

Victorian Climate Change Framework

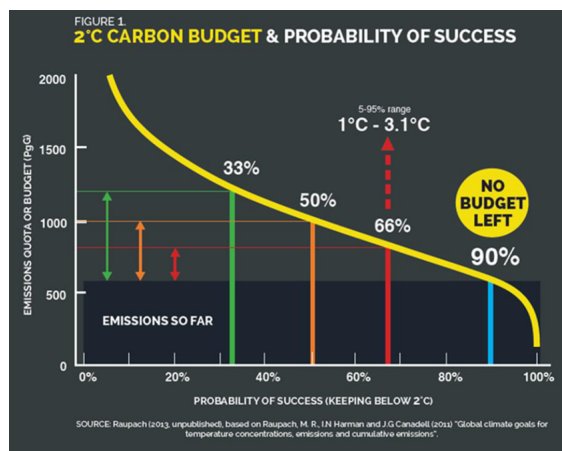
*Submission from Victorian community climate action groups to the Victorian Government regarding the actions the state government should take to drive emissions reductions and the magnitude of the emissions reductions required.*¹

PART A: THE CLIMATE SCIENCE

1. We have zero carbon budget remaining

In Paris in December 2015, the countries of the world united around the commitment to keep global warming to well below two degrees Celsius (°C) and to leave the door open to the possibility of remaining under 1.5°C of warming. However the implications of this agreement for the setting of emissions reduction targets have received little discussion. It is not widely known that in order to meet our international obligations, very strong and immediate action is required.

The IPCC reported that “to provide a 93 per cent mid-value probability of not exceeding 2°C, the concentration [of atmospheric greenhouse gases] would need to be stabilised at, or below, 350 ppm CO₂e”². This means that we need to stabilise atmospheric concentrations below current levels for around a 90% chance of staying under 2°C of warming³. **Thus we have zero carbon budget remaining** for a low risk of exceeding the target, or if 2°C is considered a cap (upper boundary) as per the Copenhagen Accord, rather than a target (which can be significantly exceeded). We must achieve a zero-emissions society as fast as we can and safely draw down and sequester the excess greenhouse gases already in the atmosphere. There is no choice but to leave coal and gas in the ground, rapidly phase out fossil fuel use and achieve net zero emissions transport, agriculture, land use, buildings and industry.

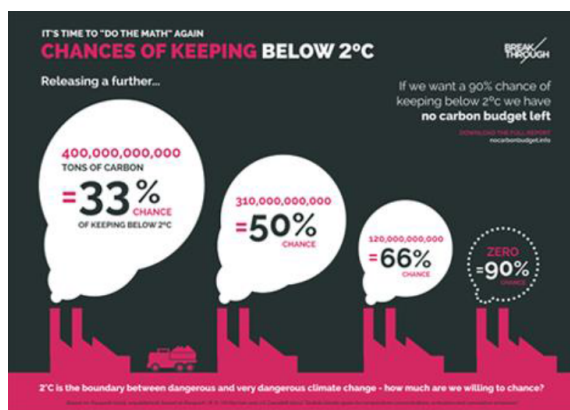


Graphic: <http://www.nocarbonbudget.info/>

2. Zero emissions by 2050 is not fast enough

Many groups including the Climate Change Authority and the Climate Change Round Table suggest that we have sufficient carbon budget remaining to allow a gradual reduction in our emissions reaching zero in 2050. Indeed, Federal Labor is considering a 2030 target of a 45% emissions reduction on 2005 levels based on the lower end of a Climate Change Authority recommendation of 45%-65%.

However, these recommendations are based on only a 66% chance of staying under 2°C of warming. They ignore mounting evidence that even at 1°C of warming our earth



Graphic: http://vcan.net.au/wp-content/uploads/2016/02/Zero_Carbon_Budget_IG-

¹ This submission draws heavily on the work of David Spratt, co-author of Climate Code Red (2008) and “Recount: It’s time to ‘Do the math’ again” (<http://www.nocarbonbudget.info/>) and papers posted to <http://www.climatecodered.org/>. We are grateful to David for permission to make use of his work.

² Anderson and Bows (2008) “Reframing the climate change challenge in light of post-2000 emission trends”, Phil. Trans. R. Soc. A 366: 3863-3882, quoting Meishausen (2006) “What does a 2°C target mean for greenhouse gas concentrations? A brief analysis based on multi-gas emission pathways and several climate sensitivity uncertainty estimates”, in “Avoiding dangerous climate change” (eds H. J. Schellnhuber, W. Cramer, N. Nakicenovic, T. Wigley & G. Yohe), pp. 253-279. Cambridge, UK: Cambridge University Press.

³ The precautionary principle requires that the risk of an aircraft crash be less than 0.1%. Why would we accept more than a 10% chance of catastrophic climate change?

is already experiencing dangerous climate change and is perilously close (if not past) critical tipping points (see below.) These recommendations are also inconsistent with Australia's commitment to keep warming to well below 2°C.

3. The earth is already too hot. Two degrees of warming is not a safe limit

The earth is already too hot. It is now widely acknowledged by climate scientists that, at only 1°C of warming, climate change is already dangerous. In the words of former senior Obama advisor John Holdren in 2008:

"...the world is already experiencing dangerous anthropogenic interference in the climate system".⁴

Some decades ago, a 1°C limit on warming was thought likely to keep us safe from major climate tipping points. However major tipping points have already been triggered and others are close to being triggered. One of the most significant research findings in 2014 was that the tipping point for the collapse of the West Antarctic ice sheet has already passed. Scientists found that:

"the retreat of ice in the Amundsen Sea sector of West Antarctica was unstoppable, with major consequences – it will mean that sea levels will rise 1 metre worldwide... Its disappearance will likely trigger the collapse of the rest of the West Antarctic ice sheet, which comes with a sea level rise of between 3–5 metres. Such an event will displace millions of people worldwide".⁵

What was also significant was the strong reaction to this news from the climate science community, because it represented a clear case of a tipping point having already occurred. Tipping points are generally considered to be long term in nature.

Dr Malte Meinshausen called the evidence "a game changer", and "a tipping point that none of us thought would pass so quickly"; noting that "now we are committed already to a change in coastlines that is unprecedented for us humans".⁶

Arctic tipping points have been crossed⁷ for sea-ice-free summer conditions, with severe consequences for the future stability of permafrost and frozen methane stores, sea level rises, as well as accelerated global warming as ice sheets retreat and the Earth's albedo (reflectivity) decreases. Extreme weather events are being made worse, with record heat and drought such as in California at present, and more intense cyclones including Superstorm Sandy and Cyclone Haiyan, both of whose impacts have a climate-warming component.

During 2015, new lines of evidence were published suggesting that more elements of the system may be heading towards tipping points including:

- the slowing of the Atlantic conveyor⁸; accelerating ice mass loss from Antarctic ice shelves⁹
- indications of the vulnerability of East Antarctica glaciers¹⁰
- declining carbon efficiency of the Amazon forests¹¹ and other sinks¹²
- accelerated ice mass loss from the Greenland Ice Sheet¹³

⁴ Holdren (2008) "Meeting the Climate Change Challenge", Eighth Annual John H. Chafee Memorial Lecture on Science and the Environment. Washington, DC: National Council for Science and the Environment

⁵ Rignot, Mouginot et al (2014) "Widespread, rapid grounding line retreat of Pine Island, Thwaites, Smith, and Kohler glaciers, West Antarctica, from 1992 to 2011", *Geophysical Research Letters* 41:3502–3509;

⁶ "A climate game change", video with Dr Malte Meinshausen, June 2014, <http://vimeo.com/97926131>

⁷ Livina and Lenton (2013) "A recent tipping point in the Arctic sea-ice cover: abrupt and persistent increase in the seasonal cycle since 2007", *The Cryosphere* 7:275–286; Maslowski, Kinney et al (2012) "The future of Arctic sea ice", *Annual Review of Earth and Planetary Sciences* 40:625–654

⁸ Rahmstorf, Box et al (2015) "Exceptional twentieth-century slowdown in Atlantic Ocean overturning circulation", *Nature Climate Change* doi:10.1038/nclimate2554

⁹ Paolo, Fricker et al (2015) "Volume loss from Antarctic ice shelves is accelerating", *Science* 348:327–331

¹⁰ Greenbaum, Blankenship et al (2015) "Ocean access to a cavity beneath Totten Glacier in East Antarctica", *Nature Geoscience* 8:294–298

¹¹ Brien, Phillips et al (2015) "Long-term decline of the Amazon carbon sink", *Nature* 519:344–348

¹² Raupach, Gloor et al (2014) "The declining uptake rate of atmospheric CO₂ by land and ocean sinks", *Biogeosciences* 11:3453–3475

- rapid thinning of Arctic sea-ice¹⁴ and a new record low winter maximum for Arctic sea-ice extent¹⁵
- increasing evidence of the vulnerability of Arctic permafrost¹⁶
- concerns about the origins and possible proliferation of Siberian methane craters.

An estimated tipping point for the complete melting of the Greenland Ice Sheet is 1.6°C (with an uncertainty range of 0.8 to 3.2°C)¹⁷. Preserving more than 10% of coral reefs worldwide would require limiting warming to below 1.5°C (uncertainty range: 1.3–1.8°C)¹⁸. 1.5°C is also thought to be a tipping point for extensive permafrost thaw.¹⁹

The paleoclimate record also tells us that even the current level of CO₂ (without accounting for 85 ppm of non-CO₂ greenhouse gases we have added to the atmosphere) is enough for 3°C or more of warming at equilibrium:

- During the middle Miocene, 14 to 16 million years ago, when temperatures were approximately 3 to 6°C warmer and sea levels were 25 to 40 metres higher than at present, the CO₂ level was similar to current levels (350 to 400 ppm).²⁰
- In the early-to-mid Pliocene, three to five million years ago, temperatures were 3°C above those of pre-industrial times and CO₂ levels were around 360 to 400 ppm, very similar to the levels today. The northern hemisphere was free of glaciers and ice sheets, beech trees grew in the Transantarctic Mountains and sea levels were 25 metres higher.²¹

Two degrees of warming would take us to climatic conditions unprecedented in the period of human civilisation.²² According to Prof. Kevin Anderson:

*“2°C represents the threshold between dangerous and extremely dangerous, rather than between acceptable and dangerous climate change”.*²³

4. The IPCC’s published carbon budgets underestimate the risks

It is important to note that the IPCC’s published carbon budgets include only ‘short term feedbacks’ and explicitly omit consideration of ‘long term feedbacks’, which are difficult to quantify and which were originally assumed not to be relevant in coming decades – at less than 2°C of warming.

However, as described in Part 3, ‘long term feedbacks’ are already happening, and will accelerate in the near-term, which undermines the accuracy of the IPCC’s calculated carbon budgets.

Another important consideration, not included in the oft-quoted IPCC carbon budgets, is the effect of lags in the expression of stored warming. As far back as 2008, it was demonstrated that if just the then-current

¹³ Khan, Kjaer et al (2014) “Sustained mass loss of the northeast Greenland ice sheet triggered by regional warming”, *Nature Climate Change* 4:292–299

¹⁴ Lindsay and Schweiger (2015) “Arctic sea ice thickness loss determined using subsurface, aircraft, and satellite observations”, *The Cryosphere* 9:269–283

¹⁵ <http://nsidc.org/arcticseaicenews/2015/04/a-double-dip>

¹⁶ Natali, Shuur et al (2014) “Permafrost degradation stimulates carbon loss from experimentally warmed tundra”, *Ecology* 95: 602–608

¹⁷ Robinson, Calov et al (2012) “Multistability and critical thresholds of the Greenland ice sheet”, *Nature Climate Change* 2:429–432

¹⁸ Frieler, Meinshausen et al (2013) “Limiting global warming to 2°C is unlikely to save most coral reefs”, *Nature Climate Change* 3:165–170

¹⁹ Vaks, Gutareva et al (2013) “Speleothems reveal 500,000-year history of Siberian permafrost”, *Science* 340:183–186

²⁰ Tripathi, Roberts et al (2009) “Coupling of CO₂ and ice sheet stability over major climate transitions of the last 20 million years”, *Science* 326:1394–1397

²¹ Barreiro, Philander et al (2006) “Simulation of warm tropical conditions with application to middle Pliocene conditions”, *Climate Dynamics* 26:349–365

²² “A climate game change”, video with Dr Malte Meinshausen, June 2014, <http://vimeo.com/97926131>

²³ Anderson and Bows (2011) “Beyond ‘dangerous’ climate change: emission scenarios for a new world”, *Phil. Trans. R. Soc. A* 369:20–44

greenhouse gas level was maintained over time, it was sufficient to produce 2.4°C of warming, without taking long-term feedbacks into account.²⁴

RECOMMENDATION: SET A TARGET OF ZERO EMISSIONS IN TEN YEARS

The role of state governments is particularly important if the federal government continues with policies which are not even close to those required to meet our international obligations. Victoria can be, and should be, a leader on climate action and we are heartened by your interest in this goal.

In order to secure the conditions needed for the wellbeing of current and future generations, we call on the Victorian government to ensure that Victoria's emissions reductions targets are based on recognition of the need for an emergency transition to a zero emissions economy and for drawdown of the excess greenhouse gases already in the atmosphere.

PART B: SPEAKING THE TRUTH

The implications of the climate science are not often spelled out. In part this is for fear of causing panic or despondency.

1. Some things are difficult to tell

Prof. Hans Joachim Schellnhuber, the director of the Potsdam Institute for Climate Impact Research in Germany, and advisor to German Chancellor Angela Merkel, told the Four Degrees conference in Melbourne in 2011²⁵ that he had not told her about some of the impacts associated with a 4°C-warmer world because "some things are too difficult to tell".

He left it unclear whether he meant too difficult *personally* or too difficult *politically*. Both are relevant. Even amongst policy makers and world leaders the personal impact of confronting the enormity of the challenges we face may be overwhelming (*Let's speak about climate change*, 2013²⁶). At a political level, those who tell unpalatable truths risk being denied access to those with the power to make decisions.

Similarly, in Australia, the implications for the future of the coal and gas industry, of the limited carbon budget available if we are to stay under even 2°C of warming, are seldom spelt out.

2. Leadership is required

These facts are unpleasant and create fear and resistance. But downplaying the risks is not the answer. Leadership is required to help us face the truth, so that we can address the scale of the problem. If the severity of the problem is not explained to those in power, there is no chance of planning for effective action and of gathering public support. When their leaders show they understand the problem and its implications for people's lives, and the community see that commensurate action is being taken, this will help people come to terms with the climate reality.

This lack of public ideas leadership on climate change within Australia is clearly not in our collective best interest. How many figures of public standing in Australia are prepared to consistently canvas the main issues discussed here, even if we disagree about some of the details? You could count them on the fingers of one hand. In fact, how many are prepared to talk about these issues in the public arena at all? Timidity and a relentless bright-siding infuse the public conversation, as if people cannot bear to speak the truth.

3. The public are ahead of political leaders

The public appears to be more prepared for the conversation than are our public ideas leaders. Recent work by Melanie Randle and Richard Eckersley investigated the perceived probability of threats to

²⁴ Anderson and Bows (2008) "Reframing the climate change challenge in light of post-2000 emission trends", Phil. Trans. R. Soc. A 366:3863–3882

²⁵ <http://www.fourdegrees2011.com.au/>

²⁶ *Let's speak about climate change*, by Psychology for a Safe Climate, download at <http://www.PsychologyforaSafeClimate.org>

humanity and different responses to them (nihilism, fundamentalism and activism) in the US, UK, Canada and Australia.

“Overall, a majority (54%) rated the risk of our way of life ending within the next 100 years at 50% or greater, and a quarter (24%) rated the risk of humans being wiped out at 50% or greater. The responses were relatively uniform across countries, age groups, gender and education level, although statistically significant differences exist. Almost 80% agreed “we need to transform our worldview and way of life if we are to create a better future for the world” (activism). About a half agreed that “the world’s future looks grim so we have to focus on looking after ourselves and those we love” (nihilism), and over a third that “we are facing a final conflict between good and evil in the world” (fundamentalism). The findings offer insight into the willingness of humanity to respond to the challenges identified by scientists and warrant increased consideration in scientific and political debate.”²⁷

So here is the great irony: people have got a fair, intuitive sense of what might be coming, but our ideas leaders can’t talk about it.

RECOMMENDATION: INFORM POLICY MAKERS AND THE PUBLIC ABOUT THE NEED FOR EMERGENCY ACTION

We welcome the stronger language already being used by the Victorian government and the use of detailed briefings on likely changes in local areas as a way of engaging people in the reality of climate change. However, the job is only half done. We call on the state government to be much more direct in letting the public know that big changes are needed in order to address climate change – including a rapid transition to zero emissions - and that there is no choice as the effects of climate change are potentially catastrophic.

In particular we call on the Victorian government to:

- **ensure that members of parliament and bureaucrats involved in policy and planning are well informed about the need for a rapid transition to zero emissions and the scaling up of draw-down and sequestration**
- **begin a process of considering how best to convey the need for large scale transformation to members of the public, so that they are inspired by the possibilities of transformation and reassured that the government recognises the seriousness of the threat**

PART C: TAKING EMERGENCY ACTION IN VICTORIA

1. Zero emissions not low emissions

If the Victorian government takes seriously the science suggesting that the earth is already too hot and that there is zero carbon budget remaining, then it is clear we need zero emissions technologies, not low emissions technologies, and it is vital that all initiatives be measured against this yardstick. It is only technologies that are already commercially available that are likely to be able to make a contribution within the very limited time available. Low emissions technologies such as carbon capture and storage of emissions from fossil fuel power stations, are not appropriate, even in the unlikely event that they were to become commercially viable.

²⁷ <http://ro.uow.edu.au/buspapers/740/>

2. Fossil fuels must stay in the ground

Continuing investment in fossil fuels merely inflates the carbon bubble and exacerbates the coming carbon bust. Each piece of fossil fuel infrastructure we build at this point in history will soon become a stranded asset and represents a wasted opportunity to make an investment in the future. These investments waste valuable time and worsen the problem.

We applaud your support for a moratorium on onshore unconventional gas mining and call on you to institute a complete and permanent ban on all new coal, gas and oil mines. It is not just the risk on gas mining to our food, water and air that we need to consider, but also the destructive impact on the livability of our planet

We have no time for a 'gas transition' and there are serious doubts about the emissions reductions claimed for gas as a power source. Fossil gas is sometimes seen as a lower emissions transition fuel. However, fossil gas is methane, which has a 20-year Global Warming Potential (GWP20) of about 105 times that of CO₂. The remaining four years of this 'critical decade' are crucial if we are to avoid catastrophic climate change. So there are very good reasons to consider GWP20 rather than the more common GWP100 in assessing the impact of methane.

Considering GWP over a 20 year period, it only takes about 2.6% leakage of fossil gas as fugitive emissions to effectively double the net climate effect of gas. That is, over 20 years the 2.6% of gas escaping as methane would have the same warming effect as the (remaining) 97.4% being burned and entering the atmosphere as carbon dioxide. Thus, if fugitive emissions are considered over a 20 year period, fossil gas is roughly equal in impact to black coal.²⁸

James Hansen, former Director of NASA GISS, draws attention to the need to focus on shorter atmospheric life greenhouse gases (such as methane and nitrous oxide) at the same time as we face the difficulties of eventually stabilising carbon dioxide.

3. An emergency speed transition to 100% renewable energy

At present the over-supply of the grid with dirty fossil fuel power is inhibiting the further growth of renewable energy power. There is an urgent need to set up mechanisms which will ensure the rapid but orderly closure of our coal, gas and diesel fired power stations and provide support for affected communities.

We need to close the dirtiest power stations, like Hazelwood, first, but it is important to ensure that this closure is recognised by all as the first of a rapid succession of such closures. Strict and rapidly tightening energy supply standards for power stations would be one method of achieving this. Appropriate support needs to be given to the renewable energy and energy storage industries to ramp up at emergency speed to fill the gap.

4. A suite of measures to rapidly and steeply reduce energy demand.

Beyond Zero Emissions, a Victorian climate think tank, have produced a detailed plan for the transition of all existing buildings to zero emissions from their operations within ten years. It sets out how we can transform our building stock to reduce energy bills, generate renewable energy, add health and comfort to our living spaces, and make our workplaces more productive²⁹.

UK leading climate scientist Professor Kevin Anderson (2014)³⁰ has proposed measures for the United Kingdom to begin a rapid and deep emissions reductions. These provide an overview of the sort of regulation measures which could begin immediately Victoria, offering a model for the rest of the nation. They include:

²⁸ Keech, Richard. *Gas - Is it a natural fit for buildings?* Beyond Zero Emissions, April 2013

²⁹ <http://bze.org.au/buildings>

³⁰ Anderson, K. (2014) "Why carbon prices can't deliver the 2°C target", blog, 13 August 2013, <http://kevinanderson.info/blog/whycarbon-prices-cant-deliver-the-2c-target/>, accessed 19 May 2014

- strict energy/emission standards for appliances with a clear long-term market signal of the amount by which the standards would annually tighten
- stringent energy/emission standards for industry equipment
- stringent minimum efficiency standards for all properties for sale or rent
- world leading low-energy standards for all new buildings
- a moratorium on airport expansion
- technological and operational standards for shipping

5. A focus on improved public transport not new roads

An important part of implementing an emergency transition to a zero emissions society would be the provision of relevant climate related guidelines to Infrastructure Victoria and other relevant planning bodies. We need to roll out an entire zero emissions transport system and the focus will need to be on providing zero emissions electric public transport, and support for walking and cycling. Electric vehicles will also need appropriate support, but we will need to markedly reduce our use of private cars if we are to meet the climate challenge. Decisions about freight and ports also need to be made with a zero emissions target in mind.

6. Changes in land use and food choices

The *Land Use: Forestry and Agriculture* discussion paper by *Beyond Zero Emissions*³¹ includes detailed recommendations for changes to agricultural activities in order to achieve zero emissions for agriculture and forestry within ten years.

This would require:

- a cessation of land clearing for agriculture
- cessation of forest re-clearing
- reduced savanna burning
- reduced emissions from the enteric fermentation of livestock via new technology and management procedures
- reduction in livestock herds
- reduced soil emissions
- reduced manure emissions
- limited revegetation

RECOMMENDATION: IMMEDIATE ACTION TO BEGIN REDUCING EMISSIONS TO ZERO AND BEYOND

We call on the Victorian government to implement:

- **an emergency speed transition to a zero emissions economy in all sectors of society in about ten years** (including stationary energy, buildings, transport, land use and industry)
- **the rapid scaling up of safe measures to draw-down the excess greenhouse gases already in the atmosphere** (including re-afforestation and increased levels of soil carbon).

All the technology we require to reach zero emissions is already available, what is required is the political will to drive the scale and speed of change which is required. The drawdown of greenhouse gases at the scale required will require support for further research and development of scalable and safe methods and these must be pursued as a matter of urgency.

³¹ <http://bze.org.au/landuse>

PART D: CONCLUSION

We are in a position to act with responsibility and integrity for future generations. To wait on the sidelines for others to act is morally bankrupt. Victoria can help move the global conversation into the domain of moral responsibility and ethical leadership, and away from a short-sighted, materialistic and self-destructive selfishness.

The Victorian government is in a position to help change the direction of human history. State parliamentarians are in power at a critical point in human history. You have a unique pressure to bring to bear. This could be your single opportunity to make a stand which sets out the real position.

HAVE COURAGE

We ask you to have the courage to say what Schellnhuber found too difficult to tell, and spell out in clear and evocative language both the unspeakable risks we face, and the inspiring opportunity that transition to a zero emissions society provides.

We ask you to immediately begin on the path of bold and transformative action we need.

We ask you to provide the kind of leadership required at this pivotal point in history.

Failure to act now will haunt us till the end of time. (Garnaut, 2008)

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Submitted by:

Darebin Climate Action Now on behalf of:

Climate Action Moreland

Psychology for a Safe Climate

Locals Into Victoria's Environment (LIVE)

Lighter Footprints

Wodonga Albury Towards Climate Health (WATCH)

CLIMARTE

ClimActs

Centre for Climate Safety

Beneath the Wisteria

Slap Tomorrow

Stonnington Climate Action Network (SCAN)