network asset costs.

Conclusions and Recommendations

In the discussion above, the Panel has indicated its general support for AEMO’s progressive enhancement of the roles and calculation of the WACC and the discount rate, including how the WACC and the discount rate serve different functions in the ISP analysis. To this extent, we support the AER’s conclusion in its Transparency Review that: (AER, Review report, August 2025, p. 3)

“The final IASR presents information to clarify in greater detail the reasoning behind the change to technology specific WACCs from a core 7% that was used in the 2024 ISP. It also contains a broader discussion on how these WACCs are intended to be used in the ISP and how they will interact with the discount rate”.

The Panel, however, encourages AEMO to reconsider its proposal to use the same discount rate across the different scenarios. This approach is inconsistent with the purpose of the scenarios and the associated narratives to describe different states of the future world. OEA has provided a clear basis for adopting different discount rates for different scenarios in line with the respective scenario narratives. OEA’s approach is also more consistent with the AER’s guidance for the discount rate to reflect the systematic risk in these three future worlds.

To be clear, we are not advocating a different discount rate for different technologies within a scenario.

The Panel therefore recommends the following for AEMO’s further consideration in the 2026 ISP and/or future ISPs:

Recommendation 1.12

AEMO adopt a **scenario specific** technology neutral discount rate as this better aligns with the individual scenario narratives and the CBA Guideline’s discretionary criteria for the discount rate to reflect the systematic risk of the expected cash flows across the different development paths while being technology neutral.

Recommendation 1.13

¹⁹ Systematic risk refers to risk that impacts the overall financial/macro-economic environment, and includes (inter alia) inflation risk and interest rate risk

AEMO updates the economic and financial parameters in the analysis, such as risk-free interest rates and expected inflation for the calculation of both the WACCs and discount rates in the Draft and Final ISP.

Recommendation 1.14

AEMO reconsiders OEA's approach to estimating the investment risks for some technology specific WACCs (e.g. for off-shore wind) by including consideration of potential government subsidies and government and private sector off-take agreements.

Recommendation 1.15

AEMO review and explain why it uses a discount rate of 5% in the ENOR in its analysis of the LRMC of additional distribution network capacity while adopting a 7% technology neutral central discount rate in the IASR.

Recommendation 1.16

AEMO explains its reasons for the significant change it has made in the approach to scenario weighting and how it proposes to use the Scenario workshop data to support the weighting of the scenarios in the selection of the CDPs and ODP in line with the CBA Guideline directions.

5.4.4 Social Licence / social acceptance

Social Licence in the Energy Transition

Social licence is critical for the success of the energy transition. If energy businesses do not build and maintain acceptance around their projects, and governments do not ensure that at a regional scale there is social acceptance and direct benefits to communities hosting this infrastructure, there is a great risk to the deliverability of all projects.

The Panel considers social licence for the energy transition to have three broad meanings – 1. broad acceptancy by the general public for the overall change; 2. acceptance of individual projects by communities that host or are impacted by new energy infrastructure and 3. arrangements for property owners directly hosting energy infrastructure. Acceptance is often tied to compensation to landholders and neighbours, direct community benefit investments as well as general understanding of the reasons for the change; perceptions of fairness, and potential to engage in and benefit from opportunities.

In the context of energy consumers and communities, those opportunities could include participating by investing in CER, experiencing improvements to reliability (especially in the regions), economic diversification, increasing job and workforce opportunities and wider infrastructure improvements that may flow because of energy projects.

Social acceptance levels vary across projects and locations and continue to impact timing, deliverability and cost of projects included in the IASR and remain a factor that is largely understood through cost (increases) and timing (delays).

Through the Panel's engagement in the IASR we continue to stress that the IASR and the ISP have an interplay with social acceptance on the ground and in the wider community. The IASR nomination of 'optimal development' can be used in justification of transmission project RIT-T applications, including for hundreds of millions of dollars in early works (NEM wide), and plays an effective role of backing in the big transmission infrastructure projects.

We note AEMO is moving to incorporate more distribution-system information into its modelling (see mid-scale project understanding below) and welcome this step towards a more whole-of-system understanding of all participants and assets.

The ISP plays a strong role in public perception about the energy transition. There is a significant opportunity for AEMO to include more discussion of the demand-side as the aspect of energy transition that directly interacts with peoples' day to day lives – whether in a REZ region or not.

Consumers and communities as stakeholders and participants

AEMO clearly recognises the roles of consumers both as energy users and as investors in the energy transition. The IASR acknowledges the growing adoption of resources including rooftop solar, battery storage and electric vehicles that may participate - passively, or actively through VPPs or orchestration -in the energy system. The role of communities – as landholders, neighbours and broader stakeholder groups around individual projects – and their acceptance being key to social licence is also broadly reflected in the IASR narrative.

The Panel has emphasised that there is a wider opportunity for AEMO to ensure its IASR and ISP 'speak' to community energy project stakeholders as a specific cohort, investor and provider of value to the system and to the wider community buy-in to the energy transition. As noted in the section on mid-scale projects, there are emerging signs that this size of asset is increasingly of interest to incumbents that may not have the same perceptions of local agency, ownership and control compared to community-led projects.

How AEMO considers social licence

The final IASR includes the following statements in relation to social licence for the energy transition:

From Actions in the Energy Minister's response to the Review of the ISP – Incorporating community sentiment "...AEMO should have regard to community concerns or sensitive locations in the identification of the optimal development path, and consider existing and available data on community sentiment, where available for the 2026 ISP."

"Social licence" is commonly used to refer to local community acceptance of new infrastructure development....The efficient and effective transition of the energy sector will rely on both government and the energy industry understanding and delivering the community's ambition and needs for the future power system, both broadly in the community and in the places that host new development. Conversely, a lack of social licence could lead to significant project delays and increased cost..."

"...It is vital that developers and TNSPs identify key stakeholders and commence engagement on land and access as early as possible for AEMO's assessment of future REZ potential. This includes engagement with communities,

title holders, and Traditional Owners. Early identification of sensitivities in proposed future REZ areas will assist in the assessment of...opportunities, improving the projections of future potential in the ISP candidate paths''

From the above statements in the IASR, there remains a narrative gap regarding how AEMO talks to and addresses communities as participants and potential project stakeholders.

Project-level social acceptance

The recent ENOR noted that social licence costs (increased expenditure on community engagement, landholder payments and community / stakeholder investments) were one factor among several, contributing to rising costs of new transmission. The Panel considers that this present adjustment also reflects the fact that insufficient investment was made in past years to undertake high quality community engagement and appropriately compensate landholders for impacts. We welcome the IASR incorporating a fairer approach to communities and landholders in REZs, while also noting that there is an ongoing need for assessment bodies to balance fair compensation for hosts and neighbours with the overall cost to energy consumers.

The Panel recommended that AEMO consider how it (AEMO) could more holistically take account of community views about projects in our response to the draft IASR part 1 (Section 3: Social Licence. 2026 ISP Consumer Panel submission, February 2025. P. 13-17). In that response, the Panel outlined a potential way for AEMO to develop a more granular and structured assessment of social acceptance factors for projects. Over the last few months AEMO and the Panel have discussed the limits to AEMO's remit with respect to project-level information.

Ultimately AEMO advised that their role does not extend to assessment of projects and clarified in subsequent publications - including the ISP Stakeholder Engagement Plan, AEMO ISP Toolkit and the ENOR - that their role is restricted to early planning of transmission, with no assessment or project related role. The graphic below has been developed to help stakeholders understand the role(s) of AEMO and others in relation to transmission planning, development, delivery and operations.

The transmission planning process

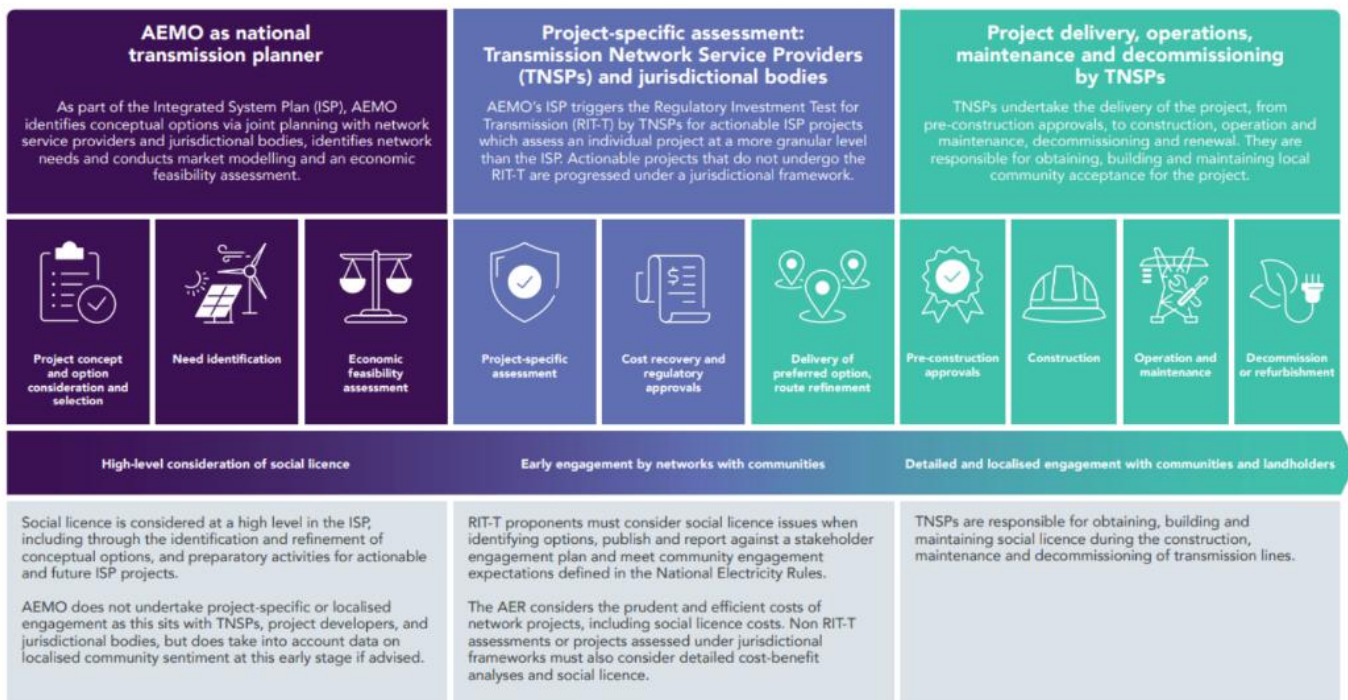


Figure 3: AEMO's consideration of social licence is limited to the very early stage of the transmission lifecycle (marked in dark purple). This diagram builds upon the one in The Energy Charter's 2024 [Factsheet on Community Engagement in Decision-Making for Transmission Projects](#).

Figure 15 AEMO Transmission Planning Process, ENOR page 55.

As we noted in ISP Consumer Panel Report responding to the Draft IASR Stage 2 report, quoting OEA,

“high concentrations of Renewable Energy Zones may face unique challenges that influence cost escalation and project delivery”.

This statement is consistent with our knowledge and understanding of community and consumers’ lived experience within designated as Renewable Energy Zones. There are significant challenges in managing the volume of proposed projects – all undertaking required engagement with communities – and associated impacts on local workforce, local infrastructure and services, local housing and accommodation services and other local industries, particularly agriculture, tourism, existing industrial activity, mining and other energy industries (particularly gas extraction/production).

The Panel also noted in response to the Draft IASR Stage 2, there has been little attention yet to coordinating other aspects of REZ that greatly influence local people’s experience, their ability to feel positive and to engage with potential opportunities. There remain concerns, across all REZ regions, about a disjointed understanding of ecosystem and agriculture impacts of multiple projects located in a REZ region. While there are now efforts underway to better manage and coordinate across state and Federal governments, communities still feel overwhelmed with the volume of projects being proposed, frustrated by variable quality of engagement and concerned about impacts. Enabling solutions that meet local needs requires further effort and (likely)

investment to directly engage and involve regional stakeholders, including community members, organisations, service providers, businesses, education providers etc. While AEMO’s role may be limited, it is not zero.

AEMO could proactively orient its engagement and communications to be more inclusive of and responsive to regional communities and project stakeholders who are crucial partners for the energy transition. As we noted in response to the Draft IASR Part 1:

“Communities are as important as individual customers, with their support for major energy projects crucial and the associated social licence essential for successful implementation of the ISP.” (p.2)

From an inputs and assumptions perspective, the final IASR has included *“updated REZ assumptions including geographic areas, land-use limits, resource limits and transmission limits”*, in section 3.9. We recognise that these changes respond – in part – to the points that the Panel made in our earlier feedback as well as to Energy Ministers’ directions and other stakeholder input. AEMO has adopted a land-use penalty factor for REZs and an upper land-use limit for REZ resources – of 5% land area for wind and of 1% land area for solar (final IASR P. 170) and incorporated updated information from jurisdictions. We note that the Final IASR was released prior to the Victorian Transmission Plan being published (which occurred on 17 August 2025). We note that the VTP’s proposed REZ regions and expectations regarding resource land impacts of less than 1%, which on the face of it seems lower than the limits that AEMO is assuming apply to REZs.

AEMO’s role in considering and communicating social licence

The Panel welcomes AEMO’s moves to clarify the (limited) role that it plays in transmission planning and projects (as outlined in the graphic included above from ENOR). AEMO has stressed that it is not able to evaluate social licence at a project level. We broadly accept these limits on AEMO’s influence at a project level. However, AEMO’s role is bigger than transmission planning.

In the context of the IASR, and the ISP, AEMO has a clear role in communication and public education and awareness raising, that goes beyond the ‘engaged’ stakeholder cohort. AEMO needs to better articulate – in the IASR and the ISP – the *why* as well as the *what* and *when* of the energy transition. This is a perspective that the Panel continues to emphasise, for both formal and less formal processes and for AEMO in concert with other relevant stakeholders.

In the Panel’s view, this communication remit fits within AEMO’s role as a national planner, as the key agency with visibility over all NEM states and as the operator of the market as it manages the energy transition in real time, including with more consumer-owned assets as market participants. This connects to the IASR, particularly in how AEMO articulates the narrative for each scenario included in the Integrated System Plan.

AEMO’s role in leading targeted and broader public communications to build awareness and understanding about the scenarios and the plan, in ways that connect with key issues for communities could be enhanced. In the view of the Panel, key issues for communities include (but are not limited to) the following matters:

- Why this is happening – across key risk areas (energy, climate, cost, exit of coal, emissions and climate risks from rising temperatures)

- What it will mean for bills, emissions, temperature/climate risks, security & reliability of supply if we do, or we don't stick to the plan
- What it will allow me, my local region, and my state to do
- (And particularly for regional communities), what is being done to support host regions in managing through this change

AEMO needs to ensure there is a consistent message across the industry and coordinated approach between AEMO, state planning bodies, transmission and distribution companies. It is critical that AEMO make it clear it recognises communities as well as consumers in the way it speaks about social licence and the energy transition – not just as hosts, but as potential investors, participants and critical partners for local and regional energy resilience and reliability.

Distribution-grid connected mid-scale projects, orchestration and community acceptance

The Panel notes that in recent years and particularly in regions where transmission and utility-scale projects are being progressed at pace and in volume, communities are asking 'so how does this improve my reliability, or my ability to add solar or augment my farm or business energy with renewables and storage'?

There is both a need to address and inform the challenge of reliability in the distribution grid and opportunities (capacity) for generation and storage from household scale up to connect to the grid, particularly in rural and regional areas and agricultural zones.

At a conceptual level, being able to model the interaction between all parts of the system is critical for a full and clear discussion, about mid-scale assets (those connecting into the distribution grid). We welcome moves by AEMO to test collection and analysis of distribution system data.

The Panels sees that from a social licence and overall value to consumers and communities, mid-scale developments provide an opportunity for a clearer narrative and planning that connects the multi-level nature of the energy transition to local experience. Intuitively, more mid-scale stuff may mean less large-scale stuff is required which speaks to community and consumer concerns about the cost of large transmission and generation projects versus the direct benefit to their home, community and region.

The Panel looks forward to AEMO having improved ability to model interactions between the two levels of the system. We would also expect that with better information, AEMO's future ISPs will also more deeply value the investments made at the small scale by consumers, businesses and communities in renewable energy assets that support them and their neighbours.

Mid-scale renewables – updated assumptions

The Panel welcomes the inclusion of assumptions about the potential for mid-scale renewables – especially solar and storage – into the IASR. We also note that we have at least a decade or so of policy and investment settings pushing for big transmission connecting to large generation in renewable energy zones and an energy industry and financiers oriented to utility scale developments.

There are some signs of change however. As of September 2025, there are ‘emerging’ policy settings in the mid-scale context:

1. the Federal Governments move to encourage ‘aggregated’ projects through the Capacity Investment Scheme
2. NSW Tender Round 7 for 500 MW of firming projects to support the Sydney-Newcastle-Wollongong sub-region, which sets a minimum threshold of 5 MW AC which “can be met by aggregating smaller units which can be connected to the distribution grid”. (<https://asl.org.au/tenders/-/media/80F010E3A3014DE2A8E52FA86F6A02D6.ashx>)
3. The Hunter Renewable Energy Zone’s push to utilise existing distribution assets and easements as the foundation to enable capacity upgrades that will support renewable energy and storage connecting into the grid. NSW expect construction to start in 2026 and be complete by 2028. (<https://reneweconomy.com.au/nsw-gives-quick-planning-approval-for-hunter-renewable-zone-built-around-existing-lines/>)

These present measures add to (build on) the stop-start approach to community energy project ‘carve-outs’ and short-term grant programs at the generation/storage side and indicate that policy settings are starting to shift, but it is still early days. To our knowledge distribution networks in the NEM have not yet moved to invite or incentivise mid-scale connections differently to the existing connection process which may also impact community energy project developers.

Distribution businesses are a key advocate for the IASR and ISP to account for the potential of ‘mid-scale’ developments. Distribution businesses are also proactively investing in ‘neighbourhood’ storage, leveraging the Regulatory Sandbox waiver to enable direct ownership of these assets. We are also aware that large gentailers see a growing opportunity for aggregation of commercial and large business energy storage and solar into their VPPs as well as investing directly in “neighbourhood” or “community” storage projects.

While support for mid-scale developments being better accounted for and included in the IASR and the ISP, we have some concern that there is potential for dominance of mid-scale opportunities by incumbents over communities. We know – and have articulated previously – that there is a substantial number of community owned renewable energy projects that want to have a clear path to distribution connection. We acknowledge that the IASR considers mid-scale projects from 5-30 MW scale. We note that for community owned energy projects, many are in the 1-5MW size.

From a social licence and overall value to consumers and communities, mid-scale developments – all the way down to 1 MW, provide an opportunity for a clearer narrative and planning that connects the multi-level nature of the energy transition to local experience. (Indeed, the recently announced NSW storage tender includes potential to aggregate small assets together to meet a 5 MW AC threshold)

Orchestration, social licence and 'mid-scale' assumptions

Consideration of mid-scale investments interacts with assumptions made in relation to orchestration. The IASR assumes a level of orchestration of consumer owned (and possibly community and/or business owned) assets, particularly in VPPs. Assumptions about how much orchestration is likely have been reduced because there is growing evidence that retailer-provided VPPs do not offer consumers a level of participation or remuneration commensurate with the spot market opportunity, particularly in the absence of clear rules to ensure consumer choice and access to fair value is protected. The low trust and approval ratings of energy retailers only exacerbate this.

There are emerging learnings from South Australia and Western Australia where emergency backstop mechanisms and export charges being imposed on CER owners have seen consumer trust and interest in orchestration and VPPs drop (<https://arena.gov.au/knowledge-bank/project-jupiter-national-alignment-report/>) For orchestration to become a more socially accepted and attractive option, the value stack needs to be clear to consumers, communication about personal (and system) benefits needs to be immediately attractive and the protections for CER understandable and fair.

Place this is text: Consider the 1-5MW scale of projects and orchestrated VPPs being included in discussions of mid-scale developments from a generation and storage perspective and community / consumer participation perspective.

Recommendation 1.17

Include recognition that AEMO's role extends to communication and awareness raising about the energy transition in public and through targeted stakeholder engagement and acknowledge this is broader than transmission planning.

Recommendation 1.18

Draft 2026 ISP to include discussion of community energy in mid-scale developments, noting the significant project development potential at this scale and the wider potential value to community acceptance of the energy transition as a whole, including enhancing social licence.

Recommendation 1.19

Continue to leverage sentiment insights from jurisdictions, research institutes, industry, civil society and transmission / network planners and project developers to inform social licence assumptions in the IASR about REZ resource limits, land-use limits and broader opportunities.

Recommendation 1.20

Identify savings in implementing ISP projects that accrue from social licence being established (eg. When done well, how much faster and cheaper can project delivery be?) As opposed to assuming social licence investment is always a cost.

6 Demand-Side Factors Statement

For the first time, the 2026 ISP will include a Demand-Side Factors Statement (DSF), another of the outcomes from the DCCEEW 2023/4 ISP Review. A draft of this statement will be released with the draft 2026 ISP in December 2025. The Panel is very supportive of enhanced demand-side factors being included in ISP development, it has been a recurring theme from each of the three ISP Consumer Panels, including this 2026 ISP Panel.

The process from the DCCEEW 2023/4 ISP review included the Minister lodging a Rule Change request for “Improving consideration of demand side factors in the ISP - Rule 2024.”

The AEMC²⁰ released their “more preferable final rule (final rule) to improve the robustness of the Integrated System Plan (ISP) and provide greater transparency and information to decision-makers and stakeholders on the expected development of demand-side factors” in December 2024.

Key aspects of the Rule change are:

1. “The final rule requires the Australian Energy Market Operator (AEMO) to publish a demand-side factors statement as part of its ISP. The final rule introduces obligations on distribution network service providers (DNSPs) to provide information to AEMO for the purposes of informing the ISP and demand-side factors statement.”
2. “The data sets, and timing, frequency and format for providing the data, will be established in guidelines that AEMO will be required to publish in consultation with the Australian Energy Regulator (AER), DNSPs and other interested stakeholders.”

(summary statement 2 from the rule determination)

Regarding the second of these responsibilities for AEMO, they have published an “Information Guidelines consultation paper” on 14th August 2025 with the draft guidelines to be released in October 2025.

The draft Demand-Side Factors statement will be released with the draft 2026 ISP in December 2025 and, we understand, be part of the consumer and stakeholder engagement process for the whole draft 2026 ISP ‘package’. The Panel will contribute actively to this process.

For now, the Panel has been given a high-level overview of intended aspects of the Demand-Side Factors Statement and can observe that a substantial amount of work has been put into preparation for the statement. It is evident to us that AEMO staff have put a considerable amount of thinking, internally, into the DSF and that it is substantial work that will have implications for future ISP’s and for overseas electricity systems as well. We have had a ‘taste’ of this significant work and eagerly await the full draft statement with considerable interest.

²⁰ https://www.aemc.gov.au/sites/default/files/2024-12/erc0396_final_determination_-_improving_consideration_of_demand-side_factors_in_the_isp.pdf

Given the significant increase in scope for this ISP, the DSF statement is expected to evolve from the draft to final 2026 ISP, and from one ISP to the next.

From our initial briefing there are two topics that we wish to comment on at this stage of the process, and make comment about:

1. The Modelling includes considerations of curtailment of CER as a variable in modelling. This will need to be carefully explained as some curtailment of CER is reflective of an efficient energy system.

The NEM can't afford a view to be promulgated that every milli-watt of electricity lost is wasted and reflective of inefficiency. Extra marginal cost renewable generation is a much better way to meet demand variability for consumers, than building ever more network to cope with short periods of high demand.

Investing to avoid curtailment is nuanced

2. While we recognise that the DSF statement will be released with the draft 2026 ISP, our initial thinking is that some DSF specific briefings and engagement with stakeholders and consumer groups will be important – in part because there is likely to be a significant amount of new information, modelling and thinking for stakeholders to come to grips with, over a very short period of time, for the 2026 ISP. This additional engagement should actively seek to include community energy organisations and other relevant consumer groups, including some with interest in, but limited capacity to engage in the breadth of the ISP.

Recommendation 1.21

The Modelling includes considerations of curtailment of CER as a variable in modelling. This will need to be carefully explained as some curtailment of CER is reflective of an efficient energy system.

Recommendation 1.22

That some DSF specific briefings and engagement with stakeholders and consumer groups be conducted as part of the engagement about the draft 2026 ISP.

7 Appendices

7.1 Appendix 1: National Electricity Rules (NER), clause 5.22.7 (of version 233).

ISP consumer panel

- a) In respect of the preparation of an Integrated System Plan, AEMO has the function of establishing and supporting a panel ("**ISP consumer panel**") to provide written reports to AEMO on:
 - 1) the *Inputs, Assumptions and Scenarios Report* that will be used to prepare a draft Integrated System Plan; and
 - 2) the draft Integrated System Plan,
(each a "**consumer panel report**").
- b) The ISP consumer panel must consist of at least 3 members appointed by AEMO, who have qualifications or experience in a field AEMO considers relevant to the assessment of the Integrated System Plan and who have experience representing consumer interests.
- c) Prior to appointing members to the ISP consumer panel, AEMO must publish an expression of interest for persons to apply to become a member. The expression of interest must include:
 - 1) the terms of reference for the ISP consumer panel; and
 - 2) information about the requisite qualifications and experience required to become a member.
- d) The ISP consumer panel:
 - 1) must, in accordance with the terms of reference, give a consumer panel report to AEMO within two months of AEMO publishing the *Inputs, Assumptions and Scenarios Report* and draft Integrated System Plan respectively;
 - 2) must, in preparing the consumer panel report have regard to the long term interests of consumers; and
 - 3) may carry out its activities, including the giving of a consumer panel report, in the way it considers appropriate but must seek to give the report by consensus.
- e) A consumer panel must:
 - 1) include the ISP consumer panel's assessment of the evidence and reasons supporting the *Inputs, Assumptions and Scenarios Report* or draft Integrated System Plan respectively; and
 - 2) state whether the report is given by consensus.

- f) AEMO must publish a consumer panel report on its website.
- g) AEMO must have regard to a consumer panel report but is not obliged to give effect to any recommendations in a consumer panel report.

7.2 Appendix 2: Language and explanations of key terms

Clarity of language with consistent use of key terms across the energy system is important in assisting consumers and stakeholders to engage with important aspects of energy debates, including in considering the ISP and the many documents that form the ISP process. The following summaries key terms that the panel has used in this report and our meaning for them.

1. Consumer, Customer and Community: we consider
 - Consumers to be people who use a product or service, in this case energy
 - Customers are the people who buy a service, ie those who pay the bill
 - Communities are groups of people, we use the term to mean a group of energy consumers who have something in common, generally a shared geography and as such are communities are consumers with a shared interest (eg community energy organisation) or concern (people from a location hosting energy infrastructure)
2. Firming, shaping, storage. We give a fair bit of attention to these terms as they are increasingly important as the electricity system transitions from a focus on total generation and Transmission projects to 'back up' and 'storage.'

The definition of 'firming' that is used by AEMO is:

“Grid-connected assets that can provide dispatchable capacity when variable renewable energy generation is limited by weather, for example storage (pumped-hydro and batteries) and gas-powered generation.”

We also note the NEM review (Nelson review) uses these term

- “Bulk energy”. The ISP Panel sees this as similar to AEMO’s “[retiring] coal and renewable energy”.
 - “Shaping”. The ISP Panel sees this as similar to AEMO’s “firming” and agrees batteries will play a key role there.
 - “Firming”. The ISP Panel sees this as similar to AEMO’s “back up”, and agrees gas will play a key role there.
1. Technology vs the Services provided, eg gas; Gas generation is a technology, but the services are more important to consumer eg short term reliability in supply etc
 2. Batteries: We mean both household level battery owners, included in definitions of Consumer Energy Resources as well as grid scale batteries, which can be community owned or commercially owned.

3. Battery rating. There is a language about batteries being x hour rated, ie Battery duration (DP). This refers to the rate of discharge of electricity, however the amount of energy stored is a more useful measure. We focus on total GW (gigawatts) not hours of discharge.
4. Social Licence refers to three levels of consumer interest:
 - a. Landholder who directly host energy infrastructure
 - b. Communities of people impacted by energy infrastructure but who do not directly host it
 - c. The broader community and their level of acceptance of plans and policies to transition to net zero.

7.3 Appendix 3: Notes from ISP Consumer Panel workshop with DER /CER Stakeholders

4 February 2025

Regarding coordination of CER:

For coordination of CER to be taken up at optimal levels (for the energy system, for future energy cost minimisation and for consumer benefit), there are several current challenges that need to be understood and addressed. These things are currently limiting the uptake of aggregation programs (e.g. Virtual Power Plants).

From the perspective of consumers, some of the barriers currently inhibiting greater coordination include:

- There is considerable consumer interest in community batteries and VPPs, but conditions are not such that this is a straightforward undertaking or an obvious business case
- Network operations and pricing are not currently able to reflect value to the network as well as the consumer. In addition, VPPs struggle to balance differences between consumer and network drivers. For example, personal use of batteries for household energy security versus network, or wholesale market benefits.
- A lack of transparency around what current operating guidelines are and who will benefit in what ways
- Lack of consumer protections for VPP participants and ensuring complaints are addressed and systems improved in response to consumer issues.
- Clarity around data access for VPP participants and who owns this data and how it can be used
- Addressing trust issues through having the right proponents driving VPP initiatives and investing in participant consumer awareness raising, education and mentoring to support people to understand and participate in the VPP in a way that meets their needs and expectations. This requires building real, on-the-ground relationships with people. There is a role here for intermediaries like local government and

community-based organisations (such as community energy groups). People are not very trusting of energy retailers and (state and federal) government.

- The lack of dynamic and cost reflective pricing is still a barrier This could unlock more value for consumers participating in VPPs (which would act as an incentive for greater participation). Long run marginal cost-based pricing is critical for efficiency, but alone is not enough to fully capture value where energy flows are more complex, such as in VPPs.

Some opportunities include:

- Being informed by behaviour science to consider how to best communicate the benefits of coordination through values-based messaging. Remembering that consumers are motivated by many factors including energy resilience, environmental and community outcomes, sense of independence, health benefits, ease, as well as economics.
- Market and tariff reforms that can help to remove or reduce transactions costs for people wishing to store or trade electricity within defined areas of the distribution network. As one stakeholder said: “the way we are collecting tariffs is inhibiting the way we move energy around efficiently”.
- There are real potential in “app” and smart appliance opportunities for households to undertake load shifting, if paired with the right price signals and education support.
- As battery costs decrease people may become more willing to participate in VPPs, as they may feel less concerned about sharing the benefit of their expensive equipment with the grid. The ‘behaviour science’ exploration as the first dot point would likely enhance this “willingness”

There was also discussion of an approach to managing CER in the grid that is less about coordination and more about the ability for CER to behave in responsive and dynamic ways (individually) though the right market and technical settings, for example via time of use tariffs, the way EV integration is undertaken. This could circumvent issues of (mis)trust and undesirable benefit allocation that prevent some consumers being willing to sign up to VPPs. The forum also discussed the extent to which coordination be aided or abetted by increased EVs, and how to model this? For example, households may not buy batteries but invest in EVs instead and then operate in a largely off-grid manner.

Regarding mid-scale (100kW-30MW) renewable generation and batteries, including community projects

Mid-scale (100kW-30MW range) generation (solar, micro hydro and wind) and storage (‘neighbourhood’ and ‘community’ batteries) is an area that has often been overlooked in Australian energy system policy and planning. However, with the increased focus on

distribution networks, we recommend an explicit effort is made to understand and include the assessment of the contribution that projects at this mid-scale can make to the future electricity system. Benefits both include grid / energy systems contributions and enhancing ‘social licence’ as consumers and their communities are more directly ‘engaged’ in the energy system and benefits are experienced locally.

From the perspective of consumers and community-based organisations pursuing mid-scale generation and storage projects, some significant the barriers to such projects currently exist. These barriers include:

- Challenge of ‘community’ batteries not actually being owned by or even directly benefiting community members. It would be better to only call batteries owned and/or operated by or for community as ‘community batteries’ and refer to others as distribution or mid scale batteries.
- Navigating regulatory and market technicalities is a barrier for many projects as it is costly, time intensive and often not obvious from the outset
- Tariff options and power purchase prices vary widely for both mid scale batteries and generation, which makes business cases difficult to stack up. Lack of options for peer to peer or local network trading make this particularly difficult.
- It is difficult to access detailed data on the status of the distribution network and the places where investment in mid-scale generation or storage would be possible and useful for the grid.
- Distribution loss factor methodology is not fit-for-purpose to identify (or incentivise) the best scale and location for network and/or non-network solutions.
- varying jurisdictional requirements regarding grid connection for different scales of projects are inconsistent and difficult to understand, and not tailored to the unique need and role of mid scale generation and storage
- Community batteries are finding it impossible to obtain insurance

Some of the opportunities uniquely presented by mid-scale projects include:

- More ability to directly involve and benefit consumers as participants, co-investors, or co-owners of the generation and storage.
- There is evidence of community-based energy CER and DER projects contributing to social licence for the energy transition at large due to increasing people’s understanding of, benefit from and sense of agency in the transition.
- There are potential distribution network benefits of mid-scale generation and storage being owned and operated by third parties (not DNSPs).
- Midscale projects potentially much easier to coordinate than an equivalent MWs of CER.
- Co-benefits in terms of grid services and benefit to communities/ consumers if mid-scale generation and storage are co-located and ideally also service some behind the meter load as well.
- These projects are quick and nimble compared with large solar farms and so can more easily be responsive to consumer and network needs.

Discussion regarding the role of the ISP and AEMO in this space:

There was strong support for an increased focus on CER / DER in the 2026 ISP and the explicit (quantified) role these can play in keep future electricity costs down. Consumers would like to see more of this kind of content (there was some discussion about the scope for it to be deepened, enhanced?).

There is an urgency to increase coordination of CER and DER uptake, and to adequately support consumers to do so. For example, could AEMO play a role in helping to understand and make recommendations for how to address current barriers to coordination, either in the ISP or as part of its role in liaising with other market and regulatory bodies?

There was a question regarding the extent to which AEMO's increased scope to work with DNSPs could help to understand how distribution network augmentation options could enable CER and DER, and the opposite: what kinds of restrictions to connection and export will there be if there isn't the 'right' kinds of investment in network and non-network solutions? In this way, the ISP could help to identify areas where more CER is needed and the ways that it can be incentivised, and potentially what the other co-benefits of such an approach could be e.g. to building social licence for the transition.