

Submission
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INQUIRY INTO CLIMATE CHANGE (NET ZERO FUTURE) BILL 2023

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Australian Academy of Science submission on the New South Wales *Climate Change (Net Zero Future) Bill 2023*

Australia is vulnerable to the impacts of global warming, and a changing climate is already having and will continue to have significant impacts on Australia's people, economy, and environment. There is overwhelming evidence that land heatwaves, bushfires, storms, and coastal flooding have become more frequent and intense, and that the increased severity and frequency of these extreme events is a direct result of climate change.

These extreme events and their associated risks require scientific evidence to inform a robust policy response. New South Wales policy and emissions targets must be in alignment with the Paris Agreement temperature targets of limiting global temperature rises to well below 2 degrees, preferably to 1.5°C.

Human activities, specifically the burning of fossil fuels and the destruction of forests, are rapidly changing Earth's climate.¹ A transition away from fossil fuels is unavoidable if the world is to achieve the necessary reduction in emissions to achieve the Paris Agreement target.² There should be a statutory obligation for the New South Wales government to consider the environmental impact of emissions-intensive activities.

The Bill would be improved by implementing the following:

- Guiding principles, targets, and objectives should be aligned with globally agreed emissions reduction targets.
- Adaptation objectives should be supported by a just adaptation strategy.
- The Net Zero Commission's remit should include monitoring, reviewing, and providing science-based advice and recommendations to the Minister on targets for greenhouse gas removal.

Alignment of the guiding principles, targets, and objectives to globally agreed emissions reduction targets

Achieving the Paris Agreement goals of limiting global temperature rises to well below 2 degrees, preferably to 1.5°C, requires ambitious and coordinated action in all states and territories including New South Wales.

In principle, legislation of climate targets is a necessary step in responding to climate change impacts. The purpose of the proposed Act is to "give effect to the commitment established through the 2015 Paris Agreement." To meet the goal, the New South Wales target must be aligned with national targets.

The federal *Climate Change Act 2022* sets Australia's national emissions reduction targets as 43% below 2005 levels by 2030 and net zero by 2050. However, as previously noted by the Academy this is well below the thresholds identified in 2021 by the Climate Targets Panel, which found:

To be consistent with the Paris Agreement goal of limiting global warming to 1.5°C, Australia's 2030 emissions reduction target must be 74% below 2005 levels, with net-zero emissions reached by 2035.

The targets set by the proposed Act (part 2, clauses 8&9) should align with this more ambitious national target. For example, Victoria has set an emissions reduction target of 45-50% by 2030, 75-85% by 2035 and net zero by 2045.³

¹ Australian Academy of Science (2021). [Position statement: Climate change and Australian science.](#)

² Australian Academy of Science (2021). [The risks to Australia of a 3°C warmer world.](#)

³ The State of Victoria Department of Energy, Environment and Climate Action (2023). [Victoria's 2035 Emissions Reduction Target.](#)

Greater alignment is achievable by removing greenhouse gas emissions from sectors which have seen an increase from 1990-2019 including stationary energy for electricity generation and increases from transport emissions⁴. A 2021 [Academy](#) report identifies a range of opportunities to reduce emissions including electrifying the transport sector, industry, and buildings; increasing energy efficiency across the board; and reducing non-energy related greenhouse gas emissions from all sectors including industrial processes and agriculture⁵.

Adaptation objectives to be supported by a just adaptation strategy

The objective for adaptation (clause 10) would be enhanced with the development of a just adaptation strategy designed to be wholly inclusive of vulnerable and remote communities, as well as workers in industries whose jobs may be impacted by climate change mitigation and adaptation.

The [National Strategy for Just Adaptation](#), developed by Future Earth Australia, provides a blueprint for how local, state, and federal governments, and other stakeholders can embed justice in climate adaptation. It encompasses social, political, and behavioural strategies and systems change and enhances the adaptive capacities of people, places, and ecosystems in all their diversity. The strategy is a valuable resource to build on as the principles and governance underpinning New South Wales' adaptation objective are established.

There should be early, comprehensive, and coordinated consideration of the impact of adaptation policies on communities, including Indigenous communities, disadvantaged communities, rural communities, children, and young people.

The Net Zero Commission's remit should include monitoring, reviewing, and providing science-based advice and recommendations to the Minister on targets for greenhouse gas removal

The highest priority to achieve net zero emissions is to reduce greenhouse gas emissions (such as carbon dioxide) as much and as quickly as possible.

In parallel, scaling up carbon dioxide removal (CDR) is important to meet the temperature goals of the Paris Agreement.⁶ The Intergovernmental Panel on Climate Change Working Group III report [Mitigation of Climate Change](#) highlighted that “Affordable and environmentally and socially acceptable CDR options at scale well before 2050 are an important element of 1.5°C-consistent pathways”.⁷

The IPCC define carbon dioxide removal as “technologies, practices, and approaches that remove and durably store carbon dioxide (CO₂) from the atmosphere.”⁸ We emphasise that this definition includes storage, which is essential to ensure that removed emissions do not return to the atmosphere. Carbon dioxide removal fulfils three complementary functions:

1. further lowering net emissions in the near term with the goal of reducing warming
2. counterbalancing hard-to-abate residual emissions (for example, from agriculture, aviation, shipping and industrial processes) in order to reach net-zero CO₂ or greenhouse gas (GHG) emissions in the medium term
3. achieving or sustaining net negative emissions in the long term if deployed at levels exceeding annual residual emissions.⁹

⁴ Adapt NSW. [NSW greenhouse gas emissions](#).

⁵ Australian Academy of Science (2021). [The risks to Australia of a 3°C warmer world](#).

⁶ Smith et al. (2023). [The State of Carbon Dioxide Removal - 1st Edition. The State of Carbon Dioxide Removal](#). doi:10.17605/OSF.IO/W3B4Z.

⁷ Climate Change Authority (2023). [Reduce, remove and store: The role of carbon sequestration in accelerating Australia's decarbonisation](#).

⁸ IPCC (2022). [IPCC ARC WGIII: CDR Factsheet](#).

⁹ Smith et al. (2023). [The State of Carbon Dioxide Removal - 1st Edition. The State of Carbon Dioxide Removal](#). doi:10.17605/OSF.IO/W3B4Z.

Australia has been active in promoting land-based approaches such as afforestation, reforestation and carbon farming, but these approaches can only account for part of the large-scale greenhouse gas removal required. Oceans also have CO₂ storage potential, but critical questions around minimising harms and maximising co-benefits of ocean carbon storage need to be answered. Natural sinks alone will not be enough to draw down the required emissions from the atmosphere and further critical questions remain about the potential impacts of over-relying on our natural sinks, such as complications from ocean acidification.¹⁰

Last year, the Academy convened a [roundtable](#) on the scientific capability, research and collaboration needed to support breakthroughs in greenhouse gas removal. The roundtable identified a range of novel greenhouse gas removal and storage approaches, including direct air capture methods; ocean alkalinity enhancement; technologies that split CO₂ into carbon and oxygen; mineral carbonation; enhanced mineralisation; blue carbon; and using photosynthetic organisms.

The roundtable also discussed the need to further understand the benefits, risks, and limitations of removal of CO₂ (and other greenhouse gases), storage and use to inform decision making; and creating policy frameworks that can enable cooperation and development of suitable approaches.

The Portfolio Committee should consider including in the remit of the Commission to monitor, review, and provide science-based advice and recommendations to the Minister on targets for greenhouse gas removal.

To discuss or clarify any aspect of this submission, please contact Mr Chris Anderson, Director Science Policy at science.policy@science.org.au.

¹⁰ Australian Academy of Science (2023). [Greenhouse gas removal in Australia: A report on the novel negative emissions approaches for Australia roundtable](#).