Submission to the
Garnaut Climate Change Review
for
Issues Paper 2
Financial Services for Managing Risk:
Climate Change and Carbon Trading

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Executive Summary

This submission contends that an emissions trading framework based on carbon will not deliver the comprehensive policy and technical adjustments needed for the National climate change response.

An ideal policy response to climate change for Australia should produce a framework which integrates carbon with the other core cycles which support the natural world – the water, nitrogen, and oxygen cycles.

These natural cycles are intrinsically linked. An economic framework should not work to separate them, if its intent is to enhance sustainability.

In terms of managing the National policy framework, we should also avoid an approach which produces multiple and divergent systems for restricting the flows of environmental capital.

Developing a national common environmental trading market, with nitrogen as the common environmental currency, may provide a better framework for designing Australia's climate change response.

The rationale for the common environmental trading market is outlined together with suggested framework assembly measures.

This submission is truncated. Further information can be provided on request, if the initial proposal is considered to have merit.

Introduction

Ideally, Australia's National policy response to climate change will deliver eight outcomes:

1. Rapid and ongoing reductions of greenhouse gas emissions.
2. Ongoing reductions in the concentration of greenhouse gases in the atmosphere.
3. Early discovery by the market of the cost of effective abatement measures.
4. An even spread of the abatement burden and opportunities through the economy.
5. Incentives for developing relevant new technologies and energy saving measures.
6. Balanced development of relevant forward markets, including markets related to adaptation measures and risk mitigation.
7. Framework control systems that are simple to implement and manage.
8. All of the outcomes above at the lowest cost and risk to the economy.

If so, does the focus on emissions trading and carbon really provide the best opportunity for an effective climate change policy response to emerge?

This is not an argument against legislating greenhouse gas emissions caps. Such caps will be critical components of the design of whatever framework we finally choose.

However, before accepting an ETS based on carbon as the centre-piece of the climate change response, we should develop and analyse a model based on **introducing nitrogen permits into the economy, allowing the market to establish their value and using nitrogen permits as the currency across all environmental trading systems.**

The objective of this approach is to restrict the flow of nitrogen through the economy in association with the implementation of greenhouse gas emissions caps, and current or future caps on the use of other environmental resources and discharges.

It is anticipated that such a model will enable the emergence of a more effective and comprehensive policy response to climate change. It will allow different sectors of the economy to participate and respond in different ways to climate change, but within a single framework and on economically comparable terms.

A Common Environmental Trading Market

Photosynthesis is the world's most important economic equation. Without its operation, the world cannot exist.

$$6H_2O + 6CO_2 \rightarrow C_6H_{12}O_6 + 6O_2$$

Critically, for this reaction to occur, we need the Sun + Nitrogen. (Phosphorus and potassium are also required but to maintain focus in this submission they will not be discussed further here.)

In economic terms, nitrogen provides leverage for photosynthesis.

The processes leading to global warming, together with other human activities such as industrial agriculture, waste discharges and urbanization, are producing fundamental imbalance in the operation of the equation on a global scale.

Photosynthesis demonstrates the perfect synthesis of the four core natural cycles of water, carbon, oxygen and nitrogen and suggests why the individual components of the equation should not be treated separately in an economic framework whose intent is to enhance sustainability.

The core idea of this proposal is to use the leverage of nitrogen to restore balance across multiple environmental systems concurrently, with the greatest economic efficiency.

The introduction of nitrogen permits into a **Common Environmental Trading Market (CETM)** creates the economic means for this to occur.

The underlying hypothesis of CETM is that the economic value of all forms of environmental capital can be standardised by reference back to photosynthesis and that nitrogen provides the most efficient reference currency.

It is envisaged that CETM will control all environmental markets, trading in all forms of natural capital, and that all sectors of the economy will participate. The nitrogen permit will be the only trading currency.

Developing CETM will not undermine the objective of establishing an ETS for reducing greenhouse gas emissions – it will simplify and enhance it.

Nitrogen Permits

The idea of Nitrogen Permits is to restrict the flow of **new nitrogen (Nnew)** through the economy. Nnew is nitrogen which is manufactured using non-renewable inputs, especially natural gas. Any nitrogen gained from recycling or nitrogen fixation is not considered Nnew.

Consider the following:

The current proposal for ETS is based on the CO_2e standard. Assume Australia sets an emissions reduction target of 100 Mt of CO_2e by 2020. Further assume that under this scenario, prices for emissions permits fall within a range from $20 - $60 per tonne of CO_2e.

N_2O is another major greenhouse gas. Its global warming potential is quoted as approximately 300 times greater that CO_2. If we change the emissions reduction standard from CO_2e to N_2Oe, the equivalent target should be 333,333t of N_2Oe. (100,000,000t/300)

The price of an equivalent N_2Oe emissions permit should be in the range $6,000 – $18,000 per tonne of N_2Oe. ($20x300 - $60x300)

The total predicted cost of emissions abatement measures under both scenarios would be in the range of $2-6 billion. It is not clear what percentage of this sum will be an annual cost and what percentage may be once-off.

Each year, Australia uses approximately 1Mt of Nnew in various forms of fertilizers. If we price only the nitrogen component of these fertilizers at today's rates, we would get a price for nitrogen in the range of $1000/t. The approximate cost of all Nnew used in fertilizers is therefore about $1 billion pa. (Nitrogen prices are rising quickly in line with natural gas.)

We must assume that each year, an equivalent amount of Nnew as is applied as fertilizer is lost into the environment and not recycled. If all of it were to end up in the atmosphere over time as N_2Oe, the greenhouse gas emissions value of that loss would be:

- 500,000T N_2Oe (150Mt CO_2e)
- with a potential abatement value in the range of $3 - 9 billion pa. (500,000T N_2x$6000 - $18,000)

If this is true, or even partially true, we should consider a new approach to the climate change policy framework based on nitrogen permits.

Can we assemble an economic framework to leverage, on an annual basis, $1 billion of nitrogen inputs into a minimum $3 billion of emissions abatement, by using nitrogen permits to restrict the flow of Nnew though the economy?

Can that same framework also integrate trading in all other forms of environmental capital, using a single reference currency – the nitrogen permit – and provide the foundation for a comprehensive National climate change policy response?

The approach, if it can be implemented, has implications for a wide range of environmental management challenges apart from greenhouse gas abatement.

Assembling the CETM

There are a variety of ways in which CETM could be assembled. This discussion will confine itself to one example.

Steps:

1. Establish a National Environment Bank (NEB).
1.1 The NEB will have a charter to control the issue of all nitrogen permits into CETM.
1.2 It would have other currency management functions much the same as the Reserve Bank and be responsible for all environmental trading markets within CETM.

2. Establish the initial pool of nitrogen permits and rules for trading in CETM.
2.1 The initial pool should probably be based on the median of the 10 year forecast of the annual market for Nnew, divided into a feasible number of permits to facilitate trading.
2.2 For the purpose of this discussion, let's assume NEB plans an initial pool issue based on 1Mt Nnew divided into 100kg units, giving 10 million nitrogen permits.
2.3 Based on the assumptions explained earlier in this submission, each permit is tagged to an annual right to 100kg of Nnew **or** 50kg of N_2Oe forever.
2.4 NEB will hold a reserve pool of, say, 10million nitrogen permits, which it may issue at its discretion, to ensure the permits market can maintain liquidity.
2.5 When permits are sold from the Nnew sector to the emissions sector, the equivalent amount of Nnew is permanently removed from circulation, unless the permit is purchased back into the Nnew sector. The same holds true in reverse for N_2Oe from the emissions sector.
2.6 Trading of GHG sinks or sequestration measures is not permitted in CETM.

3. Establish control measures and issue nitrogen permits into the economy.
3.1 Nnew will become a controlled commodity. Audit mechanisms will be required.
3.2 The initial issue of nitrogen permits will be made to historical users of Nnew, who will be mainly primary producers, based on average use data for, say, the last 5 years.
3.3 In today's nitrogen market, the face value of the permits on issue is approximately $100.
3.4 From the time of issue, the purchase of Nnew can only be conducted by someone holding the equivalent number of nitrogen permits. For example, to purchase 1t Nnew in any year, the buyer must hold 10 nitrogen permits valid for that year.

4. Set the first GHG emissions reductions target and convert this target to N_2Oe.
4.1 In this model, based on 1Mt Nnew pa, the equivalent emission reduction target would be 500,000T N_2Oe (150Mt CO_2e)
4.2 The target should initially be applied across all major emitters using fossil fuels, including stationary energy and transportation fuels. Other sectors can be integrated over time.

5. Open trading in nitrogen permits.
5.1 Emitters who cannot meet their target obligations, must purchase nitrogen permits from permit holders. It is expected that the exchange price for one nitrogen permit under the scenario in this discussion would be in the range of $600-$1,800.

6. Bring other Environmental Markets into CETM
6.1 This matter should be dealt with in a separate discussion. It is only feasible if CETM is adopted as the framework for GHG emissions trading.

Conclusion

ETS based on carbon will not deliver the comprehensive policy and technical adjustments needed for the National climate change response.

A different approach, based on the trade of nitrogen permits through a common environmental trading market (CETM) should be modeled, before settling on Australia's climate change policy framework.

The underlying hypothesis for CETM is that the economic value of all forms of environmental capital can be standardised by reference back to photosynthesis and that nitrogen provides the most efficient reference currency.

Nitrogen permits provide the potential to restrict the flow of new nitrogen through the economy. Such restriction can be leveraged into significant emissions abatement outcomes at minimal cost and disruption to the economy.

CETM should eventually incorporate all environmental markets. It will enable different sectors of the economy to participate and respond in different ways to climate change, within a single framework, and on economically comparable terms. The approach has implications for a wide variety of environmental challenges apart from greenhouse gas abatement.

Several options exist for the assembly of the CETM. Modeling will indicate the best pathways, but CETM will simplify management protocols and provide a more comprehensive framework for Australia to develop its climate change and environmental policy.

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