Published in *Climate Change On for Young & Old* in 2009 by Future Leaders (www.futureleaders.com.au)

If Not Now, Then When?

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> A day of bushfires, brassy sky; the air stilled, smelling of char. Fine ash falling, as if the sun at last had burnt itself out and the last flakes of it were descending to cover the earth.[1]

Bushfires have long been part of the European view of Australia's landscape, captured in our literature — the quote is from David Malouf's *Remembering Babylon* — and in art. William Strutt's *Black Thursday, February 6th, 1851*,[2] with its terror-struck animals and panicked settlers fleeing the firefront, and Eugene von Guerard's Bushfire between Mount Elephant and Timboon, March 1857,[3] with its long, blazing horizon and tiny pale sun shrouded in smoke, are among the most famous fire images in Australian colonial painting.

The Black Thursday fire of 1851, the one depicted by Strutt, began near Craigieburn on the morning of February 6, a day reported to be the hottest ever experienced by the settlers, with temperatures reaching 117 degrees (over 47°C) in the shade.[4] 'The blasts of air were so impregnated with smoke and heat that the lungs seemed absolutely to collapse under their withering influence'.[5]

> Farmhouses, fences, crops, orchards, gardens, haystacks, bridges, wool-sheds, were swept away by the impetuous on-rush of the flames, which left behind them nothing but a charred heap of ruins, and a scene of pitiable desolation. The human fugitives fled to water, wherever it could be found, and stood in it, breathing with difficulty the suffocating atmosphere, and listening with awe to the roar of the elements and the cries of the affrighted animals.[6]

Smaller fires converged and burnt down the Merri and Darebin creeks and the Plenty River and across to where Sydney Road now runs. The larger conflagration threatened Melbourne Town. Twelve settlers died, properties were devastated, over a million sheep and thousands of cattle lost. The blaze was 'so fierce and far reaching that its glow could be seen by ships in Bass Strait' and its smoke reached northern Tasmania. One contemporary writer described how, afterwards, 'from Gisborne to Carlsruhe nothing could be seen but the blackened stumps of trees.'

Almost 160 years later, Victoria's Black Saturday fires occurred at almost exactly at the same time of year, on Saturday 7th February, 2009. The days of soaring heat before this Saturday were more numerous, as were the tragic loss of life and devastation of property — partly reflecting more extensive settlement — with 173 killed, and an estimated 1830 houses razed. Yet the fierce temperature of 47.2 degrees and the long preceding drought seemed to be a repeat of a natural scourging pattern, and of the 1851 fire.

Black Thursday in 1851, Black Friday in 1939, Ash Wednesday in 1983, Black Saturday in 2009. We think of Australia as a continent of extremes, where droughts and flooding rains, bushfires and dust storms — great variability in weather and climate — are the norm. Our landscape is made of plants and animals that have evolved to almost welcome fire, flood and drought. For instance, the mountain ash forests of south-eastern Australia, phoenix-like, need to burn to regenerate — a fact now understood, admired and feared.

However the slow, hard-won realisation by non-Indigenous Australians that this is how our continent behaves has also slowed recognition that something has now changed. Only over the past three years has there been a shift, an emerging understanding we now have to interpret tragedies like 2009's Black Saturday differently. These events now point forward to another, starker continent with new, different, fiercer patterns of change. The past is no longer a reliable guide to the future. We have stepped out of history.

The long, harsh drought affecting south-eastern Australia, Al Gore's film, *An Inconvenient Truth*, the Stern Report on the *Economics of Climate Change*, and growing Australian media attention to global warming, have all contributed to this shift in public perception. But

above all, it has been climate science that has driven this transformation in awareness among communities, and even some politicians.

Global warming threatens to transform our planet by raising sea levels, causing widespread water shortages, increasing the frequency and intensity of storms, extinguishing species, altering almost everything we do in future. It is the greatest environmental challenge ever faced by humans as a species. It is also, without doubt, one of the greatest social, political and economic challenges we face — a challenge far greater even than the global economic turmoil we are seeing around us at present.

Three questions run through the debate over what we in Australia should do to combat global warming. First, what should be the pace and scale of mitigation — our attempts to reduce greenhouse emissions? Second, what should we do in response to inevitable climate change and its impacts? Third, what responsibility do we have in Australia for the global climate threat, and therefore to what extent should we shoulder the international burden for change? To answer these questions, we need to begin with the science.

Shifting Science and Dangerous Climate Change

Climate change has given rise to a notable — indeed, a Noble Peace prize-winning — international institution, the Intergovernmental Panel on Climate Change, or IPCC. The IPCC, which includes not only physical scientists, but also sociologists, economists and policy-makers, was created in 1988 in response to growing concern that human activity was beginning to transform the planet's atmosphere, climate and ecosystems. It has produced four major reports, issued roughly five years apart. The first report, published in 1991, informed negotiations at the Earth Summit held in Rio de Janiero in 1992 and contributed to one of that Summit's key outcomes, the international climate treaty known as the United Nations Framework Convention on Climate Change (or UNFCCC).

One hundred and ninety-two countries have signed the UNFCCC and another four are observers. The sheer number of parties to the Convention gives you a sense of the difficulties encountered in getting agreement to its implementation measures, such as targets for emissions reduction. The first round of international targets was determined in Kyoto in 1997. The second round

will hopefully be determined at the next Conference of the Parties (or COP), to be held in Copenhagen at the end of 2009, or if not then, then in 2010.

The UNFCCC places obligations on its nation-state members: Australia, as a signatory, is legally bound to respect the Convention's requirements. Article 2 of the Convention outlines its ultimate aim and defines the broad obligation of nations to reduce climate change.[7] It says that the Convention seeks the:

> stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

Much effort has gone into defining what we mean by 'dangerous anthropogenic (human-generated) interference'. This discussion has been transformed over time into one about defining 'dangerous climate change' and the point (and level of emissions) at which the risks of triggering dangerous climate change become too great.

The idea of 'dangerous climate change' has especially taken hold among climate scientists and European politicians. The commonly accepted view is that dangerous climate change begins when the planet has warmed, on average, by around two degrees Celsius above pre-industrial levels (since before 1750). This increase may not seem like much, but even with such modest warming we begin to see the planet's ecosystems collapse, some 10-15% of species face extinction, and millions more humans face the threats of drought and starvation.[8]

It is also at this point that we increase the chance of going beyond certain 'tipping points' where natural processes begin to take over from human influences and further warm the planet: the Arctic summer sea ice will have disappeared, oceans begin to warm autonomously, melting land-based ice begins to raise sea levels, the once-frozen tundra and taiga plains begin to release huge volumes of methane (a highly active greenhouse gas), and drought-stricken rainforests in the Amazon and Asia degrade, increasingly become fire-prone and begin to release large volumes of carbon dioxide.

So where are we now? There is one way of describing the problem that involves an eye-glazing, mind-numbing tumbler full of numbers about temperatures, targets and the concentrations of various gases in the atmosphere. These numbers — however boring — matter desperately.

Global average temperatures have already risen by about 0.8 degrees above pre-industrial levels. Because of the long persistence of gases already in the atmosphere (carbon dioxide remains in the air for decades to centuries, and about 15–30% will remain for thousands of years) and the additional warming presently masked by 'cooling agents' such as pollutant aerosols, we have also committed — 'locked in' — the planet to warming of up to 1.5 degrees and perhaps beyond.

Concentrations of carbon dioxide (CO_2) in the atmosphere have risen from about 280 parts per million (ppm) before the Industrial Revolution to around 387 ppm CO_2 in 2008. This may seem a trivial amount and it is, except that CO_2 is the most important of the various greenhouse gases and even small increases or decreases lead to significant planetary warming or cooling.[9]

If we raise atmospheric concentrations of CO_2 to around 400 ppm (450 CO_2-equivalent, when also including the presence and impact of other greenhouse gases in terms relative to the effects of carbon dioxide), we will arrive at a point at which we have about a one in two chance of exceeding the two-degree warming threshold. We are almost at there, at 450 CO_2-equivalent, now. Clearly there is little time for manoeuvre. The head of the IPCC, Rajendra Pachauri, says global emissions must peak by no later than 2015 if we are to avoid significantly exceeding 450 CO_2-equivalent.

The IPCC's Fourth Assessment Report was written by some 1200 authors, reviewed by some 2500 scientific experts, and published in 2007. It warns that we face an increase in global average temperatures of between 1.1 to 6.4°C by the end of this century, and an increase in sea levels of between 20 and 60 cm, if action is not taken to reduce global emissions of key greenhouse gases (of which the most important is carbon dioxide) by between 50% and 85% below 1990 levels by 2050.[10]

For that 50/50 chance of staying below two degrees, according to the IPCC developed countries need to reduce their collective emissions by between 25 and 40% below 1990 levels by 2020 and by

between 80 and 95% by 2050.[11] Developing countries would also have to begin to take up their share of reduction within this period. If 'business-as-usual' in terms of emissions continues, temperatures and sea-levels will continue to rise over the centuries to come.

Now let me complicate the picture a little further and make it even darker.

One of the problems with the IPCC's reporting process is that it is cumbersome and time-consuming. The reports depend on a four-year review of refereed and published scientific data and articles, followed by a process of agreeing consensually to the content of the reports. The 'plus' here is that the reports are authoritative. The 'minus' is that by the time they are published, the IPCC's findings can lag behind and significantly understate the latest scientific thinking. This is the case with the latest report.

Dr James Hansen, head of the NASA Goddard Space Institute, has recently insisted that the IPCC's latest claims about sea-level rise are far too conservative. Reviewing ice core data going back at least 600,000 years, Hansen and his colleagues have concluded that atmospheric concentrations of above 350 ppm CO_2 already threaten dangerous climate change: the last time we had that level of carbon dioxide in the atmosphere the temperatures were at least two degrees warmer, the Arctic and Antarctic ice caps vastly reduced, and sea levels several metres higher than at present.[12]

Separately, leading climate scientists have recently reported that we have been emitting greenhouses gases at such a rate over the past decade that we are exceeding the highest rates projected by the IPCC in 2001. Over the period 2000-2007, the growth rate in emissions was 3.5% per annum, almost four times the level of 0.9% each year for the period 1990–1999.[13] This exceeds the assumptions built into the IPCC's most 'extreme' model, which delivers its highest estimates for projected sea-level rise and warming. The most recent data show that we are tracking at or above the highest levels of emissions estimated by the IPCC in their 'worst case' development scenario. John Holdren, special adviser to President Obama, recently compared the current state of global warming to being 'in a car with bad brakes driving towards a cliff in the fog'. We are rushing towards a hotter planet, rather than slowing our pace. Together, these data and these claims have implications that we need to consider closely.

First, it seems that even lower levels of atmospheric concentrations of greenhouse gases than initially estimated will lead to much greater — more immediate and nastier — consequences than first understood. Global atmospheric concentrations of CO_2-e of 450 ppm — previously considered by scientists to be tolerable, or relatively 'safe' in terms of planetary consequences — now begin to look positively dangerous. This is not only because of the very high risk of exceeding the two-degree mark, but because it is likely to be preceded by tipping points like the loss of the Arctic and Antarctic sea ice, major sea-level rise, autonomous warming, and the additional likelihood that (at this point) ocean acidification will become irreversible and cause the collapse of whole marine ecosystems.

Second, when one looks closely at the implications of even lower levels of warming, region by region, it becomes clear that 'dangerous climate change' is a relative term. A global average temperature increase of two degrees *may* seem tolerable for temperate Europe. But it spells catastrophe for low-lying island states and the millions who live in the deltas of the Mekong and the coastal flats of Bangladesh, which face permanent inundation.

It is also catastrophic for climate-sensitive continents such as Australia. Research into possible impacts for Australia has shown that even at less than one-degree warming, we will see between a 10 and 40% decline in the area of snow in the Australian Alps, leading to reduced river flows; a major increase in bleaching episodes to the Great Barrier Reef's corals caused by warming seas, and loss of corals and dependent fish species; half of Australia's montane rainforest lost in northern Australia, and half the available habitat for vertebrates in northern Australian tropical forests also lost.

Between one and two degrees — well before we get to the two-degrees global 'trip wire' for dangerous climate change — we see threats to up to 80% of the Great Barrier Reef, with hard coral reef communities widely replaced by algae; a significant additional decline in rainfall in the Murray Darling Basin seriously affecting agriculture in Australia's major food bowl; increased water shortages for many major cities; and a significant increase in extreme weather and bushfire risk across southern and eastern Australia.[14] Even 1.5 degrees constitutes 'dangerous climate change for Australia'.

One clear implication of this discussion is that the broad global targets of two degrees and 450 ppm CO_2-e that are now desperately being sought in international climate negotiations are likely to be too weak to protect us from significant climate impacts, or to substantially reduce the risk of dangerous climate change and runaway effects. James Hansen and others have suggested that 350 ppm CO_2 may be an appropriate target. However, a lower target of 350 ppm CO_2-equivalent, which equates to around 310 ppm CO_2, would be more appropriate and give us something like a 90% (or nine in 10) chance of staying below two degrees.

This tightening of critical targets is causing anguish among those politicians and policy-makers who now recognise the consequences of 20 years of inaction on mitigation. A very dramatic reduction in emissions is now necessary if we are to act responsibly and confront the climate crisis. It is in this context that we in Australia need to consider three major challenges.

Australia's Mitigation Challenge

The UNFCCC's Article 2 talks about the need to ensure that warming is slowed so that natural processes can continue or evolve without dramatic human-caused disruption. Given the exceptional vulnerability of Australia to small levels of warming, to act 'in the national interest' means that Australian governments should argue for very substantial and early reductions in global emissions … reductions that would keep global warming close to and probably well below 1.5 degrees.

Unfortunately, since 1988, when Australians first became aware of global warming, and particularly under the Howard Government (1996-2007), almost nothing has been done in Australia to wean us off our addiction to fossil fuels. Since 1990, Australia's domestic and industrial greenhouse emissions have increased, on balance, by some 4.2%. Its underlying emissions have increased by 28.8%. Most of this change is associated with the unchecked development of coal-fired and gas-fired power stations to produce electricity (+47% in emissions since 1990) and increased transport use (+27%). It is only because emissions from land clearing have been halved — by reducing the rate at which we have been destroying of one of our greatest carbon stores, our forests and woodlands — that Australia has

managed to offset this underlying increase and approach its Kyoto Protocol-determined target of 108% above 1990 levels.[15]

As a result, Australia has the world's highest level of emissions per person (per capita). On average, around 25.6 tonnes (CO_2 equivalent) are emitted by every Australian each year. With only 21 million people, we produced 536,066 million tonnes of greenhouse gases in 2006 — about 1.5% of the global total. By comparison, Italy, with 60 million people, produced only slightly more emissions (568,000 million tonnes). Australia ranks 13th among all countries in the list of national emitters.

The first challenge, therefore, is for Australia to reduce its dependency on fossil fuels for generating electricity (which are responsible for half of Australia's total annual emissions) and as fuels for transport and other industrial activities. We must also reduce our massive economic dependency on these fossil fuels as an unsustainable source of export income (Australia is the world's largest exporter of coal, and 13th for natural gas).

In 2007, Australia's Labor Party (then in Opposition) and the leaders of all State and Territory governments together commissioned Professor Ross Garnaut to undertake an inquiry modelled on the internationally renowned economic study completed by Sir Nicholas Stern for the British Government in 2006. The Garnaut Inquiry was to review the science and estimate the economic costs of global warming for Australia, and to look at the costs and benefits of Australian action to combat climate change. Garnaut reported in September 2008, and contributed to fierce debate about desirable national targets and about a proposed Australian emissions trading scheme, also promised by the Rudd Government when it was elected.[16]

Garnaut too found that Australia would be hard hit by global warming. He suggested that the Government should agree to medium-term national cuts in emissions of 10% below 1990 levels by 2020, in the absence of an international agreement. This would put Australia on track to contributing to a global target of 550 ppm, or at least three degrees warming. Or, he suggested, Australia should indicate it is prepared to cut emissions by 25% in the context of an international agreement to pursue a global stabilisation target of 450 ppm. Critically, Garnaut found that early, deep cuts would be less

expensive — and better for the planet and for this continent — than delay, and that putting a price on carbon would make alternative energy sources more economically attractive and competitive than they are at present.

As 450 ppm still involves a high risk of dangerous climate change and has consequences that are unacceptably harsh for this continent, a greater early effort — of at least 40% and probably much greater — is necessary if we are to contribute to outcomes and global targets that are safe for Australia. All this may seem like a revolution, and it certainly would involve very rapid and significant changes, including the development of a major renewable-energy sector in just a decade, switching Australian industries, transport and homes to more efficient patterns of energy use and conservation, and producing power from a range of available and new, dispersed sources, including solar, wind and geothermal power.

For the past two decades, the emphasis in Australia has been on building new coal and gas-fired power stations. Tellingly, zero-emissions renewable-energy sources (such as hydro, solar and wind) have declined in importance over the past two decades. Renewables contributed 10.2% of Australia's electricity output in 1990, by 2006 this contribution had declined to only 7.7%.[17]

By contrast, Germany has cut its emissions by some 18% since 1990 and aims to reduce its emissions by 40% by 2020.[18] Much of this reduction initially occurred as a result of industrial restructuring in East Germany at the end of the Cold War, but it has been maintained through growth of energy-efficient new industries, the creation of a significant renewable-energy sector, and increased efficiencies in the transport and household sectors. As a result, 250,000 jobs have been created in the German renewable-energy sector alone.

Australia's Adaptation Challenge

Our second major challenge is to prepare for and to adapt to the inevitable impacts of global warming on our fragile continent. Bushfires, floods and drought are warnings and symptoms of current and impending permanent change. We already are seeing farmers across south-eastern and south-western Australia responding to dramatically altered climates over the past decade, including permanent declines in rainfall and increases in temperature. The CSIRO has

projected changes across Australia that will lead to entrenchment of these outcomes.[19] Such shifts will have an impact on what and how much we can grow — and where. It will make some farming communities unviable and others marginal. The price of foods will probably rise as a result.

We use water like there is no tomorrow. Australians still are among the highest per capita water users in the world. But with sharp declines in the rains that once provided for our rivers and dams, irrigated agriculture is becoming harder to sustain without causing permanent damage to our riverine and wetland environments. Water storages for capital cities such as Adelaide, Perth and Melbourne have fallen to record lows, despite restrained demand. A combination of permanent restrictions, increased prices and infrastructural activity (the construction of expensive desalination plants) is being deployed to secure diminishing water supplies for these settlements.

We love our beaches. Australia is a land of seaside towns, coastal capital cities and summer holidays in the surf. Over the next century we will see seas rise, and the threat increase of more intense storms, higher tides and major coastal flooding. Coastal suburbs, including both poor and expensive beachside properties, are threatened — over the coming decades — with inundation, or will require expensive works to barricade them. Choices about which areas to protect, which to allow to be permanently lost, and who bears the costs of 'coastal defence' or relocation, are quickly becoming issues for coastal planners in state and local governments, real estate agents, insurance companies and banks.

These examples alone point to the need for us to plan for climate adaptation. Adaptation involves an assessment of vulnerability and the level of threat, and then response. It is this process that then shapes the likely impact of global warming. The severity of the impact can in some instances be limited or reduced by how prepared we are — on our adaptation. In Australia, our collective wealth may serve as a potential barrier to impacts if we act fast enough. But we are not yet clear about what we need or want to save. Getting timely agreement about what we need to worry about and then need do is the challenge here. We are yet to have the discussions about what our priorities will be.

Australia's Regional Challenge

The third challenge concerns our place in the world, but especially in the near Asia–Pacific region. Why should we care about what happens elsewhere? There are four arguments that suggest we should. The first two arguments are matters of justice.

First, Australians have a historical responsibility for the problem of climate change. Even though — at least until about 1990 — we didn't know we were contributing to a growing global climate crisis, we did so much more than many other nations and peoples through our patterns of industrialisation and farming, use of coal and oil and the clearing of forests.

Second, we have benefited disproportionately from these historical actions. Our wealth has been generated, potentially, at the expense of the future of the planet's species and ecosystems, and its other peoples. This is clearest when you consider Australians' current per capita contribution of 25.6 tonnes (CO_2 equivalent) per capita to the problem of global warming while an average Bangladeshi contributes only some 0.25 tonnes but will likely suffer harsher impacts. It is from the conversion of our forests to farmland, and from the burning of fossil fuels to produce electricity for our manufacturing industries and our homes, that we have managed to develop our national wealth and maintain lifestyles that are more affluent than others in developing countries, who now will not be able to take advantage of the same opportunities that we had to pollute the global atmospheric commons, first unknowingly and now consciously.

The third argument is related, in part, to these first two. We should help others because we have the capacity to do so. This capacity to help is based on our relative wealth and has been derived in part from our overuse of our share of the planet's environment. But even if this were not the case, one could argue that it is simply right that we help others if we can.

Finally, there is an argument based on naked self-interest. Global warming is a problem that cannot be solved by one country alone. It is only by acting as best we can and contributing to a collective effort that we set an example that might encourage others to do so as well, and may solve the global problem, and therefore we save ourselves.

It is a bitter irony that those who have contributed least to the impending problems of global warming — especially those living on

vulnerable low-lying islands, and the populous but poor communities that have settled the river mouths and flat coastal lands of Asia who will be hardest hit by its impacts on their livelihoods, their health, their capacities to produce food, their settlements. This fundamental injustice — in part a simple product of geography — is recognised in the Convention, which calls on developed countries like Australia to take the first substantial steps to address global warming.

Article 3.1 of the Convention states that:

> The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.

In accepting the principle of 'common' (meaning, collective and global), but also 'differentiated' responsibility (meaning our share defined according to our capacity and historical role and responsibility), where then should Australia focus its attention as we take up our fair burden of international action? When we look at our near-Pacific and near-Asian neighbours, it is evident that many are poor, and many are threatened with disproportionate climate impacts. Extremely poor countries such as East Timor don't have the resources to buffer their communities against the impacts of global warming on their food and water supplies, on their coastal settlements, through the spread of new diseases and via the impact of extreme weather events. For many Pacific islands the same applies – and also for populous neighbouring countries such as Indonesia.

Australia — far wealthier in per capita terms, than any of its neighbours — has the capacity, the responsibility, and the reasons, to help our neighbours in numerous ways. For instance, Indonesia and New Guinea both have substantial tropical forests that are massive stores of carbon as well as globally important sanctuaries for biodiversity. These forests can only be saved if we put a high value on their preservation and assist in their conservation. Indonesia is probably the planet's third greatest source of greenhouse emissions if its legal and illegal land clearing is taken into account. Material aid from Australia would help effect very substantial regional mitigation while transferring wealth to those that deserve it. We also know that global warming has the potential to cause great trauma and disruption and

create insecurity among desperate populations. We have the technical know-how and the material wealth to assist near neighbours with adaptation measures that will lessen climate impacts and enhance our collective security.

If Not Now, Then When?

I have argued that if we are to have a chance of getting a global response that cuts emissions as fast and as deep as we need to protect Australia, then Australia must now show leadership at home and internationally. The Rudd Labor Government was elected in November 2007 on the promise that it would take climate change seriously. It did so immediately after it was elected, by ratifying the Kyoto Protocol. Unfortunately, it has since veered into the slow lane, taking a stance that is far less likely to be in Australia's or the planet's interest.

Despite the Garnaut Inquiry, and the even clearer and stronger advice of climate scientists, the Rudd Government is currently proposing an unconditional national emissions target for Australia of –5% below 1990 levels by 2020. At the time of writing (April 2009), it is prepared to extend this to –15% in the face of an international agreement that commits developed and developing countries to a goal of 450 ppm. Labor also supports a national emissions reduction target of –60% by 2050.

These targets — if adopted internationally — would lead to atmospheric concentrations of greenhouse gases that would almost certainly lead to warming of over 3 degrees by the end of this century, and much higher in the longer term. The outcomes would be especially devastating for Australia. Such targets are wildly insufficient. They are not in the national interest, nor do they reflect our obligations to consider an internationally equitable approach to emissions reduction.

Any suggestion that we can delay pursuing tougher and more meaningful targets until other countries agree to comparable measures, rather than showing leadership, at the end of the day, is also clearly not 'in the national interest'. There are several reasons why this approach makes no sense.

First, to delay seems to suggest either that we believe that we *won't* have to engage in deep cuts at some later stage, or that it will benefit us economically to do so.

On the one hand, as we have seen, the science is toughening its view about what needs to be done and by when, rather than suggesting less effort is required. On the other hand, as we know, it takes time to change the infrastructure and the social values that have made the problem … As Garnaut and Stern have indicated, any delay, while still eventually intending to meet substantial targets, merely defers and intensifies the effort and increases the cost, making the trajectory of emissions reduction much steeper, much more traumatic socially and much more expensive.

Second, the real reason for reducing emissions is not merely to reach a lower emissions target at a later date, but to reduce the quantity of emissions being emitted. Early, deep cuts reduce the quantity of emissions. Remembering that some greenhouse gases remain in the atmosphere and active for hundreds and even thousands of years, each additional tonne emitted will remain a lingering problem for us and for future generations. Delaying the cuts means a greater volume of emissions will be released, with predictable enduring consequences.

Third, by showing international leadership, Australia indicates that it is prepared to take on its fair share, its burden of responsibility. Leading by example, we just might encourage other countries to act in ways that will help us all — and us in Australia especially. We may encourage other developed countries to do the same, resulting in a virtuous 'race to the top' with each competing to outdo the other in emissions cuts, rather than engaging in a selfish and collectively suicidal game of constant delay. And for the same reason of equity, we also should use our rich resources to help our developing neighbours face the climate challenge.

All this suggests we must set national targets that we believe are meaningful and 'safe' for Australia in a global context. So what should those targets be? The science makes it clear that the target bandwidth suggested by the IPCC in 2007, of 25-40% by 2020, is now far too conservative and too dangerous for Australia (and the planet) if we are to avoid warming that nears two degrees — a level especially dangerous for this continent.

I suggest that we must therefore effectively halve our emissions by 2020 — adopting a national target that is greater than 40% below 1990 levels, in the expectation that moving to such a goal will create a dynamic in technological and social innovation that enables us to

go further still. The ultimate goal for Australia should be at least net zero emissions by 2050 (but preferably sooner). On equity grounds this will provide some 'emissions space' for developing countries to continue to use conventional technologies during their own transition to a post-carbon future.

If this all seems too hard or too extreme or indeed impossible … then look closely at the alternatives. Flip a coin. Even at 450 ppm, it's heads we drive the planet to the point where warming begins to run away from us, tails we don't. The bushfires in Victoria, the floods in Queensland, the drought crippling the Murray Darling Basin, and the losses they have delivered to our communities, our friends, our environment, are harbingers of that alternative future. This is as close to a climate crisis as we should get. We must choose and act to stop things getting worse. If not now, then when?

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