

Updating Australia's climate targets based on current science

Overview

The Paris Agreement includes a goal of limiting global warming to well below 2 degrees while still continuing action aimed at 1.5 degrees. In 2014, Australia's Climate Change Authority reviewed the then available science and determined that to be consistent with the Paris 2 degrees goal, Australia's emissions reduction targets would need to be 40-60% reduction on 2000 levels by 2030 (which translates to 45-65% on 2005 levels by 2030) before reaching net-zero by 2050.¹ This CCA calculation was based on assessing the remaining global 'carbon budget' and allocating Australia's fair share of that budget at 0.97%.

Since the CCA report, global emissions have increased and new scientific studies have been presented to the Paris Agreement parties, notably the 2018 IPCC special report on remaining below 1.5 degrees², the most recent UN Emissions Gap Report³ and the Science Advisory Group Report to the 2019 Global Climate Action Summit⁴, the latter of which confirmed the current global pledges have us on track for up to 3.4 degrees of global warming, and that the world would need to do at least 3 times as much as currently pledged to stay below the 2 degrees goal.

This document seeks to update the 2014 CCA report to take account of recent science. It concludes that by using the same methodology as the CCA and accepting its allocation of Australia's fair share, and assuming that emissions will be as projected by official government figures until 2022, the time of the next election, Australia's 2030 targets would now need to be:

- 2 degrees
 - Starting now (2020): a 49% reduction on 2005 levels by 2030 with net zero emissions by 2044
 - Starting after the next election (2022): 48% reduction on 2005 levels by 2030 with net zero emissions by 2043
- 1.5 degrees
 - Starting now (2020): 75% reduction on 2005 levels by 2030 with net zero emissions by 2035
 - Starting after the next election (2022): 80% reduction on 2005 levels by 2030 with net zero emissions by 2033

The analysis also finds that according to the government's projections, we are currently on track to exceed the budget required for 1.5°C in 2027 and to exceed the budget for the Paris goal of 2 degrees by 2032.

Analysis

In February 2014, the Climate Change Authority (CCA) released a *Targets and Progress Review* of Australia's greenhouse gas emissions reduction goals and report on progress towards them.

¹ Climate Change Authority (2014) *Reducing Australia's Greenhouse Gas Emissions— Targets and Progress Review Final Report* <<http://climatechangeauthority.gov.au/reviews/targets-and-progress-review-3>>

² Intergovernmental Panel on Climate Change (2018) *An IPCC Special Report on the impacts of global warming of 1.5°C* <<https://www.ipcc.ch/sr15/>>

³ United Nations Environment Programme (2019) *Emissions Gap Report 2019* <<https://www.unenvironment.org/resources/emissions-gap-report-2019>>

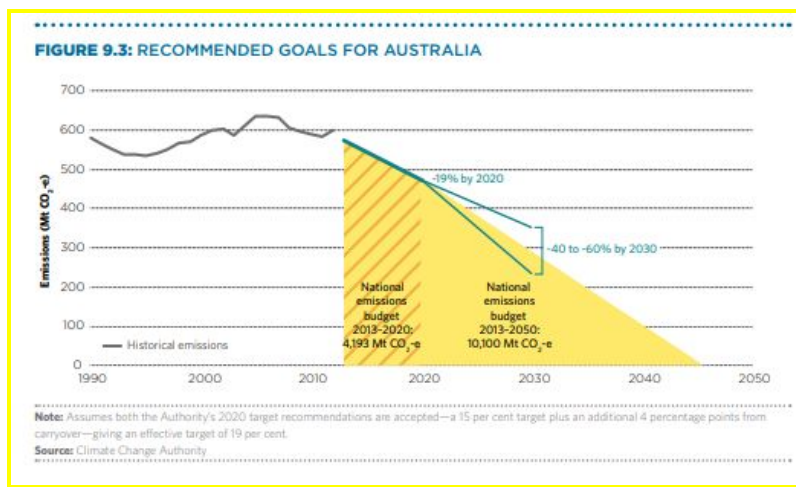
⁴ Science Advisory Group of the UN Climate Action Summit 2019 (2019) *United in Science* <https://public.wmo.int/en/resources/united_in_science>

The approach taken was to firstly determine the remaining global ‘carbon budget’ consistent with the Paris Agreement goal of 2 degrees and to then assess Australia’s ‘fair share’ of this budget. The CCA found that to remain well below 2 degrees (the Paris goal), the remaining global carbon budget from 2000 to 2050 was 1,700 GtCO₂e.

The CCA considered various options to determine Australia’s ‘fair share’ of the global carbon budget and ultimately used a ‘modified contraction and convergence’ approach.

Australia’s ‘fair share’ was determined to be 0.97% of the global budget, creating a budget of 10.1 GtCO₂e for 2013-2050.

On this basis, Australia’s emissions targets were derived. A ‘straight line’ approach was then taken, spending the remaining budget in a linear fashion heading out to zero emissions by 2046 (see Figure 9.3 below). From here, a 2030 target was derived.



The CCA proposed that to meet the Paris goal of remaining well below 2 degrees, Australia would need to reduce greenhouse emissions by 40-60% on 2000 levels by 2030, which equates to 45-65% on 2005 levels by 2030.

The CCA’s approach has been broadly accepted and used since then to inform, for example, the ALP and Victorian Government’s own targets.

Updated emissions and science since 2014

As noted, the CCA found in 2014 that the remaining global carbon budget from 2013-2050 was 1090 GtCO₂e and that Australia’s ‘2 degrees’ budget was thus 10.1 GtCO₂e.

Since that time, further global emissions updates have been made available, including:

- IPCC Special Report on the impacts of global warming of 1.5°C⁵
- Emissions Gap Report 2019 (UN Environment Programme)⁶
- United in Science (Science Advisory Group to UN Climate Action Summit 2019)⁷

⁵ Intergovernmental Panel on Climate Change (2018) *An IPCC Special Report on the impacts of global warming of 1.5°C* <<https://www.ipcc.ch/sr15/>>

⁶ United Nations Environment Programme (2019) *Emissions Gap Report 2019* <<https://www.unenvironment.org/resources/emissions-gap-report-2019>>

⁷ Science Advisory Group of the UN Climate Action Summit 2019 (2019) *United in Science* <https://public.wmo.int/en/resources/united_in_science>

A June 2018 paper, *Greenhouse Gas Emissions Budgets For Victoria*,⁸ authored by Associate Professor Malte Meinshausen, Yann Robiou Du Pont and Anita Talberg of the Australian-German Climate and Energy College, assessed whether the CCA budget “continues to be valid in the context of scientific and methodological developments”.

After re-evaluation, they concluded that “a budget in the vicinity of the former CCA budget is relatively certain to be in line with meeting the 2°C target and the Paris Agreement’s decision to limit warming to ‘well below’ 2°C.

They also re-evaluated the CCA’s determination of 0.97% as Australia’s ‘fair share’ and concluded it remained ‘valid and within a plausible range’.

Given these findings, they recommended to further change the CCA budget as follows:

- the remaining global budget from 2000 to 2050 should be revised from 1700 Gt to 1750 GtCO₂e
- Australia’s 2013-2050 budget was therefore 10.4 GtCO₂e

Implications

Australia has emitted more pollution in the years 2013 to 2020 than envisaged in the 2014 CCA report.⁹ Australia’s emissions during this period total 4261 MtCO₂e. As such, of the 10.4 GtCO₂e 2013-2050 budget for the Paris goal of well below 2 degrees, only 6139 MtCO₂e currently remains.

Further, the government has issued projections of the amount of pollution that will be emitted between now and the latest year for the next election (2022). The projections are 523.9 MtCO₂e in 2021 and 522.1 MtCO₂e in 2022, a total of 1046 MtCO₂e.

As such, at the time of the next election, only 5093 MtCO₂e (10.4 GtCO₂e – 4261 MtCO₂e – 1046 MtCO₂e) will remain of the 2013-2050 ‘2 degrees’ carbon budget.

Paris ‘2 degrees’-compatible targets starting from now (2020)

If Australia were to adopt a ‘zero by 2050’ approach starting from now (2020), then using the same ‘straight line’ projection of the CCA would result in a 2030 target of 49% on 2005 levels, and net zero emissions by 2044.

A simple CCA-style ‘straight line’ projection out to ‘zero by 2050’ starting from 2020 will involve total future emissions of 7740 MtCO₂e. This would exceed the remaining 2 degrees budget by 1601 MtCO₂e.

In other words, in the absence of stronger early targets, simply adopting a ‘zero by 2050’ target is incompatible with the Paris goal of staying well below 2 degrees.

Paris ‘2 degrees’-compatible targets starting from the next election (2022)

⁸ Meinshausen, M., Robiou du Pont, Y. and Talberg, A. (2018) *Greenhouse Gas Emissions Budgets for Victoria* <<https://engage.vic.gov.au/climate-change-targets-2021-2030>>

⁹ Department of Agriculture, Water and the Environment (2019) *Australia’s emissions projections 2019* <<https://www.environment.gov.au/climate-change/publications/emissions-projections-2019>>. Projections are used from the chart data for 2020 and 2021/22 where identified.

If the start year is shifted to 2022 for a 'zero by 2050' straight line approach, then the 2030 target would be basically the same as in a 2020 start case, i.e. 48% on 2005 levels, with net zero by 2043. Because of the later start date for serious decarbonisation, while the 2030 target remains approximately constant, the net zero year must be brought forward to stay within the 2°C budget.

Assuming government projections are correct and that annual pollution at 2022 will be 522.1 MtCO₂e, a simple CCA-style 'straight line' projection out to 'zero by 2050' starting from 2022 will involve total future emissions of 8094 MtCO₂e. This exceeds the remaining 2 degrees budget by 1955 MtCO₂e.

In other words, because so much of the 2 degrees carbon budget will have been spent between 2013 and 2022, simply adopting a 'zero by 2050' target from 2022 is also incompatible with our Paris '2 degrees' budget.

1.5°C Budget

Using the same methodology as set out above for 2 degrees, in March 2019, a paper by Associate Professor Meinshausen, *Deriving a global 2013-2050 emission budget to stay below 1.5°C based on the IPCC Special Report on 1.5°C*¹⁰, calculated a global 2013-2050 emissions budget of 800 GtCO₂e for the world to have a 50% chance of limiting global warming to 1.5°C, informed by analysis from the IPCC Special Report on 1.5°C. This provides for a 7.76 GtCO₂e budget for Australia from 2013-2050.

Taking into account actual emissions in 2013-2020¹¹, which together total 4261 MtCO₂e, the remaining 1.5 degree budget for Australia is 3499 MtCO₂e. Accordingly, if we started from now (2020), Australia would need to reach targets of 75% on 2005 levels by 2030, with net zero by 2035, to limit global warming to 1.5 degrees.

When taking into account government forecasts of pollution of 1046 MtCO₂e in 2021 and 2022, and if starting from the next election, a target of 80% reduction on 2005 levels by 2030, with net zero by 2033, is required to limit global warming to 1.5 degrees.

According to the government's projections, we are currently on track to exceed the budget required for 1.5°C in 2027 and to exceed the budget for 2°C by approximately 2032.

¹⁰ Meinshausen, M. (2019) *Deriving a global 2013-2050 emission budget to stay below 1.5°C based on the IPCC Special Report on 1.5°C* <<https://engage.vic.gov.au/climate-change-targets-2021-2030>>

¹¹ Department of Agriculture, Water and the Environment (2019) *Australia's emissions projections 2019* <<https://www.environment.gov.au/climate-change/publications/emissions-projections-2019>>