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Free Allocation in the New Zealand Emissions Trading Scheme
A Critical Analysis

Introduction

In November 2009 the government passed significant amendments to New Zealand's emissions trading scheme (ETS), barely two months after the legislation was introduced. Submitters were given two weeks to make written submissions, and some were asked to appear for oral submissions with only a few hours notice. Very little economic analysis of the legislation was released by the government at the time or has been since.

This paper provides an introduction to, and critical analysis of, the key change to scheme: the shift from historical grandparenting of free units to an uncapped production-based allocation. Decisions around long-term allocation will drive major investments and steer New Zealand's emissions track over the coming decades.

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Background: the New Zealand emissions trading scheme

New Zealand's ETS, first passed into law in late 2008, is unique internationally in that all sectors of the economy are to be phased in by 2015: electricity generation, energy, industrial processes, transport fuels, agriculture and forestry.

Under the ETS, entities that are responsible for greenhouse gas emissions (such as fuel importers, cement manufacturers, dairy processors, or those clearing forests) are required to submit one New Zealand unit (NZU) to the government for each tonne of emissions. Those undertaking compliant forestry activity are entitled to receive units.

Some emissions-intensive sectors, such as industry and agriculture, will receive free allocations of units, ostensibly to protect their international competitiveness. Other sectors, such as electricity generation and liquid fuels, will be required to purchase (domestically or internationally) units to surrender to the government. As international Kyoto-compliant units are acceptable under the scheme, the price of NZUs will be capped at the international price of emissions.

Carbon leakage and free allocation

There is substantial economic analysis showing that once there is widespread international emissions pricing, the least-cost domestic response is economy-wide pricing with no exemptions or free allocation (for example, see Montgomery, 1972; Stavins, 2007; NZIER/Infometrics, 2009). However, there is a common concern that without widespread international action, emissions pricing could cause emitters to lose competitiveness or even relocate to jurisdictions that don't price emissions, leading to both job losses and higher global emissions. This effect is known as carbon leakage.

This concern is often overstated, both environmentally and economically. Although the competitiveness of some sectors will certainly be affected by emissions pricing, analysis shows that this does not generally lead to major economy-wide issues or major increases in emissions (IEA, 2008; WRI, 2008).

Nonetheless, free allocation of units

forms part of every emissions trading scheme currently being developed. It aims to support the competitiveness of affected sectors until the world transitions to more widespread emissions pricing, or at least to uniform action across sectors. It can be thought of either as compensation for assets stranded by the policy change, or else as a production subsidy to be phased out as competitors introduce emissions pricing.[1]

New Zealand's 2008 ETS used a 'grandparenting' approach to allocation: that is, the free allocation was to be a fixed number of units based on historic levels of emissions. Energy-intensive trade-exposed industries and the agriculture sector were to receive a fixed annual allocation of units until 2018, set at 90% of 2005 emissions, phasing out to zero by 2030.

Under grandparenting, new investments or expanded production do not receive any allocation. This could lead to lost investment in the short term, but avoids locking in high emissions activity that could be uneconomic in the future. It also ensures that the allocation of new capital investment across different sectors of the economy is efficient for the new environment in which emissions are priced, thus promoting a lower carbon economy as a whole.

The 2009 ETS amendments change the free allocation from grandparenting to a production-based (also called intensity-based) approach, in which units are awarded per unit of current production. Under production-based allocation, new investments and increased production receive the same level of support as existing activity, so are encouraged. There is, however, a risk of locking in uneconomic high emissions activities, leading to inefficient allocation of capital between various sectors of the economy. Even though firms are awarded units for free, they still have an incentive to improve emissions intensity at the margin, because any efficiency improvements free up permits that can be sold at the full market price.

Cost of free allocation to the wider economy

Intuitively and according to economic theory, providing protection to some sectors means the rest of the economy will face greater costs. As the specialist adviser to the parliamentary select committee, Dr Suzi Kerr, put it:

> Not having effective reduction policies in every sector would raise the costs of compliance to the economy as a whole. Excluding a sector from the emissions trading system or providing high levels of free allocation to some firms imposes high costs on all other sectors and firms who must cover the costs of those emissions through taxes. (Kerr, 2009)

At an emissions price of $100/+$CO_2$, free allocation of 30 to 40 million units per annum is an annual cost to government of $3-4 billion.

Results of New Zealand general equilibrium modelling (NZIER/Infometrics, 2009) suggest there is no impact or even a small benefit to the economy as a whole from free allocations. This result hinges on the assumption that few mitigation opportunities exist in the protected sectors, so introducing an emissions price simply leads to output being curtailed, with flow-on negative consequences in the wider economy. Other economic analyses argue that significant abatement opportunities do in fact exist (Bertram and Terry, 2008), in which case free allocation would clearly be welfare-diminishing.

Even if we assume that free allocation comes at no overall cost to the economy, there can still be significant effects. Again to quote Kerr (2009):

> Free allocation redistributes the cost of climate policy away from the owners of protected firms, who tend to have higher than average incomes, toward all taxpayers. It also significantly raises the overall cost of the climate policy to the economy. A policy that is fiscally neutral can still have large damaging effects on the parts of the economy and society that do not receive free allocation.

International experience

Unlike the economy-wide coverage of the New Zealand ETS, overseas schemes tend to cover only the energy, industy and sometimes transport sectors.

Empirical analysis of a proposed ETS for the United States shows that a free allocation in perpetuity of 13–21% of the total number of units issued would fully compensate private industry for equity losses, or equivalently a 50% allocation phasing out to zero by 2025 (Bovenberg et al., 2003; Stavins, 2007).[2]

Legislation currently being considered by the United States Senate proposes a similar split: roughly 17% of the total value of allocation to 2050 will accrue to private industry (Stavins, 2009a). Trade-exposed emissions-intensive industries receive an initial allocation of 15% of total units, decreasing over time in line with the overall cap, and phasing out to zero after 2025. Within this cap, allocation is production-based (Stavins, 2009b).

Under the European Union's ETS, trade-exposed industries (around 25% of emissions in the scheme) receive free allocation for 100% of their emissions if they are using best practice technology. There is a capped pool for allocation to these industries which declines with the overall reduction target (European Union, 2009).

The proposed Australian carbon pollution reduction scheme (CPRS) initially provides 94.5% free allocation to highly trade-exposed energy-intensity sectors and 66% to moderately exposed sectors. Both phase out at 1.3% per annum for the first ten years, with the phase-out rate reset five-yearly thereafter (Wong, 2009).[3] Free allocation is initially around 20% of total units, but this pool is uncapped and expected to rise as industrial

production growth outstrips the 1.3% phase-out rate (Australian Government, 2008).

Economic modelling of the Australian proposals shows that production in some sectors, particularly aluminium, would be affected, suggesting that some free allocation may be warranted. However, there does not appear to have been any analysis on the optimal level of this support from the perspective of the economy as a whole. Interestingly, carbon leakage is not observed in the modelling until emissions prices of well over AU$200/tCO2. (Australian Treasury, 2008)

Free allocation in the New Zealand ETS

The amended New Zealand ETS is closely aligned to the proposed Australian CRPS, and uses production-based free allocation. Agriculture and high emissions-intensity sectors are to receive a 90% free allocation per unit of production; moderate intensity sectors a 60% free allocation. Both are phased out at 1.3% per annum, with this rate fixed in legislation.

Figure 1 shows the free allocation of units to industry and agriculture expected under the previous and current legislation,[4] compared to two target levels for New Zealand emissions: a 50% reduction on 1990 levels by 2050 (the government's current target), and an 80% reduction. Note that while the 50% and 80% curves give an indication of the number of NZUs that might be issued, they do not actually represent a cap on New Zealand's total domestic emissions: under the New Zealand ETS, emissions can be arbitrarily high as long as additional units are purchased offshore to cover them.[5]

Note that these curves ignore units generated by (and used to cover) the growth and harvest of post-1990 plantation forests. Forestry has been excluded because it is cyclical: at some times it generates significant units, in others these need to be repaid as forests are harvested. Over the long term it is assumed to net out to zero.

The projections represented by the dashed and black lines were released by the minister for climate change issues, Nick Smith (Smith, 2009a), and minister of finance, Bill English, respectively.[6] Neither of these data sets was made available to the public at the time when the legislation was open for public submissions, and the second was only recently released under the Official Information Act.

Several important points can be noted in relation to Figure 1:

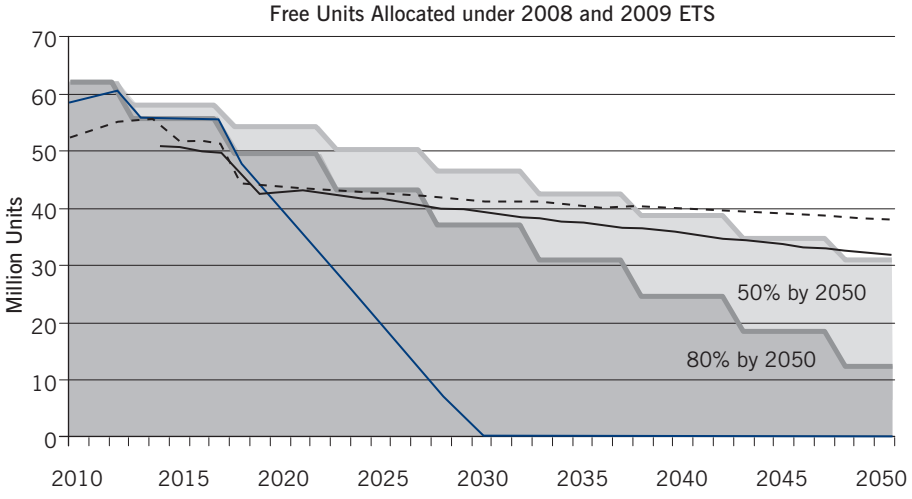
- The total allocation is very high compared to overseas schemes. Under the 2009 legislation, most NZUs will be allocated for free to cover emissions in industry and agriculture.
- Until around 2020, both the 2008 and 2009 schemes provide comparable, very high, levels of free allocation. Beyond 2020, the 2009 allocation phases out much more slowly.
- The free allocation under the 2009 legislation declines by less than 1% per annum. Although allocation per unit of production phases out at 1.3% per annum, production levels increase with time, partially offsetting this.
- Under production-based allocation, the small changes in assumptions between the dashed and solid curves have significant impacts on allocations (and hence fiscal implications).[7]
- If the 1.3% phase-out rate continues, the scheme may not be compatible with the government's 50% emissions reduction target, depending on how quickly production grows in the subsidised sectors.
- If New Zealand takes on a more ambitions target closer to 80% reductions by 2050, the 1.3% phase-out rate is far too gradual.

The very high level of free allocation in the New Zealand ETS means that unlike in overseas schemes, there is no specific allocation of units for transition in the residential or small business sectors, or to fund emissions reductions programmes. This is partly because New Zealand's gross emissions are now much higher than the 1990 baseline, so the entire pool of units is taken up covering just the agriculture and industry sectors. The free allocation also comes at a considerable fiscal cost: at an emissions price of $100/tCO2, free allocation of 30 to 40 million units per annum is an annual cost to the government of $3–4 billion.

Criticism has been levelled at the assumption underlying the solid and black curves, namely that the 1.3% phase-out rate will remain unchanged when the legislation will be reviewed every five years.[8] There are two major reasons why this assumption is appropriate. First, the 1.3% rate is set in legislation and will remain fixed unless a future government amends the law. The analysis presented in Figure 1 is therefore of the law as it currently stands.

Second, the government's communications relating to the 2009 amendments assume that the rate will remain unchanged, including graphs (presumably based on the black curve of Figure 1) to illustrate how a 1.3% phase-out rate is consistent with a 50% by 2050 target (see appendix of Hood (2009)). The government's message

Figure 1: Long-term free allocation of units to agriculture and industry under the 2008 ETS (blue line) and two government estimates for the 2009 ETS dashed and solid, and possible emissions reduction targets for New Zealand of 50% and 80% reduction on 1990 levels by 2050 (grey areas)



has been that, all things being equal, there is no reason that the rate need change.

Of course, Figure 1 only shows the level of free allocation to industry and agriculture, not actual emissions levels. Emissions are expected to continue rising, and by 2030 New Zealand's total gross emissions in the dashed-line data set of Figure 1 reach 80 million tonnes. With rising emissions, New Zealand will need to meet its targets largely through purchasing units internationally. As the international price of emissions units escalates, this will become an increasingly expensive strategy. At some point there will need to be a clear signal to investors of the need to transition to a low-carbon economy.

At present there is no long-term stable carbon price path on which to base investment decisions. It therefore falls on governments to signal the expected policy settings well into the future. The current signals – that substantial free allocation should still be in place in 2050 – run the risk of locking in inappropriate investment, especially where investment decisions are made around long-lived assets in the short term.

The value of free allocation

Under the 2008 legislation, free allocation would have phased out quickly, leaving the government with surplus units after 2020. These could have been sold to fund tax changes, debt reduction or climate programmes. With the 2009 amendments, the government has instead chosen to allocate virtually all NZUs for free to industry and agriculture.

The forgone revenue to the government resulting from the change has been estimated by the Treasury to be $110 billion to 2050, assuming a modest emissions price of NZ$50 per tonne (Treasury, 2009). With a more plausible (IPCC, 2007; OECD, 2009; Australian Treasury, 2008) emissions price rising to NZ$100 by 2050, the cost to the government approaches $200 billion.

Economic theory suggests that using any surplus units to reduce debt or general taxation, rather than maintaining subsidies, would have the greatest benefit economy-wide. However, there would also have been the opportunity to fund transitional assistance for households and small businesses, support clean technology, and undertake emissions reductions such as energy efficiency. The proposed United States legislation takes this approach, with 80% of the scheme's proceeds being directed to householders over the life of the scheme, both directly and through programmes (Stavins, 2009a).

Unfortunately, the government has not undertaken (or at least released) any economic analysis of the optimal means of allocating units in the New Zealand scheme, so it is unclear why the decision was made to allocate all units to agriculture and industry.

Breakdown of allocation – agriculture and industry

Figure 2 shows the breakdown of units allocated to the agriculture and industry sectors.

Industry

There are two obvious changes brought in by the 2009 amendments. First, the initial allocation has decreased by around one third. Because eligibility rules have been changed to match the draft Australian legislation, fewer New Zealand firms are expected to qualify.

Second, allocation remains more or less constant, because production increases at roughly 1.3% per annum, matching the 1.3% phase-out in support. These data sets clearly do not provide for any significant new entrant activity, such as expanded methanol and cement production, a coal-to-urea plant or a coal-to-liquid fuels plant (plans for all of which are being actively developed). These would see the allocation rising significantly.

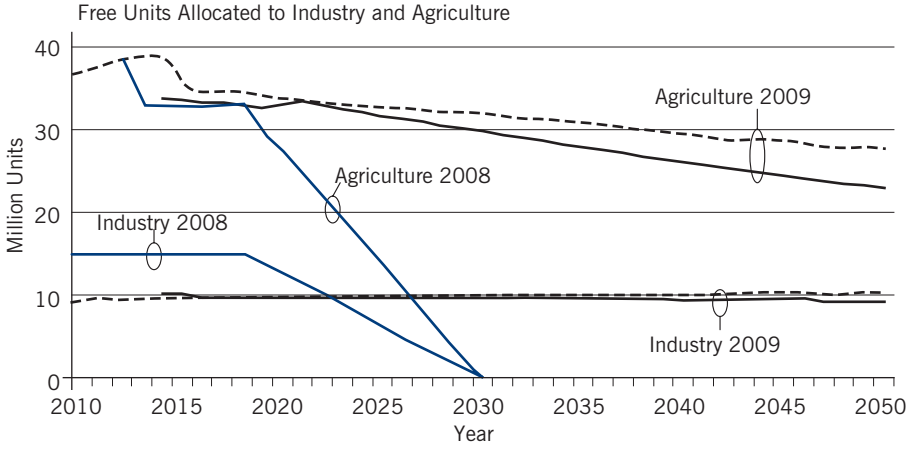
The initial level of assistance appears similar to that proposed in other markets. To see this, consider a hypothetical New Zealand ETS that includes only the transport (25MT emissions) and energy (22MT emissions) sectors. In this market, 10MT of free allocation is around 20% of total units. But the New Zealand timeframe for assistance is clearly longer, and likely to be overcompensating firms, based on US experience (Stavins, 2007).

The allocative baseline (number of units awarded per unit of production) is to be set at historic New Zealand sectoral average emissions. Firms producing with better than average efficiency will receive more units than they require, and vice versa for low-efficiency producers. Particularly in sectors where only a single plant operates, this choice of baseline sends a message that business as usual is all that is expected.

However, the New Zealand legislation also allows Australian baselines to be imported directly into the New Zealand scheme. For example, New Zealand sectors can be deemed eligible for assistance because their Australian counterparts are, even if they would not have been otherwise. In this case the New Zealand ETS must use the Australian baseline. This raises the potential of further significant windfalls or costs to firms, and uncertain costs to the taxpayer.

The effect of the change in allocation methodology coupled with a generous

Figure 2: Long-term free allocation of units to the agriculture and industry sectors under the 2008 (blue lines) and 2009 (black dashed and solid lines) ETS



Example: Holcim's investment in a new cement plant

Holcim is considering replacing its current cement plant, increasing production and reducing emissions intensity. If the new plant is not built, incremental demand would be met with imports. At a carbon price of $50 per tonne, free allocation is roughly as shown in Table 1.

Table 1: Potential value of free allocation to Holcim

	Existing plant + imports	New plant
Production	500,000 tonnes at 0.93tCO2/t	880,000 tonnes at 0.75 tCO2/t
Imports	380,000 tonnes at 0.87 tCO2/t	
Holcim emissions	465,000 tonnes p.a.	660,000 tonnes p.a.
Global emissions	797,000 tonnes p.a.	660,000 tonnes p.a.
Emissions cost to firm and taxpayer, 2008 legislation	Firm $2.32 million p.a. Taxpayer $20.9 million p.a.	Firm $12.07 million p.a. Taxpayer $20.9 million p.a.
Emissions cost to firm and taxpayer, 2009 legislation[9]	Firm: $5.0 million p.a. Taxpayer $18.2 million p.a.	Firm: $0.9 million p.a.[10] Taxpayer: $32.1 million p.a.

choice of baseline is illustrated in the example below, that the government has put forward to illustrate their preference for production-based allocation: Holcim's pending decision on a new cement plant.

Holcim has said it would not have invested in the new plant under the 2008 legislation. Under the 2009 legislation there is clearly a strong incentive to upgrade: note that the company's costs decrease substantially even though its emissions rise.

However, the incremental cost to the taxpayer of supporting the new plant is substantial: $14 million per annum. It employs roughly the same number of people, so there are not significant employment benefits. Global emissions are reduced by 137,000 tonnes, but at $50/tCO2 this should only cost $6.85 million.

Also consider the $18 million per annum of free allocation to the existing plant. If the plant's production was replaced by imports, global emissions would decrease, not increase. The plant supports around 130 direct jobs, so $18 million is around $140,000 per job per year.

It may be the case that these high levels of subsidy are necessary and desirable based on the plant's contributions to the wider economy, but this would need to be demonstrated through careful analysis.

Obviously, these costs are highly dependent on the emissions price assumed, so the intention is not to draw concrete conclusions. Rather, this example is intended to illustrate that detailed cost-benefit analysis of individual allocation decisions could be very important where large wealth transfers are involved.

Agriculture

Returning to Figure 2, it is clear that the majority of free allocation is to the agriculture sector.

No overseas jurisdictions currently plan to price agricultural emissions. However, there is a bipartisan political consensus in New Zealand that matching this 100% level of cover would be unaffordable here. This is because New Zealand's emissions profile is unique for a developed country: agricultural emissions make up nearly half of total emissions, so to exclude them completely would place a significant additional burden on other sectors of the economy.

Although agriculture is not given 100% cover, Figure 2 shows that the current legislation provides a very high level of ongoing free allocation. The benefits and costs of this support to the economy as a whole, rather than simply to the agriculture sector, should be considered. An allocation of 30 million units per annum (an opportunity cost of $3 billion per annum at an emissions price of $100 per tonne) may be a poor investment compared to alternatives.

Dr Suzi Kerr made this point in advice to the select committee:

> It is very costly to taxpayers and the economy as a whole to maintain this high level of protection. To raise the taxes to pay for it we need to distort economic activity (people work and save less when their earnings are taxed). In the US the cost of raising taxes is in the order of 40c in every dollar. It is probably similar in New Zealand, i.e. it costs the economy around $1.40 for every dollar worth of free allocation given to specific sectors.
>
> Free allocation should certainly be removed as our competitors enter the agreement. It should be phased out relatively quickly even if they do not. This is for the same reasons that we do not subsidise our agriculture even though the US and EU do. The benefits to the protected activities are vastly outweighed by the costs to the economy as a whole. The phase out of free allocation in the existing bill was probably already too slow on economic grounds. (Kerr, 2009)

Without detailed cost-benefit analysis it is not clear what level of support is optimal, and whether these units would provide a better return elsewhere. It seems irresponsible to commit up to $3 billion per annum of taxpayer funds without more careful consideration.

Agricultural interests have argued that there are few emissions reduction opportunities in the sector, so pricing will simply lead to cuts in production. However, New Zealand's experience in removing agricultural subsidies in the 1980s should be remembered. This change, while painful for many at the time, brought significant benefits in the long run and demonstrated the tremendous innovative and adaptive capacity present in the sector. It would be wrong to assume

that protecting the status quo is the best and only option.

Discussion

As outlined above, free allocation on a production basis tends to drive investment toward subsidised sectors, potentially locking in high-emissions activities. One way to ameliorate this is for allocation to be clearly transitional. Investors must be made aware that over the lifetime of their plant, the expectation is that they, and their competitors, will face the full price of emissions. In this regard, free allocation can be thought of as bridging support for industries that are competitive now and will be competitive under global emissions pricing, but may suffer during the transition. In the New Zealand ETS, this signalling could be achieved by capping the pool of units available for free allocation, with this pool declining at least in line with overall target levels.

Another key issue is setting appropriate baselines, particularly in a small economy like New Zealand's where sectoral emissions may be far from the global average, and where there is often only one firm of any consequence per sector. The current legislation potentially creates significant windfalls to firms, and gives only weak signals for change. Moving to best-practice benchmarking (as done in the European ETS) would ensure that firms face a continual incentive to improve.

Then there are the issues raised by linking so closely to the yet-to-be-established Australian scheme, as discussed by Wilson (2009). The structure of the two economies is very different. Support that is cost effective in the Australian economy may not be in New Zealand's. Rigid coupling to the Australian scheme could therefore lead to further distortion of New Zealand investment decisions, at a cost to the economy as a whole. If an Australian scheme is implemented, the decision to directly import eligibility and baseline regulations into the New Zealand ETS effectively cedes sovereignty over these issues.

The most important concern with free allocation is, however, not so much with the nature of allocation (grandparented or production-based), but rather the level of allocation, particularly over the long term. The current New Zealand scheme seems highly likely to over-compensate firms. Detailed cost-benefit analysis is needed to find both the optimal level of free allocation, and the optimal way of recycling ETS revenue more generally.

Finally, allocation decisions have clearly not been subject to proper analysis and scrutiny. Compare this with the government's annual budget process. If, for example, a new energy efficiency programme is proposed, it must demonstrate a very high benefit-cost ratio to proceed. Spending decisions are balanced against all other government priorities – education, health, superannuation and so on – and against overall taxation and debt levels. If free allocation in the ETS were subject to the same scrutiny, this would soon flush out whether it is in fact a good investment. Would, for example, corporate tax cuts provide a better return than subsidising existing emissions intensive sectors?

free allocations were subject to the same budget scrutiny as other government spending, they may well not pass the test of being wise use of taxpayers' funds.

The slow phase-out also fails to send the signal to investors that there will need to be a transition to full market pricing in the medium term.

One way to address these concerns would be to cap the pool of units available for free allocation, with this pool reducing over time to ensure support is phased out much more quickly. Within the cap, allocation on a production basis could continue, retaining the positive characteristics of an intensity-based approach.

The government has argued that any long-term analysis shouldn't be taken seriously, because there will be reviews of the legislation. But leaving it to future governments to amend the scheme on an ad-hoc basis creates enormous uncertainty for long-term investors (IEA, 2007). It would be better to put in place a framework now that sets a more realistic pathway for allocations into the future, so that major amendments are less likely. An allocation methodology with bipartisan political support is needed, underpinned by strong cost-benefit analysis and a clear view on where global emissions pricing is headed.

Unlike in overseas schemes, there are no units set aside to fund transitional assistance or programmes for the residential, small business, electricity generation or transport sectors, or to fund tax and debt reductions.

Conclusion

The free allocation provided by the 2009 legislation leaves only weak incentives for subsidised industries to change and is likely to over-compensate them for the impact of emissions pricing; hence, it is likely to be expensive for the wider economy while generating few environmental gains.

The problem is not the production-based allocation per se; rather, it is that the total level of allocation is high, uncapped and only phasing out very slowly (or for industry, not at all). Unlike in overseas schemes, there are no units set aside to fund transitional assistance or programmes for the residential, small business, electricity generation or transport sectors, or to fund tax and debt reductions. If the legislation's

The first scheduled review of the scheme is in 2011. As the ETS will only be coming into operation at this time, there will be a temptation for this review to be cursory. Instead, the review provides an opportunity for the proper cost-benefit analyses to be undertaken to inform decisions on how ETS revenues should be best allocated for the benefit of New Zealand as a whole.

1 Providing a subsidy for a number of years allows assets to depreciate, so can be seen as equivalent to a compensation payment (Kerr, 2009).
2 This assumes compensation to all affected market participants, not just trade-exposed energy-intensive industries.
3 The phase-out rate is set by regulation, so can be reset without passing new legislation.
4 All curves include a small allocation to 2018 to partially cover deforestation of pre-1990 forests.
5 Under the Kyoto Protocol the New Zealand government receives a free allocation of units corresponding to its target level. If this regime persists, the 50% and 80% curves represent these free units received by the government.
6 The dashed line data set ends in 2030 but is tracking linearly at that time, so has been extrapolated linearly to 2050.
7 The dashed line data set assumes agricultural production grows at around 0.7% p.a. and industrial production at 1.5% p.a. The solid line data set has agricultural production increasing at 0.7% p.a. until 2020, with zero change thereafter, and industrial production rising at around 1.3% p.a. to 2030 and 1% p.a. thereafter.
8 The minister called Treasury's analysis to 2050 'fantasyland' (Smith, 2009b).
9 Assumes New Zealand industry average emissions of 0.81tCO2/t, estimated from production levels at Holcim and Golden Bay Cement
10 This cost is low because the new plant benefits from a high allocative baseline, set in part by the old, inefficient plant. The baseline can be reset under the legislation, but governments will be likely to be reluctant to do so because it would reduce the incentive for firms to upgrade.

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