A Safe Climate Bill for Victoria

> *"There will be unavoidable and tragic losses in the decades ahead, but far fewer if we act to contain the scope and scale of climate change now.... Our best course is to reduce the scale and scope of the problem with a sense of wartime urgency. And we better move quickly and smartly, while the moving's good."*
>
> David Orr, Professor of Environmental Studies and Politics at Oberlin College and author of the 2009 book: *"Down to the Wire: Confronting Climate Collapse"*.

Contents

Introduction

This discussion paper has been developed to provide background information to support the project to develop an effective Safe Climate Bill for the state of Victoria. It outlines some of the arguments regarding the need for a Bill, summarises the scientific evidence, outlines some of the opportunities offered to Victoria by shifting to a safe climate economy, and proposes a set of priorities to drive the development of policy.

The project

This project is being conducted in collaboration between community climate action group Lighter Footprints, Friends of the Earth (Melbourne) and Greenleap Strategic Institute.

The project aims to develop a draft Bill that, if implemented, would establish Victoria's commitment to climate protection and create a framework to meet Victoria's share of the

global obligation to cut global greenhouse gas emissions to net zero, addressing both its historical carbon debt, and providing for a safe climate future.

This draft Bill will be developed through collaboration between the above parties and consultation with other climate action groups.

It is hoped it will provide a contrasting and alternative piece of legislation to the draft Climate Change Bill currently being developed by the Victorian Government, anticipated for release in late 2009.

It is also hoped this Bill will provide a blueprint for other jurisdictions (national or international) in outlining legislative measures necessary to contribute to the restoration of a safe climate.

What is being done around the world?

There is widespread recognition in many jurisdictions that comprehensive legislative change is vital to achieve the emissions reductions necessary to avert dangerous climate change.

While many policy initiatives being developed represent important efforts towards positive environmental outcomes, there is not yet any comprehensive legislation in any jurisdiction that assumes a fair share of the global responsibility to reduce emissions, remove carbon from the atmosphere and ensure a transition such that, if such a model were implemented on a global scale, would achieve the restoration of a safe climate.

Examples of policy from other jurisdictions (some of which are outlined below) provide useful guidance to the development of climate policy and will be considered in the process of developing a Safe Climate Bill for Victoria. It is the intention of this project to carefully consider the scientific evidence and the full range of policy options this suggests as well as existing policy in the development of the Bill, with the aim of achieving an effective legislative and environmental outcome.

Close to home, the first and to date only climate change act was developed in South Australia in 2007. The *Climate Change and Greenhouse Emissions Reduction Act 2007* established a 2050 target of greenhouse gas emissions reductions by at least 60% to an amount that is equal to or less than 40% of 1990. It also establishes a renewable energy target to increase the proportion of renewable electricity generated and consumed to 20% by 2014.[1] It provides for the establishment of targets for various sectors of the state's economy. It covers six greenhouse gases. It empowers the relevant Minister to determine both baseline and target levels for emissions reductions, and to seek the advice of experts in doing so. It provides for the establishment of targets for particular enterprises or industries and allows for revision of all targets. Accountability is through two yearly reports on the operation of the Act; progress towards targets; greenhouse gas emissions; use of renewable energy; any "significant national or international commitments or agreements"; and any "relevant trends or impacts" associated with climate change. The Act establishes a Premier's Climate Change Council to provide advice on climate change, the implementation of the Act, costs associated with mitigation and failing to address climate change, and the effectiveness of the targets. The Act also provides for the establishment of other policies and programs to reduce emissions and mitigate/adapt to climate change.

There are several examples from international jurisdictions - the United Kingdom, Scotland and South Australia each have a Climate Change Bill; and the United States has draft legislation moving through Congress. Ireland, Hungary, Austria and Belgium all have legislation either about to be debated or being debated in their parliaments.[2]

Climate laws are also being drafted in Finland, Sweden, Austria, and Slovenia. All proposed and draft legislation sets long range targets, ranging from 60% by 2050 (Ireland) to 80% by 2050 (Scotland and Malta) and 87% (Finland). Interim targets range from 30% by 2020 (Ireland) to 40% by 2020 (Sweden). Some include a tax on fossil fuels and CO_2 emissions (Sweden, Finland, Denmark, and Norway). France has announced it will introduce a carbon tax in 2010.[3] Some cover all six greenhouse gases (Scotland, Belgium), others do not.[4]

The United Kingdom (UK) *Climate Change Act 2008* establishes a legally binding target of an 80% cut in greenhouse gas emissions by 2050 and an interim target of a reduction in CO_2 emissions of 26% by 2020, both against 1990 levels.[5] It also provides for the establishment of carbon budgets, which outline the cuts in emissions for each industrial sector, with three five-year budgets to be prepared at any one time. The carbon budgets in this legislation provide for an estimation of annual net emissions, offering a more flexible mechanism than annual targets.[6]

The Scottish Parliament passed a Climate Change law in June 2009 that sets a target of 42% reduction in emissions by 2020 and an 80% cut by 2050. It allows for the inclusion of international aviation and shipping (considered difficult because of the uncertainties associated with knowing where emissions originate); a commitment to reducing all six GHGs, and annual targets (with levels to be set each year, informed by new scientific evidence, economic circumstances, law and policy in other jurisdictions, effect on employment and biodiversity). It establishes carbon budgets and requires 80% of emissions cuts to occur domestically. It provides for the development of strategies for adaptation and plans to address energy efficiency, forestry, waste and recycling, and standards for government buildings.[7] It also provides for a public engagement process to test policy options with the community, assisting in the public's understanding of the policy objectives, and ensuring their coherence with the community's priorities.

It is instructive for Australia's federated system that Scotland, which has obligations under the UK Climate Change Bill, has chosen to adopt emissions reduction targets (42% by 2020) that are stronger than those in the UK legislation (26% by 2020). This demonstrates an important option available to Victoria to set strong targets within its Climate Change Bill, and in doing so, to positively influence the setting of stronger targets nationally and within other jurisdictions.[8]

The European Union has agreed to reduce its overall emissions by 20% below 1990 levels by 2020, scalable to 30% if a new global climate change agreement can be reached with other developed countries. It has also set a target of increasing renewable energy by 20% by 2020. Its central strategy to achieve this is its emissions trading scheme (ETS), first introduced in 2005. Following recent amendments, the scheme now has an EU-wide cap on total emissions, permits to allow specific levels of pollution, and annual reporting obligations.[9] The annual cap will decline each year, to achieve its target reductions.[10] It is anticipated that other greenhouse gases and other sectors will be included in subsequent periods, starting with aviation in 2011.[11] Emissions reductions outside the EU are able to be

claimed as credits, however at least half of the reductions must be achieved domestically. Emissions from transportation, buildings, agriculture and waste are not covered by the EU ETS, and are to be limited by 10% of 2005 levels by 2020 by other policies and measures. Energy consumption is to be cut by 20% of projected 2020 levels by improving energy efficiency and 10% of transport fuel in each country must be renewable.

California first established legislative targets to cut greenhouse gas emissions in 2005. Executive Order #S-3-05 established what were then the world's most ambitious targets: a 2010 target of reducing emissions to 2000 levels; to reduce to 1990 levels by 2020, and to reduce to 80 percent below 1990 levels by 2050.[12] This followed a series of measures established in the 1990s to cut vehicle emissions, and the establishment of a mandatory renewable energy target in 2002. This required an annual increase in renewable electricity of 1% each year, with an aim of 20% by 2017.[13]

Further legislation in California in 2007 (*California Global Warming Solutions Act of 2006)* established an economy-wide cap on California greenhouse gas emissions at 1990 levels to be achieved by no later than 2020. (This represented a 30% reduction from projected business-as-usual levels in 2020). The legislation requires the California Air Resources Board (CARB) to develop regulations and market mechanisms to reduce California's greenhouse gas emissions by 25 percent by 2020. Evaluation of these measures must take into account impacts on California's economy, the environment and public health; equity between regulated entities; electricity reliability, conformance with other environmental laws and ensure that the rules do not disproportionately impact low-income communities. Other provisions made reporting of significant sources of greenhouse gases mandatory from the beginning of 2009.[14]

Other relevant legislation and policies in California include: the 2006 Assembly Bill (AB 1811) providing for $25 million in incentives for the use and production of alternative fuels; the Low Carbon Fuel Standard (LCFS) established by Executive Order in 2007, which reduced the carbon intensity of fuels for passenger vehicles and transportation.

The *American Clean Energy and Security Act 2009* passed by the US House of Representatives in June 2009 outlines a number of changes to existing policy aimed at reducing greenhouse gas emissions.[15]

If passed by the US Senate, the bill would:

- create a progressive reducing annual cap on emissions, so that emissions are reduced by 3% of 2005 levels by 2012, 20% of 2005 levels by 2020 (6% below 1990 levels), 42% by 2030 (33% of 1990 levels), and 83% by 2050 (equivalent to 80% below 1990 levels);
- provide for the development of a national emissions trading scheme, which would apply to stationary sources emitting more than 25,000 tons of GHGs;
- establish a federal GHG registry;
- cover seven greenhouse gases;
- create allowances to emit those gases, of which some would be distributed free, and some would be auctioned;
- regulate black carbon; and
- impose a border tax on imports (to equalise emissions costs between domestic products and imports).

Other major provisions of the legislation would:

- provide support to low-income families to offset higher energy prices;
- establish economy-wide goals for emissions from all sources;
- require energy efficiency and renewable energy targets;
- create energy efficiency standards for buildings;
- provide for the development of a “smart grid”;
- establish emissions standards for the transportation sector;
- support research and development of carbon capture and sequestration technologies;
- provide support for electric car manufacturers;
- provide incentives to purchase fuel efficient vehicles; and
- provide for the development of programs for green jobs and worker transitions.

Significant emissions cuts have been achieved in Germany using a single policy made possible through the *Renewable Energy Sources Act*. This legislation gives priority to renewable energy sources and provides investment security by guaranteeing compensatory payments for investing in domestic renewable energy sources. The creation of a gross feed-in tariff under the Act provides differing compensation rates depending on energy forms and installation size, reflecting differences in production costs to ensure profitability. This has encouraged a booming renewable energy sector and been effective in substantially reducing Germany's emissions. It works through making the costs of renewable energy competitive with other energy sources which are often heavily subsidised.[16] It applies to a diverse range of renewable energy, compensating electricity generated from hydrodynamic power, wind energy, solar radiation energy, geothermal energy, gas from sanitary landfills, sewage treatment plants, mines, or biomass.[17] Progress under the Act is reported every two years, and has provision to adjust the compensation provided per energy source according to developments in technology.[18] This legislation (enacted in 2000) was developed with the aim of doubling the percentage share of renewable energy sources in total energy supply by 2010. This objective stems from Germany’s commitment under the Kyoto Protocol to reduce greenhouse gas emissions by 21% by 2010.[19] An amendment to the Act in 2004 raised the target to 20% of all energy to be produced from renewable sources by 2020.[20] The policy has reduced emissions; improved Germany's energy security, as it relies less now on energy imports; and led to a robust renewable energy sector. It has created thousands of jobs, created demand for innovative renewable energy technology and created a more level playing field for energy production companies. This legislation is considered to be responsible for the development of a world-leading wind industry sector in Germany,[21] and making it the largest producer of solar heating technology in the world.[22] The turnover of the renewables industry in Germany was €21.6 billion in 2006, up from €16.4 billion in 2005. It was responsible for the employment of over 21,000 people – and is expected to employ 500,000 people by 2020.[23]

The following table summarises some emission reduction targets from other jurisdictions:

Target year	**UK**	**California**	**EU**	**USA**	**France**	**Germ-any**	**Scotland**

2020	26%-32% by 2020	Reduce to 2000 levels by 2010; to 1990 levels by 2020	20-30 % by 2020	20% of 2005 levels by 2020 (6% below 1990 levels)	Cut in transport emissions by 20%; reduce energy use in buildings by 38%	40% by 2020	42% by 2020
2050	80% by 2050	80% below 1990 levels by 2050	80% by 2050	83% by 2050 (equivalent to 80% below 1990 levels)	Aims to reduce emissions by 75% between 1990 and 2050	80% by 2050	80% by 2050

The following table outlines some of the policy mechanisms for emissions reductions in other jurisdictions:

UK	**South Australia**	**California**	**USA**	**France**	**Germany**	**Scotland**
Part of European Union (EU) emissions trading scheme (ETS)	Renewable energy target (RET)	Renewable energy target (RET)	Proposed emissions trading scheme (ETS)	Part of European Union (EU) emissions trading scheme (ETS)	Feed in tariff	Renewable energy target (RET)
Energy tax	Sectoral targets	Fuel standards	Renewable energy target (RET)	Carbon tax in 2011	Energy efficiency standards	Emissions trading scheme (ETS)
Sectoral agree-ments			Buildings and fuel standards	Renewable energy target (RET)	Part of European Union (EU) emissions trading scheme (ETS)	Carbon budgets
Renewable energy target (RET)						

Benefits and risks of current policy initiatives

SA:

The lack of a legislated medium-term (2020) target in the SA Act is considered to be a serious omission as it puts the achievement of a 2050 target at risk. The two yearly (rather than annual) time period for reporting is also considered to put achievement of the target at risk. While there is currently provision for the Minister to vary targets based on new or updated methodologies or advice, the Act lacks the impetus of an obligation to respond. In general, accountability mechanisms within the Act are considered to be weak, with much of the responsibility for implementation, review, and reporting of this Act resting with the Minister. The Premier's Climate Change Council, for example, although required on for expert advice, is appointed by the Minister and limited only to an advisory role. Much of the

action the Act relies on is voluntary and therefore risks a failure to meet the set targets. While there are obligations to report on progress towards renewable energy targets within the Act, the targets themselves are based on voluntary action. The provisions for sectoral agreements are also voluntary. There is no provision within the Act to over-ride or amend contradictory legislation (for example targets within the SA Strategic Plan are inconsistent with those outlined in the Act). The essential role of energy efficiency improvements to meet emissions targets is not made explicit in the Act and no provision is made for funding to incentivise energy efficiency. There is no provision for the regulation of offsetting schemes to ensure either transparency or effectiveness in the Act.[24]

UK:

The advantages of the UK legislation are that it established a strong long term goal in law; it provides for the establishment of emissions trading for sectors outside the EU system; it obliges the government to set five year carbon targets and outline how it will achieve them; and establishes an independent committee to evaluate and report on the government's progress.[25] Early indicators of the cost: benefit ratio for the implementation of climate change legislation from the UK are extremely positive. An impact assessment of the UK Act estimates the average annual costs of implementing the measures outlined in the Bill are £14.7 to £18.3 billion; while annual benefits estimated at £20.7 to £46.2 billion. The lower value reflects a scenario in which the UK takes action but the rest of the world does not. In this case the benefits would be distributed across the globe, whereas all the costs would be borne by the UK and the UK would not receive any benefits from reciprocal action by other nations. This suggests that the costs will be in the range estimated by the Stern Review (of 1% +/- 3% of GDP). The UK targets however are too low and inconsistent with preventing a 2ºC global temperature rise.[26] Other criticisms of the UK Act are the intention to offset domestic emissions by buying pollution offsets internationally, a strategy expected to slow the UK transition to a low-carbon economy.[27]

California:

California provides a useful example of the positive effects of climate change policy action: energy efficiency measures and regulation of motor vehicle emissions introduced in this state almost three decades ago has more than halved total air pollutants, despite a concurrent 50% increase in the population (25 million to 36 million) and 110% increase (from 389 million to 873 million) in vehicle miles travelled.[28] Per capita electricity consumption in California (7,000kWh annum) is just 2/3 that of Australia (11,221).[29]

It is important to note that, despite a population double that of Australia's and with a larger economy, California accounts for the same proportion of global emissions as Australia - just over 1%. Regulations such as these that demand that companies that wish to trade in California to comply have been central to positioning the state as a world leader on climate change policy and in a position to achieve the significant reductions necessary to meet effective national and international targets once they are established. It is also important to note that these reductions have been achieved without a carbon trading system – California will only introduce this system in 2009. California’s response to climate change has provided it with significant future opportunities for California businesses in mitigation and adaptation.[30]

EU:

An emissions trading system adopted as the main mechanism for realising EU targets under the Kyoto Protocol.[31] However the early over-allocation of permits and redirection of allocations through the Clean Development Mechanism credits led to lower carbon prices than anticipated and less incentives for abatement.[32] (The purchase of credits through the Clean Development Mechanism allows for the offsetting of domestic emissions through investing in abatement projects in third countries).

Future plans however now include a single, EU wide, cap and no CDM credits allowed after 2013. [33]

Critics of the EU emissions trading system say the emissions cuts that have been realised to date are more likely to be have resulted from concurrent rising energy costs, rather than the emissions trading caps.[34] Ongoing risks to the overall ambitiousness of the scheme include continued lobbying from energy intensive industries for allocation of free permits to prevent "carbon leakage" (i.e. that they are forced to relocate to countries with less stringent regulation).[35]

There are serious concerns about using offsetting as a mechanism to meet domestic greenhouse gas emissions reductions targets.[36] Essentially this approach facilitates the "off-shoring" of emissions, by allowing developed countries to meet their targets through the financing of projects that reduce emissions in developing countries.

This is considered a flawed approach for the following reasons:

- the science clearly demonstrates emissions cuts are needed on both developing and developed nations; however offsetting allows cuts in developing nations to be counted among those promised by developed nations;
- it is impossible to establish that the outsourced cuts would provide the same reductions domestically;
- reliance on outsourcing means developing nations are delaying a economy-wide shift to a low carbon economy;
- there is nothing to ensure the cuts achieved through offsetting are actually sustainable or are appropriately compensated.[37]

The availability of offsetting has led to many developing countries delaying their investment in low carbon technologies, and this is further delaying a transition to a low carbon economy. There are concerns that the revenue from projects financed under the CDM are paying for the expansion of carbon intensive industries in developing nations.[38]

USA:

The proposed American Clean Energy and Security Act of 2009 (ACESA) has been broadly criticised for rewarding polluters and failing to set targets that will be effective, with loopholes expected to mean emissions reductions will not occur until 2027.[39] There are also concerns that the Bill will replicate the shortcomings of the European Union (EU) emissions trading system in this regard, with the offsetting of emissions and low targets initially failing to deliver emissions cuts or boost renewable energy technology.[40] The Bill is likely to face a difficult passage through the Senate, with several key Republican Senators opposed to its passage and the fossil fuel industry warning of threats to energy security and price rises.[41,42]

What is the science telling us?

Please note: This discussion paper presents a summary of current and possible impacts of climate change, globally and in Victoria. Most of the future impacts, unless it is made clear in the text, are based on projections that use a climate sensitivity close to 3ºC. Climate sensitivity is measure of how much the earth's temperature is expected to increase for each doubling of CO_2. James Hansen and colleagues have argued that when slow feedbacks in the climate system are taken into account (eg. the release of natural carbon stored under the impact of rising temperatures) the climate sensitivity might be more like 6ºC. This means that future climate impacts are likely to be worse sooner than expected and that more stringent measures will be needed to tackle the climate issue effectively.

Climate change is occurring extremely rapidly and projections regarding its effects are now well beyond the predictions of the 2007 IPCC report.[43]

Global warming of almost 1°C as a result of greenhouse gas emissions has already occurred, [44] and even with no further emissions, the world is very likely committed to a warming of more than 2°C.[45]

Atmospheric CO_2 is now at 387ppm and rising about 2ppm each year – a faster rate than has occurred in the last 800,000 years.[46]

In contrast, over the last million years, an increase of 30ppm has always taken more than 1000 years to occur.[47]

Since the pattern of global warming directly correlates to the increasing concentration of greenhouse gases in the atmosphere, the average global temperature has increased almost 1°C over the last century. [48,49] Ice core samples tell us that a change of 5°C is the difference between current global average temperature and the last ice age.[50]

There is broad consensus that catastrophic and irreversible global warming is likely to be associated with a global average temperature rise beyond 2°C, and that global efforts must concentrate on keeping warming to within the 2°C "guardrail".[51]

Irreversible climate change has already occurred with the current level of warming.[52] We are already experiencing extreme weather events and diminished viability of already threatened species.[53] The distribution of negative impacts where the majority of people are adversely affected by climate change becomes a severe risk beyond 2°C warming.[54] A high risk of "large scale discontinuities" accompanies a scenario of more than 3°C warming.[55]

If atmospheric CO_2 concentrations reach 700ppm by 2100, it is estimated daily maximum temperatures will increase to 50°C in some parts of Australia.[56] This will have significant implications for human health, biodiversity, food and water security in the affected regions.

The 2007 IPCC report predicted a sea level rise of 19-59cm by the end of the century, however this is well short of current estimates. The loss of ice in Greenland and Antarctica will likely lead to a rise of at least a metre by 2100, and quite possibly higher.[57] This would

lead to an increase in coastal flooding in Australia with events we currently expect just once a century likely to occur several times a year.[58]

Artic sea ice has been thinning by approximately 18cm a year since 2004.[59] And since the pre-industrial era that total loss of ice volume in the Arctic is now about 80%. Once this ice has melted, the earth will lose the reflective protection the ice currently affords, and lead to faster melting. It will also allow the unprecedented release of billions of tonnes of carbon dioxide and methane (much more powerful a greenhouse gas than carbon dioxide) from the permafrost beneath the ice. There is estimated to be in excess of 1,600 billion tonnes of carbon (in frozen plant material) in the permafrosts of Eurasia and North America and about 1.500 trillion tonnes of carbon under the Arctic Ocean. This carbon store could be mobilised as the Arctic atmosphere and Ocean warms. By way of comparison, this is twice the amount of greenhouse gases already in the atmosphere.[60]

It is predicted that the warming of the Arctic will lead to feedback loops that may lead to a surge in global warming and dramatic alterations in the earth's climate that human intervention may not be able to reverse.[61]

The loss of ice habitats is threatening the viability of many species,[62,63] not least vast human populations dependent of the Himalayan and Andes glaciers for water and food production.

Estimates of the number of climate refugees by 2050 range from 35 million people to one billion, as sea levels rise, loss of land, environmental degradation and hunger forces people to migrate.[64,65,66]

More extreme weather events are already occurring, with unprecedented levels of fires and floods, both of which are occurring more frequently, and affecting vast areas of land.[67]

Drought and desertification now affect larger areas Australia, Africa, Mediterranean Europe and western USA threatening food and water security for large populations.[68,69,70,71]

As atmospheric CO_2 rises, the ability of the ocean to absorb excess CO_2 also diminishes,[72] leading to a significant decline in the effectiveness of the ocean as a carbon sink. It is thought around 30-40% of the CO_2 emitted over the last two centuries has been absorbed by the ocean.[73] Uptake of CO_2 in the ocean is now known to be slowing and, as a result of warming surface water and influx of fresh water from melting ice, may cease in the near future.[74] At the same time, oxygen depletion in the ocean linked to fossil fuel combustion is increasing mortality rates in marine species, as surface warming leads to large "dead zones" in the ocean.[75]

The world's science academies have called for urgent and huge cuts in emissions, warning ocean acidification is irreversible in any timeframe relevant to humans or to ecosystem protection, and will cause "massive corrosion of our coral reefs and dramatic changes in the makeup of the biodiversity of our oceans, [which will] have significant implications for food production and the livelihoods of millions of people.[76]

Climate change has been identified as the biggest threat there is to global health;[77] and it is already responsible for the deaths of 300,000 people each year.[78]

Natural disasters are occurring more frequently and with greater intensity: the recent World Disasters report by the Red Cross shows that in the last 33 years, there have been eight years in which over 100,000 people have died from natural disasters – with three of these occurring in the last six years; 2003, 2004 and 2008.[79]

The increase in ocean temperature resulting from atmospheric CO_2 exceeding 320ppm has caused widespread mortality on the Great Barrier Reef and many other reefs around the world.[80] With CO_2 now at 387ppm, reefs are seriously declining and they will continue to decline, affecting the viability of the marine and coastal ecosystems they support.

Marine science experts meeting in London in July 2009 said current plans to stabilise atmospheric CO_2 at 450ppm would cause the catastrophic loss of coral reefs from the combined effects of climate change and ocean acidification, and that urgent stabilisation of the earths' atmosphere at less than 350 ppm was necessary to ensure long-term viability of coral reefs. They acknowledge this requires active removal of CO_2 from the atmosphere. In addition, cessation of the threats to reefs from over-fishing, destructive fishing, coastal pollution and sedimentation was essential to ensure their continued survival.

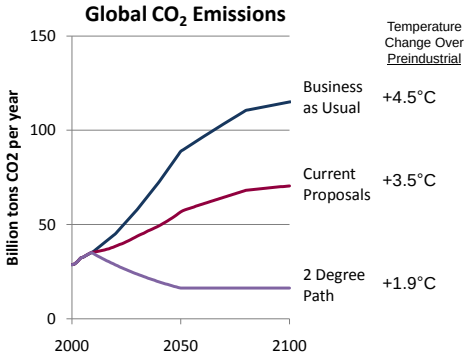
The final paragraph of the Royal Society report plainly summarises the dangers:

> *The Earth's atmospheric CO_2 level must be returned to <350ppm to reverse this escalating ecological crisis and to 320ppm to ensure permanent planetary health. Actions to achieve this must be taken urgently. The commonly mooted best case target of 450ppm and a timeframe reaching to 2050 will plunge the Earth into an environmental state that has not occurred in millions of years and from which there will be no recovery for coral reefs and for many other natural systems on which humanity depends.*

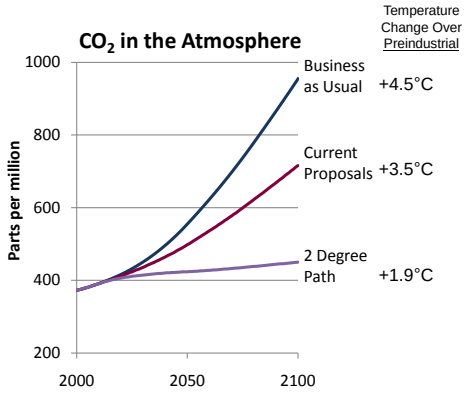
If emissions continue at a "business-as-usual" level, it is predicted atmospheric CO_2 will reach 1000ppm by the end of the century.[81]

As illustrated below, the business-as-usual approach also risks a temperature rise of almost 5°C (or more - if higher climate sensitivities are used); and current emissions reductions proposals will not achieve a return to preindustrial atmospheric CO_2 levels.

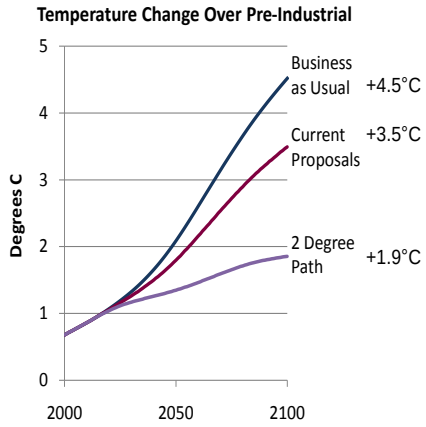
Recent Results: Emissions



Recent Results: Concentrations



Recent Results: Temperature



Source: ClimateInteractive.org

The adjacent figure demonstrates global emissions, CO_2 concentration, and temperature increase for a range of scenarios:

- Business As Usual (BAU) is calibrated to the Fourth Assessment report of the IPCC;
- "Current Proposals" represents global emissions reductions proposals as at September 2009;
- The emissions reductions, atmospheric CO_2 , and temperature increase likely if the world implemented cuts that would stay within the 2°C guardrail.

This modelling is conducted using a simulation model known as C-ROADS-CP. It has been used to develop the Climate Interactive Scoreboard to calculate the long-term climate impacts of proposals under consideration in the negotiations to produce a global climate treaty.

For more information see: http://climateinteractive.org/state-of-the-global-deal/

It is important to note that these graphs are developed using a climate sensitivity of 3 ºC. James Hansen and colleagues have estimated that a more reliable estimate of climate sensitivity, taking into account slow feedbacks is 6 ºC. Therefore these graphs **do not account f**or several positive feedbacks found in the climate system, and provide a **conservative** picture of future climate impacts.

In summary, climate impacts fall into two categories.

1. Near term damaging impacts on people or nature – now or in the near future. These are impact that cause direct harm.
2. Impacts on the earth system that drive further changes that will worsen the direct impacts – at a later time. That is, these are dangerous feedbacks that boost later damage to a higher level or that set off runaway changes.

What does climate change mean for Victoria?

Failure to address climate change will have serious and in many cases irreversible effects on the natural environment, economic stability, population health, food security and social cohesion.

Victoria is already experiencing a rapid change in climate, with average temperatures increases and lower rainfall every year.

A recent study by the Bureau of Meteorology and CSIRO has confirmed the dramatic decline in rainfall in Victoria over the last decade is caused by climate change and as such is not a natural "drought", nor will it be temporary – if a safe climate is not restored.[82]

Based on the very conservative assumption of a 3º C climate sensitivity,[83] the Victorian Government's 2009 *Climate Change Green Paper* suggests that under the current emissions trajectory it is possible Victoria will see an increase in annual average temperatures of up to 3.8°C by 2070.[84] Increases are expected to be even higher inland, while metropolitan areas such as Melbourne will experience a "heat island" effect. According to the Green Paper, average annual rainfall may decrease by as much as 25% by 2070.[85] The risk of drought is likely to increase by 20-80% in southern Victoria, while in the north the risk is between 10-60% by 2070.[86]

The state will experience increasing evaporation rates (possibly up to 8% higher by 2070), increased high fire danger, much less snowfall, more frequent drought and greater risk of coastal erosion and inundation.[87] In areas with the highest snow cover, there may be up to a 96% decrease in snow cover by 2050.[88] There is predicted to be significant loss of biodiversity, water insecurity will intensify, agricultural production (from food to forestry) will decline, coastal developments will be at risk from rising sea levels, and there are much higher risks of severe storms and coastal flooding.[89]

There are expected to be dramatic effects on biodiversity in the state, with ramifications for a range of species, especially those with small populations and restricted habitat. Significant extinctions are likely from a global average temperature rise of 2°C; with alpine species particularly at risk.[90] Streamflow in inland waterways is predicted to decline by up to 40% by 2030, and could lead to the disappearance of tens of thousands of hectares of native forest,

threaten bird and fish populations, and lead to the degradation and loss of internationally listed wetlands.[91]

As demonstrated in such a devastating manner across Victoria in the past twelve months, increases in drought and dramatic weather events (including bushfires) predicted in national and international climate change reports are increasing.[92]

Climate change poses serious health risks to Victorians, with increased morbidity and mortality from heatwaves, infectious diseases, air pollution, mental illness, poor water quality and food insecurity.[93] Children, the elderly, and those in coastal as well as rural, remote and regional communities are expected to be most severely impacted.

Increases in global temperature have led to more heatwaves in the state, with the risk of death from heatwaves higher in Victoria than northern Australian states.[94] Heat-related illnesses are already increasing in Victoria: a single heatwave in January 2009 saw a 62% increase in mortality, from both direct heat related illnesses and associated exacerbations of chronic medical conditions. The Victorian Department of Human Services reported that during this five day event, ambulances had a 46% increase in demand; emergency departments experienced an eight-fold increase in heat related presentations; cardiac arrests almost tripled; and there was a threefold increase in patients dead on arrival.[95]

As heatwaves increase there are more bushfires, and an increasing incidence of related deaths, injuries and burns, as well as respiratory disease. Extreme weather events associated with flooding and heavy rains will cause more fatalities as well as traumatic injuries and post traumatic stress disorders. Infectious diseases are now more likely - with every rise in temperature of 1°C, there is an 8% increase in the rate of hospitalisation of children with diarrhoea. Asthma and allergies will increase as a result of rising temperatures associated with climate change, and the mental health consequences of living with climate change are expected to increase in incidence and severity as more and more communities are affected.[96]

As temperatures continue to rise and associated extreme weather events in Victoria increase in incidence and severity, action to halt and reverse the effects of climate change is vital to prevent further serious and increasing health risks and unnecessary deaths.

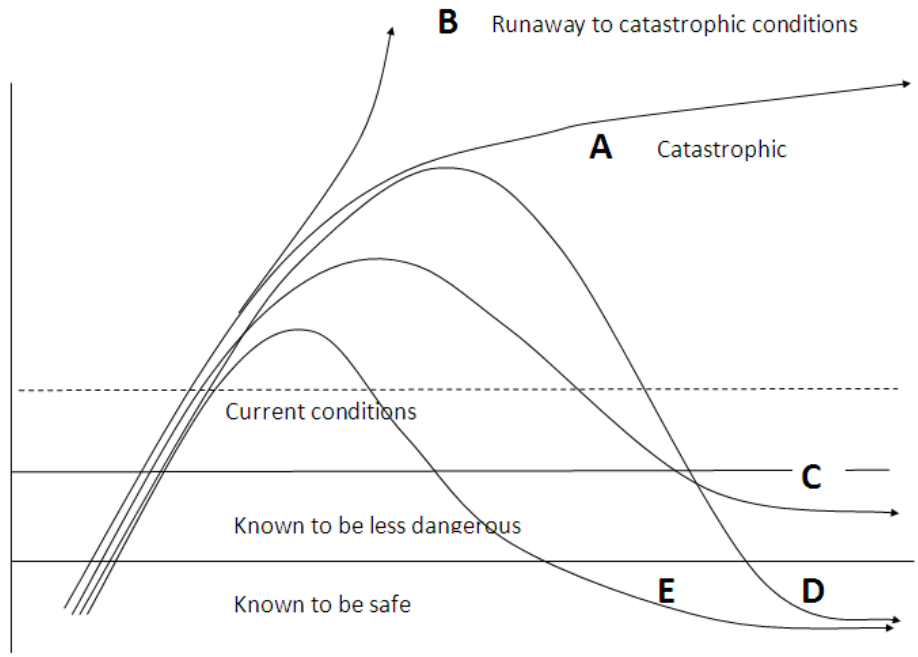
It is important to note that modelling and predictions outlined above **do not** take into account the most recent climate science, and are generally based on IPCC predictions from the Fourth Assessment Report. The actual future risks may be much more severe.[97]

What are some of the current proposals to address this challenge?

There are currently a range of proposals aimed at addressing this challenge around the world.

These have emerged according to variations in scientific advice and political decisions about what is possible to achieve in terms of domestic mitigation activities, as well as expectations with regard to international agreements. There has not yet been a commitment by any country to climate policy options that scientists expect will avert runaway climate change.

The following graphic illustrates the predicted trajectory of atmospheric CO_2 under a number of these approaches and the likely consequences.



A = what current Australian policies are aiming for;
B = the likely outcome of these policies;
C = the outcomes of policies to stabilise the climate by aiming for an atmospheric CO_2 concentration of 350ppm (as advocated by James Hansen);
D = the representation of the policies being advocated by Meinshausen;
E = Australian 'Safe Climate' policies as outlined in Climate Code Red.

At present, there are at least two distinct paradigms with respect to climate policy approaches and expectations about what is achievable or desirable. And there are a number of intermediate variations.

The main paradigms are:

- limiting dangerous climate change
- restoring a safe climate

These paradigms can be defined according to the target atmospheric CO_2 level, the recommended emissions cuts, and the mitigation outcome, sometimes are expressed as a global temperature rise. The paradigms and some important variants, their rationale and implications are outlined below.

The first, described here as: **"limiting dangerous climate change"** is based on the concept that came from the Framework Convention on Climate Change and is now being developed into policy responses based on a maximum 2ºC temperature rise, an atmospheric CO_2 upper limit of 450 ppm, and an emissions reduction target of 25-40% by 2020 and 60-80% by 2050 for developed countries.

This paradigm is built on the assumption that only a compromise outcome is possible, leading most politicians and corporate leaders to assume that targets framed within the 'avoid dangerous climate change' are not absolute and that they can be compromised even further.

The rationale behind these approaches is that any more effective policy outcomes are politically too difficult to achieve, and that this approach will at least limit dangerous climate change, prevent the loss of some species and slow the rise in sea levels and other climate effects.

The outcome of these policies however is predicted to fall into the range of the **A** trajectory outlined above, in that it will not avoid dangerous climate change over the long term, will fail to limit warming to 2ºC, and will lead to catastrophic and irreversible feedback loops.

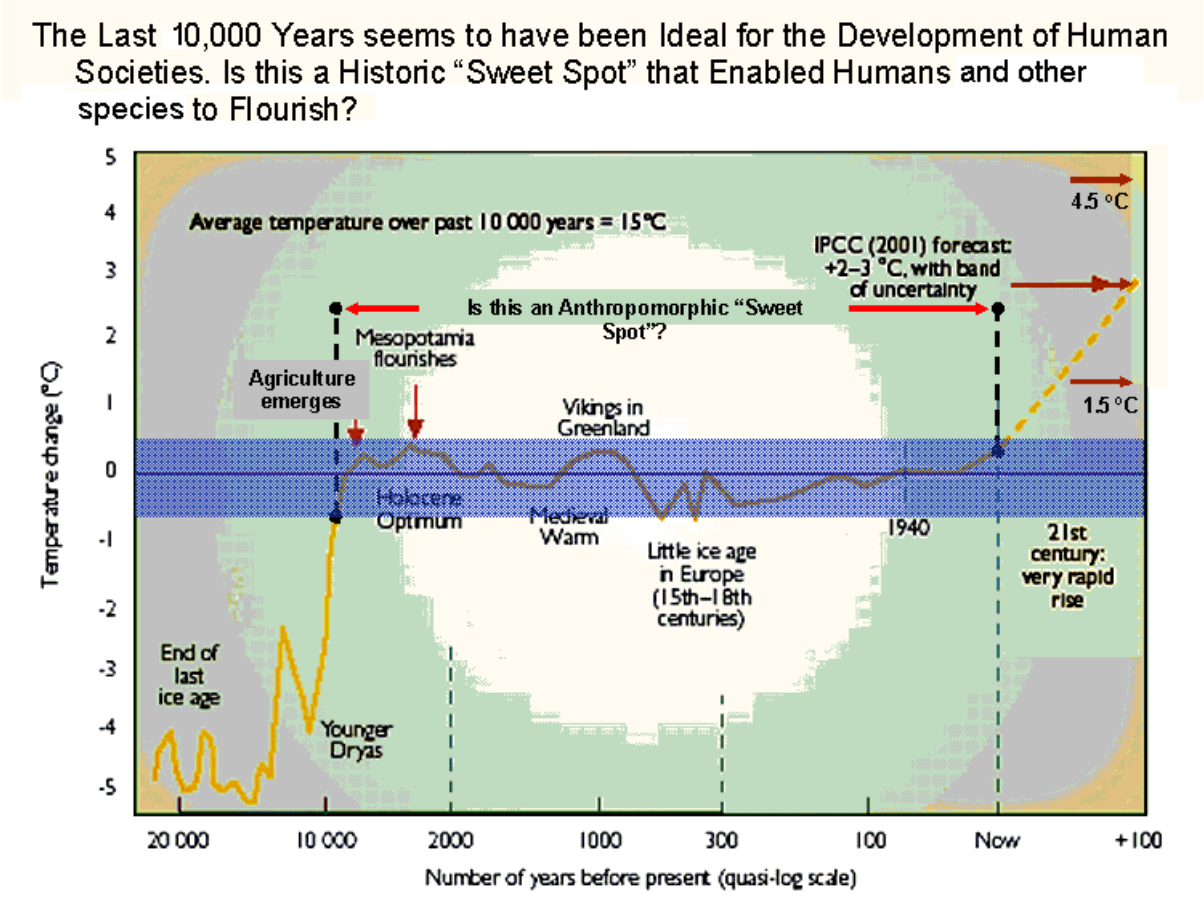
A stabilisation of atmospheric CO_2 at 450ppm will not prevent the catastrophic loss of coral reefs,[98] will lead to massive sea level rises,[99] and may quickly lead to uncontrollable feedback loops.[100] Due to underestimation of the impact of slow feedbacks (eg. the mobilisation of some or all of the massive carbon stores in the Arctic [probably over 3000 billion tonnes of carbon], these strategies in reality are likely to lead to rapid runaway conditions.

The second paradigm described here is that of **"restoring a safe climate"**. It is the thinking that underpins the approach being taken in developing this draft Bill. This is a seriously intended aspiration to restore a safe climate, not simply avert dangerous climate change, but to reverse anthropogenic climate change, and return atmospheric CO_2 to preindustrial levels that are know from long experience to be safe. This is the paradigm first outlined in the 2008 book, *Climate Code Red,* by Melbourne authors David Spratt and Philip Sutton and now being developed by Safe Climate Australia.

The rationale for this approach is simply that we should aim for nothing less than the restoration of safe climate, the definition for which is drawn from the relatively stable pre-industrial levels of atmospheric CO_2 of between 280-310ppm. The predicted outcomes of this approach would be the restoration of summer Arctic sea ice, restoration of the glaciers in the Himalayas and the Andes, a halt in the decline and then the restoration of coral reef systems, restoration of natural carbon sinks, and a reduction in oceans acidity such that marine species are no longer threatened.

The safe climate paradigm is built on the concept of homeostasis. Most living things have a capacity to keep the internal conditions of their cells/body within optimum operating conditions (eg. salinity, acidity or temperature etc.) In the case of warm blooded animals the core temperature of the body is kept remarkably constant. For example, most humans in any environment on the planet will have a core temperature close to 37ºC. This temperature provides an optimum operating environment for humans – it assists in protecting them from disease and creates the conditions necessary for healthy growth and development.[101] Invasion by pathogens and the subsequent immune response however can lead to a rise in temperature – itself able to cause physical harm if untreated. With effective treatment however, these effects are minimised, wellbeing is restored and the body temperature returns with remarkable faithfulness to 37ºC.

Systems applying this homeostatic model (from the Latin meaning staying the same) have a suite of mechanisms to prevent temperatures going outside the safe/optimum range. If deviations do occur other responsive mechanisms are activated which bring the conditions back within range. When this concept it applied to climate, this means that even if the climate is currently outside the safe or optimum range, it is not appropriate to accept the new conditions as a permanent feature of the planet. Maintaining homeostasis demands that we restore the optimum conditions for a safe climate, and in doing so protect critical elements of the earth system while the optimum conditions are restored.



Sitting close to the safe climate approach are three approaches that have gained significant support recently:

- the 80% emissions reduction by 2020 target of Lester Brown[102]
- the 350 ppm CO_2 atmospheric target of James Hansen[103] and Bill McKibben[104]
- the total carbon budget approach of Malte Meinshausen[105] and advocated by Hans Schellnhuber[106].

Lester Brown, the President of the Earth Policy Institute, has argued in his series of books "Plan B" (versions 1.0 – 4.0) for an 80% reduction in CO_2 emissions by 2020.[107] This reduction is aimed at capping atmospheric CO_2 emissions at 400ppm, and acknowledges that 'sets the stage' for reducing CO2 concentrations to the lower concentrations advocated by James Hansen and other climate scientists. The target of 80% by 2020 is also supported

by Jim Garrison and the State of the World Forum and is now being promoted actively in an international campaign that was launched in Brazil in 2009.[108]

The position advocated by climate scientist James Hansen and the **"350.org"** campaign is based on a one degree warming cap and 350 ppm CO_2 as the level of atmospheric CO_2 that must not be exceeded. The rationale for this approach stems from James Hansen's 2008 paper "Target CO_2: Where should humanity aim" which advocated an ***initial*** reduction of atmospheric CO_2 at 350ppm ***or less***. Unfortunately, the rider "or less" has been lost in translation, and many people, including Bill McKibben, who established the international 350.org campaign, did not take this into account in calling for 350ppm to be acknowledged as the optimum atmospheric CO_2 level. Unfortunately it also means that for many people 350ppm *becomes* the target, rather than being an indication of what is not acceptable (i.e. being above 350ppm). James Hansen's article (which has been utilised in the development of the 350 target), actually explains that 350ppm is a *precautionary target* to stop global loss of all the ice-sheets on the planet, and as such it is not an indicator of what is needed to restore the extent and thickness of the Arctic sea.[109] If the atmosphere was in fact stabilised at 350ppm of CO_2 the result would be a global average temperature 1ºC above the known safe preindustrial level, with further sea rise and patterns of extreme weather events and desertification even more severe than at present, with coral reef systems be severely degraded and with near complete loss of ice in the Himalayas and the Andes – making food production more difficult for several billion people.

Malte Meinshausen and colleagues propose that emissions reduction targets be based on the total amount of carbon that can be safely emitted in order to remain within the 2°C guardrail. In a study published in *Nature* in April 2009, Meinshausen et al estimate no more than 1000 billion tonnes of carbon can be emitted between 2000 and 2050. The authors argue policy targets based on limiting cumulative emissions are more likely to be robust than emissions reduction or atmospheric stabilisation targets. One third of this amount has already been emitted. Han Schellnhuber from the Potsdam Institute of Climate Research has calculated that, if the remaining emissions budget were shared equally across the globe, each person could emit around 11 tonnes of CO_2 between now and the middle of the century. If the expected population increase is taken into account, this would allow just 85 tonnes per person. This would require countries like the United States moving to zero net emissions by 2020.

The restoration of safe climate requires consideration of a range of mechanisms that will achieve emission reductions. This will require a bold approach to policy that is committed to a science-informed approach, and uses targets that are consistent with and responsive to evolving earth system science.

Why we need a Safe Climate Bill

A Safe Climate Bill is needed to give effect to the strategy of restoring safe climate conditions globally, with Victoria playing its full part.

The critical elements of the safe climate vision are:

- The restoration of a "safe climate" to protect all people, all species and all generations.

- The need to return the climate to a state that restores the environmental conditions found in the preindustrial era and bounded by precautionary limits set using scientific data and best practice safety protocols.
- The need to (a) stop worsening the problem by creating a global economy that causes zero forcings of the climate system leading to warming (this implies net zero emissions globally); (b) reduce the atmospheric CO_2 to a safe level (likely to be somewhere near the preindustrial 280 ppm and certainly no higher than 310 ppm CO_2 so that the earth's temperature can fall to a safe level; and (c) use direct cooling techniques to protect the earth system from damaging climate change while natural safe climate conditions are restored.
- It has been estimate by Safe Climate Australia that the three physical strategies need to be applied at full scale within 10 to 20 years.[1]
- This implies a rate of economic change not seen since the economic mobilisation of World War 2. Such economic change will need to draw from the full suite of policy instruments include a wide range of non-market instruments.

This requires the intervention of governments to develop effective mechanisms and strategies to deliver the necessary reductions in emissions and remove excess CO_2 from the atmosphere and to manage the use of direct cooling .

A Safe Climate Bill will establish mechanisms that will ensure Victorian industries and communities to implement these three physical strategies.

The actions of government through effective legislation, regulation, public policy and investment in response to climate change are the key to protecting Victoria's environment, its economy, the health and wellbeing of its residents and species.

The Victorian community wants action and leadership on climate change – a recent study demonstrates it is the highest priority public policy issue for Victorians.[110] Victorian industry also acknowledges the need for action, with the vast majority of Victorian businesses accepting they have a responsibility to reduce emissions and that there will be a cost to do so.[111]

How does this compare with the Victorian Government's policy?

The recent Victorian Climate Change Green Paper outlined three distinct areas of action for the Victorian government in response to climate change. These are:

1. Complementing the Carbon Pollution Reduction Scheme;
2. Positioning Victoria to take advantage of the opportunities offered by a low carbon economy; and
3. Adapting to "unavoidable" change.[2]

The approach outlined above does not suggest a commitment to prevention of climate change, and it is evident that the Victorian government sees its role as one of adaptation, while relying on limited national policy initiatives for slowing down climate change.

[1] SCA Strategic Framework for a Safe Climate Transition Plan (Discussion Draft), October 2009
[2] Much of the impact assumed by the Victorian government is avoidable using safe climate strategies.

Recent political events in Australia's federal parliament highlight the difficulty for Victoria in relying of the federal government to take responsibility for acting on climate change.

The reality that the CPRS as it currently stands will not cut Australian emissions in the near term,[3] means Victoria is currently without an economy- wide strategy for cutting emissions.

Delaying action in Victoria while a national scheme is still being developed is risky and could be construed as an abdication of this states' responsibility to take action to put in place a safe climate economy.

However by demonstrating leadership with strong policy action, Victoria could: demonstrate to other jurisdictions that the state is prepared to accept its share of the global burden in responding to climate change and act accordingly; position the state for a key role on a zero emission economy; and create an important tactical position in seeking national and international action.

How should Victoria respond?

Victoria needs to eliminate its contribution to human-induced climate change.

The restoration of safe climate requires the stabilisation of atmospheric CO_2 between 280-310ppm. This therefore requires cutting current emission to zero, and action to "draw down" CO_2 to this level.

Furthermore, during the time that the earth is still too hot and before a safe climate has been restored, protective measures will be needed to directly lower the temperature (eg. by increasing the reflectivity of the earth) and to protect people, the economy, agriculture and nature from the impacts of climate change. Adaptation is part of this response.

This not only requires addressing the overshoot in atmospheric CO_2, since we have already passed the limit identified as safe, but it also requires invoking the precautionary principle, and taking action to mitigate against changes which may not yet be manifest.

It is worth noting that even the best overseas legislation does not aim for an economy that produces zero human-induced warming (compared to pre-industrial), nor does it deal systematically with drawdown or direct cooling and effective safe passage.

Moving to zero net emissions

As a major contributor to national greenhouse gas emissions due to its reliance on fossils fuels for electricity generation, specifically coal, Victoria needs to act to quickly and decisively to alter the current structure of its energy sources by making immediate and significant investments in renewable energy. Major investments are also needed in energy and resource efficiency.

[3] Federal Treasury modelling indicates that the Labor Government's initial version of the CPRS legislation would not actually cut Australia's greenhouse gas (especially CO_2 emissions) before 2035, and then only because of the assumed introduction of carbon capture and storage techniques that allow continued reliance on fossil fuels.

Victoria's total annual greenhouse gas emissions are 123,025 kilo-tonnes,[112] with the stationary energy sector responsible for 72% of all greenhouse gas emissions.[113] The average Victorian household is responsible for almost 12 tonnes of greenhouse gas emissions from energy used at home, and the average Victorian car produces 4 tonnes of greenhouse gas every year.[114]

Rapid reform of the energy supply system will be necessary to eliminate net emissions. In addition to regulating emissions and other causes of warming, direct public investment in clean energy technologies to deliver immediate and long term cuts in emissions.[115] Substantial increases will also be needed in the direct public financing of research, development, and implementation of innovative energy technologies.[116]

Draw down of excess CO_2

The concept of an ecological debt, or carbon debt, refers to the historical (and current) ecological damage by industrialised countries in either its' own or other jurisdictions.[117] The carbon debt of any jurisdiction is made up of the extent to which its CO_2 emissions have exceeded a sustainable in the earth's atmosphere.

By ascertaining the carbon debt of a jurisdiction, it is possible to ascertain (and quantify) the extent of their obligation to draw down excess CO_2 to restore the atmosphere to a safe climate level.

Australia's carbon debt between 1750 and 2001 is estimated to be 7.6 gigatonnes (i.e. excess carbon produced during this period). Given the 20% contribution of Victoria to the national emissions total, the state's carbon debt is likely to be approximately 20% of this figure. While costs of addressing this debt are also likely to be considerable, a failure to commence action to reduce this carbon debt will only lead to greater costs later on, just as economists Stern and Garnaut have referred to in their respective reports.

Australia's per capita greenhouse gas emissions are the highest of any OECD country and among the highest in the world.[118] Victorian per capita emissions are the nation's highest, and annual emissions exceed 120 million tonnes of CO_2.[119] This is more than 20% of the nation's total, and an increase of almost 10% on 2000 levels, i.e. less than a decade.[120]

Victoria will also need to develop strategies for all sectors to rapidly achieve very large annual reductions in emissions in order to create a net zero emissions economy needed to ensure a safe climate.

Safe passage

Since the restoration of safe climate is a long term goal because the drawdown of excess atmospheric CO_2 necessarily takes many decades to achieve, in the short to medium term it will be necessary to continue to act to protect the community and other species (all people, all species, and all generations) from the harmful effects of climate change and minimise damage and species loss. The development of strategies to develop emergency protection mechanisms and adaptation measures by the Victorian government is an important part of managing current climate impacts while we transition to a safe climate. However, the longer it takes to implement these strategies, the greater the risk of climate impacts, making longer term emissions cuts will be much more difficult and expensive.[121] Also Victoria will need to

make well thought out and adequately scaled contributions to research, testing selection and deployment of environmentally beneficial direct cooling technologies.

Victoria acting globally

As well as making sure that Victoria plays its full part in eliminating its contribution to human induced warming the people and economy of the State can be engaged in helping the rest of the world tackling the climate issue. A Safe Climate Bill could create mechanism to facilitate this contribution.

Benefits of action

As outlined in the 2006 Stern report,[122] and the 2007 Garnaut [123] review, early action is the most effective and cost effective way to tackle climate change. The longer the delay, the greater the financial, economic, social and environmental costs will be. Failing to act quickly enough may mean the progressive destructive effects of climate change are irreversible.

The evidence suggests it is possible to substantially reduce our greenhouse gas emissions in a relatively short time without major technological breakthroughs or even major lifestyle changes – if governments, business and the community act quickly.[124]

A 2008 report by the Nous Group, *Turning It Around*, demonstrated significant cuts in Victorian greenhouse gas emissions are possible, revealing that if significant investments were made in Victoria in renewable energy (with concurrent efforts to reduce energy demand), greenhouse gas emissions in Victoria could be reduced by 60% by 2020.[125]

This demonstrates that shifting to a low carbon economy is well within the reach of Victoria. In addition, the costs of doing so are well within our reach: a 2009 report has demonstrated Australia could successfully transform to a low carbon economy at less than half the amount spent by the federal government on the recent economic stimulus package. While the time-frame for the report of 2010-2050 is outside the parameters required to address dangerous climate change, it is instructive in that its' estimate of the costs of making this necessary transition over four decades would be a relatively small investment - AUD $28.3billion.[126]

Substantial reductions are possible without emission reductions delivered through a carbon trading scheme. These cuts can be achieved by substituting cleaner energy for coal and by moderating energy demand; both important strategies for a sustainable Victorian future.

Recent reports on jobs clearly demonstrate the economic benefits associated with investments in clean energy: a recent report from Environment Victoria found the establishment of modest incentives in the solar, rail, recycling and wind industries would lead to the creation of 23,260 new jobs in the state.[127]

Shifting to a reliance on renewable energy sources will not only strengthen security of the state’s energy supply, but it will also protect the climate, create jobs and have no damaging external costs. Victoria’s dependency on brown coal for electricity generation puts the state n a precarious position in terms of energy security as carbon emissions are increasingly regulated across the globe. The risk this poses, given the extremely high carbon emissions from this power source, leaves Victoria with no alternative other than moving to a coal free

energy sector as quickly as possible. Transitions from coal *are* possible - research in NSW has shown that the Hunter Valley could provide 40% of New South Wales's energy from renewable sources by 2020, creating more than 10,700 jobs in the process.[128]

One of the other imperatives for shifting away from a fossil fuel economy is the impending diminution of the global supply of oil, as the period of peak global oil production passes and the availability of oil begin to decline. Even aside from the impending dangers of the stress being placed on the other finite resources of our planet, it is vital Victoria begins preparations for an inevitable transition to a fossil fuel free economy.

Links to national policy

The central piece of legislation currently being proposed in Australia to reduce greenhouse gas emissions is an emissions trading scheme known as the Carbon Pollution Reduction Scheme (CPRS). The central aim of an emissions trading scheme is to place a price on carbon while allowing polluting industries the flexibility to buy and sell their carbon allowances.[129] The key to an effective scheme is ensure there are less allowances available than are needed, creating an incentive to reduce emissions,[130] as it places a value (cost) on carbon dioxide raises the delivered price of fossil fuels relative to other fuels.[131,132]

However the climate change legislation being considered in the Australian federal parliament in the form of a carbon emissions trading scheme is not expected to be in itself effective in meeting the government's long term targets.[133] The parameters of the scheme, with a very low target for emissions cuts, massive compensation to carbon emitters, the opportunity to offshore emissions and the failure to set progressive reductions in the emissions cap, all mean that, as it stands, the scheme will neither impose a cost on industries emitting carbon dioxide nor encourage (in anything other than the very long term) their transition to using alternative clean energy technologies.[134,135]

Achieving cuts in emissions consistent with the science means developed nations and the large developing nations (such as China, India, Brazil) must cut emissions quickly – possibly by as much as 100% within the next decade. Only a scheme that creates a significant disincentive to pollute, creates a strong incentive to shift to cleaner energy, reduces allowable emissions over a short timeframe trajectory and requires emissions cuts occur domestically, will be effective in reducing our nation's emissions.

Initiatives to drive innovation and knowledge in clean energy technologies will be vital; as will policies that drive energy efficiency across all sectors, but particularly in energy intensive industries.

Emissions trading however is not seen as the only answer to emissions reductions. For example, a carbon tax and carbon emissions trading systems are not mutually exclusive – they are already in place in a number of European countries.[136]

There is an increasing consensus that a suite of policy measures beyond a carbon price are necessary to achieve the emission reduction necessary to restore a safe climate.[137,138,139,140,141] While cap and trade schemes and/or carbon taxes may be part of a suite of measures, the implementation of other significant policy measures is necessary to facilitate the rapid transition to a zero emissions society in the time indicated by the science.

Current policy measures and those being proposed are insufficient to achieve the speed of transition required. Major economic modelling suggests "fully operational, low carbon infrastructure" must be at "full speed" before 2014 to avoid major economic disruption and avoid runaway climate change.[142] Market based measures will not meet this timeline for abatement, therefore policies that will deliver massive investment in renewable energy technologies, considerable scaling up of energy efficiency measures, implementation of tight emissions standards, and protection of natural carbon sinks are necessary to achieve the cuts in emissions necessary to restore a safe climate.[143,144,145,146]

Action by the Victorian Government to move to achieve significant and immediate reductions in emissions will demonstrate leadership on a national level and make a strong contribution to the development of international agreements on emissions cuts with effective targets. It will also ensure significant benefits for the environment, the economy, for the health and wellbeing of the population, for national security and, of course, for the stabilisation of global atmospheric CO_2 necessary to restore a safe climate.

Conclusion

As discussed throughout this paper, it is the intention of the Working Group to develop a Safe Climate Bill based on the "restoration of a safe climate" paradigm.

While there are useful lessons from other approaches (which are by no means explored exhaustively here), it will be with the ultimate goal in mind that all powers, provisions, and inclusions in a Draft Bill be considered.

It is not with the intention of being politically pragmatic that this approach has been chosen – although there are many others who have chosen particular approaches for that reason. The aim of this project is to design a Bill, that if implemented would restore a safe climate, for all people, all species and all generations.

Questions to consider

1. How can Safe Climate legislation for Victoria be framed to help mobilise the entire population to (a) eliminate Victoria's contribution to human-induced global warming, including dealing with our ecological debt of excess CO_2 in the atmosphere, and (b) maximise the effectiveness of Victoria's contribution to the world creating a safe climate at emergency speed?

2. What goals should the legislation have?

3. What processes should the legislation establish to makes sure that action under the legislation is based on:
    a. Inclusive ethics;
    b. The latest and best scientific knowledge;
    c. The best safety/risk management protocols?

4. What machinery or processes should the legislation establish to drive the change process at emergency speed? e.g. for strategy development and implementation in government, business and the community?

5. How should obligations to act be established for government, business and the community? (i.e. for everyone)

6. What powers should be established in the legislation to enable the needed changes?

7. What processes of community engagement and education should the legislation establish?

8. What provisions does the legislation need to enable a transformation of the economy at wartime intensity and emergency speed?

9. How should the legislation facilitate structural adjustment?

10. What kinds of review processes need to be built into the legislation so that it can drive its own improvement?

Next steps

The next steps in the project are to collect and consider all feedback to inform the development of a Draft Safe Climate Bill. Once the Draft Bill has been developed, it will be recirculated for comment.

The Draft Safe Climate Bill Working Group would be pleased to have your feedback on the project and in response to this **Discussion Paper** and the **Draft Principles** to underpin the Bill.

In order to allow enough time for you to respond, we will be accepting **feedback until 31 January 2010**.

If you would like to provide feedback, please do so by either:

- using the following Feedback Form
- or write, email or phone to offer your views with respect to this project (addressed to: Safe Climate Bill project coordinator, Fiona Armstrong, PO BOX 395, Burwood, VIC 3125; fiona-armstrong@bigpond.com, or phone 0438900005.

Thank-you for your participation in this project.

Feedback Form

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