

Submission on Climate Change Policy

This submission is focused more on how to get an effective policy response to the challenge of climate change than the particulars of the response itself. Most of the attention is given to an effective process for achieving consensus and ensuring enforceability.

Garnaut Review Terms of Reference

For item (1) of the Garnaut review terms of reference it is assumed that the case can be made for a significant response to the impact of climate change. For item (2) it will be argued that the recommendations made below are mutually self-enforcing among nations and represent a fair outcome for Australia and for others. Some of the recommendations directly address item (3). Item (4) is dealt with in the suggested Policy Roadmap below.

Recommendations are stated first, followed by the policy roadmap. Then particular recommendations are explained in more detail as needed. Some complementary or minor recommendations appear only in the body of the report, but are highlighted there in bold text. References are appended.

Recommendations

Recommendations are given followed by the order in which they should be pursued.

1. Australia should provide leadership in the development and application of a rigorous process to build consensus and commitment to an appropriate climate change response. The required process is described in this submission.
 - a. Australia should work with interested nations to develop that process and demonstrate its usefulness
 - b. Cross-border adjustments should be made reflecting the GHG emissions involved in producing exports.
2. Australia should encourage the adoption of an adaptive framework where responsibilities and commitments are reworked every few years as technology opportunities and climate change challenges evolve
 - a. Aid funded by levies on trade should be used to underpin an effective international response in a manner which is fair
3. Australia should seek to have the UNCC protocol become a binding multi-lateral treating which is superordinate to all other treaties and organisations, notably WTO. An International Climate Change Response Commission (ICRC) should be established to oversee treaty obligations.
4. Australia should declare itself ready to commit to enforceable provisions of that treaty providing that nations contributing 67% of expected total emissions at 2010 do so, and, as described in the submission:
 - a. Enforceability of certain imposts for non-compliant nations will be collected by other nations through levies on trade
 - b. The purpose of imposts on non-compliant nations should be to ensure that there is no free-loading
 - c. Provision for cross-border adjustments are included
 - d. Previously granted concessions to Australia are maintained
 - e. The ICRC will oversee iterations of the consensus process and compliance, aid and levies or imposts

5. Australia should commence a cap and trade permit system immediately with a 2012 ending term and substantial rebates, for the purpose of creating an orderly and proven trading market before binding and full cost permits become applicable.
 - a. Information about added emissions in each stage of production should be recorded in a GST (or VAT) manner on all invoices as a prelude to a possible carbon tax or carbon rationing.
6. Australia should channel investment towards those commercial outcomes which are aligned with the expected UNCC framework.
 - a. Government co-investments should be aligned towards the commercial terms of investments on a “like for like” basis meaning
 - i. that if an enterprise has 50% debt and equity, the Commonwealth should invest on the same terms.
 - ii. Available government funds for such investment should be allocated on a pro rata basis to the funds of applicants
 - b. R&D grants and subsidies that are independent of immediate commercial outcomes should have a priority percentage allocation among key national objectives where national interest or comparative advantage are high, notably
 - i. Climate change
 - ii. Exports
 - iii. Productivity
 - c. Australia relies to a considerable extent on coal, and increasingly on oil imports. We need to take out insurance against future price moves by investing in alternative renewable energy resources. Those investment decisions should be based on price signals due to cap and trade or generic carbon taxes introduced as quickly as possible. An early signal is desirable to make new electricity generation more favourable from gas compared to coal so that emission targets can be more easily met.
7. A computer model is required to be built as a consequence of (1) which will enable the full range of complex issues and trade-offs to be examined by interested parties, through simulation. Australia needs it anyway and should offer to build that model.
8. Channelling of economic activity in response to climate change should be consistent with achieving recommendation (1b) in particular, and of implementing recommendation (6). As well, the government needs to commit to ensuring more investment funds are available in respect of Australian equity through fiscal policy and allowed superannuation investments.
9. The government should ensure that high energy use industries are not required to adjust too quickly because of treaty obligations by ensuring that (1b) achieves passing on GHG emission content to importing nations. Designated industries should be given until 2015 in which to begin to implement current best GHG practice, and another five years over which all allowances converge to zero. This may require some permits to be “handed out” up to 2015. Early on permit terms should be of shorter duration, gradually extended.
10. The government should ensure that policy decisions are aligned to market prices consistent with international carbon (GHG) prices, and that any taxes or subsidies are transparent to public scrutiny. Note desalination, aluminium.

Policy Roadmap

The local priorities (5,6) can be pursued starting with the next budget. There's no need to wait until the final report.

Commencement of action to achieve a better consensus building framework and a more adaptive UNCC response also need not await finalisation of the Garnaut review: Australia should contact the UNCC secretariat and interested nations to create a working group to pursue recommendations (1,2,3).

Australia can declare its intention with respect to recommendation (4) on the proviso that there is progress on recommendations (1,2,3)

Recommendation (7) can be pursued independently of (1) as it will in any case be of benefit to have a sophisticated model to support our own deliberations and negotiations.

Recommendations (8, 9) should be pursued consistent with developments in (1,2,3,4)

Recommendation (10) needs to be part and parcel of the whole policy framework

Current negotiating positions

Presently there are two main groups in the Kyoto protocol to which policy response to climate change has been assigned. That is akin to the idea of "two sizes fits all" in choosing clothing. Another way of looking at it would be that all of the complexity of physical properties of matter could be dealt with by two columns representing how to deal with whatever is assigned to either.

Mathematicians know that if you have fewer equations than variables, you can't get a single certain result, although, if there is an appropriately structured set of inequalities and objective target function (such as GHG ppm), then it is possible to determine what parameters associated with each relevant factor will provide the best fit to the objective. So, the UNCC participants need to get all the factors on the table and deal with them rigorously. That requires a rigorous consensus building process and sophisticated mathematical modelling in support. Negotiating groups and plenary sessions simply won't do. The history of Gatt, Doha and other international negotiations demonstrate the problem. So does the history of Kyoto; since 1992 how much real progress has there been towards emission reduction?

The policy roadmap offers a new way forward. Developing & Developed nations alike need to be persuaded to the fairness of the proposals recommended here.

One major obstacle to effective climate change response is the unwillingness of each nation to make the commitment necessary to deal with it because of the position taken that other nations should do more. However, much of the problem may be due to the complexity of the inter-relationship of all of the relevant factors and simply determining what is fair. For that reason we need a process which helps make explicit the complexity and which evolves towards a consensus. We also need enforceable binding targets. First I make the case for a rigorous consensus building process.

A rigorous consensus building process

How not to do it

Consider that to reach a consensus of around 190 nations there are thousands of permutations if the nations want to pair off for discussions. For just the top 20, there are hundreds if each nation tells each other nation what it expects of it or is prepared to offer. Then there is the negotiation process. Then there are all the factors that each might raise as special circumstances for itself. We have seen how the Doha round got bogged down.

A better way

Mathematicians know how to optimize complex sets of equations and inequalities in terms of target (objective) functions. The process to be elaborated here evolves through a number of steps in which closer agreement is reached at each stage to what is most important and reasonable. For the most part these steps can be conducted over the internet, through a secretariat which includes staff with appropriate mathematical and statistical skills.

Getting started

The process allows for iteration. The first step is to agree what are all the relevant factors. There are a number of issues that have held back negotiated outcomes in previous UNCC meetings. Some of these relate to past emissions by developed countries, some relate to the aspirations of developing nations, some relate to GDP per capita, some to population growth. As far as practical, relevant factors need to be enumerated with assessable values for each over time, so that facts or at least reasonable estimates can guide consensus building. The baseline should cover values for each nation for 1990, 2000 and 2010 for parameters that are relevant to climate change response decisions, such as:

- emissions per person
- national GDP at purchasing power parity
- national gross level of GHG emissions
- national GHG offsets
- GHG emissions generated in the course of exports
- energy intensity
- Total emissions from 2010 onward
- Population, by age group 0..20, 20+..40, 40+ and above.
- population replacement level, births per population count, per 20..40 age group.
- land use for agriculture
- passive carbon in trees and soil
- land cleared, carbon emitted
- GHG atmospheric inventory (ppm)
- Contingent aid required
- GHG content of imports

The UNCC secretariat can develop the starter set. In principle new factors can be added at any stage in the process.

The top 60 GHG emitters account for over 98% of all emissions. The 61st emitter accounts for less than 0.1%.

The top 40 emitters account for over 95% of all emissions, with the next emitter contributing less than .33%.

The top 20 emitters account for over 85% of all emissions with the 21st accounting for less than 1%.

It is suggested that a sensible way to proceed is to divide the nations into groups of around 20 based mainly on emissions or expected future emission, but possibly by special categories such as the AOSIS group, or geography .

While it is conceivable that a smaller number of groups might work, say three groups of 20 and the rest, the issues facing the lowest 130 emitters might better be brought out in 6 groups of 20 to 25. The first reference in [3] includes one suitable composition of most of other than the main groups. The main group of high emitters could comprise:

- United States
- Japan
- China
- Germany
- India
- United Kingdom
- France
- Italy
- Canada
- Russian Federation
- Spain
- Korea, Rep.
- Australia
- Brazil
- Mexico
- Netherlands
- Taiwan
- South Africa
- Poland
- Saudi Arabia

Carbon debt

There is a view that those nations which have contributed most to GHG inventory in the atmosphere should make a greater emission reduction than others. Carbon debt could be assessed as a relevant factor, based on its relationship to other relevant factors enumerated above. Carbon debt would need to be repaid in addition to other emission reductions required. It should be accounted for separately.

Suppose the world-wide end target is 60% reduction of emissions by 2050, in the context of achieving a final state of GHG in the atmosphere in which carbon debt was repaid. If a nation had a carbon debt assessed at 50 units, and suppose that their current level of emissions are 100 units per year, then it would need to reduced annual emissions by 1.5 a year but it also would need to rein in the current excess of 50 over the same 40 years, at 1.25 per year. So that requires reducing emissions by 2.75 units each year until it reaches the sustainable level at 40 in 2050.

The main process' essential features

*In the first iteration, each nation would make an assessment of the most desirable year 2050 state of the agreed relevant factors for each **other** nation in its own group and for each (other) nation in the main group, and the total world position, but not for itself.* The primary objective target factor would be GHG emissions at 2050. The secondary objective factor would be carbon debt to have been repaid. An alternative formulation could be total emissions from 1990 to 2050. This would effectively include both. The significance of the process is that no negotiating is required to take place at a particular venue. Of course, nations might lobby amongst themselves, but the nature of the process, of privately assessing other nation's required response is the key to achieving reasonable assessments.

The UNCC secretariat will gather each nation's assessments and calculate the mean and standard deviation for each groups assessment excluding the high and low values for each relevant factor, and publish those figures but not any nation's individual assessments of the others. It will also publish the same figures for each nation in the main group.

At this stage, the assessed value for the world position will be known, along with each other nation's assessment of the main group of twenty. As well, the assessment for each other group of twenty (or so) will be known, and within each of those groups, individual assessments of each member will be known as seen by the others.

Mathematicians will be able to provide sensitivity analysis for each relevant factor on how a change in its level for a particular nation would affect that nation's position in terms of the world position with regard to the target emissions level.

Mathematicians will also be able to provide the implicit value of the benchmark level of each factor to the final commitment level in 2050 for total emissions by country. For example, there would be a parameter for each relevant factor such as x% of year 2000 emissions, and y% of year 1990 GDP per capita, and z% of year 2010 GDP, and so on, providing parameters for each relevant factor.

After the first iteration, factors for aid and allowances would be added. Contingent aid is that which a nation believes is necessary to meet the emission targets it expects to be set. **An assumption is that there are no restrictions on licensing of technology at reasonable commercial rates.** Further discussion of aid and allowances appears below.

On the second iteration, each nation should also assess the average it would expect for the second main group, and on the third iteration it should do the same for the average of the third main group.

This process should be repeated a few times until there was little change in the mean values for the major emitters.

In practice, a small working group with participants broadly selected might perform a "trial run" and populate some initial values from which a tutorial document would be produced.

At this point we briefly examine what strategies nations might adopt in moving towards convergence. I then turn to inclusion of aid and allowances and cross border adjustments before dealing with the final stages of the process.

National strategies

It might be helpful for the reader to consider how each nation might respond to the assessments made by others in relation to itself. In once scenario each nation could record its own preferred parameters for each relevant factor. Supporting software could then calculate the adjustment required by others to make its choices compatible. Alternatively, each nation could choose a compromise level on a percentage scale, of how much it is prepared to move towards the consensus position, and the supporting software would make the necessary adjustments, and return in effect a new value for that nation's assessments in the next cycle.

Basis for Aid

The implication for aid is that the ICRC would need to place a levy on trade anyway. Determining the basis for aid may require its own contributing factors. That is to say, aid would be a function of overlapping and separate factors.

For example if some level of energy use is established as reasonable, say x kw per person per annum, and today's average GHG emissions are determined relevant to that, a reasonable estimate of the GHG emissions that are fair in 2050 can be determined.

Those nations whose population are consuming more GHG product per capita might be expected to pay those who are consuming less. So factors might be established for:

- Contribution according to GDP (at ppp), emissions
- Aid received to be based on:
 - Percentile below median GDP per capita, emissions per capita

Some nations which are today low emitters might not be able to directly contribute to the overall reductions in emissions which are required, though they may be able to contribute by way of offsets, say in agriculture. Thus, aid might be based on commitments to achieve lower emissions or emission offsets through the funding of investment to achieve those results. It is a matter for the UNCC participants to determine if such aid should be contingent on criteria other than emissions, for example limiting population through voluntary programs.

Allowances

Some allowances have been made in the past. Some nations have benefited from generous initial allowances in the context of changes in energy use and technology. These adjustments need to be treated as separate relevant factors, which affect 2010 and 2050 and intermediate targets. For example, a nation receiving a 10% margin for 2010 would receive the same margin at 2050, so if the emission level allowed in 1990 was $100x$ and for 2010 was $110x$, then for 2050 the target would be $66x$. A nation receiving an allowance of $100x$ GHG emissions at 1990 whose 2010 emissions had fallen to say $80x$ would perhaps only be required to reach $60x$ in 2050.

Cross border effects

An important cross border effect is the transfer of product containing the result of GHG emission from an exporting nation's production processes to an importing nation, where it is consumed or processed further and consumed or exported. Obtaining the data will be difficult. Assumptions will initially be necessary, and as indicated earlier, the treaty arrangements themselves would need to allow adaptation as new data becomes available. A crude early assumption would be that exports comprise a share of a nation's total energy and GHG, spread pro rata against GDP.

It is noted that **countries using high levels of energy for exports need to have the corresponding emissions transferred from their emission targets to importing nations.** Estimates need to be retrofitted to 1990.

To better understand the ramifications consider some scenarios:

Nation ABC relativity of trade to GDP is 0.2, of GHG at some price to GDP is .05.

Nation DEF relativity of trade to GDP is 0.1, of GHG at some price to GDP is .05.

Nation GHI relativity of trade to GDP is 0.2, of GHG at some price to GDP is .025.

Nation JKL relativity of trade to GDP is 0.1, of GHG at some price to GDP is .025.

Each nation's GDP is \$1000b, so their trade (both export and import) is either \$200b or \$100b, and their emission value is either \$50b or \$25b.

Let's assume that each trades with each other in proportion to the other's trade. ABC will want to offload \$50b in emissions across the other three. GHI will want to offload only \$25b to the other three. To the extent that the products are interchangeable, imports will be preferred from GHI and JKL, and the terms of trade will worsen for ABC and DEF if the importing governments cause there to be corresponding price signals in their economy to the effects on their economy of meeting transferred emission targets.

Of course, what really matters is the actual GHG involved in the products themselves from each source. That requires accurate energy and GHG recording at the level of each firm.

Each nation would need to incorporate energy usage and GHG emissions data added to invoices and for firms to carry forward the values from invoices received.

Internationally approved auditing of this procedure is necessary. Later on, firms certified as compliant in GHG and energy recording would be able to pass on their actual GHG emission record which other firms could then rely on. It is probably appropriate that a nominal carbon tax be applied to invoices to underpin enforcement and accuracy. This could be as low as 1% of the effective carbon cap and trade price. Importing nations would be required to pay the carbon tax on imports to the ICRC. National governments could retain net local carbon taxes.

The implication for Australia is clear: as a high user of energy in export commodities, we face a high emission burden. However, exports provide foreign exchange which enables us to buy imports and achieve a higher standard of living. If we only go as far as the crude transfer in the scenarios above, then the terms of trade might turn against us. They could still do so if we get to detailed GHG accounting. However, because of the substantial nature of sunk costs in our and others primary export industries, the adjustment period would be long, time enough for industry to adapt. The most concerning industry would be coal, if various sequestration or clean coal technologies "don't make the grade". For that reason, we need to take precautionary measures such as recommendation (6c).

References [2,3] practically ignore cross-border effects in assigning a large reduction burden to Australia. **Australia needs to stress the responsibility of final and intermediate consumers for the emission contributions they implicitly buy. A VAT style carry-forward carbon tax may be the best way to clarify this.**

Because of the complexity involved, **I recommend that the cross border effect be implemented gradually in terms of transfer of responsibility from emissions, but that an allowance be given immediately for what should have been transferred.**

Subsequent Iterations

The appropriate maximum term of cap and trade permits should probably have been included as a relevant factor, and should now be assessed. **Permits should have a range of terms and the longer ones should be auctioned first.** It may be appropriate to start with shorter terms and gradually extend them.

A few more iterations would lead to clarity on the level of aid required, and what level of allowances and cross border adjustments was regarded as fair.

Also at this stage, each nation in the top three groups would make an assessment of each nation in the second main group of emitters, 21st to 40th, and also for the third group 41st to 60th. Other nations may do so as well.

With these two groups given closer attention, over 98% of all emissions would have come under close scrutiny.

Filling in the gaps

2050 is more than forty years away. It is only speculative that the targets set in say 2010 would remain appropriate. Even so, targets need to be set for the intervening period. The final round of iterations prior to dealing with enforceable imposts would fill in the gaps starting with 2020, 2030, 2040, and revising 2050 on each pass, then fitting in 2015.

The weighting of viewpoints

Some nations will have to make greater contributions than others in restraining future growth or at least the rate of growth. For those who have not contributed as much to the climate change problem in the past that may be seen as quite unfair.

The UNCC participants need to also consider whether each nation has equal weight, or whether the sacrifices that need to be made are weighted in some way. The basis of aid and the setting of imposts are two key issues where the weighting of votes needs to be considered. It is just possible that an inadequate climate change response could lead to matters coming before the security council where nations do not have an equal voice.

On the assumption that an ICRC will be established, the UN needs to address the issue of weighted voting. A possible scenario would be that voting would reflect some formula incorporating:

- Population
- GDP per capita
- Emissions
- Reduction in emissions

As each iteration of the main process proceeds the unwillingness of some nations to stay the course will become clear. The enforceability provisions and accompanying imposts will make or break the final negotiations.

Enforceability

The author of this document believes that unless there is an internationally enforceable regime requiring an appropriate climate change response, less stringent measures will fail to achieve the necessary outcomes that are needed to avert very serious consequences for the world in general, and Australia in particular. We should therefore face up to enforceability at the outset and what it implies and how it should be implemented.

The first requirement of enforceability is that there is a consensus of what is needed and what is the fair share of each participant in getting there. The second is that there is no opportunity for free-loading.

No opportunity for free-loading

No nation should be able to go its own way in defiance of others. There are many obstacles to obtaining a consensus on what each nation should do in response to climate change but the process I have outlined should lead to very strong pressure to reach consensus. The enforcement regime I will now outline will avert free-loading because...

Penalties will be imposed by others

Nations tend to come up with reasons why they should not need to meet obligations, or just plain say, we “won’t play under those rules”. The alternative is for others to impose those obligations, in the case of climate change, through the application of tariffs and through withholding tax on dividends, and currency exchange surcharge. An International Climate Change Response Commission, the ICRC, is envisaged. It will be authorised by the UN to set the appropriate tariffs, taxes, or surcharges at levels which reflect the extent to which a nation has failed to meet its obligations, using the consensus approach presented earlier.

What is left quite open for now is whether each nation needs to commit to the same level of compliance at the outset or in respect of relativity to other nations, how quickly convergence might take place in terms of the applicability of imposts, and what limits should be placed on imposts.

These matters should be decided in the same way as the relevant factors for 2050 above, with each nation making assessments of what others should be prepared to do if non-compliant or non-signatory.

What is important is that no nation can opt out of its responsibilities, each nation is fully accountable to all others. Hopefully it is obvious that a process which extracts an optimal world-wide weighting of relevant factors, including inter-nation aid obligations and settlements, would be acceptable to most nations. The more who join the enforceable policy regime, the more pressure there will be on others to join. Then, any recalcitrant nations would have to face up to the terms available.

Population

Clearly any increase in population level is a relevant factor in emission levels. However while it might be an aspect in respect of which aid is required it is not one for which imposts would be appropriate from outside a given nation.

Applicable imposts – the final stage

Levies on trade have been foreshadowed. Similar levies should be applied to dividends and interest payments, and to currency exchange. A general charge (impost) would be levied for each of these in any case to provide the funds needed for aid to developing nations below the (say) median GDP per capita level. These charges apply to all nations and are collected by the ICRC from complying (signatory) nations. Non-compliant nations receive an additional impost, collected by signatory nations for the funds they have not collected and paid to the ICRC.

UNCC participants also need to establish what imposts should be applied to nations which do not meet their emission targets. A suitable factor might be a percentage of an internationally traded GHG emission permit for a nation's assessed excess emissions over the consensus target. An upper cap could be set at a factor to the level of aid that is required to be funded by that nation.

The only remaining factor would be any deferral for the whole or partial applicability of any factor across all nations.

What if the whole world fails to meet its obligations? The imposts apply anyway, and now the ICRC has more funds to invest in renewable energy projects.

Outcome of the consensus process

It would be nice to think that every nation agreed with every detail. What ought to be clear is what every other nation expected of each other in terms of all the relevant factors. It would be crystal clear for the top twenty emitters accounting for over 85% of all emissions. It would be reasonably clear for the next 40, together constituting 98% of all emitters. Any nation which chose to stand outside that consensus could expect to be a pariah. The pressure to become a signatory would be extremely high. The pressure of economic sanctions against non-compliant nations should make compliance with the consensus inevitable.

An Adaptable framework

This contributor stresses that the outcome of this process and the treaty framework which should be enacted needs to provide for revision and adaptation to evolving technology and climate change challenges. So, there should be planned updates to five year out targets in the second and fourth year of each five year period.

Surrounding year figures should be aligned by linear interpolation. In the fifth year new targets should be set for all of the five year period targets for the next 40 years.

Cap and Trade, Carbon Tax

It is viewed as unlikely that all nations will be able to reduce emissions equally by 2050. Offsets are essential.

One particular form of offset that needs to be examined is agrichar. **Australia should pursue the consideration of agrichar within the Kyoto framework as an applicable offset. See:**

www.dpi.nsw.gov.au/research/updates/issues/may-2007/soils-offer-new-hope

An international trading scheme in emission permits is also necessary to provide flexibility to the international response to climate change. What then carbon taxes?

The role of carbon taxes is primarily:

- **To bring integrity and auditability to the permit system**
- **To influence consumer behaviour through VAT style carry forward invoicing, without rebate across borders**

Carbon Rationing

Carbon rationing is explained at reference [10]. It seems quite promising but needs public support to be established before it becomes politically viable. It may become more feasible if made consequent on a small carbon tax, and if the stringency of the rationing or purchase price of excess to rations were tightened gradually. **Carbon rationing should be explored further.** See references [6,10].

Policy Initiatives

Various policy initiatives have been proposed, some of which depend upon technology which is only in pilot stage. It is not the focus of this submission to push for one technology over another. The overall thrust is that we should establish the pricing signals for the market to make appropriate commercial decisions. **The report should highlight the nonsense that desalination projects can use only “green energy” and so their energy requirements can be separated out, any more than aluminium or a pulp mill.**

A key idea is the use of wedges to approach the challenge in different ways or from different angles. Reference [8] addresses that, as partly does [10].

Apart from other issues raised, there are two other areas of concern.

Ethanol

There is an ethanol lobby group. There are compounds, methanol, propanol, and butanol which are closely related to ethanol. To take a comparable case, there could have been a petrol excise policy that benzene and no other hydrocarbon should receive an excise exemption. The oil industry would be quite different and less efficient with such a rule. Butanol is highly compatible with petroleum fuel both in distribution and in engines. Having an ethanol policy ignoring related compounds is too particular. It may be that the others are uneconomical, and ethanol is a good policy choice for subsidy, but they should not be ignored or excluded at the policy level: It should be a commercial decision in the context of policy as to what fuels to use, based on the carbon prices set in the market. See reference [13]

Any excise or subsidy related to fuel should avoid specifying particular chemicals but rely on market generated pricing signals which reflect across the board GHG emissions policy and energy return on energy used.

Competition between Bio-fuels and food

There are significant issues emerging in the diversion of land use from production of food to its use to provide fuel. Reference [9] gives good coverage of the issues.

The ICRC

The need for an ICRC operating under the auspices of the UN was mentioned earlier. **The essential basis of all decision making by the ICRC is the application of the process whereby each nation makes assessments of what other nations need to do.**

An international market for emission permits trading appears essential, along with trading in emission offsets. That needs to take place within the context of an enforceable scheme managed by the ICRC. The ICRC should have the role of allocating all emissions permits among nations according to the consensus reached by signatory nations as to what each nation should receive. Individual nations will determine how to allocate those emission permits internally, and on what terms.

The ICRC should also oversee imposts that are set consistent with proposals for enforcement outlined earlier, and collect those funds. The ICRC will provide aid in accordance with the consensus guideline reached by signatory nations. The ICRC will also monitor and audit compliance in respect of emissions and offsets. The ICRC will evaluate technology options and report on the potential for changes in emissions and offsets. Some funds available to the ICRC may be devoted to research and pilot projects by outsourcing those projects via tender to member nations.

The ICRC will take particular notice of the relationship between population replacement levels, energy intensity and per capita income changes in relation to projected emission levels, and provide analysis and simulations for the consideration of signatory nations.

- The post-Kyoto signatory nations will be obliged by treaty to institute imposts as outlined earlier on non-signatory nations and pay the proceeds to the ICRC. The level of the tariffs will be set to as far as practical recoup the funds not received by the ICRC that would have been received if that nation had been a signatory nation. **Non-signatory nations have no automatic recourse to funds available to signatory members. There has to be real and continuing pressure to join and achieve targets.**

References:

- Reference [1] outlines scenarios which Australia might follow. High levels of immigration appear implicit.
- Reference [2] focuses on the responsibility of developed nations and what needs to be done to assist developing ones. Issues of responsibility and capability and potential to reduce emissions are canvassed. Somewhat critical of raw “Contraction & Convergence” model (reference [12]), on equity grounds.
- References in [3] give a good account of European commitments and plans and the comparative needs of developing and developed nations. Issues of responsibility and capability and potential to reduce emissions are canvassed. Most of the conclusions of the second reference in [3] are apposite to be read with this submission.
- Reference [4] examines effects of climate change policy response for Australian and US Industry
- Reference [5] Gives broad coverage of cross-border issues
- Reference [6] provides a useful summary of advantages and disadvantages of different policy responses for Australia. The second reference at the same site explores hybrid permit, tax and safety net options.
- Reference [7] examines issues associated with obtaining accurate energy intensity measures.
- Reference [8] addresses several wedges which should be considered relevant to policy response.
- Reference [9] deals in considerable detail with the relationship between bio-fuels and land use, covering Brazil and Indonesia as cases in point.
- Reference [10] provides a brief overview of carbon rationing and some links.
- Reference [11] provides a software model corresponding to reference [2].
- Reference [12] covers the “Contraction & Convergence” model and offers a corresponding spreadsheet.
- Reference [13] points to recent advances in bio-fuel renewable energy efficiency (ethanol) using perennial crops.
- Reference [14] is a submission by the Alliance of Small Island States and suggests that more than 0.12% of GDP needs to be devoted to mitigation
- Reference [15] addresses the risks associated with the economic impacts of climate-related disasters in developing and transition countries. A software tool is available.

Ref.	Title, URL	Authors	Source
1	Leader, follower or free rider? The economic impacts of different Australian emission targets http://www.climateinstitute.org.au/images/stories/CI058_ER_FullReport_NEW.PDF	Hatfield-Dodds, S., Jackson, E.K., Adams, P.D. and Gerardi, W.	Climate Institute, Sydney, Australia.
2	Greenhouse Development Rights http://www.ecoequity.org/GDRs http://www.ecoequity.org/GDRs/GDRs_Nairobi.pdf http://www.boell.de/downloads/global/global_issue_paper30.pdf	Athanasίου, T., S. Kartha, P. Baer	
3	A proposal for an adequate and equitable global climate change agreement. http://www.wupperinst.org/en/projects/proj/uploads/tx_wiprojekt/1085_proposal.pdf Also: Taking the lead: Post 2012 Climate Targets for the North http://www.wupperinst.org/en/publications/wuppertal_paper/uploads/tx_wibeitrag/WP155_02.pdf		Wuppertal Institute for Climate, Environment and Energy

Ref.	Title, URL	Authors	Source
4	Industry capacity building with respect to market-based approaches to greenhouse gas reduction : U.S. and Australian perspectives http://www.lib.murdoch.edu.au/adt/browse/view/adt-MU20060615.132356	C. Sonneborn	
5	Competitiveness and Carbon Pricing http://www.tai.org.au/documents/downloads/DP86.pdf	H.Saddler, F.Muller, C.Cuevas	Australia Institute
6	Some issues on greenhouse and competitiveness - a discussion paper. http://www.lateraleconomics.com.au/outputs.html Also, same site: A carbon price cap		Lateral Economics
7	Energy Intensity of GDP as an Index of Energy Conservation http://eneken.ieej.or.jp/en/data/pdf/400.pdf	S.Suehiro	
8	Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies http://www.sciencemag.org/cgi/content/abstract/305/5686/968	S. Pacala, R.Socolow	Science mag. 2004/8
9	Towards a Sustainable Biomass Strategy http://www.wupperinst.org/uploads/tx_wibeitrag/WP163.pdf		Wuppertal Institute for Climate, Environment and Energy
10	The Idea of Carbon Rationing http://www.carbonequity.info/rationingidea.html		Carbon Equity website
11	Greenhouse Development Rights software http://gdrs.sourceforge.net .		EcoEquity
12	Contraction & Convergence http://www.gci.org.uk/model/dl.html		Global Commons
13	Net energy of cellulosic ethanol from switchgrass http://www.pnas.org/cgi/reprint/0704767105v1	M.Scmer et al	US. Dept. Ag.
14	AOSIS submission to UNCC http://unfccc.int/files/meetings/dialogue/application/pdf/wp14-aosis.pdf		AOSIS
15	Risk, Modelling and Society www.iiasa.ac.at/Research/RMS		IIASA