# 2026 ISP Consumer Panel

**To:** **AEMO**

**Attn:** isp@aemo.com.au

**Report:** **Response to:**

**2025 IASR Scenarios Consultation Paper**

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# Executive Summary

The ISP is defining a transition path to contribute to limiting global warming to 1.5 degrees by 2050, and/or the more unofficial goal of less than 2 degrees in line with international targets for global warming and associated ‘carbon budgets’.

## A Distributed Energy Scenario?

In considering the three continuing scenarios proposed by AEMO in the consultation paper, with updates, the Panel has given significant focus to distributed energy considerations, including CER. DER and orchestration. We note that there has been a substantial number of recent reports dealing with these topics.

To achieve optimal amounts of CER as outlined in the 2024 ISP Optimal Development Path (ODP) rates of solar PV, EV and battery uptake will need to continue to grow. The Clean Energy Council estimates that achieving AEMO's ISP Step Change would result in average annual energy bill savings of $35-71 for all residential and small-business NEM customers until 2050.

Noting the many recent reports dealing with CER / DER and the extent of current and likely future activity associated with distributed energy options, the Panel thinks that a 2026 ISP scenario focusing on the range of actions that include a plausible distributed energy future is worthy of further consideration. We propose removing the Progressive Change scenario and replace it with Distributed Energy scenario because Progressive change was rated closely by the Delphi Panel with the Step Change scenario. Moreover, with the likely inclusion of 2035-36 carbon targets in the 2026 ISP, the scope for differentiating the various parameter forecasts (at least up to 2040) for the two scenarios Progressive Change and Step Change, will be extremely limited.

Whatever combination of scenarios is decided, some of the nuance and detail will need to be explored by sensitivity analysis. Some of the intended 'sensitivities' should be presented in the draft IASR.

## Parameters

The Panel encourages AEMO to consider the following additional parameters

1. Social License is not currently a proposed parameter and we think it should be included in the 2026 ISP scenario parameters.
2. A gas supply parameter (separate from the hydrogen forecast)
3. Add in a distribution capacity forecast (providing the DNSPs come up with more specific info than they currently have)
4. Carbon budget parameter

## Base case

The Panel recognises the value of the base cases or counterfactuals for each scenario and encourages AEMO to identify and explain the base cases more overtly for 2026 ISP. We think that it could be presented alongside the scenarios as they are ultimately used as a reference 'point' for comparisons, particularly for the ODP.

The base cases need to be better explained for 2026 ISP than they have been in the past with clear communication about what they are and how they are calculated.

# Introduction

This submission is from the 2026 ISP Consumer Panel. The ISP Consumer Panel (the Panel) was established under the National Electricity Rules in November 2020 as part of the oversight framework that accompanied the introduction of the Integrated System Plan (ISP). We are four energy professionals with long histories in consumer issues and the National Electricity Market (NEM).

This submission is not a requirement for our reporting under the National Electricity Rules, however the 2026 Panel considers that the scenarios chosen are crucial in shaping the final ISP which is released nearly two years after the development of the scenarios. As scenarios are developed very early in the ISP process, we understand that this is the first time that AEMO has involved a consumer panel in scenario development. We commend AEMO for making the effort to enhance consumer input, including from the Panel in forming the scenarios for 2026 ISP and in commencing engagement on the scenarios as the final 2024 ISP was released.

This submission is presented as a reflection of the discussions that Panel members have had with each other and seeks to reflect our efforts to understand and constructively challenge the ideas presented in the Consultation Paper. As such the submission invites further consideration and debate while also attempting to provide clear proposals to AEMO as they finalise the 2026 ISP scenarios.

# 1. Purpose of ISP

## Discussion

In global context, the Economist wrote in their 8-14 April 2024 edition[1] *"A recent report by the Energy Transitions Commission … sees the split in costs between the new generating capacity needed for an ample supply of clean electricity and the distribution, transmission and storage systems needed to make that supply useful as a roughly 55%-45% proposition. The 45% that goes on grids and storage comes to about $US1.1trn a year between now and the middle of the century."*

Australia's ISP is clearly dealing with issues that are global.

The ISP emerged from the Finkel Review's 'trilemma' of balancing affordability, reliability and greenhouse gas emissions from the energy sector and from the separate CoGATI[2] (Coordination of Generation and Transmission Investment) process. The CoGATI process highlighted the challenge under the prevailing market structures to coordinated grid and generation development. The ISP is therefore designed to optimise investment in generation, storage and transmission as the NEM (and the country) transitions to net zero emissions by 2050.

The optimisation process is constrained by and made more complex by the requirement to develop the plan in line with both the 2050 and interim Federal and state carbon reduction plans and targets, and environmental and reliability standards, amongst a range of other legislative requirements set out in the NER and jurisdiction laws and policies.

## Carbon targets

In addition to specific carbon targets the ISP process recognises Australia's international commitments to limiting global temperature increases to 1.5 or less than 2 degrees Celsius, and the resulting national carbon budget that is consistent with these temperature outcomes.

[1] Article titled "Hug pylons not trees" is on page 7 of the print edition.
[2] See COGATI information sheet (aemc.gov.au) for more information

The carbon budget for the electricity sector generally, and the NEM specifically, is derived from an allocation of the national carbon budget. As described in the box below, the ISP scenarios musts in principle be linked to global temperature rise outcomes.

The starting points for considering the ISP scenarios are the international commitments to limiting temperature increases and the carbon budgets that followed from this. In the 2024 ISP, there were three scenarios that reflected three transition paths consistent with 1.5, 1.8-2, 2.5+ degrees, being the Green Energy Exports (GEE), Step change (SC) and Progressive Change (PC) respectively. A fourth scenario, the Slow Change scenario was included in the 2022 ISP but was dropped in the 2024 ISP in part because it could not reasonably achieve the carbon objectives.

## Why Scenarios?

Long term planning for a complex system involves accepting that there are multiple variables that may impact future requirements, and there is uncertainty and debate about how each of these variables may evolve over the planning horizon. Transitioning to a new world of net zero emissions makes the task far more complicated than the more traditional network/system planning. Instead of considering consumer trade-offs and preferences between cost and reliability, the transition requires the ISP to also take account of a new third dimension, the achievement of specific carbon reduction and temperature outcomes. As part of this, the Federal Government has recently set an interim $ value for carbon which must be included in the 2026 ISP optimisation modelling task.

One methodology to best manage these uncertainties is the development of a set of scenarios, each of which provides a narrative that describes the state of a future world and lists a set of key parameters, the parameters being common to all scenarios The second step is to prepare a ‘base’ forecast for each of these parameters for each scenario. The third, and equally crucial step to address uncertainties in the forecast, is to identify which parameters in each scenario will be selected for sensitivity testing – the selection of the parameters for sensitivity testing should be identified early in the process but remain open to ongoing review.

Guidelines for Scenario use

The AER describes the process in its Forecasting Best Practice Guideline for the ISP in some detail. In the Guideline the AER states: “AEMO’s modelling should consider scenarios and identify the key parameters for sensitivity testing” (p14). For example, many stakeholders have expressed their concerns with the CER parameter forecast and/or the CER coordination parameter forecasts that sits within each of the three scenarios. AEMO may benefit by saying at this early stage that these two factors will be subject to sensitivity testing, and therefore its CER focus will be on identifying the range of forecasts relevant to each scenario.

In its modelling, AEMO has adopted the Delphi process to obtain expert views on the probability of each of the scenarios eventuating. This is a relative assessment of probability

–the task for the Delphi participants is to compare the scenarios at a high level and does not require the experts to agree on every parameter value in their preferred scenario.

For example, the expert(s) might allocate a percentage probability of 60% to one scenario e.g. Progressive Change (PC) 20% to each of the other two (SC and GEE) That does not mean they agree with every individual parameter forecast in the PC Scenario, just that the overall picture the Delphi Panel as whole considers is more likely to eventuate than the other two scenarios. Concerns with individual parameter forecasts in the PC, particularly if they appear wide-spread, can be addressed by AEMO through sensitivity testing of that parameter.(see above)

AEMO currently uses the scenario probability outcomes from the Delphi Process in 2 ways in the selection of the CDPs and ODP.

- To use a weighted average net benefit measure where the weighting is based on the probability of each scenario. In the example above, this would mean that the net benefits of any modelled development path would be based on a weighted net benefit result of 60%, 20% and 20% for PC, SC and GEE respectively.
- To select the most probable scenario (in this example, PC) for more detailed analysis, such as sensitivity testing.

*Note: it is not clear to us when and why AEMO uses one or other of these two approaches. The published ISP has a mix of both in different sections without clear explanation of why they have done so. Similarly, it is not clear which is the most appropriate scenario result for third parties such as the transmission companies to use in their analyses. Currently most planning appears to occur around the SC scenario, even though the probability allocated to that scenario by the Delphi Panel was only marginally higher than the PC scenario.*

### ISP Review

A significant context for the 2026 ISP is the Commonwealth review of the ISP that was undertaken by DEECCW in 2023 and finalised in January 2024.

An important overview comment from the Commonwealth review is the following statement:

> "*The changes are expected to ensure that the **ISP expands** to set **a direction for the transformation across the energy system as a whole**, including consideration of non-electricity technological advances, while **maintaining its critical function in directing investment in electricity infrastructure**."*

## Consumer Panel Opinion

As the ISP review suggests, the 2026 ISP must be an INTERGRATED system plan for the whole electricity supply system in the NEM, not just a transmission plan, as important as transmission planning is, for Australia's future energy system.

We believe that the new emphasis on the transformation across the energy system as a whole has important implications for how we consider the nature and scope of the scenarios. For example, there is now an emphasis on developing a plan that considers:

- The extent to which the distribution system can be better utilised and contribute to the carbon targets

- Similarly, the extent to which consumer energy resources (CER) could be further developed and utilised, particularly through better coordination between CER and overall system requirements
- The extent to which gas will be available and deliverable to meet the electricity system reliability requirements during transition
- The development of innovative technologies that may better support transition, e.g., new battery and other storage systems.
- The human element – the extent to which social licence factors impact on the feasibility

The Panel also recognises the international and national factors that set the context for the ISP.

We agree that the 'high level' starting point defined in terms of international targets for global warming and associated 'carbon budgets' – In this context, the ISP is defining a transition path to contribute to limiting global warming to 1.5 degrees by 2050, and/or the more unofficial goal of less than 2 degrees as per global commitments. We note in this context that the 2024 PC scenario, while consistent with 2050 targets of net zero, does nots reflect our national ambition to fairly contribute to limiting temperature rise to less than 2 degrees.

# 2. Reviewing Proposed Scenarios

## Discussion

The 2025 IASR Scenarios Consultation Paper (17th July 2024) proposes that the 2026 ISP *"retain the scenario narratives for the Progressive Change and Step Change scenarios, with some minor amendments"*

The Paper asks three direct questions:

- ***Since the 2023 IASR publication, what changes (such as environment, social, policy) do you consider most impact scenario development for the 2025 IASR scenarios?***
- ***Is AEMO's proposal … a suitable evolution of each scenario's parameters that will effectively support AEMO's functions in planning the transition? '***
- ***What additional changes should be considered?*** *(to scenarios and parameters)*

These questions have also been framed as *"what are the scenarios that best describe the 'future state' of the world under different transition paths consistent with the end point of carbon targets (and/or carbon budgets)."*

AEMO says (page 10) that it *"has also conducted early engagement with the ISP Consumer Panel, and with key planning bodies such as transmission network service providers (TNSPs) ahead of this consultation. Key insights from these groups include:*

- *Scenario consistency is valuable for all stakeholders and users.*
- *Existing scenarios need to be re-examined against all possible futures.*
- *New information and developments need to be incorporated."*

The Panel notes that of these 3 insights, we discussed the 'scenario consistency' insight as we considered that while scenario consistency was a priority from ISP to ISP, it is more

important for any ISP that the scenarios reflect a breadth of plausible futures that are the best representation of these options at time of their development, while not dismissing scenario consistency. This recognises that energy markets are rapidly changing and there are many uncertain aspects, meaning that the context changes from ISP to ISP and so scenarios should also be able to change to better reflect changing future outlooks.

## Principles for Scenarios

AEMO has also presented the following 5 scenario principles:

| Scenario principles |
| --- |
| • **Internally consistent** – the underpinning assumptions in a scenario must form a cohesive picture in relation to each other |
| • **Plausible** – the potential future described by a scenario narrative could come to pass.<br>  • Rather than applying a minimum 'likelihood' threshold for each individual parameter, plausibility considers the likelihood and significance of the impact of the uncertainties on planning outcomes, and the degree of stakeholder interest. |
| • **Distinctive** – individual scenarios must be distinctive enough to provide value to AEMO and stakeholders. |
| • **Broad** – the scenarios explore a diverse range of possible futures that could be achieved over the planning horizon. |
| • **Useful** – particularly for AEMO's ISP planning requirements, the scenarios explore the risks of over and under-investment. |

These are useful principles that are supported by the Panel, however there is a possibility of 'tension' between some of these in application in particular between "internally consistent" and "Broad". There are plausible future scenarios that are not necessarily internally consistent, a broad set of scenarios may not be internally consistent. The Panel thinks that it is more important that the ISP Scenarios provide a breadth of reasonably plausible options compared with being internally consistent, providing that overall, each scenario is still consistent with achieving the interim and final carbon targets for that scenario.[3]

We note that AEMO has a remit to apply a greater focus to distributed energy from the ISP review and the Energy and Climate Change Ministerial Council,[4] who on 5th April 2024 included the following:

> *"Action – Enhanced demand forecasting - AEMO should enhance demand forecasting in the 2026 ISP by:*
>
> *• Undertaking targeted stakeholder engagement to enhance assumptions underpinning consumer energy resources (CER) and distributed resources projections in the ISP. The assumptions should reflect a comprehensive view of initiatives affecting CER and distributed resources uptake and evaluate the implications for operational demand.*

[3] For example the 3 scenarios in the 2024 ISP all met the interim and final carbon targets – but did so at different speeds – which is why Progressive Change did not meet the carbon budget aspirations.
[4] ecmc-response-to-isp-review.pdf (energy.gov.au)

*• Analysing how electrification and CER / distributed resources development sensitivities affect operational demand projections and consider these directly in the ISP modelling where relevant.*

*• Subject to available information, analysing how distribution network service provider (DNSP) investments, programs and annual plans, may impact CER and distributed resources development, and thereby the Optimal Development Path (ODP) for Transmission, and include these findings in the ISP in order to send clearer signals to inform DNSP planning.*

*• Developing a framework, methodology and guidance material to support DNSPs and jurisdictions to develop projections and undertake analysis in a consistent manner to support the ISP's development.*

*• Including a statement in the 2026 ISP, and subsequent ISPs, aimed at informing the market and policy makers about the expected development of CER and distributed resources. The statement should be sufficiently detailed to provide a baseline for the identification of opportunities to promote the uptake of CER and distributed resources within each jurisdiction."*

The terms CER, DER, orchestration and distributed energy are all used in this submission. The Panel uses these terms with the following meanings.

Distributed Energy: includes distribution networks, storage at grid, mid and small scale as well as DER and CER and 'orchestration' energy assets.

DER refers to distributed energy resources, including smaller and mid scale storage and generation owned or managed by network businesses, community energy organisations and consumers.

CER uses the definition from Energy and Climate Ministerial Council 2024:4: "Consumer energy resources (CER are consumers' resources that generate or store electricity well as flexible loads that can alter demand in response to external signals."

CER coordination = orchestration, it is the orchestration component that is increasingly important for all consumers to benefit from CER.

## Recent reports about CER and Distributed Energy

There have also been a significant number of distributed energy / CER/ DER focused reviews and reports over recent months, including:

- ESB – Energy Sector Board: Consumer energy resources and the transformation of the NEM 07 February 2024[5]
- Clean Energy Council: National Consumer Energy Resources Roadmap[6] June 2024: outlines the costs of not meeting CER opportunities that risk losing: over $22bn in savings for Australian taxpayers, $35-71 off average annual energy bill for all Australians. They include recommendations to empower consumers and to maximise CER uptake, including community education and support, incentives, consumer projections and setting government targets.

[5] ESB report - CONSUMER ENERGY RESOURCES AND THE TRANSFORMATION OF THE NEM.pdf
[6] National Consumer Energy Resources Roadmap | Clean Energy Council

- AEMC rule change: Unlocking CER benefits through flexible trading[7]
- ECMC - Energy and Climate Change Ministerial Council: National Consumer Energy Resources (CER) Roadmap[8] July 2024; Federal and State Government commitments to enabling greater uptake of CER.
- Community Power Agency (2023); Australian Community Energy Collective Impact Assessment,[9] A report detailing the motivations, achievements and barriers experienced by over 730 community-owned renewable energy projects across all states and territories
- NEXA Advisory: Accelerating Consumer Energy in Australia[10], April 2024; presents current barriers to CER and changes that would need to be in place to realise high rates of CER and orchestration.
- AEMC: Review into consumer energy resources technical standards[11], September 2023

## CER Status

Consumer and distributed solar PV has been installed in Australia more quickly than utility scale PV for the last decade, and Australian households, businesses and community installations have spurred led the commercialisation and maturation of the PV industry. Australia now has 22.6GW of installed rooftop PV, accounting for one third of Australian households (ESB 2024: 4). Collectively, rooftop solar is the second largest source of renewable electricity generation in Australia (behind wind energy generation), and the fourth largest source of electricity generation, making up approximately 11.2 per cent of the country's installed capacity for power supply (Clean Energy Council 2023).

In addition to roof top solar, which is generally <100kW, there are increasing numbers of mid-scale solar projects in the 500kW-10MW range, often owned by businesses, farmers or community groups. These projects have a unique role to play as they can be driven by local interests, connect to existing distribution networks, can have quick approval timeframes and face fewer social licence challenges. However, they have historically faced significant barriers unique to mid-scale projects, having fallen ‘through the cracks’ of policy interest and support mechanisms.

There are currently 124 operating community energy groups across Australia, who have together completed over 730 small and medium scale generation, storage and/or energy efficiency projects (CPA 2023). The future ambition of these groups is significant, if enabled by the right context.

Australian consumers, communities and businesses are now also at the forefront of investing in electric vehicles and small and medium scale batteries. Currently, there is 1GW of small scale batteries in the NEM (AEMO 2024) and a fleet of 180,000 electric vehicles (Electric Vehicle Council 2023)[12].

## CER Insights & Trends

Currently, approximately 30% of households are ‘locked out’ from owning rooftop solar due to renting, living in an apartment or having an unsuitable roof. This is a major impediment to

[7] Unlocking CER benefits through flexible trading | AEMC
[8] Energy Ministers agree to the National Consumer Energy Resources (CER) Roadmap | energy.gov.au
[9] Australian Community Energy Collective Impact Assessment:
[10] Nexa-Advisory-_Accelerating-CER-in-Australia.pdf (nexaadvisory.com.au)
[11] Review into consumer energy resources technical standards | AEMC
[12] https://electricvehiclecouncil.com.au/wp-content/uploads/2024/03/EVC-Australian-EV-Industry-Recap-2023.pdf

desired future levels of rooftop PV and presents a significant equity issue. However, innovative models such as ‘solar gardens’ and ‘solar banks’ are helping to overcome such hurdles by offering shares in a solar farm to locked out customers, with the electricity generated by their shares being credited on their energy bill through a retail partnership. See Haystacks Solar Garden, for example.

To achieve optimal amounts of CER as outlined in the 2024 ISP Optimal Development Path (ODP) rates of solar PV, EV and battery uptake will need to continue to grow. If achieved, CER has the potential to decrease costs for all energy consumers particularly by deferring some need for large scale generation, storage and transmission projects – but also, crucially, it has the potential to increase the stake, commitment and direct benefits that consumers have in the energy transition. The CEC estimates that achieving AEMO’s ISP Step Change would result in average annual energy bill savings of $35-71 for all residential and small-business NEM customers until 2050 (CEC 2040:15).

In addition, CER employs more people than large-scale renewables projects. The Clean Energy Council (2024:16) modelled that the level of CER in the Step Change scenario would employ 18,200 more people than delivering the same MW of generation with large-scale solar.

All of these opportunities can also ease social tensions that are currently emerging around large scale projects and the pace of change.

## Barriers & Options

A range of barriers currently exist to achieving optimal levels of CER and DER. These have been collated in various reports (EMCM, CEC, CPA, Nexa). Key barriers to be aware of include:

- **Market settings** need to reflect value of CER for the system, and enable free exchange between agents and the ability for people to be rewarded for their investments in CER.
- **Equity:** how to support low-income households, public housing and those with inappropriate rooftops to also be able to participate in CER if they wish to, and reap the benefits.
- Investment in and modernisation of the **distribution network** to enable greater penetration of CER and dynamic management. Greater transparency on grid opportunities, and improved grid enquiry and connections processes is needed to speed up mid-scale project timelines and reduce costs.
- **Trust and confidence** of people to engage in orchestration and vehicle-to-grid programs. This will require supporting people to understand *and* take up such options, including incentives to participate and support to resolve challenges that come up. Community energy projects have a proven track record in overcoming these barriers through their work in households to be early adopters of solar PV via bulk-buy, education and support programs. This experience could be drawn on to roll out orchestration, V2G, electrification and batteries.
- **Technical standards**: need to keep pace with technology changes to enable high penetration of CER and V2G arrangements.
- **Retailer disincentive:** there is currently no real incentive for retailers to help solve the challenge of maximising and orchestrate CER (not part of their regulated asset base, in fact it potentially undermines their future regulated asset base).
- **Customer pricing disincentives**: currently people are experiencing curtailment and price disincentives for having solar PV.

- No targets, incentives, **support for mid-scale and community-owned projects.** With attention to this currently under-invested element of a healthy grid 'ecosystem', mid-scale and community projects could present an excellent opportunity to augment small- and large-scale generation and storage.

Future projections for CER uptake should also include close attention to DER more broadly, and particularly the potential for increased role for mid-scale generation and storage. Because of the innovative edge CER orchestration will need to involve, it will be important to look beyond DNSPs and retailers to obtain a full picture of this potential. This will involve the need to consult with a broad range of CER stakeholders including CER/ DER advocacy, research and support organisations, mid-scale solar developers and community energy groups.

## A different Scenario?

As a part of our role to challenge during the ISP process, the Panel have asked ourselves, as a thought experiment, if there are plausible future scenarios that are not included in the 3 scenarios but are plausible future states: Our brainstorm yielded:

a. **Post Federation:** Where State and Territory governments increasingly drive jurisdictional energy policies that lack national coordination, which may be deleterious for a (mainly) national plan.
b. **Distributed Energy:** A dramatically more distributed energy world where new technologies enable much more localised, affordable energy generation and distribution, where small-and mid-scale generation and storage utilise an optimized and upgraded distribution network and thereby offset some investment needed at transmission and large-scale generation and storage.
c. **Hard Right Agenda:** An abandonment of or retreat from carbon reduction objectives from a continued rise of "hard right" climate change denial. Donald Trump in accepting the Republican nomination for President for the 2024 US election said: "We will drill, baby, drill," while criticising green energy policies.

We will not argue that the 2026 ISP scenario include dystopian futures as plausible as they may become, however our thought experiment leads as to some observations about the ISP context and future scenarios:

a. Technology will change and this will impact energy market outcomes, particularly beyond 2035 – 40. The Panel opines that storage (grid and household level) and firming at grid level are the areas where innovation is most likely over the next decade or so, with significant impact. Innovations in orchestration and dynamic grid management will be significant and are highly likely.
b. Potentially there will be a shift in roles for electricity services away from retailers to other dynamic management services.
c. Political settings globally and domestically are significant factors influencing the future. As an indication, the Economist wrote for 16th September 2023 edition: *"Almost four-fifths of the EU's population now live in countries where the hard right commands the loyalty of at least a fifth of the public."*[13] The trending rise of 'hard right' politics is a global phenomenon with potential for significant political and hence policy impact.

[13] A fresh wave of hard-right populism is stalking Europe (economist.com)

d. A future with greater levels of distributed energy than currently projected in plausible and warrants some consideration, especially if greater policy focus and support is directed to mid-scale projects and supported by technology developments (as above)

The political, economic and demographic impact of these possibilities, in the Panel's opinion, should be reflected in the forecasts of at least one of the scenarios.

## Scenario Progression

The following table shows the progression of scenarios over the two ISP's leading to considerations for 2026. It also makes a distinction between Domestic and External / Export focused scenarios and has been used to initiate our thinking about scenarios for the 2026 ISP, with a major consideration being about where distributed energy fits into the scenarios for 2026 ISP.

| **ISP release year** | **Scenario - Domestic** | **Scenario - Domestic** | **Scenario - Domestic** | **Scenario – External / Export** |
|---|---|---|---|---|
| **2022** | Slow Change | Progressive Change | Step Change | Hydrogen Super Power |
| **Scenario Progression** | *Removed, superseded by change* | ⬇ | ⬇ | ⬇ |
| **2024** | | Progressive Change | Step Change | Green Exports |
| **Scenario Progression** | ? | ? | ⬇ | ? |
| **2026** | Does a slower (than Progressive Change) scenario make sense in a complicated political setting? | Progressive Change as amended or Distributed Energy scenario | Step Change – as amended with some distributed energy considerations / parameters | Green Energy Industries or Distributed Energy Scenario. |

Chart 1, Progression of ISP Scenarios: Panel initial considerations.

The Panel's thinking about the scenarios proposed for 2026 has used the following thought process. The initial view of the Panel was agreement that two scenarios most likely to be carried forward are Progressive and Step Change, noting that these are also the two most likely futures as voted by the 2024 ISP Delphi process. These continue to be likely scenarios, though will need some revision and updating to take into account recent policy and market developments which has been undertaken for the 2025 IASR scenarios consultation paper. Then again, maybe the scenarios are similar enough to reduce their capacity to add plausible breadth to the scenarios mix. (See Section 3: Parameters)

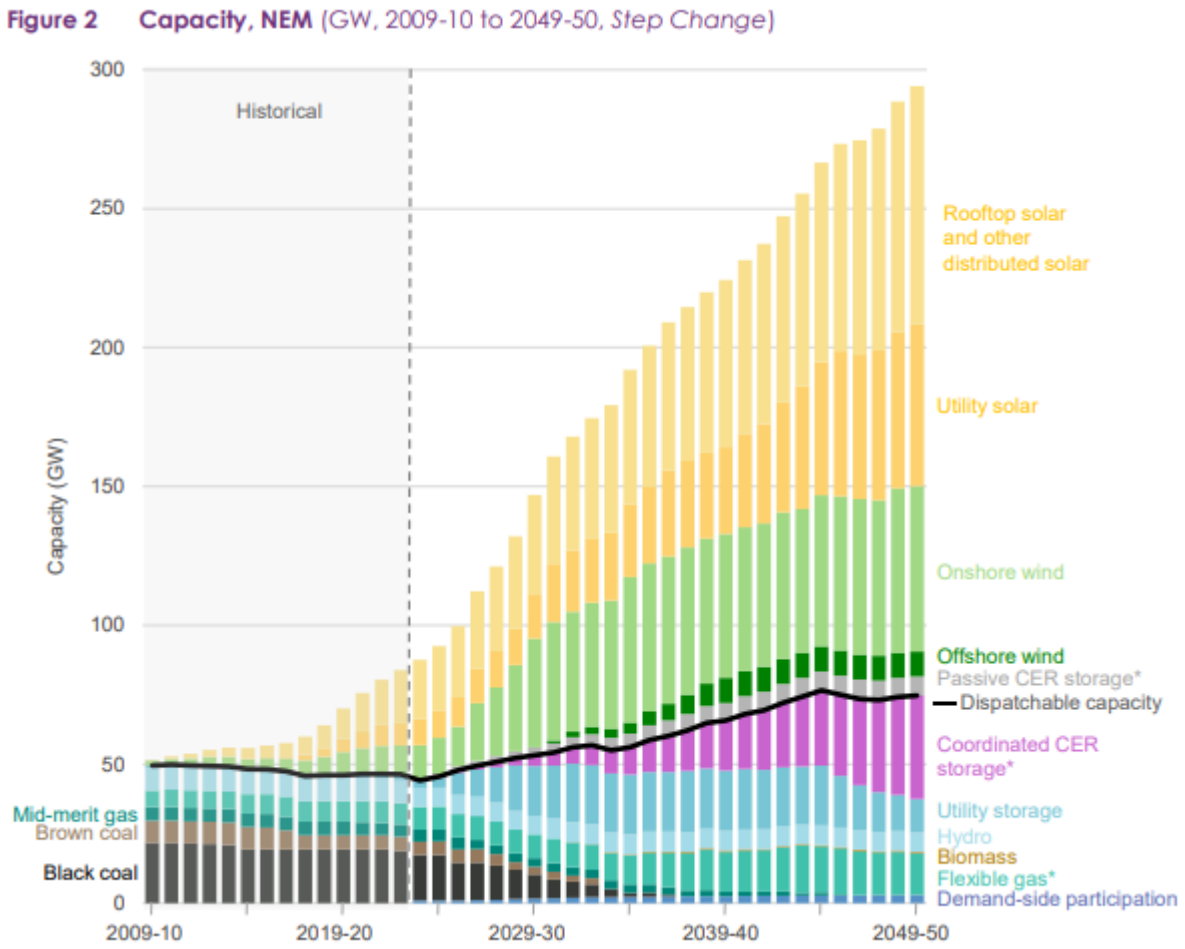
We asked whether there should continue to be an externally focused scenario, e.g. "Green Exports," or should it be an additional domestic NEM focused scenario? Part of usefulness of the Green Exports scenario for 2024 was that it provided a narrative for a 1.5 degrees future. The Panel understands that all 3 proposed scenarios meet Australia's 2050 net zero commitments. We explored the understanding that jurisdictional government green energy export (e.g. green steel, green cement, green aluminum, liquid ammonia) strategies are more focused on industrial hubs with tax-payer funded subsidies but remain largely external to NEM consumers.

So, there is a perspective that green exports are increasingly “industry policy” not “energy policy” and so increasingly outside the remit of the ISP.

We then considered the question of whether there is a more appropriate scenario that takes into account recent developments and which meets the scenario principles, in particular providing breadth in 2026 ISP scenarios.

We considered that if there was to be a new scenario we think that it would most likely focus on a ‘more’ distributed Australian energy market, including but not limited to: ever more CER and DER at small and mid-scales, including PV, batteries and maybe some grid support function from electric vehicles; greater role of distribution networks; higher levels of orchestration; a greater role of SAPS (stand alone power systems) and likely more storage (and firming) developments from innovation.

We considered that there is implicit support for this perspective in the 2024 ISP[14]. In particular the summary presented in the fantastic figure 2:




Amongst other matters, this projection of sources of generation (NEM capacity) shows significant contributions to Australia’s electricity supply being made by ‘rooftop solar and other distributed solar’ (pale yellow) and ‘coordinated CER storage’ (purple), particularly increasing from about 2030. In other words, distributed energy, particularly from CER will become increasingly important for Australia’s future energy.

[14] 2024-integrated-system-plan-isp.pdf (aemo.com.au) page 11.

The Panel considers that the 2026 ISP scenarios should have a greater level of focus on a distributed energy future, including CER.

We recognise that this can be achieved in different ways, the main approaches being:

i. As a stand alone scenario.
ii. More strongly incorporated into the proposed scenarios (compared to 2024 ISP parameters, we recognise that the proposed 2026 parameters have a greater CER presence than the 2024 ISP parameters).
iii. Through the use of sensitivity analysis across all scenarios.
iv. Building distributed energy into the Step Change scenario (in part proposed in the AEMO Scenarios discussion Paper).

# Consumer Panel Opinion

## Language

Regarding scenario language, the Panel believes that “Green Energy Industry” is a better summary descriptor of the scenario described in the Consultation Paper as Green Energy Exports. We think that ‘green energy’ is increasingly the focus of domestic industrial innovation, research and change and is broader than, though inclusive of, green energy export opportunities. This language also helps to keep the focus on domestic energy context, which is directly the remit of the ISP and consumer interests.

## Incorporating Distributed Energy

The inclusion of distributed energy considerations, including DER, CER, distribution network and improved CER orchestration was a major area of interest to 2024 ISP Consumer Panel and continues as a major interest / concern for the 2026 Panel.

Noting the recent reports, examples given above, and the extent of current and likely future activity associated with distributed energy options, the Panel thinks that a 2026 ISP scenario focusing on the range of actions that include a plausible distributed energy future is worthy of further consideration.

For such a scenario to be considered, significantly more data is likely to be needed including revised consumer and community energy resource supply capacity and timing, costs, current and likely future levels of investment, alongside a better understanding of the barriers and enablers facing CER and DER.

The Panel observes that from a policy perspective, it is difficult to ascertain where carriage of CER/DER and associated coordination lies. This may create a setting where consumer support for and interest in distributed energy solutions are understated and/or underdeveloped by planning and regulatory bodies.

All components of distributed energy forecasts need to be closely reviewed.

The Panel recognises that the revised scenarios place a greater focus on distributed energy but we opine that there is a risk that by being a part of a Step Change (or other) scenario, distributed energy factors may be ‘crowded out’ by other factors that form part of the scenario. A distributed scenario would bring distribution network investment options to the fore.

With the understanding that AEMO staffing and computing capability can likely effectively deal with 3 scenarios, the question is which of the proposed scenarios would be replaced by a distributed energy scenario? We think that either the Green Energy Exports or Progressive

change could be removed. Green energy exports because it is more related to industry policy than energy policy while Progressive Change could be picked up, in part at least, by the base / counterfactual scenario (See section 4). Our preference would be to remove Progressive Change and replace it with Distributed Energy scenario because Progressive change was rated closely by the Delphi Panel with the Step Change scenario. Moreover, with the likely inclusion of 2035-36 carbon targets in the 2026 ISP, the scope for differentiating the various parameter forecasts (at least up to 2040) for the two scenarios will be extremely limited.

The alternative approach would be to keep the three scenarios proposed in the discussion paper and explore distributed energy through the considered application of sensitivities in the modelling stage of the ISP process. The sensitivities to be applied would best be presented in the draft IASR. However, the problem identified above with the level of overlap between the two scenarios remains.

### Data

Whatever combination of scenarios is decided, some of the nuance and detail will need to be explored by sensitivity analysis. It is recognized that decisions about sensitivities to be applied are made much later in the ISP cycle, however we propose that key sensitivities that are likely to be applied to help define scenarios are listed in the draft IASR and then carried forward through the Methodology development process.

# 3. Reviewing Parameters

## Discussion

The starting position for the parameters is the 11 from the 2024 ISP, with only one being updated; “Australian economic and demographic drivers” while 4 new parameters are proposed; “electrification”, “emerging commercial loads”, “industrial load closures” and “coordination of CER – VPPs and V2G.”

Of note for the Panel is that 8 of the 15 scenarios follow the same pattern with low levels of the parameter for progressive Change, medium / higher levels for Step Change and the highest levels for Green Energy Exports. These parameters being ‘global economic growth and policy coordination”, “demand side participation”, “CER”, “coordination of CER”, “energy efficiency”, “hydrogen use and availability”, and “supply chain strength”. These parameters are quite different from each other so the methodology for the IASR and subsequent Candidate Development Path (CDPs) development will need to be carefully structured so that the relative impacts of each parameter is well understood.

A situation where the three scenarios end up being similar, is not and option, **t**he methodology review (later in the ISP cycle) will need to ensure that differing impacts of parameters, eg supply chain pressures, global economic growth and CER can be seen between the parameters within all three scenarios.

Table 3 Proposed amendments to scenario parameters

| Parameter | *Progressive Change* | *Step Change* | *Green Energy Exports* |
|---|---|---|---|
| National decarbonisation target | At least 43% emissions reduction by 2030, Net Zero by 2050 | At least 43% emissions reduction by 2030, Net Zero by 2050 | At least 43% emissions reduction by 2030, Net Zero by 2050 |
| Global economic growth and policy coordination | Slower economic growth, lesser coordination | Moderate economic growth, stronger coordination | High economic growth, stronger coordination |
| Australian economic and demographic drivers | Lower | Moderate economic growth, with near-term economic growth impacted by current economic challenges[5] | ~~High~~Higher, with near-term economic growth impacted somewhat by current economic challenges ~~(partly driven by green energy)~~ |
| **Electrification** | Electrification is tailored to meet existing emissions reduction commitments, with slower adoption given weaker economic circumstances | High electrification to meet emissions reduction commitments, with pace of adoption reflecting economic conditions | Higher electrification efforts to meet aggressive emissions reduction objectives, with faster pace of adoption |
| **Emerging commercial loads** | Emerging sectors such as data centres experience lower growth as weaker economic circumstances limit technology uptake | Emerging sectors such as data centres match opportunities associated with moderate domestic economic drivers | Emerging sectors such as data centres match opportunities associated with higher domestic economic drivers |
| **Industrial Load Closures** | Weak economic conditions provide challenging commercial conditions, resulting in load closures across key commercial and industrial facilities | No specific load closures | No specific load closures |
| Demand side participation uptake | Lower | Moderate | Higher |
| Consumer energy resource investments (batteries, PV and EVs) | Lower | High | Higher |
| **Coordination of CER (VPP and V2G)** | ~~Lower~~Low long-term coordination, with gradual acceptance of coordination | ~~High~~Moderate long-term coordination, with gradual acceptance of coordination | ~~Higher~~High long-term coordination, with faster acceptance of coordination |
| Energy efficiency | Lower | Moderate | Higher |
| Hydrogen use and availability | Low production for domestic use, with no export hydrogen | Moderate-low production for domestic use, with minimal export hydrogen | ~~Faster cost reduction.~~ High production for domestic industries, with ~~high~~moderate exports in the short term, and high exports in the longer term |
| Renewable gas blending in gas distribution network[A] | Up to 10% (hydrogen), with unlimited blending opportunity for biomethane and other renewable gases | Up to 10% (hydrogen), with unlimited blending opportunity for biomethane and other renewable gases | Up to 10% (hydrogen), with unlimited blending opportunity for biomethane and other renewable gases |
| Supply chain strength influencing demand forecasts | Low | Moderate | High |
| Global/domestic temperature settings and outcomes[B] | Applies Representative Concentration Pathway (RCP) 4.5 where relevant, consistent with a global temperature rise of ~ 2.6°C by 2100 | Applies RCP 2.6 where relevant, consistent with a global temperature rise of ~ 1.8°C by 2100 | Applies RCP 1.9 where relevant (~ 1.5°C), consistent with a global temperature rise of ~ 1.4°C by 2100 |
| IEA 2021 World Energy Outlook scenario alignment | Stated Policies Scenario (STEPS) | Sustainable Development Scenario (SDS) | Net Zero Emissions (NZE) |

Of importance is the consideration of what are the forecast parameter values that apply within each scenario given the overall description of the scenario, including:

1. What are the *realistic forecasts* for parameters for each scenario? (We recognise that this is role for the IASR, with draft due in December 2024)
2. How does each parameter contribute to the overall objective of least cost solution given constraints. ( this will likely link to sensitivity testing?)
3. Note mix of parameter values per scenario and narrative. Dan's slide 7 Scenario key settings

## Gas Parameter

We also think that the recommendations from the Federal Government's ISP review (discussed above) suggest the need for additional parameters, The action "integrating gas into the ISP" suggests that (hydrocarbon) gas could also be a parameter for each of the scenarios, noting that the 2024 ISP along with other reports has identified the need for gas for electricity generation into the 2040's while industrial and domestic use for gas will continue to be important, even though it will decline. This is additional to the parameters "hydrogen use and availability" and "renewable gas blending in gas distribution networks." The Panel thinks that these two parameters could be reconsidered and posits that the 'renewable gas blending parameter is more a constraint than a parameter, ie there is a technical limit to how much hydrogen can be blended with existing gas supply.

## Role of Distribution Network

The ISP review identified the analysis of the distribution network as part of future ISP analysis, perhaps the role of distribution networks is a parameter too? The 2024 ISP Panel was firm in their advice that the distribution network can have a greater role to play in achieving ISP objectives.

## Carbon Budget

The Panel considers the carbon budget topic to be very significant and recognises that it is a very technical topic in application. It is not a legislative requirement in the same way that 2050 target is, but it is really important and we think there s scope for deeper consideration in the consideration of scenarios

Total carbon budget, we suggest, should have links to the overall scenario descriptions and we believe should play a larger part in assessment of the parameter forecasts and outcomes for the CDP's.

The challenge is whether the amended parameter forecasts are consistent with the carbon targets? The Panel opinion is that they are probably not for the near and mid-term targets but should squeeze into the 2050 net zero target. This also suggests to us that carbon budget may be a parameter.

The draft IASR will need to be able to identify the narrative that accompanies the scenarios and the parameter mix for each scenario as this will continue to be important for many external (to AEMO) audiences.

## Differentiate supply side from demand side parameters

We think that there is value in listing the parameters under the headings of supply side and demand side. This assists in recognizing both demand and supply side aspects of the ISP when there is a risk that communications can be heard as the ISP being supply side only.

Eg

| Supply Side parameters | Demand side parameters |
|---|---|
| Economic Growth | CER Uptake |
| Policy settings / Coordination | Consumer Engagement with CER, eg VPP, DSP |
| Gas–- hydrocarbon | Social License |
| Gas – hydrogen / ammonia | |
| Supply chains and barriers | |
| Grid Scale Storage | |
| Orchestration | |

## Social Licence

Social Licence to Operate is an essential condition for effective and timely delivery of renewable energy and transmission projects required to meet national targets – and other major infrastructure project too. Social licence in this setting is used to refer to conditions of social acceptance for particular projects as an ongoing and dynamic process (unlike other licences and approvals, which are achieved at a given moment in time). Inability to secure social support can have tangible cost and timing implications for projects. Wind farm proponents, for example, have calculated this cost to be valued at $5 per MW hour of electricity produced by the wind farm over its lifespan and 36 months of delay in securing development approval[15]. Social support is largely contingent on communities' perceptions of fair process (e.g. communications and engagement practices) and fair outcomes (e.g. landowner and neighbour payments, benefit sharing, local procurement and jobs). Efforts are underway to improve both generation and transmission project processes and outcomes, e.g. via new. These processes include merit criteria in the Capacity Investment Scheme and state-based tenders, the proposed developer rating scheme, and the functions of the office of the Australian Energy Infrastructure Commissioner - as well as plans for better communications with the public around the imperatives for the energy transition.

However, there remain substantive social licence risks, especially for large-scale generation and transmission projects, and these need to be accounted for in parameters. Smaller scale and fewer transmission projects may well face fewer social licence risks and this should be further researched and modelled, and the outcomes factored into scenario planning. In addition, policy setting and government investment (federal and jurisdictional) in generating conditions for strong social understanding and support will have a tangible bearing of achieving social licence for the transition as a whole, as well as individual projects. The Panel considers that these factors warrant consideration as a parameter for all scenarios.

# Consumer Panel Opinion

The Panel encourages AEMO to consider the following additional parameters

5. Social License is not currently a proposed parameter and we think it should be included in the 2026 ISP scenario parameters.
6. A gas supply parameter (separate from the hydrogen forecast)

[15] (CEC 2019)

7. Add in a distribution capacity forecast (providing the DNSPs come up with more specific info than they currently have)
8. Carbon budget parameter

We also propose removing “renewable gas blending in gas distribution networks” as a parameter as this is a technical constraint rather than a parameter.

Parameter forecasts are a crucial aspect for the draft IASR, to be released in December 2024 and should include the following to be reflected across all scenarios :

- Review economic forecasts from 2024 (e.g. slower for longer GDP growth, higher for longer inflation etc)
- CER/DER forecasts , particularly coordination forecasts to reflect increased policy focus on this, particularly coordination
- Reduced confidence in green gas exports, lower and slower local green processing
- Lower and slower EV roll out but increase in the role of hybrid vehicles in the nation’s fleet.

# 4. Counterfactual / Base case

## Discussion

The 2024 ISP includes the following paragraph in the executive Summary.

> *“The ISP’s optimal development path sets out the needed generation, firming and transmission to transition to net zero by 2050 through current policy settings. The transmission elements would repay their investment costs, save consumers a further $18.5 billion in avoided costs, and deliver emission reductions now valued at $3.3 billion.”*

The Panel understands that this benefit is based on comparison of the Optimal Development Path with a ‘base case’ or ‘counterfactual.’ We will refer to this as the ‘base case.’

The Panel asks what is the counterfactual and how is it calculated?

We understand that the base case is an ‘alternative plan’ to satisfy the various current carbon targets and other policy settings for each scenario.

Perhaps the base cases are more akin to a candidate development path in which new transmission is restricted to maintenance of the existing network only and so requiring other solutions to achieve legislated carbon requirement.

We have asked ourselves whether there is a consolidated base case could also be considered to be a scenario, a bit like the earlier ‘slow change’ scenario – but even slower!

## Consumer Panel Opinion

The Panel recognises the value of the base cases or counterfactuals (we will refer to it as the base case) and encourages AEMO to identify and explain the base cases more overtly for 2026 ISP. We think that it could be presented alongside the scenarios as they are ultimately used as a reference ‘point’ for comparisons, particularly for the ODP.

On reflection, the Panel considers that a consolidated base case is not likely to be a scenario in its own right, but each base case might ‘sit alongside’ each scenario.

The base cases need to be better explained for 2026 ISP than they have been in the past with clear communication about what they are and how they are calculated.

# 5. Conclusion

Our consideration of the scenarios Consultation Paper leads us to suggest the following scenarios for the 2026 ISP, using figure 1 and amending it to reflect the discussions presented in this submission.

| **ISP release year** | **Scenario - Domestic** | **Scenario - Domestic** | **Scenario - Domestic** | **Scenario – External / Export** |
|---|---|---|---|---|
| **2022** | Slow Change | Progressive Change | Step Change | Hydrogen Super Power |
| **Scenario Progression** | *Removed, superseded by Progressive Change* | ⇩ | ⇩ | ⇩ |
| **2024** | | Progressive Change | Step Change | Green Exports |
| **Scenario Progression** | ↷ | ⇩ | ⇩ | ⇩ |
| **2026** | Base cases that ‘sit alongside each scenarios. | Distributed Energy scenario | Step Change – as proposed | Green Energy Industries. |