SUBMISSION

Submission to the Climate Change Authority

Submission to the 4th Annual Report Issues Paper

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The Australian Academy of Technological Sciences and Engineering (ATSE) is a Learned Academy of independent, non-political experts helping Australians understand and use technology to solve complex problems. Bringing together Australia's leading thinkers in applied science, technology and engineering, ATSE provides impartial, practical and evidence-based advice on how to achieve sustainable solutions and advance prosperity.

Limiting global warming to 1.5°C above pre-industrial temperatures is necessary to minimise climate-related risks for natural and human systems (IPCC 2021). The world is now reaching that limit. 2024 was the warmest year on record, reaching 1.55°C above pre-industrial levels (World Meteorological Organization 2025). While a single year above the target does not mean global climate goals are unattainable[1], there is now a 70% chance that the next five years will average above the 1.5°C threshold (United Nations 2025). Along with other nations, if Australia wishes to meet its climate commitments, it will need to accelerate the rate of emissions reductions, as it continues to work towards net zero emissions.

This transition will only be successful if all sectors of the economy are participating in the transition, with central coordination for both planning and reviewing the transition. ATSE has been proud to provide input to the Department of Climate Change Energy, the Environment and Water (DCCEEW) sectoral plans as they are being developed. The following recent submissions are also relevant to the Climate Change Authority's issues paper:

- Electricity and Energy Sectoral Plan
- Agriculture and Land Sectoral Plan
- Transport and Infrastructure Net Zero Roadmap

ATSE's recent report on Decarbonising Diesel Industries provides additional insights across these sectors. In addition to sector-specific work, nationally coordinated levers can help to accelerate Australia's emissions reductions trajectory. Speeding up approvals for renewable energy projects and strengthening the Safeguard Mechanism are key opportunities for regulatory change. Investing in research and development to support and accelerate the transition will be vital to continue to develop, identify and apply new emissions-reduction and low-carbon technologies, enabling Australia to meet its targets and benefit both economically and environmentally from the energy transition.

To support these goals, ATSE makes the following recommendations for the Climate Change Authority's Fourth Annual Report:

Recommendation 1: Uplift Australian research and development investment, including in energy and climate science, and low-carbon technologies.

Recommendation 2: Reform approvals processes across jurisdictions for green energy projects to accelerate the rollout of renewable energy generation, storage and transmission infrastructure.

Recommendation 3: Expand the coverage of the Safeguard Mechanism to include more facilities by reducing the emissions threshold required for facility inclusion.

Recommendation 4: Consider additional measures to encourage facilities to meet their Safeguard Mechanism obligations through genuine emissions reductions.

Investing in new knowledge and technologies to drive emissions reduction

Innovation and technology will be essential to meeting the challenge of emissions reduction, particularly in hard-to-abate sectors where suitable technology solutions do not currently exist. Practical zero emissions technologies still need development to support long distance heavy transport, zero emission grazing cattle and improvements in energy storage and distributed network management. Australian capacity to solve these challenges is hampered by low levels of research and development (R&D) investment, well below that of our international peers. Australia spends just 1.68% of its GDP on R&D, much lower than many international partners who spend 3% of their GDP (World Bank 2024). In energy, research, development and demonstration (RD&D) funding compares especially poorly to other nations. Energy R&D spending remains well below its peak in 2013 and far below that of international partners like Canada, Germany and Japan – both as a proportion of GDP and as a proportion of Australia's R&D investment (ACOLA 2022). The lack of investment in vital emerging technologies makes Australia dependent on overseas R&D to meet our net zero ambitions and solve uniquely Australian problems. Australia's landscape, seascape, demographics and energy mix make this reliance on overseas innovation untenable for reaching emissions reduction obligations. There is insufficient funding for commercialisation and pilot projects to de-risk and demonstrate scale-up of new low emissions technologies. A targeted uplift in funding through successful structures such as the Clean Energy Finance Corporation, Australian Renewable Energy Agency and their

[1] Warming thresholds are usually measured across 20-year averages to account for yearly variations.

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joint Clean Energy Innovation Fund would enable promising technologies to progress to translation and commercialisation. Another important area for multidisciplinary RD&D is in methods for carbon credits. The Australian Carbon Credit Units (ACCU) Scheme is an important part of Australia's climate change policy landscape and is underpinned by methods which incentivise the uptake of new technologies and practices in the agriculture sector. Rigorous testing of new methods is vital for rebuilding integrity and trust in the scheme. Increasing research into ACCU methods could expand the available methods and improve data measurement, modelling and provenance approaches.

Alongside energy RD&D, weather and climate science is a high priority area for climate adaptation and mitigation. There is an interplay between the energy transition and weather and climate science, with modelling enabling more resilient planning of energy projects. There is a need for R&D investment that strengthens and sustains Australia's climate science capability, encompassing observations, process studies, and climate modelling, and supports mutually beneficial international collaboration. Weather and climate science requires research infrastructure such as atmospheric composition observing networks, high performance computing infrastructure, and sovereign artificial intelligence capability. Strengthening the associated workforce is also critical, as highlighted by ATSE's response to the National Research Infrastructure Workforce consultation (ATSE 2025).

Increasing Australia's investment into R&D aimed at developing new and improved solutions to reduce emissions will help Australia to meet its climate goals while also developing new industries to support Australia's future in a net zero global economy.

Recommendation 1: Uplift Australian research and development investment, including in energy and climate science, and low-carbon technologies.

Removing barriers to clean energy projects

Improving the speed of deployment of new green energy and fuel projects will not only lead to lower emissions sooner, but also lower prices for energy consumers. Delays in the project development pipeline leads to increased project costs, resulting in higher consumer prices as electricity prices recoup this extra cost once deployed. Delays also lead to higher emissions as Australia relies on more expensive coal and gas generation in the meantime. Delays are primarily caused by two factors: the time taken to receive government approvals and community objections to projects.

Australia's current two-layered approval process causes significant delay in approving energy projects. Almost three quarters (74%) of renewable energy capacity in the development pipeline has yet to receive planning approval, with projects facing delays measured in years (Johnston 21 May 2025). This is becoming a major barrier to investment as projects are left in limbo while they attempt to navigate a complex web of state, territory and federal approval processes. Applications in different states can have wildly different outcomes, with application fees in New South Wales up to 150 times those in Queensland, while New South Wales approvals take up to three times longer (Riley 2024). Once at the federal level, projects take 500 days on average to get an approval decision (Productivity Commission 2025). The *Environment Protection and Biodiversity Conservation Act 1999* has been criticised as both failing to protect the environment and causing unnecessary delays in approvals (Samuel 2020). To maximise the benefit to Australia's emission reduction targets, the environmental approvals system should be streamlined and unified across states, territories and at the federal level, with clear standards and mandated approval timelines, to ensure projects are deployed quickly and at the lowest possible cost. Reforming approvals processes could also identify opportunities to reduce barriers to co-development projects, such as integrating solar panels with farming (agrivoltaics) or combining offshore wind infrastructure with aquaculture.

Several large-scale green energy projects have been significantly delayed by community concern regarding the impacts of these projects. As highlighted by Climate Change Authority's Sector Pathways Review as one of their six strategies to achieve net zero, strengthening social licence is critical to the success of energy projects (Climate Change Authority 2024). Offshore wind projects across the country from the Hunter to the South West have had vocal opposition from community groups. Misinformation has spread in

these communities, with unscientific claims of impacts on whale migrations and damage to marine life. This speaks to a need for genuine community consultation and intensified efforts to debunk misinformation to build trust and social licence. Building bipartisan support for this effort will be key: in a United States context, it has been demonstrated that co-partisan misinformation corrections were most effective (Benegal & Scruggs 2024). Additionally, high-standard consultation processes across all renewable energy industry sectors would help ensure that bad practice by individual actors does not compromise the opportunities for all players. Such practices need to consider local factors, including local industries, businesses, history, landowners and the Traditional Owners of the area. Exploring examples of good practices, community-led initiatives and expectation setting in Australia and overseas could help build new, fit-for-purpose approaches in the Australian context. While considering the concerns of local communities is important, the process should not be so open-ended as to lead to inordinate delays. The adoption of the EU approach of restricting permitting approvals and objections to one year for projects of Overriding Public Interest (OPI) is one option to consider as part of planning reforms.

Recommendation 2: Reform approvals processes across jurisdictions for green energy projects to accelerate the rollout of renewable energy generation, storage and transmission infrastructure.

Strengthening the Safeguard Mechanism

The Safeguard Mechanism currently applies to all facilities with 100,000 tonnes of carbon dioxide equivalent emissions each year, currently equating to 219 facilities in 2023-24 (Clean Energy Regulator 2025). Facilities are required to cap their total greenhouse gas emissions, with the cap reducing by 4.9% each year, to encourage net emissions reductions. Collectively, these facilities are responsible for around 30% of Australia's emissions (DCCEEW 2025). Reducing the emissions threshold for inclusion in the Safeguard Mechanism would help to increase the speed of emissions reductions without significant change to the regulatory environment. Data is already collected on facilities with 25,000 tonnes or more of emissions under the *National Greenhouse and Energy Reporting Act 2007*, making the identification of facilities and the implementation of such an expansion relatively straight forward. Such an expansion could be done gradually, reducing the emissions threshold for inclusion in the Safeguard Mechanism at the same rate as emissions caps are reduced (4.9% per annum), ensuring the threshold remains useful as emissions are reduced across Safeguard Mechanism facilities.

Facilities that exceed their emissions allowance can surrender Australian Carbon Credit Units (ACCUs) or Safeguard Mechanism Credits (SMCs) to make up for this gap. ACCUs are generated through activities that reduce carbon emissions, while SMCs are generated by facilities within the Safeguard Mechanism that successfully keep emissions below their required cap. The use of carbon credits is necessary for facilities where emissions reducing technologies or processes may not yet exist or are prohibitively expensive. However, permitting the unlimited surrender of ACCUs and SMCs allows facilities to avoid or delay making changes to reduce on-site emissions. ATSE's recent report on *Decarbonising Diesel Industries* suggests that strengthening cost signals via the Safeguard Mechanism could facilitate emissions reductions. Limiting the use of carbon credits for facilities that are unable to effectively reduce emissions due to technological constraints would encourage facilities that can reduce emissions to make on-site reductions. Another option would be to only allow the use of SMCs, but not ACCUs, to offset emissions over a facility's cap. As SMCs are generated only when other facilities do not meet their emissions limit, only using SMCs would ensure that onsite emissions reductions would occur across all facilities as limits are gradually reduced. ATSE's report recommends reviewing financial incentives, including the Safeguard Mechanism, in the context of diesel use.

Recommendation 3: Expand the coverage of the Safeguard Mechanism to include more facilities by reducing the emissions threshold required for facility inclusion.

Recommendation 4: Consider additional measures to encourage facilities to meet their Safeguard Mechanism obligations through onsite emissions reductions.

ATSE thanks the Climate Change Authority for the opportunity contribute to their 4th Annual Report. For further information, please contact academypolicyteam@atse.org.au.

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