New Zealand

The World's Carbon Markets: A Case Study Guide to Emissions Trading

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Brief History and Key Dates:

The New Zealand Emissions Trading System (NZ ETS) was developed to fulfill the requirements of the Climate Change Response Act (2002). It was legislated and came into force in September, 2008, and was further amended in November 2009. Obligations for the forestry sector took effect retrospectively as of January 1st, 2008.[1, 2] It is a national level system that gradually phases in covered sectors from 2008 to 2015. It is the only ETS in the world that includes emissions liabilities for land-use sectors: deforestation of pre-1990 forest land (as of 2008) and biological emissions from agriculture (as of 2015 as previously legislated; however, in 2012 the government has passed an amendment to defer this pending a review in 2015).[3]

Summary of Key Policy Features:

CAP/TARGET: The primary purpose of the NZ ETS is to assist the country to meet its international obligations under the Convention and the Kyoto Protocol and to reduce New Zealand's net emissions below business-as-usual (BAU). Under the ***Kyoto Protocol's first commitment period*** (2008-2012), New Zealand has committed to reduce its annual average GHG emissions to 1990 levels (61.9 $MtCO_2e$/yr excluding emissions from Land Use, Land Use Change, and Forestry, or LULUCF)[4] or to take responsibility for the excess.[5] New Zealand plans to achieve its Kyoto commitment via emissions reductions, increased carbon sinks from LULUCF, and participation in the international carbon market for Kyoto units. In 2011, the country emitted 72.8 $MtCO_2e$ (excluding LULUCF) and stored 13.5 $MtCO_2e$ in forests; so, according to Point Carbon (2013), "New Zealand estimates it will emit 29.6 million tons of CO_2e less over the five years than the U.N. treaty allows".[6] The NZ ETS uses New Zealand Units (NZUs) as permits that may be traded domestically by regulated entities, or that may be exchanged for Kyoto Assigned Amount Units for international trading. One NZU equals one metric ton of CO_2e emitted in the atmosphere. The Ministry of the Environment (MfE) estimates that the ETS could achieve 19 $MtCO_2e$ of non-LULUCF emissions reductions over 2010-12, and, when adding carbon sequestration from forest plantings to this number, New Zealand is set to readily achieve its Kyoto target,[7] as evidenced by its February 2013 net position of 35.2 million (see "Unique Aspects" section for a description of 'net position').[8] New Zealand also signed the Copenhagen Accord, in which it pledged a ***conditional emissions target range of 10 to 20 per cent below 1990 levels by 2020. However, in August 2013, Climate Change Minister Tim Grosser announced that it would adopt a 5% reduction target below 1990 levels by 2020***.[9] The country's long-term target is a ***50% emissions reduction below 1990 levels by 2050***. The ETS will undergo a statutory review in each commitment period or every five years if there are no subsequent commitment periods. The first review was completed in June 2011.[10]

SCOPE/COVERAGE: The NZ ETS was designed to cover six ***gases*** (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) and to regulate nearly 100% of national GHG emissions once all sectors are brought in.[11] With the 2012 amendment,

however, the government exempted synthetic GHGs (HFCs and PFCs) contained in imported motor vehicles and other goods; they will be covered by a levy instead.[12] Emissions are categorized into seven ***sectors*** whose unit surrender obligations begin in various years ('phase in') from 2008 to 2015: forestry (1 January 2008); stationary energy (1 July 2010); liquid fossil fuels (1 July 2010); industrial processes (1 July 2010); waste (1 January 2013); specified synthetic greenhouse gases (2013); and agriculture (1 January 2015 as previously legislated; this has been deferred indefinitely pending a 2015 review under the 2012 amendment).[13] This ***phasing in*** process enabled the ETS to start immediately with the forestry sector, remedying a perverse incentive to bring forward deforestation while creating a further incentive for new afforestation. Other sectors could then take more time to prepare for obligations.[14] In the case of the agriculture sector, the government's 2012 amendment has deferred obligations pending a review in 2015 to determine whether there are technologies available to reduce these emissions, and whether international competitors are taking sufficient action on their emissions in general.[15]

Participation in the ETS is compulsory for individual ***installations*** that exceed sector-specific ***emissions thresholds***. As currently legislated in the forestry sector, for example, forest managers must participate if they deforest more than two hectares of non-exempt, pre-1990 forest land between 2008 and 2012 (explained further below). By contrast, liquid fossil fuel refiners must participate if the total amount of fuel refined exceeds 50,000 liters.[16]

The NZ ETS ***point of obligation*** is aimed as far ***upstream*** as possible in the supply chain of a good or service to enable coverage of the final emissions without necessarily setting the point of obligation at the actual point of emissions.[17] For ***each sector***, the source of the emissions supply and, thus, the point of obligation differs. As Table 1 shows, the points of obligation in the forestry (landowners and forestry rights holders), industrial (manufacturers), agricultural (nitrogen fertilizer suppliers and meat and dairy processors, unless changed to a farmer-level obligation by Order in Council), waste (landfill operators) stationary energy (coal, gas, and geothermal suppliers), and liquid fossil fuel (fuel suppliers) sectors are upstream. Note that large purchasers of coal, natural gas, and liquid fossil fuels can opt in as direct points of obligation. However, the ***point of allocation differs from the point of obligation*** in the stationary energy and liquid fossil fuels sectors because fuel producers from these sectors were expected to pass along the costs (see "Allowance Distribution" section).

Sector	Point of Obligation
Forestry	Landowners and forestry rights holders
Fossil fuels and transport	Fuel suppliers
Stationary energy	Coal, gas, and geothermal suppliers
Industrial	Manufacturers
Agriculture	Nitrogen fertilizer suppliers and meat and dairy processors
Waste	Landfill operators

Table 1: NZ ETS Point of Obligation for Capped Sectors[18]

THE FORESTRY SECTOR: The NZ ETS ***defines 'forest land'*** as an area at least one hectare in size that contains forest species and has, or is likely to have, trees covering 30% of each hectare. If the width of the land area is less than 30 meters, that area cannot qualify as a forest. There are two systems for calculating the amount of carbon contained by these forests: (1) forests less than 100 hectares use standard "look-up tables," and (2) forests greater than 100 hectares use the "field measurement approach."[19]

The NZ ETS classifies forests that were established after December 31 1989 differently from those that were established on or prior to that date. Post-1989 land rights holders have the option to voluntarily participate and earn units for sequestration in return for assuming liabilities for future reversals. On the other hand, people with rights to pre-1990 forests incur mandatory obligations for emissions if they deforest their land, which requires coverage with

emissions permits. Two main types of lands qualify as ***post-1989 forest land***: (1) forest that was established on unforested land after December 31 1989, and (2) land that was forest land on December 31, 1989, but was subsequently deforested between January 1 1990 and December 31 2007.[20] People or communities with rights to post-1989 land may voluntarily join the ETS and earn NZUs as their forests grow. If their credited forest stock falls due to harvests or either intentional or unintentional occurrences, participants must surrender permits. As long as forest land was registered prior to December 31 2012, participants could receive NZUs for carbon stock changes for the entire first Kyoto commitment period (2008-2012). People with rights to post-1989 forest land must submit emissions returns every five years, beginning January 1st 2008, but may choose to make more frequent submissions. As an alternative to joining the NZ ETS, however, people with rights to post-1989 forest land may join the Permanent Forest Sink Initiative (PFSI), which enables landowners to receive Kyoto compliant AAUs for forest sequestration in return for a covenant on future land use. The NZ government is responsible for how emissions from post-1989 forest lands that are neither part of the NZ ETS nor PFSI impact the country's carbon budget.[21]

Pre-1990 forest land refers to areas that were forested on December 31 1989 and remained intact through December 2007. The NZ ETS requires people with rights to pre-1990 forest land to surrender permits if their land is deforested. Deforestation is defined as the clearance of at least two hectares of forest land within a five-year commitment period, and the subsequent (1) change in land use away from forest or (2) failure of forest species to reach specified thresholds. Unlike people with rights to post-1989 forest land, however, those with rights to of pre-1990 land do not receive NZUs as their forests grow. Instead, each land rights holder may receive a one-off free allocation of NZUs. Rights holders of forests bought prior to November 1 2002 receive 60 NZUs per hectare (23 prior to December 31 2012 and 37 after). Rights holders of forest land acquired between November 1 2002 and January 1 2008 receive 39 NZUs per hectare (15 before December 31 2012 and 24 after). Rights holders of forest land purchased after January 1 2008 receive 18 NZUs per hectare (7 before December 31 2012 and 11 after). Old growth indigenous forest is not included as pre-1990 land because it was already illegal to deforest this land, so it is not subject to NZ ETS rules. Forest lands of fewer than 50 hectares are also exempt from the ETS, as are lands with specified tree weeds.[22]

The government's 2012 NZ ETS amendment enables pre-1990 forest land owners to participate in an offsetting mechanism that allows them to convert forest land without deforestation liabilities as long as new forest is established elsewhere.[23]

ALLOWANCE DISTRIBUTION: With the exception of some transitional provisions for early entrants, allowance ***compliance periods*** last one year, and allocations are made for the next year based on emissions and output data for the previous year. A reconciliation mechanism, or 'true up,' corrects for errors in allocation later in the present year once valid data from the previous year is available.[24] Through 2012, allowances have been distributed via ***free allocations***. No ***auctioning*** has happened to date, but the government has proposed to introduce auctioning starting in 2013.[25] A 2012 amendment introduced a power to allow the New Zealand government to increase NZU supply via auctions and within an overall cap on the number of NZUs auctioned and allocated.[26] The following ***sectors*** can receive freely allocated allowances: forestry, agriculture, industrial activity, and fishing. There are two purposes for these freely allocated allowances: (1) compensation for the effect of the ETS on asset values in the fishing and forestry sectors, and (2) prevention of ETS-driven loss of competitiveness and carbon leakage in the industrial and agricultural sectors.[27] Allocation in the industrial and agricultural sectors is intensity-based, meaning that it can increase as production increases and no absolute emissions limits apply to allocation to those sectors.[28] See Table 2 for sector-specific allocation detail.

The sectors that do not receive freely allocated allowances are stationary energy supply, waste, liquid fossil fuels supply, and synthetic GHGs. Free allocation was not provided to the upstream points of obligation in the stationary energy[29] and liquid fossil fuels[30] sectors because these producers were expected to pass on the costs. Likewise,

electricity generators were not allocated free units. Many are government-owned and because the electricity sector is deregulated they were all expected to pass costs on directly.[31]

Sector	Reason for Free Allocation	Free Allocation Provision
Forestry	Asset Value Compensation	Explained earlier when describing the forestry sector.
Fishing	Asset Value Compensation	The total amount of emissions units to be allocated to fishing quota owners is 700,000 NZUs. Each eligible person receives allowances based on a formula.[32]
Industrial	EITE/Carbon Leakage	90% free allocation for highly emissions intensive activities (>1,600 tCO_2e per NZD$1 million) and 60% free allocation for moderately emissions intensive activities (>800 tCO_2e per NZD$1 million). Free allocations are set to decline by 1.3%/yr starting in 2013.[33, 34]
Agriculture	EITE/Carbon Leakage	All agricultural activities facing ETS obligations are eligible for free allocation. When (and if) the agricultural sector enters the ETS, land owners are set to receive allowances covering 90% of an emissions baseline which will be established by regulation. Free allocations are set to decline by 1.3%/yr starting in the year after entry.[35]

Table 2: Sector-Specific Summary of NZ ETS Free Allowance Allocation Provisions

FLEXIBILITY PROVISIONS: Participants can meet their NZ ETS obligations with NZUs or with eligible ***Kyoto-compliant emission reduction units*** purchased abroad. These may include approved Removal Units (RMUs), Emissions Reduction Units (ERUs), or Certified Emission Reductions (CERs). ERUs and CERs from nuclear projects are excluded.[36] In 2011, CERs from HFC-23 and N_2O industrial gas destruction became ineligible.[37] In December 2012, ERUs generated in Eastern Europe from projects destroying HFC-23 and N_2O from adipic acid plants became ineligible.[38] New Zealand has not signed up to the second commitment period of the Kyoto Protocol, and therefore from 2015 onwards New Zealand firms will not be able to use CERs and ERUs for compliance. [39] There is no limitation on ***trading*** domestic or approved international units, nor are there quantitative limits for ***banking*** or ***offsets***.[40] During the first commitment period of the Kyoto Protocol, New Zealand must adhere to the Commitment Period Reserve (CPR) requirement to maintain 90 percent of its assigned amount in its registry.[41] The ETS does not permit ***borrowing*** from future allocations[42]; however, because of the relative timing of surrender obligations and free allocation, participants can surrender units freely allocated in a given year to cover obligations from a previous year. The domestic market is open to potential ***linkages*** with international markets. According to Aldy and Stavins (2012), some elements of the NZ ETS, such as allowance allocation, were crafted in order to facilitate linkage with Australia. Discussion about establishing a two-way linkage with the Australian ETS began officially in 2011.[43] According to OECD/IEA (2010), however, an element that could affect its direct linkage with foreign carbon markets is the NZ ETS "inclusion of sectors (agriculture, forestry) other schemes may not wish to include."[44] Further, according to Thomson Reuters Point Carbon (December, 2012), "experts say New Zealand must make a number of significant amendments to its CO_2 scheme before it can link to the common Australia-EU market, such as setting a total cap on emissions for companies and introducing a ceiling on the use of U.N. offsets."[45] Indirect linkage, on the other hand, between New Zealand and the EU ETS already exists because both systems allow overlapping international offsets, such as credits from the Clean Development Mechanism (CDM) of the Kyoto Protocol.[46] Because of the small relative size of the NZ ETS, it is effectively a "price taker" on the market for international credits. International trading imposes a price ceiling on the NZ ETS as New Zealand's entities have no incentive to pay more domestically for a credit than the price obtainable on the international market.

COST CONTAINMENT AND VOLATILITY MANAGEMENT: The NZ ETS ***"transitional period"*** was initially designed to span January 1st 2010-December 31st 2012, and has been extended until at least 2015 as part of the 2012 *Climate Change Response (Emissions Trading and Other Matters) Amendment Act*.[47] During this period, covered entities from the stationary energy, liquid fossil fuels, and industrial processes sectors are privileged to surrender one NZU for every two tons emitted; the price of allowances is fixed at NZD $25 per NZU; and the export of allowances from sectors other than forestry is prohibited.[48] To reduce volatility and improve stability, a five-year notice is required to precede any significant changes to the program.[49]

COMPETITIVENESS AND ANTI-LEAKAGE PROVISIONS: One purpose of free ***intensity-based allocations*** of NZUs is to protect firms at risk of losing competitive leverage, creating incentives for shifting production and associated emissions to other countries (i.e. "carbon leakage"). All agricultural and some industrial activities are considered ***energy intensive trade exposed (EITE)***, and, for these activities, energy intensity determines allocation.[50] See the "Allowance Distribution" section for more detail.

MARKET REGULATION AND OVERSIGHT: Verified annual self-reporting is required for covered sectors, and, for forestry, there is an option for voluntary quarterly reporting. Installations that fail to meet their obligations are ***fined NZD $30-60/$tCO_2e$***, in addition to being forced to surrender units. A ***NZD $24,000 fine*** will face regulated entities that fail to: collect emissions data or other required information; submit emissions returns when required; calculate emissions and/or removals; register as a participant when liable; keep records; or notify the administering agency or provide information when required to do so. A ***NZD $50,000 fine*** will be levied against entities that knowingly alter, falsify, or provide incomplete or misleading information about NZ ETS obligations. Entities that deliberately lie about obligations for monetary gain are subject to a ***NZD $50,000 fine*** and/or ***prison sentence*** of up to five years.[51]

As part of the Climate Change Response Act of 2002, the NZ ETS is subject to ***independent review panel every commitment period or five years***. The first such panel occurred in 2011, and one of its suggestions was that "the agricultural sector face a lower price as it enters the system and that the government review the wisdom of allowing offsets from HFC-23 destruction projects under Clean Development Mechanism."[52]

For the NZ ETS, the Ministry of Economic Development is in charge of ***market oversight***, the New Zealand Emissions Unit Register, or the Registrar, manages the ***registry***, and the Environmental Protection Authority enforces the program's rules and is in charge of ***monitoring, reporting, and verification***.[53]

COMPLEMENTARY POLICIES: Energy efficiency measures and agricultural research endeavors compliment the NZ ETS as contributors to the country's GHG emissions reductions. The Energy Efficiency and Conservation Strategy aims to improve ***energy efficiency*** and conservation, as well as increase economy-wide ***renewable energy*** use. The country's 2025 target is for 90% of energy generation to derive from renewable sources.[54]

ECONOMIC PROJECTIONS: A 2011 study by NZIER and Infometrics finds that the ETS will cost between 0.1 and 1.0% of ***GDP*** in 2020.[55] In aggregate, the estimated cost to the ***average household*** of projected 2010-12 emissions reductions is NZD $165/year.[56] General equilibrium model projections, which use prices that range from NZD $25/$tCO_2e$ to NZD $100/$tCO_2e$, indicate that, through 2025, New Zealand's GDP is expected to grow 46% under BAU, 44% if the allowance price is NZD $25/$tCO_2e$, and 40% if the price is NZD $100/$tCO_2e$.[57]

RESULTS: For the period 2008-2011, the ETS contributed to ***increasing yearly afforestation***, and cumulative ***new plantings*** spanning 12,000 hectares by 2011.[58] According to Aldy and Stavins (2012), "early evidence suggests that the forestry component has deterred deforestation, although international policy and consequent price uncertainty are major problems for investment."[59] However, the amount of afforestation has not yet balanced the amount of deforestation that occurred prior to 2008 by forest owners seeking to avoid obligations, and thus the

overall environmental impact of the forest provisions are still questionable.[60] Nevertheless, according to a 2011 analysis by Eric Karpas and Suzi Kerr[61]:

> "The forestry ETS is working relatively smoothly from an administrative point of view and a reasonable number of participants have already registered. The inclusion of forestry in New Zealand's ETS has reduced deforestation and changed thinking about management and new planting, but with only limited observable change to behavior so far. The markets in which units are sold are evolving slowly and linking in predictable ways to international markets… If long term carbon prices become firmer, through either an extended or a new international agreement or a linkage to a larger market such as the European Union ETS, foresters are poised to respond on a large scale."

The ETS has also contributed to a 12-year high in ***renewable energy generation***. In 2010-11 there was a five-fold increase in renewable energy capacity consented, as compared to pre-ETS levels.[62]

While the NZ ETS is still in its transitional phase, in which the price of carbon is capped at NZD $25 for every second ton of CO_2e emitted for the stationary energy, liquid fossil fuels and industrial sectors, covered emitters are allowed to buy unlimited quantities of ***international offsets***, which have had prices of under NZD $5/t$CO_2e$ recently. As a result, New Zealand's major emitters met over 70% of 2011 ETS obligations by using international offsets.[63] Hence, international linking has worked to benefit those with emissions obligations but not those with units to sell from free allocation or afforestation.

What Distinguishes This Policy?

CHALLENGES:

1. Options for ***reducing biological agricultural emissions*** are limited relative to emissions reduction options in other sectors, and about 50% of New Zealand's emissions derive from agriculture. See Figure 1.[64]
2. Forestry emissions removals are essential for New Zealand to meet international obligations. Because the majority of carbon stored in trees is emitted to the atmosphere when trees are harvested, ***forestry emissions are cyclical***. Consequently, New Zealand's emissions are cyclical (Figure 2).[65]
3. New Zealand already generates a relatively large portion of its ***energy*** from renewable sources, so, in the energy sector, other countries have more abatement options than New Zealand.[66]

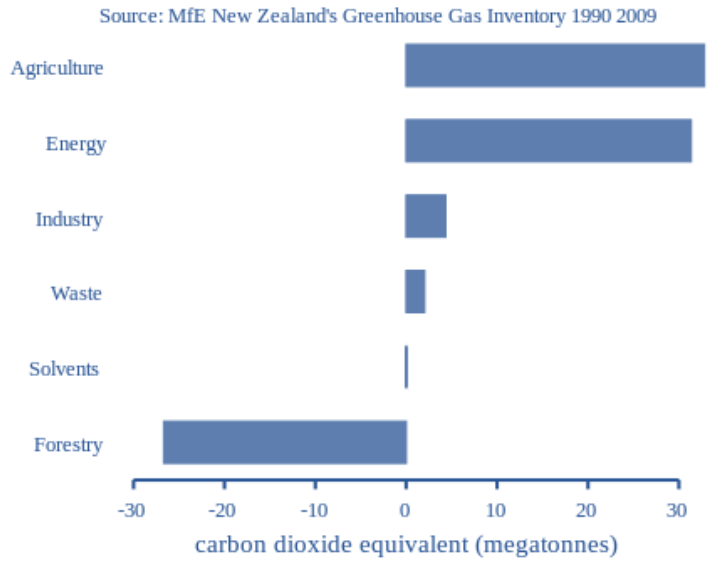

***Figure 1: Sectoral breakdown of NZ GHG emissions in 2009. "LULUCF" refers to Land Use, Land-Use Change and Forestry; this net sink is managed through the forestry sector under the ETS. Source: New Zealand's Greenhouse Gas Inventory 2010.[67]**

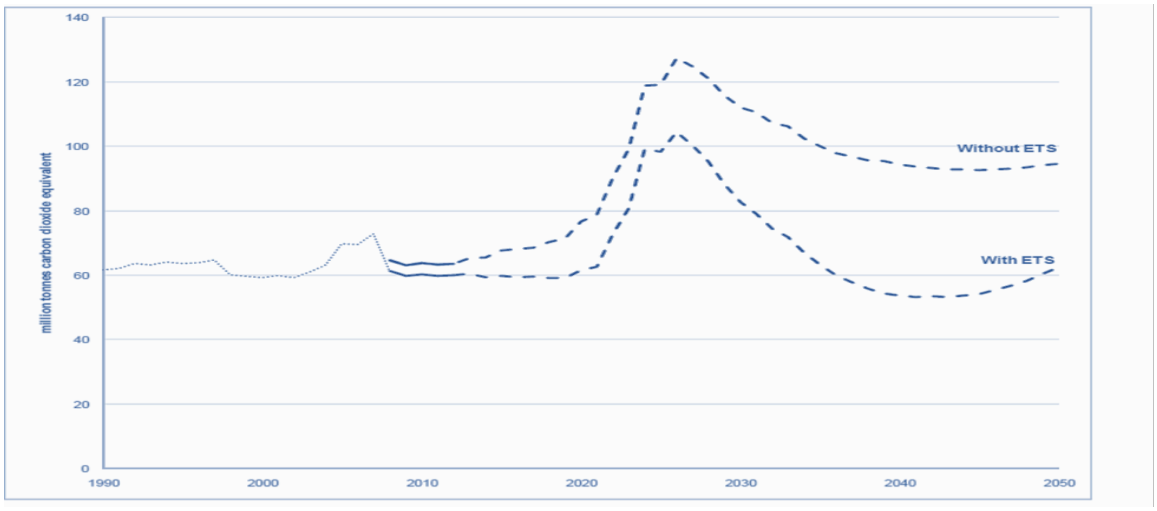

***Figure 2: NZ GHG emissions are cyclical as harvesting forests releases CO_2, and the subsequent regrowth of forests sequesters CO_2. Modeled emissions with an ETS are significantly lower than in a scenario without one.[68]**

*Figure 1 uses IPCC accounting for forests, whereas Figure 2 uses KP accounting with KP forest definitions.

Unique Aspects:

1. The ***point of obligation*** is as far upstream as possible within the country (see Table 1). However, ***the point of allocation differs from the point of obligation*** in the case of suppliers in the stationary energy and liquid fossil fuels sectors because producers from these sectors were expected to pass along the costs (see "Allowance Distribution" section).

2. The NZ ETS **includes land-based sectors**, with forestry included as of 2008 and agriculture scheduled to enter at an undefined date pending a review in 2015. The forestry sector functions as a net carbon sink, and allowance credits are generated on an opt-in basis by landowners who actively remove GHGs from the atmosphere in return for accepting liabilities for future reversals.
3. The ***absolute amount of net emissions attributed to New Zealand is ensured by the government***, not by the ETS. There are neither national nor subnational caps. Instead of a hard cap, the NZ ETS has a stated purpose, which is to assist New Zealand to meet its international obligations under the Convention and the Kyoto Protocol and to reduce its emissions below business-as-usual. The system of intensity-based allocations means that the required economy-wide reductions will not automatically be met through the allowances distributed to domestic sectors. As a result, the government itself, rather than the capped entities, may be required to purchase credits internally or elsewhere at the end of the particular commitment periods to ensure the country meets its international commitments.[69]

   The country's ***net position*** (see Equation 1) is the number of allowance units under its Kyoto target (surplus) or the quantity of emissions that must be abated to meet the Kyoto target (deficit).

   Net Position = NZ Kyoto Protocol Target Emissions Level – NZ Actual Emissions Level

   For example, as of February 2013, New Zealand's net position was 35.2 million. In addition, the value of this net position was about NZD $15.5 million because the international carbon price was NZD $0.44/$tCO_2e$.[70]

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Disclaimer: The authors encourage readers to please contact them with any corrections, additions, revisions, or any other comments, including any relevant citations. This will be invaluable in strengthening and updating the case studies and ensuring they are as correct and informative as possible.

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[17] *Supra*, Note 12.
[18] *Supra*, Note 1.
[19] Ministry of Agriculture and Forestry (May 2011). "Forestry in the Emissions Trading Scheme." Available at http://www.mpi.govt.nz/news-resources/publications.aspx?title=Guide%20to%20Forestry%20in%20the%20Emissions%20Trading%20Scheme
[20] There are two other categories in the act: (1) Pre-1990 forest land, other than exempt land, that was deforested on or after 1 January 2008 and in respect of which any liability to surrender units arising in relation to an activity listed in Part 1 of Schedule 3 has been satisfied; and (2) Exempt land that has been deforested and in respect of which the number of units that would have been required to be surrendered in relation to an activity listed in Part 1 of Schedule 3, had the land not been exempt land, have been surrendered under Section 187(2).
[21] *Supra*, Note 18.
[22] *Supra*, Note 18.
[23] Some rules for participating in this offsetting mechanism are as follows: (1) new forest must achieve the same carbon stocks as the deforested forest land within a specified timeframe; and (2) New forests must be established on land that is eligible for post-1989 forest planting. Source: New Zealand Ministry for the Environment (November, 2012). "2012 Amendments to the New Zealand Emissions Trading Scheme (NZ ETS): Questions and answers." Available at http://www.climatechange.govt.nz/emissions-trading-scheme/ets-amendments/questions-answers.html
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[33] *Supra*, Note 1, Note 12, and Note 15.
[34] Industrial sector free allocation is based on allocative baselines that are based on either: (a) the average emissions and electricity use per unit output from the activity, based on data collected from those undertaking the activity in New Zealand in financial years 2006/2007, 2007/2008, and 2008/2009, or (b) information on equivalent emissions and electricity use per unit of output from Australia. This latter was to enable alignment of New Zealand's industrial allocation regime with Australia's as appropriate. Source: New Zealand Ministry of Environment (2012). "Industrial Allocation: NZUs for Industry." Available at http://www.climatechange.govt.nz/emissions-trading-scheme/participating/industry/allocation/
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