Submission to Climate Change Authority's' Caps and Targets Review.

1. Introduction.

I welcome the opportunity to make a submission to the Climate Change Authority's first review of Australia's greenhouse gas emissions reduction targets. I particularly welcome the Authority's interest in receiving submissions that go beyond the immediate issue of the targets for greenhouse gas emissions reductions by 2020.

2. Comments on the Issues Paper itself.

2.1 Lack of Urgency.

The Issues Paper was very good, but lacked an essential ingredient: urgency. There was no clear message that a major decrease in greenhouse gas emissions was necessary to avoid the 2 °C warming target. Table 1 and its associated text did indicate that time was short, but there was no urgency in the general tone of the paper. In addition, the risk of exceeding 2 °C in Table 1 would have been better expressed as follows:

Table 1: Alternative statement of Table 1, page 18 from the Issues Paper.

Risk of exceeding 2 degree limit	Global budget from 2010 onwards (Gt CO_2)	Years of emissions at 2010 levels (before exceeding budget)
1 in 5 chance	485	14
1 in 3 chance	993	28
1 in 2 (fifty-fifty) chance	1679	47

A further problem with Table 1 was the third column – the years of emissions at 2010 levels. It would have been much better to have done a business as usual calculation and to have headed the column "Years of emissions based on 2010 levels assuming current growth in emissions." Such a calculation would better represent the "no change" scenario.

The Executive Summary of the International Energy Agency's 2012 World Energy Outlook[1] included (on page 3):

> **Successive editions of this report have shown that the climate goal of limiting warming to 2 °C is becoming more difficult and more costly with each year that passes.**
> Our 450 Scenario examines the actions necessary to achieve this goal and finds that almost four-fifths of the CO_2 emissions allowable by 2035 are already locked-in by existing power plants, factories, buildings, etc. If

> action to reduce CO_2 emissions is not taken before 2017, all the allowable CO_2 emissions would be locked-in by energy infrastructure existing at that time. Rapid deployment of energy-efficient technologies – as in our Efficient World Scenario – would postpone this complete lock-in to 2022, buying time to secure a much needed global agreement to cut greenhouse-gas emissions.

The comment about action being needed by 2017 to avoid "lock in" of emissions is particularly pertinent. If we (all of humanity) were to have arrived at 2017 with no reductions in emissions, then the objective of having some chance of limiting warming to 2 °C would require us to cease building energy infrastructure immediately and permanently. That would mean ceasing to build all coal and gas fired power stations; all cars, trucks, ships, diesel trains, tractors, diesel powered plant, machinery and aircraft; all gas fired heating and cooking appliances; all petrol and diesel generators; all petrol powered portable equipment and so on. Surely avoiding being placed in that predicament is worthy of urgent discussion?

2.2 Bias.

The setting of emissions reduction targets is usually seen as requiring a balance between the biophysical risks of climate change and the economic risks of reducing emissions. My reading of the Issues Paper is that it is biased towards putting more weight on the economic risks and less weight on the biophysical climate risks. This assessment of bias is based on both the weight of argument and the space devoted to the discussion of the two types of risk. For example, the discussion of what other countries are doing appears to be motivated entirely by the perceived (and unproved, in my opinion) economic risk of Australia's moving more quickly to reduce our emissions than other countries.

In an effort to be more quantitative about this bias, I studied the use of the word "risk" in the Issues Paper. It is used 25 times; in 7 of those times the usage is generic and does not distinguish between economic and biophysical risks; of the remaining 18 usages, from the context 11 referred to economic risks and 7 to risks of biophysical damage due to climate change.

This bias is an important issue which deserves more detailed consideration. There are several ways to unpick the issue:

1. Ultimately, the dichotomy between the environment and the economy is a false one; if the climate deteriorates very significantly, the economy will be damaged. Already we can see increased costs due to extreme weather events. It would seem to me to be folly to protect the economy against the perceived damage from over-zealous emission reductions while setting up much more grievous damage from climate change.

2. I am not suggesting the bias is deliberate; rather I think it is unconscious and rises both from perceptions of risk and from a person's comfort zone. A person who is an economist or who works in an economic policy area is likely to perceive economic risks more strongly than they perceive biophysical risks. To them economic risks are more front of mind and they are more comfortable thinking about and discussing economic risks. A physical scientist, on the other hand, perceives the physical risks more vividly; to them the laws of physics and biology are

front of mind and considering the associated climate risks is in their mental comfort zone.

My background is indeed physics and to me the bias in the Issues Paper towards worrying more about the economic risks of reducing emissions than about the biophysical risks of climate change is obvious. Such bias seems to be very prevalent in public discussions of climate change.

3. While there is (unconscious) bias in the Issues Paper, there is an important asymmetry in the issue which works in the other direction. The prediction of the future impact of climate change is based on the laws of physics: the radiative forcing in the atmosphere changes the Earth's energy balance, which results in changes to climate. These laws of physics are extremely well established, cannot be changed by any possible mechanism and have had centuries of success making important predictions. When was the last time a prediction of the date, time, extent and location of a solar or lunar eclipse was wrong?

   On the other hand, our economic system was created by us humans and can be controlled by us – despite the prevailing orthodoxy that such control is usually a bad idea. We are able to influence economic outcomes: it is our system. In contrast we cannot control what happens in the atmosphere/earth/ocean system once we have perturbed it by adding greenhouse gases to it. Finally, what is the track record of economic predictions?

On the basis of both prudent risk management and the issues discussed above, I submit that any policy bias should be towards limiting the biophysical climate change risks. The Climate Change Authority's primary responsibility, in my opinion should be to make recommendations aimed primarily at protecting Australia from the biophysical risks of climate change.

There is a final implication of the bias evident in the Issues Paper – it diminishes the perception of urgency. An incompletely informed reader could decide, on the basis of the Issues Paper, that if it is so important to not do more on emissions reductions than other countries, then the issue cannot be very urgent.

2.3 Australia's fossil fuel exports.

I was disappointed in the Issues Paper's failure to mention Australia's fossil fuel exports. While such exports are not counted as emissions on Australia's account – they are counted as emissions in the countries in which they are burned – the fossil fuels are the property of the Crown for the people of Australia, and as such I believe we have some ethical responsibility while we continue to encourage their development and export. In addition I cannot see how Australia can avoid a charge of rank hypocrisy whenever it tries to encourage other countries to reduce their emissions but does nothing about limiting its fossil fuel exports. This is very much an ethical issue in my opinion.

Given that Australia's fossil fuel exports are not counted as Australia's emissions, what should the Issues Paper have done with this issue?

1. It should have acknowledged that the exports are not counted in Australia's emissions, and why, as uninformed readers may assume by the Paper's silence that our exports are included in the emissions figures.
2. The size of the exports should have been discussed, particularly in terms of carbon budgets.
3. The projected size of exports in the future should have been discussed, assuming that all projects (coal mines, LNG plants) currently under construction are completed and export at their rated capacity. Also shown should be the additional exports if planned and not yet commenced projects are built and become operational.

3. Comments on Issues Raised in the Issues Paper.

3.1 Timeframes and trajectories. (Refer section 3.1.1 in the Issues Paper).

I strongly support using carbon budgets as the basis for emissions reduction planning, as that approach gives the strongest link to climate science, which is the basis for the reductions. Given that carbon budgets are usually expressed as emissions between some past start date and 2050, the times scale considered by the Authority should also be to 2050. One of the difficulties in planning Australia's use of whatever budget it has is how much of the budget should be reserved for the post-2050 period.

One approach to defining an appropriate trajectory would be to use the PwC low carbon economy index[2], which calculates the carbon intensity of the global economy (in $t_{Co2\text{-}e}$/$m GDP). Even though PwC used the fifty-fifty risk of exceeding 2 °C carbon budget to 2050 to make their calculation, they calculated that the carbon intensity of the global economy needed to decrease by 5.1% per year to stay within that budget.

My recommendation is that in order to decide the trajectory of emissions reductions, the Authority should:

- Recalculate the reduction in the index required to stay within the 1 in 3 chance carbon budget to derive the minimum reduction trajectory (minimum annual reduction in carbon intensity required).
- When calculating Australia's actual low carbon economy index for a past period, the Authority should do the calculation twice, once including Australia's fossil fuel net exports and once excluding those exports.
- Both results should be compared with the minimum reduction trajectory in the Authority's public comments and reports.

The reason for the above recommendation is that I believe it represents the absolute minimum reduction performance that the rest of the world can expect of

Australia. If Australia's high per capita emissions and significant relative wealth are ignored as leading to an expectation of above minimum grade effort from Australia, then we should at the very least reduce our emissions so that our emissions intensity tracks the reductions needed to achieve the 2 °C target.

My strong preference would be to include our fossil fuel exports in this tracking of emissions intensity, so if our exports go up our domestic emissions will need to be more strongly reduced. The reason for this is that I anticipate an argument along the lines of "other countries are not endowed so richly with fossil fuels as Australia is, and they need these fuels for their development". My response in effect is that if you want to run that argument, fine, but we will therefore need to reduce our domestic emissions even more to compensate.

I also advocate front loading reduction trajectories so that initial reductions are as large as possible. This is recommended for risk management purposes: if, for example, northern hemisphere permafrost melting is found to proceed faster than anticipated[3], increasing the fear of runaway climate change, being further advanced down a reduction trajectory will give scope for additional reductions in emissions.

To be completely clear, I am advocating a duel system of setting trajectories and targets, with both sets of objectives needing to be met:

(1) A set of emissions budgets, not including exports; and

(2) An annual emissions intensity reduction target which does include exports in the accounting.

3.2 Treatment of carry-over from the first Kyoto period. (Section 3.1.2)

These extra units are conceptually identical to extra reductions achieved by voluntary actions, in my opinion. In both cases the extra units should be cancelled.

I would really like to see the shipping emissions associated with our fossil fuel exports included in our targets and caps.

3.3 Global Budgets. (Section 3.2.1)

Table 1 shows the difficulty of our situation: our emissions already exceed the budget at which we had a high probability (>90%) of staying within 2 °C. Indeed, the budget to stay within 80% is out of reach at current levels of political will around the world. My view is that 50% is far too risky – it is playing Russian Roulette with bullets in 3 out of the 6 chambers. I therefore advocate using at most the 993 Gt budget, and preferably a lower one, say 600 Gt.

I have not had time to research this aspect, but I understand that there could be benefits in being particularly stringent on the short-term, high greenhouse potential GHGs such as methane, as additional efforts to reduce them could buy us time as our CO_2 emissions are reduced. It would be good for the Authority to explore this as an additional control measure.

3.4 International Actions (Section 3.2.2)

Australia's GHG reduction actions should be unconditional. The situation is far too urgent for countries to sit around waiting for each other to blink first. The only concern we should have about international actions is whether they are sufficient or not, while we make our efforts beyond reproach. If our efforts are beyond reproach then we will be better placed to advocate much stronger actions from all nations. Let's get our house in order first before worrying about what others are doing.

Australia's emission reduction goals should not be driven by what others are doing; they need to be driven by science and international equity.

3.5 Influencing Others (Section 3.2.2)

Clearly this is crucial; we cannot improve the situation very much on our own. I think there are several pre-conditions before Australia can become truly influential:

1. We must put the science first. If the science is telling us the situation is extremely urgent, then that must be our position.
2. Our own actions at reducing our emissions must be extremely vigorous.
3. We need to be transparent in our target setting. The Issues Paper describes the international equity and generational equity issues around setting targets well. We need to use an approach that many outside Australia will see as being fair, and we need to transparently explain our approach, our reasoning and our calculations to arrive at our targets. No hidden agendas, no special pleading: we should make an honest attempt at being fair while not being crazily ambitious (but almost so) with our reduction targets.
4. We simply must do something about our fossil fuel exports.

It will be hard for the Authority to set a suitably ambitious reduction target. My view is that reductions will be easier and cheaper than currently thought. The scope for energy efficiency improvements in our society is very large indeed. (I work as an energy consultant.) The Authority will need to shut its ears to shrill special pleading from emitters who will claim that the sky will fall in if they have to make even slightly ambitious cuts; when they properly look at it they will often find that they can easily make larger cuts more cheaply. There is a long history of industry's prior claims about excessive costs of proposed increased workplace and environment controls being shown after the event to being wrong. The Authority's attitude should not be "we can't afford to make very ambitious reductions"; it should be "the risk of climate change is such we cannot afford NOT to make ambitious reductions".

My understanding is that the Authority is not specifically tasked with considering Australia's fossil fuel exports in any way. However, the Authority is considering Australia's role in influencing others, and it is in this context that Australia's fossil

fuel exports are highly relevant. Getting into this area will take courage on your part! The actions I would like to see Australia take are:

1. Implement an immediate ban on expansion of our coal and LNG exports. No new mines, no new LNG plants, no new LNG trains, no new coal loaders are to be approved.
2. No new exploration acreage to be released for fossil fuel exploration. Why explore for it when it needs to stay in the ground?
3. A levy should be imposed on all fossil fuel exports from the existing operations (and those already approved and under development). Proceeds of the levy should mostly be spent on energy efficiency and renewable energy projects in the customer countries, with a proportion spent on similar projects in other developing countries.

3.5 Sharing Global Budgets. (Section 3.2.3)

I appreciate the difficulty of this area. I have a preference for an approach based on equal per capita budgets, whether cumulative or not. The Authority might find that enlisting the help of a suitably qualified Reference Panel made up of ethicists and others of high standing from developing countries to provide guidance on fairness in this difficult area might be of assistance. A person such as Archbishop Desmond Tutu is the kind of person I have in mind for such a panel.

3.6 Economic and Social Implications. (Section 3.2.4)

It was this section which started me to think about the bias in the Issues Paper discussed in section 2.2 of this submission. Essentially, this section speaks to me of doing what can be done, rather than what must be done. The science must drive what we do, not economic expediency. We may have to manage the economic fallout as we go; if that is what is required, then that is what we should do.

The Issues Paper says that: “the Review will take account of the full suite of policies contributing to emissions reductions.” The big gaps in the current policy arrangements, in my view, are energy efficiency and the transport sector.

3.7 International Linkage. (Section 3.2.4)

The problem with the current international linkage arrangements is the situation in Europe, where the emissions units market has an over-supply of freely issued units which were not needed because of either initial over-estimation or reduced economic activity. These units do not represent real reductions below business-as-usual. They should not be used by Australia to "reduce" emissions.

3.8 Economic Modelling. (section 3.2.4)

In my notes from my reading of the Issues Paper I annotated the section on economic modelling with “stuff the economic modelling, it’s the physics we should be concerned about”. Rather more elegantly expressed, this is one of the big themes of this submission: we must be driven by the science, we can’t change the

laws of physics, but we can change the economy to help ameliorate any problems. Essentially, I think the economic modelling should not be an input into setting targets, trajectories and caps: they must be driven by the science and equity considerations. Where the economic modelling may be able to help is to identify particular adverse impacts of the targets, caps, etc. so that economic interventions can be planned to ameliorate the worst of those impacts.

3.9 Uncovered Emissions - Transport. (Sections 4.1 and 4.2)

Australia's recent history of declining emissions from the stationary energy sector and increasing transport emissions means that sooner or later, the uncovered emissions from transport will need to be addressed. I think it is a very significant concern that current state and federal government infrastructure plans are very likely to increase transport emissions. Major road projects (such as the Melbourne East-West Tunnel) are still being proposed, as is a second major airport for Sydney. Continuing to build out infrastructure on the premise of being able to burn more and more fossil fuels is simple madness, and must stop.

The policies I advocate are:

- An immediate indefinite moratorium on all new road projects and airport capacity expansion projects.
- Funding that would have gone into roads and airports should go into electrified light and heavy rail.
- The very fast train linking Melbourne-Canberra-Sydney-Brisbane should be built, and the existing tracks between those cities upgraded and electrified to allow improved freight transport.
- Australia should implement vehicle fuel economy standards as stringent as any in the world.
- Australia should have a "feebate" system in which registration and other charges for the most efficient vehicles in a class are subsidised by increased charges for the least efficient (I believe France has such a system).
- The Fringe Benefits Tax system should be further reformed to provide a bigger disincentive against employer provided salary package cars. The disincentive should apply to all vehicles, and be scaled by vehicle efficiency. (It would be interesting to see data on what proportion of SUV purchases in cities are employer provided cars.)
- The current 250 W maximum power for electric bicycles should be at least doubled, or preferably changed to 10 W per rider kg.

3.10 Voluntary Reductions. (Section 4.2.2)

One of the psychological reasons why climate change is such a difficult issue is agency. People can easily feel defeated by the magnitude of the climate change problem and their inability to make any difference. Any government program that increases people's feelings of agency, of having more control and feeling less helpless, is to be strongly encouraged. A policy on voluntary reductions may seem

an unimportant sideline, but it is actually really important in building societal consensus for action. What is needed is policy built on two key planks:

1. Vigorous efforts should be made to measure the success of voluntary actions to reduce emissions; and
2. Every year permits equivalent to the additional voluntary actions anticipated for that year should be withdrawn from auction and cancelled. Adjustments of anticipated versus actual can be made in the following year.

How to measure voluntary actions? I think there should be a system of recruitment and engagement. People should be able to register via a web site and submit documentary information about their emission reductions. The Authority could seek the engagement of existing community groups such as the Australian Climate Action Network[4] and relevant business networks to define the voluntary reductions measurement systems, recruit members, design audit programs, etc. Every person who makes a submission to the Authority seeking more ambitious reductions is a potential volunteer who could be recruited to help measure voluntary reductions.

It should be remembered that many individuals, families and businesses have programs of emissions reductions; including these in a program which captures their efforts and recognises their achievements is likely to be very powerful. Another way of saying the above is the Authority should crowd-source voluntary reductions and their measurement.

3.11 Long Term Targets. (Section 5.1)

It is good that the 80% reduction by 2050 is enshrined in law; however I fear that 80% may be too low. I think the Authority should adopt Australia's budget to 2050 and then assume that the reduction to 80% has occurred by, say, 2040 and then see how much of the budget is left. Essentially, the use of a budget will override the 80% reduction. My gut feel is that if we don't try to get down to zero net emissions before 2050 we will be in deep trouble.

4. Conclusion.

I think we (humanity) have a real problem – a slow onset emergency – in climate change. The physics is clear, the warming process inexorable. Our current efforts are grossly inadequate because of a combination of failed leadership, incorrect priorities, and very successful sowing of fear, uncertainty and doubt by parties whose short-term financial interests are served by delaying action. We know what we have to do: a zero emission future does not have to be bad, a future in which we fail to control our emissions will be bad.

David Hamilton,
30th May 2013.

[1] http://www.iea.org/publications/freepublications/publication/English.pdf accessed on 28th May 2013.
[2] *Too late for two degrees? Low carbon economy index for 2012*. PricewaterhouseCoopers LLP, November 2012.
[3] *Policy implications of warming permafrost*, United Nations Environment Program, November 2012.
[4] http://www.cana.net.au/