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To whom it may concern,

Climateworks Centre submission to the Productivity Commission's interim report on investing in cheaper, cleaner energy and the net zero transformation

Climateworks Centre welcomes the opportunity to respond to the Productivity Commission's interim report on *Investing in cheaper, cleaner energy and the net zero transformation*. Climateworks bridges the gap between research and climate action, operating as an independent not-for-profit within Monash University. Climateworks develops specialist knowledge to accelerate emissions reduction, in line with the global 1.5 degrees Celsius temperature goal, across Australia, Southeast Asia and the Pacific.

This paper builds on our previous submission to the Productivity Commission's inquiry on *Investing in cheaper, cleaner energy and the net zero transformation* and our work on housing is cited in the interim report (Climateworks Centre 2023a). We met with Productivity Commissioners Barry Sterland, Martin Stokie and Assistant Commissioner Lou Will in March 2025. A subsequent engagement took place in August 2025, and our CEO Anna Skarbek was invited to Minister Bowen's Climate Change and Energy Roundtable on 8 August 8 2025.

We look forward to leveraging our technical insights and expertise to strengthen the Commission's independent analysis and advice to the Government.

Our submission draws on a range of Climateworks' modelling and research, in particular:

- *Climateworks Centre's decarbonisation scenarios 2023* (2023)
- *Pathways to industrial decarbonisation: Positioning Australian industry to prosper in a net zero global economy* (2023)
- *Renovation Pathways: Defining zero carbon homes for a climate resilient future* (2023)

Thank you for taking the time to consider our submission. We would welcome an opportunity to brief your team if you would like to explore our responses in further detail.

Yours sincerely,

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Submission summary

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    - **Recommendation 2:** Recommend that the ECMC determines how to provide energy users and investors with additional information to help them plan investments to optimise outcomes, including opportunities for cost reductions based on shaping demand activities around time, day, season and location.
    - **Recommendation 3:** Recommend revising AEMO's approach to system forecasting and planning so that the Integrated System Plan (ISP) bases its optimal development path not on the 'most likely' scenario, but on the scenario that is 'most consistent with government policy commitments'.
    - **Recommendation 4:** Recommend that the ECMC and energy governance bodies design an energy system that will enable Australia to become a 'renewable energy superpower', including analysis to forecast and plan supply, storage and transmission solutions for integrated system plans at the regional-level ('regional ISPs').
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Reducing the cost of meeting emissions targets

Productivity Commission draft recommendation 1.1: Reducing emissions in the electricity sector after 2030

Climateworks recommendation 1: Recommend that the Energy and Climate Change Ministerial Council (ECMC) accelerate effective integration of demand-side energy management and performance improvements.

Climateworks recommends:

- a comprehensive demand strategy across system planning
- market reforms through the National Electricity Market (NEM) wholesale market settings review (or NEM review)
- more effective governance of demand-side measures and technologies, and alignment of wider policies driving new investment.

The Productivity Commission can recommend that the ECMC accelerate effective integration of demand-side energy management and performance improvements across Australia's electricity and energy system. Demand management supports a low-cost transition to renewables and helps the energy system meet the rapid demand growth required for decarbonisation. Demand management will help optimise existing network assets and reduce the need for new infrastructure investment.

Currently, demand-side measures – including energy efficiency, electrification, energy management, demand response, demand flexibility and load shifting – are not sufficiently coordinated. This will limit achieving a cost-effective response to expected rates of demand growth and the ability to provide energy to meet the Future Made in Australia ambition. Coordination will ensure that energy demand is better aligned with renewable energy supply and support sufficient investment in new energy infrastructure and technologies to capitalise on low-cost renewable energy.

Responsibility for demand-side measures, including demand flexibility, energy efficiency and consumer energy resources, remains fragmented across multiple government departments and agencies covering buildings, industry, transport and energy markets. Additionally, states and territories bear primary accountability for many energy performance measures and employ different approaches. This decentralised approach fits with constitutional powers and supports effective state and territory-level delivery. However, it can be a barrier to coordinated NEM-wide improvements.

More coherent governance would ensure system planners, energy users and investors receive effective information and aligned incentives that would be more likely to optimise overall energy outcomes. Australia would then realise the performance improvements and cost savings that effective demand-side integration can deliver. Insufficient coordination remains a key barrier to Australia’s net zero and renewable energy superpower ambition.

A comprehensive approach to integrate demand-side measures would include:

- Enhanced planning processes to provide greater visibility of the impacts and opportunities of changing demand patterns, ensuring both supply-side and demand-side investors have the information needed for informed decision-making.
- NEM Review reforms and improvements to existing mechanisms to unlock and monetise demand-side value, creating proper price signals and participation pathways for demand-response resources and other demand-side management.
- Clear objectives and governance frameworks to coordinate demand measures and incentives across sectors and jurisdictions. We see particular value in better alignment between demand management considerations and broader policy initiatives, including decarbonisation

investments through the Clean Energy Finance Corporation and National Reconstruction Fund, electric vehicle uptake under the National Electric Vehicle Strategy, green industrial development through Future Made in Australia policies, and energy efficiency measures under the National Energy Performance Strategy.
- Equity considerations for communities during implementation.

A demand strategy through the ECMC would set out governance and objectives including for the areas outlined above. This would build on the National Energy Performance Strategy, and relevant workstreams under the ECMC, creating additional clarity and transparency about responsibility of governments, agencies and government bodies.

Recommendation 2: Recommend that the ECMC determines how to provide energy users and investors with additional information to help them plan investments to optimise outcomes, including opportunities for cost reductions based on shaping demand activities around time, day, season and location.

This would extend the demand-side factors statement to a Demand-side Statement of Opportunities. This is a planning document that could be developed to demonstrate the value of demand-opportunities to guide the plan for and identify the most effective information to support demand-investors. The suite of current energy market planning documents, including the Integrated system plan (ISP) and electricity and gas statement of opportunities (ESOO) (GSOO) remain supply-focused, missing the opportunity to reduce costs through demand-management opportunities.

AEMO's planning and forecasting tools have primarily guided supply-side investments, with recent reforms seeking to begin to address an additional focus on the demand side. However, significant planning gaps remain, including gaps in modelling responsive demand and making this visible to improve demand-side investment decisions and therefore energy system planning overall.

Uncertainty over patterns of future demand has become a source of planning risk in the energy transition. Large-scale energy-intensive investments – including data centres, hydrogen production and new low-carbon industries – are being considered, alongside widespread electrification of building and transport systems. Additionally, there is ongoing growth in Consumer Energy Resources (CER), which reached 25 per cent of generation capacity in the NEM in 2024 and continues to present coordination challenges (AEMO 2025).

Under the ISP 'Step change' scenario, the NEM's 'optimal development path' would deliver 213 GW of large and small-scale renewable generation capacity, 75 GW of firming capacity and an additional 10,000 km of transmission. In contrast, high electricity demand under the 'Green energy exports' scenario would require 461 GW of renewable generation capacity, 117 GW of firming capacity and an additional 26,000 km of transmission – more than double the infrastructure requirements of the 'Step change' scenario.

The new demand-side factors statement introduces, for the first time, a focus on optimising CER and demand activities. This represents a significant step toward creating a more comprehensive approach to considering demand factors. However, at this stage, it is unclear whether the demand-side factors statement, alongside the ISP, will address key gaps in modelling responsive demand scenarios and guiding efficient demand-side investment decisions.

Future energy costs in Australia, and economic productivity and competitiveness, will be greatly influenced by the extent to which industry can effectively pursue a renewable-energy future. The factors that will affect this include:
- the ability to capture Australia's strategic advantage of low-cost solar generation
- minimised exposure to firming costs when renewable generation does not match demand
- the use of strategic locations to reduce network costs and respond effectively to increasingly volatile price signals (driven by weather conditions that affect renewable energy output and

electricity demand).

Making the most of Australia's strategic advantages has the potential to reduce investor and business costs and improve the overall competitiveness of the Australian economy.

The decisions that affect a facility's impact on the energy system include: planned operating hours and energy utilisation rates, the use of technologies that are able to flex production and hence energy use, facility location and plans for onsite electricity production. The window for demand-infrastructure investors to capitalise on these facility-level and orchestrated system opportunities is narrow.

Currently, the ISP provides minimal insight into demand-side trends, omitting any modelling of price patterns and their underlying drivers, demand-side opportunities for cost reduction or differences between regions. This has resulted in investors having insufficient visibility and insights into demand-side opportunities.

We note that a particular gap for when renewable energy supply may not meet demand is during winter, when heating requirements increase and wind and solar resources can be limited. If this supply gap results in greater use of gas firming when gas demand, and therefore costs, are high, it will increase overall energy costs.

Targeted mechanisms to reduce winter loads could be relatively fast to develop. Such a mechanism could be similar to the Reliability and Emergency Reserve Trader (RERT). Whereas the current RERT targets short term reserve shortages only for a few hours, a mechanism to target winter energy-constraints would incentivise shutdowns over multiple days. This opens opportunities for different types of load to respond, for example shifting planned operational and maintenance shut-downs to winter months or altering the timing of production contracts, without having to upgrade to more responsive technologies.

This could be paired with energy efficiency measures targeted to minimise winter-overnight loads. Reducing winter overnight loads with energy efficiency measures such as residential heating and street lighting could be aligned with current programs encouraging electrification and CER. Broader energy efficiency programs could also be reviewed to ensure that they effectively value their impact under future market conditions.

Current expectations are that gas firming is the most effective way to ensure reliability. Climateworks sees much greater value in exploring specific demand-side mechanisms to sit alongside energy storage to provide a more cost-effective and low-emissions solution.

Climateworks recommends that the Productivity Commission urge the ECMC and AEMO to continue investing in demand-side capabilities and provide more comprehensive information for investors, potentially in a 'Demand Side Statement of Opportunity'. This would identify opportunities to reduce costs, for both the energy system and individual energy users, through demand-side actions. It would provide greater transparency on electricity cost drivers and patterns, trends across seasons, times of day and locations. Improving the ability of demand-side investors and energy users to make informed decisions will have a material benefit to energy costs and will help reduce the level of investment otherwise needed in grid-scale infrastructure.

Recommendation 3: Recommend revising AEMO's approach to system forecasting and planning so that the Integrated System Plan (ISP) bases its optimal development path not on the 'most likely' scenario, but on the scenario that is 'most consistent with government policy commitments'.

An AEMO that plans the energy transition based on government policy commitments from the outset will result in greater investor confidence, stronger economic outcomes, reduced emissions and a more robust grid. By changing how it selects scenarios and assesses sensitivities, AEMO could shift its focus from predicting what is 'most likely' to happen, to actively enabling what governments want to achieve for the economy. This approach would better assist governments and energy market

agencies in meeting these objectives.

Australia's electricity and energy landscape is undergoing unprecedented change. All levels of government have implemented policies to reduce emissions and ensure a prosperous economic future. These policies — including Future Made in Australia, National Consumer Energy Resources Roadmap, National Energy Performance Strategy, National Hydrogen Strategy and increasingly ambitious jurisdictional emissions reduction targets — will significantly impact the nature and requirements of the NEM.

The Australian Energy Regulator (AER) can place binding obligations on AEMO and the ISP process through directives in the cost-benefit analysis guidelines (AER 2024). Currently, these guidelines require AEMO to use 'the most probable value(s) for each variable and/or parameter that forms part of the most likely scenario'. Where the scenarios all have an equal likelihood, AEMO must 'identify one scenario as the most likely scenario for the purposes of clause 5.22.5(e)(3) of the National Electricity Rules' (AER 2024).

The requirement for AEMO to select a 'most likely' optimal development path was appropriate when Australia's energy system faced less disruption. However, current transformations – driven by renewable energy adoption replacing fossil fuels, rapidly expanding electricity demand and the frequent impacts of evolving government policy – necessitate that AEMO take an approach to scenario selection and modelling that enables government policy from the outset.

AEMO has the highly complex task of analysing a range of potential outcomes in a rapidly evolving energy demand and policy environment while planning alternatives for an energy system that ensures reliability, security, safety, affordability and quality – all while helping jurisdictions achieve emissions reduction targets. Similarly, governments and investors face increasingly complex challenges in designing long-term policies and investments in a market with diverse outcomes. The lack of synchronisation between these efforts has become increasingly apparent as the accelerated pace of market and policy change outpaces planning mechanisms.

While AEMO considers government targets and policies as key inputs for the Inputs, the current guidelines in the AER's cost-benefit analysis guidelines (AER 2024) and the National Electricity Rules 5.22.3 exclude consideration or comparison of policies that do not meet a rigid commitment threshold (AEMC 2024b). There is also a gap around policies that are not energy specific, but can have substantial energy implications, for example, the Future Made in Australia agenda.

Governments, in turn, use ISP scenarios as key inputs to design new policies and estimate impacts, but have limited capacity to update or consider interactions with wider ISP assumptions and modelling dynamics. Given the current rate of policy development, this leads to the ISP becoming rapidly outdated as policies evolve, while governments receive limited insights into policy impacts. Several findings in the ECMC's *Response to the Review of the Integrated System Plan* explicitly reflect this need (Section 2.4), seeking more transparency and guidance regarding policy considerations and impacts in the ISP, including AEMO's consideration of emerging and potential future policies (Commonwealth of Australia 2024).

Both governments and market bodies would benefit if AEMO modifies the balance between responding to energy system dynamics and providing the information that shapes them. AEMO and governments would both benefit from greater engagement between ISP scenarios and policy design to inform and optimise policy and planning outcomes.

Therefore, Climateworks recommends that the Productivity Commission call for a formal change to how AEMO fulfils its role in planning for the NEM. The ECMC could formally request that the AER adjust their cost-benefit analysis guidelines. This revision could shift AEMO's obligation to outlining the scenario 'most consistent with government policy commitments' to proactively design a pathway

that will inform and optimise the energy system transformation.

Recommendation 4: Recommend that the ECMC and energy governance bodies design an energy system that will enable Australia to become a 'renewable energy superpower', including analysis to forecast and plan supply, storage and transmission solutions for 'regional ISPs'.

Climateworks supports the establishment of net zero industrial precincts (NZIPs) across Australia. Our research suggests that establishing NZIPs in regions like Gladstone, Kwinana, Illawarra, Hunter and Pilbara could accelerate emissions reductions and attract new industries to regional areas. Precinct-scale planning for industrial regions will provide long-term guidance for industry and assurance to communities transitioning to net zero emissions. Precinct effectiveness could be enhanced if each major industrial region had a ‘regional ISP’ or equivalent to show how much renewable energy is needed to support ambitious decarbonisation. This place-based planning approach will make it easier for industrial actors to integrate and share resources, workforces and clean energy alternatives. Through a place-based approach, policy-makers can leverage a region's comparative advantages and unique characteristics and support Australia’s ambition to establish itself as a ‘renewable energy superpower’.

Heavy industry supply chains for iron and steel, aluminium, copper, nickel, zinc, lithium, chemicals and liquified natural gas account for around 44 per cent of Australia’s total emissions. Mining and manufacturing processes consume 44 per cent of total energy and 40 per cent of electricity. Most emissions come from burning fossil fuels to power boilers, turbines, and haulage and electricity use (Climateworks Centre and Climate-KIC 2023).

Transitioning away from fossil fuels will significantly increase industry’s reliance on electricity and, to a lesser extent, green hydrogen and bioenergy and, to an even lesser extent, gas with carbon capture and storage. For this shift to be successful, industry and investors need confidence that there will be sufficient renewable energy supply that is affordable and reliable.

That confidence does not currently exist. The ISP ‘Step change’ scenario plans for moderate levels of industrial electrification and new renewable energy and resource exports, with generation capacity (excluding rooftop solar PV) reaching 85 GW by 2030 and 150 GW by 2050 (AEMO 2024). Climateworks anticipates the forthcoming 'Step change' scenario will maintain similar capacity projections. To fully capitalise on the economic opportunities presented by low-emissions exports and to electrify industry consistent with a 1.5 degree pathway, the Australian Industry Energy Transitions Initiative report indicates a NEM generation capacity of 141 GW by 2030 and 341 GW by 2050 (Climateworks Centre and Climate-KIC 2023). Similarly, the ISP ‘Green energy exports’ scenario projects grid generation capacities of 124 GW by 2030 and 396 GW by 2050 (AEMO 2024).

Detailed region-based energy system planning is critical to provide confidence for industry and investors to transition to green products. Climateworks recently conducted an analysis showing that even the ‘Green energy exports’ scenario may fall short of the electricity capacity needed to rapidly decarbonise existing industries and establish new low-emissions export sectors in the Gladstone region. Our analysis estimates electricity demand in Gladstone alone could reach 74 TWh/year by 2040 (Climateworks Centre 2025a). In contrast, the industrial forecast for all of Queensland under the ‘Step change’ scenario is only 44 TWh/year (AEMO 2024). If future analyses of industrial precincts across Australia tell a similar story, it may be that even the ‘Green energy exports’ scenario would not provide enough generation capacity to support industrial energy transformation.

Climateworks recommends the Productivity Commission call on the ECMC and energy governance bodies to develop precinct-scale energy system planning to better deploy energy generation, storage and transmission technologies. This would support localised planning to provide detailed insights into the specific electricity and energy needs of different regions and sectors. This is essential for directing investment, allocating resources and securing social license. It can help give industry actors, investors

and communities the confidence to transition away from fossil fuels by integrating place-based modelling (e.g. DCCEEW or Net Zero Economy Authority's regional modelling) and planning in AEMO's forecasting and planning materials.

Productivity Commission draft recommendation 1.2: The Safeguard Mechanism should cover more industrial facilities, and carbon leakage provisions should be improved

Recommendation 5: Recommend that the Australian Government ensure decline rates under the Safeguard Mechanism are consistent with the 2035 emissions reduction target and net zero goal.

Climateworks supports broadening the Safeguard Mechanism threshold. Climateworks recommends that the Australian Government ensure that decline rates under the Safeguard Mechanism are consistent with the 2035 emissions reduction target and net zero goal.

Climateworks' scenario analysis suggests that highly emitting industries – including in the subsectors covered by the Safeguard Mechanism – have the substantial technical potential to reduce emissions on least-cost pathways to net zero (Climateworks Centre 2023b). We note that these scenarios show emissions reduction potential from an economy-wide perspective and do not provide information on the short-term economic and financial interests at a facility level.

There are opportunities to reduce emissions across industrial scope 1 emissions by an average annual rate of around 8 per cent to 2030 on a least-cost pathway in line with a 1.5ºC limit. This is based on a 'coordinated action' scenario (Climateworks Centre and Climate-KIC 2023).

Robust consultation with industry and a phased approach would likely help ensure greater compliance and integrity of reporting. However, there are some inherent limitations in the Safeguard Mechanism in terms of achieving emissions reductions in covered facilities, such as the reliance on Australian carbon credit units (ACCUs) by facilities that exceed the threshold. To achieve higher-impact emissions reductions in the industry sector, governments and industry can work together to implement initiatives on-site to support clean and low-carbon industrial processes and products, such as green hydrogen, on both the supply side and demand side.

Investment in industry abatement technologies required to transition the energy system could be as high as A$625 billion by 2050. Over a 30-year period, the annual investment equates to roughly A$20.8 billion if Australia is to tap into the full potential Climateworks identified on a cost-effective pathway to limit global warming to 1.5ºC. While this represents a substantial financial commitment, it is a tenth of the annual export value of iron and steel, aluminium, other metals, chemicals and liquefied natural gas supply chains. This is approximately A$236 billion. It is also comparable to investments made through other major transition efforts (Climateworks Centre and Climate-KIC 2023). A key challenge is that ACCU prices are currently lower than the cost of investing in on-site abatement, making credit purchases the more attractive option despite their lower long-term value for business operations and ongoing emissions reduction.

Financial incentives to support low-carbon industrial processes, coupled with an expanded Safeguard Mechanism, will inspire a steady and effective transition away from the heaviest-emitting technologies, while providing a stable policy environment for businesses and investors.

Recommendation 6: Introduce a robust Carbon Border Adjustment Mechanism, updated regularly to ensure it remains fit-for-purpose.

Alongside these measures, Climateworks supports the introduction of a robust Carbon Border Adjustment Mechanism (CBAM) to level the playing field with imported goods and maintain competitiveness. This will be particularly important for Australia's industrial sector, given its economic reliance on heavy industry, and the proliferation of low-carbon industrial technologies overseas, such as green ammonia. The introduction of a CBAM could be coupled with the phase-out of the trade-exposed baseline-adjusted status for facilities where relevant products are captured by the CBAM. A strong CBAM, updated regularly to ensure it remains fit-for-purpose, will support the integrity of the Safeguard Mechanism as well as other industrial decarbonisation measures.

Productivity Commission draft recommendation 1.3: Introduce an emissions-reduction incentive for heavy vehicles and phase-out policy overlaps for light vehicles

Climateworks agrees with the importance of emissions-reduction incentives for heavy vehicles. In Climateworks' 1.5ºC technology-focused scenario, zero-emissions (ZE) trucks make up 60 per cent of new truck sales by 2030 (Climateworks 2024d). However, ZE trucks are yet to gain a solid foothold in Australia's truck fleet; they made up less than 0.5 per cent of truck sales in Australia in 2023 (Interleasing 2024).

Freight operators face a suite of challenges to purchasing and operating ZE trucks, including road network access barriers, higher upfront vehicle cost, limited charging infrastructure, grid upgrades and changing freight operations to cater for zero-emissionsE vehicles (ZEVs). Aligning road network access and regulations at a national level would reduce inefficiencies and increase the confidence of freight operators investing in zero emission vehicles. A suite of measures can help operators address these challenges and incentivise a significant increase in investment into low-emissions technology.

While Climateworks supports well-designed road pricing, applying additional Road User Charging (RUC) to ZE trucks poses a significant risk to the nascent uptake in Australia.

A well-designed RUC scheme for Australia

RUC can be a powerful tool for pricing pollution, funding the provision of road infrastructure and managing congestion. It can fundamentally boost productivity and improve the efficiency of Australia's transport sector, which is the fastest-growing source of emissions nationally. As the shift to electric vehicles accelerates, RUC is essential to replace fuel excise revenue and ensure funding sustainability for transport. It can be a powerful new lever to realise Australia's emissions targets by supporting the transport sector to shift to low-emissions technologies by incorporating emissions-based charges – ensuring that electric vehicle users pay their way while charging more by size and emissions intensity.

We note the risk that if the charge is introduced too early, Australia could lose its hard-earned momentum in increasing ZEV uptake.

Recommendation 7: A national RUC scheme that prices externalities of driving and fuels, while also creating a new funding stream that supports sustainable, low-emissions transport choices.

This creates a number of direct and indirect productivity benefits, including:

- reducing costs due to congestion
- ensuring there is sustainable funding for road transport infrastructure and maintenance
- improving sustainable transport alternatives, such as public transport, through targeted reinvestment of RUC revenue, improving efficiency and reducing congestion
- stimulating wider economic benefits through improving public transport and more efficient transport networks to give a greater proportion of Australians access to jobs, especially across Australia's urban areas
- improving the reliability and efficiency of freight movements
- reducing Australia's infrastructure costs through efficiency improvements, enabling governments to make the most of current infrastructure assets, achieved through pricing-based demand management and increasing funding for public transport and rail freight.

Following advice provided to Australian Government stakeholders (Climateworks 2025d), we recommend the RUC:

- Provides Australians with clear incentives to choose electric vehicles (EVs) and ZE trucks by:
    - Shifting all vehicles to RUC regardless of fuel or technology, making pricing transparent and comparable across different vehicle types. A technology-neutral approach ensures effective policy design by removing parallel mechanisms. If the RUC is applied only to EVs, this risks turning away potential EV users. It could cause confusion when comparing EV running costs against those of internal combustion engine (ICE) vehicles and putting a higher administrative burden on EV users.
    - Incorporating emissions-based incentives to lock in the EV transition. This incentivises lighter ICE vehicles and lower-emissions vehicles and extends the current effect of fuel

excise – it is more expensive to drive emissions-intensive vehicles. Signalling that emissions-based charges could increase in the long term can support the phase out of ICE vehicles, starting with light vehicles.
    - Providing certainty for investment in a ZE truck fleet. We recommend delaying the introduction of RUC for electric trucks until they have a foothold in the fleet and ensure the business case stacks up.
    - Applying behaviour change analysis and insights to RUC design and implementation to ensure a smooth transition to RUC for all vehicle types.
- Be designed to reduce congestion to further lower emissions and boost productivity
    - Congestion creates emissions and economic costs. Without reforms, congestion costs in Australia are projected to reach around $39.8 billion annually by 2031 (Infrastructure Australia 2019). As vehicles sit in traffic, they generate emissions, and congestion creates pressure to build new road infrastructure, which creates more embodied emissions.
    - By incorporating congestion pricing – including in high-demand times and locations – RUC incentivises more efficient use of existing infrastructure and improves network reliability.
    - In the long term, if congestion pricing is not costed into RUC, the lower cost of running EVs could add to the problem. Australia would benefit from planning ahead for this potential issue to maximise efficiency.
    - Congestion pricing has been successfully implemented in countries around the world to improve travel times, with funds commonly reinvested into low-emissions, efficient transport choices, such as public transport. This reinvestment further cuts congestion and emissions. A location-based congestion component of RUC may need to be developed in partnership with Australian states and territories.
- Create a sustainable funding mechanism for the transport decarbonisation transition
    - Decarbonising transport requires significant investment over the coming decades in low- and zero-emissions technology, rail freight and public and active transport. A multi-component RUC scheme, incorporating congestion-based and emissions-based pricing alongside pricing for infrastructure use and maintenance, creates the opportunity to develop sustainable funding mechanisms to deliver Australia's net zero transport future.
    - To maximise benefits, emissions-based charges could be reinvested in transport decarbonisation measures and congestion-based charges into options such as public transport – further reducing emissions and congestion.
- Explore ways for Australia to realise important social benefits from introducing RUC
    - These include incorporating flexible pricing mechanisms for low-income groups and reinvesting revenue into, for example, public transport in regional and outer suburban areas. This would help provide greater low-emissions transport choices to areas currently underserved. Careful design is essential to ensure RUC does not disproportionately impact low-income groups.

Reviewing the Fuel Tax Credit (FTC) scheme to understand how a revised scheme could accelerate electrification and encourage investments into lower-emissions fuels would help Australia benefit from the transition - especially in the mining sector. A review could focus on ensuring it supports, rather than hinders, emissions reductions.

A targeted policy for low-emissions heavy vehicles

Climateworks supports further investigation into a targeted policy for low-emissions heavy vehicles. The uptake of ZE trucks needs to accelerate rapidly for Australia to reach its climate goals in a cost-effective way. Setting sales targets for ZE trucks may provide a first step ahead of exploring emissions intensity standards for heavy vehicles in more detail. While the total costs of ownership for ZE trucks are improving, the high upfront capital costs remain a barrier. Climateworks is currently undertaking research on opportunities to innovate in freight finance and boost investment. We would welcome the opportunity to share our findings with the Productivity Commission, which may shed light on this topic.

Phasing out EV-specific incentives

Climateworks advises extreme caution with phasing out state, territory or federal government incentives for EVs. While EV uptake is at around 10 per cent of new car sales in Australia, uptake of 73 per cent aligns with Climateworks 1.5ºC scenario modelling (Climateworks 2024d). To achieve more rapid uptake of EVs, Climateworks recommends demand-side as well as supply-side incentives. Over time, Climateworks suggests shifting incentives to target lower-income households (Climateworks 2022).

Other win-wins for productivity and emissions

Beyond the options set out in the interim report, Climateworks recommends exploring other options that create win-wins for productivity and emissions reduction. This includes exploring incentives to increase freight efficiencies, including optimising loads and deliveries, reducing structural and regulatory barriers to rail, and fostering a nationally harmonised approach to rail freight operations. Shifting more freight to rail through investment in intermodal terminals and rail network upgrades will help shift a greater proportion of freight onto lower-emission transport modes.. In a country as urbanised as Australia, investment in public transport can give businesses access to a wider pool of potential employees, making cities work more effectively as major drivers of productivity.

Scope 3

The government could take a leading role in conducting and publishing research on the economic implications of freight decarbonisation, particularly as transport emissions are increasingly coming under scrutiny through mandatory climate-related financial disclosures. As Scope 3 emissions reporting becomes standard, freight emissions will be directly relevant to businesses across the economy, exposing them to new regulatory and reputational risks. Delayed action by freight operators could lead to higher long-term costs, reduced access to international markets with strict emissions standards, and broader trade competitiveness risks for Australia. Proactively understanding and quantifying these impacts will support the development of policies that are both economically prudent and environmentally effective.

Speeding up approvals for new energy infrastructure

Productivity Commission draft recommendation 2.1: Reform national environment laws

Climateworks recommendation 8: Support regional planning with digital mapping tools and expanded strategic land use assessments

In May 2025, Climateworks and the Clean Energy Investor Group (CEIG) brought together state and territory governments to better understand the planning and approvals process for renewable energy at the state and territory level. Over two workshops, attendees discussed the barriers to improving renewable energy planning process, and what solutions are available to address slow approvals.

Workshop participants noted that pathways designed to unify processes between tiers of government are not functioning as intended. Bilateral agreements aim to reduce duplication, but achieving effective collaboration is inherently challenging when different agencies tackle the same issue with differing processes. Coordination between agencies can be strengthened through inter-agency working groups and parallel decision-making. This is supportive of the ‘strike force’ proposed by the Commission and the Coordinator General role though we would note the importance of clear frameworks for operation and decision-making roles to ensure success. This would include clear interaction between these teams and other similar entities like the Future Made in Australia ‘Single front door’.

A shared and complementary approach to environmental impact assessment can streamline processes at the subnational level and be integrated into forthcoming reforms to the Environment Protection and Biodiversity Conservation (EPBC) Act 1999 for more consistent and coherent policy outcomes.

Climateworks supports the Commission's recommendation to facilitate regional planning. This can be leveraged to yield a strategic approach to understanding impact, enabling lower-impact projects to move through the planning system more efficiently. Regional planning can also be used to harmonise the local and national policy context. Climateworks recommends additional government support for regional assessments, up to and including government assuming the responsibility for these assessments to accelerate priority developments.

Regional planning can be strengthened through the expanded use of strategic land use assessments. There is precedent for this in Victoria. VicGrid undertook a statewide strategic land use assessment to inform the six proposed renewable energy zones in the *2025 Victorian Transmission Plan* (VicGrid 2025). This took into account existing land uses and landscape features across the state from several, and sometimes competing, perspectives, including environment, cultural heritage, social, land use and engineering.

Climateworks recommends displaying the results of these assessments through digital mapping tools. Workshop attendees discussed the following benefits of digital mapping tools:

1. Informed decision-making
   Quality spatial data can help channel renewable energy into ideal locations, both from an economic and environmental perspective.

2. Minimising environmental harm
   Mapping biodiversity values provides better information up front to inform land use planning.

3. Unlock social license
   Community engagement can be integrated into the mapping process to identify areas to avoid and where community support is concentrated.[1]

4. Accelerate the approval processes
   Identifying sensitive areas up front can avoid or reduce land use conflicts.

5. Address data gaps
   This is particularly relevant in regional and remote areas, where assessments can lag.

Digital mapping can highlight where regulatory requirements are material to project development and which legislative instruments may be triggered in a particular location. This enables developers to assess the lowest cost, highest return pathway to approval. There is nothing to stop proponents from choosing a particular area, but the Australian Government can flag potential additional requirements that will affect costs, and what the constraints are. Making these tools publicly available to proponents, investors and regulators can direct development and capital flows towards suitable areas.

Climateworks has developed tools that could support this work, such as the Land Use Trade-Offs model v2 (LUTO2). This maps the best way to use and manage Australian land to meet climate and biodiversity targets without compromising economic growth and food and water security (Climateworks Centre 2024a). We have also developed the Natural Capital Measurement Catalogue that helps integrate natural capital considerations into business, financial and government decision-making. It facilitates convergence on a core set of consistent and comparable natural capital metrics that can be measured across all scales and different land use types (Climateworks Centre 2025b).

Statutory timeframes with clear accountability have been successfully implemented in some Australian jurisdictions. Clear milestones and shared expectations enable regulators to be fair and transparent. It also puts the onus on proponents to make a quality application from the outset.

[1] There's precedent for this in Tasmania. Mapping Important Places was developed and deployed to facilitate community consultation in the proposed North West Renewable Energy Zone. This enabled the community to identify important places and the Government to understand places of social value. This builds social licence into the planning process.

Looking abroad, Climateworks notes that the use of a 'deemed to approve' approach (where permit applications not responded to within a certain amount of time will be granted automatically) has been applied in Spain. Solar projects smaller than 150 MW and wind farms under 75 MW could bypass the country's lengthy Environmental Impact Assessment Procedure, provided projects are in low- or moderate-environmentally sensitive areas (Energy Transitions Commission 2023).

Attempting to be too comprehensive and aiming for optimisation across too many objectives can stall meaningful progress. The urgency of the transition compels us to act, iterate and improve. This supports the Commission's point that making comprehensive plans might be slow and inefficient.

Providing detailed data about environment and cultural heritage to proponents, communities and regulators is important. Standardised environmental reports with pre-populated information can give proponents what they need early and stop proposals being overly iterative.

While Climateworks supports the open sharing of information, we also note the risk of creating the impression or assumption that if something is not mapped, it does not exist. This risk is particularly pronounced for First Nations cultural heritage, as many of these sites remain unmapped. We note that collating the necessary range of information for strategic assessments will necessitate interagency coordination and collaboration, potentially across jurisdictions.

Climateworks supports national standards for community engagement. Establishing issue or impact-related stakeholder working groups that feed into the policy development process can support efficient input and targeted issue management. Local communities expect tangible benefits from renewable energy projects. However, disparities in how these benefits are distributed can lead to feelings of inequity and resentment. Identifying who will be impacted by a project can inform community benefit flows.

Climateworks supports using the *First Nations Clean Energy Strategy 2024–2030* as a baseline to build standards for engagement with Aboriginal and Torres Strait Islander people. We acknowledge and agree that appropriate resourcing of Aboriginal and Torres Strait Islander groups can facilitate engagement. We add and emphasise the importance of managing 'consultation fatigue'.

As noted by the New South Wales Department of Planning and Environment (NSW DPE 2022):

> 'Aboriginal communities may also be engaged at different phases and for different reasons throughout the project development (e.g. for other EIS studies such as Aboriginal cultural heritage assessments). It is important to coordinate engagement activities with Aboriginal communities to avoid duplication and "consultation fatigue".'

Climateworks recommends that the national standards require proponents and governments to invest their time in reviewing relevant studies and reports related to the community.

Consistent with NSW DPE (2022), Climateworks recommends that the national standards for engagement with Aboriginal and Torres Strait Islander people:

- identify areas of duplication with other studies and project activities
- prepare engagement activities in a way to serve dual purposes
- share engagement activities and outcomes as appropriate
- manage key messaging for the community
- establish a single point of contact.

Recommendation 9: Environment Information Australia curates a set of nationally consistent environmental metrics and measurement methods.

Climateworks supports the introduction of national environmental standards. Proponents and regulators have a shared need for clear benchmarks and guidance on unacceptable impacts. National

environmental standards can be aligned with the Global Biodiversity Framework to yield more strategic, coherent and consistent approaches to project approvals.

In addition, Climateworks recommends that Environment Information Australia (EIA) curate a set of nationally consistent environmental metrics and measurement methods. If EIA collects and provides high-quality and accessible natural capital datasets in readily available formats (at site and subnational levels), this will support robust decision-making.

Productivity Commission Draft recommendation 2.2 Set up a specialist 'strike team' for priority projects. Productivity Commission Draft recommendation 2.3 Establish a Coordinator-General for priority projects

It's critical that coordination is well resourced and defined across federal, state and territory governments. The Future Made in Australia Front Door is an example of an activity that needs to be coordinated with resources inside the Department of Climate Change, Energy, the Environment and Water that are bringing the picture together to accelerate approval times.

Productivity Commission draft recommendation 2.4: Consider the energy transition in approval decisions

Climateworks recommendation 10: Consider Australia's emissions reduction targets, renewable energy targets and actions in forthcoming sector plans as part of approval decisions.

The window to keep global warming within 1.5ºC is still open, but narrowing. Climateworks supports the Commission's recommendation to consider the energy transition in approval decisions. We recommend detailed consideration of Australia's emissions reduction targets, renewable energy targets and forthcoming sector plans as part of approval decisions.

The Australian Government has set a renewable energy target of 82 per cent by 2030, and many state and territory governments have set targets of 50 per cent or more by 2030 (Climateworks Centre 2024c). Renewable energy underpins the decarbonisation of all other sectors, and Climateworks modelling shows that electricity demand increases substantially as the country progresses towards net zero (Climateworks Centre 2023b).

Considering the energy transition in approval decisions can reduce fragmented policy implementation. State and territory policy-makers have noted the difficulties in filtering broad strategic objectives (like emissions reduction or renewable energy targets) into project-level decision-making. The Australian Government is currently discussing changes to the planning system and has indicated that energy projects are likely to be part of a reformed approach. We look forward to hearing more about these proposals and would be interested in discussing how the approach compares to Climateworks' current thinking with the Commission.

Addressing barriers to private investment in climate adaptation

Productivity Commission draft recommendation 3.2: Develop a nationally consistent climate resilience rating system for housing

Climateworks welcomes the recommended development of requirements and guidance for resilient housing. The Australian Government is in a good position to lead the development of a nationally consistent climate resilience star rating system for housing. Seventy per cent of existing homes were built before minimum energy efficiency requirements or adequate attention to disaster risks, leaving a legacy of homes that are not resilient in their current state. We note this increases the likelihood of households facing multiple cycles of disruptive events.

Recommendation 11: Integrate the climate resilience rating system into Built Environment regulatory frameworks

Climateworks recommends a national rating tool to complement processes for mandatory Development Assessment (DA), either through the National Construction Code (NCC) or planning approvals, so that it has the potential to be adopted as mandatory and is as seamless as possible for consumers and industry alike.

The climate resilience rating can be compatible with the home energy rating disclosure (HERD) framework to form a single energy and climate resilience rating tool, to avoid duplication and ensure a streamlined, consumer-friendly approach. This tool can be developed in tandem with the national adoption and implementation of the HERD framework. The framework should not be delayed by the development of this new tool.

Recommendation 12: Outcome-based ratings reflect location-specific hazards and property characteristics, including energy efficiency and heat exposure risk.

Climateworks recommends the rating system be outcome-based, with ratings reflecting potential damages from locational risks and property characteristics. Ratings can incorporate both location-specific climate hazards (bushfire, flood, cyclone risk, 'wet-bulb' temperature events, humidity levels and heatwave duration) and property characteristics (age, expected lifespan, structural integrity and existing thermal performance) to reduce embodied emissions.

Heat adaptation has a direct impact on the sizing of renewable energy systems, household health, community productivity and quality of life. The factors, in addition to the cost-of-living and housing affordability crises, underscore its importance. Seventy per cent of homes are not climate-ready as they were built before minimum energy efficiency code requirements for new homes. This has left a legacy of households without sufficient insulation or low-energy ways of keeping cool, placing households at significant risk during heat events. It will benefit many Australians to address this legacy of insufficient regulation.

Ratings can recognise both whole-of-home climate resilience and the provision of at least one climate-resilient room, with minimum sleeping space allocations (e.g. at least 2m² per occupant) that take cultural needs, including those of First Nations people, into account.

Resilient home ratings can be verified with evidence-based approaches and on-site testing (airtightness, insulation, ventilation, condensation management) to address the limitations of modelled compliance. New homes can demonstrate resilience rating at the point of sale, to prevent consumers from bearing retrofit costs for non-resilient builds.

Supporting material to guide resilience upgrades

Households, builders and insurers can be provided with upgrade pathways tailored to local climate hazards, building condition and budget – ranging from full retrofits to affordable, staged interventions (e.g. from establishing a climate-resilient room sized for the number of occupants to whole-house compliance).

In Climateworks' experience, the view that resilient, compliant homes significantly increase costs is poorly supported by evidence. Costs can be managed through design choices such as reducing total floor area, selecting cost-effective finishes and omitting gas infrastructure.

There's a role for the Government in establishing a rating tool development timeline that includes how tools will be incorporated into national mandatory regulations to send clear market signals. A national plan for resilient housing, built into the work undertaken by the Australian Building Codes Board (ABCB) to progress NCC, will provide industry with sufficient lead time for innovation, supply chain preparation and management/innovation to reduce any perceived cost increases. Dedicated funding can be provided for pilot studies in all Australian climate zones to measure the health, productivity and quality-of-life gains from resilience retrofits, reducing reliance on assumed values over time.

Building on existing work and lessons from the Nationwide House Energy Rating Scheme

Development of the rating system and supporting material can build on existing work and learn lessons from the development of the world-leading Nationwide House Energy Rating Scheme (NatHERS).

Real estate agents, conveyancers and maintenance contractors could be enabled to capture data for a resilient homes rating as part of their services, including heat exposure risk (wall to window areas, insulation, colour of roofing material), and risks such as flooding, bushfire and cyclones. Collection and recording of this data could be part of their services offered or collected routinely whilst attending properties for other reasons, such as house sale marketing or maintenance. This could be done alongside independent assessors and self-reporting. Integration into online real estate listings, alongside existing features like the number of bedrooms and bathrooms, would normalise climate resilience ratings in the property market.

Productivity Commission draft recommendation 3.3: Governments should agree on a series of actions to improve housing resilience over time

The Australian Government is in a good position to lead work with the states, territories and local governments to agree on a series of actions that will improve the resilience of housing stock over the coming decades.

Anchoring this work around time-specific and outcome-based goals for household-level resilience will help to account for climate damages and the effects of heat. The goals will form the basis for a shared understanding of how agreed actions will improve resilience. Actions can be staged in line with the expected pace of climate change and coordinated with public investment to achieve measurable improvements in precinct resilience.

Recommendation 13: The Regulatory Impact Statement for the climate resilience rating system accounts for full societal and household benefits, not limiting this to impacts on energy bills.

Climateworks recommends the Regulatory Impact Statement (RIS) for the climate resilience rating system accounts for full societal and household benefits, not limiting this to energy bill savings. A more representative assessment could include healthcare costs, number of sick days, sleep quality, reduced emergency accommodation needs during heatwaves, and levels of strain on community-level health systems, disaster recovery time, and costs associated with temporary housing.

RIS can include assumptions for all household benefits of climate-resilient homes, through careful use of cost assumptions where research is unable to specifically quantify financial benefits. The absence of precise financial quantification for some health and quality-of-life benefits need not delay their inclusion in the RIS. Agreed cost assumptions can be applied now, supported by future refinement.

Resilient design does not need to add significant costs to new home construction. The industry can innovate to locate savings, such as reducing the overall size of homes, using lower-cost internal fittings and omitting gas (creating savings from omitting the gas meter, infrastructure and plumbing) so that they can be delivered at the cost deemed acceptable while remaining high quality.

Which homes to rate?

An initial focus on housing in known high-risk areas and new homes will create the most impact. The climate resilience rating system includes proposed developments for housing on the green-belt, for homes not yet built, and new homes not yet sold. This process could be initiated in new housing.

The climate-resilience rating system can be applied as climate-resilient to the whole home and one room, including the climate-resilient room floor area and sleeping occupancy. That is, at least $2m^2$ (2m x1m) per home occupant, taking into consideration cultural needs, particularly First Nations people. This will enable cost-effective solutions for all household budgets and so as not to compound the housing crisis and affordability in the short term.

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