ATSE POSITION STATEMENT

Pathways to Australian decarbonisation

Reaching Australia's 2035 emissions reduction target

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Australian Academy of Technological Sciences & Engineering

Climate science is clear: rapid and substantial emissions reductions are essential to limit global warming and avoid escalating long-term impacts.

ATSE supports an ambitious science and engineering-led pathway to net zero emissions by 2050, alongside the interim 2030 and 2035 emissions reduction targets of 43 per cent and 62-70 per cent respectively below 2005 levels. This target will only be achieved through the urgent application of an evidence-based approach grounded in climate science, the most effective and practical technologies, and the needs of the national population and economy.

Australia has both a significant opportunity and a responsibility to accelerate the national transition to net zero as one of the world's highest emitters per capita. The country is highly vulnerable to climate impacts, making the consequences of inaction substantial. Australia is projected to experience increasing extreme heat, flooding and bushfires, along with declining air quality, under a changing climate.*

ATSE presents a series of positions focused on enabling emissions reductions across all major sectors of the economy. Together, these positions are intended to support the Government's 2035 emissions reduction targets and place Australia on a credible, resilient pathway to achieving net zero emissions by 2050.

*(Australian Climate Service, 2025)

POSITION 1

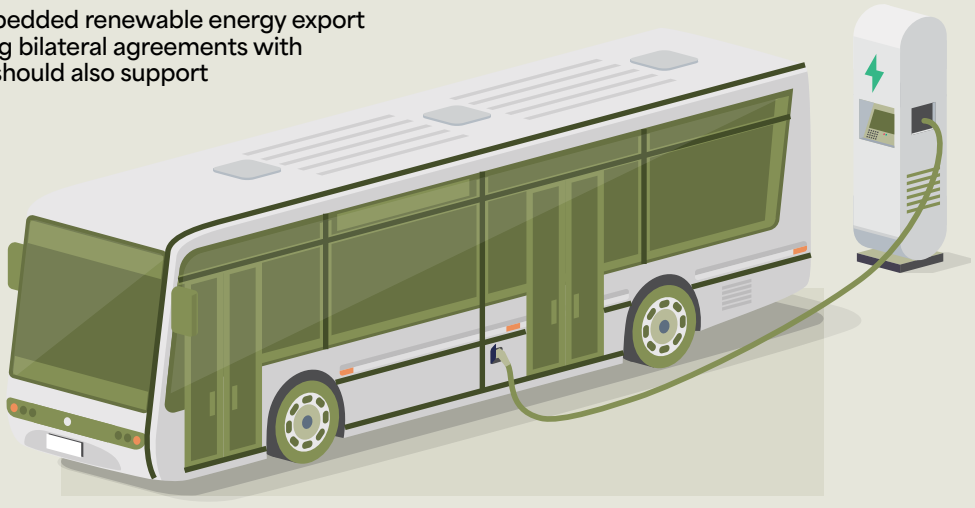
Accelerating the electrification and decarbonisation of Australia's energy systems will enable a globally competitive net zero economy.

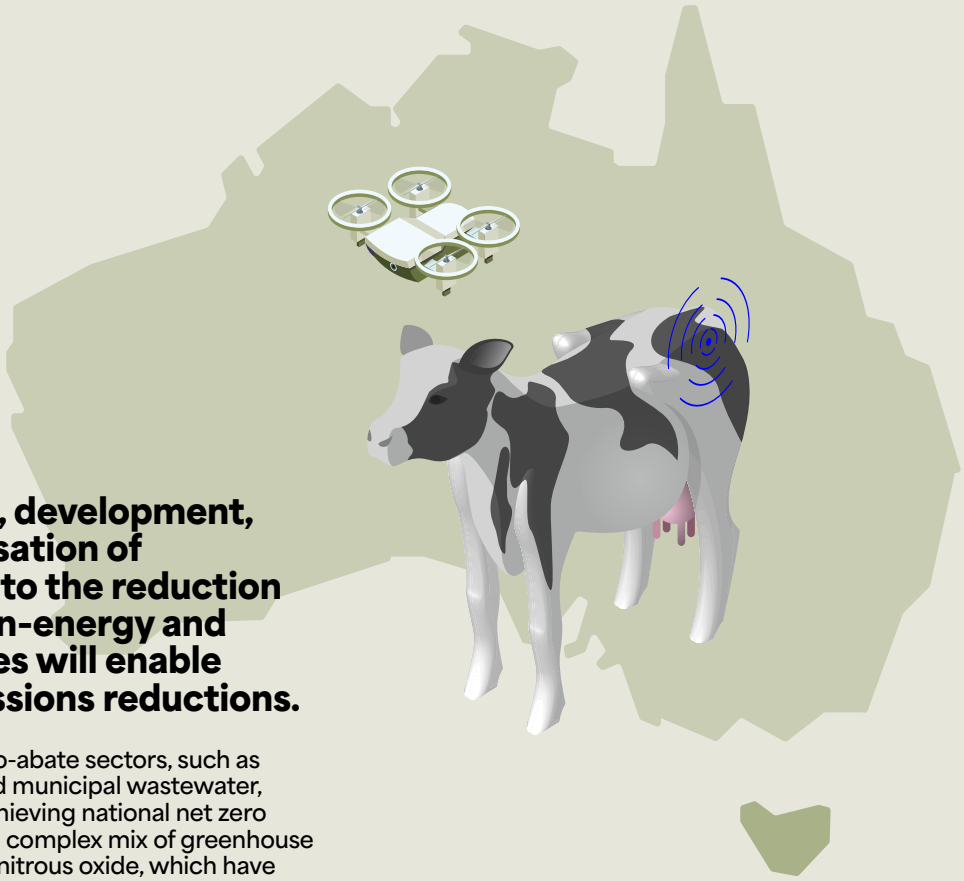
Electricity is Australia's largest source of emissions and offers the most advanced and immediate pathway to decarbonisation. Rapidly transitioning to a low-emissions electricity system is essential, not only to reduce emissions from electricity generation itself, but to enable economy-wide emissions reductions through the electrification of other sectors: transport, industry and waste, agriculture and land, resources and the built environment.

Domestic action must be complemented by efforts to address Australia's future export prospects and their embedded emissions profile in an increasingly competitive and carbon-constrained world. Decreasing demand for our current emissions-intensive commodity exports will need to be replaced by income from new value-added, renewable energy-based products (such as renewable hydrogen derivatives and green metals).

Achieving these outcomes requires a comprehensive suite of policies to optimise the deployment of currently available emissions reduction technologies. This includes accelerating and scaling up the construction of solar, wind and large-scale energy storage, all supported by expanding transmission, interconnection and digital management tools to balance supply and demand in real time. Further emissions reductions can be achieved by accelerating energy efficiency improvements, integrating consumer-owned assets such as rooftop solar and batteries at scale through tools such as virtual power plants, and investing in renewable and low-emissions fuels for applications that cannot yet be electrified. In parallel, emerging nuclear technologies, including both fission and fusion, should be monitored to assess their potential future viability within Australia's energy system.

The early development of embedded renewable energy export can be assisted by kick-starting bilateral agreements with key trading partners. Policies should also support the electrification of industrial processes and prioritise the commercialisation of breakthrough technologies in emissions-intensive sectors such as cement, steel and chemicals. Underpinning these efforts is the need to address social licence challenges in regional, rural, remote and urban Australia, which currently limit the pace and scale of energy system electrification.





POSITION 2

Investing in research, development, and the commercialisation of technologies critical to the reduction of emissions from non-energy and hard-to-abate sources will enable greater national emissions reductions.

Reducing emissions from hard-to-abate sectors, such as agriculture, mining, industrial and municipal wastewater, and solid waste is essential to achieving national net zero targets. These sectors produce a complex mix of greenhouse gases, particularly methane and nitrous oxide, which have significant short and long-term climate impacts.

Targeted innovations offer clear opportunities to address these emissions. In agriculture and transport, solutions such as feed additives or alternatives, genetic improvements in livestock, and renewable fuels can deliver meaningful reductions. In municipal wastewater treatment, operational optimisation, bioenergy conversion plants and emerging biological systems aim to reduce or mitigate fugitives. In the waste sector, improved waste diversion, enhanced recycling systems, and the capture of methane from landfills and organic waste streams can significantly reduce emissions while delivering co-benefits for resource efficiency.

While deploying current commercially available technologies is necessary, it will not be sufficient to meet Australia's long-term net zero objectives. It is therefore important to develop and commercialise new technologies that build on today's solutions. Achieving deeper and sustained reductions will require a comprehensive focus on those areas where technologies face significant commercialisation gaps and where the most effective pathways are yet to be fully defined – such as heavy industry, infrastructure, and agricultural emissions. This will require sustained investment in research, demonstration projects, and early-stage commercial deployment, supported by a mix of grant funding, debt and equity finance, and offtake agreements to de-risk investment and accelerate scale-up.

POSITION 3

The integrity of carbon accounting is fundamental to the credibility and effectiveness of Australia's emissions reduction efforts.

Carbon accounting must be rigorous, transparent and independently verified to ensure offsets represent real climate benefits and make use of embedded digital technologies for open accounting. Properly accounted offsets will play a key role in providing those emissions reductions that cannot be achieved through other means. Improving the accuracy and transparency of emissions measurement, reporting and verification (MRV) is critical to maintaining public trust, supporting effective policy design and ensuring that markets and regulatory mechanisms deliver genuine emissions reductions.

Strengthening emissions MRV and carbon accounting integrity will require sustained investment in research capability and measurement infrastructure. Advances in monitoring technologies and verification processes offer opportunities to improve emissions detection and reporting, particularly for gases such as methane across mining and gas infrastructure. Rigorous, independently verified carbon accounting must also be applied to land-based offsets to ensure environmental integrity and guard against over-crediting or non-permanence. Carbon capture and storage may play a role in addressing residual emissions; however, its deployment must be cautious, science-led and subject to robust governance and long-term monitoring.

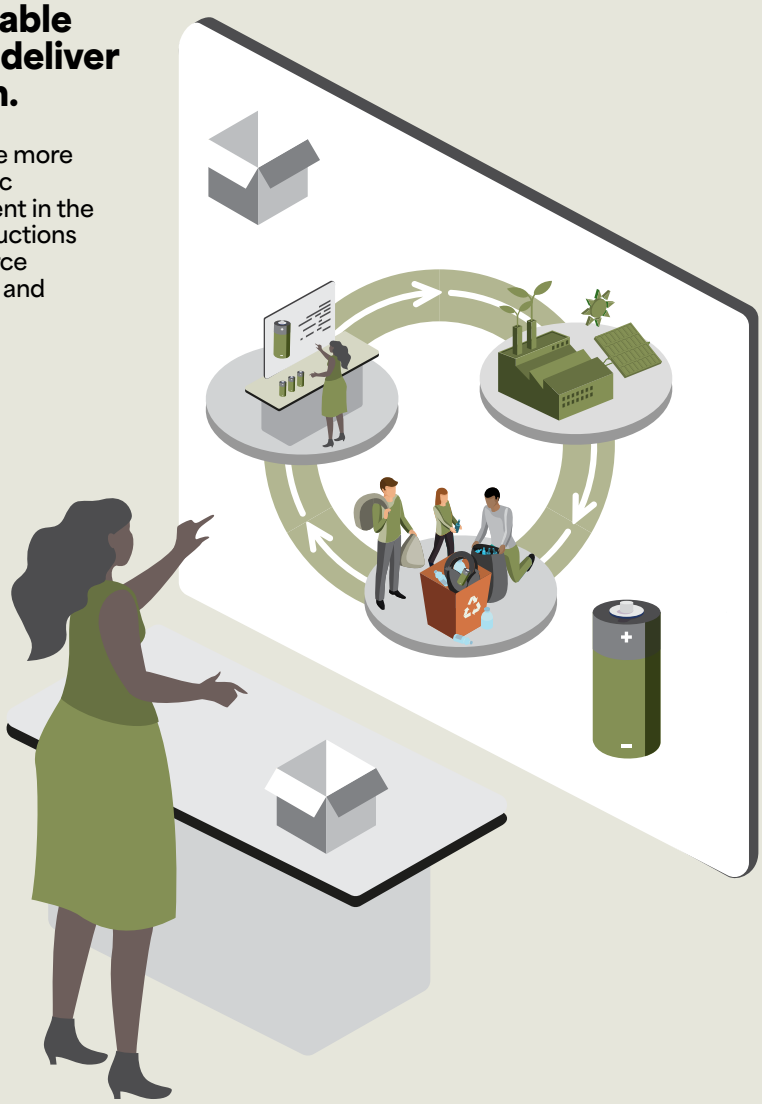
POSITION 4

Coordinated investment in skills development, planning and governance is essential to enable cohesive national action and deliver Australia's net zero transition.

Reaching national net zero targets will require more than individual technologies or sector-specific solutions. It will require coordinated investment in the enabling systems that support emissions reductions across the entire economy, including workforce capability, planning and delivery frameworks, and cohesive governance.

Embedding circular economy principles and energy efficiency across all sectors will be critical to reducing material use, lowering emissions and improving economic resilience. Designing products, infrastructure and systems for reuse, recycling and energy efficiency can deliver emissions reductions while supporting productivity and long-term competitiveness. At the same time, expanded education and workforce development is needed to ensure the workforce exists to deliver decarbonisation infrastructure at scale.

Reforming planning and regulatory systems is critical to accelerating the deployment of low-emissions infrastructure. Streamlined, transparent approval processes, alongside stronger cross-sectoral and cross-jurisdictional collaboration, will support cohesive national action, effective implementation, and reduced policy fragmentation.



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Australian Climate Service (2025), Australia's National Climate Risk Assessment
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Acknowledgement of Country

We acknowledge Traditional Owners of Country across Australia and recognise their continuing connection to land, water and community. We pay respect to Aboriginal and Torres Strait Islander culture, and Elders past and present.

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