

New Zealand Delegation, United Nations Framework Convention on Climate Change (FCCC)

Working Paper

The Design of a Possible Low-Level Carbon Charge for New Zealand

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TREASURY WORKING PAPER

NEW ZEALAND DELEGATION

PROPOSALS IN SUPPORT OF THE DEVELOPMENT OF A PROTOCOL TO THE FRAMEWORK CONVENTION ON CLIMATE CHANGE (FCCC)

February 1997

INTRODUCTION

At COP2 in July 1996 New Zealand endorsed the adoption of legally binding commitments, subject to their achievement at least cost. This paper develops proposals which we consider would improve the prospects of collective action to reduce greenhouse gas emissions at least cost. It builds on our submission of 15 January 1997 relating to mechanisms for flexibility.

SUMMARY

New Zealand proposes the following for inclusion in the Protocol to the FCCC:

- i. an emissions envelope be adopted, initially for Annex I Parties, which minimises overall abatement costs through time, consistent with the long-term goal of stabilising the atmospheric concentration of greenhouse gases
- ii. that beyond the initial Berlin Mandate commitments to be taken by Annex I Parties, future commitments should be conditional upon the extent of participation in action to restrain emissions
- iii. that an individual Party's commitments could be specified as proportional shares of any emissions envelope to facilitate future adjustment
- iv. Parties be allowed to trade and bank emissions reductions (New Zealand, in association with the United States and Canada, proposed this on January 15)
- v. that anyone be permitted to trade subject to clear accountability requirements (we support Article 6(2) tabled by the United States)
- vi. fossil fuel subsidies be removed by all Parties
- vii. absolute increases or decreases in the stock of carbon in land use and forestry be offset against an individual Party's gross emissions commitments (in contrast to the existing approach which offsets changes in the rate of change of biomass relative to 1990 levels against changes in gross emissions)
- viii. the allocation of commitments for the post-2000 period be based on a five year average of base emissions

In developing its proposals New Zealand considered the following key principles:

Coverage

- to achieve the goal of stabilising atmospheric concentrations of greenhouse gases emissions restraint must ultimately apply to the bulk of emissions globally
- sources and sinks of CO₂ and other greenhouse gases should be included where practical and cost effective

Global least cost

- the specification of commitments in a manner which minimises the overall costs of achieving over time any given atmospheric greenhouse gas concentration
- a mechanism for updating the overall concentration goal and emissions envelope which balances the need for certainty against the desirability of incorporating new information
- flexibility over when and where abatement occurs to lower overall costs without compromising the commitment to the emissions envelope

The first part of the paper is structured around key elements of a global least cost approach including:

- the emissions envelope or profile of emissions reductions sought over time (initially for Annex I)
- consideration of mechanisms to achieve the progressive inclusion of all Parties (essential to achieving the long term objective of the Convention)
- elements of flexibility which could lower the costs of emissions restraint including emissions trading, and the ability to bank any over-achievement of emissions commitments for future use
- the inclusion of all sources and sinks of greenhouse gases

Subsequent sections cover issues relating to the allocation of commitments, and methodological issues including the treatment of land use and forestry changes.

AN EMISSIONS ENVELOPE - A LEAST COST WAY TO ACHIEVE THE LONG TERM GOAL

The key problem in terms of anthropogenic climate change is the atmospheric concentration of greenhouse gases. This is determined by the sum or accumulation of greenhouse gas emissions. This fact introduces scope to trade-off the timing of emissions reductions to lower the costs of achieving a given outcome - an opportunity that is not necessarily available in addressing other environmental problems. It makes sense to use this opportunity to lower overall costs. An emissions envelope is proposed which can provide flexibility, while ensuring that there is a commitment to emissions restraint.

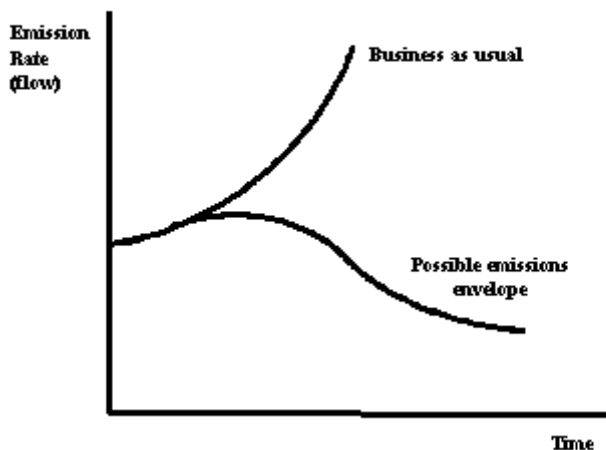
In the short run, the capital stock and technology are relatively fixed, and emissions reductions must be achieved at relatively higher cost in terms of economic output. Over

time, capital and technology can respond to a shift in relative price signals, thereby lowering the costs of achieving a given reduction in emissions. It makes good sense, therefore, to aim for increasing reductions in emissions over time relative to expected emissions growth. Setting shorter run targets that are relatively modest would also improve the prospects for acceptance of legally binding commitments by a wide group of Annex I Parties, and minimise relocation of emitting activities (which could undermine the achievement of atmospheric stabilisation of greenhouse gas concentrations).

An approach based solely around a longer term concentration target would in principle provide full flexibility over when abatement occurs (emissions entitlements equivalent to the concentration target could be issued now, with full flexibility over when they are used). However, an atmospheric concentration target could only be an "aim to" objective given that the Berlin Mandate does not propose emissions limitations for non-Annex I countries. In addition, providing full flexibility without any intermediate milestones of progress risks undermining the credibility of commitments. However, such milestones would need to be set carefully to ensure they did not unduly limit flexibility.

The proposed approach to addressing the tension between flexibility and commitment would be to have an emissions envelope which became progressively more stringent over time. The emissions envelope would provide annual markers of progress towards a cumulative emissions target. Initially the envelope concept would be applicable to Annex I, but over time the concept could be extended to any Parties accepting new commitments. Figure 1 illustrates a business as usual emissions trajectory, and a possible emissions envelope which would initially restrain and then progressively reduce emissions over time.

Figure 1: Illustrative emissions envelope relative to business as usual



In the short run achieving sharp changes in the absolute level of emissions is not the key issue, rather it is important that emissions are restrained relative to business as usual and progressively reduced over time. Over time, the emissions trajectory can be turned around by steady 'pressure' from an increasing relative price for carbon in the case of CO₂ (analogous to turning around a supertanker).

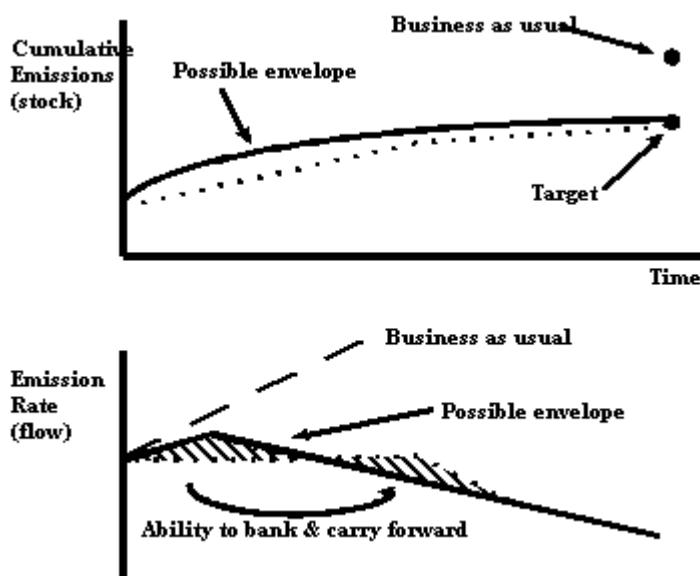
Provided the emissions envelope is set with appropriate allowance for short run rigidities, Parties would not wish to delay action. Proposals to allow Parties to borrow

against future commitments are then redundant. Any desire to borrow would necessarily imply that the overall constraint on emissions is too severe in the early years (provided the overall commitment is credible - borrowing could also reflect an expectation that future commitments would not be binding). Such concerns are best addressed, in our view, through the careful choice of the emissions envelope. The envelope would need to be supported by mechanisms which ensure that the cost of non-compliance exceeds the costs of compliance in order to be credible and durable. Domestic and international mechanisms to ensure compliance would be necessary.

In theory, any number of emissions tracks are consistent with a given cumulative emissions target. The important thing is not to over-constrain the emissions path early on. As long as the envelope does not lead to too much initial reduction then agents can choose the optimal abatement path. Therefore, for a given concentration target, the amount of early action consistent with least cost will be independent of the precise shape of the emissions envelope. The emissions envelope concept is not about delaying action, which ultimately depends on the overall emissions constraint over time. In setting the constraint, the time frame and degree of increase allowed should not preclude the attainment of a range of concentration targets. Provided banking is allowed, Parties may always bring action forward if by doing so they can lower overall abatement costs through time. It is the overall constraint that ensures early and appropriate price signals are generated to motivate change and innovation.

Figure 2 illustrates the operation of an overall cumulative emissions envelope. Consistent with the chosen cumulative target, emissions envelopes could be allocated to individual Parties. Continued emissions growth is shown in the short run, but below the expected business as usual rate, followed by a declining emissions envelope. If individual Parties, or those involved in emissions trading, considered that more substantive early action was a lower cost option, then action could be brought forward. The scope to bank and carry forward commitments is illustrated in the lower figure by the shaded areas.

Figure 2: Illustrative cumulative and emissions rate profiles showing a cumulative target, emissions envelope, and possible banking (lower figure)



It is proposed that an emissions envelope be adopted, initially for Annex I Parties, with the aim of minimising overall abatement costs through time, consistent with the long term goal of stabilising the atmospheric concentration of greenhouse gases. A simple specification of the envelope concept is proposed to facilitate negotiation. The interval over which emissions are increasing (but restrained below business as usual), and the emissions rate at the end point for which the envelope is specified are proposed as the only elements that would need to be agreed. Intermediate milestones of progress to which Parties would be committed could then be interpolated.

ACHIEVING GLOBAL COVERAGE

Action by a limited group of nations cannot achieve the ultimate objective of the Convention, which is to stabilise the atmospheric concentration of greenhouse gases. Yet current negotiations include emissions restraint commitments for a limited group of nations who alone cannot hope to stabilise atmospheric concentrations of greenhouse gases in the longer run. This fact does not remove the responsibility from Annex I Parties to agree to restrain and reduce emissions. However, it is crucial that the approach adopted is compatible with the longer term objectives of the Convention, and includes elements which provide for a transition to genuine collective action over time.

There are two key elements to achieving genuine collective action - overcoming the free rider problem within Annex I, and finding a longer term transition path to global action. The two issues are necessarily linked since, in the absence of a transition path to global action, the relocation of emitting activities will tend to offset efforts to address the underlying problem (efforts by Annex I alone to restrain emissions are also likely to be limited by the domestic acceptability of such action).

In order to move towards genuine global action, and over-come the free rider problem inherent to greenhouse gas abatement, the following three concepts are put forward for further consideration by all parties:

- i. ***Specifying individual commitments as shares of an overall emissions envelope or target level of emissions.*** This element would simplify future adjustment of the envelope. It also avoids the difficulty of trading off the time period over which flexibility is allowed in order to allow commitments to be periodically revised.
- ii. ***Flexibility over the allocated envelope for those accepting new commitments.*** Accommodating initial allocations could be provided for those accepting new commitments in recognition of their development aspirations and low per capita emissions, and as an incentive to accept commitments. However, there is necessarily a trade-off between the allocation for new Parties, Parties with existing commitments and the atmospheric concentration objective.
- iii. ***Making substantive additional action to reduce emissions conditional on wide participation.*** A limited goal in terms of greenhouse gas concentrations could be agreed by Annex I in the short term. A more ambitious goal for Annex I would be triggered once a certain share of global emissions were covered by commitments to restrain and reduce emissions. Those with initial commitments would be clearly signalling their willingness to act, and demonstrating the feasibility of elements of a least cost approach such as trading and banking; while those without commitments would face a clearer choice between action and inaction. A threshold in terms of coverage for more substantial action would also reduce concerns over the relocation of emitting activities.

ELEMENTS OF FLEXIBILITY

New Zealand, in association with the United States and Canada, tabled a simple and practical proposal which would allow Parties to trade and bank emissions reductions on 15 January 1997. These proposals would enable flexibility in meeting commitments without compromising such commitments.

Banking has been considered in the preceding section on the emissions envelope. The proposal to allow banking is consistent with the science of the issue, and can only result in additional early action relative to later action.

Benefits of trading

Trading would result in equalisation across Parties of the relative price of abatement, thereby minimising overall costs for those who participate. In addition, trading is a voluntary transaction from which all parties can benefit. For example, while trading necessarily drives up the price (and abatement costs) on the sellers side of the market, this is more than compensated by the income from selling surplus abatement.

An important implication of trading is that, by equalising marginal abatement costs (the 'price' of emitting CO₂), it allows a globally efficient outcome regardless of the initial allocation of commitments. The initial allocation does, however, have implications for national income.

Essential international building blocks for trading

The essential building block for trading is simple - credit for over-achievement of one Party's commitment need only be transferable to other Parties. While other institutional elements would be required, with careful design such elements need not be complex.

The Protocol need only agree a framework for trading which includes the key permissive building blocks. The key elements of the protocol are those that ensure accountability in terms of overall emissions, the allocation of legally-binding commitments between Parties, and recognition of any trading or transfer of such commitments.

Provided emissions reductions are verified there is no reason to restrict who can trade. Parties to the convention should be permitted to decentralise participation in trading within their national borders, for example, to domestic firms, individuals, non-government agencies etc. **New Zealand supports Article 6(2) of the draft Protocol framework tabled by the United States which would permit individual Parties to allow anyone to trade.**

Details of a trading system

Detailed elements of a trading system could be worked out subsequently by Parties who wish to trade and need not be the concern of COP or included in the Protocol to the FCCC. It is important that the decisions required at different levels are clearly delineated to clarify discussion over trading. Indeed, some aspects are purely of domestic concern. For example, whether individual Parties chose to grandparent or auction their individual allocations, and whether or not to have a domestic credit or permit based system.

The key point is that at the international level all that really matters in terms of trading is that Parties who exceed their commitments can sell their 'surplus' entitlements to other Parties. Whether or not such entitlements were initially grandparented or auctioned, or defined domestically as credits or permits, they are identical entitlements when traded internationally (with permits, emission reductions generate surplus permits which are identical in every respect to reduction credits).

Policies and measures

The key commitment is to limit emissions - individual Parties can then meet their commitments how they wish. Harmonised policies are unlikely to prove cost effective for all given differences in national circumstances. However, **New Zealand supports the removal of subsidies for the production and consumption of fossil fuels by all parties.** This would provide environmental and economic gains. Agreement to phase-out subsidies should be included in the Protocol.

Carbon sinks and other greenhouse gases

Carbon dioxide emissions are the predominant source of changes to the atmospheric concentration of greenhouse gases. However, it makes good sense to take action in relation to sinks and reservoirs of CO₂ and other greenhouse gases where this is practical and cost effective. Other greenhouse gases can be included on a global warming potential equivalent basis. The focus should be in areas where anthropogenic changes can readily influence emissions and where it is possible to adequately verify that reductions have occurred. The treatment of the different levels of uncertainty for different sources, sinks and greenhouse gases should be considered further and a mechanism established to agree on the approach to be adopted. One approach would be to estimate the statistical confidence of any measurement, and only accept changes up to some confidence level. Methodological issues regarding the treatment of sinks of CO₂ are considered in a later section.

ALLOCATION OF ENTITLEMENTS

With emissions trading, the overall global supply and demand for emissions reductions will determine the increase in the relative price of carbon for parties who trade. In turn, this relative price increase will provide the incentive for reductions in emissions in individual sectors and regions. Alternative allocations of commitments between Parties therefore impact on national wealth, but not directly on factors such as the terms of trade, or sectoral adjustments. Differentiation, with trading, is an allocation question.

New Zealand has previously stated that the complexity of differentiated commitments, and the fact that they necessarily involve relative winners and losers, makes movement on this front difficult. However, some Parties are concerned that the choice of 1990 as a base year for the allocation of commitments could have widely differing impacts on national wealth (since relative emissions growth for individual Parties has diverged significantly since 1990 for reasons that in general have little to do with greenhouse gas stabilisation *per se*).

The following points are put forward in considering any alternative allocation to a 1990 emissions base:

- any alternative approach should be simple

- reducing the disparity in allocation between Parties is desirable and would contribute to Parties agreeing to legally binding commitments (the more recent the base, the smaller such disparities will be)
- basing allocations on historical emissions avoids providing an incentive to increase emissions to achieve a higher proportion of the total emissions allocated.

It is important to note that, of itself, the base for initial allocation says nothing about the overall reduction in emissions sought. The two questions, burden sharing and overall burden, can be addressed independently.

METHODOLOGICAL ISSUES

Base year variations in emissions

Any single base year for future allocations of emissions entitlements will be perceived as unfair by those whose emissions were atypically low due to factors such as economic fluctuations and/or annual variations in weather. An alternative, which could avoid the consideration of complex individual circumstances and any adjustments to base inventories for individual Parties, would be to use average emissions over a number of years to allocate commitments.

New Zealand proposes that the allocation of commitments for the post-2000 period be based on a 5 year average of each Party's base emissions.

Measuring the contribution of carbon sinks and reservoirs

New Zealand considers that the current approach to changes in land use and forestry creates an anomalous situation that can reward deforestation and penalise afforestation, while not recognising the underlying contribution of reservoirs to removing CO₂ from the atmosphere. An alternative is proposed whereby any changes in land use and forestry are effectively zero based ie absolute changes for land use and forestry, rather than changes relative to 1990, would be offset against gross emissions growth.

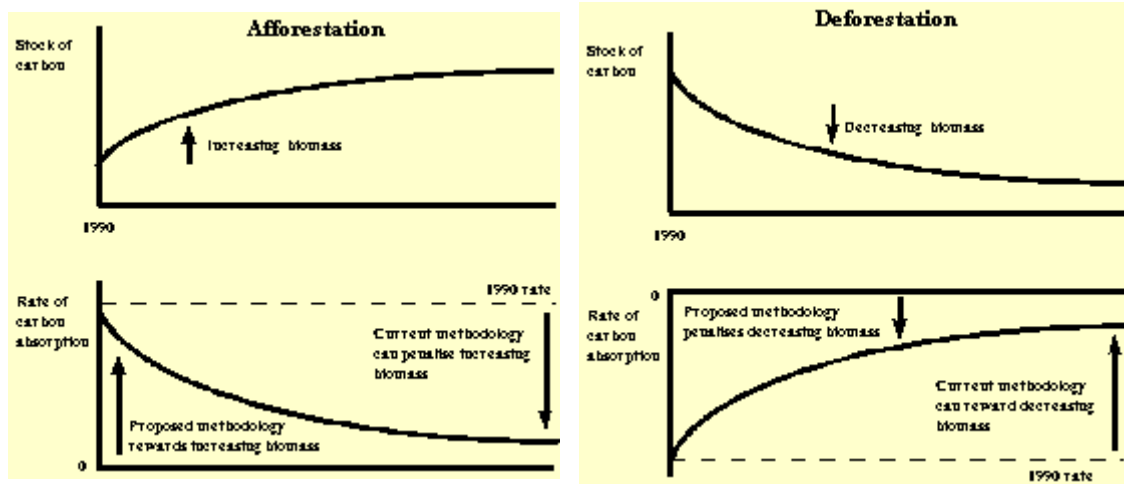
Under the current approach for counting changes in land use and forestry, the rate of change or flow of carbon is measured relative to the rate of change that was occurring in 1990. Such an approach is not, in our view, consistent with the intent of the Convention to 'protect and enhance sinks and reservoirs'. For example, a Party who was deforesting in 1990 is effectively entitled to continue to do so under the existing approach (since emissions from deforestation are 'grandparented' into their base emissions). Conversely, any afforestation in 1990 ultimately makes it more difficult for a Party to meet their commitments since the rate of afforestation must eventually decline due to land constraints.

Policy 'action' to reduce fossil fuel and industrial emissions are naturally referenced to some historical baseline. However, for land use and forestry changes, a more natural and intuitive baseline is the existing level of biomass - 'action', in terms of afforestation or deforestation, is then captured by absolute changes to the reservoir of carbon stored in biomass and the corresponding flux of carbon.

Figure 3 illustrates the existing and proposed approaches for both afforestation and deforestation. The upper figures show changes in the absolute stock of biomass, while

the lower figures illustrate the rate of change in the stock relative to a 1990 baseline (the existing approach).

Figure 3: Illustration of alternative approaches for measuring carbon sequestration with afforestation (left) and deforestation (right)



New Zealand proposes that absolute increases or decreases in the stock of carbon in land use and forestry be offset against individual Parties' gross emissions commitments (in contrast to the existing approach which offsets changes in the rate of change of biomass relative to 1990 levels against changes in gross emissions).