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Minister of State Services
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30 May 2008

Mr Charles Chauvel MP
Chairperson
Finance and Expenditure Committee
Parliament Buildings
Wellington

Dear Charles

**INFORMATION FOR THE COMMITTEE ON REVENUE TO THE CROWN AND
COMMITMENT PERIOD RESERVE**

There has been interest recently on the possible revenue to the Crown from the ETS and concerns raised by submitters on the ability of firms to sell units internationally.

Attached in Appendices I and II are two reports on these topics.

While earlier advice was provided to the Finance and Expenditure Committee on the possible revenue flows from the sale of units, the calculations in that advice are now out of date with the proposed delayed entry of liquid fossil fuels. Also, this advice did not include any analysis on the possible increased revenue received by generators which might generate additional dividend and tax revenue for the Crown. Appendix I provides an update to the earlier advice.

Please note, copies of letter and annexes have been provided to the Clerk for distribution to Committee members.

Yours sincerely

Hon David Parker
Minister Responsible for Climate Change Issues

Appendix I: Revenue Implications of the NZ ETS

Background

1. The Finance and Expenditure Committee has heard submissions about the possible revenue to the Crown from the ETS. Earlier advice was provided to the Finance and Expenditure Committee on the possible revenue flows from the sale of units. However, the calculations in that advice are now out of date with the proposed delayed entry of liquid fossil fuels. This advice also did not include any analysis on the possible increased revenue received by generators which might generate additional dividend and tax revenue for the Crown. This note provides an update to the earlier advice.
2. The next section looks at the possible net revenue accruing to the Crown from the sale of units and the following section looks at possible increased revenue received by generators which might generate additional dividend and tax revenue for the Crown. There are also other possible sources of increased revenue to the Crown such as from tax paid on emissions units as they are traded. However, these revenue sources are even more difficult to forecast so have not been included.

Net revenue from the sale of units

Revenue impacts between 2008 and 2012

3. Current forecasts suggest that the operation of the ETS could result in the government receiving a similar number of ETS compliance units to the number it freely allocates or awards for removal activities. If this holds there will be few or no net units surrendered by New Zealand ETS participants available to use towards meeting New Zealand's expected Kyoto deficit and the government would need to purchase additional units to cover New Zealand's Kyoto liability (currently estimated to cost \$482m). However, this position is subject to change as there is:
 - uncertainty around the actual levels of New Zealand emissions (and thus the level of the Kyoto liability); and
 - uncertainty around the number of units that will be given out or received under the ETS (driven by such factors as the uptake of post-1989 afforestation credits by landowners and the ultimate level of free allocation to the industrial sector).

Revenue scenarios beyond 2012

4. Once all sectors have entered the scheme and are required to surrender units equal to their total emissions, net revenue accruing to the Crown under the ETS can be estimated as:

$$(\text{AAUs}^1 - \text{NZUs freely allocated}) \times \text{World Carbon Price}$$

5. Questions have been raised by stakeholders about whether the New Zealand government should sell any of the AAUs it receives. Instead some have suggested that the government freely allocate all of its AAUs to emitters. AAUs are allocated at a country level as part of establishing the overall Kyoto cap. The retirement of every AAU allocated to the Crown to meet New Zealand's international obligations constitutes an opportunity cost to taxpayers. It is up to the relevant government to determine how best

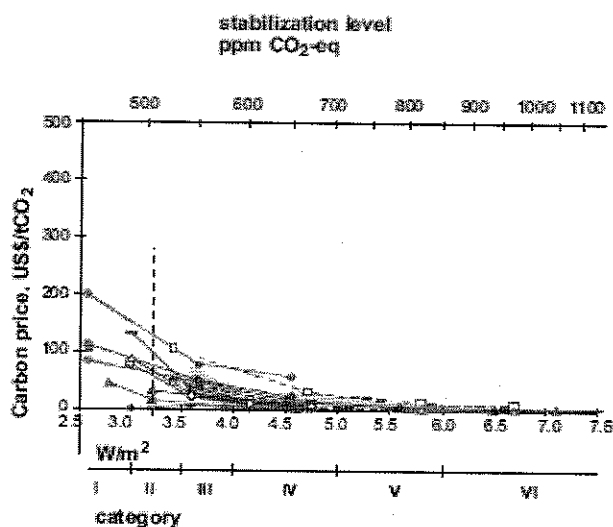
¹ While the government will also receive RMUs we have not assumed any revenue from these, as over longer time periods the credits received also result in an equal liability (assuming the rules for forestry stay as they are).

to use these units in meeting its Kyoto obligations. The government has the option of retaining these toward meeting its obligations, allocating some for free, and/or auctioning some and using the revenue to (for example) provide assistance to households or reduce taxes. Free allocation indefinitely is not recommended for economic efficiency², equity and administration reasons. No country is proposing to freely allocate all the units it receives.

6. The tables in Annex I show annual Crown revenue implications between 2013 and 2030 based on different post-Kyoto allowance allocations to New Zealand (AAUs), different average carbon prices, and the previous and current proposed phase-out of free allocation (i.e. the current proposal involves a five-year delay from previous proposal). We have then highlighted our **best guess** as to which assumptions may prove to be accurate in each of the different time periods. For example, we assume that carbon prices will trend up over time and New Zealand's emissions allowance will trend down over time. These highlighted numbers form our central projection of what a realistic scenario for government revenue could look like.
7. The main points to consider from this exercise are:
 - In the near term, relatively little revenue will be created. Our central projection indicates that government revenue may not go above \$500m per annum before 2022. If New Zealand's position in the international agreements is worse than predicted, or the carbon price is lower, revenue would be even less
 - This revenue would only represent between 0.06% to 0.14% of New Zealand's forecast nominal GDP in those years.
 - In some scenarios the Crown would lose revenue as a result of the ETS. For example if over 2013-2018 New Zealand's obligation is 15% less than our CP1 obligation and the price of carbon is \$50/tonne of CO₂-e the Crown would be freely allocating more units than it has received to the value of \$177m per annum.
 - In the longer term the Crown could be generating revenue of between \$2 to \$6 billion in 2030. However, even increased revenue of \$4b (as per our central projection) in 2030 is still likely to only be around 1% of GDP at that time. Currently total Crown revenue is around 34.4% of GDP.
 - Total revenue over the period 2013 to 2030 based on our central projection may approximate \$21b. This same analysis done based on the previous phase-out decision indicates that total revenues over the period would approximate \$34b. This implies that the five-year delay to the phase-out will cost the government, and benefit sectors by, \$13b in revenue.
 - It would seem that some submitters at select committee have based their revenue estimates on a high carbon price and New Zealand maintaining a high emissions allocation from international agreements. These assumptions are somewhat inconsistent. High prices will be driven by sharp cuts in emission allowances, most likely including New Zealand's emissions allowance. Thus while such scenarios are included in the attached tables it is unlikely that some of these will occur (for example a 5% reduction in New Zealand's international allocation and a \$100 carbon price).

² Assume efficient revenue recycling.

- Obviously policy changes would alter predicted revenues. Further slowing, or reducing altogether, the proposed phase-out of free allocation would reduce revenues. Alternatively, the government could reduce other taxes to offset the ETS-generated revenues, although this would be difficult to implement for small amounts of annual revenue.
- Estimates of carbon prices are inherently uncertain. The price of \$100 per tonne in 2030 is very loosely based on the IPCC 2007 Fourth Assessment Report. This report synthesised a number of the more recognised models, and provided an approximate price range for 2030 as depicted below.



World price of carbon (2030) (Source: IPCC)

The dashed vertical line represents the maximum concentration that would ensure greenhouse gases in the atmosphere remain below 535ppm. The prices to the left of this line represent the range of likely scenarios from various models. While it is impossible to accurately determine an average price, as many of the models use different assumptions around participation and rules, an average figure in 2030 is likely to be somewhere around US\$50/tonne. Based on the average NZD/USD exchange rate from the last ten years of \$0.59, this would equate to around NZ\$85. Based on this, the tables below use the figure of \$100 per tonne as an upper estimate.

Increased revenue to generators

Methodology for assessing increase in revenue for generators

8. The introduction of a price on carbon will have a beneficial effect on the revenue of renewable generators who do not face a corresponding increase in fuel costs. A forecast of future revenue for generators under various carbon scenarios can be readily calculated using standard electricity market models. However, quantifying how much of this revenue is a result of the carbon price, and how much is due to normal market and investment operations is much more difficult, as the use of different assumptions and different methodologies will give rise to quite different predictions of windfall gain. Data used in this analysis is from GEM model runs by the Electricity Commission.

9. The method adopted in this analysis is to define the windfall gain in revenue in terms of the difference in net revenue between a scenario with the carbon price included and a base case with no carbon price. That is:

$$\text{Windfall gain} = \text{Change in Revenue} - \text{Change in Costs}$$

where: Change in Revenue = Revenue (scenario - base case)

and: Change in Costs = Costs (scenario - base case)

10. A further assumption is that this calculation is made only for sunk assets that exist at the time of the introduction of the carbon price and that it persists only for the assets' economic life. Although, in this modelling exercise, as a result of a high \$100 carbon price, Huntly ceases production in 2017. New renewable generation built after the ETS is introduced is assumed not to earn a windfall gain as the economics of the investment decision will have been based on an electricity price path that includes the cost of carbon.

Results of revenue gain

11. Modelling of the expected gains in revenue for each scenario is shown in Annex II. The total expected revenue gain is sub-divided into the expected portion for the three SOE's and that attributed to the private sector – Trustpower and Contact Energy. Within these totals however, the majority of the gain accrues to the largely renewable generators: Meridian Energy, Trustpower and Mighty River Power. Generators with large thermal plants such as Genesis Energy and Contact Energy have predicted revenue³ drops in some years based on expected average wholesale price and carbon price.

Assessing increased profit and potential dividend to the government

12. Exactly how much of the expected change in revenue is reflected in generator company profits will depend in part on the hedge and contractual positions of these companies relative to their retail sales and commercial customer commitments. For example, a significant portion of Meridian's generation is dedicated to the Comalco contract. The extent to which Meridian can pass through carbon prices in the current Comalco contract (and thus benefit from any windfall gain) is unknown, and therefore the Comalco load has been excluded from this analysis. A similar argument could be applied to the aggregate of other large significant commercial contracts and generator hedge positions, but has not been applied in this analysis.
13. The portion of this additional revenue that is due to the government as tax or dividend from SOE's is equally difficult to assess, as this will depend in part on whether these companies choose to finance future investment from debt or partly from earnings. In particular, it should also be noted that SOE dividend policy is a decision for the board of each SOE. The SOEs may choose to retain these funds to invest in additional renewable generation in response to the ETS, thereby reducing the dividend return to government.
14. The second table in Annex II assumes that while the net revenue gained by SOEs is due to the government, only a portion of it will be returned as cash, either through dividends or tax because much of it will be used for other purposes instead of funding through debt. This portion is set conservatively in the tables below at 50%. For the private companies it is assumed 30% of this revenue gain will be available to the government through tax.

³ The values are changes in net revenue, not in net profit.

Conclusion

15. Any revenue that the Crown might receive as a result of the introduction of the ETS is highly uncertain due to a number of variables such as the price of carbon, New Zealand's future obligations, uptake of units, and SOE dividend decisions. However, officials have made a number of assumptions to calculate a number of possible revenue scenarios. The key points from these calculations are:
- based on forecasts for the first commitment period – which are subject to uncertainty – the government may not receive any significant surplus units from the ETS and is likely to be required to fund most or all of the cost of meeting New Zealand's Kyoto liability from general taxpayer revenue;
 - in the medium term, relatively little revenue will be created as officials' central projection indicates that government revenue may not go above \$500m per annum before 2022;
 - the introduction of a price of carbon will have a beneficial effect on the revenue of renewable generators who do not face a corresponding increase in fuel costs resulting in a possible increase in revenue of (for example) around \$140m in 2012 (assuming a \$25/t carbon price); and
 - how much of this increase in revenue will result in a subsequent increase in profit and then potentially increased SOE dividends or tax revenue to the Crown is difficult to determine. Assuming that 50% of any net revenue gained by SOEs is returned to the Crown as dividends or tax and 30% by private companies, the possible cash received by the Crown could be (for example) around \$60m in 2012 (assuming a \$25/t carbon price).

Key: Government's international target
 Scenario 1: 5% below 1990 levels of emissions
 Scenario 2: 15% below 1990 levels of emissions
 Scenario 3: 30% below 1990 levels of emissions

Annex I: ETS Government Revenue Implications – Sale of Units

Note that these tables represent an intuitive treatment of net revenues. This will not be the same as the accounting treatment that will be applied in the Budget documents.

Current Cabinet Position for Phase Out

Phase-out 2018-2030

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total (\$m)
Crown revenue if carbon price = \$30/tonne of CO₂e (million)																			
Scenario 1: CP1 less 5%	-\$106	-\$106	-\$106	-\$106	-\$106	-\$106	-\$106	-\$106	-\$106	-\$106	-\$106	-\$106	-\$106	-\$106	-\$106	-\$106	-\$106	-\$106	-\$1,287
Scenario 2: CP1 less 15%	-\$371	-\$371	-\$371	-\$371	-\$371	-\$371	-\$371	-\$371	-\$371	-\$371	-\$371	-\$371	-\$371	-\$371	-\$371	-\$371	-\$371	-\$371	-\$4,566
Scenario 3: CP1 less 30%																			
Crown revenue if carbon price = \$50/tonne of CO₂e (million)																			
Scenario 1: CP1 less 5%	\$265	\$265	\$265	\$265	\$265	\$265	\$265	\$265	\$265	\$265	\$265	\$265	\$265	\$265	\$265	\$265	\$265	\$265	\$3,285
Scenario 2: CP1 less 15%	-\$177	-\$177	-\$177	-\$177	-\$177	-\$177	-\$177	-\$177	-\$177	-\$177	-\$177	-\$177	-\$177	-\$177	-\$177	-\$177	-\$177	-\$177	-\$2,166
Scenario 3: CP1 less 30%	-\$619	-\$619	-\$619	-\$619	-\$619	-\$619	-\$619	-\$619	-\$619	-\$619	-\$619	-\$619	-\$619	-\$619	-\$619	-\$619	-\$619	-\$619	-\$7,500
Crown revenue if carbon price = \$100/tonne of CO₂e (million)																			
Scenario 1: CP1 less 5%	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$6,570
Scenario 2: CP1 less 15%	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$4,248
Scenario 3: CP1 less 30%	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$14,856
Central Revenue Projection																			
Scenario 1: CP1 less 5%	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$530	\$6,570
Scenario 2: CP1 less 15%	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$354	-\$4,248
Scenario 3: CP1 less 30%	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$1,237	-\$14,856
Total (\$m)																			

Position in Bill for Phase Out

Phase-out 2013-2025

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total (\$m)
Crown revenue if carbon price = \$30/tonne of CO₂e (million)														
Scenario 1: CP1 less 5%	-\$106	\$16	\$139	\$261	\$384	\$506	\$629	\$751	\$874	\$996	\$1,119	\$1,241	\$1,364	\$20,157
Scenario 2: CP1 less 15%	-\$371	-\$249	-\$126	-\$4	\$119	\$241	\$364	\$486	\$609	\$731	\$854	\$976	\$1,099	\$15,386
Scenario 3: CP1 less 30%														\$10,615
Crown revenue if carbon price = \$50/tonne of CO₂e (million)														
Scenario 1: CP1 less 5%	\$265	\$469	\$673	\$878	\$1,082	\$1,286	\$1,490	\$1,694	\$1,898	\$2,103	\$2,307	\$2,511	\$2,715	\$33,595
Scenario 2: CP1 less 15%	-\$177	\$27	\$232	\$436	\$640	\$844	\$1,048	\$1,252	\$1,456	\$1,660	\$1,864	\$2,068	\$2,272	\$25,644
Scenario 3: CP1 less 30%	-\$619	-\$414	-\$210	-\$6	\$198	\$402	\$607	\$811	\$1,015	\$1,219	\$1,423	\$1,627	\$1,832	\$17,692
Crown revenue if carbon price = \$100/tonne of CO₂e (million)														
Scenario 1: CP1 less 5%	\$530	\$938	\$1,347	\$1,755	\$2,163	\$2,572	\$2,980	\$3,388	\$3,797	\$4,205	\$4,613	\$5,022	\$5,430	\$67,190
Scenario 2: CP1 less 15%	-\$354	\$55	\$463	\$872	\$1,280	\$1,688	\$2,097	\$2,505	\$2,913	\$3,322	\$3,730	\$4,138	\$4,547	\$51,287
Scenario 3: CP1 less 30%	-\$1,237	-\$829	-\$420	-\$12	\$396	\$805	\$1,213	\$1,621	\$2,030	\$2,438	\$2,846	\$3,255	\$3,663	\$35,384
Central Revenue Projection														
Scenario 1: CP1 less 5%	\$530	\$938	\$1,347	\$1,755	\$2,163	\$2,572	\$2,980	\$3,388	\$3,797	\$4,205	\$4,613	\$5,022	\$5,430	\$67,190
Scenario 2: CP1 less 15%	-\$354	\$55	\$463	\$872	\$1,280	\$1,688	\$2,097	\$2,505	\$2,913	\$3,322	\$3,730	\$4,138	\$4,547	\$51,287
Scenario 3: CP1 less 30%	-\$1,237	-\$829	-\$420	-\$12	\$396	\$805	\$1,213	\$1,621	\$2,030	\$2,438	\$2,846	\$3,255	\$3,663	\$35,384

Annex II: ETS Generator Revenue Implications

Estimate of windfall gain in generator revenues (\$ millions)

\$25 carbon price	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
SOE portion	\$80	\$84	\$71	\$113	\$123	\$91	\$148	\$247	\$75	\$121	\$69	\$111	\$44	\$8
Private portion	\$65	\$68	\$57	\$88	\$122	\$83	\$108	\$161	\$43	\$73	\$45	\$73	\$18	-\$8
TOTAL	\$145	\$152	\$128	\$201	\$244	\$174	\$256	\$408	\$118	\$195	\$113	\$184	\$62	\$0

\$50 carbon price	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
SOE portion	\$203	\$202	\$209	\$266	\$196	\$163	\$207	\$239	\$162	\$210	\$170	\$212	\$151	\$120
Private portion	\$144	\$143	\$147	\$186	\$172	\$134	\$165	\$189	\$105	\$138	\$106	\$135	\$79	\$56
TOTAL	\$347	\$345	\$356	\$452	\$368	\$297	\$371	\$428	\$267	\$347	\$276	\$346	\$230	\$175

\$100 carbon price	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
SOE portion	\$305	\$287	\$320	\$394	\$361	\$307	\$384	\$445	\$260	\$279	\$220	\$262	\$203	\$153
Private portion	\$207	\$184	\$203	\$247	\$281	\$210	\$264	\$309	\$150	\$169	\$130	\$163	\$112	\$94
TOTAL	\$512	\$471	\$523	\$642	\$642	\$517	\$648	\$754	\$409	\$448	\$350	\$425	\$315	\$246

As the expected carbon price increases, the expected windfall gain in revenue also increases. However, at the same time the expected revenue loss for thermal generators also dramatically increases, and at \$100 /CO2 the model elects to discontinue coal generation in 2017.

Estimate of Government "gain" in revenue from ETS (\$ millions)

\$25 carbon price	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
SOE portion	\$40	\$42	\$36	\$56	\$61	\$45	\$74	\$123	\$38	\$61	\$34	\$56	\$22	\$4
Private portion	\$20	\$20	\$17	\$26	\$37	\$25	\$32	\$48	\$13	\$22	\$13	\$22	\$6	-\$2
TOTAL	\$60	\$62	\$53	\$83	\$98	\$70	\$106	\$172	\$50	\$83	\$48	\$78	\$27	\$1

\$50 carbon price	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
SOE portion	\$101	\$101	\$105	\$133	\$98	\$82	\$103	\$120	\$81	\$105	\$85	\$106	\$75	\$60
Private portion	\$43	\$43	\$44	\$56	\$52	\$40	\$49	\$57	\$32	\$41	\$32	\$40	\$24	\$17
TOTAL	\$145	\$144	\$149	\$189	\$150	\$122	\$153	\$176	\$112	\$146	\$117	\$146	\$99	\$77

\$100 carbon price	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
SOE portion	\$153	\$144	\$160	\$197	\$181	\$153	\$192	\$222	\$130	\$140	\$110	\$131	\$102	\$76
Private portion	\$62	\$55	\$61	\$74	\$84	\$63	\$79	\$93	\$45	\$51	\$39	\$49	\$34	\$28
TOTAL	\$215	\$199	\$221	\$271	\$265	\$216	\$271	\$315	\$175	\$190	\$149	\$180	\$135	\$105

Portion of revenue returned to shareholder	SOE	Private
Portion of revenue as tax	50%	30%

Appendix II: Commitment Period Reserve

1. Concerns have been raised by submitters on the ability of firms to sell units internationally. This is linked to New Zealand's obligation to maintain a Commitment Period Reserve (CPR) for CP1 under the Kyoto Protocol.
2. The CPR obligation requires New Zealand to hold in its Registry Kyoto units totalling no less than of 90% of its initial assigned amount (309.6 million units). If fewer than 278.6 Kyoto units are held in the Registry, no units can be transferred out of the Registry (i.e., sold overseas) until the CPR threshold is regained by purchasing Kyoto units. Note that any Kyoto units can be used to meet the CPR requirement; they do not have to be Assigned Amount Units (AAUs).
3. The operation of the CPR has the potential to create uncertainty and risk for New Zealand parties wishing to sell Kyoto units internationally. Risk of international delivery could reduce the market value of contracted units. Intermittent stops to trading could affect the operation of trading exchanges in New Zealand. In particular, some stakeholders have suggested that increased risks around the ability of landowners to sell their units internationally because of the CPR (associated with the deferral of liquid fossil fuels) could devalue their units.
4. The government is awarding Kyoto units to participants in Projects to Reduce Emissions, Negotiated Greenhouse Agreements, and the Permanent Forest Sinks Initiative. New Zealand firms will be receiving New Zealand Units (NZUs) through the free allocation mechanism for the forestry, industry and agriculture sectors, as well as for removals (e.g., post-1989 afforestation and embedded carbon in products). As part of maintaining international linkage to Kyoto markets, the NZ ETS enables participants to "swap" New Zealand Units (NZUs) for AAUs for the purpose of transfer overseas.
5. The potential for New Zealand to breach the CPR during CP1 will depend on the balance between international sales and acquisitions of Kyoto units. Once the Crown has allocated at least 30.96 million units, in the form of either Kyoto units or NZUs, it will start to face the risk of breaching the CPR. This risk will be reduced or avoided to the extent that:
 - recipients bank their units to cover their future liability or for future sale
 - recipients sell their units domestically rather than internationally
 - post-1989 forest landowners do not elect to receive afforestation credits and liabilities under the NZ ETS
 - New Zealand firms purchase Kyoto units from overseas
 - the Crown purchases imported Kyoto units or NZUs to cover the projected Kyoto deficit.
6. Once at least 30.96 million units have been allocated by the Crown into the marketplace, the risk of breach will continue until a compensating number of units has been surrendered to the Crown for compliance under the NZ ETS, or the Crown has purchased additional units (either domestically or internationally).
7. On the basis of the 2008 net position and the proposed ETS design, officials anticipate that starting in 2009 or 2010, a sufficient number of Kyoto units and NZUs may have been allocated into the marketplace to enable potential breach of the CPR. However, this risk is highly uncertain. Key drivers are as follows:

- In 2008, the Crown will start to allocate units to participants in PRE (approximately 1.4 million units per year), and will continue any allocations that result from NGAs.
 - In 2009, the Crown will allocate an estimated 17 million units¹ to owners of pre-1990 forests, and will start to award units for post-1989 afforestation under the NZ ETS and PFSI. A significant factor will be the extent to which post-1989 forest landowners take up afforestation credits, and when they claim those credits. For example, if we assume 50% uptake by landowners, then an average of about 8 million units per year could be given to landowners.
 - In 2010, the Crown will start to allocate an estimated 15 million units per year to industrial firms.
 - Although the Crown will start receiving surrendered units in April 2010 because of deforestation liabilities, the Crown will not receive significant numbers of surrendered units until April 2011, the first compliance date for stationary energy and industrial processes.
8. The risk of breaching the CPR (as well as the size of the Crown's Kyoto liability) is increased by the deferral of the liquid fossil fuels sector's entry into the NZ ETS until 2011. This sector would otherwise have started surrendering units to the Crown in April 2010. However, officials expect that points of obligation for stationary energy, industrial process emissions and liquid fossil fuels will commence purchasing units, both domestically and internationally, in advance of the requirement to surrender them under the NZ ETS. The government will also have to purchase additional units as a result of the liquid fossil fuel sector's deferral in order to meet its Kyoto commitments, and this requirement is not tied to ETS surrender dates. These factors will reduce the risk of breach.
9. The government can manage the risk of breach in two key ways. The first way is to reduce uncertainty in the market by keeping the market informed of the likelihood of breach.² The second way is for the government to purchase units, which is expected to be required because of the projected Kyoto deficit.³ to help ensure greater unit holdings in the Registry during the early years of the NZ ETS when the potential to breach the CPR is greatest. The government could also choose to purchase international Kyoto units on the spot market if the Registry's unit holdings approached a specified margin above the CPR.

¹ The total allocation for pre-1990 forests would be 21 million units in CP1, but an estimated 4 million units would be needed to cover exempt land under the ETS.

² Note that section 27 of the Climate Change Response Act already identifies Registry information accessible by search, and this list is amended by clause 25 of the Bill to extend to New Zealand Units.

³ As noted above in the discussion on revenue implications of the ETS, the government may need to purchase units to cover most or all of its Kyoto deficit, depending on a number of factors (including actual emissions, the uptake of post-1989 afforestation units, and the final allocation plan for the industrial sector).