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Linking Emissions Trading Schemes with the European Union

by

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Abstract

Emissions trading is a crucial policy tool for reducing greenhouse gas emissions in a cost-effective way. The world's largest existing emissions trading scheme is the European Union's cap-and–trade Emissions Trading Scheme (EU ETS). It was established in 2005 through the Emissions Trading Directive to help the European Union and its member states to reduce greenhouse gas emissions and fulfill their commitments under the Kyoto Protocol in a cost-effective way. The Directive recognizes that linking the EU ETS to other emissions trading schemes would increase the cost-effectiveness of reaching the community's emissions reduction commitment.

When the EU ETS was launched in 2005, in its first phase, it covered over 11,500 energy-intensive installations across the then 15 EU member states, representing 45 percent of the EU's carbon dioxide (CO_2) emissions. Currently in its second trading period, from 2008 to 2012, the EU ETS now addresses emissions from the enlarged EU, with 27 member states. The EU ETS is also linked to domestic emissions trading schemes in Norway, Iceland and Lichtenstein. Most recently, in August 2012, Australia and the EU announced their intention of linking their emissions trading schemes. Switzerland is also considering the establishment of a domestic emissions trading scheme and anticipating linking to the EU ETS in the future. Because of its size and harmonization experience, this scheme offers a starting point for establishing a global network of greenhouse gas emissions trading schemes.

Greenhouse gas emissions trading schemes in Canada, in particular, the proposed federal scheme and the existing Alberta provincial scheme are also potential candidates for linkage under article 25 of the EU Trading Directive, through an agreement for the

mutual recognition of allowances. However, the different designs of the EU and Canadian domestic emissions schemes will pose challenges in establishing linkage. This thesis identifies some of the key features in the design of emissions trading schemes and the implications of these design features when exploring linkage between the EU ETS and the Canadian emissions trading schemes.

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Chapter One: Introduction

1.1 Background

Emissions trading is a market-based environmental policy tool for combating climate change in a cost-effective way. It is not a new phenomenon, having been used most prominently in the United States during the 1990s to reduce sulfur dioxide and nitrogen oxide emissions. Emissions trading is now being applied to reduce greenhouse gas (GHG) emissions.

Among the best known emissions trading schemes are those established by the Kyoto Protocol.[1] The Protocol sets binding greenhouse gas emissions reduction targets for 37 developed countries, the so-called Annex I countries, relative to their 1990 emissions. It requires parties to reduce their collective greenhouse gas emissions by an average of 5.2% below 1990 levels from 2008 to 2012 (the first commitment period), with specific targets varying from country to country. The government of Canada has committed to reducing its greenhouse gas emissions by 6% while the European Union as a group has committed to a reduction by 8% below the 1990 level by the year 2012.[2]

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[1] *Kyoto Protocol to the Framework Convention on Climate Change*, Dec. 11, 1997, 37 I.L.M. 22, (entered into force 16 February 2005) [Kyoto Protocol].

[2] See UNFCCC, "Kyoto Protocol: Targets", online: UNFCCC <http://unfccc.int/kyoto_protocol/items/3145.php> (last visited Sept. 16, 2012). In order to better reflect different GHG emissions reduction abilities among EU member states, the 15 EU member states entered into Burden Sharing Agreement in June 1998. This agreement became legally binding among EU member states by Council Decision (EC, *Council Decision 2002/358/EC of 25 April 2002 concerning the approval, on behalf of the European Community, of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the joint fulfillment of commitments thereunder*, [2002] OJL130 [Council Decision 2002/358/EC]). Under this Agreement, they translated 8 % emissions reduction target agreed under Kyoto Protocol into differentiated emissions reduction targets of each EU member states. Since 2004, twelve additional countries joined the EU, all of which, except for Malta and Cyprus, have ratified the Kyoto Protocol and have accepted individual GHG emissions reduction targets of 6% or 8% thereunder.

The Kyoto Protocol established a number of new innovative market-based mechanisms to reduce the cost of compliance.[3] One of these mechanisms, provided for in Article 17, allows parties to achieve their emissions reduction objectives through emissions trading.[4] The concept of emissions trading is simple: a party that emits less than its emissions reduction target levels (known as assigned amounts) would be allowed to sell its surplus emissions allowances, or assigned amount units (AAUs) to other parties that need them to cover emissions above their targets.[5]

In December 2009, nearly 200 countries gathered in Copenhagen to debate a new post-Kyoto global climate change agreement. What emerged from this conference was a statement of intent rather than a binding pledge to mitigate greenhouse gas emissions but it was still an important step. It was hoped that a second commitment period of Kyoto Protocol could be agreed to in Cancún, Mexico a year later. That did not happen, but a number of steps taken indicated progress under the Kyoto track and signaled a way forward.[6] After the frustrations at the Copenhagen conference and the struggle to save the international climate regime in Cancun, negotiations in Durban (December 2011) finally turned a corner and not only brought back to life the Kyoto Protocol but, in doing so, adopted a decision that will lead to negotiations on a more inclusive

[3] Richard Baron & Stephen Bygrave, "Towards International Emissions Trading: Design Implications for Linkages" (Paper prepared for the Organisation for Economic Co-operation and Development, 2002), online: Organisation for Economic Co-operation and Development (OECD) <http://www.oecd.org/environment/climate change/2766158 .pdf> at 7 [Baron & Bygrave].

[4] *Ibid*.

[5] *Ibid* at 5.

[6] Cesare Romano & Elizabeth Burleson, "The Cancún Climate Conference" (2011), online: Case Western Reserve University <http://law.case.edu/lectures/files/2011-2012/20110909_Burleson_E-Cancun_Climate_Conf.pdf> at 4 [Romano & Burleson]. There was an agreement that Emissions Trading, the Clean Development Mechanism and Joint Implementation, should continue to be available for meeting emissions reduction targets. This sends a signal that carbon markets will continue to play a role in the future for Annex I countries in meeting their targets regardless of what happens to the Kyoto Protocol after 2012.

climate regime. The countries agreed to work on a new international climate change treaty that would include the developed as well as the developing countries for the first time.[7] States have agreed to decide on the particulars of this treaty by 2015 and implement it from 2020.[8] In the absence of a comprehensive successor to the Kyoto Protocol, the world is left with an array of regional and national plans to limit greenhouse gas emissions. Many of these plans include emissions trading schemes, which are quickly becoming the developed countries' preferred mitigation tool. Each of these schemes differs in its design and characteristics. Some of these schemes are designed to be used for compliance with emission reduction commitments under the Kyoto Protocol, whereas others are designed for other purposes.

The world's largest existing emissions trading scheme is the European Union cap-and–trade Emissions Trading Scheme (EU ETS). It was launched in 2005 through the EU Trading Directive[9] as a means to help the European Union and its member states to reduce greenhouse gas emissions and to fulfill their commitments under the Kyoto protocol in a cost-effective way.[10]

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[7] Climate Connect, "Decision Summary – Durban Climate Negotiations (COP-17)" (December 12, 2011), online: Climate Connect <http://www.climate-connect.co.uk/Home/sites/default/files/Durban%20COP%2017%20Summary%20&%20Highlights%20Sample.pdf> (The agreement will provide that big emitters such as China, India and the US will ultimately have legal emission reduction commitments after 2020. In addition, some developed countries – EU, Norway, Australia and New Zealand – agreed to participate in a second commitment period of the Kyoto Protocol. The second commitment period would start from 1 January 2013 and would continue until either 2017 or 2020 (this is to be decided at COP 18 Qatar, 2012). The extent to which Japan, Russia and Canada will participate in the second commitment period of Kyoto Protocol is still unclear, even though they clearly rejected doing so before the Durban COP.).

[8] *Ibid.*

[9] EC, *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*, [2003] OLJ 275/32 [EU Trading Directive].

[10] MJ Mace et al, "Analysis of the Legal and Organizational Issues Arising in Linking the EU Emissions Trading Scheme to Other Existing and Emerging Emissions Trading Schemes" (Report prepared for the Foundation for International Environmental Law and Development (FIELD), May 2008), online: Foundation for International

The first phase of the EU ETS, launched in 2005, covered over 11,500 energy-intensive installations across the then 15 EU member states, representing 45 per cent of the EU's carbon dioxide (CO_2) emissions.[11] Currently in its second trading period, which runs from 2008 to 2012, the EU ETS now addresses emissions from the enlarged EU of 27 member states. The EU ETS is expected to continue beyond 2012 after the first commitment period of the Kyoto Protocol.[12]

The EU Trading Directive acknowledged that linking the EU ETS to other emerging emissions trading schemes would increase the cost-effectiveness of reaching the community's emissions reduction commitment.[13] Article 25 of the EU Trading Directive allows linking through an agreement for mutual recognition of allowances.[14] Consequently, Article 25 authorizes the EU to conclude an agreement with countries listed in Annex B that have ratified the Kyoto Protocol.[15] In addition, the preamble to Directive 2004/101/EC[16] which amends the EU Trading Directive, anticipates linkage with Annex B parties that have not ratified the Kyoto Protocol.[17]

The EU ETS is already linked to the domestic emissions trading schemes in Norway, Iceland and Lichtenstein. Most recently, in August 2012, Australia and the EU announced their intention to

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Environmental Law and Development (FIELD) <http://www.field.org.uk/files/Linking%20emission%20trading%20schemes_0.pdf> at 1 [Mace et al].

11 *Ibid*.

12 EC, *Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community*, [2009] OJL 140/63 [Directive 2009/29/EC]. The Commission adopted this directive in 2009 to amend the current EU ETS for Phase III, which will start on 1 Jan 2013.

13 EU Trading Directive, *supra* note 9, paragraphe 18.

14 Mace et al, *supra* note 10 at 1.

15 *Ibid* at 86.

16 EC, *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*, [2004] OLJ 338/18 [Linking Directive].

17 *Ibid*, in its Preamble, recital 18.

link their emissions trading systems.[18] The EU Commission sees the EU ETS as an important building block for the development of a global network of emissions trading schemes.[19] Presently, national and sub-national schemes are already established in countries such as Australia, Japan, New Zealand and the United States, and are planned in Canada, China, South Korea and Switzerland. These schemes may potentially seek linkage with other emissions trading schemes such as the EU ETS in the future.

In Canada, the province of Alberta has been a leader in regulating GHG emissions. In 2007, the province became the first jurisdiction in North America to establish a compliance-based GHG emissions trading scheme under the terms of the 2007 Specified Gas Emitters Regulation[20] and the 2002 Climate Change and Emissions Management Act[21]. SGER requires facilities that emit more than 100,000 tons of CO_2 a year to reduce their emissions intensity by 12 percent annually.[22] Emissions intensity refers to the quantity of GHGs released by a facility per unit of production.[23] An emissions intensity target does not establish an absolute limit on total emissions. Covered facilities can comply by reducing the emissions intensity of their operations,

[18] European Commission, "Australia and European Commission Agree on Pathway Towards Fully Linking Emissions Trading Systems" (August 28, 2012), online: European Commission <http://europa.eu/rapid/press ReleasesAction.do?reference=IP/12/916&format=HTML&aged=0&language=EN&guiLanguage=en> (last visited Sept. 2, 2012) (A full two-way link by means of the mutual recognition of allowances between the two schemes will begin no later than 1 July 2018. Until then, an interim link will be established. Australian participants will be able to use EU allowances to meet their emissions reduction commitments under the Australian ETS from 1 July 2015. On the other hand, the European participants won't be able to use Australian allowances until full link between two schemes is established, i.e. no later than 1 July 2018.).

[19] See European Commission, "Linking the EU ETS to Other Emissions Trading Systems and Incentives for International Credits", online: European Commission <http://ec.europa.eu/clima/policies/ets/linking_en.htm> (last visited Aug. 29, 2012) [Linking the EU ETS to Other Emissions Trading Systems and Incentives for International Credits].

[20] *Specified Gas Emitters Regulation*, Alta Reg 139/2007 [SGER].

[21] *Climate Change and Emissions Management Act*, SA 2003, c C-16.7 [CCEMA].

[22] SGER, *supra* note 20, s.3.

[23] *Ibid*, s.1(1)(h).

purchasing or using Emissions Performance Credits[24] (EPCs), by contributing CND $15 per tCO_2 to the Climate Change and Emissions Management Fund, or by purchasing Alberta-based offset credits.[25]

The Canadian federal government's most recent proposal to limit industrial greenhouse gas emissions is its "Turning the Corner"[26] plan. It also proposes an emissions intensity based scheme. This plan does not include definite provisions to reach Canada's Kyoto target of a six-percent reduction from 1990 levels by the 2012 commitment period. Instead, it outlines proposals for reducing emissions of carbon dioxide and other greenhouse gases by 20 percent below 2006 emissions by 2020, and by 60 to 70 percent by 2050. Furthermore, in 2010, the government of Canada announced that it will harmonize its greenhouse gas reduction targets with the United States, to 17 percent from 2005 levels by 2020.[27] Unfortunately, no policy implementation has followed since. Most recently, in December, 2011, Canada announced that it was withdrawing from the Kyoto Protocol effective December 2012.[28] Article 27(2) of the Kyoto Protocol allows states to withdraw within one year from the date of notification of withdrawal.[29] Formal notification of withdrawal from the treaty occurred on December 15, 2011, making

[24] Covered entities that are able to do better than their emission reduction target can generate Emission Performance Credits. These credits can be banked for use in future years or sold to other covered entities that have not met their emissions reduction obligation.
[25] SGER, *supra* note 20, ss.7, 8, 9.
[26] Environment Canada, *Turning the Corner: Taking Action to Fight Climate Change* (Ottawa: Environment Canada, 2008), online: Government of Canada, Climate Change <http://www.ec.gc.ca/doc/virage-corner/2008-03/pdf/COM-541_Framework.pdf > [Turning the Corner: Taking Action to Fight Climate Change].
[27] Environment Canada, "Canada's Domestic Action" (2011), online: Environment Canada <http://www.climatechange.gc.ca/default.asp?lang=En&n=4FE85A4C-1> (last visited Jul. 28, 2012).
[28] Environment Canada, "Statement by Minister Kent" (December 12, 2011), online: Environment Canada <http://www.ec.gc.ca/default.asp?lang=En&n=FFE36B6D-1&news=6B04014B-54FC-4739-B22C-F9CD9A840800> (last visited Apr. 20, 2012).
[29] Kyoto Protocol, *supra* note 1, Art. 27(2).

Canada's withdrawal effective December 15, 2012.[30] Therefore, at the moment, it seems that the federal government has abandoned its "Turning the Corner" plan adopting instead a wait-and-see policy until the US emissions trading legislation is unveiled.

To sum up, there are strong signs that emissions trading schemes will be established in non-European Union countries and potentially seek to link with the European Union Emissions Trading Scheme. Canada is one of the potential linking partners.

1.2 Thesis Research Question

This thesis addresses the following question: will the proposed Canadian federal and the existing Alberta provincial emissions trading schemes be able to achieve effective linkage with the European Union Emissions Trading Scheme? In addressing this question, I will assess the design features that will be crucial for linking different emissions trading schemes, identify potential incompatibilities, if any, and outline what adjustments, if any, might be made to facilitate effective linkage.

1.3 Methodology

To achieve my objective of assessing the potential impacts of linking emissions trading schemes such as those of the EU and Canada which have different design features, I used a comparative method. I examined three particular schemes: (1) the EU Emissions Trading Scheme – EU ETS; (2) the existing Alberta Emissions Trading Scheme; and (3) the proposed Canadian Federal Emissions Trading Scheme.

[30] See UNFCCC, "Status of Ratification of Kyoto Protocol", online: UNFCCC <http://unfccc.int/kyoto_protocol/background/items/6603.php> (last visited Apr. 20, 2012).

In my research, I undertook a literature review of secondary sources on the linking of different emissions trading schemes. I focused on the literature on linking to determine the design elements of an emissions trading scheme that will be crucial for linking different emissions trading schemes. The literature emphasizes several core criteria for evaluating the implications of linking. The criteria are environmental effectiveness, institutional compatibility, cost effectiveness, equity, political feasibility, transaction and administrative costs. The assessment of the potential implications is based on possible links between any emissions trading schemes, rather than between specific schemes.

To address my thesis question, I used a comparative and analytical approach to primary and secondary sources to consider how each aspect of the design of the emissions trading scheme, identified in the literature review as crucial for linking, is addressed by the existing and proposed trading regimes in the EU and Canada. The key primary sources include legislation, regulations, and guidelines from the European Union and Canada (federal and Alberta provincial). The key secondary sources are: (1) legal academic commentaries on the linking of different emissions trading schemes and the emissions regulatory frameworks in the European Union, Alberta and Canada; and (2) reports and commentaries from government departments such as Environment Canada,[31] Environment Alberta,[32] the European Commission,[33] and other entities such as the International Energy Agency[34] and the Intergovernmental Panel on Climate Change.[35]

[31] Online: Environment Canada <http://www.ec.gc.ca> (last visited Sept. 15, 2012).
[32] Online: Environment Alberta <http://environment.alberta.ca> (last visited Sept 15, 2012).
[33] Online: European Commission <http://ec.europa.eu> (last visited Sept. 15).
[34] Online: International Energy Agency <http://www.iea.org> (last visited Sept. 15).
[35] Online: Intergovernmental Panel on Climate Change <http://www.ipcc.ch/index.htm> (last visited Aug. 15, 2012).

Within each comparative scheme, I searched legal databases, including ABI Inform Global, Social Science Research Network (SSRN), Canadian Business & Current Affairs Databases (CBCA), Environment Complete, ScienceDirect, Pais International, Omnifile, HeinOnline and CanLII for terms including “carbon trading”, “emissions trading”, “EU ETS”, “climate policy”, “emissions trading schemes”, “linking”, “carbon market”, “climate regime”, “ETS” and “climate change”.

1.4 Framework

This thesis is divided into six chapters. Following this introductory chapter, I provide in chapter two a brief outline of the problem of global climate change and the main Kyoto obligations and mechanisms. I also explain how an emissions trading scheme as a market-based tool can help combat climate change in an efficient manner.

In chapter three I examine the concept of linking, its rationale and benefits, and also provide a brief discussion of potential linking partners.

Chapter four considers available literature on linking to determine which design elements are generally regarded as minimum requirements for the linking of different emissions trading schemes. I identify the problematic issues as well as mechanisms that could potentially harmonize these different design elements. I use several core criteria, emphasized in the literature, to guide a consideration of how and whether to link emissions trading schemes. These criteria are environmental effectiveness, institutional compatibility, cost effectiveness, equity, political feasibility, transaction and administrative costs.

Chapter five examines critical issues that could arise in the event of linking the EU ETS to the Canadian ETSs and identifies some minimum preconditions for allowing linking. A series of design elements is examined in the context of their importance for the linkage of these schemes.

Chapter six is a summary of my conclusions.

1.5 Conclusion

This thesis examines the issues related to linking the existing EU to the proposed Canadian federal and existing provincial Alberta emissions trading schemes for greenhouse gases. The main benefit of linking is increased cost efficiency.[36] Linking the EU and Canadian emissions trading schemes should create a carbon market with a larger number of participants with increased diversity of control costs.[37] This, in turn, should lower the overall costs of achieving the emissions targets of the linked regimes.[38]

Nonetheless, each possible linking with the EU ETS must be considered cautiously and should be analyzed for environmental effectiveness, competitiveness and technical problems.[39] While it is not necessary that the schemes are identical in order to be linked, certain design features will need to be harmonized to ensure the technical compatibility and environmental effectiveness of

[36] The Canada Europe Roundtable for Business, "Linking EU-Canada Emissions Trading Systems: An Option Paper by IETA" (September 2005), online: The Canada Europe Roundtable for Business <http://www.canada-europe.org/en/pdf/Linking_EU_Canada_Emissions_Trading_Systems___Sept_2005.pdf> [Linking EU-Canada Emissions Trading Systems: An Option Paper by IETA] at 7.
[37] *Ibid*.
[38] *Ibid*.
[39] Michael Faure & Marjan Peeters, *Climate Change and European Emissions Trading: Lessons for Theory and Practice* (Cheltenham, UK: Edward Elgar Publishing Limited, 2008) at 319 [Faure & Peeters].

the linked emissions trading schemes.[40] Other differences may result in issues of equity and competitiveness which by themselves will not hinder linking.[41] This is because the EU and Canadian emissions trading schemes are different and a link between these emissions trading schemes will highlight the differences in the treatment of similar participants. All in all, these issues will need to be addressed in the political and societal arena before linking can be established.[42]

[40] Linking EU-Canada Emissions Trading Systems: An Option Paper by IETA, *supra* note 36.
[41] *Ibid*.
[42] *Ibid*.

Chapter Two: Background Information

2.1 The Problem of Global Warming

The accumulation of greenhouse gases such as carbon dioxide, methane, ozone, and nitrous oxide as well as perfluorocarbons in the Earth's atmosphere hinders long wave radiation from the sun from being reflected back into the space.[43] This phenomenon, known as the greenhouse effect, is a natural and crucial part of the Earth's climate system.[44] This is because these greenhouse gases keep some of the sun's warmth from reflecting back into space, thus trapping the heat and warming the planet.[45] Without this, the world would be a cold and uninhabitable place.[46] However, in the 1980s, scientific evidence began to emerge showing that human activities are responsible for an increase in the concentrations of greenhouse gases in the Earth's atmosphere, causing the global temperature to increase thus altering the earth's natural climate.[47] As a result, in 1988, the United Nations established the Intergovernmental Panel on Climate Change (IPCC) to determine whether the Earth was getting warmer because of natural climatic variations or because of human activities.[48] In 1990, the IPCC issued its First Assessment Report on global warming.[49] It determined that activities such as industrialization and the use of gasoline-powered vehicles had increased the concentrations of greenhouse gases in the atmosphere and that the Earth's temperature had increased by 0.3°C to 0.6°C (0.5°F to 1°F) over

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[43] Jonathan Robinson et al, *Climate Change Law: Emissions Trading in the EU and the UK* (London, UK: Cameron May Ltd., 2007) at 26 [Robinson et al].
[44] *Ibid.*
[45] Paul Ruschmann, *Environmental Regulations and Global Warming* (New York, USA: Chelsea House Publishers, 2009) at 18 [Ruschmann].
[46] *Ibid.*
[47] Robinson et al, *supra* note 43 at 26.
[48] Intergovernmental Panel on Climate Change (IPCC) consists of three working groups. WGI considers the science issues, WGII deals with impacts, adaptation and vulnerability, and WGII deals with mitigation. IPCC reports are available online: IPCC <www.ipcc.ch> (last visited Sept. 15, 2012).
[49] *Ibid*.

the past 100 years.[50] It refused, however, to exclude the possibility that global warming was a consequence of natural variations rather than human activities.[51] In the following years, the IPCC issued three more assessment reports on global warming.[52] Each determined, with a greater degree of certainty in every successive report, that the Earth was becoming warmer; that this warming was the consequence of the higher greenhouse gas concentrations in the atmosphere; and that human activities are responsible for emitting those gases.[53]

2.2 UNFCCC

Convinced that the threat of the global climate change is real, the international community took steps to combat it. In 1992, the representatives of more than 170 countries attended the Earth Summit at Rio de Janeiro, where they agreed to adopt the United Nations Framework Convention on Climate Change[54]. The UNFCCC separates its parties into two major groups: Annex I nations, which are predominantly developed countries, and non-Annex I nations, which are essentially developing countries.[55]

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[50] *Ibid.*

[51] *Ibid.*

[52] The IPCC published its second assessment report (SAR) in 1995, and the third assessment report (TAR) in 2001. The fourth assessment report (AR4) was released in 2007. The fifth assessment report is anticipated in 2013/2014. These reports are available online: IPCC <www.ipcc.ch> (last visited Sept. 15, 2012).

[53] *Ibid.* In December 1995, the IPCC's Second Assessment Report indicated that the balance of evidence suggest that there is a discernible human influence on global climate. The third IPCC's Assessment Report included an increasing body of observations supporting global warming and other changes in the climate system, stronger evidence that recent warming is attributable to human activities and a finding that those with least resources have the least capacity to adapt and are thus most vulnerable. The latest report, the IPCC's Fourth Assessment report, argued that warming of climate system is now unequivocal and that most of the increase in the past 50 years is very likely to be man-made. It further stated that many (but not all) impacts can be reduced, delayed or avoided by mitigation.

[54] *United Nations Framework Convention on Climate Change*, 9 May 1992, 1771 UNTS 107, 31 ILM 849 (entered into force 21 March 1994) [UNFCCC].

[55] *Ibid* , Annex I. UNFCCC divides countries into three main groups according to their differing commitments: Annex I countries (industrialized countries and economies in transition), Annex II countries (industrialized countries that were members of the OECD (Organization for Economic Co-operation and Development) in 1992, but not countries with economies in transition) and non-Annex I countries (developing countries).

The main objective of the UNFCCC is to achieve the "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system".[56] The Convention also stipulates that such a level "should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner".[57]

At the center of the Convention lies the principle of "common but differentiated responsibilities". This principle acknowledges the historical contributions of states to the issue of global climate change as well as the different capabilities of states to address it.[58] Although all states contribute to global climate change and will be affected by its consequences, the Convention recognizes that developed countries established their economies at the time when there were no limitations on emissions and they continue to emit a much larger amount of greenhouse gases per capita than the developing countries.[59] Thus, while all states should take actions to address global climate change, the developed countries should take the lead.[60] Consequently, the UNFCCC places greater responsibilities on the 41 developed countries listed in Annex I to the Convention than on the developing countries.[61] In concrete terms this means that while all parties to the UNFCCC must develop programs to deal with the causes and effects of global climate change,[62] Annex I countries have a further responsibility to take the lead in responding to climate change

[56] *Ibid* at Art. 2.
[57] *Ibid.*
[58] Robinson et al, *supra* note 43 at 28.
[59] *Ibid*.
[60] *Ibid* at 29.
[61] *Ibid*.
[62] *Ibid.* See also UNFCCC, *supra* note 54, Art. 4(1).

by developing policies and measures directed at stabilizing greenhouse gas emissions at 1990 levels by 2000.[63] Furthermore, the developed countries listed in Annex II[64] must provide new and additional financial resources to developing countries,[65] to assist particularly vulnerable developing countries with the cost of adaptation,[66] and to transfer mitigation technologies and know-how to developing countries.[67]

However, while the UNFCCC recognized the need to stabilize greenhouse gases, it set neither mandatory limits nor timelines on greenhouse gas emissions for individual countries; neither did it provide any enforcement measures. In the meantime, it became increasingly evident that firm and binding emissions reduction commitments by developed countries were necessary.

2.3 The Kyoto Protocol

In December 1997, after seeing minor progress on reducing greenhouse gas emissions, the countries that were party to the UNFCCC met at COP-3 in Kyoto, Japan to formulate a new agreement that would require developed countries to set legally binding targets and timelines for the GHG emissions. As a result, the Kyoto Protocol was adopted in 1997 in Kyoto, Japan. On February 16, 2005, the Kyoto Protocol came into force, making the obligations contained therein legally binding on its parties. The objective of the Kyoto Protocol mirrors the objective of the UNFCCC – the stabilization of GHG emissions at a level that will prevent damage to the climate

[63] *Ibid*, Art. 4(2).
[64] Annex II is different from Annex I in that it does not contain countries with economies in transition.
[65] UNFCCC, *supra* note 54, Art. 4(3).
[66] *Ibid*, Art. 4(4).
[67] *Ibid*, Art. 4(5).

by reducing human-induced GHG emissions on a global scale.[68] The major difference between the Kyoto Protocol and the UNFCCC is that while the UNFCCC encouraged the industrialized countries to reduce greenhouse gas emissions, the Kyoto Protocol commits them to do so. It requires Annex I countries (37 industrialized countries including Canada and the European Union) to reduce their collective GHG emissions by at least of 5.2% below 1990 emissions by 2012.[69]

Within this general target, the individual Annex I countries committed to differentiated targets that reflect their specific circumstances, including their state of economic development and access to low-carbon technologies.[70] For example, Canada committed to a 6% reduction below the 1990 baseline while the European Union as a group committed to an 8% reduction.[71] By only imposing legally binding emissions reduction targets on Annex I countries, the Kyoto Protocol maintains the principle of "common but differentiated responsibilities" established by the UNFCCC.[72]

One of the most significant features of the Kyoto Protocol is the inclusion of a set of flexible market-based mechanisms designed to help Annex I countries in meeting their emissions reduction targets.[73] These mechanisms are Emissions Trading (ET), Joint Implementation (JI) and the Clean Development Mechanism (CDM). The development of these market-based

[68] John C. Goetz, "Development of Carbon Emissions Trading in Canada" (2009) 46 Alberta Law Review 377 at 377 [Goetz].
[69] Ruschmann, s*upra* note 45 at 21.
[70] Robinson et al, *supra* note 43 at 29.
[71] Ruschmann, s*upra* note 45 at 23.
[72] Robinson et al, *supra* note 43 at 30.
[73] *Ibid.*

mechanisms can be traced back to the provisions of the UNFCCC which envisaged that parties could achieve emissions reductions by acting jointly.[74] Essentially, these market-based mechanisms allow Annex I countries to use emissions reductions carried out in other countries to offset their own emissions in order to meet their emissions reduction targets.

This thesis will concentrate on emissions trading rather than on JI or the CDM, with special emphasis on the European Union and the Canadian federal and Alberta's provincial emissions trading schemes.

2.4 Emissions Trading

The term "emissions trading" refers to a market where parties can purchase or sell permits for emissions (i.e. allowances) or credits in order to reduce emissions of defined pollutants.[75] Emissions trading can be used within a region, a country or globally.[76] Governments, businesses and voluntary groups are possible parties in emissions trading.[77] As in any market, emissions trading involves many purchasers and sellers coming together to trade a commodity, in this case emissions allowances or permits or emissions reduction credits.[78]

2.4.1 Economic Theory behind Emissions Trading

The use of marketable allowances or permits as an instrument to achieve cost-effective environmental regulation was first suggested by Dales in the late 1960s as an alternative option

[74] See UNFCCC, *supra* note 54, Art. 4(2).
[75] Allan Greenbaum, Ron Pushchak & Alex Wellington, *Canadian Issues in Environmental Law and Policy* (Concord, Ontario, Canada: Captus Press Inc., 2009) at 65 [Greenbaum, Pushchak & Wellington].
[76] *Ibid.*
[77] *Ibid.*
[78] *Ibid.*

to environmental taxes and fees.[79] His idea can be traced back to the school of property rights in economics that held that externalities should be internalized.[80] This generally means that negative external costs that are not reflected in the market price, such as environmental pollution, should be incorporated in this price by allocating property rights or imposing taxes.[81]

2.4.2 Functioning of Emissions Trading

At the beginning of an emissions trading program, the state may allocate allowances or permits to polluters either by selling them, i.e. by auctions, or free of charge, i.e. by a "grandfathering mechanism".[82] The total amount of the allocated permits or allowances represents the overall emissions reduction target for the covered polluters.[83] Polluters that reduce their emissions below their permitted levels can sell their unused allowances on the market to polluters that are emitting above permitted levels.[84] In this way, polluters make their abatement decisions by comparing the cost of additional abatement measures with the price of allowances on the market.[85] Polluters with higher marginal abatement costs will buy allowances, while polluters with lower marginal abatement costs will carry out abatement measures and sell their surplus allowances on the market.[86] Thus, emissions reductions are achieved wherever marginal abatement costs are lowest.[87] This creates an environmental benefit at the lowest cost for society.[88]

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[79] JH Dales, *Pollution, Property and Prices: An Essay in Policy-Making and Economics* (Toronto: University of Toronto Press, 1968).
[80] Edwin Woedman, Alessandra Arcuri & Stefano Clo, "Emissions Trading and the Polluter-Pays Principle: Do Polluters Pay under Grandfathering?" (2008) 4(2) Review of Law & Economics 565 at 567.
[81] *Ibid.*
[82] Bernd Hansjurgens, *Emissions Trading for Climate Policy* (Cambridge, UK: Cambridge University Press, 2005) at 2 [Hansjurgens].
[83] Greenbaum, Pushchak & Wellington, *supra* note 75 at 65.
[84] *Ibid*.
[85] Hansjurgens, *supra* note 82 at 3.
[86] *Ibid.*
[87] *Ibid*.

Emissions trading is a non-traditional regulatory approach that depends entirely on an agency, usually the government, issuing standards and specific directives as to the amount by which polluters must reduce their emissions and the sanctions for failure.[89] The traditional command and control regulatory approach has been criticized because it tends to involve too many government regulators, leads to strict and uniform use of standards and provides inadequate incentives to innovate.[90] Although emissions trading still involves a regulator, the role of the regulator is limited to issuing allowances, supervising the market, monitoring, and applying sanctions in the case of non-compliance.[91] Thus, emissions trading harnesses the power of the market to discover the lowest-cost options for reducing emissions.[92]

2.4.3 Major Design Considerations in Emissions Trading

There are three main forms of emissions trading schemes (ETSs): "cap-and-trade", "baseline-and-credit" and "offset" schemes. The EU ETS is a cap-and-trade scheme whereas the proposed Canadian federal and existing Alberta provincial ETSs are baseline-and-credit schemes.

2.4.3.1 Cap-And-Trade Schemes

In a cap-and-trade scheme, a regulatory authority first establishes an aggregate limit or cap on emissions.[93] The goal is to reduce emissions by setting the cap at a lower level than historical emissions.[94] For example, the Kyoto Protocol established this kind of aggregate cap for

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[88] *Ibid.*
[89] Greenbaum, Pushchak & Wellington, *supra* note 75 at 65.
[90] *Ibid.*
[91] Hansjurgens, *supra* note 82 at 3.
[92] Greenbaum, Pushchak & Wellington, *supra* note 75 at 65.
[93] *Ibid* at 69.
[94] Brian Evans, "Principles of Kyoto and Emissions Trading Systems: A primer for Energy Lawyers" (2004-2005) 42 Alberta Law Review 167 at 178.

developed countries.[95] Once a cap has been determined, selected groups of polluters are allocated, either free of charge or via auctioning or a combination of both, a certain proportion of the total amount of available emissions, which they are authorized to emit.[96] Subsequently, polluters that take measures to minimize their emissions below the level represented by the allowances they hold may sell their unused allowances to other polluters that are emitting at a level higher than that represented by their allocated allowances.[97] Polluters that emit above their limits without the necessary allowances will face sanctions.[98] An emissions trading scheme therefore guarantees that the overall environmental target will be met since total emissions will be held below the cap.[99] The EU ETS is the major example of a cap-and-trade scheme currently in operation.

2.4.3.2 Baseline-and-Credit Schemes

Under a baseline-and-credit scheme a government allocates allowances based on some assessment of a normal rate of emissions.[100] For each participant an emissions baseline is defined below which there is no charge for emissions.[101] Participants can increase their production and their emissions without being required to submit credits as long as the amount of emissions per unit of production remains below the set baseline.[102] Participants who manage to keep their

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[95] *Ibid*.
[96] Greenbaum, Pushchak & Wellington, *supra* note 75 at 69.
[97] *Ibid.*
[98] *Ibid.*
[99] *Ibid.*
[100] David Freestone & Charlotte Streck, *Legal Aspects of Carbon Trading* (Oxford; New York: Oxford University Press, 2009) at 62 [Freestone & Streck].
[101] *Ibid.*
[102] New Zealand Ministry for the Environment, "Discussion Paper on Measures to Reduce Greenhouse Gas Emissions in New Zealand Post-2012" (2006), online: New Zealand Ministry for the Environment <http://www.mfe.govt.nz/publications/climate/discussion-paper-post-2012-dec06/discussion-paper-post-2012-dec06.pdf> at 32 [Discussion Paper on Measures to Reduce Greenhouse Gas Emissions in New Zealand Post-2012].

actual emissions below the baseline for a period obtain credits, which they can sell through a market to those who exceed their baseline.[103] At the end of the compliance period any participant that has exceeded its baseline must deliver to the government sufficient credits, purchased in the market, to cover the excess and achieve compliance.[104]

A main difference between baseline-and-credit and cap-and-trade schemes is the timing of distribution of allowances.[105] While the intensity baseline is established in advance for the baseline-and-credit scheme, the actual level of production and the emissions intensity is not known until the end of the year or other compliance period used.[106] Therefore, participants do not know the extent of their liabilities or benefits until the end of the compliance period when emissions allowances are distributed.[107] With cap-and-trade scheme, the amount of cap is known in advance regardless of production levels, so allowances can be distributed with certainty at the beginning of the compliance period.[108] The proposed federal and existing Alberta provincial emissions trading schemes are an example of this type of approach.

2.4.3.3 Offsets

Under an offset scheme, unregulated sources can obtain credits for emissions reduction projects that take place outside the regulated activities.[109] These credits can be sold to other entities where

[103] Freestone & Streck, *supra* note 100 at 62.
[104] *Ibid.*
[105] Discussion Paper on Measures to Reduce Greenhouse Gas Emissions in New Zealand Post-2012, *supra* note 102 at 32.
[106] *Ibid.*
[107] *Ibid.*
[108] *Ibid.*
[109] Environment Canada, "Domestic Emissions Trading for Greenhouse Gases", online: Environment Canada <http: //www.ec.gc.ca/default.asp?lang=En&xml=00A362E1-A98E-4D5C-9997-8FB7AF9ECF2C> [Domestic Emissions

they can be used to achieve compliance with a conventional regulatory requirement.[110] The decision to reduce emissions and to generate these credits is generally voluntary; however, the resulting credits must be certified before they can be used by others for compliance purposes.[111] Certification will be withheld unless the entity is going beyond business as usual (BAU).[112] If an entity receives credits for emissions reductions for BAU this would lead to higher overall emissions.[113]

The offsets could be traded in a number of ways. One option is to establish a trading scheme, such as cap-and-trade or baseline-and-credit, and allow for offset credits to enter this market.[114] This is a common feature of emissions trading schemes and effectively means that specific types of offset credits will have the same value as an emissions allowance.[115] Nevertheless, it is expected that offsets will be restricted to specific sectors and activities.[116] On one hand, allowing emissions trading schemes to use offset credits can improve the cost effectiveness of

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Trading for Greenhouse Gases] (last visited Sept. 15, 2012). Examples of possible projects include energy-efficiency projects, solar and wind-powered electricity systems among the others.

[110] Dora Fazekas, *Carbon Market Implications for New EU Member States: Empirical Analysis of the Pilot Phase of the European Carbon Trading System* (Saarbrücken, Germany: LAP Lambert Academic, 2011) at19 [Fazekas].

[111] *Ibid.* Certification is a distinctive feature of carbon trading because the regulator concludes that credit-worthy activity has taken place and that the credit can be transferred. Thus, an offset scheme requires a process of verification and government approval or at least registration as well as constant monitoring. This makes the transaction costs and uncertainty high.

[112] *Ibid.*

[113] *Ibid.* Additionality is an important issue to consider when purchasing offsets. An offset project is considered additional if it goes beyond BAU. Usually, this means that the project wouldn't have happened without the extra funding from the sale of offsets. Only by buying offsets that have met additionality criteria we can be assured that the purchase is resulting in a net benefit for the climate.

[114] Discussion Paper on Measures to Reduce Greenhouse Gas Emissions in New Zealand Post-2012, *supra* note 102 at 33.

[115] *Ibid.*

[116] Greenbaum, Pushchak & Wellington, *supra* note 75 at 69.

the scheme as well as encourage emissions reductions from unregulated sources.[117] On the other hand, allowing the use of offset credits can weaken the motivation for emissions reductions.[118]

Every mandatory emissions trading scheme to date has allowed for the use of offsets by regulated entities to meet their emissions reduction obligations.[119] The EU, as well as Alberta and the Government of Canada, include offset systems in their emissions reduction programs and activities.[120] Most of the transactions and offsets have been created from projects in developing countries through the Clean Development Mechanism (CDM).[121]

Another option would be to establish a market that trades only in offsets by requiring part or all of the GHG emissions from a covered source to be met solely by offsets from a specified sector or sectors.[122]

2.4.4 Advantages of Emissions Trading as a Policy Tool

There are a number of advantages to adopting emissions trading as a policy tool. First, properly designed emissions trading schemes may provide polluters with flexibility without sacrificing the environmental goal of reducing emissions.[123] Polluters can meet their emissions reduction targets

[117] Discussion Paper on Measures to Reduce Greenhouse Gas Emissions in New Zealand Post-2012, *supra* note 102 at 33.
[118] *Ibid.*
[119] Anja Kollmuss et al, *Handbook of Carbon Offsets* (London; Washington: Earthscan, 2010) at 5.
[120] *Ibid.*
[121] *Ibid.*
[122] Discussion Paper on Measures to Reduce Greenhouse Gas Emissions in New Zealand Post-2012, *supra* note 102 at 33.
[123] Greenbaum, Pushchak & Wellington, *supra* note 75 at 65.

solely by their own efforts, by purchasing allowances auctioned by the government or from other polluters, or by doing both.[124]

Second, emissions trading can significantly minimize overall compliance costs if the emissions reductions take place where they are most cost-effective.[125] The use of market-based instruments such as domestic and international emissions trading schemes could reduce the costs of complying with emissions reduction targets by up to 50 percent or more.[126]

Third, emissions trading can also stimulate innovations in the reduction of greenhouse gas emissions.[127] Competition among polluters for lowest-cost emissions can encourage innovation and the development of the least costly measures and techniques of emissions reduction.[128] For instance, a polluter can significantly minimize its emissions by creating renewable technologies to replace traditional fossil-fuel-fired electricity generators.[129]

2.4.5 Emissions Trading and Climate Change

There are two aspects of the climate change problem that favour the use of emissions trading as a policy tool.[130] The first is that most emitted greenhouse gases have no direct local environmental

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[124] *Ibid.*
[125] *Ibid* at 66.
[126] Denny Ellerman, Paul L Joskow & David Harrison, Jr, "Emissions Trading in the US. Experience, Lessons, and Considerations for Greenhouse Gases" (Report prepared for the Pew Centre on Global Climate Change, 2003), online: Pew Centre on Global Climate Change <http://www.pewclimate.org/docUploads/emissions_trading.pdf> at iv [Ellerman, Joskow & Harrison].
[127] Greenbaum, Pushchak & Wellington, *supra* note 75 at 65.
[128] *Ibid.*
[129] *Ibid.*
[130] Cédric Philibert & Julia Reinaud, "Emissions Trading: Taking Stock and Looking Forward" (Paper prepared for the Organization for Economic Co-Operation and Development, 2004), online: Organization for Economic Co-

effects.[131] This is because they uniformly mix in the atmosphere, so the location of emissions occurrence or reduction does not matter.[132] The second aspect is the importance of lowering the emissions reduction cost.[133] This is important given the scale of global emissions reductions likely needed to meet the ultimate objective of the UNFCCC.[134] Market-based mechanisms, such as emissions trading, recognize that emissions sources have different abatement costs and in response provide those affected with the flexibility and incentive to meet their emissions reduction targets cost-effectively.[135] Though an emissions trading scheme cannot completely resolve the issue of climate change, it is, nevertheless, a policy tool that can help reduce global greenhouse gas emissions to the agreed-upon levels at a lower cost that might not be attained by traditional regulatory approaches.[136]

Operation and Development (OECD) <http://www.oecd.org.ezproxy.lib.ucalgary.ca/dataoecd/58/59/32140134.pdf> at 29 [Philibert & Reinaud].

[131] *Ibid.*

[132] Warren Bell & John Drexhage, Climate Change and the International Carbon Market" (Paper prepared for the International Institute for Sustainable Development, 2005), online: International Institute for Sustainable Development (IISD) <http://www.iisd.org/pdf/2005/climate_carbon.pdf> at 2.

[133] *Ibid.*

[134] *Ibid.*

[135] *Ibid.*

[136] Greenbaum, Pushchak & Wellington, *supra* note 75 at 69.

Chapter Three: Linking

Section 3.1 of this chapter introduces the concept of linking, describes the major types of linkages as well as the types and possible contents of linking agreements. Section 3.2 examines the general implications, including potential benefits and concerns of linking. Section 3.3 briefly surveys possible linking partners. And finally, section 3.4 provides a conclusion for this chapter.

3.1 Concept of Linking

The emergence of different domestic emissions trading systems (dETSs) poses the question of whether they should be linked to each other and if so, how.[137] Linking between different domestic emissions trading systems takes place when the covered entities of one emissions trading scheme are allowed to use emissions allowances or other trading units from another emissions trading scheme in order to comply with their GHG emissions reduction commitments.[138] Such links may be created directly or indirectly.

3.1.1 Direct Linking

Direct linking between ETSs can be established if either one or both schemes allow regulated entities to buy and use tradable units directly from the other scheme in order to meet domestic compliance obligations.[139] In other words, direct linking is a mutual recognition and acceptance

[137] Wolfgang Sterk & Ralf Schuele, "Advancing the Climate Regime Through Linking Domestic Emissions Trading Systems" (2009) 14 Mitig. Adapt. Glob. Change 409 at 409 [Sterk & Schuele].
[138] Javier de Cendra de Larragan, "From the EU ETS to a Global Carbon Market: An Analysis and Suggestions for the Way Forward" (2010) 19(1) European Energy and Environmental Law Review 2 at 2 [de Larragan].
[139] Richard Boyd et al, "Broadening Alberta's Carbon Markets" (Discussion paper prepared for the Climate Change Central, 2008), online: Climate Change Central <http://www.climatechangecentral.com/files /C3_BroadeningAlbertasCarbonMarkets_PhaseI.pdf> at15 [Boyd et al].

of the allocated allowances in each participating ETS for the purpose of compliance.[140] Financial markets cannot link the ETSs; they can only facilitate inter-scheme trading where links have already been established.[141]

Direct linking can be one-way (unilateral) or two-way (bilateral).[142] In a one-way link, the allowances from Scheme A can be used in Scheme B, but not vice versa.[143] For example, through its Linking Directive, the European Commission allowed EU ETS participants to use CDM units (CERs) to meet their compliance targets beginning in 2005, and JI units (ERUs) beginning in 2008.[144] In a two-way (bilateral) link, the allowances from Schemes A and B can be used for compliances in both A and B Schemes.[145] For example, two-way bilateral linkages were recently established between the EU ETS and emissions trading schemes in Norway, Iceland and Lichtenstein.[146]

In a one-way direct link where Scheme A recognizes Scheme B's allowances, if Scheme A's allowances cost more than Scheme B's, participants in Scheme A will purchase allowances from participants in Scheme B, thereby reducing the allowance price in Scheme A and increasing

[140] Faure & Peeters, *supra* note 39 at 305.
[141] Boyd et al, *supra* note 139.
[142] Judson Jaffe & Robert Stavins, *Linkage of Tradable Permit Systems in International Climate Policy Architecture* (Cambridge, Mass.: National Bureau of Economic Research, 2008) [Jaffe & Stavins].
[143] Jane Ellis & Dennis Tirpak, "Linking GHG Emission Trading Schemes and Markets" (Paper prepared for the International Energy Agency, 2006), online: International Energy Agency (IEA) <http://www.iea.org/papers /2006/Linking.pdf> at 8 [Ellis & Tirpak].
[144] Linking Directive, *supra* note 16, Art.5. However, the Linking Directive places limits on these linkages. It does not allow the use of the CERs and ERUs generated from nuclear facilities, land use charge, or forestry activities; there are also, quantitative limits on the use of CERs and ERUs.
[145] Ellis & Tirpak, *supra* note 143 at 8.
[146] Jaffe & Stavins, *supra* note 142 at 10.

Scheme B's price until the price is equalized.[147] This will lead to the increase of emissions in Scheme A and a decrease in Scheme B by an equal amount.[148] This, in turn, will lead to overall cost savings since the higher cost of emissions reductions in Scheme A are avoided and replaced by the lower cost of the emissions reductions in Scheme B.[149] However, if the allowance price in Scheme A is lower than that of Scheme B, there will be no trading in a one-way link.[150] Therefore, a unilateral linking where Scheme A recognizes Scheme B's allowances will ensure that Scheme A's allowance price never exceeds Scheme B's price.[151]

In a two-way direct link, both participating schemes recognize each other's allowances, making it possible for allowances to circulate in either direction.[152] Two-way links can be either bilateral or multilateral in nature.[153] As a result of two-way linking, any disparity between the allowance prices of schemes involved will lead to sales of allowances from the lower price scheme to the higher price scheme until the schemes' allowance prices equalize at an intermediate level, increasing emissions where allowances are more expensive with offsetting emissions reductions in the lower price scheme.[154] However, according to Ellis and Tirpak, two-way bilateral linking can also have negative effects depending on the design features of the linked ETSs.[155] It could

[147] Judson Jaffe, Matthew Ranson & Robert Stavins, "Linking Tradable Permit Systems: A Key Element of Emerging International Climate Policy Architecture" (2009) 36 Ecology Law Quarterly 789 at 797 [Jaffe, Ranson & Stavins].
[148] *Ibid.*
[149] *Ibid.*
[150] Judson Jaffe & Robert N Stavins "Linking a U.S. Cap-and-Trade System for Greenhouse Gas Emissions: Opportunities, Implications, and Challenges" (Working paper prepared for the Reg-Markets Center, 2008), online: Social Science Research Network (SSRN) <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1089042> at 8 [Linking a U.S. Cap-and-Trade System for Greenhouse Gas Emissions: Opportunities, Implications, and Challenges].
[151] *Ibid.*
[152] Jaffe, Ranson & Stavins, *supra* note 147 at 797.
[153] *Ibid.*
[154] *Ibid.*
[155] Ellis & Tirpak, *supra* note 143 at 9.

reduce the ETS's overall environmental effectiveness where an ETS with a fixed cap on emissions is linked to an ETS without such a cap, or where the ETS with limited monitoring and verification procedures (and/or covering difficult-to-quantify emissions sources) is linked to one with more stringent monitoring and verification procedures.[156] Two-way links could also reduce overall compliance where an ETS with no (or weak) penalties for non-compliance is linked to one with more stringent penalties for non-compliance.[157] Jaffe and Stavins suggest that these negative effects could be addressed by the governments of the linked ETSs.[158] For example, a government could limit the quantity of allowances from another ETS that can be used for compliance in its own scheme.[159] Or alternatively, the participants in one ETS may be permitted to use without restrictions the allowances from another ETS or ETSs, but an exchange rate could be applied to their use.[160] However, if governments limit trading, allowance prices may never converge.[161]

3.1.2 Indirect Linking

Indirect linkage can exist between two dETSs where neither of them recognizes the other's allowances for compliance purposes but where each of them independently has a direct link with a common third emissions trading scheme.[162] For example, if Scheme A is directly linked with Scheme B, and Scheme B independently established a direct link with Scheme C, then an

[156] *Ibid.*
[157] *Ibid.*
[158] Jaffe & Stavins, *supra* note 142 at 8.
[159] *Ibid.*
[160] *Ibid*.
[161] *Ibid.*
[162] Boyd et al, *supra* note 139 at 16.

indirect linkage would be created between Scheme A and C, even if Scheme A does not recognize allowances from Scheme C for compliance purposes.[163]

As a result of indirect linkage, the developments in unlinked schemes will affect other schemes, despite the lack of a formal link.[164] Hence, changes in the allowance price and emissions level in one scheme can impact the allowance price and emissions level in a scheme with which it is indirectly linked.[165]

3.1.2.1 Indirect Linkage Arising from a One-way Link between Multiple Cap-and-Trade Schemes and a Common Baseline-and-Credit Scheme

Indirect links can be established between two cap-and-trade schemes if both have a one-way link with a common baseline-and-credit scheme.[166] As result of such a one-way link, the two indirectly linked schemes will compete for credits from the third scheme.[167] This indirect linking will reduce the difference between the two cap-and-trade schemes` allowance prices since the credits will be transferred to the scheme with the higher price.[168]

3.1.2.2 Indirect Linkage Arising from Linkage between Cap-and-Trade Schemes

A number of bilateral links between several schemes can also establish indirect links among those schemes.[169] For instance, if Scheme A has a two-way link with Scheme B, which has a

[163] *Ibid.*
[164] *Ibid.*
[165] *Ibid.*
[166] Jaffe & Stavins, *supra* note 142 at 10. For example, this would be the case if authorities in multiple cap-and-trade schemes recognize only offset credits from a common baseline-and-credit scheme (e.g. CDM credits).
[167] *Ibid.*
[168] *Ibid.* (In fact, if there is a sufficient supply of credits at a price that is below the pre-link allowance price of the two cap-and-trade schemes, prices in all three schemes will be equalized fully.)
[169] *Ibid.*

two-way link with Scheme C, then trading will lead allowance prices to converge across all three schemes even if Schemes A and C are not directly linked.[170]

Therefore, when creating a direct link (whether bilateral or unilateral) with a dETS, consideration needs to be given to all indirect links that the new linkage creates with other dETSs.[171]

3.2 Nature of a Possible Linkage

Mace et al suggest that linkage between various ETSs can be achieved in a number of ways. These involve: (1) a binding international treaty; (2) a political cooperation agreement; (3) mutual reciprocal commitments; (4) mutual recognition agreements; and (5) contracts and private international law.[172]

3.2.1 A Binding International Treaty

The term "treaty" is used to describe any type of agreement between two or more countries or an international organization that establishes legally binding rights and obligations for the parties and that is governed by international law.[173] Terms such as "Conventions", "Charters", "Covenants", "Protocols", "Pacts", or "Agreements" may be used to describe these treaties.[174]

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[170] *Ibid.*
[171] Boyd et al, *supra* note 139 at 16.
[172] MJ Mace & Jason Anderson, "Legal and Design Issues Arising in Linking the EU ETS with Existing and Emerging Emissions Trading Schemes" (2009) 6.2 JEEPL 197 at 225 [Mace & Anderson].
[173] Mace et al, *supra* note 10 at 73. Vienna Convention on the Law of Treaties (*Vienna Convention on the Law of Treaties*, May 23, 1969, 1155 U.N.T.S. 331, 8 ILM 679 (entered into force 27 January 1980) [Vienna Convention]), Art.2(1)(a)) defines a treaty as "an international agreement concluded between States in written form and governed by international law, whether embodied in a single instrument or in two or more related instruments and whatever its particular designation".
[174] *Ibid.*

Treaties by their nature can be bilateral (two parties) or multilateral (multiple parties).[175] The essential feature of these agreements is that they reflect the will of the parties involved to be bound by international law.[176] Treaties can be established in a number of ways, from the negotiation and drafting of text through formal conferences of government ministers to the simple exchange of diplomatic notes.[177]

Treaties can be concluded only by formal subjects of international law – i.e. states or international organizations.[178] Sub-national bodies do not ordinarily have this ability either under public international law or under most federal systems (including the United States, Australia and Canada).[179] As a result, such entities cannot conclude legally binding treaties with other similar entities or states.[180] This creates a challenge for concluding legally binding linking agreement between the EU and sub-national emissions trading schemes in these countries.[181]

An international treaty provides a high degree of certainty, transparency and formality.[182] It also provides the possibility of sanctions and measures to remedy the non-compliance either through

[175] *Ibid* at 74.
[176] *Ibid*. Also, Art. 26 of Vienna Convention provides that every treaty in force is binding upon the parties and must be performed by its parties in good faith.
[177] *Ibid.*
[178] See Joanna Harrington, "Redressing the Democratic Deficit in Treaty Law Making: (Re-) Establishing a Role for Parliament" (2005) 50 McGill Law Journal 465 at 473. In countries such as the United Kingdom, Australia and Canada, the power to conduct foreign affairs including the power to enter into international treaties, is a prerogative power of the Executive Branch of Government, usually exercised by the Minister of Foreign Affairs without needing to obtain the consent of Parliament.
[179] Mace & Anderson, *supra* note 172 at 74.
[180] *Ibid.*
[181] *Ibid.*
[182] *Ibid*.

internal compliance mechanisms or through international law.[183] Despite these advantages, international treaties (and especially multilateral treaties) are time consuming to negotiate and agree on and may be difficult to amend and withdraw from.[184]

3.2.2 A Political Cooperation Agreement

Political cooperation agreements differ from international treaties in that they are not legally binding.[185] They can be concluded in many forms, such as a joint statement, a declaration of intent, a statement of cooperation and a Memorandum of Understanding (MOU).[186]

In 2006, for instance, the UK's Prime Minister and the Governor of California signed an MOU to become partners in addressing climate change and promoting energy diversity.[187] While this agreement indicated the political intent of both parties to work together on climate change issues, it did not provide any specific details as to how this was to be done, or commit either party to legally binding actions.[188] In order for the essential provisions of these agreements to have any legal effect, the relevant parties have to enact domestic legislation giving effect to their agreed upon provisions.[189]

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[183] Michael A Mehling, "Bridging the Trans-Atlantic Divide: Legal Aspects of a Link between Regional Carbon Markets in Europe and the United States" (Winter 2007) 7 Sustainable Development Law and Policy 46 at 47 [Mehling].
[184] Mace et al, *supra* note 10 at 74. That said most MEAs do provide for the right of withdrawal or denunciation. See Art. 27(2) of the Kyoto Protocol, *supra* note 1. It permits states to withdraw from the Kyoto Protocol within one year from the date of written notification of withdrawal.
[185] *Ibid.*
[186] *Ibid.*
[187] See Office of Governor, "California, New York Agree to Explore Linking Greenhouse Gas Emission Credit Trading Markets; Gov. Schwarzenegger Tours Carbon Trading Floor"(2006), online: Office of Governor <http://gov.ca.gov/index.php?/press-release/4449/> (last visited Dec. 10, 2009).
[188] Mace et al, *supra* note 10 at 74.
[189] *Ibid.*

Political cooperation agreements have the benefit of avoiding lengthy negotiation and ratification procedures of the treaties.[190] Although they are not legally binding, they can also lead to more substantial commitments of the parties.[191] Two or more governments and/or regulatory entities might, for instance, agree to start negotiations on possible mutual recognition of allowances, possible harmonization or approval of offsets, creation of a negotiating group to consider a framework to evaluate comparable efforts, or an agreement to establish a regulatory body to assess the progress in achieving compatible procedures for reviewing or accrediting bodies.[192]

3.2.3 Mutual Reciprocal Commitments

When two or more bodies do not have the authority to conclude or do not want to conclude a legally-binding agreement, but nevertheless seek to achieve the mutual recognition of each other's regulatory frameworks or accreditation systems, this can be achieved through mutual commitments to adopt reciprocal legislation in their jurisdictions.[193] These commitments may be declared in a joint political declaration of some form, or in unilateral declarations; however, they are implemented and enforced through the separate domestic legislation of each participating jurisdiction.[194]

In the emissions trading context, the Regional Greenhouse Gas Initiative's Memorandum of Understanding (RGGI's MOU) provides an example of such mutual reciprocal commitment.[195]

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[190] Mehling, *supra* note 183.
[191] Mace et al, *supra* note 10 at 75.
[192] *Ibid.*
[193] *Ibid.*
[194] *Ibid.*
[195] See Regional Greenhouse Gas Initiative, "Regional Greenhouse Gas Initiative, Memorandum of Understanding" (2005), online: Regional Greenhouse Gas Initiative (RGGI) <http://www.rggi.org/docs/mou_12_20_05.pdf>.

Participating individual US states negotiated and signed a MOU setting out common understandings and obligations.[196] Each participating US state commits to propose the emissions trading scheme outlined in the RGGI MOU for domestic legislative approval.[197] The integrity of this emissions trading scheme as a whole could be secured by the enactment of domestic laws within each participating jurisdiction, i.e. US states, implementing the elements agreed upon.[198]

Reciprocal commitments thus rely on the mutual political commitment of the participating parties to keep the emissions trading link operational.[199] It is always possible that a participating party might unilaterally withdraw from its agreement to recognize allowances from another emissions trading scheme by amending or revoking its domestic legislation provisions.[200] If this occurs without notice, it could lead to significant market and cost impacts.[201]

Nonetheless, mutual reciprocal commitments offer some degree of certainty and transparency as well as flexibility.[202] While each participating party has the security of the other parties' domestic legislation, each party reserves the power to alter its own legislation to restrict the recognition of allowances or other trading units from another jurisdiction if it proves to be necessary.[203] This may be useful, for instance, where one participating jurisdiction decides to recognize a new trading unit that is not acceptable to the other reciprocating jurisdiction(s).[204]

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[196] *Ibid* at 2.
[197] *Ibid*.
[198] *Ibid.*
[199] Mace et al, *supra* note 10 at 75.
[200] Mehling, *supra* note 183.
[201] Mace et al, *supra* note 10 at 75.
[202] *Ibid.*
[203] *Ibid.*
[204] *Ibid* at 79.

3.2.4 Mutual Recognition Agreements

Mutual recognition agreements normally set the conditions for recognizing the validity of foreign laws, regulations, standards or certification procedures between contracting parties to persuade the host countries that these laws, regulations, standards or certification procedures are in fact compatible with their own.[205] This is typically done to secure assurance that incoming products and services are safe.[206] An agreement between the EU and the US on sanitary measures is an example.[207] Mutual recognition principles can also be applied in areas other than trade.[208]

Bilateral mutual recognition schemes have two integral parts: (1) first, parties agree to recognize the equivalence of their counterpart's regulatory system; and (2) second, they simultaneously and reciprocally agree to relocate regulatory authority to the other party, subject to agreed-upon conditions.[209]

Under a mutual recognition agreement, the EU and the US could, for instance, agree to conditions for the recognition of allowances generated under separate domestic emissions trading schemes, instead of requiring the complete harmonization of schemes or harmonization of the

[205] Kalypso Nicolaidis & Gregory Shaffer, "Transnational Mutual Recognition Regimes: Governance Without Global Government" (2005) 68 Law and Contemporary Problems 263 at 268 [Nicolaidis & Shaffer].
[206] *Ibid.*
[207] EC, *Council Decision 98/258/EC of 16 March 1998 on the conclusion of the Agreement between the European Community and the United States of America on sanitary measures to protect public and animal health in trade in live animals and animal products*, [1998] OJL 118 [Council Decision 98/258/EC]. This agreement facilitates trade of live animals and animal products between the EU and the US by establishing a mechanism for the recognition of equivalency of sanitary measures maintained by each party.
[208] Nicolaidis & Shaffer, *supra* note 205 at 285.
[209] *Ibid* at 268. See also Mace et al, *supra* note 10 at 80 (In the context of linked emissions trading schemes, this would be the regulatory authority to determine that a tradable allowance truly reflects an authorization to emit a ton of CO_2 under a capped emissions trading scheme, and that credits or offsets truly reflect a ton of emissions avoided over a business as usual baseline).

way in which allowances are created.[210] Where the allowances created in one participating scheme are not capable of complying with the conditions in another scheme, they would not be allowed to circulate in the linked scheme.[211]

A mutual recognition agreement might create a supranational mechanism for supervising the parties' national decision-making, establishing the standards and procedures for mutual recognition, adjudicating the implementation of the scheme, or certifying assessment bodies under the scheme.[212] Alternatively, a mutual recognition agreement might establish a transnational network of regulatory officials to manage the mutual recognition regime, with home state officials being responsible for protecting home state consumers.[213]

Private bodies can also enter into mutual recognition agreements, or be the main implementers of the schemes,[214] but states are normally the contracting parties to a mutual recognition agreement.[215] This is also the case even where state representatives or regulatory bodies play the leading role in negotiation and implementation.[216]

[210] Mace et al, *supra* note 10 at 80.
[211] *Ibid.*
[212] *Ibid.*
[213] *Ibid.*
[214] Nicolaidis & Shaffer, *supra* note 205 at 284. Businesses in different jurisdictions may negotiate contracts for recognition in other jurisdictions. For example, the online-businesses that desire to meet criteria in multiple jurisdictions without the need for drawn out treaty negotiations between the governments.
[215] Mace et al, *supra* note 10 at 80.
[216] *Ibid.*

3.2.5 Contracts and Private International Law

Private contracts also permit the flow of allowances between emissions trading schemes but to a limited degree.[217] Where a formal link between the ETSs has been created, covered entities may conclude private agreements to exchange allowances, credits or offsets recognized in one trading scheme for those recognized in another.[218] Even if a formal link has not been created, market participants can employ private law to bridge the otherwise separate emissions trading schemes by creating a system for the conversion of the allowances.[219] This could be done through a system of private brokers providing arbitration services.[220] For example, individuals may open "person holding accounts" under the EU ETS registries regulation, which may allow them to engage in arbitrage between emissions trading schemes, facilitating the trading of CERs for instance, between businesses and individuals.[221]

Private contracts will broaden access to lower-cost allowances or reductions.[222] However, the extent of the flow between the emissions trading schemes based on private agreements will likely be limited, due to the need to establish the range of contract terms that will protect contracting parties' interests (for instance, price, volume, delivery date, provisions for force majeure, default, choice of laws, liability).[223] In the absence of a harmonized normative framework, the contractual arrangements for emissions trading will be guided either by the private law of a specific state as indicated in the contract or by the private law of the state determined through

[217] *Ibid* at 77.
[218] *Ibid.*
[219] Mehling, *supra* note 183 at 48.
[220] *Ibid.*
[221] *Ibid.* Arbitrage is the simultaneous buying and selling of fungible units in different market in order to get a profit from different prices.
[222] Mace et al, *supra* note 10 at 77.
[223] Mehling, *supra* note 183 at 48.

international private law.[224] It should be noted that international private law, also known as conflict of laws, merely helps regulate trans-boundary relations between private law subjects by determining which of the competing legal systems will be applied.[225] While this allows for great flexibility in the development of a trading link based on private law, the scope of application will remain limited to individual transactions or trading on a smaller scale.[226]

For these reasons, a private law approach will not be able to create the free movement of allowances possible through a direct linkage between emission trading schemes.[227] It will also be unsuccessful in securing cost-effectiveness for all involved, or serve the need for transparency and certainty required by the participants in the market.[228] For large scale linking of emissions trading schemes, a formal agreement between the schemes is required.[229]

3.3 Benefits and Concerns of Linking

The efficiency of carbon markets will be increased by increasing the linkages between the ETSs.[230] The involvement of more participants will result in a greater diversity of sources as well as more abatement options.[231] These factors will lead to improved market liquidity with a more stable price signal, reduce the market power of an individual or group of actors, and lead to the more efficient distribution of resources with regard to least-cost abatement measures.[232] This, in

[224] *Ibid.*
[225] *Ibid.*
[226] *Ibid.*
[227] Mace et al, *supra* note 10 at 77.
[228] *Ibid.*
[229] *Ibid.* See also Mehling, *supra* note 183 at 48.
[230] Sterk & Schuele, *supra* note 137 at 409.
[231] *Ibid.*
[232] Eric Haites & Fiona Mullins, "Linking Domestic and Industry Greenhouse Gas Emissions Trading Systems" (Report prepared for the Electric Power Research Institute (EPRI), International Energy Agency (IEA) and the

turn, should lead to lower overall compliance costs.[233] This will benefit not only companies participating in the combined ETS but also consumers, since emissions reduction costs will be reflected in the prices of energy goods.[234]

It should be noted, however, that these are gains at the macro level.[235] At the micro level, linking will produce winners as well as losers: while net sellers in a dETS with a low allowance price will profit from linking to a dETS with a higher allowance price, the opposite is true for buyers in the first dETS.[236] At the same time, net buyers in a dETS with a higher allowance price win from linking, whereas net sellers in this scheme lose.[237]

From a political point of view, Flachsland, Marschinski and Edenhofer suggest that linking has three implications. First, linking is a tool of international cooperation and, as such, indicates commitment to long-term climate change policy as well as to multilateralism.[238] Second, because linking is an effective tool to address the politically sensitive problem of competitive irregularities between the different countries with different carbon prices, it can promote the acceptance of climate policy, not only between domestic businesses but also the general

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International Emissions Trading Association (IETA), October 8, 2001), online: International Energy Agency (IEA) <http://www.iea.org/papers/2001/epri.pdf> at iv [Haites & Mullins].

[233] *Ibid.*

[234] Sterk & Schuele, *supra* note 137 at 411.

[235] *Ibid.*

[236] *Ibid.*

[237] *Ibid.*

[238] Christian Flachsland, Robert Marschinski & Ottmar Edenhofer, "To Link or Not to Link: Benefits and Disadvantages of Linking Cap-And-Trade Systems?" (2009) 9 Climate Policy 358 at 363 [Flachsland, Marschinski & Edenhofer].

public.[239] Thirdly, linking signals political approval in relation to the other ETS's underlying level of effort.[240]

From an environmental point of view, as Sterk and Schuele suggest, linking may increase environmental effectiveness.[241] While linking as such does not affect the total emissions of the linked schemes, enhanced cost-effectiveness might render stricter emissions reduction targets more politically acceptable.[242] Anger, Brouns & Onigkeit have indicated that linking could greatly decrease the costs of achieving the stabilization of atmospheric greenhouse gas concentrations at 450ppm CO_2.[243] Linking also helps to avoid the issue of "leakage", as a uniform price signal will remove the incentive for businesses to move production within the countries participating in the linked emissions trading scheme to those that have lower compliance costs.[244] Of course, businesses may still move to other countries. Yet, in relation to the linked jurisdictions, the rationale for establishing trade barriers to protect the competitiveness of domestic businesses will disappear.[245] In fact, according to Edenhofer et al., if the same price applies everywhere, the CO_2-efficient entities will obtain a competitive advantage.[246]

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[239] *Ibid.*
[240] *Ibid.*
[241] Sterk & Schuele, *supra* note 137 at 411.
[242] *Ibid.*
[243] See generally Niels Anger, Bernd Brouns & Janina Onigkeit, "Linking the EU Emissions Trading Scheme under Alternative Climate Policy Stringencies: An Economic Impact Assessment" (Paper prepared for German Federal Ministry of Education and Research, 2006), online: Wuppertal Institute for Climate, Environment, Energy <http://www.wupperinst.org/uploads/tx_wibeitrag/linking-EU-ETS.pdf> [Anger, Brouns & Onigkeit].
[244] Sterk & Schuele, *supra* note 137 at 412.
[245] Tyson Dyck, "Missing Linkages? Canada, Cap-and-Trade and the International Climate Architecture"(2009) 8(1) Canadian International Lawyer 1 at 6.
[246] Ottmar Edenhofer, Christian Flachsland & Robert Marschinski, "Towards a Global CO2 Market: An Economic Analysis" (2007) Potsdam Institute for Climate Impact Research (PIK) <http://www.pik-potsdam.de/members/robert/gutachtenaa> at 7 [Edenhofer, Flachsland & Marschinski].

On the other hand, Stark and Schuele recognize that linking can also involve a number of potential problems. First, in the end there might be only a few ETSs that could be linked to each other.[247] Currently, emissions trading is still a very new policy tool and will not necessarily be implemented in all industrialized countries.[248]

Secondly, even if ETSs are implemented broadly, it does not mean that they will all be effective.[249] The environmental effectiveness of an emissions trading scheme (as well as any linking) critically depends on its design.[250] Most importantly, emissions reductions achieved by a cap-and-trade system come not from trading but from the level of the cap.[251] The stringency of the cap also determines the extent to which cost effectiveness could be achieved through linking.[252]

Thirdly, the distributional implications of linking might also be a source of concern.[253] Impacts on any participating entity in one of the linked ETSs depend on the linkage's effect on the allowance price that the entity faces as well as on whether that entity is a net allowance seller or buyer.[254] For instance, net sellers in the ETS with a low allowance price will be in a better position after a link to the ETS with a higher allowance price because they will be able to sell their allowances at a higher price.[255] In contrast, the buyers in the ETS with a lower price will be in a worse position after linking because they will have to pay a higher price for the allowances

[247] Sterk & Schuele, *supra* note 137 at 412.
[248] *Ibid.*
[249] *Ibid.*
[250] de Larragan, *supra* note 138 at 2.
[251] Sterk & Schuele, *supra* note 137 at 412.
[252] Anger, Brouns & Onigkeit, *supra* note 243 at 395. See also de Larragan, *supra* note 138 at 2.
[253] Jaffe, Ranson & Stavins, *supra* note 147 at 800.
[254] Jaffe & Stavins, *supra* note 142 at 11.
[255] Jaffe, Ranson & Stavins, *supra* note 147.

they purchase.[256] Thus, while producing overall savings, linking can create both 'losers' and 'winners' at the same time.[257]

Fourthly, as suggested by Jaffe and Stavins, while linking may reduce emissions in some cases, it could also increase emissions under other circumstances.[258] For example, any cap-and-trade scheme that creates a one-way link with a baseline-and-credit scheme has to confront the issue of additionality, i.e. some emissions reduction credits generated by the baseline-and-credit scheme may not represent truly additional emissions reductions since it might be difficult to establish a baseline against which emissions reductions could be measured.[259] As a result, if entities covered by the cap-and-trade scheme buy such credits instead of reducing emissions within the cap-and-trade scheme, the increase in emissions in the cap-and-trade scheme may not be fully offset by reductions under the baseline-and-credit scheme.[260]

A final concern, as indicated by Helm, in relation to linking is that it can change the incentives that countries face when setting their future caps.[261] According to Jaffe and Stavins, a change in the allowance price in each linked ETS changes the tradeoff that a government is confronted with between the value it can create by issuing additional allowances, and the marginal environmental damage following the issuance of these additional allowances.[262] Furthermore, by increasing the scope of the allowance market, linkages reduce the effect that the issuance of

[256] *Ibid.*
[257] *Ibid.*
[258] Jaffe & Stavins, *supra* note 142 at 11.
[259] *Ibid.*
[260] Jaffe, Ranson & Stavins, *supra* note 147 at 800.
[261] Carsten Helm, "International Emissions Trading with Endogenous Allowance Choices" (2003) 87 Journal of Public Economics 2737 at 2738.
[262] Jaffe & Stavins, *supra* note 142 at 12.

additional allowances has on allowance prices, and thus on the value of allowances in existence.[263]

To sum up, as Sterk and Schuele concluded, the hope for economic, political and environmental benefits of linking might fail to materialize if the key industrialized countries do not introduce ETSs or introduce ETSs that are not compatible.[264]

3.4 Potential Linking Partners

There are many potential linking partners amongst countries with existing, announced or proposed ETSs.[265] Existing ETSs are those that have already adopted legislation.[266] Announced ETSs are those that, although still under discussion, have already been approved by a government.[267] And finally, proposed ETSs are those that have been suggested by a government and which are still in a more exploratory stage of their development.[268]

3.4.1 Existing Emissions Trading Schemes

Existing emissions trading schemes include a number of national and sub-national emissions trading schemes:

[263] *Ibid.* By permitting countries with high domestic reduction costs to buy cheaper emissions reductions from other emissions trading schemes, however, linking can also reduce the costs that such countries would face in committing to more stringent caps, thereby partially offsetting some of these concerns.
[264] Sterk & Schuele, *supra* note 137 at 413.
[265] Faure & Peeters, *supra* note 39 at 301.
[266] *Ibid.*
[267] *Ibid.*
[268] *Ibid.*

- The European Union Emissions Trading Scheme; cap-and-trade scheme.[269]

- The Japanese Voluntary Emissions Trading Scheme; cap-and-trade scheme.[270]

- The New South Wales Greenhouse Gas Abatement Scheme, Australia; baseline and credit scheme.[271]

- The Alberta Emissions Trading Scheme, Canada; baseline and credit scheme.[272]

- The Northeast Regional Greenhouse Gas Initiative (RGGI) (between nine north-eastern states within the United States); cap-and-trade scheme.[273]

- Norway's Emissions Trading Scheme; cap-and-trade scheme.[274]

- The Swiss Emissions Trading Scheme; cap-and-trade scheme.[275]

- The New Zealand Emissions Trading Scheme; cap-and-trade scheme.[276]

- The Iceland Emissions Trading Scheme; cap-and-trade scheme.[277]

- The Liechtenstein Emissions Trading Scheme; cap-and-trade scheme.[278]

- The UK CRC Energy Efficiency Scheme; cap-and-trade.[279]

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[269] See European Commission, "Emissions Trading System (EU ETS)", online: European Commission <http://ec.europa.eu/environment/climat/emission/index_en.htm> [Emissions Trading System (EU ETS)] (last visited Aug. 2, 2012).

[270] International Energy Agency, "Subsidies-Driven Voluntary Emissions Trading Scheme", online: International Energy Agency <http://www.iea.org/Textbase/pm/Default.aspx?mode=weo&action=detail&id=2365> (last visited Aug. 15, 2012).

[271] See Government of the New South Wales, "Greenhouse Gas Reduction Scheme", online: Greenhousegas <http://www.greenhousegas.nsw.gov.au> (last visited Sept. 10, 2012).

[272] See Alberta Environment, "Alberta Offset System", online: Carbon Offset Solutions <http://carbonoffset solutions.climatechangecentral.com/policy-regulation/alberta-offset-system> (last visited Sept 5, 2012).

[273] See http://www.westernclimateinitiative.org/ (last visited Sept 5, 2012).

[274] International Energy Agency, "National Allocation Plan for the Emissions Trading Scheme 2008-2012", online: International Energy Agency <http://www.iea.org/textbase/pm/?mode=cc&id=3909&action=detail> (last visited Sept. 15, 2012).

[275] International Energy Agency, "Swiss Emissions Trading Scheme and CO_2 Tax", online: International Energy Agency <http://www.iea.org/textbase/pm/Default.aspx?mode=weo&id=3903&action=detail> (last visited Sept. 15, 2012).

[276] New Zealand Ministry for the Environment, "Emissions Trading Scheme Basics", online: Climate Change <http://www.climatechange.govt.nz/emissions-trading-scheme/about/basics.html> (last visited Sept. 15, 2012).

[277] See Stockholm Environmental Institute, "European Union Emissions Trading Scheme (EU ETS)", online: Carbon Offset Research & Education (CORE) <http://www.co2offsetresearch.org/policy/EUETS.html> (last visited Sept. 15, 2012); See also Emissions Trading System (EU ETS), *supra* note 269.

[278] *Ibid.*

- The British Columbia Emission Offsets Regulation; cap-and-trade.[280]

3.4.2 Announced Emissions Trading Schemes

Announced emissions trading schemes include a number of national emissions trading schemes:

- The Canadian Federal Emissions Trading Scheme; baseline and credit scheme.[281]

- The South Korea Emissions Trading Scheme; cap-and-trade scheme.[282]

- The California Emissions Trading Scheme; cap-and-trade scheme.[283]

- The Western Regional Climate Action Initiative (WRCAI) (between seven western states within the United States and four Canadian provinces); cap-and-trade scheme.[284]

3.4.3 Proposed Emissions Trading Schemes

The proposed emissions trading systems include a number of national and sub-national emissions trading schemes as listed below:

- The Midwestern Greenhouse Gas Reduction Accord (MGGRA) (between six Midwestern states within the United States and one Canadian province); cap-and-trade scheme.[285]

- Mexico's Emissions Trading Scheme; cap-and-trade scheme.[286]

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[279] See UK Department of Energy and Climate Change, "CRC Energy Efficiency Scheme", online: UK Department of Energy and Climate Change <http://www.decc.gov.uk/en/content/cms/emissions/crc_efficiency/crc_efficiency.aspx> (last visited Sept. 15, 2012).

[280] See Environment British Columbia, "BC Emission Offset Regulation", online: Environment British Columbia <http://www.env.gov.bc.ca/cas/mitigation/ggrta/offsets_reg.html> (last visited Sept. 15, 2012).

[281] See Environment Canada, "Canada's Action on Climate Change", online: ecoACTION <http://www.ecoaction.gc.ca/climatechange-changementsclimatiques/index-eng.cfm> (last visited Nov. 22, 2009).

[282] See Reuters, "South Korea to Start Emission Trading in 2013-2015" (2011), online: Reuters <http://www.reuters.com/article/2011/02/07/us-carbon-korea-idUSTRE7161II20110207> (last visited Sept. 5, 2012).

[283] California Air Resources Board, "AB 32 Climate Change Scoping Plan Document", online: California Air Resources Board <http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm> (last visited Sept. 5, 2012).

[284] See <www.westernclimateinitiative.org> (last visited Sept. 5, 2012).

[285] See Midwestern Greenhouse Gas Reduction Accord, "Midwestern Greenhouse Gas Reduction Accord: Final Recommendations of the Advisory Group", online: Midwestern Greenhouse Gas Reduction Accord <http://www.midwesternaccord.org/Accord_Final_Recommendations.pdf> (last visited Feb. 15, 2010).

- Australia's Carbon Pricing Mechanism; cap-and-trade scheme.[287]

- The British Columbia Emissions Trading Scheme; cap-and-trade.[288]

- The Japanese Carbon Emissions Trading Scheme; cap-and-trade.[289]

- The Chinese Pilot Emissions Trading Schemes; cap-and-trade.[290]

3.5 Conclusion

More and more countries are implementing emissions trading as part of their national climate policies. Should these emissions trading schemes be linked with each other? Linking takes place when the regulated entities of one emissions trading scheme are allowed to use allowances from another emissions trading scheme to comply with their emissions reduction commitments. Such links can be created directly or indirectly. Moreover, these links can be established in a number of ways such as through a binding international treaty, a political cooperation agreement, mutual reciprocal commitments, mutual recognition agreements, as well as contracts and private international law. While linking offers clear economic (e.g. greater diversity of sources, more abatement options, improved market liquidity and lower overall compliance costs), political (e.g. international cooperation, acceptance of climate policy and approval in relation to the other

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[286] See Global Issues, "Mexico: Efficient Transport Needed for a Cleaner Environment", (2011), online: Global Issues <http://www.globalissues.org/news/2011/10/07/11446> (last visited Nov. 20, 2011).

[287] See Australian Government, "Clean Energy Legislation", online: Department of Climate Change and Energy Efficiency <http://www.climatechange.gov.au/government/clean-energy-future/legislation.aspx> (last visited Sept. 5, 2012). The Clean Energy Act 2011 sets up the carbon pricing mechanism. It provides rules for who is covered, the Opt-in Scheme as well as what sources of carbon pollution are included, the obligation to surrender emissions units, caps on the amount of carbon pollution from 1 July 2015, international linking, monitoring, enforcement, appeal and review provisions.

[288] See Environment British Columbia, "Consultation for a Proposed Emissions Trading Regulation", online: Environment British Columbia <http://www.env.gov.bc.ca/cas/mitigation/ggrcta/emissions-trading-regulation/> (last visited Sept. 5, 2012).

[289] See Energyboom, "Japan Postpones Plans for Carbon Emissions Trading" (January 2011), online: Energyboom <http://www.energyboom.com/emerging/japan-postpones-plans-carbon-emissions-trading> (last visited Sept. 5, 2012).

[290] See GHG Accounting, "China Announces Carbon Trading Pilot Scheme" (2011), online: GHG Accounting <http://ghgaccounting.ca/?p=575> (last visited Sept. 5, 2012).

ETS's underlying level of effort) and environmental benefits (e.g. environmental effectiveness, avoidance of the leakage issue), it should be noted that these are based on a best-case scenario where countries establish environmentally efficient and similar emissions trading schemes and then link them with each other. Real-life climate change politics might develop rather differently. Consequently, for cost, political and environmental benefits to materialize, countries should introduce ETSs that are compatible.

Chapter Four: Design Issues for an ETS

4.1 General Observations

The designs of different emerging ETSs vary considerably: some are voluntary, some are mandatory; some were designed to be used for compliance with the Kyoto Protocol, while others are planned or in use in non-Kyoto countries.[291] Differences also lie in compliance, monitoring, reporting and other provisions.[292] This makes the task of linking difficult and may also undermine the environmental and cost effectiveness of emissions trading.[293] There have been efforts in the literature to identify some minimum requirements for linking different types of ETSs.[294] Haites and Mullins suggest that in order to be linked, each ETS must resolve a number of design elements which will include:[295]

- The coverage of the scheme
- The definition and recognition of trading units
- The type and stringency of emissions targets
- Allocation methodology
- Temporal flexibility: compliance period, allowance validity, banking and borrowing
- Monitoring, reporting and verification
- The compliance framework and penalties.

[291] Faure & Peeters, *supra* note 39 at 309.
[292] *Ibid.*
[293] *Ibid.*
[294] de Larragan, *supra* note 138 at 3.
[295] Haites & Mullins, *supra* note 232 at 3.

Since many of these design elements are resolved differently by the different emissions trading schemes, this might pose significant challenges for linking.[296] The following sections of this chapter examine these design elements, explore the potential challenges for linking and identify mechanisms that could potentially reconcile these different design elements.

4.2 Overarching Criteria to Guide Consideration

The literature emphasizes several core criteria to guide any consideration of how and whether to link emissions trading schemes:[297]

1. **Environmental effectiveness** – linking emissions trading schemes should not lead to lower GHG emissions reductions than would result if these schemes operated independently;[298]
2. **Cost effectiveness** – linking different emissions trading schemes should provide the same or better cost savings relative to their independent operation;[299]

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[296] *Ibid.*

[297] See generally Mace, MJ et al, "Analysis of the Legal and Organizational Issues Arising in Linking the EU Emissions Trading Scheme to Other Existing and Emerging Emissions Trading Schemes" (Report prepared for the Foundation for International Environmental Law and Development (FIELD), May 2008), online: Foundation for International Environmental Law and Development (FIELD) <http://www.field.org.uk/files/Linking%20emission%20trading%20schemes_0.pdf>; Richard Boyd et al, "Broadening Alberta's Carbon Markets" (Discussion paper prepared for the Climate Change Central, 2008), online: Climate Change Central <http://www.climatechangecentral.com/files/C3_BroadeningAlbertasCarbonMarkets_PhaseI.pdf>; Eric Haites & Fiona Mullins, "Linking Domestic and Industry Greenhouse Gas Emissions Trading Systems" (Report prepared for the Electric Power Research Institute (EPRI), International Energy Agency (IEA) and the International Emissions Trading Association (IETA), October 8, 2001), online: International Energy Agency (IEA) <http://www.iea.org/papers/2001/epri.pdf>; William Blyth & Martina Bosi, "Linking Non-EU Domestic Emissions Trading Schemes with the EU Emissions Trading Scheme" ((Report prepared for the Organisation for Economic Co-operation and Development, 2004), online: International Energy Agency (IEA) <http://www.oecd.org/dataoecd/38/7/32181382.pdf> [Blyth & Bosi]; Wolfgang Sterk et al, "Ready to Link Up? Implications of Design Differences for Linking Domestic Emissions Trading Schemes" (Paper prepared for the German Federal Ministry of Education and Research, (2006), online: Wuppertal Institute for Climate, Environment and Energy <http://www.wupperinst.org/uploads/tx_wibeitrag/ready-to-link-up.pdf> [Sterk et al].

[298] Mace et al, *supra* note 10 at 51.

[299] *Ibid.*

3. **Equity** – linking emissions trading schemes should not unfairly disadvantage any participants;[300]
4. **Institutional compatibility** – institutional elements of emissions trading schemes such as the allowances, coverage, and registries, should be generally compatible;[301]
5. **Political feasibility** - linking emissions trading schemes should not lead to disruption or bypass of political goals/decisions on national mitigation efforts;
6. **Transaction costs -** linking emissions trading schemes should not lead to higher costs arising from the transfer of tradable permits, than would result if these schemes operated independently;[302] and
7. **Administrative costs -** linking emissions trading schemes should not lead to higher operating costs of trading schemes than would result if these schemes operated independently.

4.3 The Coverage of the ETS

The question of coverage embraces several distinct issues: gases and sectors included in the scheme, whether emissions are targeted upstream or downstream, mandatory or voluntary participation, and finally opt-in and opt-out provisions.[303]

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[300] *Ibid.*
[301] *Ibid.*
[302] Thomas H Tietenberg, *Emissions Trading: Principles and Practice* (Washington, DC: Resources for the Future, 2006) at 41 (Tietenberg defines transaction costs as costs, other than price, incurred in the process of the exchanging goods and services. These include the costs related to things such as researching the market, finding buyers or sellers, negotiating and enforcing contracts for tradable permit transfers, completing all the necessary regulatory paperwork, as well as making and collecting payments).
[303] Sterk et al, *supra* note 297 at 14.

4.3.1 Gases Covered

Gas coverage refers to the gases that are included in an ETS. Not all of the ETSs cover the same gases. The Kyoto Protocol covers six greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6).[304] Different ETSs may choose to regulate only one or several of these gases.[305] In order to increase environmental effectiveness and to create more diverse abatement options, Sterk et al. argue that schemes should cover as many types of gases as feasible.[306] According to Blyth and Bosi, emissions trading schemes which cover more gases allow participating entities to reach their emissions reduction targets at lower cost since reductions of non-CO_2 gases are often more cost-efficient than CO_2 emissions reductions.[307]

The disadvantage, as Sterk et al. suggest, is that non-CO_2 emissions are often more difficult to monitor and to calculate leading to doubts about the accuracy of the results obtained.[308] Thus, when opting for broader gas coverage, it is necessary to ensure that non-CO_2 emissions can be determined adequately in order to guarantee the legitimacy of the trading units.[309] Nevertheless, as Sterk et al suggest, so long as the emissions of the non-CO_2 gases can be determined accurately, differences in gas coverage should not prevent linking.[310] On the contrary, access to low-cost abatement options will provide participating entities in the more comprehensive

[304] *Ibid.*
[305] *Ibid.*
[306] *Ibid.*
[307] Blyth & Bosi, *supra* note 297 at 16.
[308] *Ibid.*
[309] *Ibid.*
[310] Sterk et al, *supra* note 297 at 14.

schemes with an advantage over their counterparts in the narrower schemes.[311] Companies in the scheme with broader gas coverage, for example, due to their access to the lower options, may increase their ability to sell their allowances in the wider linked scheme.[312] In addition, as Blyth and Bosi indicated, linking will extend that benefit to the participating entities in the narrower scheme because the low-cost abatement options available in the other trading scheme might lower the overall price in the narrower scheme.[313]

4.3.2 Sector Coverage

Sector coverage refers to the sources or categories of polluters that are covered by an ETS.[314] It is difficult for the different ETSs to have completely equivalent sector coverage since different countries have different emissions profiles and as a result may decide to include different sources in their emissions trading schemes.[315] One way to establish sector coverage is to include specific sectors in an ETS.[316] The types of entities that could potentially be regulated include those that emit greenhouse gases and those that produce or import gases or products that, when burned or used, produce greenhouse gases.[317] The main target of the regulations is to set standards in dealing with all large stationary sources involving fossil fuel and biomass use.[318] These sources fall into three main areas: fuel combustion activities,[319] industrial processes,[320] and natural gas

[311] *Ibid.*
[312] *Ibid.*
[313] *Ibid.*
[314] Baron & Bygrave, *supra* note 3 at 20.
[315] *Ibid.*
[316] For example, emissions sources regulated by the EU ETS include about 12,000 downstream emissions sources from following specific sectors: iron and steel; cement, glass, and ceramics; pulp and paper; electric-power generation; and refineries.
[317] Scott Deatherage, *Carbon Trading: Law and Practice* (Oxford; New York: Oxford University Press, 2011).
[318] Bert Metz et al, *Carbon Dioxide Capture and Storage* (Cambridge: Cambridge University Press, 2005) at 78.
[319] *Ibid*. The largest CO_2 emissions by far result from the oxidation of carbon when fossil fuels are burned. These emissions are associated with fossil fuel combustion in power plants, oil refineries and large industrial facilities.

processing.[321] Another way to establish sector coverage is based on the volume of GHG emissions.[322]

Stark et al. suggest that a situation in which one or more sources are covered by one dETS but not the other raises, first and foremost, questions relating to competitiveness and obtaining the necessary political support for linking.[323] If companies competing against each other are included in the ETS in one country but not in the other, this will lead to complaints of unfair treatment.[324] However, competitive disadvantages and possible discrimination caused by the different treatment of sectors in two dETSs are not caused by linking and would still arise in its absence.[325] Nevertheless, Mace et al. suggest, it may be politically appropriate to coordinate coverage of sectors through a linking agreement.[326]

Differences in coverage of sectors may, according to Baron and Bygrave, in fact have a positive effect on cost efficiency.[327] The higher the number of sources included, the lower the total emissions abatement costs.[328] Therefore, linking different dETSs with differing sector coverage

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[320] *Ibid*. Carbon dioxide not related to combustion is emitted from a variety of industrial production processes which transform materials chemically, physically or biologically. Such processes include: the use of fuels as feedstock in petrochemical processes, carbon as a reducing agent in the commercial production of metals from ores, the thermal decomposition (calcination) of limestone and dolomite in cement or lime production, the fermentation of biomass (e.g., to convert sugar to alcohol). In some instances these industrial-process emissions are produced in combination with fuel combustion emissions, a typical example being aluminium production.
[321] *Ibid* at 79. A third type of source occurs in natural-gas processing installations. CO_2 is a common impurity in natural gas, and it must be removed to improve the heating value of the gas or to meet pipeline specifications.
[322] For example, Alberta's baseline-and-credit scheme covers any facility in the province that emits more than 100,000 metric tons of CO_2 of GHGs per year.
[323] Sterk et al, *supra* note 297 at 14.
[324] *Ibid.*
[325] *Ibid.*
[326] Mace et al, *supra* note 10 at 71.
[327] Baron & Bygrave, *supra* note 3 at 21.
[328] *Ibid.*

should lead to greater cost savings, since there are different abatement costs among the participants.[329]

Conversely, differences in sector coverage, according to Haites and Mullins, do not affect environmental effectiveness nor raise the issue of institutional compatibility.[330] Thus, if the resistance of stakeholders based on competitiveness and the different treatment of comparable emissions sources can be overcome, the differences in the sources included by two dETSs should not hinder linking.[331]

4.3.3 Upstream versus Downstream

Depending on the point of application of the total limit on greenhouse gas emissions in the production and consumption cycle, emissions trading schemes can be either "upstream", "downstream" or a combination of both.[332] In an upstream scheme, emissions are regulated at the point where carbon-based products are introduced into the economy (e.g. mining coal). By contrast, downstream scheme regulates emissions at the point at which emissions actually occur (e.g. burning the coal). An upstream scheme, thus, targets producers and importers of fossil fuels, whereas, a downstream system targets the greenhouse gas emissions of the end-users of energy – usually large industrial consumers of fossil fuels such as fossil-fired generating entities and large industries.[333] The difference may also be described as follows: in an upstream emissions trading

[329] *Ibid.*
[330] Haites & Mullins, *supra* note 232 at 39.
[331] *Ibid.*
[332] Sterk et al, *supra* note 297 at 15.
[333] *Ibid.*

scheme - the covered entities are held accountable for the GHG emissions of others; in a downstream scheme - the covered entities are held responsible for their own GHG emissions.[334]

There are considerable differences between the number and the type of market participants under a downstream and an upstream ETS.[335] An upstream scheme will cover fewer and much larger participants than a downstream scheme.[336] In terms of administrative efficiency, the fewer participants in an upstream scheme will be easier to manage and to monitor than the larger number covered by a downstream scheme.[337] However, apart from the lower market liquidity due to the limited number of participants in the ETS, Philibert and Reinaud also point to the possibility that upstream entities may simply pass on their compliance costs to consumers.[338] For this reason, upstream schemes have been criticized on the basis that they turn an ETS into a carbon tax.[339]

The advantage of a downstream scheme, according to Baron and Bygrave, is that it provides wider coverage.[340] It covers small consumers of coal, natural gas and refined oil products (e.g. those in the transport, commercial and residential sectors).[341] Because of the large numbers of participants, as Philibert and Reinaud indicate, a downstream scheme has the potential of becoming impractical.[342] To avoid that problem and to improve administrative effectiveness,

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[334] *Ibid.*
[335] Baron & Bygrave, *supra* note 3 at 16.
[336] *Ibid.*
[337] *Ibid.*
[338] Philibert & Reinaud, *supra* note 130 at 23.
[339] Baron & Bygrave, *supra* note 3 at 15.
[340] *Ibid.*
[340] *Ibid.*
[341] *Ibid.*
[342] Philibert & Reinaud, *supra* note 130 at 23.

Baron and Bygrave suggest that thresholds for the number of sources/participant need to be established.[343]

According to Sterk et al., differences should not impede linking provided that a common unit is used – e.g. tons of CO_2 or the equivalent.[344] However, dETSs should be linked in a way that avoids any double- or undercounting.[345] For instance, if energy products are exported from an upstream (producers and importers) to a downstream scheme (end-users), emissions will be accounted for in both schemes, i.e. they will be double-counted.[346] One option to deal with this, according to Boyd et al, is not to require energy exporters in upstream ETS to surrender tradable units to cover emissions associated with exported energy products.[347] Or, alternatively, do not cover energy product users by an emissions target in the downstream ETS.[348]

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[343] Baron & Bygrave, *supra* note 3 at 16.
[344] Sterk et al, *supra* note 297 at 15.
[345] *Ibid.*
[346] *Ibid.* See also "Linking a U.S. Cap-and-Trade System for Greenhouse Gas Emissions: Opportunities, Implications, and Challenges", *supra* note 150 at 26 (Double counting occurs usually when emissions reduction project's mitigation effort counted twice unintentionally. For example, consider a situation in which an entity covered by the downstream scheme, receiving some of its fuel from supplier subject to the upstream system, reduces its emissions by one ton by reducing its fuel consumption. As a result of this emission reduction measure, it will receive, for example, one allowance which it can sell to another entity. The supplier in in the upstream scheme will also receive one allowance since its fuel sales will have declined. Therefore, although the emissions reduction measure undertaken in the downstream scheme only reduces emissions by one ton, it frees up two allowances (one in each scheme), leading to an offsetting two-ton increase in emissions. Because of this, allowance trading resulting from this emission reduction measure would lead to a net increase in emissions.).
[347] Boyd et al, *supra* note 139 at 42. See also Michael Gillenwater & Wiley Barbour, "Tracking Indirect Emissions in the Electric Power Industry" (Discussion paper prepared for the Environmental Resources Trust, August 2004), online: Princeton University <http://www.princeton.edu/~mgillenw/Electricity%20Accounting%20Paper%20_v2 formated.pdf> at 1 (Only direct emissions of GHG to the atmosphere by an entity should fall within the accounting boundaries. In the case of the electric power industry, indirect emissions occurring upstream or downstream from the products or services (e.g., electricity) bought or sold should be excluded from an ETS because of the quantification uncertainties and ownership issues (e.g., potential for double counting). This model of emissions accounting has been used in emission markets, such as the U.S. Acid Rain SO_2 and NOx trading programs and the EU Emissions Trading Scheme.).
[348] *Ibid.*

4.3.4 Voluntary or Mandatory Participation

Participation in an ETS may either be mandatory[349] for all participating entities or voluntary.[350] The environmental effectiveness of a voluntary scheme, according to Sterk et al, is likely to be lower than that of a mandatory one for two main reasons.[351] First, there is bound to be an inconsistency between demand and offer.[352] This is because, according to Haites and Mullins, participating sources in a voluntary scheme prefer to be sellers of allowances rather than buyers and often adopt only relatively weak targets which they achieve mainly or exclusively through internal emissions reduction actions.[353] Joining such a scheme is hardly attractive for prospective buyers.[354] This leads to low liquidity and prices.[355] Secondly, when a mandatory ETS is linked to a voluntary ETS, a participating entity in the voluntary ETS may shift its production and the attendant emissions to another entity that is not covered by the ETS in order to gain surplus allowances to sell to participants in the mandatory ETS, i.e. carbon leakage.[356] Voluntary ETSs normally achieve much lower coverage, so the scope for leakage is greater unless non-participants are covered by other policies, such as negotiated agreements or an emissions tax.[357]

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[349] This means that participation is mandatory for specified participants in a domestic emissions trading scheme. The demand in mandatory markets is created by regulatory instrument.

[350] The demand in voluntary market is created by voluntary buyers who purchase offsets. Participants normally have a powerful incentive to join the voluntary scheme, for example, in the form of a tax rebate or incentive payments from the government if they meet an agreed target. Usually, there are no penalties if targets are not met, but incentives may be removed from participants.

[351] Sterk et al, *supra* note 297 at 16.

[352] *Ibid.*

[353] Haites & Mullins, *supra* note 232 at 40.

[354] Sterk et al, *supra* note 297 at 16.

[355] *Ibid.*

[356] *Ibid.* For example, if participation in ETS increases the costs of the goods or services, sales by participants should decline while sales by firms outside the ETS should rise thus increasing the emissions of the firms outside the ETS. A participant in an ETS may be able to subcontract to a non-participant for example so that some of the emissions are transferred to non-participants. Such an action would free up allowances for sale but would increase leakage.

[357] Haites & Mullins, *supra* note 232 at 40.

If mandatory and voluntary ETSs are to be linked, it is important according to Sterk et al. to make the targets of the participants in the voluntary scheme lower than business-as-usual emissions.[358] Furthermore, these targets would also need to be bound through suitable penalties in case of non-compliance.[359] And finally, there would need to be a monitoring system to avoid leakage in a voluntary ETS after the linkage has been effected.[360]

4.3.5 Opt-in and Opt-out Provisions

A further problem that needs to be addressed is the presence of opt-in and opt-out provisions. Opt-in provisions regulate how new gases, sectors or activities can be included in the ETS.[361] In contrast, opt-out provisions regulate how participating entities can be excluded from the ETS.[362] For example, in the second trading period, the EU ETS permitted its member states to opt in activities, sectors and gases that were not yet covered by the scheme.[363] Conversely, the EU ETS permitted member states to opt out installations for the first trading period, but not for the second trading period from 2008 till 2012.[364]

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[358] Sterk et al, *supra* note 297 at 16.
[359] *Ibid.*
[360] *Ibid.*
[361] Faure & Peeters, *supra* note 39 at 314.
[362] *Ibid.*
[363] Blyth & Bosi, *supra* note 297 at 18. EU ETS covers CO_2 emissions from entities such as power stations, combustion plants, oil refineries and iron and steel works, as well as factories making cement, glass, lime, bricks, ceramics, pulp, paper and board. As for greenhouse gases, it currently only covers carbon dioxide emissions, with the exception of the Netherlands, which has opted in emissions from nitrous oxide. As from 2013, the scope of the ETS will be extended to also include other sectors and greenhouse gases. CO_2 emissions from petrochemicals, ammonia and aluminium will be included, as will N2O emissions from the production of nitric, adipic and glyocalic acid production and perfluorocarbons from the aluminium sector. The capture, transport and geological storage of all greenhouse gas emissions will also be covered. As of 2012, aviation will also be included in the EU ETS.
[364] *Ibid.*

The importance of the opt-in provisions is that they can increase the supply of allowances, motivate abatement efforts in installations/sectors not originally covered by the ETS, familiarize participants with the requirements of emissions trading and potentially reduce compliance costs.[365] According to Blyth and Bosi, the decision of an entity to opt-in or not will depend on three factors: (1) the allocation of allowances it would obtain compared to its recent emissions, (2) its abatement costs compared to the market price, and (3) the compliance costs compared to any alternative policy that it may face if it remains outside the ETS.[366]

Generous opt-out rules raise concerns in relation to the environmental performance of the ETS since they might allow net buyers to drop out, leaving only net sellers in the scheme.[367] According to Faure and Peeters, a covered entity that has an option to opt out and move to a less stringent compliance regime, reduces the scope of an ETS and thus decreases its efficiency.[368] To prevent this from happening, restrictions on opting-out should be imposed.[369] In addition, Sterk et al suggest that opting-out entities should be covered by other measures that would ensure the environmental effectiveness of the scheme.[370]

4.4 Definition and Recognition of Trading Units

There seems to be agreement in the literature that the recognition of trading units is likely to be at the center of future linking negotiations. The domestic ETS thus must identify the unit of trade

[365] Ellerman, Joskow & Harrison, *supra* note 126 at 46.
[366] *Ibid*.
[367] Sterk et al, *supra* note 297 at 17.
[368] Faure & Peeters, *supra* note 39 at 315.
[369] *Ibid.*
[370] *Ibid.*

as well as the trading rules.[371] This also includes the question of whether trading units from other ETSs can be accepted for trading in the ETS.[372]

Under the Kyoto Protocol, an assigned amount unit (AAU) is a recognized trading unit as are certified emissions reductions (CERs) generated by Clean Development Mechanism projects, emissions reduction units (ERUs) generated by Joint Implementation projects and removal units (RMUs) generated on the basis of land use, land use change and forestry.[373] When creating a domestic ETS, Sterk et al suggest that a country may identify the AAU as the trading unit or create its own trading unit, which should be substitutable with the Kyoto AAUs in order to use the emissions limits set by the Kyoto Protocol to ensure the environmental effectiveness of the ETS.[374] In addition, the ETSs should also have the same quantitative units as established by the Kyoto Protocol, namely the metric tons of CO_2, in order for them to be compatible for linking.[375] The country must also make a decision whether and how far it recognizes units from CDM/JI and from domestic offset mechanisms.[376] It may consider establishing quantitative or qualitative limits on the use of such units, e.g. it may exclude credits from certain types of projects (e.g. nuclear, LULUCF, large hydro).[377]

[371] Sterk et al, *supra* note 297 at 17.
[372] *Ibid.*
[373] Kyoto Protocol, *supra* note 1, Art. 3(3) and 3(4).
[374] Sterk et al, *supra* note 297 at 17.
[375] *Ibid.*
[376] *Ibid.*
[377] *Ibid.*

Linking two ETSs with different recognized trading units will affect the total supply of these units in the combined ETS.[378] This can directly and indirectly affect the prices.[379] First, if an ETS which accepts external trading units (Scheme A) is linked to an ETS which does not (Scheme B, e.g. credits from carbon sinks in the EU ETS), the participating entities in Scheme A can keep the units not recognized in Scheme B for their domestic compliance and sell the recognized units in Scheme B.[380] These non-recognized trading units would thus indirectly offset emissions in Scheme B.[381] Second, if Scheme A has already been linked to a third scheme (Scheme C) that is not yet linked to Scheme B, the trading units from Scheme C can also be used to indirectly offset emissions in Scheme B.[382] The political decision in Scheme B about which trading units to accept would thus be bypassed.[383] Furthermore, as Blyth and Bosi suggest, if the price of the external trading unit is lower than the price of the domestic trading unit, the total amount of emissions units in the combined ETS will be much greater than if these schemes were not linked and functioned separately.[384]

To avoid the issues discussed above, Sterk et al propose that states should harmonize the rules for the recognition of trading units.[385] While the ETS (Scheme B above) with fewer recognized trading units may take adjustment actions such as establishing exchange rates, these would only

[378] Andreas Tuerk et al, "Linking Emissions Trading Schemes" (Paper prepared for the Climate Strategies, May 2009), online: Climate Strategies <http://www.climatestrategies.org/research/our-reports/category/33/148.html> at 27 [Tuerk et al].
[379] *Ibid.*
[380] *Ibid.*
[381] *Ibid.*
[382] Sterk et al, *supra* note 297 at 17.
[383] Blyth & Bosi, *supra* note 297 at 20.
[384] *Ibid* at 21. If the price of external unit is lower than the price of allowances within the domestic trading scheme, there will a demand for them. The flow of these credits into an ETS will depend on any restrictions that are incorporated into the provisions of the schemes.
[385] Sterk et al, *supra* note 297 at 18.

increase the transaction costs while producing only limited gains in terms of reduced emissions and undermining environmental effectiveness.[386] In addition, Scheme B would have no way to tell if an incoming trading unit from Scheme A (above) was freed up by the use of an external trading unit which Scheme B does not accept.[387] Ultimately, it seems that the question in this situation is the extent to which each country would want to keep its rules for the recognition of the trading units rather than harmonizing them for the purpose of linking.[388] In short, as Sterk and Schuele suggest, if the inclusion of certain trading units is considered unacceptable by the ETS with the narrower recognition of trading units, then the only way to keep them out would be to refuse linkages with the ETS that includes them.[389]

4.5 The Type and Stringency of Emissions Targets

The stringency of emissions targets refers to how much emissions are to be reduced in comparison to historic or projected emissions.[390] It is very unlikely that a perfect balance of efforts in this area can be achieved but it is probably a political precondition for linking that all ETSs involved demonstrate efforts to establish comparable caps.[391] The reason, as Tuerk et al indicate, is that cap levels combined with the abatement cost structure determine the international allocation of mitigation costs, and linking raises the question of whether countries regard their level of effort (i.e. caps) comparable and mutually acceptable.[392]

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[386] *Ibid.*
[387] *Ibid.*
[388] Sterk & Schuele, *supra* note 137 at 417.
[389] *Ibid.*
[390] Sterk et al, *supra* note 297 at 19.
[391] Sterk & Schuele, *supra* note 137 at 418.
[392] Andreas Tuerk et al, "Linking Carbon Markets: Concepts, Case Studies and Pathways" (2009) 9 Climate Policy 341 at 347 [Linking Carbon Markets: Concepts, Case Studies and Pathways].

If entities in an ETS with strict reduction targets could largely meet their needs by purchasing allowances from another ETS with lenient targets, this, according to Sterk et al., would violate the principle of supplementarity set out in Article 17 of the Kyoto Protocol, according to which emissions trading should only play a subordinate role vis-à-vis domestic emissions reduction efforts.[393]

Linking ETSs with targets of different stringency, according to Sterk and Schuele, is problematic in that this may create an incentive for a participating country to relax its cap in order to become a net seller.[394] To avoid this, Sterk and Schuele propose that countries should have comparably ambitious climate policy strategies and a joint vision about medium- and long-term emissions trends.[395] They also suggest that it would be helpful if there were an agreement on caps in all the linked ETSs to assure all stakeholders that no country is attempting to take advantage of the others.[396]

According to Tuerk et al, the benefit of a Kyoto-type international agreement is that it establishes an accepted burden-sharing rule for participating countries.[397] However, internationally agreed caps may not be enough for linking because the participating countries may also demand that the national ETSs be of comparable stringency.[398] The fact that two or more countries have agreed to

[393] Sterk et al, *supra* note 297 at 19.
[394] Sterk & Schuele, *supra* note 137 at 418.
[395] *Ibid.*
[396] *Ibid.*
[397] Linking Carbon Markets: Concepts, Case Studies and Pathways, *supra* note 392 at 347.
[398] *Ibid.*

each other's national emissions reduction targets does not tell us anything about the relative stringency of those national emissions reduction targets.[399]

All in all, as Tuerk et al note, linking does not depend upon a Kyoto-type successor agreement since even if no such agreement is made, countries can still agree on comparably stringent caps for their ETSs.[400]

4.6 Allocation Methodology

Generally, there are two basic types of emissions trading schemes: cap-and-trade and baseline-and-credit schemes. Under cap-and-trade schemes, emissions reduction targets are assigned to every source 'ex-ante' (i.e. before the compliance period begins).[401] At the end of the compliance period, these sources have to surrender allowances equal to the total amount of emissions they have emitted.[402] By contrast, under a baseline-and-credit scheme, emissions are counted against a baseline scenario and covered entities are given credits 'ex-post' (i.e. at the end of the compliance period) if their emissions have remained below the baseline.[403] Under both schemes, entities that have over-achieved their reduction targets can sell units to those that emitted more than they were allowed.[404]

[399] *Ibid* at 348 (Since national ETSs do not establish emissions reduction obligations for all sectors, the ETS cap may be more or less stringent than that state's national emissions reduction commitment.).
[400] *Ibid.*
[401] Sterk et al, *supra* note 297 at 20.
[402] *Ibid.*
[403] *Ibid.* The baseline is normally calculated as the estimate amount of emissions which would have occurred in a business-as-usual scenario in the absence of reduction efforts.
[404] *Ibid.*

In a cap-and-trade scheme, a highly controversial issue is the initial distribution of allowances.[405] Emissions allowances can be allocated free of charge, auctioned[406] or combinations of these two.[407] Free distribution is typically based on historic levels of emissions ("grandfathering")[408] or benchmarks.[409]

Sterk and Schuele argue that the method of distribution has no impact on the ETS's environmental effectiveness since it is the cap that determines the total emission reductions.[410] Moreover, according to Blyth and Bosi, once an ETS is established, the price of carbon credits will be determined by supply and demand.[411] While the initial volume of distributed allowances is an important determinant of supply, as well as demand, the price should be independent of the method of the initial allocation.[412] Beyond the initial transfer of wealth in the case of free distribution, the method of initial allocation of allowances should therefore have no impact on the competitiveness of the entities in the ETS.[413]

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[405] *Ibid.*

[406] *Ibid*. See also Baron & Bygrave, *supra* note 3 at 9. The government sells allowances to covered entities (and possibly other interested parties) through a competitive auction. The advantage of auctioning is that it bypasses the difficult negotiation of source-by-source allocations. Instead, each entity decides how many allowances it needs to buy to meet its emissions reduction targets, and bids for these allowances in the marketplace.

[407] Julia Reinaud & Cédric Philibert, "Emissions Trading: Trends and Prospects" (Paper prepared for the Organization for Economic Co-Operation and Development and International Energy Agency, 2007), online: Organization for Economic Co-operation and Development (OECD) <http://www.oecd.org/dataoecd/60/38/39725657.pdf> at 24 [Reinaud & Philibert].

[408] *Ibid*. See also Baron & Bygrave, *supra* note 3 at 10. Allowances are allocated gratis in proportion to sources' past emissions. There can be a one-off distribution to existing entities, or distribution can be regularly updated, with new emissions data. Grandfathering is less costly for covered entities since they only need to purchase allowances for emissions in excess of their initial allocation.

[409] *Ibid*. Allowances are allocated free of charge to entities, but each entity's allocation is updated on the basis of its activity level – measured by a given metric such as an industrial output (e.g. tons of cement, GWh of electricity, etc.). An entity that can't meet the benchmark will have a shortage of allowances and the option to either reduce its emissions (e.g. through engaging in abatement) or to buy needed allowances on the market to cover its excess emissions.

[410] Sterk & Schuele, *supra* note 137 at 418.

[411] Blyth & Bosi, *supra* note 297 at 25.

[412] *Ibid.*

[413] Sterk et al, *supra* note 297 at 20.

However, according to Sterk and Schuele, while competitiveness (described as a company's ability to make a profit from its normal business operations), will not be impacted, there will be an equity issue if allowances are distributed for free in one ETS and auctioned in another.[414] Because the creation of allowances creates new economic value, entities in the ETS with free distribution will receive a lump sum subsidy while entities in the ETS with auctioning do not.[415] Once again, this distortion would occur despite linking, according to Sterk and Schuele, but entities in the ETS with auctioning can probably be expected to demand harmonization of subsequent allocation rules prior to linking.[416]

Furthermore, as Blyth and Bosi observe, differences may arise in subsequent allocation rules that can lead to different distributional effects between the entities in the two ETSs. These include the updating of allocations in future compliance periods, treatment of plant closures, and treatment of new entrants.[417]

In the case of grandfathering, governments may in subsequent compliance periods decide to distribute allowances based on emissions from the new, up-dated base year rather than using the same base-year as the first compliance period.[418] In this case, if allowance prices are likely to be higher in later compliance periods, entities may decide to avoid emission reductions in the initial period and instead comply with their targets by buying allowances from the markets since they can expect that high emissions in the first period will result in a more generous allocation of

[414] Sterk & Schuele, *supra* note 137 at 418.
[415] *Ibid.*
[416] *Ibid.*
[417] Blyth & Bosi, *supra* note 297 at 25.
[418] *Ibid.*

additional allowances in the second period.[419] In addition, according to Sterk et al, linking two ETSs in which one uses updating and the other does not could result in emissions (and also the attendant production) being moved to the ETS with updating in order to obtain a more generous allocation.[420] To avoid this, Sterk et al propose harmonizing the updating provisions prior to linking.[421]

A related issue is the treatment of plant closures and new entrants.[422] Differences in the treatment of plant closure and allocation methodology for new entrants, according to Blyth and Bosi, can result in a distortion of incentives.[423] For example, in schemes with free allocation of allowances, the government may require entities to redeem unused allowances, or be allowed to keep them.[424] On the one hand, Reinaud and Philibert suggest that the obligation to redeem unused allowances may reduce the incentive to shut down inefficient plants.[425] On the other hand, giving an on-going stream of free allowances to plants for a period of time after they have been shut down may constitute a subsidy that benefits entities that may have decided to move to an ETS with lower environmental standards.[426] This distortion, according to Sterk et al, would arise regardless of whether the ETSs are linked and might be short-term if updating is used.[427] Nevertheless, Reinaud and Philibert suggest that the rules on plant closures and new entrants should be harmonized.[428]

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[419] *Ibid.*
[420] Sterk et al, *supra* note 297 at 21.
[421] *Ibid.*
[422] Blyth & Bosi, *supra* note 297 at 26.
[423] *Ibid.*
[424] Reinaud & Philibert, *supra* note 407 at 27.
[425] *Ibid.*
[426] *Ibid.*
[427] Sterk et al, *supra* note 297 at 21.
[428] Reinaud & Philibert, *supra* note 407 at 27.

4.7 Temporal Flexibility: Trading Period, Allowance Validity, Banking and Borrowing

The temporal flexibility incorporated into the ETS relates to the trading period for that ETS and the duration of allowance validity as well as to banking and borrowing provisions.[429]

4.7.1 Trading Period

The body of literature on linking provides different answers to the question of whether the trading periods (periods within which allowances that have been issued can be used) of linked ETSs should be harmonized. Sterk et al. argue that differences in trading periods do not pose a problem.[430] On the contrary, such differences, they propose, can improve market liquidity, since temporary market shortages in one ETS at the end of its trading period can be offset by purchases from another ETS that is at the beginning of its trading period.[431]

However, Ellis and Tirpak point out that if trading periods are not harmonized, surplus allowances from one ETS can affect the environmental effectiveness of another ETS that has a later starting date.[432] For example, if allowances are available at a low price in Scheme A at the end of its trading period, they will be sold to Scheme B where its trading period is just starting.[433] Consequently, it will not be necessary to use allowances issued in Scheme B.[434] Since the trading periods overlap, these surplus allowances will then again be available to entities from Scheme A during the next trading period.[435]

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[429] Sterk et al, *supra* note 297 at 21.
[430] *Ibid.*
[431] *Ibid.*
[432] Ellis & Tirpak, *supra* note 143 at 23.
[433] *Ibid.*
[434] *Ibid.*
[435] *Ibid.*

Even if allocation of allowances, according to Edenhofer, Flachsland and Marschinski, do not ultimately provide a surplus, it is clear that harmonized trading periods would afford policymakers the possibility of controlling the total amount of issued allowances within a trading period without uncertainties.[436] If this is desirable, the trading periods of the ETSs to be linked should be harmonized.[437]

4.7.2 Allowance Validity

Most of the literature on linking does not address the issue of allowance validity explicitly, but rather implicitly through compliance period and banking rules. Allowance validity means the period during which the allowance can be used for compliance.[438]

Linking two ETSs with different allowance validity rules may cause, as Strek et al suggest, price distortions such as speculative transfers of allowances from one ETS to another.[439] The participating entities may reduce their production in a country where allowances have longer validity and move to a country with a scheme that distributes allowances to new entrants for free in the new trading period.[440] However, such incentives are likely to have only a temporary effect.[441] This is because such a risk, according to Blyth and Bosi, is balanced by the additional certainty and lower risk involved in operating in a carbon market with a long-term view of the allocation, which provides a greater opportunity for the optimization of the compliance

[436] Edenhofer, Flachsland & Marschinski, *supra* note 246 at 16.
[437] *Ibid.*
[438] Haites & Mullins, *supra* note 232 at 51.
[439] Sterk et al, *supra* note 297 at 21.
[440] *Ibid* at 22.
[441] *Ibid.*

strategies.[442] In sum, different allowance validities are unlikely to pose any significant problems to linking.

4.7.3 Banking

The possibility of banking allowances from one trading period to the next is, according to Sterk et al, an important feature for the successful functioning of the ETS.[443] It allows the participating entities to overachieve their emissions reduction targets if they expect that future allowance prices will be higher than the current ones.[444] It also provides them with additional flexibility to deal with uncertainties such as future levels of production.[445] Some authors consider that differences in banking would not pose any serious barriers for linking.[446] Even if an ETS which does not allow banking is linked to an ETS which allows banking, the latter would effectively provide a banking opportunity for all the participating entities in the combined market.[447] Furthermore, since banking effectively means that there can be potentially more emissions reduced than demanded by a set cap, this should not cause any environmental problems.[448] Presently, all emerging ETSs seem to allow banking.[449]

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[442] Blyth & Bosi, *supra* note 297 at 26. These distortions in incentive would arise from operation of the different ETSs, irrespective of whether they are linked. They may be short-lived if allocation in subsequent trading periods is based on an updated base-year (because new entrants will be new only for a limited period).
[443] Sterk et al, *supra* note 297 at 22.
[444] Sterk & Schuele, *supra* note 137 at 419.
[445] *Ibid.*
[446] See generally Sterk & Schuele, *supra* note 137; Tuerk et al, *supra* note 378; de Larragan, *supra* note 138; Sterk et al, *supra* note 297.
[447] Sterk et al, *supra* note 297 at 22.
[448] Sterk & Schuele, *supra* note 137 at 419.
[449] Tuerk et al, *supra* note 378 at 347.

Nevertheless, Mace et al suggest that banking could become problematic given its relationship to the allocation of allowances.[450] First, business as usual emissions might or might not be accurately determined during the initial allocation of allowances.[451] This could lead to over-allocation of allowances and result in larger than expected levels of banking.[452] Second, government awareness that participating entities have accumulated significant amounts of banked credits may have an impact on a government's decisions in relation to subsequent trading period caps – encouraging downward revision.[453] While it may appear logical to correct an earlier over-allocation, equity considerations come into play where banked allowances reflect in some cases over-allocation and in other cases significant mitigation effort.[454] In this case, according to Edenhofer et al, a limitation of transferability (by introducing a limit on transferable allowances per installation, for example) can make sense in order to avoid the use of allowances from an earlier trading period obtained by over-allocation, in other words, to avoid the banking of "hot air".[455]

4.7.4 Borrowing

There seems to be agreement in the literature that borrowing is a design feature for which consistency is essential if different ETSs are to be linked. Basically, borrowing allows a covered entity to delay emissions reduction measures until future trading periods where they might be achieved more cost-effectively.[456] This is generally not seen favorably from an environmental

[450] Mace et al, *supra* note 10 at 61.
[451] *Ibid.*
[452] *Ibid.*
[453] *Ibid.*
[454] *Ibid.*
[455] Edenhofer, Flachsland & Marschinski, *supra* note 246 at 15.
[456] Sterk et al, *supra* note 297 at 22.

viewpoint for several reasons.[457] First, according to Sterk et al, borrowing entails the risk that reduction measures may not be taken in future trading periods either because of a weak compliance regime or because the participating entity ceased to exist before repayment of the borrowed allowances was due.[458] Second, according to Boemare and Quiron, the participating entities may have a motive to borrow heavily in order to artificially increase their future compliance cost curve and then argue that they need softer emissions reduction targets because otherwise the costs would be prohibitive.[459]

With these reasons in mind, Sterk and Schuele argue that linking an ETS that allows borrowing to another that does not, may require restrictive measures to be taken in order to maintain the environmental effectiveness of the combined ETS.[460] Several options have been suggested in the literature to mitigate concerns related to borrowing.

First, Haites and Mullins suggest that one could allow purchases from the ETS that permits borrowing but only after its compliance period has been completed and only from participating entities that did not borrow, i.e. only allow ex-post purchases of surplus allowances from those entities.[461]

[457] *Ibid.*
[458] *Ibid.*
[459] Catherine Boemare & Phillipe Quirion, "Implementing Greenhouse Gas Trading in Europe: Lessons from Economic Literature and International Experiences", (2002) 43 Ecological Economics 213 at 223.
[460] Sterk & Schuele, *supra* note 137 at 419.
[461] Haites & Mullins, *supra* note 232 at 62.

Secondly, Baron and Bygrave suggest that one could limit the amount that participating entities could borrow.[462] And thirdly, Baron and Bygrave further suggest allowing participating entities to borrow but only for their own emissions needs, i.e. only if their emissions exceed their initial allocation and they have decided not to buy from the market.[463] This would reduce the risk of the participating entities exporting their borrowed allowances to others but at the same time would require additional monitoring by the governments of the linked ETSs.[464]

4.8 Monitoring, Reporting and Verification (MRV)

The literature suggest that robust monitoring, reporting and verification (MRV) provisions are essential for establishing a credible ETS and creating confidence in the trading units since MRV provisions determine whether each trading unit does in fact correspond to one ton of avoided emissions.[465] Actual MRV regimes however are likely to be different for different dETSs. Blyth and Bosi suggest that as long as the MRV regime is sufficiently transparent and robust to maintain confidence in the value of the trading units, then a difference in the process or even the accuracy of a MRV regime between two ETSs should not cause a problem for linking.[466]

However, if the MRV regime is not sufficiently robust, this may create an incentive, according to Sterk et al., to under-report annual emissions (or over-report base year emissions),[467] which

[462] Baron & Bygrave, *supra* note 3 at 30.
[463] *Ibid.*
[464] *Ibid.*
[465] Sterk & Schuele, *supra* note 137 at 419. See also Baron & Bygrave, *supra* note 3 at 32; Sterk et al, *supra* note 297 at 22; Haites & Mullins, *supra* note 232 at 54; Blyth & Bosi, *supra* note 297 at 28.
[466] Blyth & Bosi, *supra* note 297 at 28.
[467] *Ibid.*

would undermine confidence in the trading units.[468] This, according to Baron and Bygrave, would undermine the environmental effectiveness of the combined scheme[469] since an entity subject to inaccurate GHG monitoring could sell unqualified allowances to other entities resulting in higher emissions levels overall.[470] If this were widespread, it could reduce allowance prices, thus reducing the incentive for participants to undertake mitigation measures.[471]

Conversely, as Haites and Mullins explain, if this were to lead to a higher price of allowances, linking ETSs would provide covered entities subject to less accurate MRV procedures with the incentive to understate their emissions levels in order to sell unused allowances or avoid having to obtain them to cover their emissions.[472]

All in all, according to Mace et al, a lack of full harmonization of MRV regimes in different ETSs should not pose an obstacle for linking; but the absence of a MRV regime that can demonstrate equivalent stringency would.[473] Therefore, Mace et al suggest, linked ETSs should in general have equally credible MRV standards.[474]

[468] Sterk et al, *supra* note 297 at 22.
[469] Baron & Bygrave, *supra* note 3 at 32.
[470] *Ibid.*
[471] *Ibid.*
[472] Haites & Mullins, *supra* note 232 at 55.
[473] Mace et al, *supra* note 10 at 68.
[474] *Ibid* at 67.

4.9 Registries

Sterk et al and Blyth and Bosi suggest that the linking of different ETSs also requires registries to be sufficiently harmonized to allow a smooth transfer of allowances between them. [475] This, in turn, requires the development of common data exchange standards.[476] The parties to the Kyoto Protocol have established national registries which have to submit to detailed guidelines in order to assure their compatibility.[477] Domestic and regional schemes that use Kyoto trading units also undertake their settlements through these registries.[478] Linking with ETSs that do not use Kyoto units, Faure and Peeters suggest, would necessitate an agreement to connect the registries to one other.[479]

4.10 Compliance Framework and Penalties

Sterk et al argue that penalties for non-compliance should be sufficiently severe in order to ensure the effective operation of the emissions trading scheme.[480] This requirement is, however, according to Haites and Mullins, limited to an ETS with mandatory emissions limits because voluntary ETSs do not have non-compliance penalties.[481] In a voluntary ETS, each participant chooses its own targets as well as the cost it is prepared to incur in meeting its targets.[482] If emissions are higher than expected, a participant can choose to incur additional cost or exceed its target.[483]

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[475] See Sterk et al, *supra* note 297 at 23; Blyth & Bosi, *supra* note 297 at 28.
[476] Blyth & Bosi, *supra* note 297 at 28.
[477] Faure & Peeters, *supra* note 39 at 315.
[478] *Ibid.*
[479] *Ibid.*
[480] Sterk et al, *supra* note 297 at 23.
[481] Haites & Mullins, *supra* note 232 at 58.
[482] *Ibid.*
[483] *Ibid.*

Penalties in an ETS can either be financial, i.e. fixed sum per ton for exceeded emissions, or loss of allowances, i.e. where excess emissions can be deducted from the allowance holdings allocated in the following compliance period, or a combination of both.[484] From an environmental perspective, Convery suggests that the financial sanctions for non-compliance should be much higher than the cost of the allowance.[485] To maintain the environmental effectiveness of the ETS, Sterk et al recommend that payment of the financial penalty should not discharge the participating entities from their obligation to make up for a shortfall of allowances in the next compliance period.[486] By contrast, according to Sterk et al, in schemes where participants who have to pay a penalty are exempt from the obligation to cover their excess emissions with allowances or eligible credits, the penalty operates as a price cap: participants have no incentive to buy allowances above the penalty. [487]

Governments may also introduce a "safety valve".[488] Under this mechanism, the regulator commits to selling allowances to participants at a pre-determined price in whatever quantity is demanded once the market price for allowances increases above a certain level.[489] One of the major advantages of cap-and-trade emissions trading, according to Sterk and Schuele, is the capability to precisely define the environmental outcome.[490] Price caps and safety valves tend to

[484] Sterk et al, *supra* note 297 at 23.
[485] Frank Convery, "Emissions Trading and Environmental Policy in Europe", Paper presented at the pre-summit conference: Knowledge and learning for a sustainable society (Climate and Global Justice Session), Goeteborg University, Sweden, 12-14 June 2001, available online: University College Dublin <http://www.ucd.ie/envinst/envstud/CATEP%20Webpage/publications/goteborg.pdf> at 7.
[486] Sterk et al, *supra* note 297 at 23.
[487] *Ibid.*
[488] *Ibid.*
[489] *Ibid.*
[490] Sterk & Schuele, *supra* note 137 at 419.

crack the cap.[491] In addition, they also dampen innovation because the incentive for developing low-emission technology is greater the higher the price.[492]

Furthermore, according to Sterk and Schuele, if an ETS with strict penalties were linked to an ETS with a safety valve or price cap, the safety valve or penalty rate in this ETS would effectively act as a price cap for the whole scheme.[493] As long as the market price of allowances is higher than the price cap or safety valve level, covered entities in the price cap/safety valve scheme would have an incentive to sell their allowances to entities in the other scheme until prices equalize at the price cap or safety valve level.[494] The government in the ETS with a price cap/safety valve would thus effectively subsidize all covered sources.[495] As a result, according to Blyth and Bosi, the environmental effectiveness of the combined scheme would suffer since total emissions would be higher than if the two schemes operated separately.[496] Stakeholders in an ETS with strict non-compliance rules might, according to Sterk and Schuele, also object to linking to an ETS with less stringent rules.[497]

If linkage is to be established, Sterk and Schuele suggest that there needs to be a limit on the exchange of trading units.[498] The best option would probably be to permit price caps or safety valves to be used only by covered entities from the ETS that has this feature (i.e. price cap or safety valve) but only up to the difference between the initial allocation and the actual

[491] *Ibid.*
[492] *Ibid.*
[493] *Ibid.*
[494] *Ibid.* See also Sterk et al, *supra* note 297 at 23.
[495] *Ibid.*
[496] See Blyth & Bosi, *supra* note 297 at 29f.
[497] Sterk & Schuele, *supra* note 137 at 420.
[498] *Ibid.*

emissions.[499] This would not completely prevent access to the lower market rate allowances, but it would limit the amount of additional allowances being traded.[500] Apart from higher emissions, Sterk and Schule suggest, these measures would also split the carbon market once the price reached the price cap/safety valve level, with prices in the price cap/safety valve ETS staying at the price cap/safety valve level and the prices in the other ETSs continuing to increase.[501] This would diminish the cost benefits of linking.[502] In a situation where a non-price scheme has been compromised by linking it to a scheme with a price cap/safety valve but without resulting cost benefits, Sterk et al suggest that it would be advisable to keep these two schemes separate.[503]

Finally, according to Peterson, different compliance regimes in a combined emissions trading scheme may give rise to a "race to the bottom".[504] This means that if penalties are not comparable across all linked schemes, non-compliance is likely to be exported to the schemes with the lowest penalty level.[505] For this reason, the respective features of the two compliance schemes should be harmonized before considering linking.[506] In sum, according to Mace et al, while it is not necessary to have identical non-compliance penalties between linked ETSs, they must be comparable in magnitude, effectiveness and stringency.[507]

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[499] *Ibid.* See also Blyth & Bosi, *supra* note 297 at 31.
[500] *Ibid.*
[501] *Ibid.*
[502] Sterk et al, *supra* note 297 at 24.
[503] *Ibid.*
[504] Sonja Peterson, "Monitoring, Accounting and Enforcement in Emissions Trading Regimes" (Paper prepared for the Organization for Economic Co-Operation and Development, 2003), online: Organization for Economic Co-operation and Development (OECD) <http://www.oecd.org/dataoecd/11/56/2957646.pdf > at 10.
[505] *Ibid.*
[506] *Ibid.*
[507] Mace et al, *supra* note 10 at 67.

4.11 Conclusion

This chapter has analyzed the literature relating to the implications of linking different emerging domestic emissions trading schemes, paying special attention to critical design features.

To sum up, the need for harmonization varies widely with regard to different design features. Some design options may raise equity issues and lead to opposition from concerned stakeholders. Coverage belongs to this category. Nevertheless, they are unlikely to negatively affect the overall efficiency of the linked schemes. Other aspects have important implications for the cost, environmental effectiveness and equity issues in a combined scheme; in particular, the definition and recognition of trading units, the nature and the stringency of the targets, the provisions for banking and borrowing, MRV and compliance regimes all raise important concerns.

All of these issues in essence flow from countries' level of ambition in relation to climate protection.[508] If environmental effectiveness is the principal priority, this leads to the establishment of stringent absolute targets with a reliable MRV regime and strict non-compliance penalties.[509] Such an emissions trading scheme will also be cautious and will only permit high-quality offsets to count towards compliance.[510] By contrast, design features such as weak emissions caps, price caps or safety valves and generous recognition of offsets undermine environmental effectiveness for the sake of containing costs.[511] Through linking, these cost-containment measures would affect the combined trading scheme.[512] Linking, therefore, should

[508] Sterk & Schuele, *supra* note 137 at 420.
[509] *Ibid.*
[510] *Ibid.*
[511] *Ibid.*
[512] *Ibid.*

be sought between countries that have comparably ambitious climate policy approaches.[513] The key design features that determine a scheme's environmental efficiency such as caps and cost-containment measures should be harmonized prior to linking.[514]

[513] *Ibid.*
[514] *Ibid* at 427.

Chapter Five: Potential Barriers to Linking and Solutions to These Barriers

As we saw in the last chapter, the designs of existing and proposed domestic emissions trading schemes (dETSs) differ considerably. For example, some dETSs are voluntary, while others are mandatory; some are designed to be used to comply with Kyoto Protocol commitments, while others are planned or already in use in non-Kyoto countries, etc. These differences make the linking of dETSs more complicated and could undermine their environmental and cost effectiveness. This chapter analyses the critical issues that could occur when linking the EU ETS with Canada's proposed federal Emissions Scheme for Greenhouse Gases and Alberta's Emissions Trading Scheme and identifies some minimum requirements for allowing linking between them. Not all the issues considered are legal issues some are policy-related and cost-effectiveness-related.

5.1 European Union (EU)

5.1.1 EU ETS

On April 29, 1998, the European Community (EC) and the initial 15 EU[515] member states signed the Kyoto Protocol.[516] Under this protocol they have an obligation to jointly reduce their GHG

[515] Freestone & Streck, *supra* note 100 at 338. The EU was formally established in Maastricht by the Treaty on European Union (TEU) on 7 February 1992. It is based on three pillars, .i.e. (1) the European Communities (consisting of the European Community (EC) and the European Atomic Energy Community (Euratom)), (2) a common foreign and security policy, and (3) cooperation in the area of justice and home affairs. The EU has a single institutional framework for all three pillars. The main legislative authority is entrusted to the European Parliament, the EU Council, and the European Commission.

[516] *Ibid.* The EU itself did not have a legal personality in the TEU. The treaty-making power in the field of environmental policy in the EU is vested in the EC. However, since the EC does not possess exclusive treaty-making competence in the field of environmental policy, the EU member states themselves were also able to negotiate, sign, and ratify the UNFCCC and the Kyoto Protocol (under so-called "mixed" competence). The EC and

emissions[517] during the period of 2008-2012 by 8 percent below 1990 emissions levels; this is known as the "EU bubble".[518] In June 1998, in order to better reflect the different emissions reduction abilities of the EU member states, the 15 EU member states entered into the Burden Sharing Agreement.[519] This agreement translated the 8 percent emissions reduction target, the EU committed to under the Kyoto Protocol, into differentiated emissions reduction targets for each EU member state.[520] Since 2004, 12 further European countries joined the EU, all of which, apart from Malta and Cyprus, have ratified the Kyoto Protocol and have committed to individual emissions reduction targets of 6 percent or 8 percent thereunder.[521]

After signing the Kyoto Protocol, the EU began exploring the possibility of establishing an emissions trading scheme to assist its member states to comply with their emission reduction commitments under the Burden Sharing Agreement and the Kyoto Protocol.[522] Even though the Kyoto Protocol was not yet in force and despite strong resistance from some influential EU member states, such as Germany and France, the European Union Emissions Trading Scheme (EU ETS) was finally established in October 2003 with the objective of reducing EU GHG emissions in a cost-effective way.[523]

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the EU member states ratified the Kyoto Protocol on 31 May 2002. However, The Kyoto Protocol did not enter into force until 16 November 2005.

[517] The Kyoto Protocol covers six major greenhouse gases namely carbon dioxide (CO_2), methane (CH4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF6).

[518] Freestone & Streck, *supra* note 100 at 338.

[519] *Ibid.*

[520] *Ibid.* The Burden Sharing Agreement was made legally binding in the EU by Council Decision 2002/358/EC, *supra* note 2.

[521] *Ibid.* These new EU member states are not covered by the Burden Sharing Agreement but, except Cyprus and Malta, have individual GHG emissions reduction targets under the Kyoto Protocol.

[522] *Ibid.*

[523] *Ibid*.

The EU ETS began to operate on January 1, 2005 with the first trading period taking place between 2005 and 2007 (Phase I) - often referred to as the "trial" phase.[524] Phase I was followed by a second period between 2008 and 2012 (Phase II).[525] The EU ETS currently covers 27 EU member states plus Iceland, Norway and Lichtenstein which are linked to the EU ETS.[526]

The EU ETS covers CO_2 emissions from the following sources: energy activities from all sectors with combustion installations above 20MW of thermal rated input, oil refineries, coke ovens, and, subject to certain size criteria, producers of iron and steel, cement, lime, glass, ceramics, and pulp & paper.[527] In short, the EU ETS is a downstream ETS assigning emission constraints to point sources.[528] Since 2008, the EU Trading Directive permits member states to expand other sectors and gases, provided these have been approved by the European Commission.[529] Member states must each establish national allocation plans (NAPs) indicating the amount and the method of organizing the EUAs (European Union Allowances) allocation. Allowances are distributed for free based, inter alia, on historical emissions – so-called grandfathering.[530] Specifically, up to 5% of the total amount could be auctioned in the first trading period (2005-2007), and up to 10% in

[524] *Ibid.*
[525] *Ibid.*
[526] Linking with Iceland, Norway and Lichtenstein, (members of the European Economic Area but not the EU), was implemented through the incorporation of the EU ETS Directive into the EEA agreement by the way Of EEA Joint Committee Decision No 146/2007 (EAA, *Decision of the EEA Joint Committee (EAA) 146/2007 of 26 October 2007 amending Annex X (Environment) to the EEA Agreement*, [2007] OJ L100/92 [Decision 146/2007]).
[527] See EU Trading Directive, *supra* note 9, Annex I.
[528] Richard Baron & Cédric Philibert, "Act Locally Trade Globally: Emissions Trading for Climate Policy" (2005), online: International Energy Agency (IEA) <http://www.iea.org/textbase/nppdf/free/2005/act_locally.pdf> at 69 [Baron & Philibert].
[529] EU Trading Directive, *supra* note 9, Art. 24(1).
[530] *Ibid*, Art. 9.

the second trading period (2008-2012).[531] Moreover, member states can reserve a certain amount of allowances for new entrants who would receive an allocation before starting production.[532]

The Linking Directive (2004) enables entities to use credits from the Kyoto Protocol's project-based mechanisms (JI and CDM) to meet their emissions targets.[533] This must be employed as a "supplemental" to the domestic emissions reduction action.[534] Each member state must limit the use of CERs and ERUs to a certain percentage of the allocation of each entity.[535]

The EU ETS does not accept AAUs that have not been issued to EU countries as EUAs.[536] Essentially, this constraint prevents industry from releasing more GHGs through extensive reliance on surplus AAUs allocated to countries with economies in transition.[537] Practically, this creates two carbon markets among Kyoto parties: the EU market for CO_2 allowances, and the broader market under the Kyoto Protocol.[538]

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[531] *Ibid*, Art. 10.
[532] *Ibid*, Annex III. New entrants are defined in Art. 3(h) as "any installation carrying out one or more of the activities indicated in Annex I, which has obtained a greenhouse gas emissions permit or an update of its greenhouse gas emissions permit because of a change in the nature or functioning or an extension of the installation, subsequent to the notification to the Commission of the national allocation plan".
[533] Linking Directive, *supra* note 16, Art. 11(a).
[534] *Ibid*, Annex III.
[535] *Ibid.*
[536] EC, *Commission Regulation No 2216/2004 of 21 December 2004 for a standardized and secured system of registries pursuant to Directive 2003/87/EC of the European Parliament and of the Council and Decision No 280/2004/EC of the European Parliament and of the Council*, [2004] OJL 386/1 [Registries Regulation] (Article 45 of the Registries Regulation provides that allowances will be allocated by "converting" AAUs into allowances and that conversion will occur "through adding the allowance element to the unique unit identification code of each such AAU". This means that all allowances will be attached to an AAU and a trade in allowances will also be a trade in AAUs.).
[537] Baron & Philibert, *supra* note 528 at 69.
[538] *Ibid.* The latter market is likely to be dominated by government transactions. Project-based mechanisms link these two carbon markets.

Implementation of the EU ETS follows an annual cycle.[539] Allowances for each year must be allocated and distributed by 28 February and must be surrendered by the 30th of April the following year.[540] Entities can surrender EUAs, CERs or ERUs.[541] Unused EUAs can be used for the following year within one period.[542] If an entity does not surrender allowances commensurate with its reported GHG emissions, it must pay a penalty of EUR 100 per excess ton of CO_2.[543] Moreover, it must surrender the missing allowances in the next calendar year.[544]

Operational since January 2005, the registries keep track of the ownership of allowances issued under the EU ETS, ensuring its accurate accounting.[545] In 2009 the revised ETS directive provided for the centralization of the EU ETS operations into a single EU registry, operated by the Commission.[546] This single EU registry replaced all national registries hosted in the Member States.[547] It was established in two steps. First, as of 30 January 2012, a single EU registry was activated to allow airlines to open registry accounts and to obtain free allowances.[548] Full activation of a single EU registry took place on 20 June 2012.[549] It covers accounts for aircraft operators, which have been included since January 2012, as well as accounts for stationary installations and personal accounts previously held in national registries.[550] It covers all EU

[539] EU Trading Directive, *supra* note 9, Art. 11 (1) and (2).
[540] *Ibid*, Art. 11(4) and 12(3).
[541] See Linking Directive, *supra* note 16, Art. 11(a).
[542] EU Trading Directive, *supra* note 9, Art. 13(1).
[543] *Ibid*, Art.16(3).
[544] *Ibid.*
[545] European Commission, "Registries", (2012) online: European Commission <http://ec.europa.eu/clima/policies /ets/registries/index_en.htm> [Registries] (last visited Sept. 8, 2012). See also generally EU Trading Directive, *supra* note 9, Art. 19 and 20.
[546] See Directive 2009/29/EC, *supra* note 12, Preamble at 38.
[547] Registries, *supra* note 545.
[548] European Commission, "European Union Transaction Log", (2012), online: European Commission <http://ec. europa.eu/environment/ets/> (last visited Sept. 8, 2012).
[549] *Ibid.*
[550] *Ibid.*

member states as well as Norway, Iceland and Lichtenstein.[551] The verification, recording and authorization of transactions are now held by the European Union Transaction Log (EUTL), replacing the Community Independent Transaction Log (CITL), which had a similar role before the full activation of a single EU registry.[552]

After only a few years of functioning and despite the absence of experience in market-based environmental policy tools,[553] the EU ETS has grown from a "policy experiment" into the forerunner of the EU climate change policy.[554] In many ways, the EU ETS is a model for the development of other national, regional, and international ETSs.[555] Currently, the EU ETS is the world's largest multi-national, multi-sector, cap-and-trade emissions trading scheme and the world's largest market for GHG emission credits.[556]

Although the Kyoto Protocol stimulated the development of the EU ETS, it is independent of the Kyoto Protocol and will continue to operate even if the international community fails to agree on a post-2012 international agreement on climate change.[557]

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[551] Registries, *supra* note 545.
[552] *Ibid.*
[553] When the EU Trading Directive was drafted and negotiated, EU institutions and stakeholders drew upon the experiences of the US with its company-based cap-and-trade emissions trading schemes under the US Clean Air Act of 1990 (covering SO_2), and under the Californian Regional Clean Air Incentives Market of 1994 (covering SO_2 and NOx). Furthermore, the UK contributed the experience it had under its national voluntary company-based cap-and-trade scheme (covering all six Kyoto gases) which began in April 2002.
[554] Freestone & Streck, *supra* note 100 at 339.
[555] *Ibid.*
[556] See Emissions Trading System (EU ETS), *supra* note 269.
[557] Freestone & Streck, *supra* note 100 at 339. See also Directive 2009/29/EC, *supra* note 12, Preamble at 3 (EU greenhouse gas emissions are to be reduced by 30 % below 1990 levels by 2020 provided that other developed countries commit themselves to comparable emission reductions and economically more advanced developing countries contribute adequately according to their responsibilities and respective capabilities. Regardless of any international agreement, the EU emissions reduction commitment will be 20%.).

5.1.2 Direct Linking to Other dETSs

Direct Linking of the EU ETS is possible with the dETSs established in both Kyoto as well as non-Kyoto countries.[558] Article 25(1) of the EU Trading Directive provides a legal basis for such linking:

> Agreements should be concluded with third countries listed in the Annex B to the Kyoto Protocol which have ratified the Protocol to provide for mutual recognition of allowances between the Community scheme and other greenhouse gas emissions trading schemes in accordance with the rules set out in Article 300 of the Treaty.[559]

The EU Trading Directive does not establish any further preconditions that the third county scheme needs to meet.[560] Thus, the other scheme could be a comparable emissions trading scheme, or a totally different scheme.[561] In theory, linking could be established through a multilateral process involving all governments that are interested in linking to the EU ETS.[562] Other possibilities are explored in chapter three of this thesis.

5.1.3 Indirect Linking to Other dETSs

The EU Linking Directive of 2004 allows covered entities in Phase II to use credits from Joint Implementation (JI) and the Clean Development Mechanism (CDM) to meet their targets in

[558] Faure & Peeters, *supra* note 39 at 305.
[559] EU Trading Directive, *supra* note 9, Art. 25(1).
[560] Faure & Peeters, *supra* note 39 at 305.
[561] *Ibid.*
[562] *Ibid.* However, this would be complicated to negotiate.

place of emission cuts within the EU based on the rules of the Marrakesh Accords.[563] The EU ETS allows its covered entities to use credits generated from CDM and JI up to a specific limit (maximum 10 per cent) of their national allocation plans to meet their reduction obligations.[564] The EU ETS places some restrictions on the kind of credits from CDM and JI that might be used by entities for compliance. It does not allow covered entities to use credits generated by the project activities from land use, land use change, forestry (also known as sinks) and credits generated from nuclear facilities.[565] Moreover, with respect to hydro projects with a generating capacity exceeding 20 MW, EU member states have to ensure that the project will follow relevant international criteria and guidelines, including those established by the World Commission on Dams.[566]

5.2 Canada

5.2.1 Canadian Federal Proposal

In 2007, the Canadian government released *Turning the Corner: an Action Plan to Reduce Greenhouse Gases and Air Pollution* (hereafter referred to as the TTC plan), which proposed to reduce greenhouse gas emissions to 20 percent below 2006 levels by 2020 and between 60 to 70

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[563] See Conference of the Parties Serving as the Meeting of the Parties, *Report of the Conference of Parties on its seventh session, held at Marrakesh from 29 October to 10 November 2001*, UNFCCC, 1st Sess, Un Doc FCCC/CP/2001/13 (2001) [Marrakesh Accords], adopted by: Conference of the Parties Serving as the Meeting of the Parties, *Report of the Conference of Parties serving as the meeting of the Parties to the Kyoto Protocol on its first session, held at Montreal from 28 November to 10 December 2005*, UNFCCC, 1st Sess, UN Doc FCCC/KP/2005/8 (2005) [Montreal Accords].

[564] EC, *Communication from the Commission to the Council and the European Parliament on the assessment of national allocation plans for the allocation of greenhouse gas emission allowances in the second period of the EU Emissions Trading Scheme accompanying Commission Decisions of 29 November 2006 on the national allocation plans of Germany, Greece, Ireland, Latvia, Lithuania, Luxembourg, Malta, Slovakia, Sweden and the United Kingdom in accordance with Directive 2003/87/EC*, COM (2006) 725 final at 10.

[565] Linking Directive, *supra* note 16, Art. 11(a)(3)(b).

[566] *Ibid*, Art. 11(a)(3) and 11(b)(6).

percent below 2006 levels by 2050.[567] Although little policy implementation has followed since then, in the next year, the Canadian government released its *Regulatory Framework* to implement elements of the TTC plan.[568] This version supplemented and strengthened the government's previous *Regulatory Framework for Air Emissions*, which was released in 2007.[569] The Regulatory Framework sets intensity-based standards – provisions that cap the amount of emissions per unit of output – for existing Canadian large industrial emitters.[570] Its target: a GHG emissions reduction of 18 percent below the 2006 levels by 2012, and then a 2 percent annual increase thereafter until 2015.[571] Thus, no stringent cap is put on emissions.[572] Instead, the intensity standard allows total GHG emissions to increase while reducing the carbon intensity of production.[573]

The TTC plan was shelved in 2009, with no clear policy strategy on moving forward.[574] In January 2010, the government of Canada harmonized its emissions reduction targets with the

[567] Dave Sawyer and Carolyn Fisher, "Better Together? The Implications of Linking Canada - US Greenhouse Gas Policies" (2010), online: Social Science Research Network (SSRN) <http://papers.ssrn.com/sol3/papers.cfm ?abstract_id=1678070> at 4 [Sawyer and Fisher].

[568] Environment Canada, *Turning the Corner: Regulatory Framework for Industrial Greenhouse Gas Emissions* (Ottawa: Environment Canada, 2008), online: Environment Canada <http://www.ec.gc.ca/Publications/C16DAFD9-E250-46DC-8B26-53F0DF2E7A75%5CTurning-The-Corner-Regulatory-Framework-for-Industrial-Greenhouse-Gas-Emissions.pdf> [Regulatory Framework].

[569] Environment Canada, *Regulatory Framework on for Air Emissions* (Ottawa: Minister of Environment, 2007), online: Environment Canada <http://www.ec.gc.ca/doc/media/m_124/report_eng.pdf> [Regulatory Framework for Air Emissions].

[570] Regulatory Framework, *supra* note 568 at iii, 3 and 7 (Large industrial emitters are facilities with emissions greater than 50 kilotons of CO_2. TTC plan proposed to cover the following sectors: petroleum refineries, fossil fuel generators, oil and gas producers, heavy crude oil and bitumen upgraders, processors and transmission, chemical production, cement and lime production, iron and steel plants, metal smelters and processors, some large mines, and pulp and paper facilities. For upstream oil and gas entities, it will be only 3 kilotons of CO_2 per facility and 10,000 barrels of the oil equivalent per day per company.).

[571] *Ibid*.

[572] Sawyer & Fisher, *supra* note 567 at 4.

[573] *Ibid.*

[574] *Ibid.* Government of Canada report "A Climate Change Plan for the Purposes of the Kyoto Protocol Implementation Act – 2010" provides no reference to the Regulatory Framework and no policies for moving forward. See Environment Canada, *A Climate Change Plan for the Purposes of the Kyoto Protocol Implementation*

US, to 17 percent below 2005 levels in 2020.[575] This was Canada's commitment under the Copenhagen Accord.[576] It weakened Canada's targets by about 32 mega tons.[577]

In recent years, the government of Canada has been willing to allow relatively unburdened growth of industrial emissions and has been especially supportive of an expanding oil sands sector.[578] This policy is likely to continue and will probably include a technology fund that will act as a safety valve, i.e., putting a maximum price on allowances and using revenues from the fund to finance projects to support low-carbon technologies such as carbon capture and storage in the oil sector.[579] Finally, there is much debate in Canada over competitiveness effects with the US as the lack of action in the US has been and continues to be the main reason for Canada deferring its own action.[580] By examining the current behaviour of the Canadian government, one can anticipate a new policy based on TTC plan, but with a cap similar to what the United States eventually adopts.[581]

Act – 2010, (Ottawa: Environment Canada, May 2010) online: Environment Canada <http://www.climatechange.gc.ca/Content/4/0/4/4044AEA7-3ED0-4897-A73E-D11C62D954FD/KPIA_2010.pdf>.

[575] *Ibid.*

[576] Environment Canada, "Canada Lists Emissions Target under the Copenhagen Accord" (February 1, 2010), online: Environment Canada <http://www.ec.gc.ca/default.asp?lang=En&n=714D9AAE-1&news=EAF552A3-D287-4AC0-ACB8-A6FEA697ACD6> (last visited Sept. 16, 2012).

[577] Sawyer & Fisher, *supra* note 567 at 4.

[578] *Ibid* at 5.

[579] *Ibid.*

[580] *Ibid.*

[581] *Ibid.*

5.2.2 Linking to Other dETSs

The Government of Canada has emphasized that potential linkages with regulatory-based trading schemes in the United States will be actively pursued.[582] In particular, the government will examine the practicability of linking with ETSs such as the Western Regional Climate Action Initiative and the Regional Greenhouse Gas Initiative, as well as other schemes, as they become established.[583] Over time as national and regional carbon markets become more mature and the markets become more global in nature, with robust emission reduction verification systems, Canadian entities will have increased access to international trading markets for purposes of compliance with Canadian regulations.[584] Canadian entities will not, however, be permitted to use "hot air" credits, which do not represent real emission reductions, for compliance with Canadian regulations.[585]

5.3 Alberta

5.3.1 Alberta's Emissions Trading Scheme

In July 2007, Alberta became the first jurisdiction in North America to regulate GHG emissions.[586] Alberta's Climate Change and Emissions Management Act[587] provided the statutory framework for its GHG emissions trading scheme.[588] It established a non-justiciable

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[582] Environment Canada, "Regulatory Framework for Industrial Air Emissions: Overview", online: Environment Canada <http://www.ec.gc.ca/doc/media/m_124/p2_eng.htm> [Regulatory Framework for Industrial Air Emissions: Overview] (last visited Sept. 16, 2012).
[583] *Ibid.*
[584] *Ibid.*
[585] *Ibid.*
[586] Grant Boyle, "A Review of Emerging GHG Emissions Trading in North America: Fragmentation or Progress?" (2009) 46 Alta. L. Rev. 173 at 190 [Boyle].
[587] CCEMA, *supra* note 21.
[588] Freestone and Streck, *supra note* 100 at 477.

target to reduce its GHG emissions relative to the Gross Domestic Product (GDP) by 50% below 1990 levels by 2020.[589] For the purpose of meeting this specified gas emission reduction target, Alberta has established its GHG emissions trading scheme by enacting the Specified Gas Emitters Regulation,[590] with the initial compliance period starting from July 1, 2007 to December 31, 2007 and each following calendar year being a further compliance period.[591]

Under the SGER, large final emitters (any entity in the province that emits more than 100,000 metric tons of CO_2 per year) are required to reduce their GHG emissions intensity by 12 percent per year.[592] Emissions intensity, under the SGER, is defined as the quantity of GHGs emitted by an entity per unit of production.[593] The SGER has established different emissions reduction targets for existing and new emissions sources. For "existing" emitters (entities that began commercial operations on or before January 1, 2000), GHG emissions must be reduced by 12% below their approved baseline emissions intensity (based on the average of each entity's emissions for the years 2003-2005).[594] For "new" emitters (entities that began commercial operation after January 1, 2000 and have less than 8 years of commercial operation), the regulation has set emission reductions at an incremental level of 2% per year starting in the fourth year of operation (until the full 12% annual reduction level is attained).[595]

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[589] *Ibid.* See CCEMA, *supra* note 21, s.3(1). This provision also provides that the government may make regulations: (1) "establishing interim specified gas emission targets"; and (2) "establishing specified gas emission targets and interim specified gas emission targets for different specified gases and for different sectors of the Alberta economy". This allows different treatment of sectors. To date, however, the government of Alberta has chosen to regulate large emitters that emit 100,000 metric tons of CO_2 or more per year. It has done so through the SGER that began its operation on July 1, 2007.
[590] SGER, *supra* note 20.
[591] *Ibid*, Part 1 s.1(1)(v)(x).
[592] *Ibid*, ss.3-4.
[593] *Ibid*, s.1(1)(b).
[594] *Ibid*, s.1(1)(i) and ss.3-4.
[595] *Ibid*, s.1(1)(p) and ss.3-4.

Alberta has a unique position in Canada as the largest greenhouse gas emitter in the country, mainly because of its oil and gas production as well as its heavy dependency on thermal power production.[596] Consequently, Alberta's early and proactive provincial regulations (compared to the other provincial jurisdictions) reflect Alberta's intention to manage GHG emission issues independently and its reluctance to participate in the proposed federal regulatory regime.[597] In January 2008, the government of Alberta communicated its plan to reduce its GHG emissions by 14 percent (or approximately 29 mega tons) in absolute terms below 2005 levels by 2050.[598] This plan falls short of the proposed federal government's reduction target of 17 percent below 2005 levels by 2020 and well below Canada's Kyoto Protocol's target of 6 percent below 1990 levels by 2012.[599] This is also lower than the target established by the Alberta government in its own CCEMA, which aims to reduce emissions intensity relative to the GDP by 50 percent of 1990 levels by 2020.[600]

[596] Across Canada, a total of 249.5 Mt of GHG emissions were reported in 2009 from entities whose emissions exceeded 50 kt. Alberta was the largest provincial emitter at 47.0 per cent, due to a large energy industry and a large portion of electricity being supplied by coal-fired power plants. Other major provincial contributors were Ontario (19.6 per cent), Saskatchewan (9.0 per cent), Quebec (8.1 per cent) and British Columbia (5.2 per cent). See Alberta Environment, "Report on 2009 Greenhouse Gas Emissions", online: Alberta Environment <http://environment.gov.ab.ca/info/library/8383.pdf>.

[597] Boyle, *supra* note 586 at 190. See also Greenpeace, "Canada and Kyoto" (December 9, 2009), online: Greenpeace <http://www.greenpeace.org/canada/en/campaigns/archive/kyotoplus/background/canada-and-kyoto/> (last visited Sept. 16, 2012) (When elected in 2006 the Harper government announced that the Kyoto Protocol targets were "unachievable". Instead, the Harper government introduced its "Turning the Corner" plan for dealing with climate change in 2007. This plan is far too weak. The targets are not science-based, they are arbitrary, based on political expediency. Harper's proposed 20 per cent GHG reduction from the 2006 level is less than 3 per cent below the 1990 level.).

[598] Environment Alberta, *Alberta's 2008 Climate Change Strategy: Responsibility/Leadership/Action* (Edmonton, Alberta Environment, January 2008), online: Alberta Environment <http://environment.gov.ab.ca/info/library/7894.pdf> at 5 [Alberta's 2008 Climate Change Strategy].

[599] Goetz, *supra* note 68 at 393.

[600] *Ibid*. See also CCEMA, *supra* note 21, s.3.

5.3.2 Linking to Other dETSs

The Alberta's scheme does not include any provisions for linkage to any other dETSs. However, the SGER established the Alberta offset system as a market-based compliance option for entities regulated under this regulation.[601] Entities that cannot meet their emission reduction obligation through direct entity improvements may choose to purchase offset credits generated at entities and sectors not subjected to the SGER.[602] Section 7 of the SGER states the minimum eligibility criteria that must be met for an offset project to be eligible to generate offset credits for use as a compliance option in Alberta.[603] In order to qualify, project-based emission reductions/removals must: occur in Alberta; result from actions not required by law and be beyond business-as-usual practices; occur on or after January 1, 2002; be real, demonstrable, quantifiable, and verifiable; have clearly established ownership; and be counted once for compliance purposes.[604] In addition to the requirements stated above, Alberta also requires that offset projects must be implemented according to a Government of Alberta-approved quantification protocols and be third party verified by a qualified person(s), and be registered on the Alberta Emissions Offset Registry.[605]

Alberta has emphasized that it is working with other jurisdictions and the federal government to identify how Alberta's offset system could be linked to or incorporated into Canada's offset program or other dETSs as they emerge.[606]

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[601] Environment Alberta, *Technical Guidance for Offset Project Developers* (Edmonton: Alberta Environment, January 2012), online: Alberta Environment <http://environment.gov.ab.ca/info/library/8525.pdf> at 9 [Technical Guidance for Offset Project Developers].
[602] *Ibid.*
[603] *Ibid* at 18.
[604] *Ibid.*
[605] *Ibid.*
[606] *Ibid* at 10.

5.4 Design Issues for Direct Linking

5.4.1 Trading Units

Mutual recognition of trading units is one of the main pre-conditions for linking the EU ETS to the Canadian ETSs. For the purpose of international emissions trading, the Kyoto Protocol recognizes numerous trading units (Assigned Amount Units (AAUs), Certified Emissions Reductions (CERs), temporary Certified Emissions Reductions (tCERs), long-term Certified Emissions Reductions (lCERs), Emissions Reduction Units (ERUs) and Removal Units (RMUs)).[607] However, parties of the Kyoto Protocol, such as the EU and Canada among others, are free to define their own trading units in their domestic emissions trading schemes.[608]

Currently in its second phase, the EU ETS allows the use of EUAs[609], CERs[610], ERUs[611] and also mutually recognized third-country allowances.[612] It does not allow, however, the use of the credits from sinks and domestic offset projects.[613] International offset credits will continue to be eligible for compliance under the EU ETS in its third phase. They may not account for more than

[607] Faure & Peeters, *supra note* 39 at 310. One AAU equals to one metric ton of CO_2 assigned to a industrialized (Annex B) countries pursuant Article 3 of the Kyoto Protocol; ERUs are generated through Joint Implementation (JI) under Article 6 of the Kyoto Protocol; CERs are generated from Clean Development Mechanism (CDM) under Article 12 of the Kyoto Protocol whereas tCERs and lCERs are generated from forestry projects under the CDM; RMUs are generated by land use, land-use change and forestry (LULUCF) activities under Articles 3(3) and 3(4) of the Kyoto Protocol.

[608] Decision 9/CMP.1, 3/CMP.1 and 11/CMP.1 of COP/MOP 1(Montreal Accords), *supra* note 563. All trading units defined by the Kyoto Protocol have the same content: they are described as a unit of one metric ton of carbon dioxide. Therefore, ETSs should ideally have the same quantitative unit of trading based on the Kyoto Protocol, namely metric ton of carbon dioxide.

[609] EU Trading Directive, *supra* note 9, Art. 3(a). According to Article 11, an EU Allowance (EUA) covers the emission of one metric ton of carbon dioxide equivalent.

[610] Linking Directive, *supra* note 16, Art. 15.

[611] *Ibid.*

[612] EU Trading Directive, *supra* note 9, Art. 25.

[613] *Ibid,* Art. 11(a)(3)(b); Art. 11b(6); Art. 11a(3)(a). Forestry and land use credits are not allowed at this time to be used in the EU ETS. Certain limitations are also placed on hydro projects with a capacity over 20 megawatts and nuclear facilities.

50% of reduction efforts between 2008 and 2020.[614] Certain projects will be restricted. As of 1 January 2013 CERs and ERUs from projects relating to the destruction of trifluoromethane (HFC-23) and nitrous oxide (N_2O) emissions from adipic acid production will be prohibited in the EU ETS.[615] An exception is made until 30 April 2013 for destruction that is credited before 1 January 2013, for compliance with 2012 emissions reduction commitments.[616] Credits from CDM projects registered after 2012 can only be used in the EU ETS if they result from an approved list of Least Developed Countries (LDCs), which does not include large emerging economies such as India and China.[617] The exclusion of such countries is intended to motivate them to reduce GHG emissions in ways other than the generation of CERs and thus step up their regulatory approaches to mitigating the effects of climate change.[618]

On the other hand, both Canadian ETSs, the federal Emissions Trading Scheme for Greenhouse Gases[619] and the Alberta's Offset Credit Scheme[620] allow the use of credits from domestic offsets as well as use of the sinks.[621] Both of them require their covered entities to submit one tradable

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[614] Directive 2009/29/EC, *supra* note 12, Art.11a(8).

[615] *Ibid*. See also EC, *Memo/10/615: Questions & Answers on Emissions Trading: Use restrictions for certain industrial gas credits as of 2013*, *Memo/10/615* (Brussels, 25 November 2010); *Guidelines for the implementation of Article 6 of the Kyoto Protocol*, Dec 9/CMP.1, UNFCC, 1st Sess, FCCC/KP/CMP/2005/8/Add.2 (2006).

[616] *Ibid*.

[617] See European Commission, "Definition of Least Developed Countries in the context of Article 11a(4) of Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009, amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community (O.J. L 140, 5.6.2009, p.77)" (2009), online: European Commission <http://ec.europa.eu/clima/policies/ets/linking/docs/def_ldc_en.pdf>.

[618] Sabina Manea, "The Future of International Emissions Credits in the EU ETS" (2012), online: Climatico <http://www.climaticoanalysis.org/post/the-future-of-international-emissions-credits-in-the-eu-ets>.

[619] Regulatory Framework, *supra* note 568 at 17. Only GHG reductions or removals achieved in Canada are eligible for generating offsets under Canada's Offset System for Greenhouse Gases.

[620] SGER, *supra* note 20, s.7(1)(a). SGER requires that all emissions offsets would come from reduction projects located in Alberta.

[621] Regulatory Framework, *supra* note 568 at 18. Under federal ETS the covered entities will also be able to purchase credits generated through the CDM of the Kyoto Protocol with the exception of credits for forest sink projects. Access to CDM credits for compliance purposes would be limited to 10% of each firm's total target. See

allowance for every metric ton of CO_2 they emit.[622] In relation to international offsets, the proposed federal ETS allows regulated entities to use certain credits, determined by the government, from the Kyoto Protocol's Clean Development Mechanism (CDM) for purposes of meeting their regulatory obligations.[623] Access to CDM credits for compliance purposes for each entity will be limited to 10% of its total target.[624] On the other hand, Alberta does not allow the use of international credits. At the moment, it only allows the use of credits from project-based emission reductions/removals that occur in Alberta.[625] However, the government of Alberta has announced that it will continue to build on offset work undertaken in other jurisdictions to adapt emission reduction opportunities to suit Alberta's unique circumstances and will seek alignment between systems as deemed appropriate.[626]

Both the EU ETS and both Canadian ETSs have the same quantitative unit of trading based on the Kyoto Protocol, namely metric tons of CO_2-eq. In this regard, trading between the EU and Canadian schemes would be straightforward.

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also Environment Canada, *Turning the Corner: Canada's Offset System for Greenhouse Gases*, (Ottawa: Environment Canada, 2008), online: Environment Canada <http://www.ec.gc.ca/Publications/F7F409E2-9BA7-4083-9B57-8737B4A59169%5CTurning-The-Corner-Canada%27s-Offset-System-for-Greenhouse-Gases.pdf> at 21 [Turning the Corner: Canada's Offset System for Greenhouse Gases] (As for domestic offsets within the planned national scheme, projects that store carbon in agricultural land, afforestation, reforestation, avoided deforestation and forest management are considered as eligible project types.). For information on Alberta see Alberta Environment, "Offset Credit System Protocols", online: Alberta Environment <http://environment.alberta.ca/02275.html> (last visited Sept.16, 2012); Alberta Environment, "Approved Alberta Protocols: Guidance Documents", online: Carbon Offset Solutions <http://carbonoffsetsolutions.climatechangecentral.com/offset-protocols/approved-alberta-protocols> (Within Alberta scheme, agricultural soil sequestration and afforestation (currently retracted for revision) are mentioned as eligible carbon sinks, provided that the projects are Alberta-based, hence, international offsets are not included.) (last visited Sept. 16, 2012).

[622] See SGER, *supra* note 20, s.1(1)(f). See also "Turning the Corner: Canada's Offset System for Greenhouse Gases", *supra* note 621 at Annex A.

[623] Domestic Emissions Trading for Greenhouse Gases, *supra* note 109.

[624] *Ibid.*

[625] SGER, *supra* note 20, s.7(1)(a).

[626] Technical Guidance for Offset Project Developers, *supra* note 601 at 10.

The recognition of external tradi0ng units is one of the crucial issues when examining potential for linking.[627] Consider what happens for example if a particular type of unit, such as credits from carbon sinks, is not recognised in scheme A (EU ETS) but is recognized in scheme B (federal or Alberta ETS). In such case covered entities in scheme B could use these units for domestic compliance purposes thus freeing up 'regular' (i.e. non carbon sink) domestic allowances and sell them to companies in scheme A.[628] The political decision in the first scheme (EU ETS) about which trading units to recognize could thus be bypassed.[629] This issue is salient in this context since the EU ETS currently excludes credits from carbon sinks and domestic offset projects, while both Canadian ETSs allow them to be used for compliance purposes. According to the European Commission's proposal on ETS revision, domestic offset projects may be added to the EU ETS from 2013, but sinks would continue to be excluded.[630]

While an ETS with a narrower recognition of trading units (here the EU ETS) may take adjustment measures such as the introduction of exchange rates, which would raise transaction costs while producing only limited effects. The scheme's administrators would still never be able to tell whether an incoming allowance has been freed up by use of a trading unit which they themselves would not accept for compliance purposes.[631] The question would therefore probably

[627] Wolfgang Sterk, Michael Mehling and Andreas Tuerk, "Prospects of Linking the EU Emission Trading Schemes: Comparing the Western Climate Initiative, the Waxman-Markey and Lieberman-Warner Proposals" (Working paper prepared for the Climate Strategies, 2009), online: Wuppertal Institute for Climate, Environment and Energy <http://www.wupperinst.org/uploads/tx_wibeitrag/Linking_EU_US_ETS.pdf> at 11 [Sterk, Mehling & Tuerk].
[628] *Ibid.*
[629] Sterk et al, *supra* note 297 at 17.
[630] EC, *European Commission (2008): Accompanying document to the Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC so as to improve and extend the EU greenhouse gas emission allowance trading system - Impact Assessment*, [2008] SEC (2008) 52 [European Commission 2008].
[631] Wolfgang Sterk, "Prospects of Linking the EU Emission Trading Scheme with a Federal US Emissions Trading Scheme Along the Lines of the Lieberman-Warner Proposal" (Working paper prepared for Climate Strategies,

rather be to which extent each country would want to maintain their rules for the recognition of trading units instead of harmonising them for the purpose of linking.[632] If the inclusion of certain trading units is considered to be unacceptable by a scheme with a more narrow recognition of units, such as the EU ETS, the only option to really keep these units out would be not to link to schemes which include them.[633] Given the EU ETS opposition to sinks and domestic offsets, the inclusion of sink offsets and domestic offsets in both the federal and Alberta ETSs could therefore pose a serious obstacle to linking.

5.4.2 The Currency of Trading

To be compatible for linking, each dETS should ideally have the same quantitative unit of trading, metric tons of CO_2.[634] Since the EU and both Canadian ETSs have the same quantitative unit of trading, namely metric tons of CO_2,[635] linking of these schemes should not raise any significant complications in regard to the currency of trading.

5.4.3 Allocation

Differences in the way allowances are distributed to the entities covered by an ETS generally have no impact on the scheme's environmental effectiveness since this is solely determined by the overall cap.[636] However, the initial allocation method (free or through auction)[637] can affect

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2008), online: Climate Strategies <http://www.climatestrategies.org/research/our-reports/category/33/76.html> at 8 [Sterk].

[632] *Ibid.*

[633] *Ibid.*

[634] Sterk et al, *supra* note 297 at 17.

[635] See SGER, *supra* note 20, s.1(1)(f); "Turning the Corner: Canada's Offset System for Greenhouse Gases", *supra* note 621 at Annex A. See also EU Trading Directive, *supra* note 9, Art. 11.

[636] Sterk, *supra* note 631 at 10.

[637] There are two different allocation methods of allowances: free and by auction. The latter can be based on output (benchmarking) or on historic levels of emissions (grandfathering).

the distribution of costs and profits in a company.[638] Placing a price on emissions means that the right to emit is a valuable asset.[639] The EU ETS began the grandfathering of allowances to entities for free, based on historical levels of emissions as well as business as usual calculations.[640] In Phase I of the EU ETS, at least 95 per cent of allowances were distributed free of charge.[641] In Phase II, at least 90 per cent of allowances were distributed free of charge.[642] On the other hand, since both Canadian schemes are baseline-and-credit schemes there are no allowances to be distributed.[643] The government only requires entities to file a current emissions intensity profile and to improve on an annual basis.[644] This is clearly a grandfathering scheme.

However, the question is whether differences in allocation methods pose an obstacle to linking dETSs. These (i.e. differences in allocation methods) will occur anyway as a result of the mere existence of the dETSs, irrespective of linking them.[645] After the initial allocation, the allowance price will be defined by the supply and demand of these allowances.[646] Thus, linking dETSs with distinct initial allocation methods should not cause any distortions.[647] However, the subsequent allocation rules can lead to different distributional effects between entities in the two linked ETSs.[648] Subsequent allocation may be based on an updated base-year rather than the same base-year as the first trading period.[649] In Phase II of the EU ETS, member states could take account

[638] Faure & Peeters, *supra* note 39 at 311.
[639] *Ibid.*
[640] EU Trading Directive, *supra* note 9, Art. 9.
[641] *Ibid*, Art.10.
[642] *Ibid.*
[643] Boyle, *supra* note 586 at 188, 191.
[644] *Ibid.* See also Regulatory Framework, *supra* note 568 at iii, 3, 7.
[645] Faure & Peeters, *supra* note 39 at 311.
[646] *Ibid.*
[647] *Ibid.*
[648] Blyth & Bosi, *supra* note 297 at 25.
[649] *Ibid.*

of emissions reductions that have happened in Phase I.[650] The allocation was based on an updated base-year rather than the same base year as the first trading period (updating).[651] The allocation method in Phase III will significantly change from that used in the two previous trading periods (2005-2012).[652] Firstly, allowances will be allocated according to fully harmonised EU-wide rules, meaning that the same rules will apply across all EU member states.[653] Secondly, auctioning will be required for the power sector, which means that the majority of allowances under the EU ETS will no longer be distributed free of charge.[654] In that case, starting from 2013, national allocation plans and updating will not be needed any more in the EU ETS.

Neither of the Canadian ETSs includes updating in their programs. Instead, the emissions in these ETSs are counted against the baseline scenario and entities obtain credits ex post if their

[650] European Commission 2008, *supra* note 630.
[651] *Ibid.*
[652] European Commission, "Questions and Answers on the Revised EU Emissions Trading System", online: European Commission <http://ec.europa.eu/clima/policies/ets/faq_en.htm> [Questions and Answers on the Revised EU Emissions Trading System] (last visited Sept.16, 2012). See also Directive 2009/29/EC, *supra* note 12, Art.10(a).
[653] *Ibid.* For example, sectors deemed to be at significant risk of relocating production outside of the EU due to the carbon price (i.e. carbon leakage) will receive 100% of the benchmarked allocation for free. The Commission will determine the sectors concerned by assessing inter alia whether the direct and indirect additional production costs induced by the implementation of the ETS Directive as a proportion of gross value added exceed 5% and whether the total value of its exports and imports divided by the total value of its turnover and imports exceeds 10%. If the result for either of these criteria exceeds 30%, the sector would also be considered to be exposed to a significant risk of carbon leakage. See also European Commission, "Benchmarks for Free Allocation", online: European Commission <http://ec.europa.eu/clima/policies/ets/benchmarking/index_en.htm> (For example, industrial sectors will be allocated allowances for free on the basis of product benchmarks. The benchmarks will be set on the basis of the average of the top 10% most greenhouse gas efficient installations in the EU.) (last visited Sept. 16, 2012).
[654] *Ibid.* There might be, however, an equity issue if allowances are distributed for free in both Canadian ETSs but auctioned in the EU ETS. This distortion would occur despite linking but entities in the EU ETS with auctioning can probably be expected to demand harmonization of subsequent allocation rules prior to the linking to the Canadian ETSs.

emissions fall below the baselines.[655] Since from Phase III updating in the EU ETS will not occur any more, this feature is unlikely to cause a problem for linking.

5.4.4 Stringency of Targets

The stringency of targets indicates how much emissions must be reduced compared to historic or projected emissions.[656] Since the emerging schemes have rather different approaches to target-setting, a perfect balance is very unlikely to be attained between the linked dETSs. However, while competitiveness issues would not occur as a result of linking – they would occur even if the dETSs operated independently – it is probably a political precondition for linking that all affected dETSs demonstrate similar mitigation efforts and therefore establish comparable caps.[657]

In the Phase I of the EU ETS, member states, due to pressure from industrial lobby groups distributed an overgenerous amount of allowances.[658] In the Phase II of the EU ETS, the European Commission applied much stricter standards in its review of the National Allocation Plans (NAPs) and required overall emissions reduction of 6.5% compared to 2005 emissions.[659] For the period of post-2012 the European Commission replaced the system of NAPs by one EU-wide cap.[660] This cap will mandate an emissions reduction of 21 % compared to 2005 levels by

[655] Sterk et al, *supra* note 297 at 20.
[656] Faure & Peeters, *supra* note 39 at 312.
[657] Sterk & Schuele, *supra* note 137 at 418.
[658] *Ibid* at 421.
[659] European Commission (2008), *supra* note 630.
[660] See EC, *Commission Decision 2010/634 of 22 October 2010 adjusting the Union-wide quantity of allowances to be issued under the Union Scheme for 2013 and repealing Decision 2010/384/EU*, [2010] OLJ 279/34 [Commission Decision 2010/634]. See also European Commission, "Cap on Emissions Allowances for 2013 Adopted" (2010), online: European Commission <http://ec.europa.eu/clima/news/articles/news_2010102201_en.htm> (last visited

2020.[661] This annual reduction is expected to continue beyond 2020 but may be subject to revision not later than 2025.[662]

Both Canadian ETSs established weaker targets. While the government of Canada pledged to reduce Canada's total GHG emissions by 17 percent from 2005 levels by 2020,[663] Alberta's ETS only requires those facilities emitting over 100,000 tons of CO_2 per year to reduce their emissions intensity by 12 per cent below their 2003-2005 baseline emissions intensity.[664] In terms of reduction commitments, Alberta committed itself to 200 Mt reduction or 50 per cent below projected business as usual and 14 per cent below 2005 levels.[665] The effect of the two schemes on total emissions is difficult to assess as the targets are defined in terms of emissions intensity and some of the alternative compliance options, such as the Technology and Climate Change and Emissions Management Funds, may not lead to immediate emissions reductions.[666] Given the EU ETS's strict approach to allocation and stakeholders' foreseeable demand for equal treatment, this might pose a significant obstacle to linking.[667]

In addition, linking the EU ETS to schemes with weaker targets, such as both Canadian ETSs, will lead to higher emissions in the linked scheme than the emissions of the separate schemes.[668]

Sept. 16, 2012); EC, *Memo/10/513: Emissions trading: Questions and Answers concerning the second Commission on the EU ETS cap for 2013* (Brussels, 22 October 2010).

[661] *Ibid.*

[662] *Ibid.*

[663] Environment Canada, "Canada's Greenhouse Gas Target and Emissions Projections: Overview", online: The University of British Columbia: School of Community and Regional Planning <http://www.scarp.ubc.ca/sites/default/files/Canada%27s%20Greenhouse%20Gas%20Target%20and%20Emissions%20Projections.pdf >.

[664] SGER, *supra* note 20, s.3 and 4.

[665] Alberta 2008 Climate Change Strategy, *supra* note 598 at 24.

[666] Sterk & Schuele, *supra* note 137 at 421.

[667] *Ibid.*

[668] Faure & Peeters, *supra* note 39 at 312.

An entity in a dETS with stricter targets, such as the EU ETS, could largely meet its emissions reduction target by buying allowances from a scheme with lenient targets, such as both proposed federal and existing provincial Canadian ETSs.[669] This, in turn, may lead to a significant transfer of wealth from the dETS with a stricter target (EU ETS) to the dETS with a more lenient target (both Canadian ETSs).[670] This may also provide an incentive to a country to relax its targets or caps in order to become a net seller.[671] To prevent these effects, countries involved should have a comparably ambitious climate policy strategy and a joint vision about medium- and long-term emissions trends.[672] It would also be helpful to agree on the joint caps in all linked dETSs to assure all stakeholders that no country is intending to take advantage of the others.[673]

5.4.5 Absolute versus Relative Targets

The EU ETS sets absolute targets. Absolute targets limit the total greenhouse emissions within a specific period (ex-ante allocation).[674] Total emissions should not exceed the set target.[675] Other dETSs, such as the proposed federal ETS and existing Alberta ETS, are based on relative targets. Relative targets are defined as emissions per unit of output or activity (ex post allocation).[676] Under a scheme with relative targets, emissions may even increase as long as this is justified by an increase in production or GDP and the emissions have stayed below the relative target.[677]

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669 *Ibid.*
670 Mace et al, *supra* note 10 at 60.
671 Sterk & Schuele, *supra* note 137 at 418.
672 *Ibid.*
673 *Ibid.*
674 Faure & Peeters, *supra* note 39 at 312.
675 *Ibid.*
676 *Ibid.*
677 AM Gielen, PR Koutstaal & Herman RJ Vollebergh, "Comparing Emission Trading with Absolute and Relative Targets"(Paper presented at the 2nd CATEP Workshop on the Design and Integration of National Tradable Permit Schemes for Environmental Protection, hosted by University College London, 25-26 March 2002), online: University College Dublin <http://www.ucd.ie/envinst/envstud/CATEP%20Webpage/Papers/Koustaal.pdf> at 4.

Linking the EU ETS with both Canadian ETSs that use relative targets could impair the liquidity of the linked scheme.[678] In a scheme based on relative targets, emissions levels are typically linked to economic growth.[679] This means that entities in such scheme will obtain more allowances the more they produce, provided that they do not exceed their relative target.[680] As a result, entities under the scheme with relative targets may be motivated to increase their emissions since they will receive more allowances the more they produce, whereas entities in a scheme with a fixed cap face higher costs for any increase of emissions.[681] This may undermine the compatibility between the linked dETSs since output increases will inflate the amount of allowances available in the EU ETS.[682] This, in turn, could result in a smaller total emission reduction.[683]

There are several options to deal with this problem: (i) tax the trade between the linked dETSs, (ii) introduce an exchange rate to adjust for the relative allowance value, (iii) adjust allocation in the dETS with relative targets (both Canadian ETSs) to account for changes of growth levels stemming from the linkage of the dETS, and (iv) establishing a gateway.[684] However, all these options would make the linked scheme more complex and increase transaction costs.[685]

[678] Faure & Peeters, *supra* note 39 at 312.
[679] *Ibid*.
[680] Haites & Mullins, *supra* note 232 at 48.
[681] *Ibid.*
[682] *Ibid.*
[683] Faure & Peeters, *supra* note 39 at 312.
[684] Carolyn Fisher, "Combining Rate-Based and Cap-and-Trade Emissions Policies" (2003), online: Resources for the Future <http://www.rff.org/Documents/RFF-DP-03-32.pdf> at 12-19.
[685] Sterk et al, *supra* note 297 at 19.

The most desirable solution from an EU ETS perspective would be to persuade both the federal and the provincial Canadian policy makers to introduce absolute instead of relative targets.[686] This would not only guarantee the full environmental and cost benefits of emissions trading, but would also prevent burdensome adjustment arrangements.[687] However, if relative targets are retained, the most appropriate remedy for the Canadian ETSs would be to set sufficiently strict relative targets to keep them from undermining the environmental effectiveness of the ETS with absolute targets (i.e. EU ETS).[688]

5.4.6 Voluntary or Mandatory Participation

Participation in the EU ETS and in both Canadian (federal and Alberta provincial) schemes is mandatory (i.e. participation is made mandatory by a state). This requirement, therefore, doesn't pose a problem for linking the EU ETS with either Canadian scheme.

5.4.7 Upstream versus Downstream

The EU ETS is a downstream scheme as the allowances are distributed to the entities based on their direct emissions at a point of emission.[689] This way it concentrates on the end-users of energy.[690] Both, the proposed federal and Alberta's ETSs, combine upstream and downstream regimes.[691]

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[686] Sterk & Schuele, *supra* note 137 at 418.
[687] *Ibid.*
[688] *Ibid.*
[689] Faure & Peeters, *supra* note 39 at 313.
[690] *Ibid.*
[691] Boyd et al, *supra* note 139 at 11. Both Canadian ETSs include upstream (e.g. upstream production of oil and gas such as extraction, upgrading, initial processing, and pipelines transportation) and downstream regimes (e.g. downstream production of oil and gas such as refineries, electricity generation, fertilizer, paper and chemical manufacturing).

The EU ETS clearly differs in its coverage from the Canadian ETSs. If the EU ETS and both Canadian ETSs were linked, they should be linked in a way that avoids any double counting.[692] For instance, if energy products are exported from an upstream ETS (the federal or provincial Canadian ETS), to a downstream ETS (the EU ETS), emissions will be accounted for in both, upstream and downstream, schemes, i.e. they will be double-counted.[693] One option would be to prohibit the exports of energy products from both Canadian ETSs to the EU ETS.[694] This, however, is a drastic measure and may obstruct emissions trading.[695] A better solution would be to not require energy exporters in Canadian ETSs that regulate emissions upstream to surrender tradable units to cover emissions associated with exported energy products.[696] Or, alternatively, to not cover energy product users by an emissions target in the downstream EU ETS.[697]

5.4.8 Non-Compliance Penalties

In case of non-compliance in the EU ETS, non-compliant entities need to pay fines of €100 per excess ton of CO_2 emissions.[698] In addition to paying this fine, the entities have to purchase the

[692] Sterk et al, *supra* note 297 at 15.
[693] Faure & Peeters, *supra* note 39 at 313. See also Boyd et al, *supra* note 139 at 42 (Say, for instance, that refineries are included in an upstream ETS, and these refineries export aviation fuels to the aviation sector in a downstream ETS. Further assume that combustion emissions from aviation are covered by an emissions reduction target in a downstream ETS. If regulated aviation entities in the downstream ETS undertake – for instance – energy efficiency measures (e.g. weight reduction measures, new engine advances) that reduce fuel consumption and associated emissions by one unit (i.e. one ton of emissions), two tradable units are in effect created in the linked scheme, even though emissions are only reduced by one ton. One tradable unit is freed-up from the energy efficiency improvements by the regulated aviation entity in the downstream ETS and it is assumed that one unit is freed-up from the reduction in fuel production in upstream ETS that results from the reduced demand in the aviation sector in the downstream ETS. As a consequence of this double counting, emissions trading between downstream and upstream ETS could result in a net increase in emissions.
[694] *Ibid.*
[695] Boyd et al, *supra* note 139 at 42.
[696] *Ibid* (Under this option, the refineries in the upstream ETS will not be required to surrender tradable units to cover emissions associated with exported aviation fuel.).
[697] *Ibid* (Under this option, aviation fuel users (i.e. aviation sector) in the downstream ETS will not be covered by an emissions reduction target).
[698] EU Trading Directive, *supra* note 9, Art. 16(3).

number of allowances that they need and submit these allowances.[699] Finally, member states are also required to publish the names of the entities that have breached the requirements to surrender sufficient allowances.[700]

This is also the case in Alberta. Under the SGER, if a regulated entity fails to comply with the emission reduction limits, the entity will be subjected to a fine of $200 CAD per ton that is released over the emission intensity limit.[701] However, the SGER allows the covered entities to pay into the Technology Fund to buy Technology Fund credits to meet their emission reduction targets.[702] There is no information about non-compliance penalties for the proposed federal ETS. However, the federal ETS sets out a number of other ways firms can meet their obligations under the proposed regulatory regime. Similar to the Alberta's ETS, covered entities will be able to contribute to the Technology Fund in order to comply with the emissions intensity reductions.[703] The emitters can use this fund to meet up to 60% of their reduction obligations in 2012, falling to 55% in 2013, 50% in 2014, 40% in 2015, 10% in 2016, and 10% in 2017.[704] No further contributions to the fund will be accepted after 2017.[705] The contribution rate to the fund will increase over time, starting with $15 CAD for the 2010-2012 period, increasing up to $20 CAD per ton in 2013, and thereafter rising at the nominal rate of GDP growth until 2017.[706]

[699] *Ibid.*
[700] *Ibid,* Art.16(2).
[701] SGER, *supra* note 20, s.28(1).
[702] *Ibid*, s. 8.
[703] Regulatory Framework, *supra* note 568 at 3.
[704] *Ibid.*
[705] *Ibid.*
[706] *Ibid.*

Both Canadian ETSs have a safety valve (i.e. contributions to the Technology Fund). In contrast, the EU ETS does not contain a safety valve. A safety valve is a pre-determined allowance price in the event that the market price rises above a certain level.[707] With this mechanism, the regulator commits to selling allowances at a pre-determined price in whatever quantity is demanded in case the market price for allowances rises above a certain level.[708] A safety valve limits the cost of the participants to the safety valve level but at the cost of missing the environmental target.[709] One of the main advantages of a cap-and-trade scheme is the ability to precisely define the environmental outcome.[710] Consequently, safety valves crack the cap.[711]

If the EU and the Canadian schemes were linked, all involved entities would have access to this safety valve.[712] If the market price is greater than the safety valve, entities in the Canadian ETSs (with a safety valve) will have an incentive to use this safety valve and to sell their allowances and credits to the entities in the EU ETS (without a safety valve) until the prices were equalized at the safety valve level.[713] As a result, the environmental effectiveness of the combined scheme would suffer since total emissions would be higher than when if the schemes operated separately.[714]

The most efficient solution to the safety valve issue would be to harmonize the approach to a non-compliance regime in all three ETSs. If such solution is not possible, there would need to be

[707] Faure & Peeters, *supra* note 39 at 314.
[708] Sterk, Mehling & Tuerk, *supra* note 627 at 20.
[709] *Ibid.*
[710] *Ibid.*
[711] *Ibid.*
[712] Faure & Peeters, *supra* note 39 at 314.
[713] *Ibid.*
[714] See Blyth & Bosi, *supra* note 297 at 29f.

a limit on the exchange of trading units. This could be done by allowing the use of the safety valve only to entities covered by both Canadian ETSs that have this feature and only up to the differences between the initial allocation and the actual emissions. This would not completely prevent the access to the lower-than-market-rates allowances, but it would limit the amount of additional allowances being sold to the EU ETS.

5.4.9 Opt-in and Opt-out Provisions

A further issue that needs to be considered is the issue of opt-in and opt-out rules. Opt-in means that new gases, sectors and activities can be included in the dETS and opt-out means that participating entities can be excluded from the dETS.[715] In Phase II, the EU ETS permits its member states to opt in activities, sectors and gases that were not already covered by the scheme.[716] Conversely, the EU ETS permitted its member states to opt-out installations in Phase I, but they are not allowed to opt-out in Phase II (2008 - 2012).[717] Article 27 of the EU ETS Directive provides for a possible opt-out for small emitters and hospitals from the EU ETS in Phase III from 2013 – 2020.[718] The small emitters who want to use this provision must have annual emissions of less than 25,000 tonnes of CO_2 and a rated thermal input of less than 35 MW (excluding emissions from biomass).[719] This opt-out provision is discretionary and will also

[715] Faure & Peeters, *supra* note 39 at 314.
[716] EU Trading Directive, *supra* note 9, Art. 24. See also Blyth & Bosi, *supra* note 297 at 18.
[717] *Ibid,* EU Trading Directive, *supra* note 9, Art.27.
[718] *Ibid.* See also UK Department of Energy and Climate Change, "EU ETS Phase III (2013-2020)", online: UK Department of Energy and Climate Change <http://www.decc.gov.uk/en/content/cms/emissions/eu_ets/phase_iii/phase_iii.aspx> (last visited Sept.16, 2012).
[719] *Ibid.*

depend on emissions from opted-out installations being subjected to alternative domestic tools which achieve an equivalent contribution to emission reductions.[720]

Neither the proposed federal ETS nor existing Alberta ETS expressly include opt-in nor opt-out provisions. Both the Alberta and the Canadian federal Government cover all GHGs under the Kyoto Protocol, which are carbon dioxide (CO_2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6).[721] The Government of Alberta has indicated that any changes to this list including the addition of new gases will be assessed during the review of the Specified Gas Emitters Regulation.[722] No changes to the list have been made so far. There is no current information about any possible future changes to the list of gases included in the federal scheme.

If entities have the possibility to opt out and physically move to a less restricted dETS (i.e. federal or provincial Canadian ETS), this would reduce the scope of the dETS (EU ETS) and consequently decrease its efficiency.[723] Thus, in order to link the EU ETS to the Canadian schemes, some restrictions on the opting out ability of the EU ETS entities would be required.[724] The opting-out entities should be subjected to other measures to guarantee the environmental effectiveness of the EU ETS.[725]

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[720] *Ibid.*
[721] See SGER, *supra* note 20, Schedule: Specified Gases; Regulatory Framework for Industrial Air Emissions: Overview, *supra* note 582.
[722] Technical Guidance for Offset Project Developers, *supra* note 601 at 25.
[723] Faure & Peeters, *supra* note 39 at 315.
[724] *Ibid.*
[725] *Ibid.*

5.4.10 Monitoring, Reporting, Verification (MRV)

In any dETS monitoring, reporting and verification (MRV) provisions are essential to ensure confidence and to underpin the value of the traded unit.[726] The EU ETS Directive requires that emissions reports be subject to verification.[727] Annex V to the EU Trading Directive establishes essential requirements and tasks to be undertaken by the verifiers.[728] More importantly, it also includes a list of minimum competency requirements for the verifiers.[729]

Under the EU ETS, after each calendar year the covered entities must report their GHG emissions to the competent authority.[730] These reports have to be submitted to the competent authority by the 31st of March each year.[731] Moreover, they have to be checked by a verifier before submitting them to the competent authority.[732] The verifier must be independent of the operator so that the verification results are objective and unbiased.[733] If the entity's report has not been verified as satisfactory by the 31st of March, the entity cannot make further transfers of allowances until the report has been verified as satisfactory.[734] Once an entity's emissions have been verified as satisfactory, the amount of emissions will be entered into the verified emissions table designated for that entity for that year in the registry.[735]

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[726] *Ibid.*
[727] EU Trading Directive, *supra* note 9, Art. 14 and 15.
[728] *Ibid*, Annex V.
[729] *Ibid.*
[730] Ibid, Art. 14(3).
[731] EC, *Commission Decision 2004/156/EC of 29 January 2004 establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council*, [2004] OJL 59/1 [Commission Decision 2004/156/EC] (Section 5 of Annex I).
[732] EU Trading Directive, *supra* note 9, Art. 15(1).
[733] *Ibid*, Annex V, para. 12.
[734] *Ibid*, Art. 15(2).
[735] Registries Regulation, *supra* note 536, Art. 51.

In Canada, in 2009, the federal government released a series of program rules and guidance documents for its highly anticipated offset system.[736] Under the offset system, a project monitoring report must be prepared by the project proponent each time the project proponent requests offset credits.[737] The project monitoring report must be submitted to a third-party verifier, referred to as a "verification body".[738] The verification body has to be accredited by the Standards Council of Canada.[739] Verifiers that are in the process of becoming accredited are allowed to submit verification statements.[740] However, the reductions claimed by entities in this case will not be certified and no offset credit will be issued if the verifier does not become successfully accredited within one year of acceptance of the corresponding verification statement.[741] Where the independence of the verification body is potentially at risk, the verification body must implement a conflict of interest management plan.[742] If the verification body cannot avoid a conflict of interest it should not provide verification services to a project proponent.[743] The verification body must submit a verification statement to the Environment Canada which will certify the issuance of offset credits.[744]

Similarly, under Alberta ETS a person responsible for a covered entity on December 31 of each year must submit to the director a compliance report that year by March 31st of the following

[736] "Program Rules and Guidance for Project Proponents" and "Program Rules for Verification and Guidance for Verification Bodies".
[737] Environment Canada, *Canada's Offset System for Greenhouse Gases: Program Rules for Verification and Guidance for Verification Bodies* (Ottawa: Environment Canada, 2009), online: Environment Canada < http://publications.gc.ca/collections/collection_2010/ec/En84-42-5-2009-eng.pdf> at 5 [Canada's Offset System for Greenhouse Gases: Program Rules for Verification and Guidance for Verification Bodies].
[738] *Ibid.*
[739] *Ibid* at 7.
[740] *Ibid.*
[741] *Ibid.*
[742] *Ibid* at 9.
[743] *Ibid* at 69.
[744] *Ibid* at 37.

year.[745] Before submission, this report has to be checked by a third party verifier.[746] In Alberta an independent third-party verifier must be either a chartered accountant or a professional engineer.[747] A person is not eligible to be a verifier if that person is responsible for the facility or is a director, officer or employee of the person responsible for the facility or of an affiliate, or if that person is an employee or an agent of the Government.[748]

In this context, while the EU ETS and both Canadian schemes possess some similar MRV processes, their approaches are not identical. For example, all three ETSs provide for reporting and verification. All of them require that verification must be performed by a third-party verifier. However, the EU ETS and federal ETS require that a verifier has to be accredited.[749] In contrast, the Alberta dETS only requires the third-party verifiers to be professional engineers or chartered accountants in good standing with their professional organization.[750] Furthermore, all three ETS put in place a system to ensure the quality of the verifiers and a mechanism for removing poorly performing verifiers. For example, they all require verifiers that cannot avoid a conflict of interests stop providing a verification service.

Linking dETSs with different MRV provisions should not pose an obstacle as long as these schemes are transparent and robust enough to maintain confidence in the value of the trading

[745] SGER, *supra* note 20, s. 11(1).
[746] *Ibid.*
[747] *Ibid*, s. 18(1).
[748] *Ibid*, s. 18(2).
[749] See Commission Decision 2004/156/EC, *supra* note 731 (There is nothing express in the EU ETS Directive which requires verifier to be accredited. However, paragraph 2(f) of Annex I of the Commission Decision 2004/156/EC defines "verifier" as "a competent accredited verification body"). See also Canada's Offset System for Greenhouse Gases: Program Rules for Verification and Guidance for Verification Bodies, *supra* note 737 at 7 (The verification body has to be accredited by the Standards Council of Canada).
[750] SGER, *supra* note 20, s.18(1).

units to prevent fraud, such as the under-reporting of the emissions.[751] Therefore, lack of complete harmonization would not prevent linking; however, the absence of a system of equivalent stringency would.[752]

5.4.11 Registries

Linking different dETSs will also require their registries to be sufficiently harmonized in order to allow for an effortless transfer of allowances between the linked dETSs.[753] The Kyoto parties have established national registries that have to follow detailed guidelines in order to guarantee their compatibility.[754] Domestic or regional ETSs, such as the EU ETS, that use the Kyoto trading units also make their settlements through these registries.[755] While the proposed federal Canadian ETS allows entities to purchase credits generated through the CDM of the Kyoto Protocol, the Alberta ETS does not allow the use of Kyoto trading units.[756] Alberta has established the Alberta Emissions Offset Registry only for Alberta-based offset projects.[757] The registry only serves as a means of recording project and credit information, including assigning serial numbers that are used to track offset credits.[758] Nevertheless, documentation requirements for the registry are consistent with the requirements for CDM projects and meet the same

[751] Faure & Peeters, *supra* note 39 at 315.
[752] Mace et al, *supra* note 10 at 68.
[753] Sterk et al, *supra* note 297 at 23.
[754] Faure & Peeters, *supra* note 39 at 315.
[755] *Ibid.* The EU Commission established a standartized system of national registries designed to keep track of assigned, held, transferred and cancelled AAUs, ERUs, CERs and RMUs in order to comply with its international obligations (Kyoto Protocol, *supra* note 1, Art. 7(4)) and Eurpean law (EU trading Directive, *supra* note 9, Art. 19 and Art. 6 of the Decision 280/2004/EC (EC, *Decision 280/2004/EC off the European Parliament And of the Council of 11 February 2004 concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol*, [2004] OJL 49/1)).
[756] Goetz, *supra* note 68 at 390-411. See also Domestic Emissions Trading for Greenhouse Gases, *supra* note 109.
[757] Technical Guidance for Offset Project Developers, *supra* note 601 at 66. See also SGER, *supra* note 20, s.7(1)(a).
[758] *Ibid.*

requirements for document retention and transparency.[759] Thus, linking the EU ETS with Alberta's ETS may require an agreement on connecting the registries to one another.[760]

5.4.12 Banking

Banking allows the transfer of allowances from one trading period to the next.[761] While all three schemes allow banking, their banking rules are different. Specifically, the banking of the EUAs from Phase I into Phase II was at the discretion of member states of the EU and from Phase II onwards, there is an obligation on the member states to allow for the unlimited banking of the EUAs into subsequent trading periods.[762] The proposed federal Offset Scheme for Greenhouse Gases will allow banking by entities that create the credits.[763] Similarly, while Alberta's scheme allows banking of Emissions Performance credits, it does not allow banking of Technology Fund credits.[764]

Since it seems that all three ETSs allow banking, linking should not pose any problems.

5.4.13 Borrowing

Borrowing permits an entity in a dETS to achieve compliance for the current trading period by using allowances allocated for a future trading period.[765] In the EU ETS borrowing within a trading period is made possible because allowances from the current year are issued on 28th of

[759] *Ibid.*
[760] Faure & Peeters, *supra* note 39 at 315.
[761] *Ibid.*
[762] EU Trading Directive, *supra* note 9, Art. 13(3)(2). Also see Mark C Lewis and Isabelle Curien, "A Reminder of the EU-ETS Rules on Banking for EUAs" (Report prepared for the Deuthsche Bank, 2010), online: Carbon Emissions <http://www.zyen.info/joomla/londonaccord/images/reports/pdf/db_euets_2010.pdf> at 1.
[763] Regulatory Framework for Air Emissions, *supra* note 569 at 14.
[764] SGER, *supra* note 20, s.8 and 9.
[765] Faure & Peeters, *supra note* 39 at 316.

February of each year,[766] whereas each covered entity is required to surrender allowances for its emissions during the preceding year on April 30th of each year.[767] With respect to borrowing between different trading periods, the EU ETS directive is more restrictive. Because allowances in the EU ETS are only valid for emissions during the trading period for which they are issued, allowances that are issued for a subsequent trading period cannot be borrowed and used for compliance in the current trading period.[768]

Neither the proposed federal ETS nor Alberta ETS allows borrowing[769] and both operate on an annual compliance period.

Even though the EU ETS does not allow borrowing between trading periods, linking Canadian ETSs that do not allow borrowing to the EU ETS, a scheme that allows borrowing within the same trading period, could reduce environmental effectiveness of the linked ETS.[770] This could occur if the covered entity in the EU ETS ceased to exist before the repayment of the borrowed allowances was due.[771]

A solution would be to permit purchases from an entity in the dETS with borrowing (EU ETS) but only after its compliance period has been completed (after April 30th of each year) and only from entities that did not borrow, i.e. only allow ex-post purchases of surplus allowances.[772]

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[766] EU Trading Directive, *supra* note 9, Art. 11(4).
[767] *Ibid*, Art. 12(3).
[768] *Ibid*, Art. 3(a).
[769] Boyd et al, *supra* note 139 at 13.
[770] Sterk et al, *supra* note 297 at 22.
[771] *Ibid.*
[772] Haites & Mullins, *supra* note 232 at 62.

5.4.14 Sector and Gas Coverage

The EU ETS is a downstream cap-and-trade system. According to Annex I of the EU Trading Directive, four main types of activities – energy activities, production and processing of ferrous metals, mineral industry and the production of pulp, paper, and board with a specific production capacity – are regulated.[773] In total, the scheme covers about 10,500 entities across the 27 member states which account for about 41% of Community-wide GHG emissions.[774] Although the EU Trading Directive lists all six gases covered by the Kyoto Protocol in its Annex, it has so far addressed only CO_2 emissions, due to concerns about the accuracy of measurement of other greenhouse gases.[775]

As from 2013 the EU ETS will be expanded to include new gases and sectors. It will include CO_2 emissions from petrochemicals, ammonia and aluminium, as well as N_2O emissions from the production of nitric, adipic and glyocalic acid production and perfluorocarbons from the aluminium sector.[776] In addition, the capture, transport and geological storage of all GHGs emissions will also be covered.[777] These sectors will be issued allowances for free according to

[773] See EU Trading Directive, *supra* note 9, Annex I.
[774] European Commission (2008), *supra* note 630.
[775] Sterk, *supra* note 631 at 5. As for greenhouse gases, the EU ETS currently only covers carbon dioxide emissions, with the exception of the Netherlands, which has opted in emissions from nitrous oxide.
[776] See Questions and Answers on the Revised EU Emissions Trading System, *supra* note 652. See also Directive 2009/29/EC, *supra* note 12, Annex I.
[777] *Ibid.* See also Directive 2009/29/EC, *supra* note 12, Annex I; EC, *Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives*, [2009] OJL 140/114 (This directive established a legal framework for the environmentally safe geological storage of CO_2. It covers all CO_2 storage in geological formations in the EU, and lays down requirements covering the entire lifetime of a storage site).

the EU-wide rules, in the same way as other industrial sectors already covered by the EU ETS.[778] Starting from 2012, aviation will also be covered by the EU ETS.[779]

The proposed federal Canadian ETS will be a mixed upstream-downstream system covering the whole Kyoto basket of GHGs.[780] It will include facilities exceeding the annual emissions threshold.[781] For natural gas pipelines the threshold will be 50 kt CO_2-eq per year; for electricity - 10 MW; for upstream oil and gas – 3 kt CO_2 per year per facility and 10,000 barrels of oil equivalent per day per company.[782] It will cover facilities in the following sectors: electricity generation produced by combustion, oil and gas, forest products, smelting and refining, iron and steel, some mining, cement, lime, and chemicals.[783]

Likewise, the Alberta ETS is equally a mixed upstream-downstream system. It includes all facilities that have direct emissions totaling 100,000 tons or more in 2003 or any subsequent year.[784] In Alberta around 100 entities are required to reduce their GHG emissions.[785] It covers all GHGs in the Kyoto Protocol.[786]

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[778] *Ibid.*
[779] *Ibid.* See also Directive 2009/29/EC, *supra* note 12, Annex I; EC, *Directive 2008/101/EC of the European Parliament and of the Council of 19 November 2008 amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community*, [2009] OJL 8/3 (From the beginning of 2012, emissions from all domestic and international flights that land at or take off from an EU airport are included in the EU ETS. This applies to EU and non-EU airlines alike. Emissions from flights to and from Iceland, Liechtenstein and Norway are also covered).
[780] CO_2, CH4, N_2O, HFCs, SF6, PFCs. See Regulatory Framework for Air Emissions, *supra* note 569 at 10.
[781] Regulatory Framework, *supra* note 568 at 8.
[782] *Ibid.*
[783] Regulatory Framework for Air Emissions, *supra* note 569 at iv.
[784] SGER, *supra* note 20, s.3 and s.4.
[785] See Boyd et al, *supra* note 139 at 190.
[786] SGER, *supra* note 20, Schedule.

The EU ETS and both Canadian ETSs clearly differ in their coverage. All three ETSs have the potential to cover all the six gases included in the Kyoto Protocol, however the EU ETS so far has addressed only CO_2 emissions. On the other hand, the EU ETS has greater sectoral coverage compared to both Canadian ETSs.[787] In principle, differing sector or gas coverage is not a matter of institutional incompatibility, nor does it impact the environmental effectiveness of a linked trading scheme.[788] Linking EU ETS (addressing only CO_2 emissions) to both Canadian ETSs (addressing all six gases listed in the Kyoto Protocol) is feasible, as long as traded instruments are denominated in equivalent terms (e.g. tons of CO_2 equivalent).[789] On the other hand, a situation where more sources are included in the EU ETS but not in the Canadian ETSs raises first and foremost questions regarding competitive disadvantages and possible discrimination due to different treatment of sectors.[790] These disadvantages are not caused by linking and would also happen in its absence.[791] To reduce these potential impacts, it would be preferable to have coordinated core sectors across all linked ETSs in context of a linking agreement.[792] Another option would be the progressive expansion of the sectoral coverage over time in the Canadian ETSs.[793]

[787] While emissions trading has the potential to involve many economic sectors, the focus primarily is on emissions which can be measured, reported and verified with a high level of accuracy. In order to achieve this, minimum annual emissions thresholds are set out. Thus, what matters are the volumes of tons of CO_2 emissions rather than sectors. As result, certain sectors are more likely than others to produce large volumes of CO_2.
[788] Sterk, *supra* note 631 at 5.
[789] Mace et al, *supra* note 10 at 71.
[790] Different coverage in different ETSs will lead to competitiveness issues since different entities are exposed to different costs.
[791] Sterk, *supra* note 631 at 5.
[792] Baron & Bygrave, *supra* note 3 at 22.
[793] *Ibid.*

5.4.15 Trading Period

The EU ETS was officially launched on 1 January 2005.[794] The first trading period ran for three years until the end of 2007 and was a "learning by doing" phase.[795] The second trading period began on 1 January 2008 and runs for five years until the end of 2012.[796] The third trading period will begin on January 2013 and will run for eight years (instead of five) until the end of 2020.[797] Thus, in the EU ETS, the reduction targets are already established for 2020 with the intention to continue beyond 2020.[798]

The federal Canadian ETS was expected to come into force in 2010. It would have required industry to reduce its GHG emissions until 2020, with further reductions planned beyond this date.[799]

Alberta's CCEMA states that "the specified gas emissions target for Alberta is a reduction by December 31, 2020 of the specified gas emissions relative to GDP to an amount that is equal to or less than 50% of 1990 levels".[800] In its 2008 Climate Change Strategy, Alberta committed to a 50 megaton reduction in provincial greenhouse gas emissions by 2020, and a 200 megaton

[794] See Emissions Trading System (EU ETS), *supra* note 269.
[795] *Ibid.*
[796] *Ibid.*
[797] *Ibid.*
[798] Questions and Answers on the Revised EU Emissions Trading System", *supra* note 652. See also Directive 2009/29/EC, supra note 12, Art. 9. It is anticipated that the linear factor of 1.74% used to determine the Phase III cap will continue to apply beyond the end of the trading period in 2020 and will determine the cap for the fourth trading period (2021 to 2028) and beyond. It may be revised by 2025 at the latest. In fact, the EC announced that significant emission reductions of 60%-80% compared to 1990 will be necessary by 2050 to reach the strategic objective of limiting the global average temperature increase to not more than 2°C above pre-industrial levels.
[799] Regulatory Framework, *supra* note 568 at 1. In its TTC plan, federal Government had committed to reducing Canada's total emissions of GHGs, relative to 2006 levels, by 20% by 2020 and by 60% to 70% by 2050.
[800] CCEMA, *supra* note 21, s. 3.

reduction by 2050.[801] The Specified Gas Emitters Regulation which established Alberta's regulatory system for managing GHGs is subject to a general sun-setting provision which provides that the regulation will expire on September 1 2014 unless renewed.[802]

All three ETSs are defined until 2020 and hence are similar in scope. In addition, all of them include proposals for even longer-term commitments (e.g. until 2050). This feature therefore should not pose a problem for linking. Nevertheless, in order to control the total amount of allowances in a combined ETS without uncertainties, the trading periods of the EU ETS and both Canadian ETSs should be harmonized.

5.5 Indirect Linking Through Offsets and Issues

The EU ETS and both Canadian ETS could be linked indirectly if direct linkage is not sought. Indirect linking requires less harmonization between the involved ETSs than direct linking.[803] No mutual acceptance of allowances under each linked scheme is needed.[804] This seems easy in the case of linking the EU ETS to the emissions trading schemes of states that are parties to the Kyoto Protocol since CDM and JI are already in place.[805] However, Canada is now set to withdraw from the Kyoto Protocol. In addition, as noted above, the EU ETS does not accept certain CER and ERU credits such as credits generated by project activities from sinks or credits from nuclear facilities.[806] By contrast, the proposed federal Canadian ETS allows CERs from

[801] Alberta 2008 Climate Change Strategy, *supra* note 598 at 7. See also Boyle, *supra* note 586 at 190.
[802] SGER, *supra* note 20, s. 30.
[803] Faure & Peeters, *supra* note 39 at 317.
[804] *Ibid.* An indirect link is created if each of the independent emissions trading schemes themselves establishes a direct link with a common third scheme, such as CDM.
[805] *Ibid.*
[806] *Ibid.* See also Linking Directive, *supra* note 16, Art. 11(a)(3)(b).

sinks.[807] These concerns can be dealt with by prohibiting the import of credits from disallowed projects.[808] Such prohibitions nevertheless could be bypassed if the EU ETS were linked to an ETS, such as the proposed federal ETS, which allows these credits, since the buyers in the exporting federal ETS in theory could export eligible credits and buy up the prohibited (possibly cheaper) ones for their own compliance.[809] Consequently, if participants in the EU ETS do not want to allow their resources to be transferred to certain types of projects – even indirectly – then linking should not be allowed with any federal Canadian ETS that permits prohibited types of projects.[810]

Furthermore, in the case of an indirect link between the EU ETS and the Alberta Offset Scheme, there are no commonly accepted offset mechanisms at all. The EU ETS only accepts credits from CDM and JI (with some limitations),[811] while the Alberta ETS does not recognize or accept them. Therefore, for indirect linking of the EU ETS and the Alberta Offset Scheme, the latter must recognize and accept these credits.

In addition, in this case, a further technical issue is how these credits, even if recognized and accepted, can be transferred to accounts under the Alberta ETS. The registry in the Alberta ETS

[807] *Ibid.* See also Regulatory Framework, *supra* note 568 at 18. (However, proposed federal ETS excludes credits from forest sink projects within the scope of eligible CDM offsets). SGER, *supra* note 20, s.7(1)(a): In contrast, SGER requires that all emissions offsets would come from reduction projects located in Alberta.
[808] *Ibid.*
[809] *Ibid.*
[810] *Ibid.*
[811] Linking Directive, *supra* note 16, Art. 11(a)(3)(b) (EU ETS does not accept CERs and ERUs from sinks and some nuclear projects); Linking the EU ETS to other Emissions Trading Systems and Incentives for International Credits, *supra* note 22 (In the 2008-2012 trading period, the EU laws allow operators to use JI/CDM credits up to a percentage determined in the National Allocation Plans (NAPs). Unused entitlements are transferred to the next trading period (2013-2020). Between 2008 and 2020, the EU ETS legislation provides for use of credits up to 50% of the overall reductions below 2005 levels made under the EU ETS. The exact amount per operator is to be determined in line with the methodology outlined in Directive 2OO9/29/EC (*supra* note 12) - Article 11a(8)).

is not connected to the Kyoto Registry - the International Transaction Log (ITL). A possible solution could be that the Alberta ETS could create an account in the national registry of an Annex B party, such as in the proposed federal ETS registry (when implemented), and the ITL.[812] In order to do that, an international agreement will also be needed to establish an account in a national registry of an Annex B party other than Canada.[813] Another option: participants under the Alberta ETS could establish accounts in a national registry of an Annex B party and the CDM registry.[814] However, only entities that are approved to engage in a CDM project by Kyoto parties may have an account with the CDM registry.[815]

Even though CDM and JI are the only established offsets at the multilateral level, there is no reason why they should be the only offsets used for offset trading. There is a proposal in the EU ETS that envisages recognizing and accepting a range of offsets other than the CDM and JI.[816] In Canada, a structure for offsets is established at the federal and provincial ETS. Environmental effectiveness can be protected if mutual criteria and approval procedure for credits generated by such offsets are established.[817]

5.6 Summary

In linking domestic emissions trading schemes, a number of issues must be explored and their effect on the seven dimensions mentioned in the literature review (environmental and cost

[812] Faure & Peeters, *supra* note 39 at 317.
[813] *Ibid.*
[814] See Montreal Accords, *supra* note 563 (Decision 1/CMP.1, Appendix D).
[815] *Ibid*.
[816] EC, *Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading system of the Community*, COM(2008) 16 final.
[817] Faure & Peeters, *supra* note 39 at 318.

effectiveness, equity issues, institutional compatibility, political feasibility, administrative and transaction costs) is crucial. The differing designs of the EU ETS and Canadian schemes have implications for any future linkage between the emissions trading regimes of the two parties. A brief summary is presented below identifying some of the major components of their designs and the associated implications for linking:

Trading unit: Given the EU ETS opposition to sinks and domestic offsets, the inclusion of sink offsets and domestic offsets in both federal and Alberta ETSs, could pose a serious obstacle to linking. While the EU ETS may take adjustment measures such as the introduction of exchange rates, these would raise transaction costs while producing only limited effects. Mutual recognition of trading units is therefore one of the main pre-conditions for linking the EU ETS to the Canadian ETSs. If the inclusion of certain trading units is considered to be unacceptable by a scheme with a more narrow recognition of units, such as the EU ETS, the only option to really keep these units out would be to refuse to link to schemes which include them.

Currency of trading: Since the EU and both Canadian ETSs have the same quantitative unit of trading, namely metric tons of CO_2, linking these schemes should not raise any significant complications in.

Allocation: After the initial allocation, the allowance price will be defined by the supply and demand of these allowances. Thus, linking dETSs with distinct initial allocation methods should not cause any distortions. However, if dETSs are linked, it is important that the subsequent allocation provisions should be harmonized. In particular, linking EU ETS that uses updating and

both Canadian ETSs that do not, could lead to emissions (and also production) being shifted to both Canadian ETSs. However, since from 2013 allowances in the EU will be allocated according to fully harmonized EU-wide rules, updating will not be needed anymore. Thus, this feature is unlikely to cause a problem for linking.

Stringency of targets: The stringency of targets indicates how much emissions are reduced compared to historic or projected emissions. Linking the EU ETS to schemes with weaker targets, such as both Canadian ETSs will lead to higher emissions in the linked scheme than the emissions of the separate schemes. To prevent this effect, countries involved should have a comparably ambitious climate policy strategy and a joint vision about medium- and long-term emissions trends. It would also be helpful to agree on joint caps in all linked dETSs to assure all stakeholders that no country is intending to take advantage of the others.

Absolute/relative targets: Linking the EU ETS which uses absolute targets with both Canadian dETSs that use relative targets could impair the liquidity of the combined scheme. There are several options to deal with this problem: (i) taxing trade between the linked dETSs, (ii) introducing an exchange rate to adjust for the relative allowance value, (iii) adjusting allocation in the dETS with relative targets to account for changes of growth levels stemming from the linkage of the dETS, and (iv) establishing a gateway. However, all these options would make the linked scheme more complex and increase transaction costs. The most desirable solution from an EU ETS perspective would be to persuade both Canadian federal and provincial policy makers to introduce absolute instead of relative targets. However, if relative targets are retained, the most

appropriate remedy for the Canadian ETSs would be to set sufficiently strict relative targets to keep them from undermining the environmental effectiveness of the ETS with absolute targets.

Voluntary/mandatory participation: Participation in the EU ETS and in both Canadian federal and Alberta provincial schemes is mandatory. This requirement, thus, does not pose any problem for linking.

Upstream/downstream: While the EU ETS is a downstream scheme, both Canadian schemes combine upstream and downstream regimes. If the EU ETS and both Canadian ETSs, schemes with different coverage rules, were linked, they should be linked in a way that avoids any double counting. This could be done through not requiring energy exporters in upstream Canadian ETSs to surrender tradable units to cover emissions associated with exported energy products. Or, alternatively, this could be done by not covering energy product users by an emissions target in the downstream EU ETS.

Non-compliance penalties: Both Canadian ETSs have a safety valve, i.e. pre-determined allowance price in the event that the market price rises above a certain level. If the EU and Canadian ETSs were linked, all covered entities would have access to the price cap set by the lowest non-compliance penalty. Participants in both Canadian ETSs might have an incentive to sell allowances and credits to participants in the EU ETS and consequently fail to comply with their reduction obligations. This, in turn, can lead to lower emission reductions and so undermine the environmental effectiveness of the combined ETS. Thus, if the EU ETS and the Canadian

ETSs were linked, the most efficient solution would be to harmonize the non-compliance regimes in all three ETSs. If it is not possible, the exchange of trading units needs to be limited.

Opt-in/opt-out provisions: While the EU ETS includes opt-in and opt-out provisions, neither Canadian ETSs does so. If EU entities had the possibility to opt out and move to a less restricted Canadian ETSs, this could reduce the scope of EU ETS and consequently decrease its efficiency. To prevent this, some restrictions on the opting-out ability of the EU ETS entities will be required.

Monitoring, Reporting, Verification (MRV): While the EU ETS and both Canadian schemes possess similar MRV processes, their approaches are not identical. For example, all three ETSs require that verification must be performed by a third-party verifier. While the EU ETS and federal Canadian ETS require a verifier to be accredited, Alberta only requires that a verifier be a professional engineer or a chartered accountant. Thus, linking dETSs with different MRV provisions should not pose an obstacle as long as these schemes are transparent and robust enough to maintain the confidence in the value of the trading units to prevent fraud, such as the under-reporting of emissions.

Registries: Linking different EU and Canadian ETSs also requires that their registries be sufficiently harmonized in order to allow for an effortless transfer of allowances. The Kyoto parties have established national registries that have to follow detailed guidelines in order to guarantee their compatibility. While The EU ETS and the proposed federal ETS allow their entities to use the Kyoto units, the Alberta ETS does not. Thus, linking the EU ETS with

Alberta's dETS may require an agreement on connecting the registries to one another or establishing account in a national registry of an Annex B party. This may become more problematic once Canada withdraws from Kyoto.

Banking: Banking allows the transferring of allowances from one trading period to the next. Since all three ETSs (EU and both Canadian) allow banking, this should not pose any problem for linking.

Borrowing: While the EU ETS allows borrowing, neither Canadian scheme does. Linking Canadian ETSs to the EU ETS, a scheme that allows borrowing, may reduce the environmental effectiveness of the combined regimes. A solution would be to permit purchases from an entity in the dETS with borrowing (EU ETS) but only after its compliance period has been completed and only from entities that did not borrow.

Sector and gas coverage: The EU ETS and both Canadian ETSs clearly differ in their coverage. While all three ETSs cover all six gases included in the Kyoto Protocol, the EU ETS only addresses CO_2 emissions. However, the EU ETS has far greater sectoral coverage compared to both Canadian ETSs. In relation to the covered gases, as long as the traded instruments are denominated in equivalent terms (tons of CO_2 equivalent), linking is feasible. On the other hand, a situation where more sources are included in the EU ETS but not in both Canadian ETSs raises important questions regarding competitive disadvantages and possible discrimination due to the different treatment of sectors. To reduce these potential impacts, it would be preferable to have

coordinated core sectors across all linked ETSs. Another option would be the progressive expansion of coverage over time in Canadian ETSs.

Trading period: All three ETSs are defined until 2020 and hence are similar in scope. All of them include proposals for even longer-term commitments (until 2050). Nevertheless, to control the total amount of allowances in a combined ETS without uncertainties, the trading periods of the EU and Canadian ETSs should be harmonized.

Indirect linking: The EU ETS does not accept all CER and ERU credits. It does not accept credits generated by project activities from sinks or credits from nuclear facilities. By contrast, the proposed federal Canadian ETS allows CERs from sinks (except credits from forest sink projects). These concerns can be dealt with by prohibiting the import of credits from disallowed projects. Such prohibitions nevertheless could be bypassed if the EU ETS were linked to a scheme, such as the proposed federal ETS, which allows these credits. Consequently, if participants in the EU ETS do not want to allow their resources to be transferred to certain types of projects, then linking should not be allowed with the federal Canadian ETS that does permit these projects. Furthermore, Alberta's dETS does not recognize and accept CDM and JI credits at all. To allow indirect linking of the EU ETS and the Alberta Offset Scheme, the latter must recognize and accept these credits. In addition, the registry in the Alberta dETS needs to be connected to the Kyoto Registry in order to transfer these credits.

Chapter Six: Conclusion

In December 2009 in Copenhagen and a year later in Cancun, the parties participating in the Kyoto Protocol came together to discuss what will happen when Kyoto's first compliance period comes to end in 2012. Some fear that if a successor regime is not negotiated, the world's carbon markets will collapse.[818] A limited and conditional agreement on the second commitment period under the Kyoto Protocol was reached at the 17th Conference of Parties (COP-17) to the United Nations Framework Convention on Climate Change (UNFCCC) in Durban, South Africa.

However, it is important to note that the Kyoto Protocol was not established to control all future emissions trading; its intention was to establish the foundations for emissions trading and to stimulate national actions.[819] Consequently, the majority of the current emissions trading schemes are either not attached to the Kyoto Protocol or have made provisions to continue to function regardless of whether there will be a successor agreement to the Kyoto Protocol.[820] Therefore, as long as international emissions trading actions retain compatible trading units, consideration of how to increase their effectiveness presents structural choices independent of the Kyoto Protocol.[821]

[818] Christie J Kneteman, "Building an Effective North American Emissions Trading System: Key Considerations and Canada's Role" (2009) 20 J.E.L.P. 127 at 146.
[819] *Ibid* at 147.
[820] *Ibid.*
[821] *Ibid.*

Linking the EU ETS to the emissions trading schemes in Canada might be an important step in involving Canada in the international post-2012 process.[822] Until now, Canada has undoubtedly been moving away from any international agreement on how climate change issues should be tackled.[823] Although the most ideal situation would be to link the EU ETS to the federal emissions trading scheme, even linkage between the EU ETS and the provincial emissions trading schemes such as Alberta's would be important.[824] The main advantage of linking emissions trading schemes is that of increased cost efficiency.[825] Linking both EU and Canadian emissions trading schemes would establish a carbon market with a greater number of participants with increased diversity of control costs.[826] This, in turn, would reduce the costs of meeting the overall emissions reduction target of the linked schemes.[827] Finally, such linkage, whether to the federal or provincial scheme, would present an important sign of political support to the initiatives undertaken by both sides.[828] In terms of current macroeconomic and political context, there is no Canada-wide (and no US) emissions trading scheme.[829] However, the EU ETS has surplus permits.[830] This essentially means that linkage issues aren't on the front burner now, but they likely will be in the future. [831]

[822] Faure & Peeters, *supra* note 39 at 319.
[823] Alain Brophy, "The Canadian Regulatory Framework for Carbon Trading: Sailing Away from Consensus While Waiting for the US Federal Scheme" (2008) Carbon& Climate L. Rev. 140 at 149.
[824] Faure & Peeters, *supra* note 39 at 319.
[825] Linking EU – Canada Emission Trading Systems: An Opinion Paper by IETA, *supra* note 36 at 7.
[826] *Ibid.*
[827] *Ibid.*
[828] Faure & Peeters, *supra* note 39 at 319.
[829] Comment provided by Prof. Elizabeth Anne Wilman from the University of Calgary, Department of Economics, during the oral examination of this thesis.
[830] European Commission, "Analysis of Options Beyond 20% GHG Emission Reductions: Member State Results" (2012), online: European Commissions <http://ec.europa.eu/clima/policies/package/docs/swd_2012_5_en.pdf> at 5 (As of the end of January 2012, European Commission estimates that a large surplus of banked allowances and unused, international credits in the EU ETS is now equivalent to 2.4 billion allowances by 2020).
[831] *Supra* note 829.

Although the EU ETS is far from being perfect, it has shown that trading in greenhouse gas emissions works.[832] The environmental and cost effectiveness of the EU ETS can only attain its maximum capacity if the design of the EU ETS is optimized.[833] Linking the EU ETS to other dETSs such as Canada's could enhance its effectiveness.[834] Nonetheless, each possible linking with the EU ETS has to be considered cautiously and should be analyzed for environmental effectiveness, competitiveness and technical problems.[835] While it is not necessary that the schemes are identical in order to be linked to each other, certain design features will need to be harmonized to make sure that technical compatibility and environmental integrity of the linked emissions trading schemes is ensured.[836] Other incompatibilities or differences may result in issues of equity and competitiveness. These issues should not preclude linking but they will need to be addressed in the political and societal arena.[837]

In conclusion, the outcome of any linking negotiations such as between the EU and Canada may contribute to establishing a global emissions trading scheme for greenhouse gas emitters.[838]

[832] Faure & Peeters, *supra* note 39 at 319.
[833] *Ibid.*
[834] *Ibid.*
[835] *Ibid.*
[836] Linking EU – Canada Emission Trading Systems: An Opinion Paper by IETA, *supra* note 36 at 7.
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