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Australian Energy Market Commission
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To whom it may concern,

Climateworks Centre submission to the Review of the Wholesale Demand Response Mechanism

Climateworks Centre welcomes the opportunity to provide a submission to the Australian Energy Market Commission (AEMC) in response to the Review of the Wholesale Demand Response Mechanism.

Climateworks bridges the gap between research and climate action, operating as an independent not-for-profit within Monash University. We develop specialist knowledge to accelerate emissions reduction, in line with the global 1.5 degree Celsius temperature goal, across Australia, Southeast Asia and the Pacific.

Since 2021, the Australian Energy Market Operator (AEMO) has engaged CSIRO, supported by Climateworks, to conduct multi-sector modelling to quantify the dynamic influences that could shape electricity demand under different emissions reduction scenarios. The recommendations in this submission draw on insights from that process – and other Climateworks research and analysis – and will contribute to a robust two-way electricity market and optimised Wholesale Demand Response Mechanism (WDRM).

As variable renewable energy becomes more prevalent, flexible and responsive demand becomes increasingly important for grid firming, reliability and stability. Demand response instruments like the WDRM offer a cost-effective, low-emissions alternative to traditional supply-side solutions such as gas peaking generation. Ensuring that the energy system unlocks the potential of demand response (and other demand side measures) in a cost-effective manner would reduce the size of generation and transmission that otherwise might be needed.

Climateworks has been calling for better integration of demand side energy management for a number of years – including through calling on DCCEEW and energy market bodies to prioritise demand-side measures. Our analysis shows 9,656 PJ of energy savings are achievable between 2025 and 2050 through improved demand management (Unpublished analysis performed for the Energy Efficiency Council based on *Climateworks Centre decarbonisation scenarios 2023*).

Incorporating appropriate targets or metrics on energy savings into a framework that guides government and energy market bodies could assist their work to make the most of this potential. This could be part of an updated National Energy Performance Strategy.

The WDRM represents an important step toward a more dynamic and responsive electricity market. However, its limited uptake suggests there are potential barriers to participation or

design limitations that need addressing.

This submission proposes reforms to maximise flexible demand's potential to support renewable energy integration, reduce emissions and enhance system reliability. Our recommendations focus on expanding participation pathways, improving market integration and ensuring demand response mechanisms contribute meaningfully to emissions reduction. These changes could help unlock the full potential of flexible demand as a critical enabler of renewable energy integration and grid reliability while reducing dependence on fossil fuels.

Energy performance in Climateworks' 1.5°C-aligned decarbonisation scenario

Climateworks' modelling demonstrates that there is substantial potential for energy savings across all sectors of the economy. Recent Climateworks modelling (Unpublished analysis performed for the Energy Efficiency Council based on *Climateworks Centre decarbonisation scenarios 2023*) shows that cumulative energy savings of 9,656 PJ are achievable between 2025 and 2050, with the built environment representing the largest opportunity at 4,469 PJ, followed by industry and waste at 3,720 PJ. By 2030, annual energy savings could reach 249 PJ across all sectors, growing to 594 PJ by 2050. These savings would result in reduced energy costs for consumers and businesses, decreased pressure on electricity infrastructure and reduced emissions from avoided generation.

The built environment sector shows particularly strong potential, with annual savings growing from 124 PJ in 2030 to 246 PJ by 2050, representing opportunities for efficient appliances, thermal shell improvements and demand-responsive systems. Similarly, industry and waste sectors show increasing potential over time, with annual savings rising from 79 PJ in 2030 to 270 PJ by 2050, highlighting opportunities for industrial process optimisation and flexibility.

Table 1: Energy savings from demand-side measures (energy efficiency) by sectors (PJ)

Sectors	Cumulative (2025–2050)	2030	2035	2040	2045	2050
Agriculture and Land	49	3	1	1	2	2
Built environment	4,469	124	161	199	224	246
Industry and Waste	3,720	79	115	158	204	270
Resources	1,417	43	50	58	68	75
Total	9,656	249	328	416	498	594

Submission summary

Climateworks suggests AEMC consider the following recommendations as it reviews the WDRM. The submission body includes specific details on each point. Climateworks recommends the AEMC:

- Continue to better engage and integrate demand services in the wholesale market to support firming of renewables and reliability requirements to reduce reliance on additional energy generation infrastructure, particularly gas peaking generation.
- Update the energy market rules to allow embedded networks and complex industrial sites with multiple connection points to participate in the WDRM.
- Continue developing a comprehensive two-way National Electricity Market (NEM) through the Integrating Price Responsive Resources mechanism (IPRR) .
- Maintain the current WDRM alongside the development of the two-way market and potential changes arising from the NEM Review, to support third-party (non-retailer) demand-service providers. Once the two-way market is well established, review the WDRM to determine optimal arrangements.
- Ensure the design of new demand flexibility mechanisms minimises incentivising gas generation, including where demand response providers utilise pre-contracted gas supplies that they are obligated to purchase.

Recommendations for the Review of the Wholesale Demand Response Mechanism

Recommendation 1: Continue to better engage and integrate demand services in the wholesale market to support firming of renewables and reliability requirements, to reduce reliance on additional energy generation infrastructure, particularly gas peaking generation.

Australia's transition to a renewable energy-based grid requires significant changes in how the wholesale market integrates demand-side resources. Under Climateworks' 1.5 degree-aligned scenario, renewables reach 88 per cent of total electricity generation by 2030 and close to 100 per cent by 2035, while clean electricity capacity expands from 63 GW today to 151 GW by 2030. This transformation would necessitate moving beyond traditional supply-focused approaches to adopting flexible demand as a critical grid management tool. The limited uptake of the WDRM suggests existing market structures may not fully capture the value that demand response provides.

Effective integration of demand services offers substantial system reliability and emissions reduction benefits by providing lower-cost, emissions-free alternatives to fossil fuel-based

firming capacity. As electricity demand grows from electrification across buildings, transport and industry, deployment of flexible demand can help manage peak loads, improve reliability, reduce network constraints and provide essential grid services that would otherwise require gas peaking generation. Demand management and energy efficiency measures could significantly reduce the need for new generation and network infrastructure, supporting the more effective integration of renewable energy.

The evolving nature of electricity consumption presents both challenges and opportunities for demand response. As transport electrification accelerates and industrial processes shift from gas to electricity, the resulting demand increase also creates greater flexibility potential. Electric vehicles and industrial processes can be optimised to align with renewable energy availability. The WDRM provides one mechanism to facilitate this alignment through participation pathways that encourage load shift during peak demand periods. Another mechanism is the new reforms for IPRR. These two mechanisms target voluntary registration of responsive demand for 'dispatch mode', which may be particularly appropriate for loads consistently available to provide flexibility, such as batteries and Consumer Energy Resources (CER).

However, current market arrangements do not provide strong market signals to fully realise the value of demand flexibility or address a wider range of barriers. The NEM Wholesale Market Settings Review (NEM Review) has highlighted the value of greater integration of demand services for shaping and firming, and identified ongoing barriers, including a lack of visibility of price-responsive demand. The NEM Review has suggested that demand services should be supported through proposed long-term contracts. However, even if introduced, these long-term mechanisms will depend on effectively integrating demand response in the near term and in spot markets. This makes it important to continue developing and improving the WDRM and IPRR, and to mature these mechanisms in the market.

Enhanced coordination of demand-side programs across government departments and jurisdictions presents significant opportunities to maximise demand response benefits. Aligning decarbonisation policies and programs that drive new electricity demand with electricity market optimisation can unlock substantial value. Developing comprehensive information and planning resources will provide demand investors and aggregators with the data they need to identify and capitalise on demand-response opportunities. A coordinated strategy to address these barriers will allow increased integration of demand services. This could include new planning and information tools focused on demand-side investors and policies, clearer targeted policies for valuing demand services and market mechanisms that properly reward flexible demand for its contributions to reliability and emissions reduction.

To achieve meaningful integration, Climateworks recommends that the AEMC continue developing approaches that recognise flexible demand as equivalent to supply-side resources in providing grid services. This includes refining the WDRM to address participation barriers, ensuring demand response can compete fairly with traditional generation and creating market

structures that incentivise flexibility during both renewable energy abundance and scarcity. Such reforms could support Australia's transition to a flexible, zero-emissions electricity system while reducing reliance on gas generation and minimising new infrastructure investment needs.

Recommendation 2: Update the energy market rules to allow embedded networks and complex industrial sites with multiple connection points to participate in the WDRM.

The current restriction preventing sites with multiple, electrically interconnected connection points from participating in the WDRM is a significant barrier to achieving the mechanism's full potential. Many commercial and industrial sites, including data centres, hospitals, airports and large industrial facilities, are served by multiple connection points. Despite being excellent potential sources of grid flexibility, these multi-connection facilities cannot currently access the WDRM, limiting the program's overall potential.

In its recent WDRM rule change request, Enel X (2025) estimates that this restriction affects more than 300 MW of demand response capacity, representing a substantial untapped resource. To put this in perspective and reiterate a point made by Enel X in its rule change request, only two participants have registered as Demand Response Service Providers in the NEM to date, with a combined 74 MW of response. Removing the restriction on facilities with multiple interconnected connection points could potentially increase WDRM capacity by more than four times the current levels.

Climateworks supports Enel X's (2025) rule change request, which proposes a solution that addresses gaming concerns while unlocking capacity from loads with multiple, electrically interconnected connection points. The proposal would allow those facilities to participate in the WDRM, but only if all of the load's connection points do so as a single Wholesale Demand Response Unit and each connection point is served by the same retailer. These conditions will prevent gaming by ensuring operators cannot shift load between connection points to simulate demand response while maintaining unchanged total consumption.

Implementing this recommendation could deliver multiple benefits aligned with broader energy policy objectives. Increased demand response capacity could decrease reliance on expensive peaking generation (often fossil fuel-based) and improve grid reliability. Furthermore, enabling more demand flexibility can reduce the need for additional generation and network infrastructure investment, delivering long-term cost savings.

Recommendation 3: Continue developing a comprehensive two-way electricity market through the recent IPRR mechanism.

The AEMC's implementation of the IPRR mechanism represents a significant step toward creating a comprehensive two-way electricity market that can better accommodate flexible demand resources. The IPRR's ‘dispatch mode’ framework allows aggregated CER to be scheduled and dispatchable in the NEM, enabling Virtual Power Plants (VPPs), community

batteries, flexible large loads and other price-responsive resources to compete directly with large-scale generators and reduce network costs.

The transparency benefits of this approach are particularly valuable for Australia's renewable energy transition. By explicitly including currently unscheduled price-responsive resources in dispatch, AEMO will have visibility of their actions in the spot market, thereby improving dispatch efficiencies. Intelligent Energy Systems (2023) modelling demonstrates that perfect integration of these resources could result in cost savings between $1.4 and $1.8 billion net present value by 2050. This improved visibility is crucial as more than three million households and businesses have solar panels, with every second household expected to have them by 2040 (AEMC 2024).

As the IPRR mechanism develops, Climateworks recommends that the AEMC continue to monitor its effectiveness in attracting demand response participation and refine the framework based on real-world experience. This monitoring effort would be supported by the AER's specific role in tracking price-responsive demand uptake, as designated by the AEMC, alongside the implementation of targeted incentive mechanisms to drive greater participation. The success of this two-way market approach will be critical to achieving efficient integration of renewable energy resources while maintaining system reliability and minimising costs.

Recommendation 4: Maintain the current WDRM alongside the development of the two-way market and potential changes arising from the NEM Review, to support third-party (non-retailer) demand-service providers. Once the two-way market is well established, review the WDRM to determine optimal arrangements.

Climateworks recommends that the WDRM be retained alongside the ongoing development of the two-way market and potential changes arising from the NEM review. The WDRM remains a critical pathway for enabling participation by third-party (non-retailer) demand service providers. The two-way market is intended to facilitate active engagement from all market participants – generators, storage and demand – by allowing them to respond dynamically to price signals. However, the WDRM provides a targeted mechanism for entities that may not wish to directly participate in a two-way market.

In this transitional period, the WDRM continues to provide a fit-for-purpose avenue for third parties to offer wholesale demand response without needing to take on the obligations and risks of becoming a market customer or retailer. This is particularly valuable for innovative aggregators, industrial energy users and other demand-side service providers who can deliver system benefits but lack retail market access.

Once the two-way market is established and operating effectively – with appropriate interoperability, price signals and participation frameworks in place – Climateworks suggests a formal review of the WDRM to assess whether it continues to add unique value or whether its

objectives have been fully integrated into the broader market design.

The NEM Review's proposed contracting reforms, including the derivative products under the Electricity Services Entry Mechanism, could create new opportunities for wholesale demand response to be packaged and traded. Ensuring that the WDRM can interface effectively with these emerging contract structures will help integrate demand-side services into markets.

This recommendation provides a pragmatic balance: it supports the AEMC's long-term ambition for a flexible, fully integrated two-sided market, while preserving an accessible and proven mechanism that accelerates demand-side participation today.

Recommendation 5: Ensure the review of the WDRM and design of any new demand flexibility mechanisms meets the emissions reductions objective of the National Energy Laws and address possible risks to incentivising behind-the-meter fossil fuel generation.

Ministers and energy market bodies have recognised that management of energy demand through the market can assist in meeting multiple National Energy Objectives. There is significant potential for mechanisms to reduce the need for additional generation when demand is higher than supply, with resultant benefits for affordability and emissions reductions. However there is a risk that energy users with behind-the-meter fossil fuel generators (for example for emergency use during power cuts) may use them solely to benefit from demand-flexibility mechanisms. This risk is heightened if the user is under 'take-or-pay' obligations where they must purchase regardless of actual usage. Use of behind-the-meter fossil fuel generators to supply demand response would be counterproductive to the potential emissions reduction role of demand management.

To address this concern, Climateworks recommends that the AEMC implement safeguards within demand flexibility mechanisms to ensure there is no inadvertent impact on emissions reductions. This could include requirements for demand response providers to demonstrate how their services deliver demand reduction and transparency requirements around the energy sources used during demand response events.

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

Yours sincerely,

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