Greenhouse Gas Emissions Trading in New Zealand: Trailblazing Comprehensive Cap and Trade

*Toni E. Moyes**

Emissions trading schemes for the regulation of GHG emissions have captured much attention in the United States and in many other countries. New Zealand's national scheme is arguably the most ambitious in the world to date. It takes a pioneering approach to coverage, linkage into the international markets, allocation of emissions units, and speed of implementation. In a world-first, it covers both the agriculture and forestry sectors. This Article describes the New Zealand scheme in its context and analyzes its advantages and pitfalls. It also investigates the broader implications of the New Zealand example as a model for climate change regulation elsewhere.

Note that on November 8, 2008, the Labour Party-led government that introduced the emissions trading scheme described in this article lost power in the New Zealand general election. The new government, led by the National Party, may introduce changes to the scheme and may even adopt a fundamentally different approach to climate change regulation.

* Research Fellow, Frank J. Guarini Center for Environmental and Land Use Law, New York University School of Law, LL.M., New York University School of Law; LL.B., University of Canterbury School of Law. I am grateful to Professor Richard Stewart for his help on this article.

INTRODUCTION

The New Zealand Government proposes to launch what is arguably the world's most ambitious national cap and trade emissions trading scheme to combat greenhouse gas (GHG) emissions.[1] This comes at a time when developed countries, including the United States, are increasingly looking towards emissions trading as a cost-effective strategy to mitigate climate change. But New Zealand is doing more than climbing on the international bandwagon—it is leaping to the forefront. The New Zealand Emissions Trading Scheme (NZ ETS) is an unmatched combination of comprehensive scope and effort to internalize the full cost of GHG emissions. This Article outlines the NZ ETS and the rationale behind it. In particular, it probes some of the potential risks and rewards that the design of the scheme may deliver. With momentum building to introduce federal market-based regulation in the United States, and to reshape the international climate policy regime, the NZ ETS deserves the attention of climate policy makers everywhere.

The theoretical underpinnings of the NZ ETS are not extraordinary compared to those of most emissions trading schemes (ETS). The scheme's exceptional character is due to its relatively pure translation of economic theory into policy practice, and from the nature of New Zealand's economic activities. The key differences in the design of the NZ ETS compared with other national or regional ETS include:

Comprehensive scope: The coverage of the NZ ETS is comprehensive, extending to all of the main GHGs and across all major emitting sectors of the economy. Due in part to its unique GHG emissions profile, New Zealand is pioneering the inclusion of forestry and agriculture into a multi-sectoral ETS, and tackling the special challenges these sectors raise. The NZ ETS will thus demonstrate the feasibility of including forestry and agriculture in emissions trading for other countries.

Linkage: The level of linkage between the NZ ETS and the international market for units of emissions reductions is high. The NZ ETS has no independent national cap on emissions; it relies solely on the international cap set by the Kyoto Protocol to the United Nations Framework Convention on Climate Change (Kyoto Protocol).[2] This arrangement may be thought of as a "flexible cap," whereby all New Zealand emissions are constrained by international market prices for GHG emissions and there is no limit on emissions permitted in New Zealand provided that adequate tradable emissions units are imported into the country. Foregoing an independent national cap and also certain other price control mechanisms makes New Zealand a "price-

1. *See* Climate Change Response Act, No. 40, 2002 (N.Z.). Emissions trading was introduced to the Act by the Climate Change Response (Emissions Trading) Amendment Act, No. 85, 2008 (N.Z.), which passed into law on September 26, 2008.

2. *See* Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 11, 1997, 37 I.L.M. 22 (1998) [hereinafter Kyoto Protocol].

taker," relinquishing a greater level of control over the price of emissions faced by industry than other countries have been prepared to do. Many worry that this feature leaves industries in New Zealand too vulnerable to unexpectedly high international prices.

Allocation: Free allocation of emissions units is more restricted in the NZ ETS than in other ETS. Elsewhere, the dominant practice is to allocate a generous number of emissions allowances for free, at least initially, thereby enhancing political acceptability among participants and providing a cushioned transitional period. In New Zealand, certain sectors of the economy are not entitled to any free allocation. What free allocation is available will be phased out by 2030. A large portion of emissions units will be allocated by sale.

Monitoring, reporting, verification and compliance: The comprehensive coverage of gases and economic sectors in the NZ ETS creates special challenges in monitoring, reporting, and verifying emissions, and ensuring compliance for the NZ ETS.

Speed of introduction: Compounding the effects of these differences in design is relatively fast-paced introduction. The NZ ETS is already operative over the forestry sector. The majority of sectors will face obligations to account for emissions by 2011, and remaining sectors by 2013. There has been no pilot scheme to speak of, and with limited free allocation, transitional support is constrained.

Will a bold commitment to emissions trading efficiently advance New Zealand towards meeting its international climate change obligations, or will it unnecessarily imperil its national economy? Due to the number of unprecedented features of the NZ ETS and various contingencies, the outcome is very difficult to predict. But without doubt, as interest worldwide in harnessing market forces to manage climate change grows, New Zealand's example commands attention. This Article introduces the NZ ETS and highlights areas of particular interest. Throughout, it draws comparisons to other established or proposed national and regional ETS, including the European Union ETS (EU ETS) and schemes established in the United States.

Part I provides background information about New Zealand relevant for understanding the NZ ETS, including certain of its economic, political, and geographical features, its distinctive GHG emissions profile, and its international climate change obligations. Part II deals with two core elements of this Article in tandem—it covers cap and trade ETS for the regulation of GHG emissions in general and it sets out the main features of the NZ ETS, with special attention to aspects of the scheme that are particularly unique or important. Part III is devoted to the groundbreaking steps of including agriculture and forestry in the scheme. Part IV concludes the paper by reflecting on what lessons the New Zealand emissions trading experience might offer the international community.

I. NEW ZEALAND BACKGROUND

New Zealand is distinct from other countries in a number of ways that have a substantial influence on its approach to climate change policy. This Part gives some background information about New Zealand necessary to inform an analysis of the proposed NZ ETS. It introduces the motivations driving the national GHG reduction policy; the distinct character of New Zealand's emissions profile, in terms of the contributing sources and GHGs; and New Zealand's international obligations.

A. The New Zealand Setting

New Zealand is a Pacific Island nation with a resident population of approximately 4.1 million people and a modern, industrialized economy. It is already experiencing environmental consequences from climate change, including changes in temperature, rainfall levels and distribution, and sea level rise, but it is not predicted to suffer as severely from climate change as many developing and low-lying countries.[3] New Zealand's GHG emissions are growing and its per capita emissions are the world's twelfth highest. Still, New Zealand contributes only approximately 0.1% of total global GHG emissions[4] and could have no meaningful influence on global climate change by reducing its emissions unilaterally. Therefore, New Zealand hopes its emissions reductions will be part of internationally concerted action on climate change.

New Zealand seeks to reduce its own emissions in order to meet its current international obligations, to maintain credibility and support ongoing international climate change policy efforts, and to demonstrate a model of successful emissions reduction policy to the international community.[5] From an economic perspective, the government recognizes that the international movement toward internalizing the price of GHG emissions justifies transitioning to a "lower carbon" economy.[6] Also, New Zealand wants to preserve its reputation as a worldwide leader in environmental issues, which is particularly valuable to its two biggest economic sectors, tourism and primary production.[7] Exports account for 30% of gross domestic product[8] and many

3. *See, e.g.*, Kevin Hennessy et al., *Australia and New Zealand*, *in* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, WORKING GROUP II: CLIMATE CHANGE IMPACTS, ADAPTATION AND VULNERABILITY, IPCC FOURTH ASSESSMENT REPORT 507, 509 (M.L. Parry et al. eds., Cambridge Univ. Press 2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter11.pdf.

4. *See* UNITED NATIONS DEV. PROGRAMME, HUMAN DEVELOPMENT REPORT 2005 289 (2005).

5. MINISTRY FOR THE ENV'T, THE FRAMEWORK FOR A NEW ZEALAND EMISSIONS TRADING SCHEME 23 (2007), *available at* http://www.climatechange.govt.nz/files/emissions-trading-scheme-complete.pdf [hereinafter NZ ETS FRAMEWORK].

6. *See* CABINET POLICY COMM.., A NEW ZEALAND EMISSIONS TRADING SCHEME: KEY MESSAGES AND STRATEGIC ISSUES, POL (07) 302, at 1–2 (2007), *available at* http://www.beehive.govt.nz/Documents/Files/Cab%20Paper_Emissions%20Trading.PDF [hereinafter CABINET PAPER].

7. *Id.* at ¶ 14.

are delivered to premium markets that may value environmentally sustainable production. New Zealand is concerned that inaction on climate change could reduce its appeal to global consumers (by diluting its eco-friendly branding), and interfere with its access to foreign markets (through formal or informal trade barriers against high-emitters).[9] Further, New Zealand hopes to build on its leading expertise in agricultural, forestry and biological technologies to realize new economic opportunities to provide technologies to an international market increasingly concerned about abating GHG emissions.[10] Policies aimed at climate change are also expected to deliver a number of environmental and economic co-benefits, such as improved energy efficiency, water quality, and reduced soil erosion.[11]

B. Distinct GHG Emissions Profile

New Zealand's GHG emission profile is unique. Although some of its characteristics are typical of a developed country, others are more typical of a developing country. Its composure is distinguished by two interrelated features—the proportional representation of particular emitting activities and the proportional representation of particular GHGs. Agriculture, New Zealand's largest export-earning sector, is key to both.[12]

1. Key Emissions Sources

A broad range of activities make significant contributions to New Zealand's emissions. Primarily, New Zealand's high per capita emissions are driven by economic dependence on emissions-intensive primary industry and heavy reliance on private transportation.[13] In contrast to all other developed

8. MINISTRY FOR THE ENV'T, NEW ZEALAND'S FOURTH NATIONAL COMMUNICATION UNDER THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE 30 (2006), *available at* http://www.mfe.govt.nz/publications/climate/national-communication-2006/4th-national-communication-2006.pdf [hereinafter NZ FOURTH NATIONAL COMMUNICATION]. Exports of goods and services comprise over 30% of New Zealand's gross domestic product. Australia, North America, the European Union and East Asia each take between 15 and 30% of New Zealand's exports. *Id.*

9. NZ ETS FRAMEWORK, *supra* note 5, at 1; CABINET PAPER, *supra* note 6, at ¶ 14; Climate Change (Emissions Trading and Renewable Preference) Bill, 2007, Bill [187-1] Explanatory Note (N.Z.), at 22 [hereinafter Bill [187-1] Explanatory Note]. One example of eco-friendly branding is the "100% Pure New Zealand" brand. Tourism New Zealand, 100% Pure Campaign, http://www.tourismnewzealand.com/tourism_info/about-us/100-pure-campaign/100-pure-campaign_home.cfm (last visited Oct. 13, 2008).

10. *See* MINISTRY FOR THE ENVIRONMENT AND MINISTRY OF AGRICULTURE AND FORESTRY, AGRICULTURAL EMISSIONS RESEARCH FUNDING: A CLIMATE CHANGE DISCUSSION DOCUMENT 1 (2003) *available at* http://www.maf.govt.nz/mafnet/rural-nz/sustainable-resource-use/climate/agricultural-emissions-research-funding/agricultural-emissions-research-funding-discussion-document.pdf.

11. NZ ETS FRAMEWORK, *supra* note 5, at 2.

12. The agriculture sector earns approximately 52% of New Zealand's total merchandise export value. NZ FOURTH NATIONAL COMMUNICATION, *supra* note 8, at 30; NZ ETS FRAMEWORK, *supra* note 5, at 95.

13. NZ ETS FRAMEWORK, *supra* note 5, at 2, 20.

countries, energy emissions do not account for the largest single portion of total emissions in New Zealand.[14] Instead, agriculture is the single biggest emitting sector, accounting for nearly 49% of emissions—a huge portion compared to the average of 12% in other developed countries.[15] Generally, such high reliance on agriculture is only common with developing countries. Forestry, New Zealand's third largest merchandise export earner, is also of higher significance to the economy and GHG emissions in New Zealand than is typical of developed countries.[16] Energy contributes a comparatively low 43% of New Zealand emissions.[17] Energy emissions from electricity generation are particularly low because of a high reliance on renewable sources, in particular, hydro and geothermal.[18] Energy is, however, the biggest growth sector for New Zealand emissions, driven by increasing emissions from transport.[19]

2. Key GHGs

As a consequence of the key emitting activities, the proportional representation of each GHG in the New Zealand emissions profile is also unusual. Worldwide, carbon dioxide (CO_2) is "the most important greenhouse gas" because it is the most prevalent human-contributed greenhouse gas in the atmosphere and global stocks of CO_2 are the main driver of climate change.[20] But CO_2 does not dominate the New Zealand emissions profile to the same

14. *See* NZ FOURTH NATIONAL COMMUNICATION, *supra* note 8, at 7.

15. NZ ETS FRAMEWORK, *supra* note 5, at 3.

16. "Together, the agriculture and forestry sectors contribute 6.7% of New Zealand's gross domestic product." NZ FOURTH NATIONAL COMMUNICATION, *supra* note 8, at 29.

17. NZ ETS FRAMEWORK, *supra* note 5, at 3, 20; United Nations Framework Convention on Climate Change (U.N.F.C.C.C.), *Emissions Summary for New Zealand* (May 4, 2007). By comparison to New Zealand, in 2006, energy as a percentage of total emissions (without accounting for land use, land use change, and forestry) accounted for 74.79% in Australia, 80.92% in Canada, 80.01% in the European Community 15, 89.15% in Japan and 86.60% in the United States. U.N.F.C.C.C., *Emissions Summary for Australia* (2008); U.N.F.C.C.C., *Emissions Summary for Canada* (2008); U.N.F.C.C.C., *Emissions Summary for the European Community (15)* (2008); U.N.F.C.C.C., *Emissions Summary for Japan* (2008); U.N.F.C.C.C., *Emissions Summary for the United States of America* (2008). All U.N.F.C.C.C. emissions summaries are available at http://unfccc.int/ghg_emissions_data/ghg_data_from_unfccc/ghg_profiles/items/3954.php.

18. NZ ETS FRAMEWORK, *supra* note 5, at 3, 20. Annual electricity generation is around 60 hydroelectric and 7% geothermal. NZ FOURTH NATIONAL COMMUNICATION, *supra* note 8, at 34. "Smaller contributions are made from other renewable sources, such as biogas, waste heat, wood, and wind. The balance is made up of fossil fuel generation, predominantly gas, but with coal making an increasing contribution." *Id*. at 34.

19. Due largely to high levels of personal motor vehicle use, transport currently accounts for 19% of New Zealand's total GHG emissions, and 45% of emissions from energy. NZ ETS FRAMEWORK, *supra* note 5, at 3, 20.

20. *See, e.g.*, ROBERT REPETTO AND DUNCAN AUSTIN, WORLD RESOURCES INSTITUTE, THE COSTS OF CLIMATE PROTECTION: A GUIDE FOR THE PERPLEXED 1 (1997). Other GHGs have a more potent global warming effect than CO_2, but the total volumes of CO_2 emitted and in atmospheric stocks make it the most significant anthropogenic cause of climate change. While CO_2 is the most prevalent human-contributed GHG, the most prevalent GHG in the atmosphere is naturally occurring water vapor.

extent that it does in other industrialized countries.[21] On average, emissions in developed countries and economies in transition are 83.2% CO_2, 9.5% methane (CH_4), and 5.9% nitrous oxide (N_2O).[22] In stark contrast, emissions in New Zealand are 46.5% CO_2, 35.2% CH_4, and 17.2% N_2O.[23] The high levels of CH_4 and N_2O primarily result from agricultural activity. Relatively low dependence on fossil fuels for electricity helps to explain lower CO_2 emissions. The unusual composure of New Zealand's emissions profile, in terms of both gases and emitting activities, has important implications for the country's emissions abatement options.

C. Kyoto Protocol Obligations

1. Extent of Obligations

New Zealand is a party to the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol.[24] The Protocol requires New Zealand to take responsibility for its GHG emissions above 1990 levels during its first commitment period, 2008 to 2012. The New Zealand government concentrates on meeting its international commitments at the lowest cost.[25] In contrast to the United States, which has not ratified the Kyoto Protocol or enacted any federal policy to reduce emissions below current levels, New Zealand has moved beyond debating whether the Protocol represents the right way to address climate change and whether the damage averted by global compliance with the Protocol exceeds its economic cost. Under current conditions, withdrawal from the Protocol is considered politically infeasible because such action lacks sufficient domestic support and would damage New Zealand's reputation in the international community.

2. Anticipated Liability

Despite its international commitments, emissions in New Zealand have grown considerably since 1990. In 2005, New Zealand's emissions reached 25% above 1990 levels, and are projected to reach 48% above 1990 levels by

21. *See, e.g.*, *id.*, at 5–7.

22. U.N.F.C.C.C. Subsidiary Body for Implementation, *Compilation and Synthesis of Fourth National Communications, Executive Summary*, 5, U.N. Doc. FCCC/SBI/2007/INF.6 (Nov. 19, 2007).

23. MINISTRY FOR THE ENVIRONMENT, NEW ZEALAND'S GREENHOUSE GAS INVENTORY 1990–2005, THE NATIONAL INVENTORY REPORT AND COMMON REPORTING FORMAT 17 (2007) *available at* http://www.mfe.govt.nz/publications/climate/nir-jul07/nir-jul07.pdf [hereinafter NZ GHG INVENTORY]. The other GHGs monitored, HFCs, PFCs and SF6, together make up about 1% of the total emissions. *Id.*

24. *See* United Nations Framework Convention on Climate Change, Mar. 21, 1994, 1771 U.N.T.S. 107; Kyoto Protocol, *supra* note 2.

25. CABINET PAPER, *supra* note 6, at 20.

2020 in the absence of intervening action.[26] The main drivers of growth in emissions since 1990 are increased consumption of fossil fuels for transport and electricity generation and growth in agricultural emissions.[27] Meanwhile, inexpensive opportunities for emissions abatement within New Zealand are limited for a number of reasons. Conversion away from fossil fuels is limited by an already high reliance on renewable energy, industry is already highly energy efficient to compensate for the competitive disadvantage of New Zealand's geographical isolation from markets, and little is known about how to reduce emissions from agricultural livestock emissions.

Current projections are that New Zealand faces a deficit of 45.5 million metric tonnes of CO_2 equivalent (tCO_2-e) for the first commitment period,[28] a liability recently valued to be NZ$704 million.[29] To cover the final deficit, New Zealand will need to import Kyoto units from the international market. The basic types of Kyoto units available will be assigned amount units (AAUs), certified emission reductions (CERs) generated from Clean Development Mechanism (CDM) projects, and emission reduction units (ERUs) generated from joint implementation projects.

When the New Zealand government ratified the Kyoto Protocol in 2002, it did not expect meeting obligations would be hugely difficult. It expected New Zealand forest sink credits would be sufficient to create a surplus of credits against its obligations for the first commitment period of approximately 50 million tCO_2-e.[30] The responsible minister went so far as calling ratification a "[NZ]$200 million cheque" for the New Zealand economy.[31] Unfortunately, it became apparent by June 2005 the government expectations were seriously in error.[32] The main problems included a misunderstanding about the method by which forest sink credits would be calculated,[33] repeated over-estimation in

26. NZ FOURTH NATIONAL COMMUNICATION, *supra* note 8, at 12. GHG emissions in the United States in 2005 were 16.3% above 1990 levels. U.N.F.C.C.C., *Emissions Summary for the United States of America*, *supra* note 17.

27. NZ GHG INVENTORY, *supra* note 23, at 19.

28. MINISTRY FOR THE ENVIRONMENT, PROJECTED BALANCE OF EMISSIONS UNITS DURING THE FIRST COMMITMENT PERIOD OF THE KYOTO PROTOCOL 9–10 (2007) *available at* http://www.mfe.govt.nz/publications/climate/projected-balance-emissions-sep07/projected-balance-emissions-sep07.pdf.

29. CASTALIA, THE NEW ZEALAND EMISSIONS TRADING SCHEME: HOW DO WE MAKE IT WORK? 4 (2007).

30. MINISTRY FOR THE ENVIRONMENT, REVIEW OF CLIMATE CHANGE POLICIES 9 (2005), *available at* http://www.mfe.govt.nz/publications/climate/policy-review-05/policy-review-05.pdf.

31. *Kyoto: Compliance will cost over a billion dollars*, NAT'L BUS. REV., Jun. 16, 2005, *available at* http://www.nbr.co.nz/article/kyoto-compliance-will-cost-over-a-billion-dollars.

32. In May 2005, the Ministry for the Environment completed revised projections of New Zealand's GHG emissions. The revision indicated that New Zealand would fall short of meeting its Kyoto Protocol target by 36 million tCO_2-e. MINISTRY FOR THE ENVIRONMENT, REVIEW OF CLIMATE CHANGE POLICIES 10 (2005).

33. The expected benefits from forest sinks had to be revised down by 25%, mostly because trees planted on land previously covered with scrub were no longer to be counted as eligible for credits. Brian

forest planting rates,[34] and faster than anticipated growth in emissions.[35] This discovery changed the perceived context of New Zealand climate change policy. With 30 months remaining until the January 1, 2008 commencement of the first Kyoto Protocol commitment period, it became clear that New Zealand would have to adopt more onerous mitigation policies than originally anticipated in order to comply.

3. Key Price-Based Policy Approach

The aims of reducing the Kyoto deficit and arranging the payment of importing permits have spurred the development of a suite of government policies known as *New Zealand's Climate Change Solutions.* The policies include direct regulation, incentives, informational programs, and investment in research aimed at reducing emissions and adapting to climate change.[36] For example, regulations imposing biofuel sales obligations and energy efficiency standards, financial incentives for solar heating and insulation, and public education programs on energy and fuel efficiency have been implemented.[37] Since at least 2005, it has seemed likely that a price-based mechanism would be the centerpiece of this suite of solutions. Price-based mechanisms, such as emissions taxes and trading, attach a price to GHG emissions (either directly or indirectly), thereby deterring emissions wherever abatement is cheaper than the price of emitting.[38]

The NZ ETS is the latest, but not the first, incarnation of a price-based policy to target New Zealand GHG emissions. Previously, the government planned a tax on energy, industrial and transport CO_2 emissions. The "carbon tax", as it was known, was to apply from April 2007 at an initial rate of NZ$15

Fallow, *Kyoto bill creates $1 billion deficit*, N.Z. HERALD, Jun. 17, 2005, *available at* http://www.nzherald.co.nz/topic/story.cfm?c_id=244&objectid=10331130.

34. *Id.*

35. The unpredicted growth was largely due to increased transport emissions. *Id.*; NAT'L BUS. REV., *supra* note 31.

36. *See, e.g.*, New Zealand's Climate Change Solutions Website, http://www.climatechange.govt.nz (last visited Oct. 13, 2008).

37. NZ ETS FRAMEWORK, *supra* note 5, at 22–23.

38. The International Energy Agency has consistently recommended that New Zealand adopt a price-based mechanism in its climate change policy. Letter from the International Energy Agency to Stuart Calman, Ministry of Economic Development (Oct. 27, 2007), available at http://www.climatechange.govt.nz/files/iea.pdf [hereinafter Letter from IEA to MED]. A 2007 external report commissioned by the New Zealand government's Emissions Trading Group concludes that in the long term, a price-based mechanism is a lower cost option than making taxpayers responsible for meeting New Zealand's likely climate change commitments because "some abatement is cheaper to undertake domestically than purchasing emissions from offshore." INFOMETRICS, GENERAL EQUILIBRIUM ANALYSIS OF OPTIONS FOR MEETING NEW ZEALAND'S INTERNATIONAL EMISSIONS OBLIGATIONS 2 (2007) *available at* http://www.mfe.govt.nz/publications/climate/general-equilibrium-analysis-oct07/general-equilibrium-analysis.pdf.

per tCO_2-e and capped at NZ$25 per tCO_2-e.[39] The policy allowed large emitters facing competitiveness risks to negotiate partial or full exemptions in exchange for adopting international best practice on managing emissions.[40] However, the carbon tax proposal was abandoned on the basis that it "would not cut emissions enough to justify its introduction."[41] In its place, the government has opted for emissions trading.

The NZ ETS is now the cornerstone of New Zealand's climate change policy and strategy for meeting its costly Kyoto Protocol obligations. Within New Zealand, this policy choice affects the distribution of incentives to reduce emissions and the responsibility to pay for the shortfall in emissions reductions against Kyoto liability. The rationale behind the NZ ETS and its fitness for purpose will be considered in Parts III and IV. Preceding that review, a general overview of emissions trading schemes for the regulation of GHG emissions is provided in Part II.

II. OVERVIEW OF EMISSIONS TRADING AND THE NZ ETS

This Part deals with two core elements of this Article in tandem. It gives a broad overview of the basic theory and practice of ETS, concentrating on a cap and trade ETS for the regulation of GHG emissions in particular. It also introduces the NZ ETS and discusses how each of the main parameters of ETS design are set in the New Zealand scheme. Combining these discussions allows the example of the NZ ETS to illustrate ETS in general and highlights where the design of the NZ ETS diverges from usual practice. This Part evaluates some of the main design decisions made for the NZ ETS, points out both strengths and weaknesses, and offers some suggestions for improvement.

A. Emissions Trading Schemes

ETS are market-based instruments designed to regulate the emission of pollution in a cost-effective manner. ETS attribute an economic value to emissions reductions, producing an incentive to curb emissions. ETS use permits, referred to in this Article as "emissions units", like a form of currency to pay for emissions. The emissions units are tradable, to give participants flexibility to pay for emissions reductions wherever they can be achieved at the least cost. A participant can meet its obligations under an ETS by limiting its own emissions or by acquiring emissions units from another participant.[42]

39. MINISTRY FOR THE ENVIRONMENT, NEW ZEALAND'S RESPONSE TO CLIMATE CHANGE 4 (2005), *available at* http://www.mfe.govt.nz/publications/climate/response-climate-change-may05/response-climate-change.pdf.

40. *Id.* at 5.

41. Media Statement from David Parker, Minister Responsible for Climate Change Issues, Carbon tax will not go ahead in 2007 (Dec. 21, 2005), *available at* http://taxpolicy.ird.govt.nz/index.php?view=410.

42. T. H. TIETENBERG, EMISSIONS TRADING: PRINCIPLES AND PRACTICE 1 (2006).

Ideally, participants in an ETS will reduce emissions until the marginal cost of doing so is more than the marginal cost of purchasing emissions units.[43] ETS and similar trading schemes have been applied to control the use of various common access resources, including clean air, water, fisheries, forests and land use.[44] In response to the problem of climate change, ETS for controlling GHG emissions are developing around the world.[45] Indeed, cap and trade systems are fast emerging as the preferred form of ETS for the regulation of GHG emissions in a number of jurisdictions.[46] While certain characteristics are common to all ETS, further references to ETS in this Article are references to cap and trade ETS for GHG emissions unless otherwise indicated.

For cap and trade, the regulator sets an overall cap on emissions by deciding the aggregate level of emissions that will be deemed acceptable over a certain compliance period. The regulator then issues a number of emissions units, each authorizing the holder to emit a fixed amount (usually one tCO_2-e). The total number of emissions units issued is equivalent to the level of the cap.[47] Participants in the ETS must hold emissions units in order to emit. At the end of each compliance period, a participant must surrender emissions units equivalent to its emissions to the regulator. Emissions units are initially allocated to participants, and can subsequently be traded freely. A record of who holds emissions units at any given time is kept on a register established by the regulator. Trade in emissions units is expected because participants typically face different costs of controlling emissions.[48] Presuming that participants prefer cost-effectiveness, participants who find it relatively cheap to control emissions will reduce emissions more and sell excess emissions units. Participants who find it relatively expensive to control emissions themselves will prefer to cover their obligations by purchasing emissions units from other participants in the market.

Although the basic elements and theory of cap and trade ETS are fairly simple, designing an effective scheme is highly complex. The parameters must

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43. Richard L. Sandor, *Creating New Markets: The Chicago Climate Exchange*, *in* THE NEW PUBLIC FINANCE: RESPONDING TO GLOBAL CHALLENGES 389, 391–92 (Inge Kaul & Pedro Conceição eds., 2006).

44. TIETENBERG, EMISSIONS TRADING: PRINCIPLES AND PRACTICE, *supra* note 42, at 1.

45. Wolfgang Sterk et al., WUPPERTAL INST. FOR CLIMATE, ENVIRONMENT AND ENERGY, *Ready to Link Up? Implications of Design Differences for Linking Domestic Emissions Trading Schemes*, (JET-SET Working Paper, 2006) (on file with author).

46. Internationally, the most prominent cap and trade ETS for GHG emissions regulation are the international trading system established under the Kyoto Protocol and the EU ETS. Cap and trade systems have also been established, or are currently proposed, at a national or sub-national level in a number of jurisdictions, including Australia, Japan, New Zealand, Norway, Russia, Switzerland, Ukraine, and the United States.

47. *See generally* Jonathan Remy Nash & Richard L. Revesz, *Markets and Geography: Designing Marketable Permit Schemes to Control Local and Regional Pollutants*, 28 ECOLOGY L.Q. 569, 575 (2001); MURRAY DYER ET AL., EMISSIONS TRADING: EU ETS EXPERIENCE & LESSONS FOR NEW ZEALAND 5 (2006), *available at* http://www.frazerlindstrom.com/publications/Emissions%20Trading%20-%20EU%20ETS%20Lessons%20for%20NZ.pdf.

48. TIETENBERG, EMISSIONS TRADING: PRINCIPLES AND PRACTICE, *supra* note 42, at 27.

be set carefully, as each influences the ability of an ETS to meet its objectives. Even treating each parameter in isolation, ETS designers often face a large number of options to evaluate. To further complicate matters, the parameters are interrelated. Before discussing parameters further, it is useful to introduce the NZ ETS. This Part will then proceed to outline each of the main parameters of ETS—first in general, and then in the NZ ETS specifically.

B. Introduction of the NZ ETS

The Climate Change Response (Emissions Trading) Amendment Act 2008 ("Amendment Act") passed into New Zealand law on September 26, 2008, amending the Climate Change Response Act 2002 ("Act") to provide for the NZ ETS. The Amendment Act largely reflects policy proposals earlier released in the September 2007 *Framework for a New Zealand Emissions Trading Scheme* (NZ ETS Framework).[49] Although the NZ ETS proposal has stimulated considerable debate, a large portion of the New Zealand public and participant industries seem to have accepted its general policy approach.[50] Several elements of the NZ ETS design are still under development and will ultimately be settled by regulation.[51]

Before considering the features of the NZ ETS in detail, it is worthwhile to reflect upon the wider political and economic context within which New Zealand has opted to give emissions trading a prominent and extensive role in its climate change policy. International and domestic political acceptability and economic costs seem to have heavily influenced the policy choice.

As mentioned in Part I, New Zealand is firmly committed to the Kyoto Protocol and considers withdrawal both undesirable and infeasible for both international and domestic political reasons. A stated purpose of the NZ ETS is "to enable New Zealand to meet its international obligations under the [UNFCCC] and the [Kyoto] Protocol."[52] Once the economic cost of Kyoto compliance was understood to be larger than originally anticipated, choosing a cost-minimizing mechanism to regulate emissions reductions became imperative for both economic and political reasons.[53] Trading has the potential to harness the energies of the private sector for meeting Kyoto emissions reduction requirements as cheaply as possible. As a political strategy, the

49. NZ ETS FRAMEWORK, *supra* note 5.

50. Reporting on the Climate Change (Emissions Trading and Renewable Preference) Bill, the Finance and Expenditure Committee of the parliament of New Zealand reported that most of the 259 submitters on the bill, representing a wide range of sectors and interests, supported the introduction of an emissions trading scheme. Climate Change (Emissions Trading and Renewable Preference) Bill, 2008, Bill [187-2] Commentary, at 2 [hereinafter Bill [187-2] Commentary].

51. Some relevant secondary legislation (Orders in Council and regulations) is in preparation now, while other parts will be developed later. NZ ETS FRAMEWORK, *supra* note 5, at 5.

52. Climate Change Response Act, No. 40, 2002 (N.Z.), s. 5. Note, however, that the Act provides for the NZ ETS to continue in force even if there is no second commitment period under the Kyoto Protocol and no new replacement international agreement. *Id*.

53. *See* CABINET PAPER, *supra* note 6, at ¶ 24–25.

scheme frees the government from the embarrassment of having to pay a large bill out of general taxpayer funds in 2013 to meet the Kyoto requirements, and it avoids relying on the less popular strategy of taxation.

Also, adopting emissions trading is consistent with the prevailing international trend for controlling emissions. The Kyoto Protocol is itself a cap and trade ETS, and ETS have emerged in many of New Zealand's key trading partners, including Europe, Australia, Japan and the United States.[54] The world's most important ETS, the EU ETS, commenced in 2005 and is now firmly established in the European Union system. Also, the majority of congressional bills proposing federal climate change policy in the United States to date favor an ETS.[55] It now seems likely that more national and regional ETS will emerge, and that ETS will increasingly harmonize and link together. Because of New Zealand's small size and the relative expense of producing emissions reductions within New Zealand, an approach that links New Zealand to cheaper overseas emissions reductions is sensible.[56] On top of the demonstrated international preference for emissions trading, consultation with the New Zealand public and industry stakeholders revealed a domestic preference for emissions trading.[57]

Owing to the nature of the New Zealand's economy and emissions profile, as described in Part I, the distribution of responsibility for emissions across many sectors of the New Zealand economy is necessary to make a substantial impact in Kyoto liability and to be relatively fair and equitable between different emitters.[58] Emissions trading offers a useful way to link sectors which independently face varying marginal emissions abatement costs so that all sectors face a national average price on emissions and so that the national aggregate cost of emissions reductions are kept as low as possible. Using an ETS advances the aims of transitioning to a "lower carbon economy" insofar as it creates economic incentives for New Zealand enterprises to identify and innovate lower emitting technologies and business practices. The hope is that an ETS will encourage New Zealand businesses to lower emissions at a pace reasonably flexible to their particular circumstances. In theory, a well-designed emissions trading scheme should outperform an emissions tax by encouraging

54. *See* KARAN CAPOOR AND PHILIPPE AMBROSI, STATE AND TRENDS OF THE CARBON MARKETS (2008); CABINET PAPER, *supra* note 6, at ¶ 4; REGULATORY IMPACT STATEMENT (RIS) ¶ 48.

55. The following have been the most prominent climate change bills before the U.S. Congress over the past year and all proposed ETS: Boucher-Dingell Discussion Draft, H.R. (unnumbered), 110th Congress (2008), *available at* http://energycommerce.house.gov/Climate_Change/CLIM08_001_xml.pdf (Boucher-Dingell Bill); America's Climate Security Act of 2007, S. 2191, 110th Cong. (2007) (Lieberman-Warner Bill); Climate Stewardship and Innovation Act , S.280,110th Cong. (2007) (McCain-Lieberman Bill); Global Warming Pollution Reduction Act, S.309,110th Cong. (2007) (Sanders-Boxer Bill); and the Low Carbon Economy Act of 2007, S. 1766, 110th Cong. (2007) (Bingaman-Spector Bill).

56. CABINET PAPER, *supra* note 6, at RIS ¶ 52.

57. *Id*. at ¶ 24.

58. *Id*. at RIS ¶ 8.

an efficient mix of domestic and international emissions reductions, with possibilities for domestic reductions increasing over the long term.[59] Finally, compliance with international emissions reduction obligations and lower emissions helps to preserve New Zealand firms' ability to trade on an "eco-friendly" brand.

C. Parameters of ETS Design and the NZ ETS

Next, this Part outlines the main parameters of ETS by describing each parameter in general and as proposed to be set in the NZ ETS. Although a comprehensive description of ETS parameters is beyond the scope of this Article, highlighting the areas of principal concern serves to illustrate the relationships between different parameters and the complexity of the design task. The parameters discussed are grouped as follows: coverage and points of obligation; stringency of the cap on emissions, prices and linkage; allocation of emissions units; banking and borrowing of emissions units; monitoring, reporting and verification; compliance and enforcement; timing of introduction, pilot schemes and intellectual ratification. Each parameter of the NZ ETS will be compared with the corresponding parameter in other national and regional ETS to reveal how the choice for each parameter can substantially alter the nature of a scheme.

As discussed above, the basic premise of any ETS is that each participant surrenders emission units equivalent to its emissions to the regulator. A recording system is used to keep track of emissions and emissions units held. Participants in the NZ ETS have two core obligations. First, participants must maintain records and file reports for monitoring and verifying compliance.[60] Second, participants must surrender emissions units sufficient to cover all of their emissions to the government at the end of each compliance period.[61] The government and all participants will have individual accounts holding emissions units recorded on an internet accessible electronic register.[62] To surrender units, participants will transfer units from their own accounts into the government account.

1. Coverage and Points of Obligation

Key determinants of the scope of an ETS are (a) which gases and economic sectors the ETS covers and (b) where the point of obligation is placed within each sector. The coverage of the NZ ETS is exceptionally broad when compared to any other national or regional ETS. The scheme covers all GHGs and all major emitting sectors of the economy. It generally places points

59. *Id*. at RIS ¶ 43–47.
60. Climate Change Response Act, No. 40, 2002 (N.Z.), ss. 62, 65, 66, 67.
61. *Id*. at s. 63.
62. *Id*. at ss. 6, 7, 18, 61. .

of obligation upstream within the covered sectors to capture maximum participation.

a. Gases Covered

One or more GHGs can be included in an ETS. The six main GHGs released as the result of human activity are those identified in Annex A of the Kyoto Protocol: CO_2, CH_4, N_2O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6).[63] Different GHGs have different characteristics, which are relevant to determining which gases to include in an ETS. Important points of difference between gases include global warming intensity, activities from which a gas is emitted, availability of abatement technologies or viable alternatives to emitting activities, ability to measure emissions, and proportion of overall GHG emissions.

All six GHGs listed in the Kyoto Protocol are covered by the NZ ETS, equaling or exceeding the range of all other existing or proposed ETS. The EU ETS and the ETS of Switzerland and Norway currently cover only CO_2.[64] Other existing or proposed ETS cover all six gases, including proposed national schemes for Australia and the United States, the Regional Greenhouse Gas Initiative (RGGI) involving certain Northeast and Mid-Atlantic states of the United States, and the Chicago Climate Exchange.[65] But even these schemes do not match the NZ ETS because their more limited sectoral coverage restricts the proportion of non-CO_2 gases affected.

b. Participant Sectors and Points of Obligation

Deciding which entities to regulate in an ETS is a multifaceted issue. One aspect is which sectors of the economy to cover, and then which sources of emissions within a sector. Differences between sectors and sources may influence whether they are included in an ETS. For example, because different sectors emit different GHGs, the question is inherently related to which gases are included in the scheme. Other important points of difference between sectors include size, number of participants, quantity of GHG emissions, and exposure to competition.[66] Broad coverage can maximize environmental effectiveness and prevent emitting activities from leaking out of sectors covered by the scheme to sectors exempt from the scheme. A countervailing consideration is that broad coverage can require complicated and costly administration.

63. Kyoto Protocol, *supra* note 2, at Annex A.

64. Japan's pilot project is mandatory in relation to CO_2, and voluntary in relation to other GHGs. Sterk et al., *supra* note 45, at 78.

65. *Id*. at 78.

66. Ruth Beltzer Dagan, Feasibility of Emissions Trading as a Policy Tool for Air Quality Control in Israel: A Case-Study Based Evaluation 53 (Jun. 2005) (unpublished Ph.D. thesis, New York University) (on file with author); *see also* DYER ET AL., *supra* note 47, at 18.

The sectoral coverage of the NZ ETS is exceptionally broad, extending to all major emitting sectors by 2013.[67] No other national or regional ETS currently imposes mandatory obligations across all sectors or proposes to do so within such a timeframe. Most ETS limit mandatory participation to certain energy and industrial emissions. The EU ETS, national ETS implemented in Norway and Switzerland, the RGGI, and the ETS proposed for Canada and Australia all roughly fit this description.[68]

The New Zealand sectors covered are referred to as forestry, liquid fossil fuels (primarily transport), stationary energy (coal, natural gas and geothermal energy), industrial process (non-energy) emissions, agriculture, and waste.[69] These sectors correspond to the sectors listed in Annex A of the Kyoto Protocol most relevant to New Zealand.[70] Outside of New Zealand, proposals to include forestry within a cap and trade scheme are rare, and proposals to include agriculture are virtually unheard of. This is the case despite the fact that agriculture and forestry contribute significantly to emissions, albeit less so in other developed countries than in New Zealand.[71] Concerns about the economic impact on farmers and forest-owners, and difficulties with monitoring compliance are among the factors that deter the inclusion of these sectors, as further discussed in Part III. Normally, if forestry and agriculture are given any role in an ETS, it is restricted to allowing a limited number of emissions reductions from these sectors to offset emissions from sectors subject to the cap.[72] Such offset systems do not mandate limiting emissions from the sectors concerned and often encounter difficulties relating to the environmental integrity of offsets.

Sectors will be phased into the NZ ETS between 2008 and 2013. Forestry is regulated as of January 1, 2008. The stationary energy and industrial process sectors will begin to incur obligations to surrender units ("unit obligations") on January 1, 2010,[73] followed by liquid fossil fuels on January 1, 2011,[74] and

67. Only emissions sources below a de minimis threshold for each sector will be excluded from the scheme. The sectoral de minimis thresholds are not finalized at the time of writing, apart from the forestry sector. *See, e.g.*, NZ ETS FRAMEWORK, *supra* note 5, at 30, 76-7790, 97.

68. Sterk et al., *supra* note 45, at 78.

69. Climate Change Response Act, No. 40, 2002 (N.Z.), Schedule 3.

70. *See* NZ ETS FRAMEWORK, *supra* note 5, at 31–32; Kyoto Protocol, *supra* note 2, at Annex A.

71. In the United States, in 2006, agriculture accounted for approximately 6% of total emissions in 2006, and land use, land use change, and forestry offset approximately 14.8% of total CO_2 emissions. U.S. ENVTL. PROT. AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS & SINKS 1990–2006 ES-12 (2008).

72. For example, in the cap and trade scheme that was proposed in the Lieberman-Warner Bill, agricultural offsets would have been able to be used for credit for up to 15% of total allowances. America's Climate Security Act of 2007, S. 2191, 110th Cong. (2007). In a similar fashion, the proposed Bingaman-Spector Bill, would have allowed agricultural offsets for up to 5% of total allowances. Low Carbon Economy Act of 2007, S. 1766, 110th Cong. (2007).

73. With the exception that unit obligations for importing SF_6, HFCs and PFCs start in 2013, rather than 2010 as for other activities within the industrial processes sector. Most users of SF_6 in New Zealand have memoranda of understanding with the government valid until December 31, 2012, in which they agree to use best practices in managing it. Bill [187-2] Commentary, *supra* note 50, at 7.

agriculture and waste on January 1, 2013. The Act encourages reporting to begin on a voluntary basis from two years prior, and require reporting one year prior, to the commencement of unit obligations for liquid fossil fuels, synthetic gases (SF_6, HFCs, and PFCs), agriculture, and waste.[75] Insofar as possible within a five year period, the timing of entry is staged to accommodate some of the many practical differences between sectors. Preparedness for trading, administrative issues, incentives and price effects, and political considerations have weighed in the evaluation of when each sector should enter the scheme.[76] For example, forestry obligations commenced as early as possible to minimize the economic incentive to deforest before NZ ETS obligations apply. In contrast, the introduction of agriculture is delayed until 2013 in recognition of technical and economic difficulties associated with measuring and abating agricultural emissions, as further discussed in Part III.[77]

Another aspect of the multifaceted issue of which entities to regulate in an ETS is where to place obligations to account for emissions within each sector. The point of obligation may be upstream in the supply chain, on the initial producer or importer in an emitting sector, or further downstream, nearer the point where the final product of the sector is consumed.[78] The point of obligation selected can influence the number of participants in an ETS, the incentives of participants, how comprehensively all emissions from a sector are covered, and the relative ease of administering the system (particularly in relation to monitoring and enforcement).[79] In many cases, it is both convenient and effective to place the obligation upstream, especially where upstream providers are relatively few in number and able to influence behavior throughout the sector by transmitting the cost of emissions downstream through the supply chain. In other cases, where price signals upstream provide insufficient incentives for all participants in a sector to change, a point of obligation further downstream is preferable. Although only certain entities are directly regulated under an ETS, the costs of meeting obligations are transmitted through the supply chain to influence a much wider group. For example, regulating suppliers of fuel will lead to increased fuel prices and influence the choices of downstream consumers. Except as indicated otherwise, the term "participant" is used in the discussion below to connote regulated

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Unit obligations in relation to HFCs and PFCs will not accrue before 2013 in order to allow more time for the development of non-GHG alternatives and HFC collection and destruction programs, and to cope with "the complexity created by the number of participants in the HFCs sector." *Id*. at 5.

74. Originally, it was proposed that liquid fossil fuels be subject to unit obligations from 2009, however, in early 2008, the Government decided to delay the requirement that fossil fuels face unit obligations by two years "to reduce inflation pressures and to help lower inflation expectations" in the New Zealand economy. *Id*. at 2.

75. Climate Change Response Act, No. 40, 2002 (N.Z.), ss. 218, 219.

76. Bill [187-2] Commentary, *supra* note 50, at 4.

77. *See* NZ ETS FRAMEWORK, *supra* note 5, at 31, 98.

78. Dagan, *supra* note 66, at 52; Sterk et al., *supra* note 45, at 15.

79. *Id*. at 52.

entities. Note, however, that ETS can also allow parties *apart* from regulated entities to participate. Voluntary participation of this kind is usually motivated by economic opportunities available through trade and investment in the emissions market, and will be permitted under the NZ ETS.[80]

Generally, the points of obligation within each sector included in the NZ ETS are upstream in the supply chain, at the producer/importer level. The NZ ETS will likely have less than two hundred firms as participants, plus between two thousand and nine thousand forest owners.[81] In addition to forest owners, points of obligation likely to be chosen are fuel suppliers for the liquid fossil fuels and stationary energy sectors, industrial producers for the industrial processes sector, and landfill operators for the waste sector.[82] For the agriculture sector, choosing the appropriate points of obligation is particularly complicated because in this sector the administratively convenient point of obligation does not coincide with the point that transmits the best incentives to reduce emissions. For example, the levels of N_2O emissions from fertilizers are influenced by application techniques and soil tilling practices that can only be measured at the diffuse downstream level of the farmers. This difficulty is discussed further in Part III.

c. Evaluation of the Comprehensive Coverage Approach

Practical and theoretical considerations converge in favor of comprehensive coverage of gases and sectors in the NZ ETS. From a theoretical perspective, the comprehensive approach should maximize total emissions reductions and drive down costs. Studies support this conclusion, indicating that a broad approach increases economic and environmental benefits compared to strategies that focus on a narrower range of gases and activities.[83] Maximum coverage ensures that all of the lowest-cost opportunities for abatement are captured, enhancing cost-effectiveness. It improves environmental performance by regulating all emissions and not merely some. While a narrower ETS might be supplemented by other policies to ensure that more emissions are regulated, a piecemeal approach does less to ensure policies are coordinated in a coherent, compatible, and efficient way.

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80. Climate Change Response Act, No. 40, 2002 (N.Z.), s. 18A; NZ ETS FRAMEWORK, *supra* note 5, at 33.

81. Bill [187-1] Explanatory Note, *supra* note 10, at 5. The number of forestry participants will depend upon how many owners and leaseholders of post-1989 forests who decide to opt into the scheme. *Id.*

82. *See* NZ ETS FRAMEWORK, *supra* note 5, at 34–36.

83. *See, e.g.*, I.P.C.C. *Summary for Policymakers*, *in* CLIMATE CHANGE 2007: MITIGATION: CONTRIBUTION OF WORKING GROUP III TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 11 (B. Metz et al. eds., 2007); JOHN M. REILLY ET AL., MULTI-GAS CONTRIBUTORS TO GLOBAL CLIMATE CHANGE (2003), *available at* http://www.pewclimate.org/docUploads/Multi-Gas.pdf. For an earlier argument in favor of including all GHGs, *see* RICHARD B. STEWART & JONATHON B. WIENER, RECONSTRUCTING CLIMATE POLICY: BEYOND KYOTO 59–65 (2003).

Comprehensive coverage also avoids the problem of "leakage." "Leakage" occurs when emissions outside of a regulated sector or area increase as a result of the regulation, thereby offsetting the benefit of regulation. Leakage occurs because regulation makes activity in the unregulated sector or region relatively more economic and encourages patterns of investment that make it more difficult to regulate such sectors or regions in the future.

Economic theory also favors a comprehensive approach because it is likely to improve market liquidity. "Liquidity" generally refers to having sufficient volumes and trades in the market to allow any individual transaction to be carried out with relative ease and without impacting the overall market price. Increased liquidity means greater confidence that market participants will be able to find buyers and sellers of emissions units whenever they wish.[84] Comprehensive coverage increases the number of participants and trades in the market to enhance liquidity. This is especially important since domestic liquidity in the NZ ETS is somewhat limited by New Zealand's small population and size. Linking the NZ ETS into international markets, discussed below, will help to improve the liquidity problem, but domestic liquidity is nevertheless important as participants may find prices or transaction costs lower when trading domestically.

From a practical perspective, a reasonably comprehensive approach is necessary in order for the NZ ETS to significantly reduce New Zealand's overall emissions. Recall from Part I that New Zealand's CO_2 emissions are only 46.5% of its total emissions compared to an average of 83.2% in developed countries and economies in transition and that 52.4% of New Zealand emissions are either CH_4 or N_2O. Thus, if non-CO_2 gases were excluded, the NZ ETS would ignore over half of the problem. Likewise, sectors typically excluded from ETS must be included in the NZ ETS in order to address the majority of emissions. The NZ ETS would be far less effective if agriculture—the single biggest emitter—was ignored. New Zealand's circumstances are fundamentally different from those of the EU, where CO_2 represents approximately 82.5% of total emissions and a scheme focusing on CO_2 emissions from energy large industrial emitters can have a significant impact.

Along with maximizing the climate benefits of the NZ ETS, a comprehensive approach will also lead to a greater number of non-climate benefits.[85] Non-climate benefits are sometimes overlooked, but can be extremely valuable. For example, a comprehensive ETS including agriculture and forestry should lead to greater reductions in air and water pollution, protection of biodiversity, and improved capacity to adapt to the impacts of

84. MINISTRY FOR THE ENVIRONMENT, NEW ZEALAND EMISSIONS TRADING SCHEME: GOVERNMENT'S RESPONSE TO FEEDBACK FROM ENGAGEMENT 13–16 (2007), *available at* http://www.mfe.govt.nz/publications/climate/ets-government-response-feedback-dec07/ets-government-response-feedback-dec07.pdf [hereinafter GOVERNMENT RESPONSE TO FEEDBACK ON NZ ETS].

85. *See* REILLY ET AL., *supra* note 83, at iv; STEWART & WIENER, *supra* note 83, at 60.

climate change. It may also enhance the marketability of New Zealand forest and agricultural products. Thus a comprehensive ETS can deliver health, environmental, and economic benefits in addition to the benefits of mitigating climate change. Even in countries where agriculture and forestry do not contribute a particularly high portion of total national emissions, co-benefits add weight to the argument in favor of a comprehensive ETS.

One main complaint about a comprehensive approach is that some gases and sectors are difficult to monitor for compliance. As discussed further below, monitoring is essential to ensure the integrity of an ETS. In this regard, the greatest challenges for the NZ ETS relate to agriculture and forestry. It is imperative that the government scrutinize and enhance monitoring for these sectors as fully as possible. Another criticism of the comprehensive approach is that it might damage the international competitiveness of certain sectors whose competitors do not face an equivalent price on emissions. Here again, concerns have centered particularly certain industrial emitters, fisheries, agriculture, and forestry. Free allocation of emissions units, discussed below, is the main source of relief in the NZ ETS for these sectors. Because New Zealand is the first country to seriously grapple with the challenges of including agriculture and forestry in a national ETS, these sectors are given special attention in Part III.

2. Stringency of the Cap, the Price of Emissions Units, and Linkage

The stringency of the cap on emissions and linkage with other ETS interact to influence the price of emissions units, overall cost, and level of environmental effectiveness of an ETS. In the NZ ETS, the cap and linkage are even more intimately related than in other existing national and regional ETS.

a. The Cap and Prices

The absolute cap on emissions influences the environmental impact of an ETS by regulating how much GHG may be released into the atmosphere.[86] It also influences the price of emissions units by creating scarcity of permits to emit. To set the cap, policy makers balance the value of expected environmental benefits against the cost of controlling emissions.[87]

In practice, even with the assistance of detailed models, setting the cap is a rather imperfect science. There are inherent difficulties in obtaining complete information and calculating where and to what extent all of the benefits and costs will be felt.[88] Because of large scientific and economic uncertainties

86. Other influences on the environmental impact of an ETS include the levels of monitoring, enforcement, noncompliance, and both beneficial and detrimental ancillary environmental effects of emissions abatement activities. *See* Tom Tietenberg, *Tradable Permits in Principle and Practice*, in MOVING TO MARKETS IN ENVIRONMENTAL REGULATION 63, 70 (Jody Freeman & Charles D. Kolstad eds., 2006).

87. Dagan, *supra* note 66, at 55.

88. *Id.*

about the potential damage of climate change and the potential costs of mitigation and adaptation, it is difficult to know the optimum level of emissions at which to set the cap. A miscalculation in setting the cap will cause a loss. If the cap is too low, spending on mitigating emissions will exceed what is optimal and take valuable resources away from more worthy spending priorities. A cap that is too high will do too little to mitigate climate change, so that the environmental and economic damage inflicted by climate change outweighs the optimal level of spending on emissions reduction.[89] Quantifying the environmental benefits of an ETS that will be felt within the jurisdiction that implements it is difficult because the distribution of benefits will be global and uneven. Instead of focusing directly on environmental benefits flowing from a particular ETS, policy makers may relate the cap to some view of the proportional responsibility for global GHG stocks or emissions attributable to the participating country or region (for example, the portions allocated under the Kyoto Protocol). Also, the likely price range of emissions units can be difficult to predict, especially in cases where the ETS is linked into the dynamic global prices of emissions units.[90]

Policy makers often seek to manage the potential for very high, very low, or very volatile prices of emissions units. There are a range of tools for this purpose, including methods of free allocation of emissions units, provisions for banking and borrowing of emissions units, and management of national caps, all discussed below. Another option is to include a "price control mechanism" to set an upper or lower bound on price. Upper limits protect participants against unexpectedly high emissions unit prices. Lower limits protect environmental objectives by ensuring that price signals are always strong enough to encourage some minimum level of emissions reduction Essentially, all price control mechanisms involve a trade-off between emissions unit prices and environmental effectiveness at some pre-determined trigger point. A "safety valve," for example, protects against high prices by committing the government to sell emissions units at a pre-determined price should the market exceed that price. Similarly, a "price cap" allows a participant to pay a set rate instead of purchasing emissions units whenever the market price exceeds the rate. A common form of lower price limit is known as a "price floor."[91] The NZ ETS does not include any price control mechanism.

The cap on emissions and the price of emissions units in the NZ ETS is intrinsically linked to the scheme's progressive approach to international

89. Of course, the appropriate level of the cap in one country will depend upon the caps set in other countries as the atmosphere is a global public good. As pointed out in Part I, unilateral emissions by New Zealand would have negligible impact on the global climate system.

90. *See* POINT CARBON, ISSUES IN THE INTERNATIONAL CARBON MARKET, 2008–2012 AND BEYOND 8 (2007) *available at* http://www.climatechange.govt.nz/files/point-carbon-briefing-report-2.pdf (on the differing prices of emissions units).

91. Tietenberg, *Tradable Permits in Principle and Practice*, *supra* note 86, at 80 (price caps); NZ ETS FRAMEWORK, *supra* note 5, at 45 (price floors).

linkage. Therefore, before further considering the cap and prices in the NZ ETS, it is useful to briefly introduce the concept of linkage.

b. Linkage

Economic theory indicates that efficiency can be increased by linking two or more ETS together.[92] Linkage produces results similar to expanding a single ETS to embrace more numerous and diverse participants. This means increased liquidity and access to more low-cost opportunities for emissions reductions, placing downward pressure on price. In addition to influencing prices in an ETS, the degree of linkage also influences the level of emissions that occur within the territorial bounds of the ETS. Allowing for the import and export of emissions units allows the permitted level of domestic emissions to expand or contract accordingly.

A national ETS can be linked bilaterally (for example, with another national ETS) or into a multi-participant international scheme (such as the CDM market). Although opportunities for bilateral linkage are few at present, the number of potential linking partners is likely to increase as more ETS become operational. It is desirable to anticipate the requirements for linkage in the initial design of an ETS to avoid the cost of later reform. Certain differences between ETS can impair compatibility for linking, although sometimes solutions can be crafted to reconcile schemes.[93] Some differences are important from a technical perspective, others due to political considerations. Important differences may include divergent sectoral coverage; type of emissions cap;[94] price control mechanisms; allocation; banking and borrowing; monitoring, reporting and verification; and compliance and enforcement. For example, linking two ETS with different rules on recognizing credits from certain activities (such as land use and forestry), or containing different price control mechanisms, will undermine the rules of at least one of the ETS by creating a loophole to allow in practices that were otherwise prohibited.[95] The need to speculate on and plan for linkage adds a layer of complexity to the design of an ETS.

c. The Cap, Prices, and Linkage in the NZ ETS

The NZ ETS takes a unique approach to the cap on emissions and international linkage. Unusually, it involves no independent cap on domestic emissions. Instead, the scheme operates within the global cap on emissions set

92. Sterk et al., *supra* note 45, at 12.

93. *Id*. at 5.

94. Emissions caps in ETS to date are based on absolute emissions limits, but caps could be based on intensity of emissions per unit of production.

95. Sterk et al., *supra* note 45, at 6, 8–9.

by the Kyoto Protocol.[96] The arrangement can be thought of as a "flexible cap"—it imposes a price on all emissions without fixing a limit on total emissions permitted within New Zealand. This is possible because, in addition to using New Zealand issued emissions units (New Zealand Units or NZUs), emitters are allowed to import an unrestricted number of units issued under the Kyoto Protocol (Kyoto units) and other foreign emissions units approved by the New Zealand government (approved overseas units)[97] for use in compliance. Permitted emissions will be the sum of NZUs issued and emissions units imported by participants into the NZ ETS. This flexible cap imports risks into the scheme.

NZUs issued by the government for use in the NZ ETS will each authorize the holder to emit one tCO_2-e and will be backed by a Kyoto unit held in a government account.[98] It is not yet known how many NZUs the government will issue. The government will receive AAUs in respect of the 2008–2012 Kyoto commitment period and may also acquire additional Kyoto units,[99] but it is not clear what portion of such units will be dedicated to backing NZUs. Ultimately, the decision will rest with a designated government minister, who will be empowered to issue NZUs provided that he or she has first consulted with the Minister of Finance and has considered the number of units New Zealand holds or expects to receive under any international agreement, New Zealand's ability to meet international obligations, and the proper functioning of the NZ ETS.[100]

There is likely to be ongoing uncertainty about how many NZUs will be issued during the 2008–2012 phase of the NZ ETS. Such uncertainty is hard to avoid before all of the details of the scheme are settled and before experience reveals how easily participants in each sector are able to reduce emissions domestically or to access alternative approved overseas units, as discussed further below. The unprecedented sectoral scope of the NZ ETS and the rapid evolution of the international carbon markets means that experience in other ETS cannot provide complete guidance. It seems that the government intends to take a flexible and responsive approach to issuing NZUs rather than setting the

96. After 2012, the NZ ETS will operate within whatever cap is established by international agreement. Even if no such international agreement is reached to cover the period immediately post 2012, the government anticipates keeping the NZ ETS in operation with necessary amendments. NZ ETS FRAMEWORK, *supra* note 5, at 47.

97. The Act allows for the government to prescribe units issued by an overseas registry as units that may be transferred into the NZ ETS and used for compliance. There are not yet any approved overseas units. Approval will be able to be provided for by regulation in accordance with the Act, Climate Change Response Act, No. 40, 2002 (N.Z.), s. 30G.

98. *Id*. at s. 86.

99. For the 2008 to 2012 Kyoto commitment period, the government will be allocated AAUs equivalent to five times New Zealand's 1990 emissions levels. It could acquire additional Kyoto units through reducing domestic emissions, increasing domestic emissions sinks, or purchasing Kyoto units from other governments or on the international markets.

100. Climate Response Act, s 67. The New Zealand Prime Minister will have the power to identify a minister responsible for the administration of the NZ ETS. *Id*. at s. 6.

figure a long time in advance for this phase. Given the uncertainties, it is appropriate to proceed cautiously and incrementally in issuing units, predicting and responding to circumstances as information comes to light. In particular, the government might need to reevaluate how many NZUs to issue as each sector enters the scheme.

The pitfall of such a dynamic approach is increased uncertainty for participants in the market who need to plan whether to reduce emissions or to purchase emissions units. While retaining the flexibility it requires, the government should endeavor to provide as much accurate information as it has to the market with regard to how many NZUs it will issue and when. For post-2012 commitment periods, the Act requires that the government provide a non-binding notice of its intentions to issue NZUs no later than nine months prior to the commencement of the relevant commitment period.[101] This requirement is welcome because it will improve certainty for participants without preventing the government from revising its plans to issue units when necessary.

As discussed in Part I, New Zealand's emissions have grown significantly since 1990 and opportunities for inexpensive domestic abatement are limited. In all likelihood, it will be cost-effective for New Zealand to import Kyoto or equivalent approved overseas emissions units since emissions reductions will be cheaper abroad than domestically. Rather than relying solely on the government to source overseas units, the NZ ETS allows participants to purchase units themselves on the overseas markets.[102] Allowing overseas units is crucial to the cost-effectiveness of the NZ ETS. If NZUs backed by the AAUs assigned to New Zealand under the Kyoto Protocol were the only units available for compliance with the NZ ETS they would be in short supply. Access to overseas units is crucial to reducing compliance costs for participants and in turn reducing the cost to New Zealand of meeting its Kyoto Protocol obligations.

The limits on the import of foreign emissions units into the NZ ETS are few by comparison to other schemes.[103] At first, only Kyoto units will be allowed to be imported into the NZ ETS. Significantly, participants are prohibited from surrendering AAUs imported during the 2008–2012 commitment period of the Kyoto Protocol to meet obligations that accrue after 2012.[104] The government is also restricted from retiring imported AAUs to meet its international obligations that accrue after 2012.[105] The restriction is

101. *Id*. at, s. 70.

102. Bill [187-1] Explanatory Note, *supra* note 10, at 6; NZ ETS FRAMEWORK, *supra* note 5, at 44–46.

103. Bill [187-1] Explanatory Note, *supra* note 10, at 6; NZ ETS FRAMEWORK, *supra* note 5, at 46–47.

104. Climate Change Response Act, No. 40, 2002 (N.Z.), s. 18CC.

105. *Id*. at s. 19.

intended to facilitate linkage between the NZ ETS and other ETS, as other ETS are likely to restrict imports of AAUs.[106]

Unlike most other ETS, the NZ ETS places no limit on the volume of CERs and ERUs that may be imported. The EU ETS, for example, caps the volume of foreign units that may be imported in order to ensure a minimum level of domestic emissions reductions and to use the Kyoto Protocol's "flexibility mechanisms," including the CDM and joint implementation of emissions reduction projects, to supplement domestic actions.[107] Proposals for ETS in the U.S. would also limit imports of foreign units. The Kyoto Protocol principle of "supplementarity," which calls for domestic emissions reductions to outweigh reliance of foreign emissions units,[108] seems relatively overlooked in the design of the NZ ETS.

Apart from Kyoto units, other overseas units may later be approved for transfer into the NZ ETS.[109] Conversely, NZUs will be capable of being sold outside of the NZ ETS. High levels of NZU exports are unlikely in the short term because of the likely scarcity of domestic emissions reductions and because NZUs have not yet been approved for use in any other ETS. The NZ ETS flexible cap will allow the actual level of domestic emissions to float according to how many emissions units are imported to and exported from the scheme. Because the NZ ETS is linked to the international Kyoto market, the price of an NZU will be influenced by the price at which Kyoto units can be acquired by participants in the NZ ETS. Although bilateral linking of the NZ ETS is not likely in the short term due to a shortage of fully compatible markets, the scheme is designed with the intention of keeping open future linkage opportunities.[110] The unlimited allowance of imports of ERUs and, in particular, CERs into the NZ ETS might present obstacles for future linking. Other ETS that seek to limit the admission of these project-based credits might

106. Bill [187-2] Commentary, *supra* note 50, at 12. The reason for such restrictions is that the AAUs most likely to be available for sale on the international market represent a surplus of allocation to several Eastern European countries that have experienced economic recession since 1990 (the Kyoto Protocol baseline-year) rather than representing emissions reduction initiatives. These surplus AAUs are often referred to as "hot air."

107. Directive 2004/101/EC of the European Parliament and of the Council of 27 October 2004 amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol's project mechanisms. *See* Kyoto Protocol, *supra* note 2, at arts. 6(1)(d), 12(3)(b).

108. The Marrakech Accords to the Kyoto Protocol require that "the use of the [flexibility] mechanisms shall be supplemental to domestic action and that domestic action shall thus constitute a significant element of the effort made by each Party included in Annex I to meet its quantified emission limitation and reduction commitments." DECISION 15/CP.7: PRINCIPLES, NATURE AND SCOPE OF THE MECHANISMS PURSUANT TO ARTICLES 6, 12 AND 17 OF THE KYOTO PROTOCOL, FCCC/CP/2001/13/Add.2 (Nov. 10, 2001).

109. Climate Change Response Act, No. 40, 2002 (N.Z.), s. 6.

110. *See* NZ ETS FRAMEWORK, *supra* note 5, at 41–43.

restrict the volume of NZUs allowed to be imported.[111] Such limitations would reduce international demand for NZUs and, accordingly, price.

Finally, there is no price control mechanism in the NZ ETS. Originally, it was proposed that the Act include provision for a price control mechanism should the Kyoto Protocol or a successor international agreement cease to be in force and an international market for approved overseas emissions units cease to operate.[112] Explicit reference to this very limited allowance for a price control mechanism was removed before enactment, although detailed provisions for review of the operation of the NZ ETS, including consideration of New Zealand's international obligations regarding GHG emissions, were inserted.[113]

d. Flexible Cap and No Price Control Mechanism—Potential for High Costs

The absence of an independent national cap or a price control mechanism means that the overall stringency of the NZ ETS, and therefore the prices faced by participants, is highly influenced by factors beyond New Zealand control. The flexible cap structure requires New Zealand industry to bear full Kyoto Protocol levels of liability for its emissions almost immediately, with the exception of some targeted assistance delivered by free allocation (discussed below).

By international standards, the NZ ETS places a heavy burden on industry. Other ETS put less immediate pressure on the private sector and offer it greater protection against extreme prices in the international market by having an independent price cap, a maximum limit on the price of emissions reductions, or both. New Zealand can do very little to influence the international price of emissions units; as a small player it is primarily a "price-taker." Putting such a high degree of responsibility and pressure on industry risks incurring high costs in circumstances where industry may not be able to purchase international emissions units as cheaply as the government and where the international price of emissions might move considerably. This is especially so given the possibility of major restructuring of international climate change policy for the post-Kyoto period.

Indeed, many of the concerns about the design of the NZ ETS stem from the fear that it will expose New Zealand industry to costs that are too high. If such fears are realized, the scheme would fail to facilitate cost-effective compliance with the Kyoto Protocol and would put unnecessary strain on the

111. ETS with restrictions on the import of CERs and ERUs are likely to place equivalent restrictions on the import of NZUs. Otherwise, the effect of a CER/ERU limitation could be undermined because it would be possible to launder CERs and ERUs by importing them into the NZ ETS for conversion to NZUs.

112. GOVERNMENT RESPONSE TO FEEDBACK ON NZ ETS, *supra* note 84, at 17; Climate Change (Emissions Trading and Renewable Preference) Bill, 2007, Bill [187-1] cl. 146 (N.Z.).

113. Climate Response Act, s. 160; GOVERNMENT RESPONSE TO FEEDBACK ON NZ ETS, *supra* note 84, at 17; Bill [187-2] Commentary, *supra* note 50, at 12.

New Zealand economy. This Part next considers the reasons why the prices participants will face might become unduly high, what factors justify the risk, and measures to mitigate the risk. It then considers the consequences of a costly scheme on New Zealand's international competitiveness and reputation.

One cost-related risk is that the private sector may be unable to acquire Kyoto units as cheaply as the government. In that case, devolution of so much of New Zealand's Kyoto liability to the private sector would not be cost-effective. For example, one relatively inexpensive type of Kyoto unit is likely to be AAUs, due to a high supplies from Russia and the Ukraine. It is not clear that private actors will be able to acquire AAUs as easily as governments. While the Kyoto Protocol explicitly allows governments to purchase AAUs, it is not explicit whether private actors may purchase them, and no regular practice of private purchase has emerged thusfar.[114] If private participants are unable to access AAUs they are less able to make cost savings.

Similarly, the government is arguably better positioned than many private actors to acquire a portfolio of early-stage, low-cost CERs. The government is able to purchase units in large volumes,[115] its obligations to surrender units are less frequent than for private actors (allowing more time for CERs to mature),[116] and it is better placed to manage the regulatory risk associated with future delivery of CERs.[117] Further, the government may find the transaction costs of accessing the international market lower in proportion to total costs than smaller, private NZ ETS participants.[118]

Another cost-related risk stems from the lack of national control over prices in the NZ ETS compared to other national and regional ETS. Without a national emissions cap or a price control mechanism the government is left with very little control over prices faced by industry. Usually, ETS involve an independent national cap on total emissions. To date, such caps have been less stringent than a cap reflecting the Kyoto Protocol target of the country concerned in full. A less stringent cap makes for lower prices of emissions units. For example, in the EU ETS, a member state proposes its own cap in its National Allocation Plan, subject to the guidance and approval of the European Commission. Member states are allowed some flexibility in determining the

114. Russia, the biggest potential supplier of AAUs, has indicated that it will not sell AAUs the private sector. MINISTRY FOR THE ENVIRONMENT, UNITS OF TRADE IN THE NEW ZEALAND EMISSIONS TRADING SCHEME 6 (2007), *available at* http://www.mfe.govt.nz/publications/climate/units-trade-nz-ets-dec07/units-trade-nz-ets-dec07.pdf.

115. Early stage CERs from CDM projects are often offered exclusively in large volumes. CASTALIA, *supra* note 29, at 38–39.

116. The government has obligations to surrender units under the Kyoto Protocol at the end of a five year compliance period, whereas participants in the NZ ETS must surrender units annually. *Id*. at 39. While investments in CDM projects are often required to be made close to the time of commencement of a project, the resultant CER units do not issue until the project is complete. *Id*.

117. The government is said to have more direct knowledge and influence over the New Zealand regulatory environment and more knowledge of the international environment through its involvement in international diplomacy than private actors. *Id*.

118. *Id.*

stringency of the cap. The stringency of the cap may be balanced with other regulatory measures, provided that the resulting combination of policies is sufficient to satisfy the country's responsibility for its share of the EU Kyoto Protocol obligations. During the first phase of the EU ETS, national caps were fairly modest.[119] In other ETS, such as the Swiss and Norwegian ETS and the RGGI, caps are set by using the current industrial emissions levels as the starting reference point, and determining what level of reduction should be set as a target.[120] With current emissions levels as a starting point it seems likely that targets will be closer to current performance rather than highly ambitious.[121] In the case of Switzerland, economic and technological capacity are deemed relevant to setting the national cap, factors which are likely to militate further against a stringent national cap.[122]

In addition to national caps, several national and regional ETS include specific price control mechanisms. The main concern thusfar has been to protect industry from having to pay more than a pre-determined price for emissions should the market price of emissions rise above the anticipated level. Proposed national ETS for Canada and the United States have included a safety valve, and a proposal for Australia has included a price cap. Similarly, the RGGI allows for the use of a wider range of emissions reduction alternatives as certain threshold prices are met. The failure of the California RECLAIM nitrogen oxides (NO_X) and sulfur oxides trading scheme due to an unexpected leap in emissions prices demonstrated that a significant and uncontrollable price spike can undermine an entire ETS.[123] Price control mechanisms mitigate this risk and provide a level of protection against large losses in profitability, decreases in competitiveness, and bankruptcy.

The absence of a national emissions cap or a price control mechanism in the NZ ETS means that the prices at which overseas emissions units can be obtained could have a virtually unmitigated impact on the cost to industry. New Zealand industry will be exposed to the dynamics of the international market. Just as pegging a domestic currency to a foreign currency deprives governments of the use of domestic monetary policy to achieve internal stability, the NZ ETS lacks domestic policy mechanisms to moderate impacts on industry. The Argentine economic crisis offers a lesson. That crisis, like similar crises experienced in Southeast Asian countries during the late 1990s, demonstrated that a pegged currency can severely limit a national economy's

119. *See Emissions Trading: European Commission sets out guidance on national allocations for 2008–2012*, Finfacts Ireland, Jan. 9, 2006, http://www.finfacts.com/irelandbusinessnews/publish/article_10004437.shtml; Sterk et al., *supra* note 45, at 26; *see also* A. Denny Ellerman & Barbara K. Buchner, *The European Union Emissions Trading Scheme: Origins, Allocation and Early Results*, 1 REV. OF ENVTL. ECON. & POL'Y 66, 78 (2007).

120. Sterk et al., *supra* note 45, at 37, 39, 53.

121. *Id*. at 39.

122. *Id*.

123. Sébastien Soleille, *Greenhouse Gas Emission Trading Schemes: A New Tool for the Environmental Regulator's Kit*, 34 ENERGY POL'Y 1473, 1474 (2006).

ability to withstand external shocks.[124] New Zealand needs to be prepared to manage analogous shocks.

There is more concern that price fluctuations in a relatively immature international market for emissions units might send the wrong economic signals to industry. There is no single international market price for emissions reductions—different types of units fetch different prices and can be accessed by more or less limited classes of buyers.[125] The various prices at which different types of emissions reductions will be available may be quite dynamic. Under the NZ ETS, participants are required to account for units annually. It would be unfortunate and costly if this relatively short timeframe forced New Zealand businesses to buy overseas emissions units at high prices.[126] Indeed, either unusually high or unusually low prices could cause businesses to make unnecessary and costly adjustments, including losses of investment in physical and human capital. This type of harm can be difficult to reverse.[127]

One factor that could influence prices of international emissions units dramatically is a restructuring of international climate change policy and obligations. Restructuring is not unlikely as pressure on the United States and major developing countries to accept restrictions on emissions levels is growing. While the Act allows for review of the NZ ETS in light of changed international policy structure, no automatic protections against a major change in market conditions are built in.[128]

e. Flexible Cap and No Price Control Mechanism—Potential Advantages

The same factors that pose the risk of high costs in the NZ ETS design also offer advantages. The NZ ETS focuses on maximizing liquidity and cost-effectiveness and on harnessing private sector entrepreneurship to accomplish New Zealand's emissions reduction targets. It minimizes the possibility of political interference to preserve the integrity of the market and to maximize the possibility of benefiting from bilateral linkage in future.

The basic reason for linking the NZ ETS to the international market is to increase liquidity and cost-effectiveness. If isolated, the NZ ETS market would not be highly liquid because there are likely to be less than two hundred participants, excluding forest owners and leaseholders.[129] Linking will connect participants with much larger number of buyers in sellers, located at various points around the world. Importantly, effective linkage will allow New Zealand

124. Martin Feldstein, *Argentina's Fall: Lessons From the Latest Financial Crisis*, 81 FOREIGN AFFAIRS 8, 9–10 (2002).

125. POINT CARBON, ISSUES IN THE INTERNATIONAL CARBON MARKET, *supra* note 90, at 8.

126. This risk can be reduced to some extent by allowing banking and borrowing in the NZ ETS, as discussed below.

127. CASTALIA, *supra* note 29, at 5–6.

128. GOVERNMENT RESPONSE TO FEEDBACK ON NZ ETS, *supra* note 84, at 17; *see* Climate Change (Emissions Trading and Renewable Preference) Bill, 2007, Bill [187-2] cl. 147 (N.Z.).

129. Bill [187-1] Explanatory Note, *supra* note 9, at 5.

participants to pay for abatement offshore when doing so is cheaper than reducing emissions domestically.

By having no independent cap on emissions, the NZ ETS effectively makes no distinction between emissions reductions achieved within New Zealand and those achieved abroad—it simply favors taking advantage of the cheapest available reductions. Theoretically, participants can meet NZ ETS obligations without producing any emissions reductions in New Zealand, as long as they pay for enough emissions reductions abroad. New Zealand's more liberal attitude to the location of emissions reductions than, for example, the European Union, is pragmatic given the lack of inexpensive domestic emissions reductions.

Forcing New Zealand industry to take a high degree of responsibility for its own emissions could prove a very good thing. While the burden on industry is a considerable one, it is certain and knowable in advance and should engage the energies of the private sector to seek out low cost emissions reduction opportunities to the fullest extent possible. Further, it ensures that the polluters pay for emissions. If the NZ ETS did not devolve New Zealand's Kyoto Protocol liability to the private sector, the liability would have to be paid in another way, most likely out of taxpayer funds.[130] By internalizing the cost of emissions to those specifically responsible, rather than putting the cost on the New Zealand economy more generally, the NZ ETS creates better incentives for emissions reducing behavior.

Foregoing a government-set national cap and price control mechanism somewhat shields the NZ ETS from political interference. Experience elsewhere has shown that industry pressure can influence governments to be too lenient in setting a domestic cap. An overly lenient cap provides insufficient incentives to reduce emissions to optimum levels. Instead, it can shift responsibility outside the ETS in a manner that is unlikely to be economically efficient.[131] Price control mechanisms that set an overly lenient price threshold can have the same effect. During the first year of the EU ETS, for example, over-generous targets ultimately led to a collapse in the price of emissions units. Similarly, intervention in the form of a price control mechanism would transfer responsibility for meeting Kyoto obligations outside of the NZ ETS and elsewhere into the New Zealand economy. Further, lenient caps or price controls could obstruct potentially fruitful avenues of development of abatement techniques and technologies. Provided that the government's confidence that supply of Kyoto units increase is well-placed,[132] minimizing the possibility of government intervention in the market may be a good strategy for optimizing the market's effectiveness.[133]

130. *See* Bill [187-2] Commentary, *supra* note 50, at 22.
131. Sterk et al., *supra* note 45, at 26–27.
132. GOVERNMENT RESPONSE TO FEEDBACK ON NZ ETS, *supra* note 84, at 14.
133. *Id*. at 15.

Limiting government intervention should also enhance potential to link the NZ ETS to other markets. It is hoped that operating directly within the Kyoto market will facilitate the necessary consistency between the NZ ETS and other ETS. From a linkage perspective, price control mechanisms are best avoided. A price control mechanism in one ETS will propagate in another ETS if there is two-way linkage between them. Governments with schemes that do not have a price control mechanism are therefore unlikely to approve linkage to ETS that do. A price control mechanism in the NZ ETS would thus hinder future opportunities for bilateral linking, including with the most important existing ETS, the EU ETS.

f. Close Monitoring and Flexibility for Risk Mitigation

It is not easy to predict how much the NZ ETS will cost New Zealand industry because it depends on so many contingencies. The relevant factors are diverse and uncertain, will interact with each other and will cause feedback effects. Relevant factors include the prices of emissions units of the international markets and the ability of NZ ETS participants to access such units, technological innovation, regulations adopted in other jurisdictions, the post-2012 international climate change policy regime, and more. To mitigate risks, close scrutiny and continuous monitoring of the ability of private actors to acquire well priced Kyoto emissions units on the international market is required. The New Zealand government must actively assess whether it has opportunities to obtain units at lower prices than the private sector. If it does, the government should use such opportunities to purchase Kyoto units on the international market and pass on the benefit to private sector participants by auctioning them within the NZ ETS on a fully commercial basis.[134] With regard to price control mechanisms, protecting the option of future bilateral linking is a legitimate long-term concern, but that alone should not be enough to rule out a price control in the shorter, transitional term. A price control mechanism would not interfere with the short-term purpose of international linkage, which is to allow for the import of Kyoto units through one-way linkage. The trade-off inherent in a price control mechanism between costs and meeting the emission target can be mitigated if necessary, for example by reducing the emissions cap for subsequent years.[135] That said, if a price control mechanism were incorporated, it should not be set so low as to deter the pursuit of new and creative abatement options. Even if it is not prepared to commit to providing a particular form of support, the New Zealand government needs to

134. The government already has power to take such action under the Climate Change Response Act. GOVERNMENT RESPONSE TO FEEDBACK ON NZ ETS, *supra* note 84, at 15–16. In relation to AAUs, the government could follow the model of Japan's pilot emissions trading scheme, which allows private Japanese companies to hold AAUs on the scheme register. *See* Sterk et al., *supra* note 45, at 38.

135. Robert N. Stavins, *A Meaningful U.S. Cap-and-Trade System to Address Climate Change*, 32 HARV. ENVTL. L. REV. 293 (2008).

develop a contingency plan to manage the impact of external shocks on domestic participants.

3. International Competitiveness and Reputation

One of the major reasons for concern over the potential costs associated with the NZ ETS is their potential impact on the international competitiveness of New Zealand businesses and the attractiveness of New Zealand as a destination for foreign investment. Competitiveness risks arise because New Zealand firms will face an increase in the cost of doing business due to the requirement to pay for GHG emissions, whereas some international competitors will not face a comparable cost.[136] Reduced competitiveness is likely to result in a loss of market share, and may also result in the closure of New Zealand firms or relocation offshore. These kinds of loss are difficult to recover, even if overseas competitors are later exposed to a price on emissions. These losses also represent leakage of GHG emissions to jurisdictions with less stringent controls on emissions, rather than an overall environmental improvement through a reduction in total global GHG emissions. Loss of competitiveness could jeopardize the ability of New Zealand firms to attract foreign investors. Foreign investors may also be dissuaded from New Zealand if the NZ ETS causes a significant reduction in the value of sunk investments in emissions-intensive capital stocks that is damaging to New Zealand's international reputation for investment risk.[137] On the other hand, the NZ ETS may deliver some competitive advantages by preserving New Zealand's eco-friendly brand, encouraging more efficient business methods, and avoiding trade barriers against high-emitters.

It is not possible to know the exact nature and extent of the impact of the NZ ETS international competitiveness and foreign investment in advance. This is in part due to the uncertainty about NZ ETS costs that the risks to competitiveness and investment derive from. Other factors include what measures are taken to limit GHG emissions in other jurisdictions, whether trade measures against high emitters are introduced, and to what extent trends among investors to prefer climate-friendly investment continue.[138] The threats to competitiveness are not uniform across sectors. As discussed below in Part III, agriculture and forestry are thought to face high risks, along with some other trade exposed industrial producers. The government must conduct close monitoring of the impact of the NZ ETS on competitiveness and be flexible in

136. Some competitors reside in jurisdictions where there is no price imposed on GHG emissions, or at least the price is not imposed in relation to all GHGs and all sectors.

137. NZ ETS FRAMEWORK, *supra* note 5, at 60.

138. Influential investor organizations, such as the Investor Network on Climate Risk, which represents investment of approximately six trillion dollars of assets, increasingly invest with consideration to climate related risks, including regulatory and reputational risks. *See, e.g.* Investor Network on Climate Risk Website, http://www.incr.com (last visited November 18, 2008).

response. The main protection against competitiveness and foreign investment risks already built into the NZ ETS is free allocation as discussed below. Also, the significant delay in the commencement of obligations for agriculture also offers a degree of protection for that sector.

4. Allocation

Allocation refers to the manner in which emissions units are distributed to participants in an ETS. In theory, the method of allocation should have no long-term impact on cost-effectiveness. In practice, allocation methodology has real impacts on the fairness, cost-effectiveness, and political acceptability of an ETS, and it is often one of the most controversial issues in ETS design.[139] The two most relevant methods of allocation are administrative rules and sale by auction. Allocation by administrative rule is the most common practice in existing ETS. It involves allocating emissions units to participants, commonly on the basis of historical or forecast emissions or outputs.[140] Allocation by administrative rule usually means a free grant of emissions units to regulated participants. This is essentially a wealth transfer to regulated participants who will not have to pay for emissions up to the level of their grant, and therefore can lead to an inequitable distribution of the cost of emissions between regulated participants and general taxpayers. Participants still have an incentive to reduce emissions as doing so will give them surplus units to sell for profit. Free allocation creates a political constituency more favorable to regulation among the regulated participants. Allocation by administrative rule is also often only available to participants already in existence at the commencement of an ETS, a practice known as grandfathering. New entrants will have to buy their way into the scheme, unless a special reserve of emissions units for new entrants is set aside, as is sometimes the case. Grandfathering is also favored by the political constituency of existing regulated participants, but can result in inequitable treatment of new firms and can extend the period that older, dirtier capital stock is kept in use. Sales by auction are less common in practice, but are theoretically a more economically efficient method of allocation. In auctions, or similar types of competitive sales, participants compete with one another to buy emissions units, ensuring that units go to the participants that value them the most.[141] Auctions help to avoid many of the equity concerns associated with free allocation and grandfathering.

The initial allocation of NZUs to participants in the NZ ETS will be by a combination of free allocation and sale. Free allocation is one of the principal protections for industry in the absence of an independent national cap or a price control mechanism. Despite this, free allocation has a more limited role under the NZ ETS compared to other proposed and existing ETS. It is only available

139. TIETENBERG, EMISSIONS TRADING: PRINCIPLES AND PRACTICE, *supra* note 42, at 127–128.
140. DYER ET AL., *supra* note 47, at 16–17.
141. TIETENBERG, EMISSIONS TRADING: PRINCIPLES AND PRACTICE, *supra* note 42, at 128, 130.

within sectors deemed to include firms facing difficulties in passing the cost of emissions on to consumers, and then only for a pre-determined period of transition. Participants who exit the market will be required to surrender their free allocation. Within the industrial process sector, free allocation is available to only those participants who are considered to be "trade-exposed."[142] This trade-exposed sub-sector will receive free allocation equivalent to 90% of its 2005 emission levels, distributed to provide the most assistance to those firms likely to bear the highest costs as a result of the scheme.[143] The agricultural sector will also receive free allocation equivalent to 90% of its 2005 emissions levels.[144] Free allocation for industrial production and agriculture will be phased out on a linear basis from 2019 to 2030.[145] Although the fishing sector is not directly regulated under the NZ ETS, it will receive free allocation equivalent to 50% of its 2005 emissions levels for three years from 2011 to cushion the impact of the increased costs of transport fuel on the sector.[146] Pursuant in part to prior agreements, the government will assume liability for a total of 55 million tonnes of emissions from deforestation of exotic forests planted prior to 1990, equivalent to slightly more than 5% of New Zealand's pre-1990 forest estate.[147] To accomplish this, the government will provide some free allocation to pre-1990 forest owners, and will also exempt owners of *de minimis* forests from the scheme altogether.[148]

Free allocation in the early stages of the NZ ETS is the scheme's main protection against the cost and competitiveness risks discussed above. While initial allocations are relatively generous, it remains to be seen whether the linear reduction of free allocation down to zero according to a fixed timeframe from January 1, 2019 to December 31, 2029 proves appropriate.[149] There is a considerable chance that, by the time free allocation is scheduled to reduce, important competitors, particularly in the agriculture sector, will still not face a similar price on emissions. Adhering to a strict program of assistance reduction under such circumstances could threaten the survival of some New Zealand firms without producing any considerable global environmental benefit.

142. The factors relevant to determining whether a participant is "trade-exposed" for the purposes of the Act include, but are not limited to, whether the participant is in competition with a firm or firms outside of New Zealand and whether as a result the participant faces higher costs than such competitors due to the NZ ETS and is unable to pass on such costs due to competition. Climate Change Response Act, No. 40, 2002 (N.Z.), s. 73.

143. Climate Change Response Act, s. 73; NZ ETS FRAMEWORK, *supra* note 5, at 91–94.

144. Climate Change Response Act, s. 76; NZ ETS FRAMEWORK, *supra* note 5, at 98.

145. Climate Change Response Act, ss. 73, 76.

146. *Id*. at s. 75.

147. NZ ETS FRAMEWORK, *supra* note 5, at 75, 77.

148. Climate Change Response Act, ss. 71, 183.

149. Already, concerns about the stringency of the time frame has led the government to delay the commencement of free allocation phase-out by five years. Originally, phase-out was to commence in 2013 and reach zero by 2025. *See* Climate Change (Emissions Trading and Renewable Preference) Bill, 2007, Bill [187-2] (N.Z.) cl. 69–70 [hereinafter Bill [187-2]]; Bill [187-2] Commentary, *supra* note 50 at 19.

Clearly, strict implementation in such circumstances could be very damaging to the New Zealand economy and would not be cost-effective. The New Zealand government must retain flexibility to adjust allocation assistance in response to unpredictable future international developments. Publicly acknowledging the possibility of revising allocation assistance might beneficially provide some assurance to current and potential investors in the New Zealand economy.

Participants that are ineligible for free allocation will need to purchase NZUs from the government in order to receive an initial allocation. The mode of sale for NZUs has not been finalized, but should involve a transparent and competitive sale process, such as public auctioning. No free allocation whatsoever will be provided to the liquid fossil fuel, stationary energy or waste sectors.[150] Industrial producers who are not considered likely to be trade-exposed are also ineligible for free allocation.[151] There is no guarantee of any free allocation for new entrants to the market, although the possibility is not ruled out.[152] It is anticipated that at least some of the proceeds from the government sale of NZUs will be directed into the administration of the NZ ETS and to covering New Zealand's Kyoto Protocol obligations.

Allocation of emissions units by sale plays a more significant role in the NZ ETS than in other ETS. For example, in the first phase of the EU ETS, member states were only allowed to auction up to five% of emissions units, and only Denmark, Hungary, Ireland, and Lithuania exercised the option.[153] For participants that are not trade-exposed, sale of emissions units is appropriate because it puts the burden of paying for emissions on the emitters and thereby creates the incentive to reduce emitting practices. Although participants are generally not happy about the prospect of purchasing emissions units, opposition is not so strong that it is politically infeasible. Furthermore, sale of emissions is preferable to free allocation and grandfathering for environmental reasons and avoids discrimination against new firms. A competitive mode of sale should promote cost-effective distribution of emissions units and is preferable to free allocation in this respect. For these various reasons, the high level of allocation by sale in the NZ ETS is commendable.

5. Banking and Borrowing

Additional flexibility can be incorporated in an ETS by allowing participants to borrow or bank emissions units between compliance periods. Borrowing allows participants to use emissions units allocated for a future compliance period in advance, to cover actual emissions during an earlier compliance period. Banking allows participants to hold emissions units accrued

150. NZ ETS FRAMEWORK, *supra* note 5, at 81, 85–86, 102.

151. Climate Change Response Act, No. 40, 2002 (N.Z.), s. 77.

152. *Id*. at ss. 73, 76; *see, e.g.*, Bill [187-2] Commentary, *supra* note 149, at 19.

153. Frank J. Convery & Luke Redmond, *Market and Price Developments in the European Union Emissions Trading Scheme*, 1 REV. OF ENVTL. ECON. & POL'Y 88, 96 (2007).

during one compliance period for use in a later compliance period. Theoretically, the temporal flexibility offered by borrowing and banking will improve the cost-effectiveness of an ETS and reduce volatility in the price of emissions units.[154] The main concerns about borrowing are that it may delay the introduction of emissions abatement measures and increase the risk of future non-compliance by participants who are unable to make up for the borrowed units in future.[155] Opponents of banking argue that by shifting additional emissions allowances to the future, it can allow high concentrations of emissions in the future and can delay the achievement of the overall environmental goal represented by the emission reduction target.[156]

In the NZ ETS, participants are allowed to bank emissions units for use in future compliance periods, but borrowing NZUs will not be permitted.[157] Banking is a welcome inclusion in the NZ ETS because it provides flexibility to participants and rewards the early achievement of targets.[158] Because climate change is an environmental problem to be dealt with over the long-term, banking is not likely to cause any serious adverse environmental consequences.[159] The complaint that banking can lead to high concentrations of emissions in the future is overstated. In fact, by rewarding early action, banking encourages advances in emissions reductions technology which may allow for greater tightening of emissions caps in the future. It is not yet clear whether NZUs will be allowed to be banked from one Kyoto Protocol compliance period to another. Banking between compliance periods could further reduce compliance costs for participants and would be a particularly useful financial management tool for foresters, whose liabilities occur at concentrated times after having built up over several years.[160] The possibility of incorporating a borrowing option in the NZ ETS deserves further consideration, as firms facing stringent targets entailing competitiveness risks and adjustment costs could benefit from additional flexibility. In particular, allowing borrowing could mitigate the risks associated with price volatility in the international market by providing participants with an alternative source of units during a spike in international prices.

154. Tietenberg, *Tradable Permits in Principle and Practice*, *supra* note 86, at 85; *see* NZ ETS FRAMEWORK, *supra* note 5, at 53.

155. Dagan, *supra* note 66, at 62.

156. *Id*. at 62.

157. NZ ETS FRAMEWORK, *supra* note 5, at 41.

158. A. Denny Ellerman et al., EMISSIONS TRADING IN THE U.S.: EXPERIENCE, LESSONS AND CONSIDERATIONS FOR GREENHOUSE GASES 37 (2003), *available at* http://www.pewclimate.org/docUploads/emissions_trading.pdf.

159. TIETENBERG, EMISSIONS TRADING: PRINCIPLES AND PRACTICE, *supra* note 42, at 107.

160. *See* NZ ETS FRAMEWORK, *supra* note 5, at 45.

6. Monitoring, Reporting, and Verification

Reliable information about the emissions produced by participants in an ETS is vital to its integrity and effectiveness. Incorrect information interferes with the price of emissions units and the attainment of environmental goals of the scheme. In turn, incorrect information undermines investor confidence in the ETS market and the basis upon which participants plan to either reduce emissions or purchase emissions units.[161] Emissions must be monitored accurately and consistently across participants and the collected data must be timely reported to both the regulator and the market.[162] Further, for confidence, the regulator must be able to verify that reported emissions data is correct. Therefore, robust monitoring, reporting, and verification (MRV) systems must be included in the design of any ETS.

There are a number of different MRV options, with differing levels of cost and accuracy.[163] Some emissions can be measured directly. The most accurate technology for direct measurement—continuous emission monitors—is also relatively expensive.[164] Alternatively, emissions can be calculated with the use of proxies. For example, monitoring of fuel flows can be used as a proxy for carbon dioxide emissions.[165] Virtually all ETS rely on some degree of self-reporting coupled with external oversight.[166] The choice of MRV options depends on a range of factors, including what types of gas and emitting activities are sought to be monitored, the availability of reasonable proxies as a substitute for direct measurement, and cost.

A number of decisions regarding MRV in the NZ ETS are not yet finalized. The NZ ETS will be highly dependant on self-assessment and self-reporting by the participants. The monitoring and reporting obligations of participants will include collecting prescribed data and information, calculating their emissions using approved methodologies, retaining records, reporting on activities and emissions levels, and surrendering emissions units on an annual basis.[167] Precisely what data, information, methodologies, and records remains to be specified by regulation.[168] Some participants may be required to have data, information, and/or emissions calculations confirmed by an approved

161. *See* Joe Kruger & Christian Egenhofer, *Confidence Through Compliance in Emissions Trading Markets*, 6 SUSTAINABLE DEV. L. & POL'Y 2, 3 (2006).

162. *Id*.

163. INTERNATIONAL EMISSIONS TRADING ASSOCIATION [IETA], *Linking EU–Canada Emissions Trading Systems* 5–7 (Internal Draft ver. 3) (2005), *available at* http://www.canada-europe.org/en/pdf/Linking_EU_Canada_Emissions_Trading_Systems_Sept_2005.pdf.

164. Dagan, *supra* note 66, at 56–57.

165. TIETENBERG, EMISSIONS TRADING: PRINCIPLES AND PRACTICE, *supra* note 42, at 169.

166. *Id*. at 166.

167. Climate Change Response Act, No. 40, 2002 (N.Z.), ss. 62, 66; NZ ETS FRAMEWORK, *supra* note 5, at 51.

168. The Climate Change Response Act introduces a power to regulate for this purpose. Climate Change Response Act, s. 163.

verifier.[169] What participants will be required to use verifiers, the qualifications for verifiers, and other relevant details, will be specified by regulation.[170] Participants will be presumed to be in compliance, unless the regulator finds reason to challenge that presumption.[171] Although the level of difficulty in accurately monitoring or calculating emissions will vary according to the nature of the gas, the emitting activity, and the participant concerned, little detail is given on how these discrepancies will be handled.[172]

The role of the regulator in MRV will be to verify compliance by auditing the records of participants, targeting its efforts at participants thought to pose the greatest risk of non-compliance.[173] The regulator will have the authority to obtain records and require the participants to give further information.[174] In addition, the regulator will have some powers to conduct physical inspections or to directly collect data.[175]

The lack of detail on MRV included in the NZ ETS is worrisome. MRV must not be an afterthought because it is crucial to the integrity of an ETS and requires advanced planning the capacity-building by both regulators and participants. Prompt action needs to be taken in the area of MRV, especially since New Zealand businesses and government agencies have limited experience with emissions reporting sufficient to support robust emissions trading. Although the government currently receives some data about GHG emissions from industry, reporting is on a voluntary basis and a single set of standards has been lacking to date.[176] The provisions for voluntary and mandatory emissions reporting prior to the commencement of unit obligations are therefore welcome.[177] Another promising step would be to designate the government agency that will be responsible for collecting and verifying emissions data so that capacity-building can begin in earnest. The particular MRV difficulties posed by agriculture and forestry are considered in Part III.

Different approaches are available to ensure the accuracy of reported information. Only a fairly light-handed approach to supervising participants is presently mandated in the Act. The system could be strengthened to enhance

169. *Id*. at ss. 62, 92.

170. *Id*. at ss. 62, 92, 163.

171. NZ ETS FRAMEWORK, *supra* note 5, at 51.

172. The difficulty in measuring emissions at the farm level in the agricultural sector is acknowledged in the NZ ETS Framework. NZ ETS FRAMEWORK, *supra* note 5, at 32, 97.

173. NZ ETS FRAMEWORK, *supra* note 5, at 51–52.

174. Climate Change Response Act, No. 40, 2002 (N.Z.), ss. 94-95.

175. *Id*. at s. 100.

176. Reporting firms usually choose between one of two approaches to organizational GHG accounting, *ISO 14064 Part 1, Greenhouse gases: specification for the quantification, monitoring and reporting of organizational emissions and removals*, developed by the International Organization for Standardization, and the *Greenhouse Gas Protocol: A Corporate Accounting & Reporting Standard*, developed by the World Resources Institute and the World Business Council for Sustainable Development. Email from Stuart Frazer, Director, Frazer Lindstrom Limited, to the author (Nov. 10, 2007) (on file with author).

177. *See* Climate Change Response Act, ss. 218–219.

compliance and confidence. MRV has two distinct components; the first is to ensure initial compliance, the second to ensure continuous compliance.[178] With respect to the first, MRV aims to ensure that emissions measurement and control equipment satisfies standards at the time that a participant first enters an ETS. For example, before emitting, installations covered by the EU ETS and the United States ETS programs for sulfur dioxide (SO_2) and NO_X must develop a monitoring plan and submit it to the regulator for approval.[179] In the United States schemes, installations must subsequently submit results from certification tests to the regulator in order to obtain permission to operate. [180] Some member states in the EU ETS require the installation of appropriate monitoring equipment to be verified by the regulator or an approved independent third party. The Act does not address MRV for initial compliance in detail. This seems to imply that participants will have no reporting requirements until the end of a compliance period during which they have emitted. This invites poor quality monitoring by participants and discrepancies in the standards of monitoring applied by like participants, neither of which is easy to remedy *ex post*. Such problems may be exacerbated if the regulating agency is not empowered to prescribe the use of particular monitoring equipment.[181]

Policy provisions for the second component of MRV, continuous compliance, also seem under-developed and may fall short of EU ETS and United States SO_2 and NOx ETS standards. A key factor is the level of external supervision. In the United States, participants are required to report emissions quarterly, and all reports are screened and audited by the regulator for errors using sophisticated software. Suspect reports are followed up by field investigations, which can involve on-site physical inspection and testing of equipment. In addition, random field reports increase the incentive to ensure accurate reporting.[182] In the EU ETS, the annual self-reported data is all independently verified, usually by a government-approved independent verifier with technical expertise in emissions measurement. Under the NZ ETS, reporting is on an annual basis.[183] Verification will focus on participants identified as presenting a high risk of non-compliance.[184] It is not clear precisely how such participants will be identified, or what verification measures will be applied to them. Requirements for third-party verification lack detail, as do plans to conduct field inspections to scrutinize equipment.

178. TIETENBERG, EMISSIONS TRADING: PRINCIPLES AND PRACTICE, *supra* note 42, at 166.

179. Kruger & Egenhofer, *supra* note 161, at 4, 6.

180. *Id*. at 3.

181. The Climate Change Response Act provides for further regulations to be made to assist with MRV, but does not provide expressly (nor, arguably, impliedly) a power to regulate for the use of particular monitoring equipment. Climate Change Response Act, No. 40, 2002 (N.Z.), s. 50.

182. Kruger & Egenhofer, *supra* note 161, at 4–5.

183. Climate Change Response Act, s. 65. The exception is that certain participants conducting non-forestry removal activities may elect to report on a quarterly basis. *Id*. at s. 66.

184. NZ ETS FRAMEWORK, *supra* note 5, at 52.

Stronger measures should be adopted to improve the quality external verification in the NZ ETS. With less than 200 non-forestry participants, more robust MRV is a reasonable goal.

The framework for MRV in the NZ ETS has potential, but, in general, more detailed rules for standardized MRV need to be elaborated. At present, the preference seems to be to leave much of this task to the discretion of the regulating agency. While, to some degree, agency promulgated regulations will be desirable given the need for evolution in the NZ ETS, more details might have been fixed by the legislature in order to ensure sufficiently complete and high standards. Going forward, New Zealand should follow the lead of the United States by taking advantage of software and information technology systems to allow for sophisticated MRV. Because the regulator and participants in the NZ ETS share an interest in accurate and consistent MRV, it would be desirable for participants to contribute to MRV rule formulation on an ongoing basis, possibly through the establishment of committees.[185] Ideally, all reported information should be internet-accessible to increase the chance that non-compliance with accurate reporting requirements will be detected and to enhance the transparency and credibility of the NZ ETS.[186] The government is understandably concerned about the administrative costs of MRV for both the regulator and participants.[187] However, the administrative costs of proper MRV would pale in comparison to the sunk costs of an ETS that does not operate effectively and is unacceptable for international linking due to inadequate MRV.

7. Compliance and Enforcement

Hand in hand with MRV, ETS depend fundamentally on adequate compliance and enforcement. Compliance is essential to the proper functioning of an ETS market.[188] Compliance depends on quality MRV and on the certainty that strong penalties will be enforced against non-compliers. Penalties should considerably outweigh the cost of compliance in order to remove incentives to under-report emissions (to evade the requirement to purchase emissions units or to generate a valuable surplus of emissions units).[189] Penalties may be automatic or discretionary, and can include fines, loss of permit allocations, criminal penalties, or a combination thereof.[190]

185. The Chicago Climate Exchange allows members to contribute to rule-making through the use of committees and meetings. Sandor, *Creating New Markets*, *supra* note 43, at 399, 401.

186. *See, e.g.*, Kruger & Egenhofer, *supra* note 161, at 5.

187. NZ ETS FRAMEWORK, *supra* note 5, at 52.

188. *INECE Workshop On "Confidence Through Compliance In Emissions Trading Markets": Conference Report*, 6 SUSTAINABLE DEV. L. & POL'Y 14, 15 (2006) ("In designing an effective emissions trading system, methods of achieving compliance and enforcement must be considered first and foremost."); Tietenberg, *Tradable Permits in Principle and Practice*, *supra* note 86, at 71.

189. Tietenberg, *Tradable Permits in Principle and Practice*, *supra* note 86, at 71–72.

190. *See, e.g.*, IETA, *supra* note 163, at 7.

Participants who fail to comply with their obligations under the NZ ETS to surrender emissions units sufficient to cover their emissions ("surrender shortfall") and to meet monitoring, reporting and record-keeping requirements will face civil, and in some cases, criminal penalties. Civil penalties include make-good provisions, financial penalties, and public disclosure of non-compliance. Participants with surrender shortfall will have to make-up the shortfall (at a ratio of 1:1, or 2:1 in the case of a knowing failure) and pay a financial penalty (NZ$30 per t$CO_2$-e of emissions, or NZ$60 per tCO_2-e in the case of a knowing failure), and will have their identity and nature of non-compliance made public.[191] Other types of infringements will result in fines, which will ratchet up if a participant repeats infringement. In addition, a knowing failure to meet any type of obligation can expose participants to criminal penalties, including larger fines and criminal conviction.[192]

Compliance and enforcement is critical to the success of the NZ ETS. Participants in the NZ ETS share an interest in ensuring compliance with the regulator, because it will impact the value of NZUs.[193] The nature of the financial, make-good, and public disclosure penalties for surrender shortfall is in accord with general international practice.[194] As the NZ ETS market becomes more mature, and the market price of NZUs more easily identifiable, the fixed-sum financial penalty per tCO_2-e could be replaced by a financial penalty that is a multiple of the market price, in order to ensure that the penalty for non-compliance bears a consistent relationship to the costs of compliance. A fixed-sum minimum penalty could be retained if there is ongoing volatility in NZU prices.

It is preferable that civil penalties for non-compliance be non-discretionary and automatic, at least after an initial grace period is passed. The NZ ETS scheme design allows for penalties to be administered in this manner, and only explicitly provides discretion to reduce penalties where persons have voluntarily disclosed non-compliance.[195] Experience overseas has indicated that the certainty of a penalty for non-compliance encourages participants to focus on achieving low-cost compliance, rather than beleaguering the system with political and legal challenges to the application of discretionary penalties.[196] Criminal penalties should also be enforced strongly to ensure maximum compliance.

191. Climate Change Response Act, No. 40, 2002 (N.Z.), ss. 134, 136.

192. *Id*. at s. 129–136; NZ ETS FRAMEWORK, *supra* note 5, at 55.

193. *See* Kruger & Egenhofer, *supra* note 161, at 3.

194. *See* Sterk et al., *supra* note 45, at 81 (on international practice).

195. Climate Change Response Act, No. 40, 2002 (N.Z.), ss. 134, 136.

196. Civil penalties are non-discretionary and automatic in the EU ETS and in the United States SO_2 and NO_X programs. Kruger & Egenhofer, *supra* note 161, at 5, 7.

8. Timing, Pilot Schemes, and Intellectual Ratification

a. Timing and Information Discovery

The NZ ETS is planned to be implemented relatively soon and over a short period of time. The scheme will cover over half of the New Zealand economy within three years of its January 2008 commencement, and by 2013 virtually all of the New Zealand economy will be exposed to a price on emissions. Further, all assistance for participants is scheduled to be completely phased out by 2030. No other ETS has set such a rapid schedule for such an ambitious program. Although the timeframes in the NZ ETS extend over a number of years, they are fairly short given the time that it takes to develop new markets and the nature of business and political cycles.

Major information gaps exist around how successfully an ETS will guide New Zealand towards the lowest cost emissions reductions and what the economic cost of emissions units will be.[197] But provided that the government is firm in its intention to proceed with emissions trading, the case for commencing soon to enhance information, institutional capacity, and skills is strong.[198] Markets are information revealing devices, and it is widely observed that the best way to resolve such uncertainties is to begin trading. Further, although lessons from analogous experiences are valuable, beginning trading is also the best way to build institutional capacity and expertise specific to operating a GHG market, including market regulators, third-party verifiers, trading platforms and exchanges, brokers and other intermediaries, and more. But the desirability of "learning by doing" does not automatically justify economy-wide changes and complete devolution of liabilities for GHG emissions to the private sector. As the phrase suggests, some learning is required in advance of such major action.

b. Pilot Schemes

Successful markets typically result from multiple stages of development. One of the key preliminary stages is the operation of pilot trading schemes.[199] Pilot trading schemes facilitate institution and skill building, and information gathering, without putting too much at risk.[200] Pilot projects preceded the establishment of the Chicago Climate Exchange and some national ETS in Europe.[201] The 2005–2007, pre-Kyoto commitment period, phase of the EU

197. On these information gaps, *see* Richard Sandor et al., *Greenhouse-Gas-Trading Markets*, 360 PHIL. TRANSACTIONS: MATH., PHYS., & ENG'G SCI. 1889, 1889 (2002).

198. *Id.* at 1893.

199. Sandor, *Creating New Markets*, *supra* note 43, at 389, 404; Sandor et al., *Greenhouse-Gas-Trading Markets*, *supra* note 197.

200. Sandor, *Creating New Markets*, *supra* note 43, at 389.

201. For example, prior to launching a full national ETS, the United Kingdom launched a pilot program open to all sectors except transport and power generation and covering all six GHGs. By 2002,

ETS also served as a pilot to the current phase. Further expansion of the EU ETS is anticipated, but decisions about how and when to do so have been left for the future. Two separate pilot projects were conducted in Canada between 1996 and 2002.[202] Japan is currently undertaking a pilot project involving fifty facilities.[203] State ETS in Australia[204] and the United States[205] will be able to inform the development of national ETS in those countries.

The NZ ETS is not preceded by a pilot project, and cannot be considered to involve a true pilot phase. Although New Zealand can draw some valuable lessons from overseas, it is wrong to assume that overseas experience will necessarily be replicated in New Zealand, especially given the unique characteristics of New Zealand as discussed above in Part I. The NZ ETS is in many ways without precedent. Some aspects of the NZ ETS resemble a piloting approach, including voluntary and mandatory reporting in advance of unit obligations for certain sectors and also the phased introduction of sectors into the scheme. But the hallmarks of a true pilot phase are missing. First, flexibility to adapt the scheme on the basis of its earliest phases is limited by fixing a timeline for introducing all sectors in advance. Second, the applicability of lessons from the earliest phases to later phases is limited. The lessons from the first introduced sectors, forestry, industrial process and stationary energy, could not be expected to answer many of the questions raised in relation to other sectors, such as waste and agriculture. Third, the time available for learning is restricted, with sectors being added in relatively quick succession. The NZ ETS is a considerable leap into the unknown. It may be favorable to retain more flexibility in the timeframes set out in the scheme, in recognition that markets do not suddenly spring up but evolve gradually in response to changing circumstances and improved information. In those sectors where more time remains before introduction, limited scale pilot trading projects, possibly involving voluntary participation, should be seriously considered. Participation in pilot schemes is likely to be the most productive way to engage stakeholders in formulating the rules for future market operations.[206]

Denmark and the Netherlands also had pilot schemes in operation. Richard Black, *Emissions Trading Launches in UK*, BBC NEWS, Apr. 2, 2002, http://news.bbc.co.uk/1/hi/sci/tech/1906322.stm; Sandor et al., *Greenhouse-Gas-Trading Markets*, *supra* note 197 at 1894; *see* Sandor, *Creating New Markets*, *supra* note 43, at 393.

202. The two programs were the Ontario-Quebec Pilot Emissions Reduction Trading program conducted 1996–2000 and Greenhouse Gas Emissions Reductions Trading program, conducted 1998–2002. *See* Sterk et al., *supra* note 45, at 29.

203. The project is called the Japanese Voluntary Emissions Trading Scheme. *See id*. at 34–36.

204. Such as the New South Wales Greenhouse Gas Abatement Scheme. *See id*. at 41.

205. Such as the Regional Greenhouse Gas Initiative. *See id*. at 51.

206. Sandor, *Creating New Markets*, *supra* note 43, at 401.

c. External Review and Intellectual Ratification

Another feature of a successful, multi-stage development of new markets has been termed "intellectual ratification" of market design features by leading experts. Since a fully functioning ETS for GHGs will require special financial, technological and other innovations, close scrutiny by relevant independent experts is necessary to be confident that the proposal is feasible and to enhance public acceptability.[207] For example, a large external advisory board comprising academics, scientists, environmentalists, self-regulatory organizations, and business leaders was assembled to evaluate the market architecture proposed for the Chicago Climate Exchange.[208] Although the government had earlier invited public submissions on climate change policy in general, it did not invite further public submissions following the decision to design the NZ ETS policy. The government has solicited some external reviews relating to the NZ ETS design.[209] Going forward, the Act requires reviews of the NZ ETS by a panel with a majority of members from outside of the public sector, with the first to be completed by April 2011.[210] It is essential that robust internal and independent reviews of the NZ ETS are conducted and effectively communicated to policy-makers on an ongoing basis. It should consider appointing an advisory panel of independent experts to evaluate the NZ ETS on an ongoing basis to increase confidence that the design is well conceived and enhance the credibility of the NZ ETS for the public and investors.

III. AGRICULTURE AND FORESTRY

New Zealand is the first country to grapple with the challenge of including agriculture and forestry in a national ETS. Thus, the inclusion of these sectors in the NZ ETS warrants special attention. As mentioned in Part I, New Zealand's unique GHG emissions profile is heavy on agricultural emissions and incorporates substantial forestry sinks. It demands that measures to mitigate emissions from these sectors, particularly from agriculture, be addressed. Other countries, despite bearing different emissions profiles to New Zealand, also have incentives to reduce agriculture- and forestry-related emissions. The NZ ETS experience may influence whether other countries consider emissions trading as a feasible regulatory tool in these sectors.

207. *Id*. at 389–390, 399.

208. *Id*. at 399, 404–05.

209. *See, e.g.*, Letter from IEA to MED, *supra* note 38; SUZI KERR, MOTU ECONOMIC AND PUBLIC POLICY RESEARCH, REVIEW OF PROPOSED NEW ZEALAND EMISSIONS TRADING SYSTEM (2007), *available at* http://www.mfe.govt.nz/publications/climate/review-proposed-nz-ets-nov07/review-proposed-nz-ets-nov07.pdf; POINT CARBON, ISSUES IN THE INTERNATIONAL CARBON MARKET, *supra* note 90; POINT CARBON, FUNCTIONALITY IN THE INTERNATIONAL CARBON MARKET REDUCTION PROJECT MARKET (2007), *available at* http://www.mfe.govt.nz/publications/climate/functionality-international-carbon-reduction-market-07/functionality-international-carbon-reduction-market-07.pdf.

210. Climate Change Response Act, No. 40, 2002 (N.Z.), ss. 160-161.

A. Agriculture

New Zealand's proposal to include agriculture in its ETS is a world first. Agricultural GHG emissions mainly comprise CH_4 and N_2O from livestock produced by enteric fermentation and manure management (livestock emissions) and N_2O from synthetic fertilizer use and soil tilling (soil emissions). Including agriculture presents a number of serious difficulties, which have proved enough to deter the incorporation of agriculture into all other ETS. Because agriculture contributes nearly half of all of New Zealand's GHG emissions, New Zealand cannot afford to ignore this sector in its climate change policy. Although including agriculture in the NZ ETS presents difficulties, many of these difficulties are common to other potential policies for reducing GHG emissions. Including agriculture within a comprehensive ETS rather than dealing with the sector in isolation should ultimately allow the agricultural industry greater flexibility to achieve reductions and improve the overall coherence of New Zealand's climate change policy.

1. Challenges of Including Agriculture

a. Equity and Competitiveness Concerns

One of the main complaints against including agriculture in the NZ ETS is that obligations may impose greater hardship in agriculture than on other sectors. First, New Zealand agricultural production is already highly efficient.[211] Although there have been some considerable advances in knowledge and technology to reduce N_2O emissions,[212] practical, cost-effective measures for reducing CH_4 from livestock emissions (apart from reducing stock numbers or productivity) are yet to be identified.[213] Also, as farmers are usually price-takers, it is likely that the price of emissions will not be passed down the supply chain to consumers but will be deducted from farm profits. Further compounding the hardship is that agriculture is New Zealand's most trade-exposed industry and many key competitors are not exposed to any price on emissions.

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211. Drivers of agricultural efficiency include advance technology and management and the need to compensate for geographical isolation from export markets. NZ FOURTH NATIONAL COMMUNICATION, *supra* note 8, at 31. Also, New Zealand government subsidies and support to agriculture is the lowest in the OECD. *Id*. Agricultural producer support fell from over 30% of farm receipts in the mid-1980s to 2% in 2001–2003. *Id*.

212. Research shows that large reductions in nitrogen oxide emissions from soil can be achieved while making soil more productive and profitable. SUSTAINABILITY COUNCIL OF NEW ZEALAND, A CONVENIENT UNTRUTH ii (2007), *available at* http://www.sustainabilitynz.org/docs/AConvenient UntruthJune07.pdf. Feeding cattle a diet less rich in nitrogen can also reduce emissions while keeping milk production constant. *Id*. Other techniques for reducing emissions include improving soil drainage, soil liming, and breeding new grasses. *Id*. The extent to which these techniques are cost-effective remains to be clearly determined. *Id*.

213. GOVERNMENT RESPONSE TO FEEDBACK ON NZ ETS, *supra* note 84, at 24.

b. Point of Obligation and Incentives

Further difficulties with including agriculture are posed by choosing a point of obligation for the sector. No single point of obligation in the agricultural supply chain provides both incentives to reduce emissions and administrative convenience. The government has expressed a preference for placing the point of obligation upstream with fertilizer producers in the nitrogen fertilizers sub-sector of the agriculture sector. While this conveniently limits the number of participants to administer, the price signal it creates only relates to the levels of fertilizer bought and sold and therefore does not transmit an incentive for farmers to practice low-till or no-till soil management to reduce soil emissions. These incentives could be captured if obligations were placed directly on farmers, but with over forty thousand farming businesses in New Zealand this would be burdensome administratively and impose heavy transaction costs on small farmers.[214] In the livestock sub-sector, there is not yet a clear preference between designating a point of obligation upstream, resting on farmers, or midstream, on either farmer-representative bodies or on dairy and meat processors. Again, the decision is likely to involve a trade-off between administrative convenience and the provision of incentives for additional abatement activities such as manure management or the capture of CH_4 emissions for recycling into energy.

c. MRV Challenges

Compounding the challenge of structuring incentives are difficulties with MRV. The most convenient units of measurement for monitoring agricultural emissions are imprecise and insensitive to subtle changes in agricultural practices that can generate real emissions reductions. Emissions measurements are calculated using proxies such as animal numbers, productivity, or fertilizer purchased.[215] Again, incentives for practices like no-till or manure management are not created, and while measures could be developed to estimate emissions abatement from these practices, they would likely have to rely on generalized proxies. Because no particularly direct or accurate means of measuring or verifying agricultural emissions is yet feasible, there is a risk that reported emissions data will be inaccurate and therefore undermine the entire NZ ETS. Hopefully, the requirement that agricultural participants commence reporting on emissions one to two years prior to facing unit obligations under the NZ ETS should help to generate solutions to MRV problems. Public and

214. NZ ETS FRAMEWORK, *supra* note 5, at 97; MINISTRY OF AGRICULTURE AND FORESTRY, SUSTAINABLE LAND MANAGEMENT AND CLIMATE CHANGE 50 (2006), *available at* http://www.maf.govt.nz/climatechange/consultation/discussion-document/slm-and-cc-full.pdf.

215. *Id.* at 50.

private investment for research and development of agricultural MRV technologies and practices is also essential.[216]

d. Need for Assistance to Agriculture

The NZ ETS and supporting policies provide substantial assistance to agriculture. First, the delay in submitting agriculture to emissions trading requirements until 2013 effectively exempts the sector from meeting the cost of emissions over the next five years, allowing some headroom for adjustment. Next, the 90% free allocation level described in Part II is relatively generous. Also, the government is actively supporting research and development of agricultural abatement practices and technologies.

More flexibility in support for agriculture may, however, be required given the inherent uncertainties related to this sector. Free allocation may need to be more or less generous, differentiated between different types of farmers, and made available for a longer period of time. In 2013, New Zealand's agricultural sector may be the world's only agricultural sector subject to an ETS, and so a fixed-scale phase-out of assistance complete by the end of 2029 may be unrealistic. Because of the importance of this sector to the New Zealand economy, the government must carefully monitor and support the balance between adaptation of agriculture to emissions constraints and the continued profitability of farming.

2. Benefits of Including Agriculture

While the obstacles to including agriculture in the NZ ETS are genuine, they are not insurmountable. In any case, agriculture represents far too big a portion of New Zealand's economy and GHG emissions profile to go unaddressed in the near or long-term. Since some form of regulation in relation to agricultural emissions is essential, it makes sense to incorporate it in the comprehensive ETS. The integrated approach is likely to give the agricultural sector more access to cost-effective solutions.

Although there are currently difficulties in monitoring emissions at the farm level, the next-best alternative of calculating emissions at the level of fertilizer importers and producers and dairy and meat processors is more feasible.[217] Voluntary reporting of agricultural emissions, scheduled to begin

216. The government has provided a number of grants for projects aimed at developing techniques for monitoring of emissions from both agricultural and forestry practices, including projects focusing on the following key aspects—improvement of agricultural activity data, including statistics; agriculture inventory "best practice"; agriculture mitigation technology incorporation and monitoring; agricultural projections and net position; measurement of emissions and sinks from soils. Total grants so far are worth approximately NZ $1.3 million. For further information, *see* New Zealand Ministry of Agriculture and Forestry Website, Climate Change National Inventory Research Grants, http://www.maf.govt.nz/climatechange/slm/gg-grants.htm (last visited Oct. 13, 2008).

217. NZ ETS FRAMEWORK, *supra* note 5, at 97–98.

January 1, 2011,[218] and mandatory reporting, required from all agricultural participants from January 1, 2012,[219] will provide valuable lessons. Additional regulatory tools such as subsidies or direct regulation may be needed to complement the NZ ETS to insure that farmers are exposed to a full range of incentives to adopt the best emissions abatement practices. Pilot monitoring and trading schemes should be introduced as early as possible to assist with preparations for mandatory participation of the agriculture sector in the NZ ETS in 2012.[220] Including agriculture establishes a firm incentive to develop more sophisticated techniques for reducing agricultural emissions. It is consistent with the governments aim to encourage New Zealand businesses, already leading providers of agricultural technologies, in pursuing potentially huge economic opportunities in the international market.

B. Forestry

With the commencement of forestry obligations in January 2008, New Zealand became the first country to include forestry in a national ETS. While the government signaled its intention to introduce controls on deforestation in 2002, the decision to do so by including forestry in the NZ ETS is much more recent.[221] The inclusion of forestry reflects the important role it has in New Zealand's economy and GHG emissions profile, and the broad approach of the NZ ETS.

Forests sequester CO_2 from the atmosphere. Under the Kyoto Protocol, New Zealand is liable for its emissions associated with deforestation, and can earn credits for any net increase in forests planted after 1989 (afforestation or reforestation) during a commitment period.[222] The government has mirrored the obligations of the Kyoto Protocol in the NZ ETS, drawing a distinction between forests created before and after January 1, 1990.[223] Owners of forests planted pre-1990 are responsible for deforestation of those forests, and must surrender emissions units equivalent to the emissions from such

218. Climate Change Response Act, No. 40, 2002 (N.Z.), s. 218.

219. *Id*. at s. 219.

220. The government has said that it will encourage a pilot of farm-level monitoring and reporting in preparation for agriculture's entry into the NZ ETS. MINISTRY OF AGRICULTURE AND FORESTRY, NEW ZEALAND'S CLIMATE CHANGE SOLUTIONS: SUSTAINABLE LAND MANAGEMENT AND CLIMATE CHANGE PLAN OF ACTION 12 (2007).

221. The decision to include forestry flowed from the government's decision to adopt an economy-wide emissions trading scheme after receiving submissions on its December 2006 discussion document, *Sustainable Land Management and Climate Change*. MINISTRY OF AGRICULTURE AND FORESTRY, FORESTRY IN A NEW ZEALAND EMISSIONS TRADING SCHEME, ENGAGEMENT DOCUMENT 3 (2007), *available at* http://www.maf.govt.nz/climatechange/background-reports-and-analysis/forestry-in-nz-emissions-trading-scheme/forestry-in-NZ-emissions-trading-scheme.pdf [hereinafter ENGAGEMENT DOCUMENT].

222. The Kyoto Protocol units earned by forestry sinks are Removal Units (RMUs).

223. GOVERNMENT RESPONSE TO FEEDBACK ON NZ ETS, *supra* note 84, at 7.

deforestation.[224] Owners of forests planted post-1989 are able to voluntarily opt-into the NZ ETS, and those who do so will receive NZUs to the extent that stocks increased after January 1, 2008, and face liabilities for any reductions.[225]

1. Challenges of Including Forestry

a. Competitiveness Concerns and Allocation

As with agriculture, the inclusion of forestry in the NZ ETS has raised international competitiveness concerns because it is a trade-exposed industry and foreign forestry industries are not burdened with the cost of compliance with an ETS. On the whole, the allocation assistance provided by the government described in Part II should shield the industry to a significant degree. There is difficulty, however, with insuring that assistance is distributed equitably between different forest owners and leasholders. Pricing forestry emissions will have differential impacts depending on the alternative uses that a particular parcel of forest land could be put to.

b. MRV

The main difficulty with including forestry in the NZ ETS is with MRV. It is very difficult to accurately estimate the capacity of a particular forest to sequester CO_2, and the more accurate methods are expensive.[226] New Zealand's election on reporting requirements under the Kyoto Protocol illustrates that different approaches can yield disparate results. New Zealand elected not to conduct full carbon stock accounting for its pre-1990 forests as analysis suggested that this would increase New Zealand's net Kyoto liability. New Zealand *is*, however, obligated to conduct full carbon stock accounting for its post-1989 forests.[227] The NZ ETS mirrors the Kyoto Protocol by requiring that owners of pre-1990 forests report annually any area that has been deforested,[228] whereas owners of post-1989 forests have to submit carbon stock assessments. Settling on assessment methodologies for forests for the NZ ETS is also not straightforward and will create winners and losers. As discussed in

224. Subject to certain exemptions relating to owners of forests of less than 50 hectares and de minimis deforestation.

225. Owners of post-1989 forests who do not opt into the NZ ETS can opt into other schemes operated by the government, including the Afforestation Grants Scheme (expected to appeal mostly to smaller forest-owners) and the Permanent Forest Sink Initiative. GOVERNMENT RESPONSE TO FEEDBACK ON NZ ETS, *supra* note 84, at 9.

226. CLIMATE ACTION NETWORK EUROPE, CNE POSITION ON LAND USE, LAND USE CHANGE, AND FORESTRY (LULUCF) 1 (2006), *available at* http://www.climnet.org/Position%20papers/LULUCF/Cnesinks.pdf.

227. GOVERNMENT RESPONSE TO FEEDBACK ON NZ ETS, *supra* note 84, at 7.

228. *See* ENGAGEMENT DOCUMENT, *supra* note 221, at 29.

Part II, inaccurate information reporting caused by inadequate MRV can seriously undermine the integrity of an ETS.

c. Linkage

Distrust of MRV is one of the reasons why forestry is not included in the EU ETS and that Kyoto credits generated from land use change and forestry cannot currently be imported into the EU ETS. Other reasons behind the exclusion of forestry from the EU ETS include a long-standing reluctance on the part of European countries to "embrace carbon sequestration as an important component" of greenhouse gas emissions management.[229] Also, the articulated purpose of the EU ETS is to reduce fossil fuel related emissions in the EU, mainly by driving technology for emission abatement improvements from energy and industrial sources.[230] This EU attitude may create a barrier to the future possibility of linking the NZ ETS with the EU ETS.

2. Benefits of Including Forestry

The present exclusion of forestry from the EU ETS does not necessarily indicate that including forestry in the NZ ETS is a misguided step. The European position may change in the not too distant future; the British, French, Dutch, and Spanish governments are among those who have expressed support for inclusion of forests in the EU ETS.[231] Outside of Europe, many countries, including the United States, Australia and several developing countries advocate a more prominent role for land use, land use change, and forestry in international GHG emissions management.[232] The important role of forest sequestration was recently re-emphasized at the thirteenth conference of the parties to the UNFCCC.[233] In this context, the recognition of forestry in trading schemes seems likely to grow rather than pose an ongoing obstacle to linking.

Good reasons exist for including forestry in the NZ ETS. Reducing deforestation is expected to be one of New Zealand's lowest cost opportunities for domestic abatement during the first Kyoto Protocol commitment period. Including forestry in the NZ ETS is therefore likely to increase its overall cost-

229. Sandor et al., *Greenhouse-Gas-Trading Markets*, *supra* note 197, at 1894.

230. *See* ROBERT O'SULLIVAN ET AL., LOCAL AND GLOBAL BENEFITS OF INCLUDING LULUCF CREDITS IN THE EU ETS 1 (2006), *available at* http://www.climatefocus.com/newspubs/downloads/publications/LULUCF_EUETS_benefits.pdf.

231. TOBY JANSON-SMITH, THE CENTER FOR ENVIRONMENTAL LEADERSHIP IN BUSINESS, FOREST CARBON CREDITS AND EMISSIONS TRADING WITHIN THE EUROPEAN UNION—AN EMERGING OPPORTUNITY? (2007), http://www.celb.org/xp/CELB/news-events/features/euets.xml.

232. O'SULLIVAN ET AL., *supra* note 230, at 5.

233. The Bali Action Plan agreed by the parties called for "[e]nhanced national/international action on mitigation of climate change, including . . . [p]olicy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries." U.N.F.C.C.C., Bali Action Plan, Decision -/CP.13 (2007), *available at* http://unfccc.int/files/meetings/cop_13/application/pdf/cp_bali_action.pdf.

effectiveness and provide participants from other sectors with access to lower cost emissions reductions. It will also improve the liquidity of the NZ ETS and provide incentives to slow down current rates of deforestation and maximize sequestration.[234] Since some form of regulation in relation to forestry emissions and sequestration is necessary, it makes sense to incorporate forestry in the comprehensive, economy-wide ETS. Alternative forms of regulation would not necessarily avoid the need for MRV in relation to forests, but may not deliver all of the benefits of inclusion in a comprehensive ETS. Including forestry is consistent with the purpose of the NZ ETS as broad-based scheme to assist New Zealand in meeting its Kyoto Protocol obligations to the maximum extent possible.

Including forestry into the NZ ETS will also encourage the discovery of solutions to MRV problems. New Zealand is most likely to be a net importer of Kyoto credits during the first commitment period, and so does not need to be particularly concerned about marketing excess credits for sale internationally in the short term. To protect the integrity of the NZ ETS from likely inaccuracies in carbon stock estimations as much as possible, the government proposed to be conservative in issuing NZUs for afforestation, requiring forest owners to meet the cost of conducting more accurate and sophisticated estimations in order to receive a potentially higher number of NZUs.[235] A reassuring proposal is to require registered certifiers with specialist forestry expertise to sign-off on all deforestation and carbon stock assessments.[236] As mentioned in Part II, third party verification is a feature of MRV in other ETS and would benefit other sectors of the NZ ETS in addition to forestry.

IV. LESSONS FROM THE NZ ETS

If implemented as proposed, the NZ ETS will be a pioneering step in the use of ETS to regulate GHG emissions. To recap, the scheme's key points of difference include comprehensive coverage of all gases and economic sectors, relatively low levels of free allocation, direct linkage into the international market, minimal domestic control over emissions prices, and a relatively short time frame for implementation. The inclusion of agriculture and forestry in the scheme brings a number of special challenges, especially with regard to competitiveness, incentive structuring, and MRV.

Naturally, it is controversial to adopt an expansive scheme in which so much is new and uncertain. Emissions trading for New Zealand has enormous potential, but success requires a focused effort from the government and industry to learn by doing, and to evolve as experience accumulates. Both public and private actors must closely monitor the New Zealand and

234. NZ ETS FRAMEWORK, *supra* note 5, at 72–73, 76.
235. ENGAGEMENT DOCUMENT, *supra* note 221, at 34.
236. *See id*. at 50.

international markets, anticipate trends, observe progress, and be nimble in response.

The international community should watch with keen interest for the lessons of New Zealand's experience. Indeed, insofar as the NZ ETS is a success, it could be a model for other countries to follow. Many of the most instructive lessons from the model would arise from the unique features of the scheme mentioned above. It is worthwhile highlighting those aspects a final time to highlight their potential significance for the future of emissions trading and climate change policy in New Zealand, and for influencing the wider world.

Comprehensive scope: New Zealand is the first country to embrace all gases and economic sectors comprehensive emissions trading. New Zealand's unique GHG emissions profile is a major driving force behind this policy. But economic theory strongly suggests that a more comprehensive approach would also benefit countries with more typical profiles, improving cost-effectiveness and market liquidity. The New Zealand example will help demonstrate how realizable these benefits are in practice. In other countries, including the United States, the proposal of a comprehensive ETS is likely to encounter strong resistance from industry stakeholders. A positive experience with the NZ ETS might improve the political acceptability of a comprehensive scheme by adding credibility to arguments that such a scheme is feasible and beneficial. It would also be a source of practical experience regarding how to administer a comprehensive scheme. The successful demonstration of a comprehensive ETS also holds promise for ensuring that countries and regions adopt a coherent and integrated strategy for internalizing the cost of emissions across all sectors.

Agriculture and forestry: A comprehensive approach means including the agricultural and forestry sectors. In forestry, implementation of the NZ ETS will help to reveal if successful MRV is possible. As an empirical example, New Zealand might help to pave the way for greater recognition of forestry sinks in core climate change policies. Experience with emissions trading in the forestry sector will be important for both developed countries, such as the United States, who might seek to include forestry in national schemes of their own and for developing countries, in particular Indonesia, Brazil, and others, where reducing emissions from deforestation is a critical priority. Success in the NZ ETS may even coax Europe towards greater recognition of forestry in emissions trading and provide some practical knowledge as efforts to preserve forests in developing countries are ramped-up.

Including agriculture is among the greatest innovations of the NZ ETS and sets New Zealand apart from other countries in the management of agricultural emissions. As is also the case for forestry, whether reliable MRV for agriculture is possible is vital to the integrity of the entire NZ ETS. The NZ ETS will begin to answer a vast stream of outstanding questions in relation to agriculture. Can appropriate incentives to reduce emissions be easily incorporated in the supply chain and, if so, where? Do farmers have the ability

to alter farming practices to significantly reduce emissions? What will be the impact on the price of agricultural products? Will New Zealand agricultural products earn claim to the title "most climate-friendly" and a corresponding premium price? The New Zealand experience might provide some insight into the impact that internalizing the cost of GHG emissions to agriculture could have on global food prices and food security. With the stimulus of the NZ ETS, will New Zealand profit from developing, applying and selling groundbreaking agricultural technologies? Or, if management and technology innovations do not arrive as early as hoped, can the NZ ETS be adapted to avoid major cost to this essential industry? At present, apart from New Zealand, developed and developing countries alike seem very far off from adopting emissions trading for agriculture. Success in the NZ ETS could dramatically alter the agenda for inclusion in ETS in other developed countries, and could produce changes in farming practices and technologies worldwide.

Allocation: New Zealand's approach to allocation also accords with economic theory by preferring allocation of emissions units by sale relative to free allocation. New Zealand has demonstrated that it is politically viable to introduce an ETS without bowing to industry pressure for free allocation. In the United States, where a federal GHG emissions trading scheme is on the political agenda, the history of emissions trading for other pollutants will contribute to enormous pressure to grandfather allowances to industry. In Europe, free allocation remains the dominant method of allocation, although allocation by sale is gradually on the rise. Hopefully, the NZ ETS will avoid some of the inequities and environmental harm caused by free allocation and grandfathering and will encourage greater reliance on allocation by sale in the United States, Europe, and elsewhere.

Linkage: Theoretically, the greater the linkages between ETS worldwide, the more powerful emissions trading will be in the global fight against climate change. Many proponents of emissions trading advocate the gradual evolution and linking of national ETS into a single global trading regime. The direct linkage of the NZ ETS into the Kyoto Protocol international market will help to reveal the distance between that theoretical possibility and practical reality. Prices faced under the NZ ETS will be directly related to prices in the Kyoto Protocol international markets, unmitigated by a national cap on emissions or a domestic price control mechanism. Therefore, the story of the NZ ETS is one bound to the price and availability of international units, a matter outside of New Zealand control. If this faith in the international market turns out to be misplaced, New Zealand will have to maneuver quickly to adjust the NZ ETS or provide extra support to industry. However the NZ ETS fares floating in the international market, the New Zealand experience is likely to influence how other countries view the possibilities of international linkage.

Costs and competitiveness: Above all, New Zealand and international observers alike will want to know what the NZ ETS actually costs. Cost will depend on a number of factors. The NZ ETS effectively shifts responsibility to

acquire any necessary Kyoto units required to cover New Zealand emissions from government to the private sector. Cost-effectiveness, therefore, depends in part on the ability of the public sector to access international units at prices similar or lower than prices at which the government could acquire them. If private buyers are pushed too far towards the upper end of price scales, the government's challenge will be to make lower-priced units more accessible to participants in the NZ ETS.

The cost of the NZ ETS will also be reflected in the experience of New Zealand firms, both as a whole and on the sectoral and individual levels. Signs of success would include New Zealand firms adapting lower-emitting operations, thriving in domestic and international markets, and even gaining some competitive advantage from an enhanced eco-friendly image. Indeed, the NZ ETS may stimulate technological innovation and an overall transition to a low-carbon economy. Conversely, while it might be preferable for some emissions-intensive firms to close, generally profit downgrades, closures, or overseas relocation of New Zealand firms would indicate a failure. Exactly how the NZ ETS will impact the competitiveness of New Zealand industry is uncertain and depends on if and when other countries impose obligations on industry. As the impacts of the NZ ETS are revealed, the government will have to balance the need to provide certain signals to industry and to support industry, particularly during the period of transition and while the international approach to emissions management remains quite uncertain.

Of course, how the NZ ETS will play out is a highly complicated matter, turning on multiple factors, both internal and external to New Zealand. At least during the initial years of the NZ ETS, the government must constantly evaluate the need to inject greater flexibility into the scheme and must ensure that the relevant agency implements it with the utmost efficiency and diligence. The success of the NZ ETS, while potentially great, is no forgone conclusion. What is more certain is that emissions trading is an increasingly popular and harmonizing force in the global effort to mitigate climate change. The NZ ETS is a groundbreaking step in this international context. As countries seek to adopt and expand their own ETS, the NZ ETS should be a focus of attention and a source of lessons for others to follow.