



Ministry for the  
**Environment**  
 Manatū Mō Te Taiao

## Macro-economic impacts of different 2020 targets

<b>Date:</b>	15 July 2009	<b>MfE Priority:</b>	Non-urgent
<b>Security Level:</b>		<b>Number of Attachments:</b>	One
		<b>MfE Ref No:</b>	09-B- 01970

## Action Sought

	Action Sought	Deadline
Minister for Climate Change Issues Hon Dr Nick Smith	Direct officials of your preferences for the release of the attached report.	None
Associate Minister for Climate Change Issues (International Negotiations) Hon Tim Groser	None	None

## Ministry for the Environment Contacts [if required]

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## Background:

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The Ministry for the Environment recently commissioned consultancies Infometrics and NZIER to undertake Computable General Equilibrium (CGE) economic modelling of possible economic effects of different 2020 emissions reductions targets. The final report outlines the findings of that work and is attached to this briefing.

## Main findings of the report

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A number of different scenarios for a 2020 target were modelled, covering the effect of:

- Different AAU allocations;
- Different emission prices;
- How sensitive the New Zealand economy is to restrictions on purchasing credits internationally; and
- How action by the rest of the world to reduce emissions could reduce the economic cost to New Zealand of meeting the target.

A substantial part of New Zealand's target under all scenarios is likely to be met through the purchase of emission permits internationally (see below). This reduces the ability of New Zealanders to spend their income on other activities but does not directly affect GDP. For this reason Real Gross National Disposable Income (RGNDI) is considered a better measure of the economic impacts of different target scenarios, and the results are reported below accordingly.

Results are for the economy as a whole and the modelling has not examined the impact on particular sectors. However, no major impacts on particular sectors are expected as a direct result of the target if it is assumed that domestic policy remains unchanged. If domestic policies change, for instance in response to a more stringent target, or if there are changes to international rules and these are reflected in domestic policies, some sectors will be more greatly affected than others.

### *Impact of different AAU allocations*

Table 1, below, summarises the modelled impact on RGNDI of different 2020 targets at different emissions prices. Under a scenario of no international agreement to reduce emissions and no domestic policies, RGNDI per capita is projected to grow from around \$38,500 currently to \$49,000 in 2020. This growth is reduced under a 2020 emissions reduction target, with bigger growth reductions for more ambitious targets.

**Table 1: Macro-economic impacts of different targets in 2020**

Scenario	World Price	RGNDI \$ per capita	
		Infometrics	NZIER
Company			
BAU in 2009	N/A	38,500	38,500
BAU in 2020	N/A	49,000	49,000
+15% AAUs on 1990 in 2020	\$25	48,800	48,700
+15% AAUs on 1990 in 2020	\$100	48,500	48,200
1990 level of AAUs in 2020	\$25	48,700	48,700
1990 level of AAUs in 2020	\$100	48,100	47,900
-15% AAUs on 1990 in 2020	\$25	48,700	48,600
-15% AAUs on 1990 in 2020	\$100	47,800	47,500
-15% AAUs on 1990 in 2020	\$200	47,300	46,900
-40% AAUs on 1990 in 2020	\$200	46,200	45,800

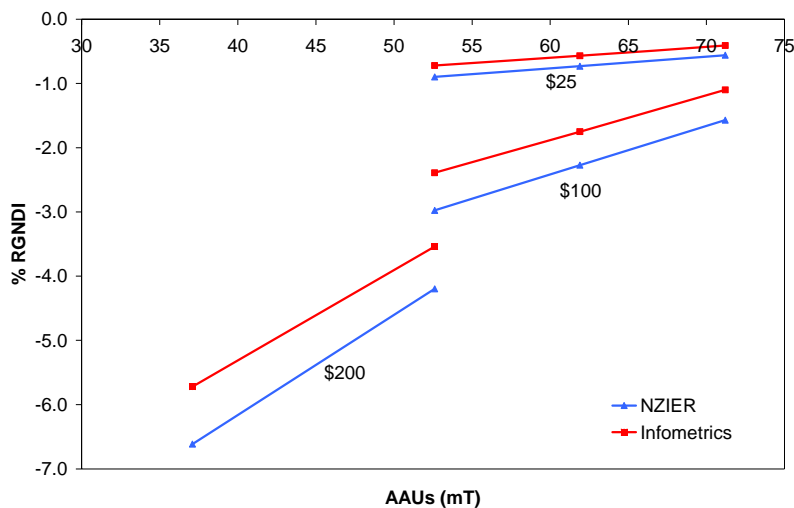
*Impact of different emission prices*

Table 1 shows that higher world emission prices result in larger economic impacts of meeting any given 2020 target. Under all scenarios modelled New Zealand meets a substantial proportion of its target by purchasing emission units internationally, due to the relatively high cost of reducing emissions domestically. Because of this, the existence of efficient and deep carbon markets will help minimise the economic costs to New Zealand of meeting its target.

Figure 1 below summarises how different AAU allocations (horizontal axis) and emissions prices impact on RGNDI in 2020 (vertical axis). It shows that the New Zealand economy is more sensitive to changes in world emission prices than changes in AAU allocations. The world emissions price is outside of New Zealand's control. Future estimates vary greatly, but in most discussions by the IPCC prices tend not to significantly exceed \$US100<sup>1</sup>.

**Figure 1 Impact of AAU allocation**

Percentage change in RGNDI versus BAU



Source: NZIER, Infometrics

*Rest of the world action*

The results in Table 1 assume no action to reduce emissions by the rest of the world. Separate scenarios were modelled to estimate the economic impact if our international competitors take on emission reduction targets and these are reflected in emissions prices in those countries. Export and import-competing firms are no longer at a disadvantage if this occurs and the economic effects of a given target are not as large. The modelling shows that for low emissions prices (about \$25) action by the rest of the world reduces the economic impact by about a third, and at higher emissions prices (about \$100) it is reduced by about a half.

This demonstrates that action by the rest of the world can offset the economic impacts of more stringent allocations of AAUs. Therefore for greater participation by the rest of the world New Zealand can take on a more stringent target at the same cost as for less stringent targets when there is less participation by the rest of the world.

<sup>1</sup> In 2020-2030, we have inferred from IPCC models that prices for the median scenarios are US\$45 and US\$100 for low (~550 ppm CO<sub>2</sub>-e) and high (~450 ppm CO<sub>2</sub>-e) global ambition respectively. The Australian Treasury uses prices of US\$30 and US\$53 for low and high ambition respectively.

*Access to global carbon markets*

During the international negotiations some developing country Parties have proposed limits on the ability of countries to meet their targets by purchasing units internationally. Under most scenarios modelled free access to international carbon markets was assumed, and New Zealand meets a substantial part of its target by purchasing units internationally.

To get an indication of the economic impact of such restrictions, a scenario of no access to international carbon markets was modelled (i.e. all reductions under the target are domestic). Summary results are presented in Table 2 below.

**Table 2: Economic impact of access to international carbon markets for meeting a 2020 emissions target (return to 1990 emission levels).**

Scenario	RGNDI per capita in 2020		Difference with BAU	
	Infometrics	NZIER	Infometrics	NZIER
No international trading	\$47,900	\$47,400	-2.2%	-3.3%
International trading with world emissions price of \$25	\$48,700	\$48,700	-0.6%	-0.7%
International trading with world emissions price of \$100	\$48,100	\$47,900	-1.8%	-2.3%

While a complete ban on the purchase of units internationally is unlikely, these results highlight that unimpeded access to international carbon markets is important for New Zealand to reduce the economic costs of meeting a 2020 target.

### **Implications for a 2020 target**

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Based upon the above, officials consider that the following general conclusions on the impacts of a 2020 emissions target can be drawn from the modelling:

#### *Target stringency*

- Under all target scenarios the economy is expected to grow between now and 2020
- The reduction in this growth due to emission reduction targets is relatively small in comparison to the overall levels of growth
- However the reductions are noticeable and more stringent targets and higher world prices result in greater per capita reductions in disposable income.

#### *Rest of the world action*

- Greater action by the rest of the world to reduce emissions is expected to result in a reduced economic impact on New Zealand to meet its target
- At low emissions prices action by the rest of the world reduces the economic impact on New Zealand by around a third, and at higher prices it is reduced by up to a half
- Therefore, for any given cost on the economy, greater levels of participation by the rest of the world allows New Zealand to take on a more stringent target without increasing the economic costs.

#### *Access to global carbon markets*

- Under all scenarios with international trading in emission units, New Zealand expects to meet a substantial proportion of its target by purchasing units internationally, reflecting the relatively high cost of reducing emissions domestically compared to reducing emissions internationally
- Restrictions on access to international carbon markets will increase the cost to New Zealand of meeting a target.

## Next Steps

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There is already an Official Information Act request seeking advice on the likely economic costs of different 2020 targets and more are expected. We seek your direction as to when this report should be released. One possible approach would be to release the report following the announcement of New Zealand's target.

## Recommended Action

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### We recommend that you:

(a) **Direct** officials of your preferences for releasing the attached report:

**EITHER**

- As soon as practically possible;

**Yes / No**

**OR**

- Following the announcement of New Zealand's 2020 emission reduction target;

**Yes / No**

**OR**

- Not in the near future

**Yes / No**

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**Minister for Climate Change Issues**

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