

SHIFTING THE BURDEN:

AUSTRALIA'S EMISSIONS REDUCTION TASKS OVER COMING DECADES



A REPORT OF THE CLIMATE TARGETS PANEL, MARCH 2021

CLIMATE TARGETS PANEL: ABOUT THIS REPORT AND ITS AUTHORS

The Secretary General of the United Nations has made it clear that the world's current greenhouse reduction pledges are not enough to limit global warming to well below 2°C, the goal of the Paris Agreement, and has beseeched the parties to the Paris Agreement to more rapidly cut pollution. United States President Joe Biden has signalled that he will hold a global summit in the first 100 days of his presidency, at which he will ask countries to do more. Later in 2021, countries of the world will meet at the next global climate summit, the Conference of the Parties, where they will be asked to lift their emissions-reduction ambitions.

To do its fair share and to be compliant with the goals of the Paris Agreement, Australia must increase its emissions reduction targets. Australia's own Climate Change Authority (CCA) produced a key review in 2014, which set out the targets Australia needed to follow to help limit global warming to less than 2°C. Since then, the CCA has not updated this research. The authors of the current paper, the Climate Targets Panel, have prepared this report to ensure that debate about the targets Australia takes to these upcoming summits to meet the Paris Agreement 2°C goal are informed by sound science and policy.

The Climate Targets Panel is an independent group of Australia's most senior climate scientists and policymakers who have come together for the purpose of ensuring that debate about Australia's emissions reductions targets are informed by sound science and policy.



John Hewson AM

John Hewson AM is the former Leader of the Liberal Party and the Federal Opposition. He is Professor in the Crawford School of Public Policy at the Australian National University, and an Adjunct Professor at Curtin, UTS, Canberra and Griffith Universities. He is Chair, Business Council for Sustainable Development Australia, Chair, BioEnergy Australia, and a Patron of the Smart Energy Council and the Ocean Nourishment Foundation.



Professor Will Steffen

Will Steffen is Emeritus Professor, Fenner School of Environment & Society at the Australian National University. He was the Inaugural Director of the ANU Climate Change Institute, from 2008-2012. From 2004 to 2011 he served as science adviser to the Australian Government Department of Climate Change. From 2011 to 2013 was a Climate Commissioner on the Australian Government's Climate Commission and is currently a Councillor with the Climate Council of Australia. He was a member of the Multi-Party Climate Change Committee, established in the minority Federal Parliament of 2010, which advised on the establishment of the carbon price and the 'Clean Energy Future' package.



Professor Lesley Hughes

Lesley Hughes is a Distinguished Professor of Biology and Pro Vice-Chancellor (Research Integrity & Development) at Macquarie University. She is an ecologist whose main research interest has been the impacts of climate change on species and ecosystems, and the implications of climate change for conservation. She is a former Lead Author in the Intergovernmental Panel on Climate Change's 4th and 5th Assessment Report, a former federal Climate Commissioner and currently a member of the Wentworth Group of Concerned Scientists and a Councillor with the Climate Council of Australia.



Associate Professor Malte Meinshausen

Malte Meinshausen is founding Director of the Climate & Energy College at the University of Melbourne and Co-Director of the Energy Transition Hub. Before coming to The University of Melbourne, he was a senior researcher at the Potsdam Institute for Climate Impact Research (PIK) from 2006 to 2011 and continues close collaborations with the Potsdam Institute. He has been contributing author to the Fourth and Fifth Assessment Report of the Intergovernmental Panel on Climate Change, the Special Report on 1.5°C and is a lead author for the forthcoming Sixth IPCC Assessment Report.

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1.0 INTRODUCTION

This is the second report of the Climate Targets Panel.

Earlier this year, we published our findings about Australia's required emissions reduction targets if we are to do our fair share in limiting global warming to well below 2° and 1.5° Celsius respectively, both of which are goals referred to in the Paris Agreement.¹

We found that for Australia to remain within its remaining '2°' carbon budget, we would need to reduce emissions by 50% on 2005 levels by 2030, reaching net zero emissions by 2045. To remain within the remaining '1.5°' carbon budget, the targets would be 74% below 2005 levels by 2030 and net zero emissions by 2035.

Since the release of our report, there has been public discussion of Australia retaining its existing 2030 emissions reductions targets of 26-28%, but then proceeding to net-zero by 2050. We understand some of the Prime Minister's recent comments to have aired such a possibility, with references to net-zero 'as soon as possible, and preferably by 2050'.

This second report considers what such an approach would mean for Australia's emissions reductions efforts over the next three decades to 2050.

2.0 AUSTRALIA'S CARBON BUDGET

The first point to stress is that a '26-28% by 2030, net-zero in 2050' approach exceeds Australia's 2° and 1.5° carbon budgets. In other words, the '26-28% by 2030, net-zero in 2050' approach is not consistent with Australia doing its fair share under the Paris Agreement.

As we concluded in our January 2021 report, Australia's remaining 2° carbon budget from 2021 onwards is 6,161 Mt CO₂e and the 1.5° budget is 3,521 Mt CO₂e. If Australia was to reach net zero by 2050 after only a 26-28% reduction on 2005 levels by 2030, the 2° budget would be exceeded by 2,813-2,998 Mt CO₂e and the 1.5° budget by 5,453-5,638 Mt CO₂e.

If Australia were to aim for net-zero in 2050 and not earlier, then a 2030 target of 58% reduction on 2005 levels would be required, as we found in our January 2021 report.

We are therefore alarmed by recent discussion of Australia adopting a net-zero by 2050 target without amending its 2030 target. Such a pathway would not only exceed Australia's remaining carbon budget, it would be inconsistent with the call for countries to upgrade their 2030 ambition prior to the next Conference of the Parties in Glasgow and would make Australia's overall emissions reduction task far more challenging and emissions reduction trajectory steeper.

¹ Climate Targets Panel (2021) Australia's Paris Agreement Pathways: Updating the Climate Change Authority's 2014 Emissions Reduction Targets <<https://www.climatecollege.unimelb.edu.au/files/site1/docs/%5Bmi7%3A%5D%5D/ClimateTargetsPanelReport.pdf>>

3.0 EMISSIONS PROFILES 2020-2050

If Australia reduces emissions on a linear trajectory between 2020 and 2030 to 26% below 2005 levels, Australia will emit 4832 Mt of CO₂e across the decade 2021-2030 and a total annual net emissions in the year 2030 of 455 Mt of CO₂e.²

This trajectory would see Australia only achieving a **1.2% annual reduction in emissions across the 2020s**, with a total annual average reduction of 6.2 Mt CO₂e per year.

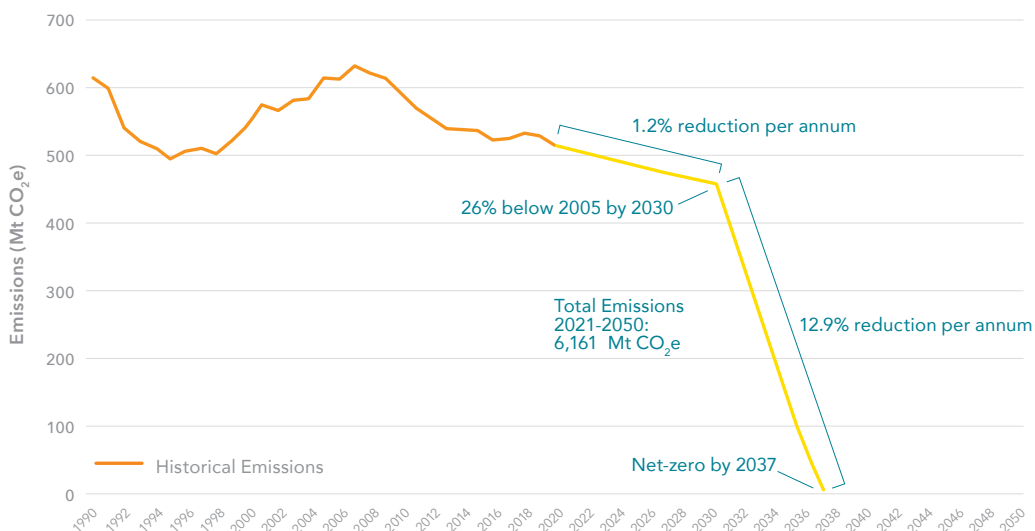
Notably, this trajectory would already rule out Australia achieving the 1.5° temperature goal of the Paris Agreement, with Australia’s total 1.5° budget being exceeded in 2028.

3.1 26% by 2030, compliant with 2° carbon budget

If Australia persists with its 26% by 2030 target but decides to remain within its 2°C budget, Australia would only be able to emit 1,329 Mt of CO₂e after 2030. The task in the decades after 2030 thus become extremely challenging. If done linearly, **a 12.9% reduction in emissions per annum would be required, representing a ten-fold increase in ambition compared to the 2020-2030 period, and the reaching of net-zero emissions by 2037.**

Such a shift would require an annual emissions reduction of 66.8 Mt of CO₂e, slightly more of a reduction than what would occur by removing every single one of Australia’s cars and light commercial vehicles from the road, but being required to do so each and every year.³

Figure 1: Paris-compliant emissions trajectory for 2°C



² While 26% is at the lower end of the 26-28% below 2005 by 2030 target range that Australia has adopted, the findings vary little when modelling the impact of a 28% below 2005 by 2030 target. Given Australia is still not on track for achieving the lower 26% target, and given that Australia has not made a binding pledge to do more than 26%, we have only included the 26% scenario in the text above.

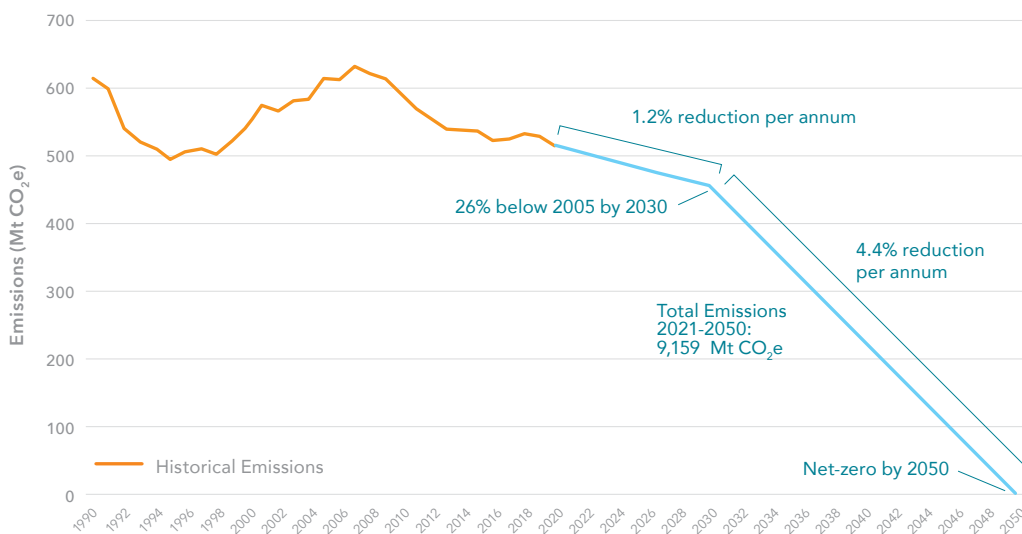
³ Department of Industry, Science, Energy and Resources (2020) *Australia’s Emission Projections 2020* <<https://www.industry.gov.au/sites/default/files/2020-12/australias-emissions-projections-2020.pdf>>

3.2 26% by 2030, net zero in 2050, exceeding 2° carbon budget

If the government proceeds with targets of 26% below 2005 levels by 2030 and net-zero by 2050, Australia would emit a further 9,159 Mt of CO₂e between 2021 and 2050, exceeding Australia's remaining 2°C carbon budget by 2,998 Mt of CO₂e and remaining 1.5°C budget by 5,638 Mt.

Additionally, if Australia was to reduce emissions linearly from 26% below 2005 levels in 2030 to net-zero in 2050, as has been suggested, **a 4.4% reduction in emissions per annum would be required**, representing a more than tripling of the task compared to the 2020-2030 period, and a required reduction of 22.8 Mt of CO₂e per year.

Figure 2: Net-zero 2050 with current 2030 targets



However, as stated above, even this increase in ambition would not be consistent with the Paris Agreement and with Australia doing its fair share to limit global temperature rise to well below 2°C, **with Australia's 2°C budget exceeded in 2034.**

4.0 CONCLUSION

Whilst the adoption of 'net zero by 2050' has been contemplated in political discussion, this report shows clearly that persisting with a 26-28% cut by 2030 means that people in Australia in the 2030s and 2040s will be required to reduce emissions between 3 to 10 times as much as people in the 2020s.

The source of the problem is not the 'net-zero' ambition, it is the low 2030 target. The 26-28% target will put a significantly higher emissions reduction task on Australian's in the years after 2030.

Such steep pathways in the year after 2030 are unnecessary, but to remain within Australia's remaining 2°C carbon budget and to spread the task evenly over future decades, the 2030 target must be lifted to at least 50% below 2005 levels.

It is absolutely critical that Australia stops being an international laggard on emissions reductions and steps up to do its fair share. There is no time to waste. Not only will strong and concerted policy action in the next decade reduce the existential risks that climate change poses to our economy, environment and health, it will underpin the opportunities for accelerating investment in new manufacturing, clean exports, and clean jobs. The cost of action will be a fraction of the cost of inaction.

NOTES ON TERMINOLOGY AND PROBABILITIES

The Paris agreement commits parties to keeping global temperatures well below 2°C. The 'global carbon budget' approach adopted by the Climate Change Authority is based on projected global warming of 2°C. Other approaches to calculating a well below 2°C budget (such as a budget based on limiting global warming to 1.8°C) would yield even more ambitious targets, but to maintain consistency with the original 2014 CCA approach, these have not been explored here.

The approach of the CCA and of this analysis has been to prepare '2°C carbon budgets' on the basis of a 67% likelihood of remaining below 2°C. The 67% probability (of remaining below 2°C) has been chosen because it is the figure used by the Climate Change Authority and also because that probability makes it likely that the desired outcome will be achieved. However it remains for many an unacceptably high risk, given that it effectively means a 1 in 3 chance of not achieving the outcome. Higher probabilities would result in more ambitious emissions reduction targets.

The CCA has not considered a 1.5°C budget and therefore has not considered what probability to apply to a 1.5°C budget. Given already-measured severe warming of 1.1°C, drastic urgent action is required to remain below 1.5°C. Recognising the challenge, the published 1.5°C carbon budgets relied upon in this analysis have presumed only a 50% (not 67%) probability of limiting global warming to below 1.5°C.

Budgets are expressed in terms of probabilities of remaining below a given temperature for a number of reasons, one of which is the possibility of carbon cycle feedbacks. This refers to self-reinforcing changes in nature that contribute to global warming. An example is the thawing of Arctic permafrost as the planet heats, which releases carbon dioxide and methane to the atmosphere which in turn contribute to global warming. The main concern of scientists is that some of these feedback reactions may become unstoppable, severely affecting the ability to limit global warming to the specified temperature, regardless of future emissions.

All references to tonnes of emissions are to tonnes of CO₂e (carbon dioxide equivalent) gases. The reference to 'GWP' in the Climate Change Authority 2014 report is to the 'global warming potential' of various gases, which measures how potent they each are as greenhouse gases in comparison with CO₂. Although CO₂ is the main source of climate pollution, other gases - such as methane - also contribute to global warming. As such, most standard measurements of greenhouse gas emissions (including the Australian government's) cover not just carbon dioxide, but also other greenhouse gases. These other emissions are measured in terms of the equivalent CO₂ emissions.

When considering Australian emissions, figures are in megatonnes (Mt). One megatonne is one million tonnes. When considering global emissions, figures are in gigatonnes (Gt). One gigatonne is one thousand megatonnes.

All historical emissions data for Australia is sourced from The Department of Industry, Science, Energy and Resources' *Quarterly Update of Australia's National Greenhouse Gas Inventory: June 2020*. The September 2020 figures were released after this report was finalised, and the government has adopted a new and more accurate method of accounting for the GWP of methane. This change will only increase the level of ambition required by the government, as the GWP of methane is now increased, leaving less of the carbon budget available to Australia and the world. Future reports will incorporate this new methodology.