



Melbourne, Monday 15 September 2025

**Subject: Inquiry into the Productivity Commission's Interim Report on
*Investing in cheaper, cleaner energy and the net zero transformation***

Dear Commissioners,

The ARC Centre of Excellence for the Weather of the 21st Century welcomes the opportunity to contribute to the final report on *Investing in cheaper, cleaner energy and the net zero transformation*. We have provided comments on seven of the 12 recommendations.

While we are broadly supportive of the recommendations, further attention to details and potential trade-offs in the implementation process must be given.

Our submission emphasises the critical need for robust and transparent use of long-term, scientifically sound weather and climate knowledge and datasets to guide the energy transition. We note that priority projects and associated criteria have been defined without input from the scientific community. This risks unexpected underperformance in renewable energy resources as they relate to weather resources due to weather and climate changes at times of peak electricity demand.

We recommend that the Commissioners consider including energy efficiency, electrification, grid infrastructure, demand-side management, balancing the duck-curve, and transport efficiencies—other than the vehicles themselves—as part of the strategy to reach net zero.

We would be happy to discuss any subject raised in this submission.

Professor Christian Jakob

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The ARC Centre of Excellence for the Weather of the 21st Century is a consortium of world-leading climate and weather researchers based across five Australian universities, together with major domestic and international partner organisations, including the Bureau of Meteorology and CSIRO.

21st Century Weather aims to address these challenges by answering a vital question:
How will Australia's weather transform as our climate changes?

We will advance our understanding of atmospheric circulation and weather systems, and develop ultra-high-resolution climate models to enhance our understanding of Australia's weather and climate.

The foundational knowledge we create will enable policymakers, industry and communities to make better decisions, harness weather resources and help us prepare for high-impact weather.



We have highlighted our recommendations and additions in **blue**.

Part 1: Reducing the cost of meeting emissions targets

Draft recommendation 1.1: Reducing emissions in the electricity sector after 2030 (Edited)

Governments should prioritise introducing enduring, broad-based market settings in the electricity sector beyond 2030. The settings should:

- create nationally consistent incentives for ~~lowest-cost~~ **best-value** clean energy, irrespective of generation technology or jurisdiction
- embed **clean energy** investment incentives to ensure reliability and system security are maintained, **including at times of weather-driven demand spikes or shortfalls in supply**.

Governments should also phase out any jurisdictional- and technology-specific incentives **over time**.

Reason for change:

- **“Best value”** encompasses a balance of cost, efficiency and grid diversity.
- Adding **“clean energy”** removes ambiguity that reliability and system security will be achieved through the inclusion of battery storage, pumped hydro, grid-forming inverters, and not with coal and gas power plants.
- Adding **“including at times of weather-driven demand spikes or shortfalls in supply”** recognises that we aim to source most of our electricity from the weather and that the weather drives decisions around energy consumption.

Clarification sought:

- It is unclear what **“over time”** refers to. It could be within the next 10 years or by 2150.

Comment: We support national consistency and removing interstate variations, which will enable investments in multiple states. However, further safeguards should accompany this national program to ensure that it leads to states and territories adopting more ambitious incentive structures to accelerate the transition nationally (lifting the incentives in some states), instead of the least ambitious incentives (reducing the incentives of some states).

Draft recommendation 1.3: Introduce an emissions-reduction incentive for heavy vehicles and phase-out policy overlaps for light vehicles (Clarification sought)

The Australian Government should introduce a new emissions-reduction incentive to cover heavy vehicles. The incentive should be as technology-neutral as possible, meaning that it should create the same incentive to reduce emissions by switching from fossil fuels to electric vehicles, low-carbon liquid fuels or any other method to reduce emissions.

Now that the Australian Government has implemented the **New Vehicle Efficiency** Standard, it should phase-out the exemption of electric vehicles from the Fringe Benefits Tax, and state and territory governments should phase-out the exemption of **electric vehicles** from vehicle stamp duty and registration discounts.

Clarification sought: Does the recommendation equate electric vehicles to low-emissions vehicles?

Recommendation: Phasing out electric vehicle incentives should be halted until they account for a reasonable proportion of electric vehicle sales (e.g., 40%), as electric vehicles are distinct from low-emissions vehicles, which contribute to emissions and Australia’s carbon budget.

Draft recommendation 1.4: Apply frameworks to achieve **or exceed emissions targets **at that balance least cost and least environmental impact** and improve transparency (Edited)**

The Australian, state and territory governments should improve the transparency of emissions-reduction policies by consistently including estimates of their cost-effectiveness in impact analyses. Those estimates should routinely be assessed against agreed national carbon values.

The Australian Government should:

- task an independent agency with relevant expertise with developing national carbon values. These values – estimates of the implied carbon prices needed to meet Australia’s emissions targets – should be used consistently as policy benchmarks across government and in regular reporting on the cost-effectiveness of emissions-reduction policies
- design and evolve policy settings to be broadly aligned with these carbon values.

To support achieving net zero in 2050 **or earlier** at as low a cost as possible, the Australian Government should:

- develop a framework for extending emissions-reduction incentives to new sectors. The costs associated with any new policies to reduce emissions in areas like agriculture and household gas should align with the target-consistent carbon values
- continue work to ensure ACCUs are high integrity and seek to integrate ACCUs into every national emissions-reduction policy in the long term so hard-to-abate emitters face consistent incentives.

Reason for change:

- Adding “**or exceed**” and “**or earlier**” recognises that we are already at a point where we need to achieve large-scale “net negative” emissions, which means removing carbon from the atmosphere at a greater rate than we emit it, to limit catastrophic climate change. Further, emissions now increase the risks of catastrophic changes, which humans cannot reverse even with carbon dioxide removal technology. In contrast, reaching net zero faster has benefits for many generations to come.
- Adding “**that balance least cost and least environmental impact**” recognises that reducing emissions should not come at the expense of environmental impacts, and that the environment provides diverse ecosystem services, including acting as a carbon sink; having both objectives—least cost and least environmental impact—would ensure investments are cost-effective. This is particularly important considering the reliance on ACCUs to reduce emissions. The volatility of Australia’s land-carbon flux from year-to-year highlights how carbon uptake due to afforestation can rise and drop with climate variability. Climate extremes, like droughts and heatwaves, can also cause carbon reversals. For example, as the world warms, an increase in fire risk will most likely limit the land’s capacity to act as a carbon sink. Therefore, the durability of offsets and

carbon uptake must be considered when estimating net emissions, climatic factors must be considered to assess the contribution of carbon uptake projects, and environmental impacts should not be relegated.

Part 2: Reducing the cost of meeting emissions targets

Draft recommendation 2.2: Set up a specialist ‘strike team’ for priority projects (Edited)

The Department of Climate Change, Energy, the Environment and Water should set up a strike team focused on priority renewable energy projects. The strike team should:

- be adequately resourced to ensure all priority projects can be efficiently assessed under the Environment Protection and Biodiversity Conservation Act 1999 (Cth)
- integrate environmental, ~~and~~ clean energy **and weather-driven resource assessment** expertise.
- be issued with clear expectations, tools and escalation procedures
- work with state and territory counterparts to reduce duplication and share information and expertise
- **invest in identifying and prioritising projects that fill critical gaps in peak seasonal (summer or winter) and peak daily (morning or afternoon) electricity demand.**

Reason for change:

- Adding “**weather-driven resource assessment**” acknowledges that energy supply and demand is fundamentally weather-driven, and that perspectives from this area of expertise are required for robust decision-making.
- Adding “**invest in identifying and prioritising projects that fill critical gaps in peak seasonal (summer or winter) and peak daily (morning or afternoon) electricity demand**” recognises that we aim to source most of our electricity from the weather and that the weather drives decisions around energy consumption.

Draft recommendation 2.4: Consider the energy transition in approval decisions (Edited)

The *Environment Protection and Biodiversity Conservation Act 1999* (Cth) should be amended to require the minister to consider the needs of the energy transition when deciding whether to approve an energy project that will have a **significant** impact on a matter of national environmental significance, **including the weather-driven properties of the resource in meeting national energy needs, and Indigenous values.**

Reason for change:

- Adding “**including the weather-driven properties of the resource in meeting national energy needs**” highlights that the energy transition depends on the weather. A lack of knowledge about generation outputs during periods of high electricity prices means that a region may be identified as having an excellent average solar resource, but its value will depend on whether it is available at times of high electricity demand and high electricity prices, which is not necessarily related to the average. We recommend that

projects provide evidence of sustained renewable resources, using observations where possible, linked to long-term, scientifically sound weather and climate datasets.

- Adding “**and Indigenous values**” calls for Traditional Owners to be considered in decision-making that affects them.
- Overall, we believe that the energy transition must not be designed at the expense of the environment because the environment provides diverse ecosystem services, including acting as a carbon sink, and plays a key role in achieving Australia’s targets.

Comment: We note that this recommendation suggests that energy projects could be developed at the expense of environmental conservation. This statement contradicts the overall objective of this report, which is to “*reduce emissions in a way that we have productivity and living standards gains*”. We reiterate that reducing emissions should not come at the expense of “**significant**” environmental impacts, and that the environment provides diverse ecosystem services, including acting as a carbon sink, a key part of reaching emission targets.

Part 3: Addressing barriers to private investment in adaptation

Draft recommendation 3.1: Set up a **weather and climate risk information database covering all climate hazards and high-impact events (Edited)**

The Australian Government should coordinate with relevant federal, state and territory organisations to support development of a central climate- **and weather**-risk information database to cover all climate hazards in different parts of Australia. The database should enable the public, builders, developers, insurers, government planners and policymakers to get granular and accessible climate risk information, **supported by robust scientific research and expert assessment of the information provided**.

Reason for change:

- Adding “**weather-**” highlights the need for the database to include both long-term climate risks (such as trends in wind or solar resource) and short-term weather-driven risks (such as floods or energy system outages due to hazardous winds or bushfire).
- Adding “**high-impact events**” includes those events that are of significant impact but not necessarily hazardous to the community in a more traditional context. For example, a wind drought (period of low winds) might not be hazardous except when it limits energy supply if wind power is a significant source of energy for the grid.
- Adding “**supported by robust scientific research**” emphasises the need to involve the scientific community beyond major Government agencies, thereby leveraging the significant expertise that resides in academia and the private sector to inform energy transition decisions. The scientific community must evaluate new data or climate model ensembles to understand their limitations and appropriate uses.
- Adding “**and expert scrutiny of the information provided**” alludes to the dimensions of risk beyond hazards: the vulnerability and exposure, which are studied by the social sciences.

- Overall, the sources for the database must be transparent and open for evaluation, and the hazards and high-impact events need to be defined and further investigated.

Draft recommendation 3.2: Develop a nationally consistent climate resilience rating system for housing (Edited)

The Australian Government should lead development of a nationally consistent climate resilience star rating system for housing.

- The rating system should be outcome-based, with ratings reflecting potential damages from **weather** ~~climate~~ hazards **and high-impact weather events**. Ratings should account for location-specific **weather** ~~climate~~ hazards **and high-impact weather events** and the characteristics of a property.
- The rating system should be complemented by supporting material so that households, builders and insurers can easily identify upgrades that would improve a property's resilience.
- Development of the rating system and supporting material should build on work undertaken in this area and learn lessons from the development of the world-leading Nationwide House Energy Rating Scheme (NatHERS).

Reason for change:

- Adding **"weather and"** highlights that small time and space scale processes can generate high-impact weather hazards, such as flood, bushfires, extreme winds and extreme heat.
- Removing **"climate"**: Changing to **"weather hazards"** acknowledges that acute hazard events, such as storms, cyclones, hail, heatwaves and floods, all occur on weather timescales and are weather events, not climate events.