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Australian Energy Market Commission
Level 15, 60 Castlereagh Street
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To whom it may concern,

Climateworks Centre response to the Review of the Integrated System Plan discussion paper

Climateworks Centre welcomes the opportunity to respond to the Australian Energy Market Commission's (AEMC) *Review of the Integrated System Plan* discussion paper.

Climateworks bridges the gap between research and climate action, operating as an independent not-for-profit within Monash University. We are climate transition specialists, working with decision-makers who have the power to reduce emissions at scale. Climateworks accelerates ambitious, evidence-based action for net zero in Australia and Southeast Asia.

The Integrated System Plan (ISP) is the central instrument for coordinating Australia's energy system transition. As the National Electricity Market (NEM) becomes more decentralised and complex, the framework underpinning it must continue to evolve so the plan can continue to deliver on core purposes under the National Energy Objectives.

Climateworks welcomes this review as an opportunity to strengthen that framework. We support Strawperson 3, which would enable the ISP to better serve its purpose by:

- planning the system as an integrated whole, treating demand flexibility and consumer energy resources as decision variables to be optimised alongside supply rather than as fixed inputs to be planned around
- retaining its national role of optimising transmission across the whole system and between jurisdictions, while granular, place-based planning and delivery remain with the state and territory bodies that hold the relevant planning and approval powers.

We also support Strawperson 5, which would extend system planning to the orderly closure of gas distribution infrastructure in areas of declining demand, protecting consumers as gas use falls and preparing the electricity system for widespread electrification. In this submission, we have set out three recommendations that expand on each of these areas.

We have also attached our original submission as an appendix. The recommendations in that submission would:

- ensure energy system planning better aligns with democratically determined policy and enables policy ambition where there is uncertainty about the pace of change in electricity demand.

- evolve the ISP framework to optimise the data and modelling used for land-use complexity scoring.

- incorporate the Demand-Side Statement of Opportunities (DSOO) into the National Electricity Rules (NER), including specifying its required content and bring it in line with the Electricity Statement of Opportunities (ESOO), Gas Statement of Opportunities (GSOO) and other reports used to build the ISP.

Submission summary

Climateworks recommends that the AEMC:

- evolve the ISP to treat demand flexibility and consumer energy resources as decision variables alongside supply-side variables, enabling co-optimisation that delivers a genuinely least-cost Optimal Development Pathway.

- retain the ISP's role in planning transmission projects and optimising across the whole system and between jurisdictions, while leaving granular, place-based network planning and delivery with state and territory governments, which hold the relevant planning and approval powers.

- expand the ISP to model and co-optimise gas infrastructure alongside electricity, consistent with Strawperson 5, treating gas as a decision variable that can be retired under the plan, rather than treating it solely as a fuel input.

Recommendations

Recommendation 1: Evolve the ISP to treat demand flexibility and consumer energy resources as decision variables alongside supply-side variables, enabling co-optimisation that delivers a genuinely least-cost Optimal Development Pathway.

The Australian Energy Market Operator's (AEMO) energy system modelling uses decision variables to optimise the electricity grid for objectives such as least cost or decarbonisation, subject to constraints including policy settings or system capacity. Demand-side resources, including demand flexibility and consumer energy resources (CER), are not modelled this way. Instead, they are treated as fixed inputs that inform the scale of supply-side infrastructure needed to meet demand. As a result, they are not actively assessed or deployed to deliver the energy transition at optimal cost, speed and performance.

Genuine optimisation means planning the electricity system with demand-side resources, not around them. Where a demand-side solution can meet a system need more cheaply than a network or generation upgrade, the ISP would benefit from being able to select it. Without that option, it cannot deliver the least-cost energy system that the National Energy Objectives require.

This is best achieved through an integrated approach that develops supply-side and demand-side options together. Assessed with the same analytical rigour applied to generation and transmission, demand-side opportunities such as load shifting, demand response, industrial flexibility and CER can lower and shift peaks, defer or avoid network upgrades, and reduce the volume of generation and storage that must be built. Treating them as decision variables would let the Optimal Development Pathway weigh managing demand against building to meet it, substituting demand-side and non-network options for network or generation investment where doing so lowers overall system cost.

Climateworks recognises that fully integrating these resources as decision variables may take time, given the scale, timeliness and nature of demand-side and CER data. That is a reason to begin the shift through this framework review, which would let AEMO phase in demand-side decision variables as the data and methodology mature.

Recommendation 2: Retain the ISP's role in planning transmission projects and optimising

across the whole system and between jurisdictions, while leaving granular, place-based network planning and delivery with state and territory governments, which hold the relevant planning and approval powers.

Climateworks supports Strawperson 3, which would see AEMO and the ISP retain its role in identifying, assessing and delivering transmission projects within the actionability framework. The ISP is the national plan through which AEMO coordinates and optimises transmission across jurisdictions and the power system as a whole. National planning is important because it accounts for considerations that no single jurisdiction can resolve on its own. In one region, the optimal timing, scale and location of investment in network upgrades, as well as generation and storage, often depends on developments in another. A jurisdiction planning within its own borders is not well placed to see or assess those interactions across the NEM. Only a whole-of-system plan can optimise across regions, and that is the value the ISP provides.

Reducing the ISP's role in identifying committed, anticipated, actionable and future transmission projects would weaken optimisation across the whole system and between jurisdictions. It would fragment the evidence base and leave trade-offs between jurisdictions less well accounted for, to the detriment of consumers.

It is appropriate that granular, place-based network planning and delivery sits with the states and territories, who hold the legal power to carry it out. State and territory planning and approval bodies, including EnergyCo in New South Wales and VicGrid in Victoria, coordinate renewable energy zones, acquire land, engage local communities and lead transmission planning and approvals within their jurisdictions. These are powers grounded in jurisdictional legislation, making states and territories the right home for place-based decisions about the detailed decisions for where and how infrastructure is built. The ISP, as a national plan, does not hold the same powers.

Strawperson 3 keeps each role with the actor best placed to perform it. Climateworks supports this division of roles, consistent with the AEMC’s initial preference. States and territories already treat the ISP as one of several considerations in their siting decisions and retain the power to conduct place-based energy planning within their own frameworks. Reducing the ISP's role would not add to jurisdictional powers, which are already sufficient, but would weaken the national plan's ability to coordinate between jurisdictions and optimise across the whole system.

Recommendation 3: Expand the ISP to model and co-optimise gas infrastructure alongside electricity, consistent with Strawperson 5, treating gas as a decision variable that can be retired under the plan, rather than treating it solely as a fuel input.

The 2026 ISP treats gas primarily as a fuel input to the electricity system, applying gas supply and price as external assumptions rather than treating gas infrastructure as something the plan can optimise. Climateworks welcomes the additional analysis of the interplay between gas supply and the electricity system in the 2026 ISP. However, the modelling still does not forecast or plan the systematic reduction of the reticulated gas network as electrification proceeds, and it does not adequately test the economic and climate consequences of maintaining gas infrastructure at declining utilisation.

This gap matters because our modelling shows domestic gas use falls sharply under a least-cost, Paris-aligned pathway. Under Climateworks' (2023) decarbonisation scenarios:

- Gas-powered generation for the NEM under the 1.5°C scenario falls 81 per cent by 2040, relative to 2024 levels, and nears zero by 2050. Under the well-below 2°C scenario, it falls by 75 per cent by 2040 and approaches zero by 2050.
- Whole-of-economy gas use falls by 47 per cent by 2030 and 84 per cent by 2050 under the 1.5°C scenario. Under the well-below 2°C scenario, it falls by 34 per cent by 2030 and 74 per cent by 2050.

- Industry gas use falls by 34 per cent by 2030 and by 73 per cent by 2050 under the 1.5°C scenario. Under the well-below 2°C scenario, it falls by 10 per cent by 2030 and 55 per cent by 2050.
- The move away from gas in residential buildings is rapid under both the 1.5°C and well-below-2°C scenarios, with gas use declining by half in both scenarios by 2030. Buildings reach near-zero fossil gas by the mid-2040s in both scenarios. The relatively small differences across scenarios show that electrification of energy use in buildings is a beneficial strategy regardless of the emissions trajectory.

Modelling gas as a decision variable, consistent with Strawperson 5, would allow the ISP to co-optimise the two systems and plan the transition as a whole. A more comprehensive approach would include assessing stranded asset risks, determining optimal retirement schedules for gas infrastructure, and modelling the costs and benefits of electrification across industrial, commercial and residential sectors. This would help policymakers and industry stakeholders make informed decisions about future infrastructure investments for both the gas and electricity systems. AEMO could expand its gas supply modelling to explicitly consider: gas phase-out pathways for distribution networks; electrification timelines, including for alternative technologies such as heat pumps for residential and commercial heating; and renewable hydrogen for industrial processes where electrification is challenging.

By explicitly modelling these interactions the ISP can improve planning for the electricity network upgrades needed to support widespread electrification, enabling a more cost-effective transition. This analysis would also support policymakers in planning for vulnerable households and businesses that may be impacted by increasing costs associated with underutilised gas network infrastructure. Furthermore, this approach aligns with the ISP's increased focus on demand-side resources.

APPENDIX

19 February 2026

To whom it may concern,

Climateworks Centre submission to the *Review of the Integrated System Plan framework* consultation

Climateworks Centre welcomes the opportunity to provide a submission to the Australian Energy Market Commission (AEMC) in response to the *Review of the Integrated System Plan framework* consultation.

Climateworks bridges the gap between research and climate action, operating as an independent not-for-profit within Monash University. We are climate transition specialists, working with decision-makers who have the power to reduce emissions at scale. Climateworks accelerates ambitious, evidence-based action for net zero in Australia and Southeast Asia.

The rapid decarbonisation of the electricity and energy systems is essential for Australia to meet its obligations under the Paris Agreement. Electricity generation is the nation's largest source of greenhouse gas emissions. The adoption of renewable energy will reduce emissions to near zero for the electricity sector (approximately one-third of 2024 totals) and act as an enabler for decarbonisation of other sectors of the economy.

Since 2018, the Australian Energy Market Operator (AEMO) has engaged CSIRO, supported by Climateworks, to conduct multi-sector modelling to quantify the dynamic influences that would shape energy demand under different emissions reduction scenarios. That modelling continues to inform AEMO's planning and forecasting tools, including the 2026 Integrated System Plan (ISP).

In this submission, Climateworks recommends that AEMC ensure the Australian Energy Regulator (AER) change the ISP *Cost-Benefit Analysis Guidelines* to require AEMO to shift its approach to developing the ISP optimal development path. Instead of basing the path on what is 'most likely' to happen, AEMO would base it on what is 'most consistent with government policy commitments'. Rather than infrastructure potentially lagging behind policy ambition, it would be designed from the outset to deliver an energy system most able to meet committed policies, while remaining reliable and affordable.

To manage the risks associated with this change, such as the potential for overbuilding and increasing costs for consumers, this submission puts forward several recommended safeguards. This includes contingency planning within the ISP, a framework for prioritising policies, enhanced transparency and accountability mechanisms, and measures for allocating risk or costs related to risks.

With these changes, Climateworks seeks to address three key energy system challenges:

1. Alongside the effective operation of the energy market, AEMO's role is to plan for the long-term future of the energy system. However, the nature of this future is largely determined by governments. At present, in many instances, governments use the ISP to guide specific aspects of energy system policy, rather than allowing policy to guide the ISP's trajectory and ambition and, by extension, the energy system.
2. AEMO currently considers jurisdictional emissions reduction targets, as detailed in the emissions targets statement (AEMC 2023), and other policies where they meet the committed

policies threshold (section 5.22.3(b)) (AEMC 2025). Both exclude consideration of many policies that affect emissions and economic outcomes through electrification, low-carbon exports and renewable energy expansion. This could mean the electricity system is not adequately planned to support the delivery of these policies.

3. The transition away from fossil fuels will significantly increase the economy's reliance on electricity, and to a lesser extent, green hydrogen and bioenergy. For this shift to succeed, industry and investors need confidence that renewable energy will be sufficiently available, affordable and reliable. Currently, this confidence is lacking, hindering private-sector investment in the transition.

Climateworks' recommendations are designed to offer several important benefits. They will ensure energy system planning better aligns with democratically determined policy rather than technocratic probability assessments. They will ensure the energy system enables government policy ambition rather than undermining it, where there is uncertainty about the pace of changing electricity demand. Finally, our recommendations aim to delineate accountability, assigning the responsibility for setting the pace and scale of the energy system transition. The recently announced review into AEMO governance offers an opportunity to advance this objective.

In addition to aligning the ISP with government policy ambition, Climateworks puts forward three further recommendations. These are to: evolve the ISP framework to optimise the data and modelling used for land-use complexity scoring; enable the orderly closure of underutilised gas distribution pipelines; and incorporate the Demand-Side Statement of Opportunity (DSOO) into the National Electricity Rules (NER), including specifying its required content and bring it in line with the ESOO, GSOO and other reports used to build the ISP.

Broadly, the recommendations in this submission are designed to enhance the energy system's operation, provide better guidance for investors and energy market participants and ensure the system delivers the rapid transformation needed to achieve a net zero economy. Climateworks will be pleased to provide further insights and analysis in writing or through meetings, where helpful, to the AEMC.

Submission summary

Climateworks recommends that AEMC:

1. ensure the AER adjust the *Cost-Benefit Analysis Guidelines* to require AEMO to develop an ISP optimal development path with a positive net benefit in the scenario ‘most consistent with government policy commitments’

2. maintains the ISP's primary focus on energy system planning, ensuring it supports broader industrial and economic policy objectives through infrastructure and system readiness and avoids appearing to direct or replace those policies

3. requires AEMO to consider a broader set of policies that affect the energy system when determining needs, including firm and established government commitments such as Future Made in Australia

4. establishes a framework and review mechanism to enable AEMO to systematically and transparently assess which policies to include in the ISP optimal development path, and to reassess those policies proportionally and efficiently when fundamental settings change. More specifically, AEMC would:

   a. establish a policy prioritisation framework with specific rules for resolving policy conflicts, enabling AEMO to determine which policies it must consider when deciding which scenario is ‘most consistent with government policy commitments’

   b. enhance transparency by requiring AEMO to publicly disclose which policies are included and excluded from ISP scenarios, document its rationale for policy prioritisation and conflict resolution, and publish sensitivity analyses for key policy uncertainties

5. requires the AER to adjust the *Cost-Benefit Analysis Guidelines* so AEMO embeds contingency planning in the modelled scenarios to better address uncertainty in energy system needs and/or policy achievement

6. further addresses overbuild risk by recommending the Australian Government employ risk-allocation mechanisms, such as the National Electricity Market (NEM) Review's proposed Electricity Services Entry Mechanism (ESEM) framework and/or direct government investment

7. require AEMO to draw on the best available spatial land-use datasets and models, including those developed by governments and research institutions, to inform land-use complexity scoring and energy infrastructure siting

8. amends the National Gas Rules to enable AEMO and state governments to proactively plan for the orderly closure of gas distribution pipelines in areas experiencing reduced demand

9. seeks to include in the NER an obligation for AEMO to produce the Demand Side Statement of Opportunity, specifying its purpose, content and publication frequency.

Recommendations

Recommendation 1: Ensure the AER adjust the *Cost-Benefit Analysis Guidelines* to require AEMO to develop an ISP optimal development path with a positive net benefit in the scenario ‘most consistent with government policy commitments’.

The current approach to selecting the ISP optimal development path risks creating a misalignment between Australia's energy infrastructure planning and its economic, climate and energy policies. Under the AER *Cost-Benefit Analysis Guidelines*, AEMO is required to develop an optimal development path that has a positive net benefit in the scenario determined ‘most likely’ to eventuate (AER 2024). This positions AEMO’s technocratic probability assessments as the overseer of Australia's energy transition trajectory, rather than as the enabler of government policy commitments. The result is energy system planning and forecasting that may lag behind policy commitments, creating the risk that infrastructure will be underbuilt.

The challenge is particularly acute for industry, where there is an interdependent relationship between the availability of renewable energy and the ability to decarbonise. Before industries can electrify their processes, investors need confidence that renewable energy will be sufficiently available, affordable and reliable. This confidence doesn't currently exist, and without it, scaled deployment of renewable energy projects isn't considered the ‘most likely’ scenario. This creates a self-fulfilling prophecy in which a lack of infrastructure confidence prevents industrial commitments, which in turn justifies conservative infrastructure planning. Breaking this cycle is enabled by shifting from probability-based to policy-aligned planning and forecasting.

Climateworks recommends that AEMC ensure the AER adjust the ISP *Cost-Benefit Analysis*

Guidelines. This, in turn, would require AEMO to develop an optimal development path with a positive net benefit in the scenario ‘most consistent with government policy commitments’. These changes would align energy infrastructure planning directly with Australia’s climate targets and energy and industry policy commitments, providing investment confidence to break the current investment deadlock. It will also allow AEMO and the energy system to fulfil their intended roles as enablers of government policy and the national economy.

Recommendation 2: Maintain the ISP's primary focus on energy system planning, ensuring it supports broader industrial, economic and adaptation policy objectives through infrastructure and system readiness and avoids appearing to direct or replace those policies.

Aligning the ISP with government policy would not fundamentally change its intent or purpose. The energy system exists to enable Australia's economy and society to function across the transport, building, industry and agriculture sectors. Climateworks proposes that governments continue to set economic, energy and climate adaptation policy direction, with AEMO's role being to enable the delivery of those policies rather than follow expected energy demand changes through probability assessments. We are not proposing that AEMO's planning and forecasting identify economic opportunities and plan infrastructure to maximise Australia's export potential or industrial development.

Basing the ISP's optimal development path on what is ‘most consistent with government policy commitments’ acknowledges the interdependent relationship between energy planning and achieving government economic and climate objectives.

AEMO's practice of responding to the 'most likely' scenario was appropriate when energy system changes were incremental. However, this approach is no longer suitable given the scale of transformation in the energy system and the extent to which this transformation is driven by government policy choices. This increases the importance of clear boundaries and accountabilities between AEMO and state and federal governments. The recently announced review into AEMO Governance presents an opportunity to reconsider these accountabilities.

Currently, when AEMO assigns probabilities to different scenarios, it risks substituting a likelihood judgement for that of policies of elected governments, creating confusion about who has responsibility for the direction of Australia's energy transition. By contrast, planning infrastructure to support stated government commitments ensures that democratically determined objectives and trajectories can be achieved. This delineation would allow AEMO to focus on its core competency of ensuring the energy system is reliable, secure and capable of meeting the needs placed upon it by the broader economy.

Recommendation 3: Require AEMO to consider a broader set of policies that affect the energy system when determining needs, including firm and established government commitments such as Future Made in Australia.

In recent years, Australia’s federal, state and territory governments have made a range of climate and economic policy commitments designed to position Australia as a ‘renewable energy superpower’ and enable the nation to benefit from the global transition to net zero (Commonwealth of Australia 2024). Future Made in Australia, for example, represents $22.7 billion in support, including for low-carbon industries, green hydrogen production and renewable exports (Treasury 2024). Similarly, the National Hydrogen Strategy (DCCEEW 2024) and Critical Minerals Strategy (DISR 2023) outline ambitions to drive industrial electrification, leading to increased electricity consumption in those sectors. However, under current rules, AEMO's consideration of these policies is limited by the committed policies threshold in section 5.22.3(b) of the NER (AEMC 2025). Despite representing firm government commitments with substantial funding allocations, many of these policies fall outside what AEMO must and does consider when developing the ISP.

The Emissions Targets Statement (AEMC 2023), while establishing jurisdictional emissions reduction obligations, does not capture the full scope of government policy affecting the energy system. In particular, it does not account for renewable export targets, a number of industrial decarbonisation policies or the broader suite of policies that will drive electricity demand growth. This further increases the gap between what governments are pursuing through policy and what AEMO is obligated to plan for in the energy system. We note that AEMO's ability to include these policies would be improved if governments set out clearly the energy impact of these additional policies.

Climateworks recommends requiring AEMO to consider a broader set of firm and established government commitments when determining system power needs. There are two mechanisms through which this could be achieved. First, by incorporating a broader range of policies into the Emissions Targets Statement, including renewable export policies (AEMC 2024). Secondly, by adjusting the committed policies threshold in section 5.22.3(b) of the NER to require AEMO to consider government policy commitments using a policy prioritisation framework and review mechanism as described in Recommendation 5 below (AEMC 2025).

Recommendation 4: Establish a framework and review mechanism to enable AEMO to systematically and transparently assess which policies to include in the ISP optimal development path, and to reassess those policies proportionally and efficiently when fundamental settings change.

- **4 (a) Establish a policy prioritisation framework with specific rules for resolving policy conflicts, enabling AEMO to determine which policies it must consider when deciding which scenario is 'most consistent with government policy commitments'.**
- **4 (b) Enhance transparency by requiring AEMO to document its rationale for policy prioritisation and conflict resolution, and publish sensitivity analyses for key policy uncertainties.**

Shifting the ISP's optimal development path from a 'most likely' assessment to alignment with the scenario 'most consistent with government policy commitments' will require guidance on how AEMO should navigate overlapping or conflicting government policies, as well as transparency about which policies are included. Currently, AEMO has discretion to determine which policies to account for when policies are at different stages of development, and the scenario development process can result in assumptions that some policies would be overachieved when federal and state commitments differ (AEMC 2025). To address this, Climateworks recommends that AEMC direct the AER to develop a structured policy prioritisation framework, with accompanying transparency and accountability mechanisms. This would give AEMO a systematic approach to evaluate government commitments and devise infrastructure plans that genuinely reflect policy direction.

Such a system would include:

(1) **Policy prioritisation framework (4a):** A hierarchical policy prioritisation process and specific rules for resolving conflicts. The framework would establish how and when AEMO should prioritise policies based on their level of commitment and materiality to energy system planning, giving greater weight to policies with direct implications for electricity demand or supply. The framework would also establish jurisdictional precedence rules to address situations where federal and state policies directly conflict.

    The framework would enable AEMO to make more systematic judgements about policy certainty and merit, and provide a process for navigating policy complexity. It could be codified in the NER or *Cost-Benefit Analysis Guidelines*, with clear examples of how different policy combinations would be treated, ensuring consistency and predictability in AEMO's planning approach. The framework would include examples of how different policy

combinations would be treated, such as conflicts between federal and state government coal phase-out timelines or renewable energy targets, ensuring consistency and predictability in AEMO's planning approach.

(2) **Policy inclusion rationale (4b):** An obligation for AEMO to provide a clear rationale for their decisions to include or exclude policies based on the policy prioritisation framework. This disclosure would extend to documenting how AEMO resolves discrepancies between competing policies, such as when federal and state commitments diverge. Additionally, AEMO would publish sensitivity analyses that examine how variations in policy assumptions would affect the optimal development path. For example, AEMO could model the impact of faster-than-expected Distributed Energy Resources (DER) uptake on grid-scale infrastructure requirements. This will allow stakeholders to understand the robustness of energy infrastructure decisions under different policy trajectories.

Recommendation 5: Require the AER to adjust the *Cost-Benefit Analysis Guidelines* so AEMO embeds contingency planning in the modelled scenarios where there is uncertainty in power system needs and/or policy achievement.

AEMO has to plan an energy system in an environment of acute uncertainty. However, by modelling sensitivity analyses and a range of assumptions, it is possible to pinpoint the areas of greatest uncertainty and create scenarios for different conditions. This presents an opportunity for AEMO to better navigate unknowns and adopt a role in energy system planning more closely aligned with government policy.

Climateworks recommends that AEMC direct the AER to include in the *Cost-Benefit Analysis Guidelines* an obligation for AEMO to identify key uncertainties in its electricity network infrastructure analysis and undertake sensitivity testing to explore how different assumptions affect system requirements. This sensitivity testing would focus on assumptions that could significantly impact power system requirements. The anticipated pathway – and alternate responses where change is inconsistent with expectations – could be transparently detailed in planning and forecasting material, including the ISP. Having alternate responses would enable governments and energy system stakeholders to plan and allocate resources in alignment with the expected pathway or alternative responses. This would provide a clearer basis for decision-making under uncertainty.

For example, Climateworks' modelling indicates that Customer Energy Resources (CER) and demand management play a crucial role in achieving an energy system aligned with a 1.5 degrees Celsius scenario. Current initiatives, including the Demand Side Statement of Opportunity, will assist AEMO in better understanding and considering these aspects. However, uncertainties remain regarding the pace and scale of adoption, and the behaviour of actors within the system. AEMO’s forecasting and planning could trigger alternative actions if changes are not in line with expectations, such as increased investment in grid-scale generation and storage, to mitigate the risks of infrastructure overbuild or underbuild.

This expanded alternative pathway approach offers two key benefits. First, it enables AEMO to plan confidently for a future consistent with Australia’s full commitments to the Paris Agreement, while preparing for deviation. Second, it empowers governments and stakeholders to understand and shape unfolding trends, allocating resources accordingly. Transparent contingency planning is essential for managing risks and maximising opportunities in a dynamic transition.

Recommendation 6: Further address overbuild risk by recommending the Australian Government employ risk-allocation mechanisms, such as the NEM Review's proposed ESEM framework and/or direct government investment.

It is important to consider the degree to which current energy consumers may bear the risk of building infrastructure for potential future demand that may not eventuate. When infrastructure is built in anticipation of large industrial consumers, hydrogen production facilities or export industries that haven't yet committed to connecting, consumers bear the risk of additional costs if these anticipated loads don't materialise. While some level of anticipatory building is necessary to enable rather than constrain the energy transition, the risk and cost should be shared between governments and those who stand to benefit.

One way to address this tension is by embedding contingency planning into the ISP, as outlined in Recommendation 6. This would involve setting out a pathway most consistent with government policy and building adaptive mechanisms into the ISP where infrastructure deployment does not eventuate at the scale and/or pace expected. In addition to this measure, risk-allocation mechanisms beyond the ISP could help manage the potential for overbuilding. The NEM Review's proposed ESEM contracts, along with frameworks like direct government investment, could mitigate the risk of stranded assets for consumers, while also addressing the risk of under-build.

If adopted, the NEM Review's recommended ESEM contracts offer a promising mechanism to shift risk from consumers to a broader range of market participants and governments. By enabling longer-term contracting and visibility of 'hidden resources', the ESEM could provide certainty to investors while allocating the risk of uncertain demand expansion to a government implementation body. Under this approach, if anticipated industrial loads or hydrogen facilities fail to connect, the financial exposure would be managed through the contract warehousing system rather than across the existing consumer base. Proposed changes as part of the NEM review will also require distributed energy resources and demand response providers to schedule their resources for dispatch, making them visible to AEMO and reducing the need for large-scale resources.

Complementary financial mechanisms could further mitigate the potential cost impacts of overbuild. For example, direct government investment in infrastructure is another option, particularly for assets critical to the energy transition. Government schemes, such as the Capacity Investment Scheme and Rewiring the Nation, provide existing frameworks that could facilitate this approach. The choice among these mechanisms would be guided by the circumstances of each infrastructure investment, the degree of demand uncertainty and the policy objectives they serve.

Recommendation 7: Require AEMO to draw on the best available spatial land-use datasets and models, including those developed by governments and research institutions, to inform land-use complexity scoring and energy infrastructure siting.

AEMO currently draws on various publicly available land-use datasets and modelling to guide the siting of energy infrastructure. Locations across the NEM are assigned complexity scores based on environmental, cultural heritage, geotechnical, community and climate factors, enabling AEMO to exclude locations with planning constraints and prioritise viable land.

For the 2026 ISP, AEMO engaged consultancy firm Jacobs to refresh its land-use inputs from 2019. The Jacobs analysis maps current land use and known constraints, then applies complexity scores based on the difficulty of siting energy infrastructure. While this mapping is comprehensive and excels at incorporating community and regulatory complexity, it is a static analysis that supports only short to medium-term planning. It does not account for how land use is likely to change over time, which is a significant limitation when planning the locations of infrastructure that will be operational for decades.

More advanced and dynamic spatial land-use models could enhance AEMO's complexity scoring and analysis of potential energy infrastructure sites. Analysing how land use could change over time under

different scenarios would enable AEMO to make more informed long-term infrastructure-siting decisions and respond to evolving trade-offs between agriculture, biodiversity, carbon sequestration, water and energy infrastructure priorities.

By way of example, with research contributions from CSIRO, Climateworks and Deakin University have developed a second iteration of the Land Use Trade Offs (LUTO2) model, which maps the best way to use and manage land to meet climate and biodiversity targets without compromising economic growth and food and water security. By projecting land-use changes, LUTO2 can highlight areas likely to become more or less complex to develop in the future, improving the ISP's ability to anticipate future land-use conflicts and embed those considerations into long-term infrastructure planning.

Climateworks is not proposing that AEMO be given responsibility for determining which land has high ecological or social value; that responsibility appropriately sits with the government. Rather, Climateworks proposes that AEMO be required to draw on the best available modelling and datasets when undertaking complexity scoring within its existing framework. Adopting LUTO2 or similar tools developed by government and/or research institutions would allow AEMO to test how land-use complexity could change across plausible futures rather than relying on a single pathway. This would complement, rather than replace, the static modelling conducted by Jacobs, which would remain valuable for short and medium-term planning.

Recommendation 8: Amend the National Gas Rules to enable AEMO and state governments to proactively plan for the orderly closure of gas distribution pipelines in areas experiencing reduced demand.

Australia's existing gas market is structured around serving gas demand and expanding distribution. However, a least-cost pathway for Australia to meet its decarbonisation goals includes major changes in domestic gas use (Climateworks Centre 2023). As gas use declines, there will be some gas distribution pipes that could be closed and removed from the asset cost base (or Regulated Asset Base).

Under Climateworks' (2023) Paris-aligned decarbonisation scenarios:

- Gas-powered generation for the NEM under the 1.5°C scenario falls 81 per cent by 2040, relative to 2024 levels, and nears zero by 2050. Under the well-below 2°C scenario, it falls by 75 per cent by 2040 and approaches zero by 2050.
- Whole-of-economy gas use falls by 47 per cent by 2030 and 84 per cent by 2050 under the 1.5°C scenario. Under the well-below 2°C scenario, it falls by 34 per cent by 2030 and 74 per cent by 2050.
- Industry gas use falls by 34 per cent by 2030 and by 73 per cent by 2050 under the 1.5°C scenario. Under the well-below 2°C scenario, it falls by 10 per cent by 2030 and 55 per cent by 2050.
- The move away from gas in residential buildings is rapid under both the 1.5°C and well-below-2°C scenarios, respectively, declining by half in both scenarios by 2030. Buildings reach near-zero fossil gas by the mid-2040s in both scenarios. The relatively small differences across scenarios show that electrification of energy use in buildings is a beneficial strategy regardless of the emissions trajectory.

Despite this outlook, the ISP gas modelling approach lacks explicit planning and forecasting for the systematic reduction of the reticulated gas network in response to electrification. While Climateworks welcomes the additional analysis of the interplay between gas supply and the electricity system in the *Draft 2026 ISP*, it still does not sufficiently explore the economic and climate impacts of maintaining gas infrastructure with declining utilisation rates.

A more comprehensive approach would include assessing stranded asset risks, determining optimal retirement schedules for gas infrastructure, and modelling the costs and benefits of electrification across industrial, commercial and residential sectors. This would help policymakers and industry stakeholders make informed decisions about future infrastructure investments for both the gas and electricity systems. AEMO could expand its gas supply modelling to explicitly consider: gas phase-out pathways for distribution networks; electrification timelines, including for alternative technologies such as heat pumps for residential and commercial heating; and renewable hydrogen for industrial processes where electrification is challenging.

By explicitly modelling these interactions, the ISP can improve planning for the electricity network upgrades needed to support widespread electrification, enabling a more cost-effective transition. This analysis would also support policymakers in planning for vulnerable households and businesses that may be impacted by increasing costs associated with underutilised gas network infrastructure. Furthermore, this approach aligns with the ISP's increased focus on demand-side resources.

Climateworks recommends that AEMC amend the National Gas Rules to enable AEMO and state governments to actively plan for the orderly closure of gas distribution pipelines in areas experiencing reduced demand. Market rules and cost allocation approaches that enable an orderly gas phase-out would include:

- shifting the regulatory obligation from ‘providing gas’ to ‘providing energy’
- providing additional assessment on the nature of network tariff structures and levels for gas distribution networks, recognising declining utilisation and expected rate of return under different usage scenarios
- determining the financially and ethically fair distribution of costs from closing some of the Regulated Asset Base (Ben-David 2025). Costs could be borne by gas asset owners, customers or the government, or by cost-sharing with those likely to benefit financially from fuel-switching, such as electricity distributors and retailers. We note the importance that regulatory frameworks consider the appropriate treatment of vulnerable customers and how to ensure that industries without fuel-switching opportunities still have access to gas
- requiring gas network operators to publish long-term (10-20 year) utilisation forecasts, scenario analyses (including electrification and demand-side alternatives) and decommissioning/exit strategies.

Recommendation 9: Include in the NER an obligation for AEMO to produce the Demand Side Statement of Opportunity, specifying its purpose, content and publication frequency.

At present, demand-side considerations are primarily incorporated into energy system planning through the ISP, ESOO and the new Demand Side Factors Statement. While these provide some visibility of demand-side opportunities, they do not offer the comprehensive analysis needed to fully capture the potential of demand response, load shifting and DER. The *Electricity and Energy Sector Plan* 2025 recognised this gap and proposed the establishment of a DSOO, acknowledging that demand-side resources require analysis and prioritisation comparable to that given to generation and transmission infrastructure. Like the ESOO for electricity and GSOO for gas, the DSOO would guide investment and inform assumptions about the demand side's role in the ISP.

Through a ministerial directive, the Department of Climate Change, Energy, the Environment and Water (DCCEEW) and AEMO have been committed to developing the DSOO and are presently establishing responsibilities and content. However, beyond this, there is no requirement in the NER for AEMO or any other body to produce such a document. Having the DSOO sit outside the NER means there are greater levels of discretion and weaker accountability around its development, publication

and content. Having it sit inside the NER would mean it would be subject to appropriate regulatory requirements, AEMC and AER oversight and challengeable through NER processes.

Furthermore, implementing the DSOO through a ministerial direction rather than the NER makes it vulnerable to future policy changes and shifts in government priorities. If it is produced solely as a policy document, it would be easy to discontinue, undermining the long-term confidence that investors and market participants need to develop demand-side solutions. Given the critical role that demand flexibility will play in the energy transition, embedding the DSOO within the NER will ensure its ongoing implementation and quality, rather than leaving it dependent on arrangements that could change over time.

Climateworks recommends implementing a rule change that would define the DSOO and specify who produces it, its publication frequency, purpose, content requirements and consultation processes. This rule change could follow the publication of the first DSOO, which would be delivered through the existing collaboration between DCCEEW and AEMO, allowing the format and content to be tested and refined before being formalised in the NER. The most logical place for the DSOO to sit would be in Chapter 3 of the NER, alongside the ESOO requirement, ensuring that supply-side and demand-side opportunities are given equal weight and consideration in energy system planning.

The content of the DSOO, as embedded in the NER, would:

- show where specific sectors or regions might have emerging demand-side opportunities for load shifting, demand response or other change and identify the distribution infrastructure changes to enable these opportunities
- provide development outlooks for projections of peak demand reduction and the impact on required generation capacity and system resilience
- provide an assessment of the impact of flexible demand on requirements for gas generation and timings of network upgrades
- incorporate assessment of industrial demand-side measures alongside residential CER, revealing new opportunities for coordinating demand management
- identify opportunities to defer or avoid network infrastructure investment and expansion through demand-side alternatives, reducing overall system costs.

In the long term, energy system planning would benefit from a more integrated approach in which the content of the ESOO, GSOO and DSOO is developed with consideration of trade-offs and shared opportunities. These instruments could ultimately be combined so that the demand side is as deeply considered and planned for as the supply side.

Thank you for taking the time to consider our submission. We welcome an opportunity to brief your team to provide further insights from our work.

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