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The Hon Matt Kean
Chair
Climate Change Authority

Dear Mr Kean

Submission to Issues Paper: 2025 Annual Progress Report

The Australian Energy Market Commission (AEMC) welcomes the opportunity to provide a submission to the Climate Change Authority's Issues Paper: 2025 Annual Progress Report.

The AEMC is an independent statutory body that works for Australia's future productivity and living standards by contributing to a decarbonising, affordable and reliable energy system for consumers. We make rules, conduct reviews, and provide advice to governments on Australia's electricity, gas and energy retail markets. We are one of three market bodies that report to the Energy and Climate Change Ministerial Council (ECMC) through the energy ministers.

At the AEMC, we acknowledge that the energy sector is at a critical juncture. Our strategic narrative[1] sets out our vision - **a consumer-focused net zero energy system** – and explores the challenges, opportunities and focus areas for the AEMC as we strive to reach this vision.

Under the national energy objectives, the AEMC considers emissions impacts in its decisions on rule changes and reviews in the energy sector, applying the interim value of emissions reduction where appropriate.[2] In February 2024 we incorporated emissions reduction considerations into the national energy rules so that other market bodies also consider emissions reduction in their planning and decision-making, solidifying a significant regulatory shift towards net zero[3].

Under the National Energy Laws, the AEMC must prepare and maintain a targets statement, stating the targets set by participating jurisdictions for reducing Australia's greenhouse gas emissions, or that are likely to contribute to reducing Australia's greenhouse gas emissions[4]. When addressing the emissions component of the national energy objectives, all entities (including the AEMC, the Australian Energy Market Operator (AEMO) and the Australian Energy Regulator (AER)), must, at a minimum, consider these targets.

To support the use of the targets statement, we recently started tracking progress towards national, state and territory emissions reduction targets and shares of renewable energy. We published the first progress tracker in July 2025, using publicly available data from the National Greenhouse Accounts and the Australian Energy Statistics, and plan to update it annually.[5]

We note that the Climate Change Authority (CCA) is seeking input on nine questions across three areas. The first two areas, supporting and enabling the transition to net zero, and facilitating the deployment of renewable energy infrastructure, are related to our work program. Accordingly, we have provided responses on those areas below. Our key recommendations include developing national target-consistent carbon values as proposed in the Productivity Commission's interim report, and advocating for alignment between the national electricity and gas objectives. We have also included information on our recent and ongoing work relating to the transition and renewable deployment.

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[1] AEMC, A consumer-focused net zero energy system, 2024

[2] Guidance on how we do this is set out in our guide: How the national energy objectives shape our decisions. AEMC, 2025. The energy objectives are set out in section 7(c) of the National Electricity Law (NEL); section 23(b) of the National Gas Law (NGL); section 13(b) of the National Energy Retail Law (NERL). The emissions provisions in the national energy objectives were introduced by *the Statutes Amendment (National Energy Laws) (Emissions Reduction Objectives) Act 2023* (SA).

[3] AEMC, Harmonising the national energy rules with the updated national energy objectives, 2024

[4] AEMC, Targets statement for greenhouse gas emissions, 2025

[5] AEMC emissions and renewables progress tracker, 2025.

Area 1: Supporting and enabling the transition to a net zero economy

The AEMC's strategic narrative identified eight challenges and opportunities that are critical to achieving a consumer-focused net zero energy system, as shown below.

In a recent submission to the Productivity Commission[6], we explored how to improve the cost-effectiveness and alignment of policies to reduce emissions across the industrial, electricity and transport sectors. As part of this, we identified that unpriced externalities impacting exit decisions are a key issue in both the electricity and gas sectors. This impacts generation investment decisions in the wholesale electricity market and creates uncertainty in the gas sector. We made these recommendations:

1. **Consider a uniform value of emissions reductions across the energy sector or economy**. The AEMC can only make and amend the electricity, gas and energy retail rules, or recommend changes to the national energy framework in reviews, if doing so will contribute to the relevant energy objective. The energy objectives refer to several components of the long-term interests of consumers. In 2023, emissions reductions were added to the national energy objectives, supported in 2024 with an interim Value of Emissions Reductions agreed by energy ministers. The AEMC considers the value of emissions reduction as a benefit (or cost) in our rule changes, and broadening this approach across the energy sector or the economy could contribute to making more efficient, least-cost decisions. The Productivity Commission's interim report references our suggestion for a uniform emissions benchmark across the economy. It recommends setting national target-consistent carbon values and suggests that the Australian Government should task an independent agency, such as the Productivity Commission or the CCA, to develop these national values, which we strongly support.[7]

2. **The National Energy Objectives could be combined to serve energy consumers rather than gas and electricity consumers separately.** The National Electricity Objective (NEO) refers to the long-term interests of electricity consumers, while the National Gas Objective (NGO) refers to the long-term interests of gas consumers separately. As a result, the AEMC is limited in how we consider the scope of benefits in rule changes that affect both sectors. For example, AEMC's *Residential Electricity Price Trends 2024* shows that a customer electrifying their transport and heating use

[6] AEMC, AEMC submission to inquiry – cheaper, cleaner energy and the net zero transformation, 2025
[7] Productivity Commission, Investing in cheaper, cleaner energy and the net zero transformation Interim report, August 2025

could save 70 percent on their energy bills.[8] There is potential for efficiency gains from switching to more energy-efficient technologies and a cheaper, low-carbon fuel source. However, the NGO constrains us from considering these benefits (apart from emissions savings) when considering customers switching fuels, since these benefits do not accrue to gas customers. In the context of government policies that seek to encourage electrification and fuel switching, rules that seek to implement these policies would likely benefit from a more holistic approach to evaluating consumer benefits in a decarbonising world and would reflect the increasing interconnection between the two sectors. A national energy objective that is consistent across gas and electricity sectors would help us to achieve this.

Below we have included a summary of relevant projects that aim to address gaps in emissions-reduction policies in the energy sector that the AEMC has recently completed or is currently progressing.

Integrating consumer energy resources

Consumer Energy Resources (CER) and Distributed Energy Resources (DER) will play a critically important role in Australia's energy transformation, helping to reduce overall system costs, improve reliability, and achieve a secure, low-emission energy supply for all. Such resources include home batteries, solar PV systems, electric vehicles and controllable appliances such as hot water heaters and heat pumps.

CER can reduce carbon emissions by directly replacing utility-scale fossil fuel generators, electrifying fossil fuel services such as heating and transport, and helping to better integrate renewables.

If CER are integrated well, the power system will operate more smoothly, and consumers and industry will enjoy the benefits of least-cost supply[9]. The benefits for consumers:

- with CER are improved flexibility in how and when they use their CER so they can save money within their own home or business, and be rewarded for their CER participation in the power system (financial incentive)
- without CER are better energy use and savings on bills as system costs are reduced, benefiting from a lower-emission energy system.

Effective CER integration does not require all consumers to participate in a market/CER program. However, we need to have the market arrangements in place to support those who are currently participating and wish to participate in the future.

A CER Taskforce convened by Energy Ministers has developed and published an implementation plan in the form of a 'CER Roadmap'[10] that defines and will help drive the necessary CER integration actions.

The AEMC is directly contributing by driving keystone CER reforms under the roadmap that will help pave the way for innovation in the market. Our recent reforms include:

- Integrating price-responsive resources in the NEM rule change,[11] which makes price-responsive CER, such as batteries, more visible to the market operator.
- Unlocking CER benefits through flexible trading rule change,[12] which allows customers to use meters on their devices as a separate metering point, allowing for more innovative electricity service offerings.

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[8] AEMC, Residential Electricity Price Trends 2024, Nov 2024

[9] A range of studies have estimated the net benefit of effective integration and coordination of CER to be between $1 billion and $6.3 billion by 2030-2040 (CSIRO and Baringa consulting, 2019; ARENA, NERA consulting, 2022).

[10] DCCEW, National Consumer Energy Resources Roadmap, Jul 2024.

[11] AEMC, Integrating price-responsive resources into the NEM, Dec 2024.

[12] AEMC, Unlocking CER benefits through flexible trading, Aug 2024.

- AEMC CER technical standards review.[13] Our technical standards review was based on the view that large-scale non-compliance with CER technical standards will significantly impact all electricity users, as it may threaten power system security and reduce the amount of CER that can be connected to the grid.

- Accelerating the rollout of smart meters rule change, which will accelerate the transition to a digital, real-time grid by requiring a full roll-out of smart meters by 2030.[14]

- Pricing review: This examines how to create the framework to ensure that customers receive better retail products and services that reduce costs for all customers.[15]

- Real-time data for consumers rule change, which is investigating how to best leverage real-time smart-meter data for customers.[16]

- Other related reforms, including work AEMC staff are undertaking for the CER Taskforce on the Distribution system and market operation review.

It is critical that the reforms under the CER Taskforce and ECMC National CER Roadmap are delivered to achieve the intended outcomes. It is also important that there is a commitment to the timelines and ongoing coordination of the roadmap. We continue to advocate for foundational pieces to be implemented as no-regrets options:

1. Establishing nationally consistent standards and the national regulatory framework for CER to set and enforce technical standards (including a national regulator) (led by CER Taskforce).

2. Implementing the recommendations of the distribution system and market operation working group (led by CER Taskforce).

3. Establishing appropriate consumer protections for CER, which is important to enable an innovative retail energy service market (ECMC, led by the Commonwealth Department of Climate Change, Energy, the Environment and Water, along with state and territory governments).[17]

Scaling public EV charging infrastructure

At present, the transport sector is Australia's third-largest source of emissions, at 21 per cent of total emissions in 2023.[18] Transport emissions, which have grown by around a fifth since 2005, are still rising.[19] As well as reducing emissions, the benefits of increased EV uptake include improved reliability, enhanced grid management and lower overall power system costs.

The availability of EV charging infrastructure can be a barrier to increased EV uptake. Charging infrastructure needs to be conveniently located and equitably distributed to support the necessary acceleration of EV uptake. A collaborative approach is needed between governments (including local government), market bodies, and industry for a faster and more coordinated rollout of publicly accessible EV charging infrastructure.

Kerbside, destination, and highway fast charging are to a large degree separate markets, and the optimal policies for supporting infrastructure roll-out are likely to vary across each use case. We recognise that EV owners and users directly benefit from charger availability. We also note that all consumers would benefit

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[13] AEMC, Review into consumer energy resources technical standards, Sep 2023.
[14] AEMC, Accelerating smart meter deployment, Nov 2024.
[15] AEMC, Pricing Review: Electricity pricing for a consumer-driven future, Jan 2025.
[16] AEMC, Real-time data for consumers, Jan 2025.
[17] DCCEEW, Better Energy Customer Experiences
[18] Department of Infrastructure, Transport, Regional Development, Communications, Sports and the Arts, Towards net zero for transport and infrastructure.
[19] AEMC, Powering the transition, August 2025.

to some extent from increased EV uptake through grid coordination that could reduce system costs and form a lower emissions energy system.

Improving resilience to climate change impacts
We aim to improve our understanding of the impact of climate change on the reliability, resilience and security of the energy system so that energy market frameworks are robust, manage the transition, and protect the interests of consumers

In May this year, the AEMC completed a rule change on *Including distribution network resilience in the National Electricity Rules*[20] establishing a formal framework for resilience that includes:

- New resilience expenditure factors that Distribution Network Service Providers and the AER must consider in developing and assessing expenditure proposals.
- A requirement for the AER to develop, publish, and maintain formal Network Resilience Guidelines.
- New annual planning and reporting requirements to improve the transparency and accountability of distribution network performance, and outcomes for consumers in extreme weather events.

The increased regulatory clarity will help distribution networks to more effectively plan for extreme weather and invest in measures that reduce the risk of power outages while helping customers in need. These could include adaptation investments to strengthen poles and wires in high-risk communities, relocate infrastructure in flood-prone areas, or increase the number of mobile generators and substations that can keep the lights on when the power supply is disrupted.

Apart from utility-led solutions, households and businesses can also take actions to ensure that they are more resilient to extreme weather and other causes of electricity outages. We are seeing growth in, and government policy supporting, the installation of behind-the-meter energy storage. Alongside lowering household energy costs, batteries can provide households with a more resilient electricity supply. We consider that there should be options for more households and businesses, both owner-occupied and renters, to benefit from energy storage. Two technologies that could support this are:

- Plug-in solar and batteries – we understand that in 2024, over 400,000 'balcony' solar systems were installed in Germany.[21] These devices are lower cost and portable, allowing renters to own, install and take with them when they move. The current Australian standards do not allow plug-in solar and battery systems.
- Vehicle to home electricity supply – the CSIRO forecasts that up to 97% of light passenger vehicles will be electric by 2050.[22] If this forecast is achieved, soon most Australian households and businesses will have access to an electric vehicle. Setting up vehicle-to-home systems is currently expensive and difficult. Making this easy and affordable could provide greater resilience to most Australian households with energy storage in their electric vehicles.

Australian regulations and standards should aim to reduce the barriers to plug-in batteries and electric vehicles, where it can be achieved safely. Minimising the restrictions on what safe products are available will allow competitive pressures to deliver the products customers want at the prices they are willing to pay.

[20] AEMC, Including distribution network resilience in the National Electricity Rules, May 2025.
[21] Bundesnetzagentur, Growth in renewable energy in 2024, Media release, 8 January 2025.
[22] CSIRO, Unlocking electric vehicles, September 2024.

Area 2: Deploying renewable energy infrastructure

There are a range of reviews and programs under way to support the delivery of renewable energy infrastructure. Governments have a key role to play in addressing non-market barriers, including in relation to supply chain constraints, workforce training and upskilling, planning and environmental approvals, and social licence.[23]

The NEM Wholesale Market Settings Review (NEM review) is proposing an Electricity Services Entry Mechanism to unlock urgent new investment in capacity.[24]

In addition to contributing to the NEM review, the AEMC has conducted several recent reviews and is progressing priority reforms to address challenges in delivering large energy infrastructure. In our recent submission to the Productivity Commission, we outlined some of the key findings from this recent work, which relate to the planning, approval and connection of new generation.[25] While this piece of work explored the barriers faced by large energy infrastructure projects in general, we still consider it to have useful insights for renewable infrastructure.

The key points are as follows:

- The time it takes to connect new generation to the market can be a barrier to entry for new investors. Reducing this as much as practicable supports competition and least cost energy for consumers.
- Planning approvals are only one of several barriers that can be addressed to reduce project timelines.
- Social licence concerns can also be addressed alongside the planning process. For example, through early engagement with the community before projects are 'locked in', maintaining multiple channels for community input to develop stronger partnerships, and considering local benefit-sharing arrangements.
- Barriers to planning, approval, construction and connection processes can have a cumulative impact that increases investor caution, reduces the ability to access finance, and raises the hurdle rate that investors require to proceed with new projects.

Additionally, we found that it is not just the time it takes to approve new projects, but uncertainty over timing, the likelihood of success and the interdependence of multiple approval processes, that can chill the signal for new investment. As an example, a recent project that was awarded a Capacity Investment Scheme (CIS) contract was not awarded NSW Renewable Energy Zone (REZ) access rights.[26] The CIS contract loses value as a result. This is particularly problematic if policymakers are simultaneously seeking certainty that renewable generation is in place before the exit of coal generation, and delivering the least cost to consumers and taxpayers, while significant uncertainties remain within the planning and approvals processes.

We have an active workstream making and considering rules that seek to lower connection costs and promote faster connections. This includes work to make the NEM technical access standards fit for purpose in a world where inverter-based resources are more prevalent.

Below, we summarise projects that the AEMC has recently completed or is currently progressing that aim to address the challenges to deploying renewable energy-related infrastructure.

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[23] These factors were recognised in the AEMC Reliability Panel's 2024 *Review of the form of the reliability standard.*

[24] National Electricity Market wholesale market settings review, *Draft Report*, August 2025.

[25] AEMC has completed various rule changes on access standards and considerations in the ISP, including Improving the NEM access standards – Package 1 and Better integration of gas and community sentiment into the ISP.

[26] For more information on CIS: https://www.dcceew.gov.au/energy/renewable/capacity-investmentscheme.

Improving grid connections and access standards for new generation
Grid connections and access standards from the basis of a key work stream for the AEMC.
This includes completion of a rule change (*Improving the National Electricity Market (NEM) Access Standards – Package 1*) on 22 May 2025 to improve the technical requirements for connection to the NEM.[27] This is the most significant modernisation of the connection standards since 2018.
The finalised Package 1 reforms will make the grid connection process more efficient by:

- adding more prescription and clarity to technical requirements, reducing costly negotiations
- better accommodating inverter-based resources like solar, wind and batteries
- broadening application to synchronous condensers and high voltage direct current links needed for system stability.

The finalised Package 1 reforms commenced on 21 August 2025, with transitional provisions to minimise disruptions to ongoing connection applications.

The improved access standards will lower overall connection costs for most applicants. They will also reduce the burden on network service providers and AEMO and simplify their function by streamlining the connections process, providing clarity and reducing the need for negotiations.

The Commission is currently working on a second rule change (*Improving the NEM Access Standards – Package 2*) which seeks to address the projected growth of large-scale electricity users, particularly data centres, driven by AI development.

Maintaining electricity system security
The impending retirement of thermal synchronous generators will materially reduce the availability of the critical services that ensure the power system remains within its technical operating envelope.

Proven and emerging technologies (such as synchronous condensers or grid-forming inverters, respectively) can deliver the required system needs. However, the deployment of proven technologies has been slow in practice, while that of emerging technologies is limited by performance uncertainty and insufficient operational experience, in the NEM and worldwide.

We believe that reforms to the existing system security frameworks could be made to support the timely delivery of essential system services in the medium to longer term. We are closely collaborating with AEMO to explore and progress several reform options, which we would be happy to discuss with the CCA.

Further, the ongoing NEM review is investigating how better coordinating incremental security and reliability investments could result in more efficient and timely outcomes for customers by minimising the risk of duplicated investments.

Enabling offshore electricity infrastructure
In October 2024, the AEMC published a final report providing an initial analysis of gaps and barriers in the National Electricity Rules (NER) to enabling offshore electricity infrastructure (OEI).[28] Our approach in undertaking this initial analysis was to focus on harmonising onshore and offshore electricity regulatory arrangements in key areas. We focused our attention on three key areas within the AEMC's remit:

- network connection and planning,
- power system security,
- network economic regulation.

[27] AEMC, Improving the NEM access standards - Package 1, May 2025.
[28] AEMC, Offshore electricity infrastructure analysis, 2024.

Within these focus areas, the report identifies gaps and barriers in the regulatory framework due to the specific characteristics of OEI which include asset and investment scale, new (to Australia) technology, and the multi-jurisdictional nature of transmission assets.[29]

We adopted this approach because the market understands the regulatory arrangements under the NER, and extending the NER to include the regulation of OEI would provide for a consistent regulatory approach. However, we recognise that there will be circumstances where departures from the national framework may be warranted.

Improving transmission planning and development
The AEMC looked at ways to improve the economic assessment framework for actionable Integrated System Plan (ISP) projects in our Transmission planning and investment review. We recommended two reforms. The first reform focused on incentivising more and earlier works to be undertaken to derisk project delivery. This reform was delivered with our *Bringing early works forward to improve transmission planning* rule change in 2024.[30]

The second reform recommended that the ISP become the centralised process for assessing the cumulative benefits of a transmission project. The RIT-T (or a new process) would then become a more focused process of undertaking a least-cost assessment for a credible option. This would include detailed consideration of environmental factors, land use and community sentiment. These changes could reduce the time taken to complete the economic assessment process and therefore deliver actionable ISPs to assist in the transition to net zero.

We noted that we plan to consider this further reform in our upcoming review of the ISP (due by 1 July 2027). We would also welcome a rule change in this area.

Comparing jurisdictional frameworks for renewable energy zones
Over the past four years, jurisdictions have introduced regulations to enable the development of renewable energy zones (REZs). Jurisdictional REZ frameworks cover matters such as network planning and investment (including investment tests), economic regulation of network projects delivered under the REZ framework, access schemes (including access fees) and connection process innovations.[31] The AEMC undertook a comparative assessment of the jurisdictional REZ frameworks to understand their features. One of the key findings was that there are interactions between the national and jurisdictional frameworks. Taking network planning as an example:

- Each jurisdiction has appointed its own state transmission infrastructure planner, which is separate from the local transmission network service provider.
- Jurisdictional infrastructure planners play a similar role to AEMO on the national level.
- Each jurisdiction is producing a statewide strategic network plan.
- Projects identified in the ISP may be brought into jurisdictional planning frameworks.

In our view, these interactions between the national and jurisdictional frameworks require further consideration, for example, in relation to the integration of state and national planning documents and the application of jurisdictional vs. national processes to different types of projects. We currently plan to consider these questions in our ISP review.

Thank you for considering our submission. Please let us know if we can provide further support to the Climate Change Authority on its fourth Annual Progress Report. Our key contact for this work is Lily Mitchell, Legal Director (lily.mitchell@aemc.gov.au).

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[29] ibid.
[30] AEMC, Bringing early works forward to improve transmission planning, September 2024.
[31] AEMC, Jurisdictional REZ frameworks review, December 2024.

Yours sincerely

Geoffrey Rutledge

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