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# H New Zealand's electricity generation sector

The Commission has identified only one significant emissions-reduction policy that applies in the New Zealand electricity generation sector: the New Zealand Emissions Trading Scheme (ETS). Because the scheme has only applied to electricity since 2010, no data were available to estimate the total subsidy equivalent or electricity sector abatement. Instead, the Commission has carried out a qualitative assessment of the ETS, and drawn on other studies to reach some conclusions about its possible effects on emissions.

## H.1 The New Zealand ETS

Under the United Nations' Framework Convention on Climate Change, New Zealand has committed to maintain its average greenhouse gas emissions at 1990 levels over the period 2008–2012. After 2012, New Zealand has committed to reduce its emissions by 10–20 per cent by 2020, conditional on the actions of other countries. As part of its efforts to achieve these targets, New Zealand has had an ETS since 2008. Entities with ETS obligations are required to surrender one New Zealand Unit (NZU) per tonne of CO<sub>2</sub> (although under transitional arrangements currently in place, firms in most covered sectors only have to surrender one permit per two tonnes). Alternatively, they can surrender certain types of Kyoto Protocol emissions-reduction units purchased on international markets. Specifically, entities can meet their New Zealand ETS obligations with Certified Emissions Reductions (CERs) created through the Clean Development Mechanism, Removal Units and Emission Reduction Units.

Initially, the ETS applied only to the forestry sector. Owners of forests planted after 1989 can opt into the ETS and earn NZUs for carbon sequestered in the process of forest growth. Owners of forests also have to pay penalties or surrender NZUs if they deforest or harvest their forests. Stationary energy (including electricity), liquid fossil fuels and some industrial processes were added to the scheme in 2010. The agriculture sector (the source of around 50 per cent of New Zealand's emissions) is currently scheduled to be added in 2015.

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Permits have been allocated to activities that are emissions-intensive and trade-exposed, with the objective being to ‘prevent a loss of competitiveness and carbon leakage’(Ministry for the Environment (NZ) 2011, p. 12). In addition, permits have been allocated to the fishing industry to compensate for the loss of value of fishing quotas, and to the owners of forests planted before 1990 (to compensate for the loss of land values). These permits can be sold on secondary markets.

The ETS incorporates a transition phase from 1 July 2010 to 31 December 2012. During this period, entities can opt to pay NZ\$25 (around A\$19) to the New Zealand Government rather than surrendering a permit. This effectively places a cap on NZU prices. Furthermore, entities in the stationary energy, liquid fossil fuel, and industrial processes sectors are obliged to surrender only one permit for every two tonnes of emissions, so the real price of emissions is currently capped at NZ\$12.50/t CO<sub>2</sub> (around A\$10).

During the transitional phase, the New Zealand Government will meet the costs of any additional emissions reductions necessary to meet New Zealand’s international obligations for emissions reductions. The cap on the NZU price is due to run until the end of 2012. The ETS is currently under review, and the Review Panel will examine whether existing transitional arrangements should be extended beyond 2012, taking into account a range of factors including the action taken by other countries.

## **Estimating the subsidy equivalent**

As is the case for the European Union ETS, the New Zealand ETS provides an implicit subsidy to lower-emissions generators, with the value of the implicit abatement subsidy per tonne of CO<sub>2</sub> being equal to the permit price. In the initial months after the introduction of the New Zealand ETS, the volume of trade in NZUs was light. Trade in permits spiked in March 2011 as a result of the Fukushima nuclear accident in Japan (Point Carbon 2011b). In response to the accident, the German Government shut down seven nuclear power plants for three months. This was expected to lead to increased use of fossil fuels in Germany’s electricity generation sector, which in turn increased the demand for CERs (CERs had been widely used by New Zealand firms to meet their ETS obligations). The increased demand for CERs meant that many New Zealand entities that had previously purchased CERs to meet their New Zealand ETS obligations (because the price of CERs was below the NZ\$25 (A\$19) price firms could pay to the Government instead of purchasing permits) found it profitable to sell their CERs

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and purchase NZUs (which were now priced below the CER price). This led to an increase in the demand for, and price of, NZUs.

Data from Point Carbon (2011a, 2011b, 2011c) suggest that in early 2011 spot prices for NZUs have been in the range of NZ\$19 to NZ\$21 (around A\$14–16). Hence, the NZU price cap of NZ\$25 (A\$19) has not been binding over this period. However, since emitters are currently required to surrender only one NZU per two tonnes of emissions, the implicit abatement subsidy is effectively half of the price (around A\$7–8/t CO<sub>2</sub>).

### **Estimating ETS-induced abatement**

In order to assess the level of abatement attributable to the ETS, it is necessary to estimate the extent of fuel switching. This will be influenced by the structure of New Zealand's electricity generation sector. In 2010, around 74 per cent of electricity in New Zealand was generated using renewable energy, with the majority of that being hydro (around 56 per cent of total generation). Geothermal power accounts for around 13 per cent of total generation, and wind for around 4 per cent. Coal accounted for around 5 per cent of total generation, and gas 21 per cent (MED (NZ) 2011a).

Given the existing high use of renewables, New Zealand's electricity generation sector has relatively few opportunities to reduce emissions through fuel switching in the short term (New Zealand Government 2007). The Ministry of Economic Development (MED) has carried out modelling of the New Zealand electricity sector to analyse the effects of the ETS. The modelling does not provide results that could be used to estimate a subsidy equivalent or electricity generation sector abatement arising from the New Zealand ETS today, but does give an indication of the possible effects of the scheme on the fuel mix in New Zealand over the longer term.

The MED has forecast that by 2030, electricity sector emissions will return to around 1990 levels (after peaking in 2006). The reduction in emissions is forecast to come from a reduction in the use of coal — the MED has forecast that New Zealand's only coal-fired power plant will be phased out over time (with operations to cease by around 2021), and no new coal-fired plant will be built. It has also forecast that two gas-fired plants will close, but will be replaced by new gas plants, leading to no net change in gas-fired generation capacity. (While the MED does not speculate on the efficiency of the new plants, it is possible that the ETS could provide an incentive for the owners to build plants with lower emissions

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intensity, leading to some abatement.) Growth in electricity demand is forecast to be met by an increase in the use of geothermal, hydro and wind power.

Given the relatively low price of NZUs, and the high level of renewables in the New Zealand electricity generation mix, the New Zealand ETS is probably not currently leading to much abatement in the electricity generation sector. This could change over time. The implicit abatement subsidy under the New Zealand ETS is simply equal to the permit price of around NZ\$10/t CO<sub>2</sub> (A\$8).

#### *Other potential sources of abatement under the New Zealand ETS*

While New Zealand appears to have relatively few options for reducing its emissions from the electricity generation sector, the inclusion of forestry in the scheme is one mechanism that New Zealand can use to achieve abatement. The Ministry for the Environment (NZME 2011b) has published a forecast of New Zealand's greenhouse gas emissions to 2050. It appears that afforestation (tree planting) will be responsible for a significant proportion of New Zealand's greenhouse gas emissions reduction in that period. However, it should be noted that abatement through tree planting is cyclical, and emissions associated with harvesting will be incurred in the longer term. International instruments (such as CERs) could also play a significant role in meeting emissions targets.