Pothole in Emissions Policy

Emeritus Professor James Trevelyan, The University of Western Australia, July 2020

Prime Minister Scott Morrison and Industry Minister Angus Taylor assert that Australia will meet our 2030 emission reduction target “in a canter”. We may just do that, but in 2031 or soon after we will hit a massive pothole unless we make changes very soon.

To meet the 2030 target, 26% - 28% less emissions than in 2005, our government intends to use an accounting trick. We will carry forward credit gained between 2008 and 2020 for emitting less than our budget negotiated under the 1997 Kyoto agreement, enabling us to continue much the same level of emissions as we do today for another decade.

Of course, there is a moral argument that we should be reducing our actual emissions. There is a further argument that our Kyoto credits are not recognised under the Paris agreement. However, even if you push these aside, we not be able to continue meeting our current targets after 2030 without very large and sudden emission reductions.

Several other countries which emitted less than their budgets renounced their accumulated credit at the 2012 UN Climate Change Conference in Doha, Qatar. Australia did not. By 2020, even before allowing for the reduction in emissions associated with the Covid-19 pandemic, Australia’s emission credit was expected to reach 411 million tonnes. This respectable ‘over-achievement’ is about 80% of Australia’s annual current emissions, originally expected to be 532 million tonnes in 2020.

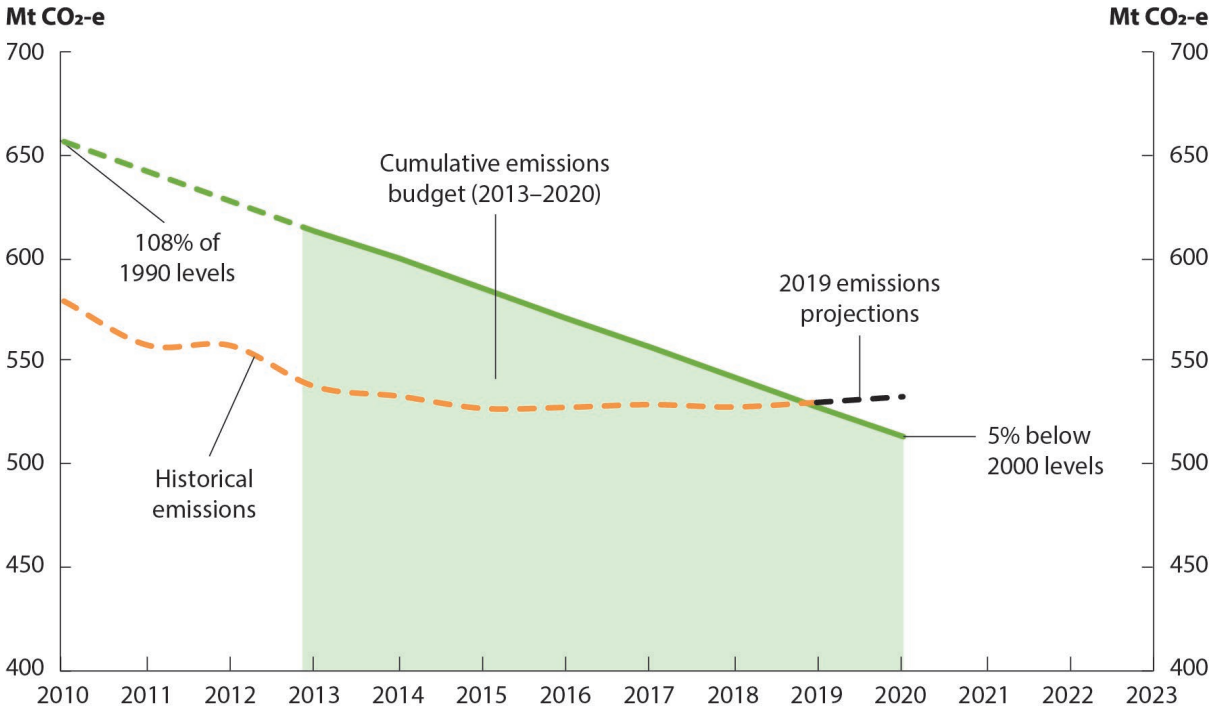


Figure 28, page 56 from Australia’s 2019 Emissions Projections, downloaded from:

https://publications.industry.gov.au/publications/climate-change/climate-change/publications/emissions-projections-2019.html

As the chart reproduced above shows, Australia’s emissions were well below the Kyoto budget until 2019. From now on, therefore, our accumulated emissions credit, or over-achievement, will reduce over time.

The government proposes to achieve our 2030 emission reduction target by carrying forward this over-achievement for the next 10 years, enabling actual emissions to remain more or less constant, and well above the 2030 reduction target level. They created the graph below to demonstrate how Australia will have achieved its commitments by using our 411 million tonnes of historical 'over-achievements' to offset higher emissions. The government asserts that by doing this, Australia can meet the 2030 target to reduce emissions by 26%, and requires only 51 million tonnes of further reductions to achieve the 28% reduction target.

They argue that this will provide the best opportunities for economic growth in the coming decade. Naturally, there are many who are arguing for much greater emission reductions much sooner, including some in Labor who want much larger, meaningful reductions.

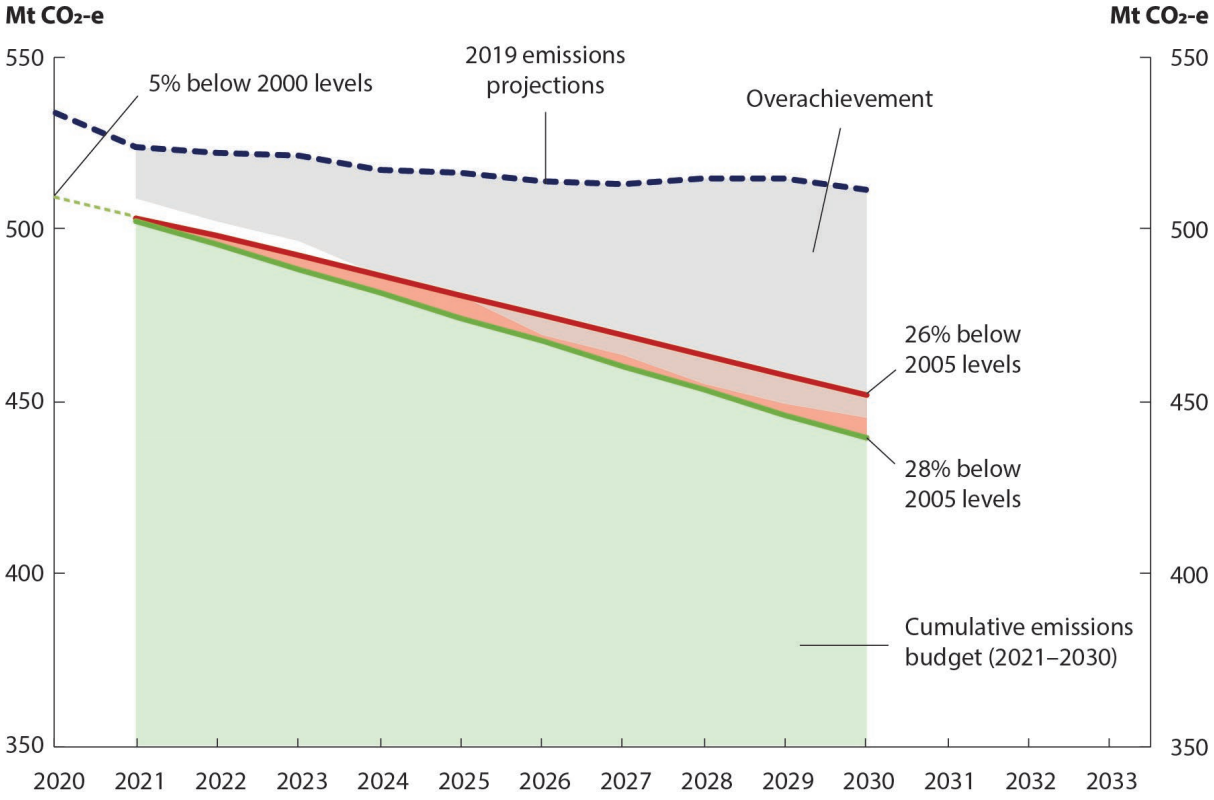


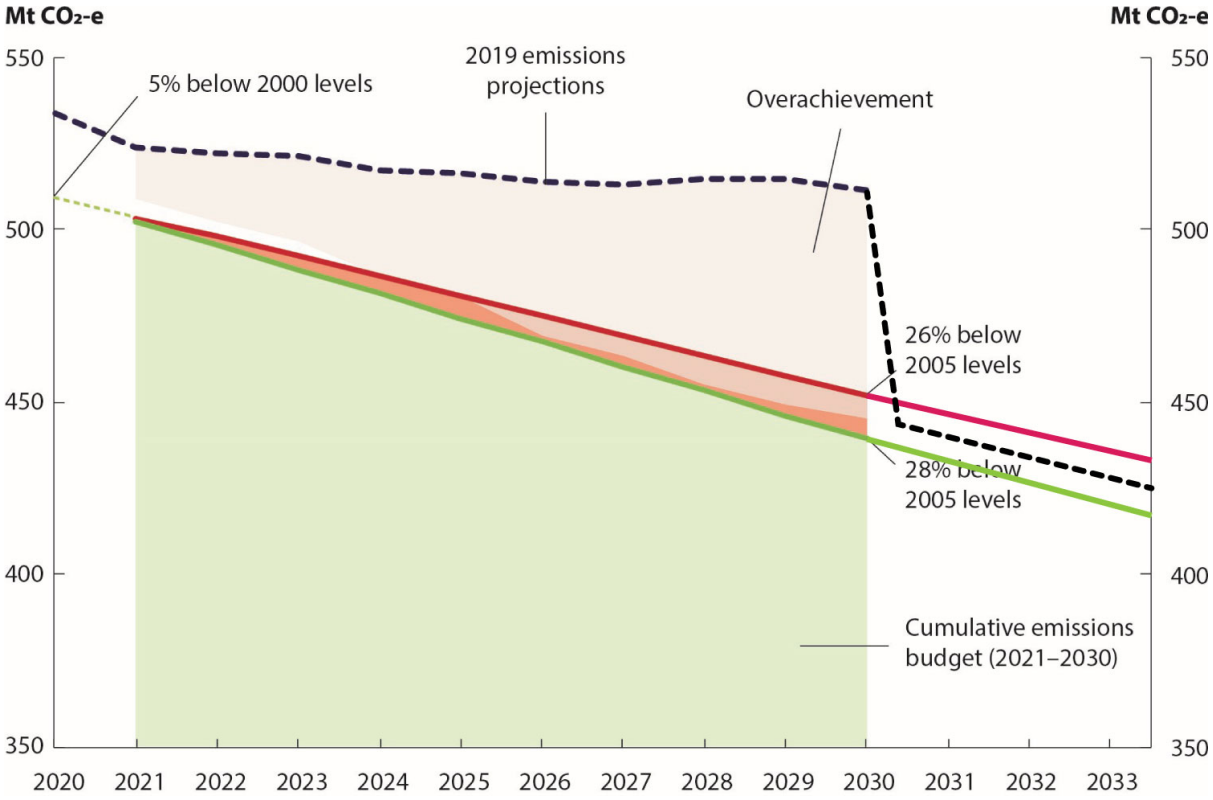
Figure 29, page 57 from Australia's 2019 Emissions Projections

The graph shows two straight sloping lines running from the left axis point labelled "5% below 2000 levels" down to points labelled "26% below 2005 levels" and "28% below 2005 levels". These lines represent our emission budget for the next decade, aiming for "26% or 28% emission reductions relative to 2005".

The dashed line *above* the budget lines shows the current emissions forecast to 2030.

But what happens *after 2030* when Australia's 'overachievement' savings will have been used up?

The next graph shows what is required for Australia to continue to meet its target beyond 2030.



In order to demonstrate that we are meeting our commitments in 2031, emissions will need to drop, in one year, from around 520 million tonnes to about 440 million tonnes, and then decrease in subsequent years beyond 2031.

Such a large and sudden reduction in emissions would be very difficult to achieve in one year. There is no evidence in the details of the report that such a large reduction in emissions in one year is remotely possible.

Therefore, even to meet stated government commitments we will need earlier and more gradual emission reductions.

However, there is a further factor to consider.

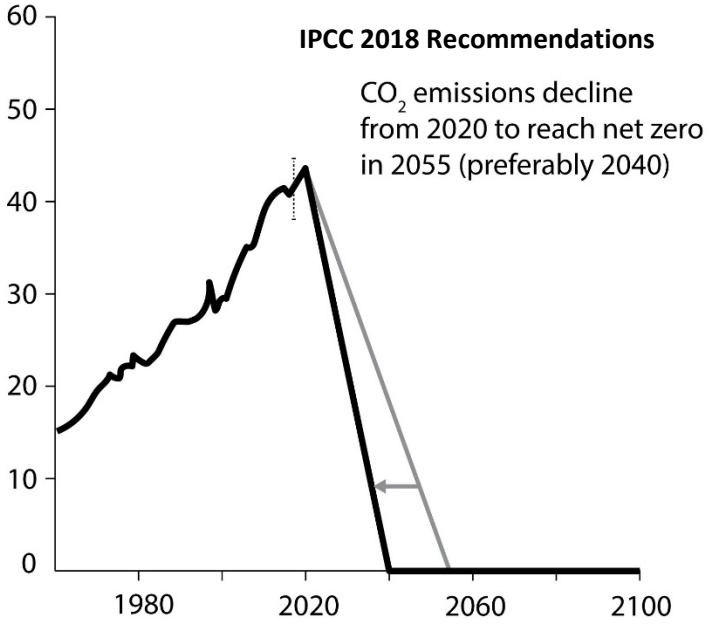
The 2020 “Low Emissions Technology Roadmap” document released in May, states “Parties to the Paris Agreement, including Australia, have collectively committed to the goal of reaching global peak greenhouse gas emissions as soon as possible and balancing anthropogenic emissions sources and sinks (‘net zero’ emissions) in the second half of this century.”

Reducing emissions in line with Australia’s current budget shown above will result in net zero emissions between 2095 and 2112.

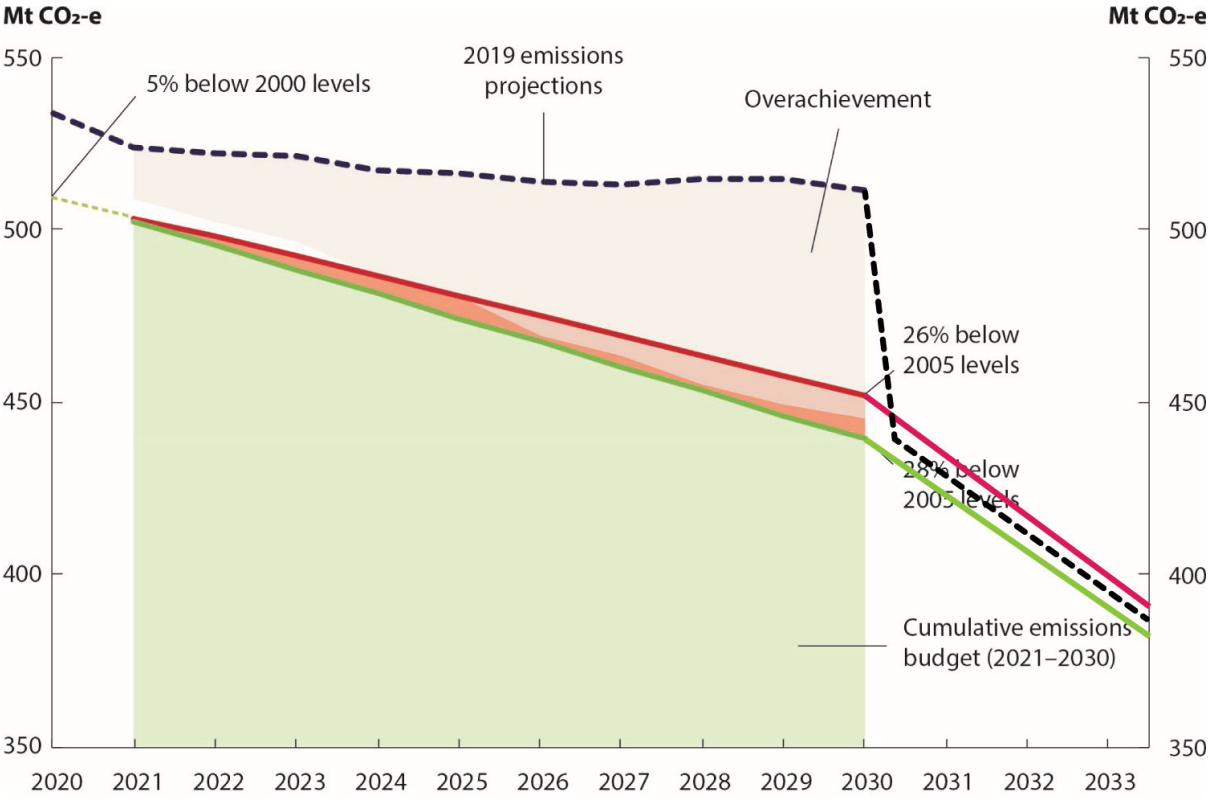
In its 2018 report on the consequences of climate warming greater than 1.5 °C above pre-industrial levels, the IPCC has shown that emissions must be reduced to net-zero by mid-century to avoid unacceptable ecosystem destruction.

To avoid these extremely undesirable consequences, the IPCC have advocated a significantly greater rate of emission reductions, as shown in the graph on the next page. This finding has gained widespread international support and, for example, has prompted some Australian state governments to set their 50% renewables targets by 2050.

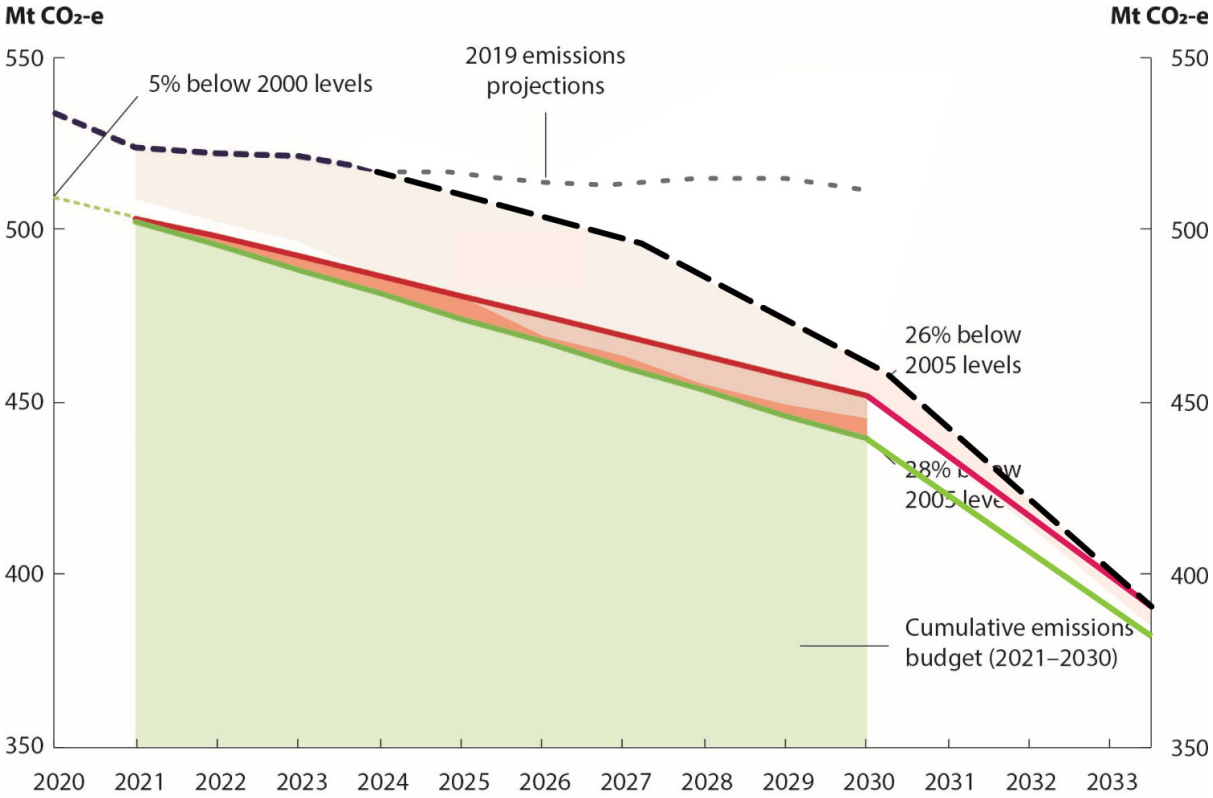
Australia's current rate of emission reductions, therefore, will have to be increased to meet what is likely to become an international consensus emissions reduction target in coming decades.



Therefore the slope of the emissions reduction budget lines has to be much steeper as shown below.



The next diagram illustrates one way to avoid the difficulty of achieving a sudden emission reduction around 2030, and enable Australia to continue to meet globally accepted emission reduction targets. It means reducing our emissions gradually more steeply from about 2023 onwards, and probably using some of our 'over-achievement' emission savings for 3-4 years after 2030.



Responding to this, Minister Taylor's department staff told me that Australia's forecasts have overestimated future emissions in the past "reducing the potential for the challenge identified". They remain confident that technology will solve this problem, if needed.

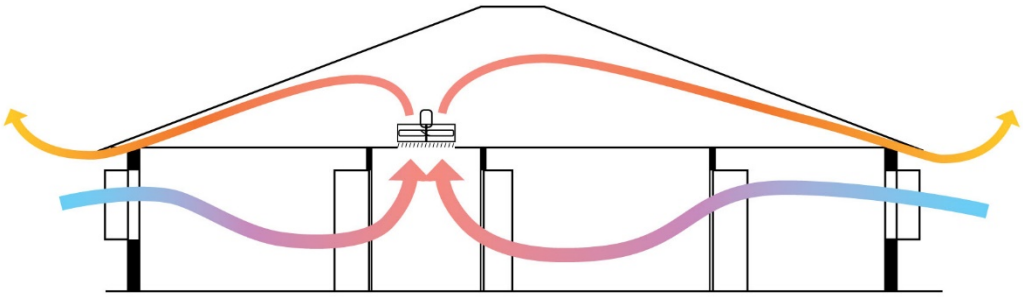
The Clean Energy Finance Corporation claims their solar, wind and energy efficiency projects will eliminate 260 million tonnes of emissions but do not provide a timescale. It's not clear whether this might lower the projections by a notch, possibly 10-20 million tonnes annually by 2030. Their projects need about $115 private and government investment for every tonne of CO_2 emissions saved.

Minister Angus Taylor in the "Low Emissions Technology Roadmap" document and public statements has argued that the government wants to achieve emissions reductions and economic growth with "technologies, not taxation".

The obvious question is whether technology changes alone will be sufficient to reduce and eventually eliminate emissions.

The difficulty with relying on technology to achieve these changes is that, ultimately, we rely on people to *adopt* and then *use* the technology. This is not automatic.

Take building ventilation fans for example, an Australian technology developed in the 1960s. Remarkably few people know about them. Typically located in the ceiling somewhere near the middle of the home, on the upper floor for multi-story homes, they draw in air through open windows and doors, pushing the air into the roof space from which it escapes. A simple automatic timer turns it on every night at about 10 pm when the air outside is cooler than inside, and off again at about 7 am before the outside air starts to get hot.



The fan moves about 6 cubic metres of air a second, far more than an air conditioner. Even though the temperature of the air rises by only three degrees or so, it removes an enormous amount of heat all through the night. The cooler air removes unwanted heat from the structure of the home: the walls, ceilings, furnishings and floors.

It works best with brick homes: brick walls have a large “thermal mass”. Because the walls are cool at the start of every day, they absorb the heat of the day so the interior of the home remains cool.

Running on about 500 Watts of electrical power, a typical ventilation fan can remove about 25,000 Watts of heat from a home, 50 times the electrical power consumed. In contrast, a ducted reverse cycle air conditioning system will require around 5,000 – 7,000 Watts to provide the same amount of cooling.

The fans cost about $2,500 installed with a timer switch.

This old technology could provide very large electricity cost savings by reducing the need for refrigeration air conditioning, and also achieve significant emission reductions. Despite this, only a few buildings make use of the technology.

There are several other attractive energy-efficient and emission-reducing technologies for heating and cooling. *None of these were mentioned* in the government’s Low Emissions Technology Roadmap. They include personal heating and cooling and indirect evaporation air conditioning. If technology experts miss them, ordinary citizens can be forgiven for not knowing about them.

This demonstrates that something more than the availability of technology is needed. We will only achieve actual emission reductions by modifying the behavior of ordinary Australians, and actively encouraging them to adopt and use low emissions technologies. Taxing emissions remains unpopular, and many have argued instead for financial rewards for emission reductions.

Fortunately Australians have demonstrated that, in exceptional circumstances, they are willing to modify their behavior when the need is explained clearly, based on scientific advice. The Covid-19 virus was substantially mitigated as a threat to Australians, for the time being, because the vast majority of people followed the advice of the Prime Minister and state leaders in March, April and May this year. Advice from trusted health experts standing beside political leaders was critical in gaining public trust.

Eliminating greenhouse emissions by mid-century will demand big changes in our country. A national and bipartisan effort would make this easier. Australians have demonstrated that we can change. The horrific bush fire season we all experienced has strengthened community resolve to do what we can to reduce climate warming. A clear and simple policy position with ambitious and achievable

emission reductions, backed by scientific and engineering experts, would gain widespread community support. That has to be different from the current government policy.

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The views expressed are the author's personal views.