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THE PRICE OF FRESH AIR
– Carbon Trading under the Kyoto Protocol

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ABSTRACT *CONTENTS*

This paper seeks to explain the rationale behind the 1997 Kyoto Protocol to the 1992 United Nations Convention on Climate Change and outline how it is intended work in practice. The paper focuses on the development of a carbon trading system and looks at how it has been interpreted on a State level, using mainly United States and New Zealand as examples, noting some of the challenges in making the market efficient. The paper concludes that with the entry into force of the Kyoto Protocol in February 2005, the carbon trading system harnesses enormous economic growth potential for New Zealand. Clear Government direction and legislative certainty are key requirements to realise this. The business community, who stands to be most affected, now has a limited window of opportunity to prepare for the effects of the legislation coming into force in full in 2008.

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I INTRODUCTION

"This is a historic step forward in the world's efforts to combat a truly global threat. Most important, it ends a long period of uncertainty."¹

Scientists have gained increased understanding of global warming since the climate change phenomenon was first recognised in the late 1800s.² The science is complex and still developing but is now able to provide a collective picture of changes in the climate system.³ The 1992 United Nations Framework Convention on Climate Change (Convention)⁴ and its 1997 Kyoto Protocol (Protocol)⁵ promotes the control and reduction of GHG emissions⁶ in the atmosphere to prevent enhanced global warming by managing pollution from human activities in a sustainable manner.⁷

Until recently the Protocol lacked the necessary backing of 55 Parties together representing 55% of estimated global greenhouse gas (GHG) emissions to come into force.⁸ Russia under President Putin – representing 17.4% of estimated global GHG emissions⁹ – recently ratified

¹ Statement by UN Secretary-General Kofi Annan, 18 November 2004, welcoming Russia's ratification of the Kyoto Protocol, <http://unfccc.int/press/interviews_and_statements/items/3290.php>.

² For the scientific history of climate change see for example, Spencer R. Weart, *The Discovery of Global Warming*, 2004 Edition, citing Svante Arrhenius, "On the Influence of Carbonic Acid in the Air Upon the Temperature of the Ground", *Philosophical Magazine* 41, 1896, pp. 237-76. Also Thomas C. Chamberlin, "A Group of Hypotheses Bearing on Climatic Changes", *J. Geology* 5, 1897, pp. 653-83, <<http://www.aip.org/history/climate/index.html#L000>>.

³ *Climate Change 2001: The Scientific Basis*, Edited by J.T. Houghton, Y. Ding, D.J. Briggs, M. Noguer, P.J. van der Linden, X. Dai, K. Maskell, and C.A. Johnson, IPCC Third Assessment Report Series, Cambridge University Press, 2001, "Summary for Policy Makers", pp. 2-4, 9.

⁴ Adopted 9 May 1992 at the United Nations Head Quarters, Washington, United States. The Convention has 189 ratified member countries, see "List of Signatories & Ratification of the Convention Parties", UNFCCC, 24 May 2004.

⁵ Adopted 11 December 1997 at the third Convention Conference (COP3), Kyoto, Japan.

⁶ Convention, Art. 1: "'greenhouse gases' means those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit infrared radiation", see further Art. 4 "greenhouse gases not controlled by the Montreal Protocol", echoed in the Protocol in Art. 2. Refer also Annex A of the Protocol: GHGs include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆). For accounting purposes GHGs are reduced to metric tonne of CO₂ through the Global Warming Potential calculation (GWP), see "Information on Global Warming Potentials", UNFCCC, FCCC/TP/2004/3, 15 June 2004.

⁷ Convention, Art. 2.

⁸ Protocol, Art. 25(1).

⁹ "Kyoto Protocol Status of Ratification", UNFCCC, 25 November 2004, p. 4.

the Protocol and it will now come into force on 16 February 2005,¹⁰ taking the membership to 129 States and regional economic integration organisations,¹¹ together representing 61.6% of estimated total global GHG emissions.¹²

The Protocol is intended to work through a system of “carrots and sticks” in the form of investment incentives to reduce GHG emissions, with penalties for excess emissions against targets, and providing methodologies and calculations for the monitoring and enforcement of emissions commitments. This paper will discuss how the Protocol is intended to work in practice, focusing on its trading mechanisms and the situation with regard to developing countries, most of which are not obliged to reduce their GHG emissions at this stage.¹³ The paper will focus on the investment incentives provided by trading of certified emissions reduction units¹⁴ under the Clean Development Mechanism (CDM),¹⁵ what challenges it faces and what benefits may be reaped from it, particularly with regard to New Zealand. The paper will conclude that the Protocol’s future is looking bright but that more needs to be done to achieve the Millennium Declaration goal of protecting our common environment¹⁶ and realise the current GHG reduction commitments.¹⁷

¹⁰ Russia presented its ratification to UN Secretary-General Kofi Annan on 18 November 2004, see “*Russia’s ratification of the Kyoto Climate Treaty ‘historic’ Says Kofi Annan*”, United Nations Environment Programme (UNEP), 18 November 2004, <http://unfccc.int/files/press/news_room/press_releases_and_advisories/application/pdf/press041119_unep.pdf>. See also “*Russia presents Kyoto ratification to U.N.*”, Washington Times, <<http://washingtontimes.com/upi-breaking/20041118-105854-4126r.htm>>. Protocol, Art. 25 (1) states that the Protocol shall enter into force 90 days after receipt of the ratification instrument.

¹¹ Protocol, Art. 4 and 22 (2) guides action where a State is both a Party and member of a regional economic integration organisation that also is a Party.

¹² “*Kyoto Protocol Status of Ratification*”, UNFCCC, 25 November 2004, including for example, Argentina, Brazil, Canada, China, the European Union, India, Japan, New Zealand and South Africa.

¹³ The majority of developing countries are not Annex I Parties and thus under no obligation to reduce emissions under Art. 2.

¹⁴ Protocol, Art. 6.

¹⁵ Protocol, Art. 12.

¹⁶ “*United Nations Millennium Declaration*”, United Nations General Assembly, A/RES/55/2, 18 September 2000, see para 6 “respect for nature”, para 22 “reaffirm our support for the principles of sustainable development, including those set out in Agenda 21”, and para 23 “make every effort to ensure the entry into force of the Kyoto Protocol”.

¹⁷ Convention, Arts. 3-4. See also Protocol, Art. 2.

II WHAT IS GLOBAL WARMING?

Global warming is the process that enables organic life on the Earth, but it is also a process that can endanger life if too much greenhouse gases (GHGs) are emitted into the atmosphere without being able to be absorbed through photosynthesis.¹⁸ The average temperature of our planet has increased by 0.6 degrees C since the late 1800s, with the 1990s appearing to have been the warmest decade and 1998 the warmest year, and is expected to rise by another 1.4-5.8 degrees by 2100.¹⁹

A The Greenhouse Effect: Nature's System of Sources and Sinks

The Earth's temperature is controlled in part by the *greenhouse effect*, which helps stabilise global temperatures to levels suitable for organic life and occurs when heat energy from the sun passes through the atmosphere and warms up the Earth.²⁰ This energy then radiates back towards space but is partly absorbed by GHGs, emitted in all directions including back to Earth.²¹ Nature has controlled the GHG levels in the atmosphere through a system of *sources* (emitting CO₂) and *sinks* (absorbing, or sequestering CO₂) for millions of years.²² Natural sources emitting GHGs include volcanoes, rotting vegetation and mammals, while natural sinks absorbing CO₂ include trees and some algae.²³ Green plants and plankton, so-called sinks, use sunlight to synthesise foods from CO₂ and water through a process called *photosynthesis*.²⁴ Thus while some parts of nature "exhale" CO₂, plants and plankton "absorb" it and use it to create

¹⁸ "Carbon currency – the credits and debits of carbon emissions trading", Nova, 18 November 2004, Australian Academy of Science, <<http://www.science.org.au/nova/054key.htm>>.

¹⁹ "Climate Change 2001: The Scientific Basis", Summary for Policymakers, IPCC Third Assessment Report Series, Cambridge University Press, 2001, p. 2. See also "Facts and trends to 2050", World Business Council for Sustainable Development, August 2004, p.1.

²⁰ "Carbon currency – the credits and debits of carbon emissions trading", p. 1.

²¹ "Carbon currency – the credits and debits of carbon emissions trading", p. 1.

²² "Carbon currency – the credits and debits of carbon emissions trading", p. 2.

²³ Vermaas, Wim, "An Introduction to Photosynthesis and Its Applications", p. 1, <<http://photoscience.la.asu.edu/photosyn/education/photointro.html>>, Arizona State University, see also a condensed version published in "The World & I", March 1998, pp. 158-165.

²⁴ Vermaas, p. 1.

carbohydrates (a form of sugar) as food for growth and continued absorption of CO₂.

B Enhanced Greenhouse Effect

Industrialisation in developed countries and increased global use of fossil fuels like coal, oil and natural gas, combined with heavy land-clearing for agriculture and urbanisation (deforestation), have led to unprecedented levels of GHGs in the atmosphere,²⁵ indicating that nature is no longer able to balance sources and sinks on her own. Scientific predictions for uncontrolled GHG emissions include the causing of widespread ecological damage, resulting in dramatic weather changes impacting on agricultural production, melting glaciers²⁶ and rising sea levels.²⁷

C The CO₂ Fertilisation Effect

Increased concentrations of CO₂ stimulates the growth of many different types of plants, including trees, and scientists call this process the *CO₂ fertilisation effect*.²⁸ The finding implies that planting forest in areas with GHG emissions can help absorb them, also adding potential benefits such as reduced soil erosion, employment opportunities and economic growth. This logic also forms the basis for current policy development and reforestation programmes (replacing forests, conservation-driven) and afforestation programmes (growing forests for commercial use) around the world.²⁹

²⁵ "Climate Change 2001: Synthesis Report", IPCC Third Assessment Report Series, Cambridge University Press, 2001, pp. 2-4, 10-13.

²⁶ "Arctic Melting Threatens to Disrupt Oil Pipelines, Report", Bloomberg.com, 7 November 2004, <<http://www.bloomberg.com>>, reporting that the Arctic Climate Impact Assessment by 300 scientists and sponsored by Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden and the US found that the Arctic sea-ice has shrunk by the size of Texas and Arizona combined since 1974.

²⁷ "Climate Change 2001: Synthesis Report", IPCC Third Assessment Report Series, Cambridge University Press, 2001, pp. 13-16.

²⁸ "Carbon currency – the credits and debits of carbon emissions trading", p. 2, citing photosynthesis may be stimulated by up to 50 per cent.

²⁹ See "Non-legally binding authoritative statement of principles for a global consensus on the management, conservation and sustainable development of all types of forest", Report of the United Nations Conference on Environment and Development, Annex III, A/CONF.151/26 Vol. III), 14 August 1992, Preamble, para (g) and Principles and

Scientists observe that the CO₂ fertilisation effect eventually reaches a saturation point, as the process can only occur when sufficient water and nutrients are available.³⁰ This means that greenhouse gas management by using sinks needs to be understood in the wider environmental context, such as considerations of security of and access to land and fresh water. This fact is reflected in *Agenda 21*,³¹ which is the international action plan for managing the impact of human activity on the environment, a commitment reiterated by the international community in the Millennium Declaration goals.³²

III UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE AND THE KYOTO PROTOCOL

International law can be described as a set of norms rather than absolute rules,³³ meaning it comprises certain standards of behaviour agreed by the international community and expressed in written documents.³⁴ The international community currently comprises somewhere between 191

Elements, para 4. See also "*The Role of Planted Forests in Sustainable Forest Management*", United Forum on Forests (UNFF) Intersessional Experts Meeting, 25-27 March 2003, Wellington, New Zealand, p. 4. See further "*New Zealand's Permanent Forest Sink Initiative for Afforestation and Reforestation under Article 3.3 of the Kyoto Protocol*", New Zealand Climate Change Office, 2004, p. 1.

³⁰ "*Carbon currency – the credits and debits of carbon emissions trading*", p. 2.

³¹ Also known as "the Earth Summit", when 178 Governments adopted the Rio Declaration on Environment and Development, the Statement of Principles for the Sustainable Management of Forests, and Agenda 21 at the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil, 3-14 June 1992. All commitments were reaffirmed at the World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa, 26 August – 4 September 2002. See also UN General Assembly Resolution "*Programme for the Further Implementation of Agenda 21*", A/RES/S-19/2, 19 September 1997.

³² "*United Nations Millennium Declaration*", United Nations General Assembly, A/RES/55/2, 18 September 2000, see para 22 "reaffirm our support for the principles of sustainable development, including those set out in Agenda 21", and para 23 "make every effort to ensure the entry into force of the Kyoto Protocol".

³³ Rosalyn Higgins, "*Problems and Process – International Law and How We Use it*", Clarendon Press, Oxford, 1994, p. 1, p. 5. See also Antonio Cassese, "*International Law*", Oxford University Press, 2001, p.3.

³⁴ The Statute for the International Court of Justice, Article 38 (1), states the sources of international law comprises international conventions (i.e. treaties), international custom, "general principles of law recognised by civilised nations", judicial decisions and teachings by prominent legal scholars. Higgins, Brownlie and Cassese all agree this is generally considered the complete statement of the sources of international law.

and 196 nations depending on perspective³⁵ and the United Nations (UN) with an almost global membership of 191 members is considered the primary body responsible for matters of international concern.³⁶ Nations that are parties to an international agreement regard the normative conduct in question as being obligatory and there is an expectation that violation by choosing to behave otherwise carries a price.³⁷ The opposing view argues that international law truly only is defined when tested by the International Court of Justice.³⁸ In rebuttal Higgins observes that it is rarely in the national interest to violate international law, even if there might be short-term advantages in doing so, and that few today believe sanctions predicate the existence of particular norms of international law.³⁹ In accepting Higgins view that international law constitutes norms that may be enforced these become the blueprints for implementation in domestic law.

A Development of a Climate Change Management Regime

The primary sources of international climate change law are the 1992 United Nations Framework Convention on Climate Change (Convention)⁴⁰ and its 1997 Kyoto Protocol (Protocol). The regime forms part of the wider international goal of sustainable development⁴¹ outlined in

³⁵ The majority of world almanacs recognise 192 countries, the United Nations has 191 member States, excluding the Vatican, Palestine, Greenland, Taiwan and Western Sahara, but including East Timor, <<http://www.worldatlas.com/nations.htm>>.

³⁶ United Nations Charter 1945, Article 1. See also Rosalyn Higgins, *Problems and Process – International Law and How We Use it*, Clarendon Press, Oxford, 1994, p. 37-38, citing Thirlway who argues that the UN International Court of Justice (ICJ) is the final arbiter. See also p. 27 that ICJ case law shows the Court gives weight to resolutions by both the UN Security Council and the General Assembly.

³⁷ Rosalyn Higgins, *Problems and Process – International Law and How We Use it*, Clarendon Press, Oxford, 1994, p. 1, p. 5. See also Antonio Cassese, *International Law*, Oxford University Press, 2001, p.3.

³⁸ Higgins, p. 18, citing H. Thirlway, *International Customary Law and Codification*, 1972.

³⁹ Higgins, p. 16, in part citing L. Henkin, *How Nations Behave*, 2nd Edition, 1979.

⁴⁰ Adopted 9 May 1992 at the United Nations Head Quarters, Washington, United States.

⁴¹ In defining "sustainable development", Cassese refers to the 1987 Report to the UN General Assembly by the World Commission on Environment and Development (WCED), chaired by Norwegian Prime Minister G.H. Brundland (the Brundland Report), that it means "development that meets the needs of the present without compromising the ability of future generations to meet their own needs", see p. 384. See also Ian Brownlie, *Principles of Public International Law*, 6th Edition, Oxford University Press, 2003, p. 276. Convention, Art. 2, "to enable economic development to proceed in a sustainable manner".

Agenda 21⁴² and in the Millennium Declaration.⁴³ The climate change management system began with the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations World Meteorological Organisation (WMO) and the United Nations Environment Programme (UNEP) in 1988.⁴⁴ The IPCC's mandate is to assess scientific, technical and socio-economic information on climate change, its potential impacts and the options for adaptation and mitigation "on a comprehensive, objective, open and transparent basis"⁴⁵ and participation is open to all WMO and UNEP member countries.⁴⁶ The Third Assessment Report (TAR) was published in 2001 and comprises four papers focusing on developments since 1995, whereof the "*Climate Change 2001: Synthesis Report*" summarises the key findings in the TAR and also draws on the findings in all previous IPCC reports.⁴⁷ The IPCC also supplies the scientific standards and calculations used for State assessments of GHG emissions sources and sinks.⁴⁸

B The United Nations Framework Convention on Climate Change

The Convention has 189 ratified member countries⁴⁹ and its objective is to succeed in the "stabilization of greenhouse gases in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system".⁵⁰ General obligations under the

⁴² Rio Declaration on Environment and Development 1992 Rio (Rio Declaration), Principles 3-4 and 15-16 in particular. See also helpful discussions by Cassese, p. 379-388, and by Brownlie, p. 276-277 with regard to these principles.

⁴³ UN General Assembly resolution A/RES/55/2, 18 September 2000, part I, para (6), sub para 5, see also part II, para 20, sub para 1, and perhaps most crucially part IV, paras 21-23.

⁴⁴ "*Introduction to the Intergovernmental Panel on Climate Change (IPCC)*", IPCC, March 2003, p. 2.

⁴⁵ "*Principles Governing IPCC Work*", approved 1 October 1998 and amended in November 2003, Principle 2.

⁴⁶ "*Principles Governing IPCC Work*", approved 1 October 1998 and amended in November 2003, Principle 7.

⁴⁷ "*Introduction to the Intergovernmental Panel on Climate Change (IPCC)*", IPCC, March 2003, p. 6.

⁴⁸ See for example, "*Guidelines for National Greenhouse Gas Inventories*", 1996, and "*Good Practice Management and Uncertainty Management in National Greenhouse Gas Inventories*", 2000.

⁴⁹ "*List of Signatories & Ratification of the Convention Parties*", UNFCCC, 24 May 2004. Note Convention, Art. 26 stipulating that the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic.

⁵⁰ Convention, Art. 2.

Convention⁵¹ include national submissions of GHG emissions inventories,⁵² development of national policies and strategies for addressing emissions,⁵³ international co-operation in adapting to expected impacts of climate change and contributing to the development of best practice through research⁵⁴ and knowledge transfer through information-sharing.⁵⁵ Aside from outlining the general commitments the Convention also provides the definitions for interpreting climate change legislation and policy, including the meaning of “sink”,⁵⁶ “source”,⁵⁷ “climate change”⁵⁸ and “climate system”⁵⁹.⁶⁰

Member countries are guided by five principles in implementing their obligations: protection of the climate system for the benefit of present and future generations,⁶¹ full consideration of the special circumstances of developing countries,⁶² taking precautionary measures to anticipate and mitigate climate change,⁶³ recognition of a right to sustainable development,⁶⁴ and that measures to combat climate change should not be arbitrary, unjustifiable, or a disguised restriction on international trade.⁶⁵

⁵¹ Convention, Art. 4(1).

⁵² Convention, Art. 4(1)(a), see also Art. 12.

⁵³ Convention, Art. 12(2)(a).

⁵⁴ Convention, Art. 4(1)(g).

⁵⁵ Convention, Art. 4(1)(h)-(i), see also Art. 6.

⁵⁶ Convention, Art. 1, “‘Source’ means any process or activity which releases a greenhouse gas, an aerosol or precursor of a greenhouse gas into the atmosphere”.

⁵⁷ Convention, Art. 1, “‘Sink’ means any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere.”

⁵⁸ Convention, Art. 1, “change of climate which is attributed directly or indirectly to human activity that alters the composition of the atmosphere and which is in addition to natural climate variability observed over comparable time periods”.

⁵⁹ Convention, Art. 1, “the totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions”.

⁶⁰ The Convention Preamble also recalls the 1972 Declaration of the United Nations Conference on the Human Environment (Stockholm), the 1985 Vienna Convention for the Protection of the Ozone Layer, the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer, and several General Assembly resolutions: 43/53 of 6 December 1988, 44/206, 44/207 and 44/228 of 22 December 1989, 45/212 of 21 December 1990 and 46/169 of 19 December 1991.

⁶¹ Convention, Art. 3(1).

⁶² Convention, Art. 3(2).

⁶³ Convention, Art. 3(3).

⁶⁴ Convention, Art. 3(4).

⁶⁵ Convention, Art. 3(5).

Convention Parties are divided into three groups and each has slightly different obligations:⁶⁶

- (i) Annex I Parties comprise developed countries that were members of the Organisation for Economic Development (OECD) in 1992, countries with economies in transition (EITs), Russia, the Baltic States and a number of Central and Eastern European countries. Annex I countries have the most detailed obligations with regard to GHG emissions reporting;⁶⁷
- (ii) Annex II Parties comprise the 1992 OECD members as above but excludes EITs and has an obligation to provide “new and additional financial resources to meet the agreed full cost incurred by developing country Parties in complying with their obligations under Article 12, paragraph 1”, meaning the national GHG emissions inventory;⁶⁸ and
- (iii) Non-Annex I Parties comprise developing countries and include 48 nations described as “least developed countries”.⁶⁹ With regard to this last group the Convention states that:⁷⁰

“The extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties.”

The Convention currently has over 600 non-government organisations (NGOs)⁷¹ and 50 intergovernmental organisations (IGOs)⁷²

⁶⁶ “Parties and Observers”, UNFCCC, <http://unfccc.int/parties_and_observers/items/2704.php>. See also “List of Signatories & Ratification of the Convention Parties”, UNFCCC, 24 May 2004, <<http://unfccc.int/2860.php>>.

⁶⁷ Convention, Art. 4(2).

⁶⁸ Convention, Art. 4(3).

⁶⁹ “Parties and Observers”, UNFCCC, <http://unfccc.int/parties_and_observers/items/2704.php>.

registered as observers, making it a well-monitored and well-reported piece of international law. Information about Convention events is easily obtained and the Conference of Parties (COP) accepts submissions for consideration in further policy development from a wide range of organisations.⁷³

Any amendments to the Convention are preferably to be made by consensus but if this is not possible a three-fourths majority of Parties present and voting will suffice.⁷⁴ Each party has one vote,⁷⁵ no reservations may be made to the Convention,⁷⁶ but a Party may withdraw by written notification after three years, with the withdrawal taking effect one year after the Depositary's receipt of the notification.⁷⁷ In the event of a dispute arising under the Convention it is to be settled through negotiation or "any other peaceful means of their own choice",⁷⁸ which leaves nations with a wide range of options available. The Convention also established the Subsidiary Body for Scientific and Technological Advice (SBSTA)⁷⁹ and the Subsidiary Body for Implementation (SBI)⁸⁰ to assist the COP in meeting its obligations.

⁷⁰ Convention, Art. 4(7).

⁷¹ For example, American Society of International Law (ASIL), Australian Council of Trade Unions (ACTU), New Zealand Forest Owners' Association Inc. (NZFOA) and Nuclear Energy Institute (NEI).

⁷² For example, International Energy Agency (IEA), Organization of American States (OAS), European Bank for Reconstruction and Development (EBRD), Commonwealth Secretariat, African Development Bank (AFDB) and League of Arab States (LAS).

⁷³ See for example, Climate Action Network (CAN), "A Viable Global Framework for Preventing Dangerous Climate Change", Discussion paper for COP-9, Milan, Italy, <<http://www.climatenetwork.org>>, arguing that a global temperature target is superior to a global concentration target.

⁷⁴ Convention, Art. 15(3). See also Protocol, Art. 20(4).

⁷⁵ Convention, Art. 18. See also Protocol, Art. 22.

⁷⁶ Convention, Art. 24.

⁷⁷ Convention, Art. 25. See also Protocol, Art. 27. It is possible to withdraw from the Protocol and remain a Convention member but Party withdrawing from the Convention shall also be considered as having withdrawn from the Protocol.

⁷⁸ Convention, Art. 14(1), see also Protocol, Art. 19.

⁷⁹ Convention, Art. 9.

⁸⁰ Convention, Art. 10.

C *The Kyoto Protocol*

The Protocol was adopted in 1992⁸¹ and will become legally binding on 128 Party States in 2005.⁸² Countries that have chosen to not ratify the Protocol include the United States⁸³ and Australia, while avid advocates include the European Union and New Zealand. The first commitment period is 2008-2012, meaning this is the period for which Annex I Governments have agreed GHG emissions reduction targets to be met, generally meaning no more than a five per cent increase on 1990 levels of emissions.⁸⁴ Annex I Parties are also bound to have made demonstrable progress in achieving Protocol commitments by 2005.⁸⁵

Article 3 of the Protocol sets out the Annex I Party obligations with regard to greenhouse gas reporting and emissions trading and paragraph three reads:

“The net changes in greenhouse gas emissions by sources and removals by sinks resulting from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation and deforestation since 1990, measured as verifiable changes in carbon stocks in each commitment period, shall be used to meet the commitments under this Article of each Party included in Annex I. The greenhouse gas emissions by sources and removals by sinks associated with those activities shall be reported in a transparent and verifiable manner and reviewed in accordance with Article 7 and 8.”

Substantial policy guidance may be obtained on what complying with this paragraph actually entails.⁸⁶

⁸¹ Convention, Art. 17(1) states that the COP may adopt Protocols to the Convention at any ordinary session.

⁸² “*Kyoto Protocol to enter into force 16 February 2005*”, UNFCCC, <http://unfccc.int/essential_background/kyoto_protocol/items/2830.php>.

⁸³ The Bush administration confirmed in November that it has not changed position in its second term, see “*Cinergy voices support for greenhouse gas cap*”, Associated Press, 1 December 2004, by Matthew Dalton. see WBCSD, <<http://www.wbcsd.org/plugins/DocSearch/details.asp?type=DocDet&ObjectID=12090>>.

⁸⁴ Protocol, Art. 3(1).

⁸⁵ Protocol, Art. 3(2).

⁸⁶ See for example, Decision 24/CP. 7, “*Procedures and mechanisms relating to compliance under the Kyoto Protocol*”, Seventh Conference of the Parties, 10 November 2001, FCCC/CP/2001/13/Add.3, p. 64. See also Decision 13/CP.9, “*Good practice*

1 Greenhouse gas emissions reporting

Annual inventories of a State's total GHG emissions, reductions by sinks and final GHG emissions against target, so-called GHG inventories, are already submitted by Convention Parties, but following Protocol implementation these reporting requirements become more rigorous and onerous, particularly for GHG emitting businesses.⁸⁷ The Protocol stipulates that the methodologies and calculations to be used are those that are available from the IPCC.⁸⁸ Annex A lists the GHGs to be reported and identifies the GHG emissions source categories. Annex B defines each country's GHG reduction commitment, ranging from 92 per cent to 110 per cent of GHG emissions in the base year. The base year is generally 1990 but 1995 may be used for certain GHGs.⁸⁹

The Eight Conference of the Parties (COP-8) to the Convention provided for the establishment of training courses for technical GHG inventory reviews,⁹⁰ a code of practice for future GHG inspectors when dealing with issues of confidentiality,⁹¹ and elements for inclusion in the agreement for expert review services.⁹² The need to make GHG emissions reporting simple and comprehensive to facilitate participation is being addressed by the implementation of common calculators and methodologies, but there is room for improvement. Out of 65 methodologies presented

guidance for land use, land-use change and forestry in the preparation of national greenhouse gas inventories under the Convention", Ninth Conference of the Parties, 12 December 2003, FCCC/CP/2003/6/Add.1, p.31.

⁸⁷ Protocol, Art. 7, states that national GHG inventories shall be submitted in accordance with the relevant decisions of the COP, also referring to Article 12 of the Convention. For an interpretation of GHG reporting requirements for corporate reporting refer "*The Greenhouse Gas Protocol – a corporate accounting and reporting standard*", revised edition, World Business Council for Sustainable Development and World Resources Institute, Switzerland, March 2004. See also "*IFRIC issues guidance on accounting for greenhouse gas emissions and scope of leasing standard*", Flash Report, KPMG New Zealand, 6 December 2004.

⁸⁸ Protocol, Art. 5(2) and (3).

⁸⁹ Protocol, Art. 3(7) and (8).

⁹⁰ See Decision 19/CP.8, "*UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to Convention*", Eight Conference of the Parties, 1 November 2002, FCCC/CP/2002/7/Add.2, p. 15, Annex I, p. 25.

⁹¹ Decision 19/CP.8, Annex II, p. 28.

⁹² Decision 19/CP.8, Annex III, p. 30.

since 2003 for the purpose of managing clean development projects, 11 are still under consideration.⁹³

2 Trading of emission reduction units

The core framework for emissions trading, meaning the buying and selling of sinks to offset GHG emissions, is found in Article 6 of the Protocol. Trading is limited to Annex I countries⁹⁴ and market participation is subject to a number of conditions. Carbon trading projects must:

- (i) be approved by the Parties involved;⁹⁵
- (ii) provide a GHG reduction that is additional to what would have been the case in the absence of the project;⁹⁶
- (iii) be compliant with Articles 5 and 7;⁹⁷ and
- (iv) be supplemental to domestic actions under article three.⁹⁸

The COP is mandated to define the relevant rules and modalities with regard to how the carbon trading system is intended to operate.⁹⁹

3 Compliance and enforcement

The primary procedural and enforcement mechanisms for the Protocol are found in COP-7 Decision 24 (sometimes called the Marrakech Accords).¹⁰⁰ The decision recalls Article 18 of the Protocol, which states that the Conference of the Parties (COP) serving as the meeting of the Parties to the Protocol (COP/MOP) is to approve the procedures for dealing with non-compliance and that they are to be adopted by means of an amendment to the Protocol. There is some debate about whether the COP is

⁹³ CDM & JI Monitor, "ViewPoint: How to ease EB's growing pains?" by Marco Monroy, Point Carbon, 23 November 2004, MGM International, p. 3.

⁹⁴ Protocol, Art. 6(1).

⁹⁵ Protocol, Art. 6(1)(a).

⁹⁶ Protocol, Art. 6(1)(b).

⁹⁷ Protocol, Art. 6(1)(c).

⁹⁸ Protocol, Art. 6(1)(d).

⁹⁹ Protocol, Art. 17.

capable of making non-compliance decisions under Article 18,¹⁰¹ although Article 17 provides for the COP to “define the relevant principles, modalities, rules and guidelines, in particular for verification, reporting and accountability for emissions trading”.¹⁰² Churchill and Ulfstein argue that Protocol mechanisms, such as trading and development assistance, are privileges rather than rights.¹⁰³ This would mean that Article 17 is of sufficient scope to encompass the enforcement mechanisms in Decision 24, as suspension from emissions trading would constitute withdrawal of a privilege instead of a right. Crossen observes that in contrast both Koskenniemi and Brunnee suggest that a COP decision is not legally binding.¹⁰⁴

Crossen evaluated the likely effectiveness of the Protocol compliance regime adopted at COP-7 and found that Decision 24 had been adopted unanimously¹⁰⁵ and therefore consistent with consensus being the preferred decision-making outcome. Crossen notes that with regard to legitimacy the regime also has strength in two other areas: its reliance on scientific evidence and the automatic application for consequences in a case of non-compliance,¹⁰⁶ but she notes that it is weakened by the absence of limited defences.¹⁰⁷ With regard to this weakness Crossen supports Brunnee’s suggestion that limited defences ought to be available when the effects of automatic application of consequences for non-compliance would

¹⁰⁰ Decision 24/CP.7, “*Procedures and mechanisms relating to compliance under the Kyoto Protocol*”, FCCC/CP/2001/13/Add.3, p. 64.

¹⁰¹ Teall Crossen “*Responding to Global Warming, a Legitimacy Critique of the Proposed Kyoto Protocol Compliance Regime*”, University of Calgary, Alberta, Canada, 2004, who refers to the “amendment dilemma”.

¹⁰² Protocol, Art. 17.

¹⁰³ Robin R. Churchill and Geir Ulfstein, “*Autonomous Institutional Arrangements in Multilateral Environmental Agreements: A Little-Noticed Phenomenon in International Law*”, 94 Am. J. Intl L. 623 at 633.

¹⁰⁴ Teall Crossen “*Responding to Global Warming, a Legitimacy Critique of the Proposed Kyoto Protocol Compliance Regime*”, LLM thesis, University of Calgary, Alberta, Canada, 2004, p. 94, citing Martti Koskenniemi, “*Breach of Treaty or Non-Compliance? Reflections on the Enforcement of the Montreal Protocol*”, 3 Y.B. Intl Env. L. 123, also Jutta Brunnee “*A Fine Balance: Facilitation and Enforcement in the Design of a Compliance Regime for the Kyoto Protocol*”, 13 Tul. Evntl. L.J., 2000, p. 223.

¹⁰⁵ Crossen, p. 100.

¹⁰⁶ Crossen, p. 120.

¹⁰⁷ Crossen, p. 120.

prevent the party from participating in the climate change regime.¹⁰⁸ This author agrees this is a significant issue that ought to be addressed, as the absence of even limited defences goes against the common law legal principle of a right to be heard, even if it may be considered economically efficient to ignore it (no protracted trials over levels of emissions). The author believes however that the weakness is mitigated by the Convention and the Protocol allowing for redress by way of nation's choice of dispute settlement procedure,¹⁰⁹ which includes the ability to refer matters to the International Court of Justice (ICJ), or to the WTO.

The COP under the Convention, serving as the meeting of the Parties (COP/MOP) under the Protocol, is the body that shall approve the compliance rules and guidelines, and with respect to binding consequences adopt them by means of an amendment to the Protocol.¹¹⁰ This has not yet been done, as the COP/MOP cannot meet in that capacity until after the Protocol comes into force in February 2005. Until then the COP proceeds with its work as usual and will hold its tenth meeting in December 2004.¹¹¹ With regard to the amendment dilemma it is somewhat of a storm in a teacup: development to date of the Protocol's future has been consensual and can reasonably be expected to continue to be so. With the Protocol coming into force next year's meeting would automatically be that of the COP/MOP, which perhaps could benefit from addressing at an early stage the notion of there being an amendment dilemma with regard to Decision 24 by simply following its own recommendation.¹¹²

¹⁰⁸ Crossen, p. 121, citing Jutta Brunnee, "A Fine Balance: Facilitation and Enforcement in the Design of a Compliance Regime for the Kyoto Protocol", 13 *Tul. Evntl. L.J.*, 2000, p. 223.

¹⁰⁹ Convention, Art. 14(1), see also Protocol, Art. 19, states that any disputes are to be resolved by negotiation, or other peaceful means chosen by the Parties.

¹¹⁰ Protocol, Art. 18.

¹¹¹ See "Provisional Agenda and Annotations", Conference of the Parties, Tenth Session, Buenos Aires, 6-12 December 2004, FCCC/CP2004/1, 15 September 2004. Includes the Canadian proposal for modalities for the accounting of assigned amounts under Art. 7 (4) of the Protocol with regard to cleaner energy exports, see p. 9.

¹¹² Decision 24/CP.7, p. 64, "[r]ecommends that the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, at its first session, adopt the procedures and mechanisms relating to compliance hereto in terms of Article 18 of the Kyoto Protocol."

D Summary

Control and reduction of greenhouse gases (GHGs) in the atmosphere is a global common good and therefore any benefits (reductions in pollution and maintenance of the mean global temperature) will automatically be rendered also to those nations who do not formally participate in the Protocol scheme. This effect is called free-riding and may be argued to be one of the Protocol's greatest dilemmas. In preventing global warming and seeing the enforcement of the Protocol unfold all parts of society play a role because GHG emissions inventories are ultimately a composite of those societal activities that result in emissions. To ensure accurate climate change modelling the integrity of reported GHG emissions data is crucial. While normally we primarily consider the willingness of States to comply with international obligations, with regard to the Protocol for enforcement to be effective society as a whole – and the business community (whose activities represent the majority of GHG emissions) in particular – must be encouraged to participate, or the data becomes unreliable and the law unenforceable. Research into the use of economic incentives show that they are proving to be a promising tool in encouraging voluntary compliance.¹¹³

IV CARBON CREDIT TRADING – THE PRICE OF FRESH AIR

Most GHG emissions result from trade-related activities¹¹⁴ and carbon credits stands become a new formal means of exchange in 2009 when the Protocol has been in effect for a year and GHG inventories have been submitted for the end of the first year of the commitment period. The ability to trade is limited to Annex I countries, i.e. largely the developed countries and “economies in transition”, so-called EITs. In the absence of an agreed second commitment period the carbon trading market will cease

¹¹³ Sinner, Jim and Guy Salmon, “*Creating Economic Incentives for Sustainable Development*”, Ecologic Foundation for the New Zealand Business Council for Sustainable Development, November 2003, p. 1-2, citing New Zealand's QMS for managing fish stock and Australia's scheme for water use management.

¹¹⁴ In particular, electricity generation, agriculture, transport and some manufacturing processes, including steel and aluminium smelters, meat-works and large dairy factories.

in 2013, one year after the end of the first commitment period. Under the Protocol commitments developed countries that are Parties are expected to provide the funding for the development of sustainable energy sources, as well as reforestation and afforestation programmes. The Protocol therefore provides incentives to invest in such projects, not only domestically but also in developing countries.

In essence the Protocol carbon trading scheme means that governments and other investors may be able to trade carbon credits both internationally and domestically to offset GHG emissions. An "unofficial" carbon market already exists and is growing.¹¹⁵ Its nature is strictly speaking quasi-legal but encouraged, since once the Protocol comes into force it will simply merge with the existing market under more formal and reliable structures. Although politicians in non-Protocol countries currently are reluctant to formally participate in the Kyoto compliance scheme, many citizens and corporates alike still report their emissions through voluntary schemes. In fact, some major countries like the United States and Australia that have not ratified the Protocol are nonetheless the nations advancing the carbon market envisioned under the Protocol at the fastest pace.¹¹⁶

By encouraging investments into renewable energy sources (wind, solar, small-scale hydro, etc.) and investments into carbon sinks projects (mainly forestry) the Protocol scheme seeks not only to raise awareness of global warming, but also provides an incentive and possible means for developing countries to become developed countries without going through the industrialisation process of developed countries. For developed countries the carbon credits generated through CDM and/or JI projects may be used to offset GHG emissions above agreed targets. Thus controlling global warming is not just about protecting the environment, although

¹¹⁵ "CDM & JI Monitor", Point Carbon, 7 December 2004, p. 2, citing the recent establishment of the Japan Carbon Fund of 180 million Yen provided by 31 Japanese private companies to run to 2014.

¹¹⁶ See Bryner, Gary C., "Carbon Markets: Reducing Greenhouse Gas Emissions Through Emissions Trading", Summer, 2004, 17 Tul. Envtl. L.J. 267. See also Mann, Roberta, "Waiting to Exhale?: Global Warming and Tax Policy", August, 2002, 51 Am. U.L. Rev. 1135.

ensuring the survival of humankind certainly is the primary objective of international environmental legislation, but effective management of global warming through sustainable development and energy efficiency also harnesses enormous capacity for increased trade and economic growth.

A *The Clean Development Mechanism (CDM)*

The purpose of the Clean Development Mechanism is to encourage investment by Annex I Parties in sustainable development projects that reduce GHGs, in particular investment in developing countries.¹¹⁷ The GHG reductions generated in approved projects are verified¹¹⁸ and if found to be compliant by the Executive Board¹¹⁹ they are converted into certified emission reductions (CERs) that can be offset against emissions, or traded on the market.¹²⁰ COP-7 Decision 17 provides the procedures and modalities for the CDM, which includes the establishment of an Executive Board (EB) for approving, registering and monitoring CDM projects.¹²¹

B *Joint Implementation of Projects*

The Joint Implementation (JI) is another mechanism under the Protocol that generates emissions reduction units (ERUs).¹²² Guidance on procedures and modalities are found in COP-7 Decision 16, which also establishes the Supervisory Committee to govern such projects.¹²³ The policy guidance provided has not been widely used to date but with Russia's ratification of the Protocol this is likely to change. When recently asked whether the EB would share its lessons learnt to date with regard to Protocol projects the EB Chair surprisingly responded that the body is not

¹¹⁷ Protocol, Art. 12.

¹¹⁸ Protocol, Art. 12(5).

¹¹⁹ Protocol, Art. 12(9).

¹²⁰ Protocol, Art. 12(3)(b).

¹²¹ Decision 17/CP.7, "Modalities and procedures for a clean development mechanism as defined in Article 12 of the Kyoto Protocol", FCCC/CP/2001/13/Add.2, p. 20.

¹²² Protocol, Art. 6.

¹²³ Decision 16/CP.7, "Guidelines for the implementation of Article 6 of the Kyoto Protocol", FCCC/CP/2001/13/Add. 2, p. 5

mandated to do that.¹²⁴ This seems an interesting comment in light of the Protocol's overarching goal of information-sharing and one can only hope that the EB will be willing to share its experience even it is not expressly told to do so.

C Voluntary Carbon Trading: The United States

Although the United States (US) has not ratified the Protocol many American companies have already invested millions into what essentially is a voluntary market, for example funding by General Motors and American Electric Power into reforestation projects,¹²⁵ and through implementing company-internal energy and waste efficiency measures. As Bryner's study shows there are multiple examples of voluntary carbon trading schemes to be found in the US notwithstanding federal reluctance to legislate for it.¹²⁶ In 1998 British Petroleum (BP) became one of the first large companies to pledge a reduction in GHGs. The goal of a ten per cent reduction by 2010 was realised in October 2001, more than eight years ahead of schedule. This rapid success was achieved by the implementation of a compulsory company-wide emission trading system where transactions were registered with a central broker and each unit represented 1 tonne of CO₂ (as per Protocol guidance, author's note). Greenhouse gas allocations were also incorporated into the performance contracts of business unit leaders.¹²⁷ Company officials reported that the program saved some US\$650 million from improved efficiency and reduced waste. L'Oreal, the world's largest cosmetics manufacturer increased production by 60 per cent between 1990 and 2000 while reducing GHG emissions by 44 per cent through energy conservation programmes.¹²⁸ Shell vowed in 2000 to reduce emissions by 25 per cent by 2002 and quickly achieved that goal through a voluntary

¹²⁴ Acharya, Mahua, "Question and Answer session with the CDM Executive Board", WBCSD, 7 December 2004, <<http://www.wbcd.org>>.

¹²⁵ Mann, Roberta, "Waiting to Exhale?: Global Warming and Tax Policy", August, 2002, 51 Am. U.L. Rev. 1135, p. 1148.

¹²⁶ Bryner, Gary C., "Carbon Markets: Reducing Greenhouse Gas Emissions Through Emissions Trading", Summer, 2004, 17 Tul. Envtl. L.J. 267, p. 281.

¹²⁷ Bryner, p. 281, citing Jeff Morgheim, "BP's Emissions Trading System: Harnessing Market Forces to Meet Environmental Goals Cost-Effectively", 2001.

company-trading scheme.¹²⁹ Another novel trading scheme was instituted in 2002 by the Greenhouse Emissions Management Consortium (GEMC).¹³⁰ The GEMC announced a plan to buy 3.5 million ERUs generated by a Canadian company project from telecommuting, meaning reducing GHG emissions by allowing employees to work from home, thus reducing transport pollution.

E. A Commercial Analysis of the CDN

Several US States have taken their own action to mitigate the effects of climate change and as at October 2003 bills had been passed in 29 States to regulate transport emissions, create registries to track emissions and emissions trades, encouraged use of alternative fuels and even carbon sequestration through forestry initiatives and improved agricultural practices.¹³¹ On a federal level two different versions of an energy tax bill is currently travelling through the Congress bureaucracy, one passed by the House of Representatives and the other by the Senate.¹³² It is clear that although the Presidential Administration is reluctant to commit on the international level, the US is nonetheless active in combating the effects of global warming and eager to embrace the investment opportunities that come with it, be it in a largely unregulated market.

D The Command and Control (Privileges) Mode

Many Protocol Parties have instituted carbon credit trading programmes that are quasi-legal in the sense that they run as pilots pending full and formal legislative direction in 2008. The European Union is expected to pass a comprehensive carbon trading directive at the end of January to complement that issued in 2003, which sets the basic parameters for carbon trading under the Protocol.¹³³ Two of its member States, Denmark and the Netherlands, have already committed significant financial

¹²⁸ Bryner, p. 281, citing Amanda Griscom, "In Good Company: Cutting Emissions to Raise Profits", 2002.

¹²⁹ Bryner, p. 281, citing Griscom.

¹³⁰ Bryner, p. 283.

¹³¹ Bryner, p. 276.

¹³² Mann, p. 1169.

resources to secure sinks over the next few years.¹³⁴ In Britain some 36 companies have joined the initial carbon trading system designed to reduce GHG emissions in exchange for financial support from government, supported by an emissions tax, which 80 per cent is excused if companies reduce emissions to target.¹³⁵

E A Commercial Analysis of the CDM

In a recent question and answer session the CDM EB Chair John Kilani emphasised that private sector involvement is critical to the success of the CDM,¹³⁶ yet few projects have so far been registered. Of 1154 proposed CDM and JI projects so far registered in the Point Carbon's Project Database only 253 projects have reached a stage where a project business case has been developed.¹³⁷ Yet this is not a new issue: the World Business Council for Sustainable Development (WBCSD) published a commercial analysis of the CDM in 2000 that concluded private and institutional investment in CDM projects will at first be heavily reliant on commercial outputs rather than CERs.¹³⁸ In response to the finding the WBCSD commissioned a project called "*Engaging the private sector in the Clean Development Mechanism*".¹³⁹ The project was a BP/Brazil venture that installed solar power panels in 1852 rural schools in 12 states of north-eastern Brazil, which produces electricity that benefits about 60,000 children.¹⁴⁰ The project never expected to make a positive return on cost and the objectives were "learning by doing" and "learning by sharing" in the

¹³³ Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003, "*Establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC*".

¹³⁴ Bryner, p. 279.

¹³⁵ Bryner, p.p 280-281.

¹³⁶ Acharya, Mahua, "*Question and Answer session with the CDM Executive Board*", WBCSD, 7 December 2004, <<http://www.wbcd.org>>.

¹³⁷ "*CDM & JI Monitor*", Point Carbon, 23 November 2004, p. 3.

¹³⁸ "*Clean Development Mechanism – Exploring for solutions through learning by doing*", World Business Council for Sustainable Development (WBCSD) on behalf of the Climate and Energy Working Group, Moorcroft, Dave, Jasper Koch and Kija Kummer, October 2000, p. 4.

¹³⁹ "*Engaging the private sector in the Clean Development Mechanism*", World Business Council for Sustainable Development (WBCSD), Oren, Kjell, Susanne Haefeli and Mahua Acharya, March 2004.

¹⁴⁰ "*Engaging the private sector in the Clean Development Mechanism*", p. 7.

hope that future projects would be able to benefit from its lessons, and numerous issues and problems were encountered during its course.

Although local institutions generally are said to be most appropriate for stakeholder consultations the project found that the lack of appropriate capacity and CDM awareness at the local level created hurdles for the project developers, particular with regard to post-project maintenance.¹⁴¹ The CDM requirement of additionality, calculated by reference to a baseline, was difficult and determining what would have happened if the project had not been commissioned was based on a "best guess" in light of the country's particular circumstances and the absence of formally approved methodologies and calculations. The project used the CERUPT 2001 baseline scenarios.¹⁴² Host country approval presented another problem: in pending the Protocol coming in force the Brazilian Government decided to pause CDM project decisions.¹⁴³ The process for gaining approval through the EB is criticised in the report, which complains of confusion about procedures to be followed and how to promote the projects that resulted in delays and increased project costs. The ongoing monitoring procedures were designed with cost-effectiveness and simplicity as the primary criteria, and the selected methodology is based on self-assessment by villages, supplemented by bi-monthly reports by local companies.

From a commercial perspective the project economics was not encouraging but some of the cost findings are instructive for future CDM projects assessments. The expected revenue was calculated on CER market prices of US\$3-5 per tonne of CO₂, converted into an expected CER revenue of US\$5,166-8,610. In contrast the cost of preparing the project design document (PDD) and including desktop review fees were over US\$35,000. Any future registration as a CDM project under the Protocol is

¹⁴¹ "Engaging the private sector in the Clean Development Mechanism", p. 9.

¹⁴² "Engaging the private sector in the Clean Development Mechanism", p. 10, citing Ministry of Housing Spatial Planning and the Environment of the Netherlands, "Standardized Baselines and Streamlined Procedures for Selected Small-scale Clean Development Mechanism Project Activities", Version 1.0, December 2001.

¹⁴³ "Engaging the private sector in the Clean Development Mechanism", p. 11.

estimated to incur a cost of at least US\$40,000, with ongoing monitoring estimated at US\$10-15,000 per year.

F Fuelling Future Growth: Climate Change-Friendly Energy Sources

By 2050 global energy demand could double or triple as population grows to around nine billion.¹⁴⁴ On a State level the energy dilemma this poses expresses itself as an objective to find the most efficient (least emission) energy source that is acceptable to its citizens, which will depend on for example, whether the State already uses the energy source in question. If a State already uses a particular energy source it is perhaps more likely to be supportive of it, even promoting its implementation in other countries. On a corporate level, the energy dilemma expresses itself as an objective to find the most efficient energy source at least cost. Impending State regulation and the prospect of a emissions charge – effectively an additional production cost – may be interpreted as an incentive to search for more energy efficient sources. The World Business Council for Sustainable Development (WBCSD) considers that there is no one-fits-all solution to meeting growing global energy needs but that a “step-change (r)evolution” needs to take place that includes a further shift to natural gas, consideration of nuclear energy, renewable energy, bio-products, carbon capture and storage, advanced vehicle technologies and other energy efficiency measures.¹⁴⁵

1 Nuclear Power: An Energy Source of Last Resort?

Nuclear energy may create toxic waste and highly radioactive spent fuel rods to be isolated from the biosphere for hundreds of thousands of years¹⁴⁶ but it does not generate a significant amount of greenhouse gas

¹⁴⁴ Hone, David, “*Facts and trends to 2050*”, World Business Council for Sustainable Development, August 2004, p. 1-2.

¹⁴⁵ “*Facts and trends to 2050*”, p. 9. See also “*A Framework for Action on Energy*”, WEHAB Working Group, World Summit on Sustainable Development, Johannesburg, August 2002, p. 7.

¹⁴⁶ “*Nuclear Power*”, Greenpeace.
<http://www.greenpeace.org/international_en/campaigns/intro?campaign_id=4016>.

(GHG) emissions,¹⁴⁷ potentially making it an attractive option from a cost-benefit perspective. Nuclear energy is mainly a developed country energy source, as there are concerns that other countries might start using nuclear capacity for weapons production. The Nuclear Energy Agency (NEA) reports that if the world's 438 nuclear reactors operating as at 2000 were to close down and be replaced by modern fossil-fuel-fired plants, global GHG emissions would rise by some eight per cent.¹⁴⁸

The fear of the consequences of nuclear power runs deep in humanity, starting with the nuclear bombs in Hiroshima and Nagasaki during the Second World War. The 1986 failure of a nuclear reactor in Chernobyl in former Soviet Union caused vast environmental damage across Scandinavia and into the Baltic States.¹⁴⁹ The dangers concerning nuclear energy are completely clear, yet the energy generation is generally considered efficient and in the face of global warming and a need to reduce GHG emissions, the question becomes which is the greater evil: the effects of global warming or the effects of nuclear power generation? The Protocol regime currently excludes nuclear power as an energy source from which emissions reductions credits may be attributed internationally.¹⁵⁰ This obstacle is enhanced by the fact that nuclear power stations are large-scale and time-consuming projects,¹⁵¹ and there is no guarantee that the Protocol carbon credit procedures will include nuclear power in the future.

¹⁴⁷ "Facts and trends to 2050", p. 10. See also "Nuclear Energy and the Kyoto Protocol", Nuclear Development Agency, Organisation for Economic Co-operation and Development (OECD), 2002, p. 7. See further "Nuclear Energy: meeting the Kyoto Targets", World Nuclear Association, p. 3.

¹⁴⁸ "Nuclear Energy and the Kyoto Protocol", pp. 7, 11.

¹⁴⁹ Antonio Cassese, "International Law", Oxford University Press, p. 379.

¹⁵⁰ Pearson, Ben, "Agreement on climate treaty; nuclear out of Kyoto Protocol!", Wise, 12 September 2001, sourced from Greenpeace International, <<http://www.antenna.nl/wise/cop6/outcome.html>>. See also by Pearson, "Loophole in Bonn Agreement?", Wise, 12 September 2001, <<http://antenna.nl/wise/cop6/loophole.html>>.

See further by Pearson, "The exclusion of nuclear power from the Kyoto Protocol", September 2001,

<<http://www.nirs.org/nukesandglobalwarming/Bonnnukelanguagefinal.htm>>.

¹⁵¹ "Interest in nuclear power rises as costs fall", New Zealand Business Review, 13 August 2004, by Jock Anderson,

<<http://nbr.co.nz/print/print.asp?id=9886&cid=8&cname=News>>, citing US Westinghouse nuclear power plant design AP1000 costing up to US\$1.3 billion to build, employing approximately 400 engineers and with annual service costs of up to US\$20 million.

Developing countries can still opt for nuclear development outside the Protocol regime and carbon trading scheme, although this would potentially become an obstacle to later if unable to account for credits generated from it.¹⁵² With regard to existing nuclear powers, Britain recently announced that it sees no need to increase its nuclear capacity, currently representing around 25 per cent of total electricity generation, for at least at decade and instead wanting to move to increased use of wind power.¹⁵³ This does not rule nuclear power out altogether, it only means that there is an absence of incentives for it under the first commitment period.

Depending on the success in reducing GHG emissions nuclear energy may become relevant for a second commitment period when procedures can be revised.¹⁵⁴ The World Energy Council notes the cost of renewable energy systems currently is high, that it is not likely that they will be broadly competitive for many years, and further states that "should the climate change threat become a reality, nuclear is the only existing power technology which could replace coal in base load".¹⁵⁵ In light of the overwhelming evidence that GHG emissions still are rising, some environmentalist even urge the world to build nuclear power stations rather than burn more oil, coal and natural gas.¹⁵⁶

G Summary

The carbon trading market currently largely resolves the Protocol ratification and amendment dilemma simply by being an informal market, allowing both governmental and private investment to flow across borders. Protocol Annex I Parties can invest in sinks in both Protocol-Party and non-party countries and may claim the credits as long as they can be verified.

¹⁵² "Nuclear Energy and the Kyoto Protocol", p. 32.

¹⁵³ "Britain sees no need now for more nuclear power", Reuters News Service, 22 September 2004, see PlanetArk, <<http://www.planetark.com/avantgo/dailynewsstory.cfm?newsid=27272>>.

¹⁵⁴ "Nuclear Energy and the Kyoto Protocol", p. 9.

¹⁵⁵ "Nuclear Energy and the Kyoto Protocol", p. 48, citing "Energy for Tomorrow's World – Acting Now!", World Energy Council (WEC), 2000.

¹⁵⁶ "Nuclear power 'too big' for NZ", The New Zealand Herald, 5 November 2004, by Simon Collins, <<http://www.nzherald.co.nz/storyprint.cfm?storyID=3570052>>, citing James Lovelock in a statement the previous week.

Nuclear power is not accepted for CDM or JI projects, which instead favours investment into renewable resources and greater efficiency in energy use. Thus Guruswami's argument that the Protocol is flawed because developing countries do not have to be parties is itself flawed.¹⁵⁷ Developed countries need developing countries to offset emissions and to transition to less GHG-emitting and more energy-efficient practices. Developing countries need developed country investment to facilitate sustainable economic growth and to avoid the high-emitting industrialisation process of developed countries last century. This mutual need not only creates an unprecedented incentive for sustainable projects in developing countries but may over time result in an international market with an "environmental currency" that may be used to repay debts in more conventional currencies.

V *NEW ZEALAND: A CASE OF SUSTAINABLE ECONOMICS?*

A *Climate Change Response Act 2002*

New Zealand is a small country in the South Pacific with a population of approximately four million, representing 0.2% of the world's GHG emissions.¹⁵⁸ The country ratified the Protocol in 2002 in the Climate Change Response Act 2002 No 40 (CCRA), the commitment period being 1 Jan 2008 to 31 December 2012,¹⁵⁹ attaching as Schedules to the Act both the Convention¹⁶⁰ and the Protocol¹⁶¹ to facilitate interpretation of climate change legislation. The CCRA establishes a carbon trading system by way of CDM and JI mechanisms under the guidance of the Minister of Finance,¹⁶² including a Registry for the management of carbon transactions¹⁶³ and an Inventory Agency for the management of GHG inventories.¹⁶⁴ The CCRA provides the framework within which

¹⁵⁷ Guruswami, Lakshman, "Climate Change: The Next Dimension", Summer, 2000 Supplement, 15 J. Land Use & Envtl. Law 341, p. 343.

¹⁵⁸ "Kyoto Protocol Status of Ratification", UNFCCC, 25 November 2004.

¹⁵⁹ CCRA, s. 4.

¹⁶⁰ CCRA 2002, Schedule 1.

¹⁶¹ CCRA 2002, Schedule 2.

¹⁶² CCRA 2002, s. 6.

¹⁶³ CCRA 2002, s. 10.

¹⁶⁴ CCRA 2002, s. 32.

transactions must take place,¹⁶⁵ as well as the compliance regime with penalties for failure to provide GHG information,¹⁶⁶ and search and seizure rights by inspectors for the purpose of verifying GHG information and suspected breaches of requirements.¹⁶⁷

Aside from the Convention and Protocol implementing legislation, Cabinet has long been working on a comprehensive compliance and enforcement regime,¹⁶⁸ including the putting in place of a competitiveness-at-risk assessment (CAR) for large corporates whose financial losses as a result of Protocol implementation may be a threat to the economic security of the nation. Once a company has been deemed to be at risk, a negotiated greenhouse gas agreement (NGA) is developed between government and the company, which exempts the company from emissions levies in return for comprehensive reporting of emissions and their sources.¹⁶⁹ GHG emissions reporting is not yet compulsory unless subject to an NGA, but guidelines developed to date are indicative of Crown direction: climate change management sits high on the political agenda and reporting requirements will be in place long before 2008, perhaps as early as 2005.¹⁷⁰ Other recent policy initiatives include the proposal for managing emissions of synthetic greenhouse gases (SGGs)¹⁷¹ and the process for evaluating renewable resource energy projects for government sponsorship.¹⁷²

¹⁶⁵ CCRA 2002, ss. 10-30.

¹⁶⁶ CCRA 2002, ss. 46-48.

¹⁶⁷ CCRA 2002, ss. 36-45.

¹⁶⁸ Refer series of papers published by the Department of Prime Minister and Cabinet, and the New Zealand Climate Change Programme in October 2001: "*Climate Change Working Paper – Legislation to Ratify the Kyoto Protocol*", "*Climate Change Working Paper – The Use of Projects, Negotiated Greenhouse Agreements and Levies to Reduce Greenhouse Gas Emissions*", "*Climate Change Working Paper – Domestic Emissions Trading*", and "*Climate Change Working Paper – Emissions Charges*".

¹⁶⁹ Refer "*Negotiated Greenhouse Agreements Application Guidelines*", New Zealand Climate Change Office / Ministry for the Environment, June 2003, see also Model Negotiated Greenhouse Agreement (dates as at 7 April 2004), available from the New Zealand Climate Change Office.

¹⁷⁰ Above, n 17.

¹⁷¹ See "*Ways of limiting emissions of synthetic greenhouse gases used to replace ozone depleting substances in New Zealand*", Discussion paper by the New Zealand Climate Change Office at the Ministry for the Environment, October 2004.

¹⁷² See "*Budget 2004: Government – Forest Industry Partnership*", Statement by Hon Pete Hodgson, 19 May 2004,

<<http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=19748>>.

Increased production and rising living standards mean a greater demand for energy generation and New Zealand currently faces significant energy (electricity) supply constraints from downsized gas fields and shortfalls in electricity generation during winters in the last few years. Demand increases around two percent every year with fossil fuel currently accounting for 65 per cent of energy use, whereof 40 per cent in the transport sector.¹⁷³ The South Island has a lot of coal, which is high in GHG emissions, while the majority of petroleum is imported. To address energy inefficiencies New Zealand launched its Programme of Action for sustainable development in 2003, which sets out to make energy use in New Zealand more efficient, expand use of renewable resources and ensure a secure electricity supply.¹⁷⁴

Compared to many countries, for example the United States, Australia and the EU the carbon trading market in New Zealand is still underdeveloped. To date only ten million CDM credits have been issued, whereof four million have been assigned to fifteen projects in New Zealand.¹⁷⁵ This is an obstacle to investment (though not to international such) and much more needs to be done in New Zealand to encourage investment in renewable resources and to avoid economic loss by business seeking to invest overseas at lower cost and greater certainty.

B Sustainable Trading in Perspective: the QMS

A recent study by the New Zealand Business Council for Sustainable Development focusing on the use of economic incentives as a means of achieving sustainable development offers multiple examples of successful

¹⁷³ "Sustainable Development for New Zealand – Programme of Action", Department of Prime Minister and Cabinet, January 2003, p.16.

¹⁷⁴ Above, n 178. See also "Sustainable Energy in New Zealand", IPENZ Presidential Task Committee on Sustainability during 2003 and 2004, Ian Shearer, Energy Services Ltd, March 2004, <<http://www.ipenz.org.nz>>.

¹⁷⁵ See "Climate Change: The Outcome of the First Projects Tender Round", Cabinet Policy Committee, Office of the Minister of Finance, Office of the Convenor, Ministerial Group on Climate Change. [Ref: POL (04) 8/10], 2004. Refer also Watt, Simon, and Anchali Anandanayagam, "Tendering for climate change projects: the second round", September 2004, Bell Gully, <<http://www.bellgully.com>>, for a useful analysis of the issues relating to tendering for ERUs, citing prices at NZ\$10/unit based on an assessment by Meridian in 2003.

environmental trading systems.¹⁷⁶ The report cites in particular the New Zealand Quota Management System (QMS) as a successful system in increasing fishing profitability while ensuring the natural resource is effectively managed.¹⁷⁷ The QMS was first established in 1986 and revised in the Fisheries Act 1996. The key element of the system is the individual transferable quota (ITQ), which is a permanent right to fish in return for a share of total allowable catch.¹⁷⁸ A 2002 review of the system found that the value of fishing quota had increased since the system's introduction.¹⁷⁹

While the QMS has a significant Maori aspect to consider under the Treaty of Waitangi, the carbon trading system arguably does not,¹⁸⁰ however there may be aspects around the State claiming sinks where the sink producing forest belong to Maori. This is partly addressed in the Permanent Forest Sink Initiative (PFSI), where landowners can apply for accreditation under the Protocol by ensuring the delivery of sinks in return for ERUs that may be traded.¹⁸¹ It is difficult to anticipate at what rate this initiative will be embraced, as it is restricted to forest planted after 1990, maintenance costs are to be born by the landowner and the contractual terms are largely non-negotiable, including a freeze on large-scale tree removals for 35 years.¹⁸²

C The Price of Carbon and Investment Incentives

For businesses at risk of incurring high emissions charges, such as the electricity industry, metal smelters and other emission-intensive industries, it makes sense to manage emissions sources and securing sinks at

¹⁷⁶ Sinner, Jim and Guy Salmon, "*Creating Economic Incentives for Sustainable Development*", Ecologic Foundation for the New Zealand Business Council for Sustainable Development, November 2003, p. v.

¹⁷⁷ Above, n 181 p. 12-16.

¹⁷⁸ Above, n 182.

¹⁷⁹ Above, n 182, citing Newell et al (2002).

¹⁸⁰ Climate Change Research Strategy, National Science Strategy Committee, New Zealand, 2002, p. 10, recommends funding be assigned to ensure Maori does not lose out on opportunities.

¹⁸¹ See "*New Zealand's Permanent Forest Sink Initiative for Afforestation and Reforestation under Article 3.3 of the Kyoto Protocol*", New Zealand Climate Change Office, 2004.

an early stage. Not only will it assist in determining the exposure to any emissions charge but it also facilitates information collection to facilitate energy planning and assess ongoing risk, thus enabling a no-surprise outcome when the Protocol comes into force in 2008. There have never been better incentives for assessing exposure to emissions charges and investing in the carbon market to offset any such charge. In the lead up to the Protocol coming into force and international standard trade prices being determined, the carbon price floats almost completely without benchmark. This generates a positive investment environment, creating the opportunity that sinks may be able to be purchased at prices lower than what the international standard price will be when the official market opens, and there is of course the added incentive from a PR point of view of being perceived as a "green" and responsible business.

Assuming all paperwork is in order all early carbon trade agreements will stand under the Protocol. Another investment incentive is that the life of the Protocol and the trading opportunities it offers may be limited. As with any market it is "first in, first served". If in 2012 no further commitment periods are agreed the carbon trading market will close. However, in light of scientific research showing that more will need to be done to control global warming,¹⁸³ it is very likely the carbon trading market will remain open, thereby making it a reasonably safe market to invest in (no more nor less than for example, foreign currency exchange).

D Summary

New Zealand is an example of a country that stands to benefit from the Protocol. The question now becomes about recycling the revenue from GHG emissions charges for example, by way of grants to promote energy

¹⁸² Above, n 183. Sustainable removal of trees according to the continuous canopy management approach is however accepted.

¹⁸³ See for example, "Kyoto will not work, warns climate expert", Belfast Telegraph, 9 December 2004, by Michael McCarthy, see WBCSD, <<http://www.wbcsd.org/plugins/DocSearch/details.asp?type=DocDet&ObjectId=12243>>. See further, "Man has 100 hundred years left, says top NZ scientist", The Dominion Post, front page on 17 November 2004, citing The Press, that Professor Barrett of the Antarctic Research Centre of Victoria University Wellington used his acceptance speech for the Marsden Medal to warn that climate change is a major threat to the planet.

efficiency in a sustainable manner in the local community, even at the individual level in the form of tax subsidies for improving energy efficiency also in schools and homes.¹⁸⁴ This would be a welcome policy development in New Zealand, which has suffered sustained criticism of the standard of housing in the last year. Such a tax rebate would also foster increased public awareness of global warming, while encouraging sustainable development at all levels of society through sharing the returns from becoming a more environmentally sound economy both domestically and internationally.

VI CONCLUSIONS

Individual States have taken different approaches for implementing the Protocol, using both carrots (carbon trading schemes, tax credits and State sponsored renewable resource projects) and sticks (emissions charges, effectively a kind of tax, as well as criminal prosecution and fines for breaches of climate change laws) to encourage domestic participation. The emergence of the carbon trading market is thus occurring in two different ways: through voluntary trading schemes (market-driven), or through command and control schemes (State-driven). Whichever model is used the carbon credits generated (and their governing legislation, methodologies and calculations) are intended to reside in and be managed through the Internet, thus easily capable of both domestic and international trading.

A *Scientific Challenges and the Need for Ongoing Research and Development*

Reliable international scenario modelling of climate change is difficult in the absence of complete information. Technological advances mean that the climate change modelling today is infinitely more reliable than it was in the 1980s but even so the scientific community faces

¹⁸⁴ See Mann, Roberta, "Waiting to Exhale?: Global Warming and Tax Policy", August, 2002, 51 Am. U.L. Rev. 1135, 1171, citing such initiatives being explored in the US. See also "Climate Change Working Paper – Domestic Emissions Trading", and "Climate Change Working Paper – Emissions Charges", Annex 1, p.13 for options.

significant challenges with regard to understanding GHG emissions. Carbon accounting under the Protocol, the precise assessing of GHG emissions and CO₂ absorption, is a difficult and relatively new science. Accuracy in climate change modelling and future scenario projections rely on scientific research into how different sources emit at different rates, and likewise how different sources absorb CO₂ to different degrees. There can be natural year-to-year variations in CO₂ storage relative to particular climates and it is also difficult to monitor the long-term effect of CO₂ and at which point a sink (a tree) transforms into a source (rotting vegetation). Similarly, different kinds of coal emit at different levels, and the processing of the coal also plays a part in the final emission. Ultimately the preferred energy solutions selected by nations will be relying on scientific data. The need for scientific research with the regard to the Protocol cannot be understated, as it will underpin the future of the Protocol and our ability to manage GHGs in the atmosphere.

B The Future of Carbon Trading

There can be no doubt that the climate change regime already has proven itself successful: scenario modelling has already significantly improved in accuracy, the majority of UN member States are not only Convention members but now also Protocol members, thus rendering the climate change policy regime close to if not already an accepted international norm. This is further illustrated by the fact that even UN member States that are not members of the Protocol, such as the United States, still have climate change management initiatives underway, which reinforces Higgins' point that international law rarely is ignored even by States who have not ratified the particular treaty. The risk of losing face internationally by being labelled a "free-rider", together with positive results delivered by the carbon trading scheme over time, will render non-participants more likely to participate.

The anticipated economic growth generated by the carbon credit trading market will influence the participation decisions by illustrating that

there are other incentives to participate than simply the common good of atmospheric balance. The introduction of a standard international carbon price after the Protocol comes into force will make it a more reliable "currency" into which to invest, although the absence of a fixed carbon price brings its own investment opportunities. The biggest issue for encouraging CDM investment is currently caused by the body most wanting to facilitate such investment, namely the high cost of registering projects with the CDM EB in a manner that is fully compliant, enhanced by the limited return by pilot projects such as that run by the WBCSD.

At present corporate benefits from being involved in carbon credit trading appears, at least by reference to the US initiatives, to lie in improving efficiencies at home by trading intra-company. This model is clearly best suited to large companies, who stand to gain the most from improving efficiency across a wide range of activities. Therefore the main carbon market participants will for the foreseeable future be large GHG emitters and sink traders who may be private or government.

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