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Linking the Alberta Emissions Trading Scheme: Difficult but Possible

Rolandas Vaiciulis

CIRL Research Fellow

CIRL Occasional Paper #58

March 2017

MFH 3353, Faculty of Law, University of Calgary, Calgary, Alberta, Canada T2N 1N4
Tel: (403) 220-3200 Fax: (403) 282-6182 E-mail: cirl@ucalgary.ca Web: www.cirl.ca

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All enquiries should be addressed to:

The Executive Director
Canadian Institute of Resources Law
Murray Fraser Hall, Room 3353 (MFH 3353)
Faculty of Law
University of Calgary
Calgary, Alberta, Canada T2N 1N4

Telephone: (403) 220-3200
Facsimile: (403) 282-6182
E-mail: cirl@ucalgary.ca
Website: www.cirl.ca

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Directeur exécutif
Institut canadien du droit des ressources
Murray Fraser Hall, pièce 3353
Faculté de droit
L'Université de Calgary
Calgary, Alberta, Canada T2N 1N4

Téléphone: (403) 220-3200
Télécopieur: (403) 282-6182
Courriel: cirl@ucalgary.ca
Site Web: www.cirl.ca

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Acknowledgements

The Institute would like to thank the Alberta Law Foundation for their generous support in the development of this occasional paper. The author thanks the Canadian Institute of Resources Law for facilitating this project. Any errors belong to the author alone.

Linking Alberta Emissions Trading Scheme:

Difficult But Possible

1. Introduction

Climate change is a global issue with national implications. Governments around the world are devising and taking the necessary actions to reduce greenhouse gas (GHG) emissions. In December 2015, the United Nations hosted the 21st Conference of the Parties (COP) in Paris with the aim of creating a legally binding agreement (Paris Agreement) to keep global warming below 2°C.[1] The Paris Agreement came into force on November 4, 2016. Under the agreement, all parties set their own targets for reducing their GHG emissions. The Government of Canada has proposed a commitment to reduce its greenhouse gas (GHG) emissions to 30% below the 2005 levels - to 523 Mt - by 2030.[2]

Alberta is likely to be significantly impacted by the federal government's commitment under the Paris Agreement. This is because Alberta's GHG emissions are a significant share of Canada's emissions. Alberta emitted 267 Mt in 2013[3], approximately 37% of Canada's total emissions, and this number is expected to grow. In addition, while Canada's emissions are expected to increase by 16% from the 2013 levels by 2030, Alberta's emissions are expected to grow by 20%.[4] If this is to happen, Alberta's emissions would account for approximately 60% of Canada's total emissions. A substantial part of Alberta's emissions come from oil and gas and other large industrial facilities - a relatively small group of sources.

To reduce its emissions, in 2007 Alberta became the first jurisdiction in North America to establish a compliance-based GHG emissions trading scheme (Alberta ETS). Under the terms of the 2007 Specified Gas Emitters Regulation (SGER)[5] and the 2002 Climate Change and Emissions Management Act (CCEMA)[6], the SGER requires facilities that emit more than 100,000 tons of CO_2 a year to reduce their emissions intensity by 12 percent annually.[7] Emissions intensity refers to the volume of GHGs released by a facility per unit of production.[8] An emissions intensity target, however, does not establish an absolute limit on the total emissions. Rather, the intensity targets were introduced to allow the oil sands industry and large emitters to continue to grow. In addition, the covered facilities are permitted to satisfy 100% of their compliance obligations under the

[1] See for more information <http://www.cop21paris.org/about/cop21> (last accessed March 4, 2017)
[2] UNFCCC, "Canada's INDC Submission to the UNFCCC" (2015), online: http://www4.unfccc.int/submissions/INDC/Published%20Documents/Canada/1/INDC%20-%20Canada%20-%20English.pdf.
[3] Government of Canada, "Alberta: Environment profile" (November 2015), online: <https://www.canada.ca/en/environment-climate-change/briefing/alberta-environment-profile.html>.
[4] Alberta Government, *Climate Leadership – Report to Minister* (Edmonton: Alberta Government, 2015), online: <https://www.alberta.ca/climate-leadership-discussion.aspx> at 14 [Climate Leadership-Report to Minister].
[5] *Specified Gas Emitters Regulation*, Alta Reg 139/2007 [SGER].
[6] *Climate Change and Emissions Management Act*, SA 2003, c C-16.7 [CCEMA].
[7] SGER, *supra* note 5 at s.3.
[8] *Ibid*, s. 1(1)(h).

SGER by paying into a Climate Change and Emissions Management Fund instead of actually reducing their emissions. Consequently, Alberta's ETS focused too much on cost containment for the covered facilities rather than on the actual emissions reductions.

In 2015, a new NDP provincial government was elected in Alberta. On November 15 of the same year, trying to assert a role as a leader on climate change issues, the new provincial government released its Climate Leadership Plan.[9] At the same time, it also released the Climate Change Advisory Panel's Report to the Minister.[10] Both documents continue to identify carbon pricing as a major policy tool for reducing emissions in Alberta.

So far, the Government of Alberta has amended its SGER to increase the stringency of its ETS. Particularly, it increased its emissions intensity to 20% instead of the previous 12%, and the price for credits paid into the Climate Change and Emissions Management Fund to $30/ton, instead of the previous $15/ton. However, covered polluters can still satisfy 100% of their compliance obligations under the SGER by paying into the Climate Change and Emissions Management Fund. Thus, it is highly unlikely that these new changes to the SGER will stimulate actual emissions reductions.

In its discussion paper that preceded the new Climate Leadership Plan, the government of Alberta indicated its commitment to explore different policy approaches to reduce provincial emissions, including, among others, a cap-and-trade scheme similar to the ones in Quebec and California as well as a partnership with other jurisdictions within Canada.[11] Thus, in order to make the meaningful contributions needed to help Canada to meet its national commitment under the Paris Agreement, and to generate actual emissions reductions, the centrepiece of Alberta's carbon pricing policy should be focusing on joining the emissions trading schemes (ETSs) currently being operated in other Canadian provinces, namely in Quebec and Ontario (Quebec and Ontario ETSs).

Those provinces are participating members of the Western Climate Initiative (WCI)[12] - a co-operation of the independent jurisdictions in Canada and the United States working together to identify, evaluate, and implement ETSs at the regional level.

Québec enacted its cap-and-trade regulation on December 14, 2011.[13] Officially, the Québec ETS has been in operation since January 1, 2013. On January 1, 2014, Quebec linked its ETS with the California emissions trading scheme (California ETS).

The province of Ontario intends to link its emissions trading scheme (Ontario ETS) with the Quebec and California ETSs in 2018.[14] Ontario enacted its cap-and-trade legislation, the

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[9] See <https://www.alberta.ca/climate-leadership-plan.aspx> (last accessed March 4, 2017)
[10] Climate Leadership-Report to Minister, *supra* note 4.
[11] Government of Alberta, "*Climate Leadership-Discussions Document*" (August, 2015), online: <www.alberta.ca/albertacode/images/Climate-Leadership-Discussion-Document.pdf> at 16-18, 57.
[12] See http://www.westernclimateinitiative.org/.
[13] *Regulation respecting a cap-and-trade system for greenhouse gas emission allowances*, RRQ, c Q-2, r 46.1 [Regulation respecting a cap-and-trade system for greenhouse gas emission allowances].
[14] Government of Ontario, "Ontario, Quebec and California Hold Joint Climate Meeting in Marrakech" (November, 2016), online: <https://news.ontario.ca/ene/en/2016/11/ontario-quebec-and-california-hold-joint-climate-meeting-in-marrakech.html>.

Climate Change and Low-Carbon Economy Act, on May 18, 2016.[15] Then, on May 19, 2016, two further regulations under the Act were adopted, namely the O. Reg. 144/16 (The Cap and Trade Program)[16] and the O. Reg. 143/16 (Quantification, Reporting and Verification of Greenhouse Gas Emissions)[17]. Together, these regulations contain the details of the Ontario ETS. However, additional regulations regarding offsets and early reduction credits have not yet been released at the time of writing this paper.

Can the Alberta ETS be linked with the Quebec and Ontario ETSs? In addressing this question, this paper will first explore the design features that are reviewed as crucial for the linking of different ETSs, and then consider how each design feature is addressed by the potential linking partners, identifying potential incompatibilities, if any, and outlining what adjustments, if any, might be made to facilitate effective linkages between them.

This paper is divided into four sections. Following this introductory section, the next will explain the meaning and the functioning of emissions trading as well as its effect on climate change. Section three considers the design features that are reviewed as crucial for the linking of the different ETSs and examines how each design feature is addressed by the Alberta, Quebec and Ontario ETSs. The concluding section, section four, summarizes the findings of this research paper.

2. Emissions Trading

2.1 Meaning and Functioning of Emissions Trading

The idea of emissions trading is not new. It can be traced back to the school of property rights in economics that held that externalities should be internalized.[18] This generally means that negative external costs that are not reflected in the market price, such as environmental pollution, should be incorporated into this price by allocating property rights or imposing taxes.[19] Thus, emissions trading internalizes the externality of pollution by creating the legal right to pollute a product that can be traded.

In practical terms, the emissions trading scheme establishes a maximum allowable amount of defined pollutants, a cap that can be emitted by the polluters in a particular jurisdiction (e.g. a province, a state, a country, or a group of jurisdictions). The cap is further divided into allowances[20] that are then allocated to polluters either by selling them, i.e. by auctions, or free of charge, or by a combination of both. The total amount of the allocated allowances represents the overall emissions reduction target for the polluters.[21] Polluters make their abatement decisions by

[15] *Climate Change Mitigation and Low-carbon Economy Act*, SO 2016, c 7 [Ontario Climate Change Act].
[16] *The Cap and Trade Program*, O Reg 144/16 [Ontario Cap and Trade Regulation].
[17] *Quantification, Reporting and Verification of Greenhouse Gas Emissions*, O Reg 143/16 [Ontario Reporting Regulation].
[18] 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.
[19] *Ibid*.
[20] These allowances permit its owner to emit a certain amount of the defined pollutants.
[21] 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].

comparing the cost of additional abatement measures with the price of allowances on the market.[22] Polluters with higher marginal abatement costs would buy allowances, while polluters with lower marginal abatement costs would carry out abatement measures and sell their surplus allowances on the market.[23] Thus, emissions reductions are achieved wherever marginal abatement costs are lower.[24] This creates an environmental benefit at the lowest cost for society.[25]

Emissions trading is an approach to control pollution by using market forces. The traditional command and control regulatory approach has been criticized because it tends to involve too many regulators, leads to strict and uniform use of standards, and provides inadequate incentives to innovate.[26] 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.[27] Thus, emissions trading harnesses the power of the market to discover the lowest-cost options for reducing emissions.[28]

2.2 Major Design Considerations in Emissions Trading

There are two main forms of emissions trading schemes (ETSs): "cap-and-trade" and "baseline-and-credit" schemes.

2.2.1 Cap-And-Trade Schemes

In a cap-and-trade scheme, a regulatory authority first establishes an upper limit or cap on emissions.[29] The goal is to reduce emissions by setting the cap at a lower level than the historical emissions.[30] Once a cap has been established, selected groups of polluters are allocated, either free of charge or by auctioning or a combination of both, a certain proportion of the total amount of available emissions, which they are authorized to emit during a specified time period.[31] Subsequently, polluters that take measures to minimize their emissions or emit below the level indicated in the allowances they hold may sell their unused allowances to other polluters that emit at a level higher than that represented by their allocated allowances.[32] Polluters that emit above their limits without the necessary allowances will face sanctions.[33] A cap-and-trade ETS, therefore, guarantees that the overall environmental target will be met since the total emissions will be held

[22] Bernd Hansjurgens, *Emissions Trading for Climate Policy* (Cambridge, UK: Cambridge University Press, 2005) at 3 [Hansjurgens].
[23] *Ibid*.
[24] *Ibid*.
[25] *Ibid*.
[26] Greenbaum, Pushchak & Wellington, *supra* note 21 at 65.
[27] Hansjurgens, *supra* note 22 at 3.
[28] Greenbaum, Pushchak & Wellington, *supra* note 21 at 65.
[29] *Ibid* at 69.
[30] Brian Evans, "Principles of Kyoto and Emissions Trading Systems: A primer for Energy Lawyers" (2004-2005) 42 Alberta Law Review 167 at 178 [Evans].
[31] Greenbaum, Pushchak & Wellington, *supra* note 21 at 69.
[32] *Ibid*.
[33] *Ibid*.

below the cap.[34] Quebec and Ontario ETSs are examples of the cap-and-trade schemes currently in operation.

2.2.2 Baseline-and-Credit Schemes

Under a baseline-and-credit scheme there is no upper limit or cap on emissions. Instead, before the beginning of the compliance period the regulatory authority establishes each participant's emissions intensity baseline (which can be business as usual or some proportion thereof), below which there is no charge for emissions.[35] Thus, polluters 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.[36] At the end of the compliance period, polluters who manage to keep their actual emissions below the baseline obtain credits (equal to the difference) they can sell through a market.[37] On the other hand, polluters who have exceeded their baseline at the end of the compliance period must purchase and surrender credits equal to the excess.[38] The Alberta ETS is an example of this type of approach.

A major difference between the baseline-and-credit and the cap-and-trade scheme is the timing of the distribution of allowances.[39] While the emissions intensity baseline is established in advance for the baseline-and-credit scheme, the actual level of production and the emissions intensity are not known until the end of the compliance period.[40] Therefore, participants do not know the extent of their liabilities or benefits until the end of the compliance period, when emissions allowances are distributed.[41] With the cap-and-trade scheme, on the other hand, the cap is known in advance regardless of the production levels, so allowances can be distributed with certainty at the beginning of the compliance period.[42]

2.3 Emissions Trading and Climate Change

There are two aspects of the climate change issue that favour the use of emissions trading as a policy tool.[43] The first is that most emitted GHGs have no direct local environmental effects.[44]

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[34] *Ibid*.
[35] David Freestone & Charlotte Streck, *Legal Aspects of Carbon Trading* (Oxford; New York: Oxford University Press, 2009) at 62 [Freestone & Streck].
[36] 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].
[37] Freestone & Streck, *supra* note 35 at 62.
[38] *Ibid*.
[39] Discussion Paper on Measures to Reduce Greenhouse Gas Emissions in New Zealand Post-2012, *supra* note 36 at 32.
[40] *Ibid*.
[41] *Ibid*.
[42] *Ibid*.
[43] 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-Operation and Development (OECD) <http://www.oecd.org.ezproxy.lib.ucalgary.ca/dataoecd/58/59/32140134.pdf> at 29 [Philibert & Reinaud].
[44] *Ibid*.

This is because they are uniformly mixed in the atmosphere, so the location of emissions occurrence or reduction does not matter.[45] The second aspect is the importance of keeping the emissions reduction cost low.[46] 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 the incentive to meet their emissions reduction targets cost-effectively.[47] Though an emissions trading scheme cannot completely resolve the issue of climate change, it is, nevertheless, a policy tool that can help reduce global GHG emissions to agreed-upon levels at a lower cost than what has been attained under traditional regulatory approaches.[48]

3. Design Issues of Linking ETSs

3.1 General Observations

There have been efforts in the literature to identify some minimum requirements for the linking of the different types of ETSs.[49] It has been suggested that in order to be linked, each ETS must resolve a number of design features that include: coverage; definition and recognition of trading units; type and stringency of emissions targets; allocation; trading period; banking; borrowing; monitoring, reporting and verification; registries; compliance framework and penalties. [50] Since many of these design features are resolved differently in the Ontario, Quebec and Alberta ETSs, this might pose significant challenges for linking.[51]

3.2 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.

3.2.1 Gases Covered

Gas coverage refers to the gases that are included in an ETS. Different ETSs may cover and regulate only one or several of these gases. Both the Ontario and Quebec ETSs cover six GHGs identified in the Kyoto Protocol, namely carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) as well as

[45] 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 [Bell & Drexhage].
[46] *Ibid*.
[47] *Ibid*.
[48] Greenbaum, Pushchak & Wellington, *supra* note 21 at 69.
[49] 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 3 [de Larragan].
[50] 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> at 3 [Haites & Mullins].
[51] *Ibid*.

nitrogen trifluoride (NF_3).[52] The Alberta ETS, on the other hand, covers the six GHGs named above and other gases not included in the Kyoto Protocol.[53]

3.2.1.1 Analysis

The Alberta ETS covers significantly more GHGs than the other two provinces. Nevertheless, linking of the ETSs that differ in terms of the gases should not pose any difficulties but rather could lead to larger cost savings, due to access to low-cost abatement options.[54]

3.2.2 Sector Coverage

Sector coverage refers to the sources or categories of polluters that are covered by an ETS. A complete equivalent sector coverage is difficult to achieve since different jurisdictions have different emissions profiles and, as a result, may decide to include different sources in their ETSs. Sector coverage is normally established at the sector level with minimum inclusion thresholds to eliminate very small polluters.

Both the Ontario and Quebec ETSs have identical emissions thresholds for inclusion, namely at least 25,000 metric tons of CO_2 or more annually.[55] Both ETSs will cover electricity, industrial sectors, and fuel distributors.[56]

The Alberta ETS, on other hand, includes only facilities that have emitted 100,000 tons of CO_2 or more in 2003 or any subsequent year.[57] These facilities must engage in one of the activities listed in the Schedule of Activities to the Environmental Protection and Enhancement Act[58] in order to be covered.[59]

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[52] SGER, *supra* note 5, Schedule; Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 3(10); Ontario Climate Change Act, *supra* note 15 at s.5.

[53] SGER, *supra* note 5, Schedule (The Schedule to the SGER lists all specified gases: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), HFC-23 (CHF3), HFC-32 (CH2F2), HFC-41 (CH3F), HFC-43-10mee (C5H2F10), HFC-125 (C2HF5), HFC-134 (C2H2F4), HFC-134a (CH2FCF3), HFC-152a (C2H4F2), HFC-143 (C2H3F3), HFC-143a (C2H3F3), HFC-227ea (C3HF7), HFC-236fa (C3H2F6), HFC-245ca (C3H3F5), sulphur hexafluoride (SF6), perfluoromethane (CF4), perfluoroethane (C2F6), perfluoropropane (C3F8), perfluorobutane (C4F10), perfluorocyclobutane (c-C4F8), perfluoropentane (C5F12), perfluorohexane (C6F14).).

[54] 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.wupper inst.org/uploads/tx_wibeitrag/ready-to-link-up.pdf> at 14 [Sterk et al].

[55] Regulation respecting the cap-and-trade system for greenhouse gas emissions allowances, *supra* note 13 at s. 2; Ontario Cap and Trade Regulation, *supra* 16 at ss. 21-27 (referring to Ontario Reporting Regulation).

[56] Regulation respecting the cap-and-trade system for greenhouse gas emissions allowances, *supra* note 13 at ss. 2, 19; Ontario Reporting Regulation, *supra* note 17, Schedule 2; Ontario Climate Change Act, *supra* note 15 at s. 9(3)(4).

[57] SGER, *supra* note 5, ss. 3 and 4.

[58] *Environmental Protection and Enhancement Act*, RSA 2000, c E-12 [EPEA].

[59] *Ibid* at Schedule of Activities (Examples of the activities include: manufacturing or processing of various products (e.g. petroleum products, natural gas, cement, pulp and paper, coal, heavy oil, oil sands), power plants, waste management.)

3.2.2.1 Analysis

Both the Ontario and Quebec ETSs have similar sector coverage, as well as the same threshold (25,000 metric tons of CO_2 annually) for mandatory inclusion under the ETS. Alberta clearly differs from its counterparts, mainly concentrating on large industrial emitters. As a result, the Alberta ETS covers fewer emission sources.

Differences in sector coverage may cause competitiveness concerns among different ETSs as well as the problem of obtaining the necessary political support for linking.[60] These concerns would arise regardless of whether the ETSs are linked.[61] Nevertheless, it would be politically feasible to coordinate the coverage of sectors and thresholds for mandatory inclusion in linked jurisdictions through a linking agreement.[62]

Differences in sector coverage, in fact, may have a positive effect on cost efficiency.[63] The higher the number of sources included, the lower the total emissions abatement costs.[64] Different abatement costs among the participants can lead to greater cost savings.[65] 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 should not hinder linking.[66]

3.2.3 Upstream versus Downstream

Depending on the point of application of the total limit on GHG emissions in the production and consumption cycle, an ETS can be either 'upstream', 'downstream', or a combination of both. An upstream ETS targets the producers and importers of fossil fuels, while a downstream ETS targets the GHG emissions of the end-users of energy – usually large industrial consumers of fossil fuels such as fossil-fired generating entities.

Both the Ontario and Quebec ETSs combine an upstream regime for smaller sources with a downstream regime for larger sources. In particular:

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[60] Sterk et al, *supra* note 54 at 14 (If facilities 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.).
[61] *Ibid*.
[62] 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 Environmental Law and Development (FIELD) <http://www.field.org.uk/files/Linking%20emission%20trading%20schemes_0.pdf> at 71 [Mace et al].
[63] 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: Organization for Economic Co-operation and Development (OECD) <http://www.oecd.org/environment/climatechange/2766158 .pdf> at 21 [Baron & Bygrave].
[64] *Ibid*.
[65] *Ibid*.
[66] 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> at 39 [Haites & Mullins].

- Emissions from industrial sources are regulated at the point of emission. Point of regulation, therefore, will be industrial entities (i.e. downstream regime);
- The point of regulation for electricity sector emissions is a first jurisdictional deliverer (FJD). For sources covered within their jurisdictions, this FJD will be the generator of power. For power generated outside their provinces, this FJD will be the first entity that delivers that power (i.e. a combination of upstream and downstream regimes);
- Residential, commercial, and industrial fuel combustion emissions are regulated where the fuels enter commerce in the jurisdictions, generally at the distributor stage (i.e. upstream regime); and
- Finally, transportation fuel combustion emissions are regulated at the point where the fuels enter commerce (i.e. upstream regime).[67]

The Alberta ETS also includes upstream (e.g. upstream production of oil and gas such as extraction, upgrading, initial processing, and pipeline transportation) and downstream regimes (e.g. downstream production of oil and gas such as refineries, electricity generation, fertilizer, paper and chemical manufacturing). However, fuel combustion emissions are not covered by the Alberta ETS. As of January 1, 2017, these emissions are subject to the carbon levy established under the Climate Leadership Act.[68]

3.2.3.1 Analysis

In the case of the Ontario and Quebec ETSs, both combine similar upstream and downstream regimes. This design feature is therefore unlikely to cause a problem for their linking. However, this is not the case for the Alberta ETS. Like the Ontario and Quebec ETSs, Alberta regulates industrial and electricity emissions downstream; however, the Alberta ETS does not include power generated outside of the province. Furthermore, fuel combustion emissions are not covered by the Alberta ETS, but by a carbon levy using a mixed upstream-downstream regime instead of the upstream regime used in Ontario and Quebec.

The ETSs should be linked in a way that avoids any double-counting.[69] One option to deal with this scenario is to not require energy exporters in the upstream ETS to surrender tradeable

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[67] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at Appendix A; Ontario Reporting Regulation, *supra* note 17 at ss.4-20

[68] *Climate Leadership Act*, SA 2016, c C-16.9 (The carbon levy applies at the following upstream points: at the point of purchase; when fuel is being imported; and at the point of removal of fuel from a refinery, terminal, plant, or oil or gas battery. Additionally, the carbon levy also applies when the recipient flares or vents the fuel, or engages in a prescribed activity (downstream point). Alberta's carbon levy takes effect Jan. 1, 2017 at a rate of $20/tonne of CO2 emissions, and will increase to $30 in 2018.).

[69] Sterk et al, *supra* note 54 at 15. See also 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 26 [Linking a U.S. Cap-and-Trade System for Greenhouse Gas Emissions: Opportunities, Implications, and Challenges] (Double counting occurs usually when emissions reduction project's mitigation effort counted twice unintentionally. For example, consider a situation in which a facility covered by the downstream ETS, receiving some of its fuel from supplier subject to the upstream ETS, reduces its emissions by one ton by reducing its fuel

units to cover emissions associated with exported energy products.[70] An alternative option is to not cover energy product users with an emissions reduction target in the downstream ETS.[71]

3.2.4 Voluntary or Mandatory Participation

Participation in an ETS can either be mandatory or voluntary. All three ETSs provide for mandatory participation. Participation in both the California and Quebec ETSs is mandatory for facilities that emit 25,000 metric tons of CO_2 or more annually.[72] Under the Alberta ETS, participation is mandatory for facilities that emit 100,000 tons of CO_2 or more annually.[73]

In terms of voluntary participants under the Alberta ETS, facilities and sectors not covered by the ETS can generate carbon offset credits that can then be sold to the covered facilities to be used as a compliance option.[74] Under the Quebec ETS, only non-emitting facilities interested in purchasing and trading emission allowances may register with the ETS as voluntary participants.[75] In Ontario, facilities that annually emit between 10,000 and 25,000 tons of CO_2 may register as voluntary participants.[76] These participants will be subject to the same requirements as mandatory participants, including the requirements to verify reported emissions.[77] In addition, the Ontario ETS allows facilities that annually emit less than 10,000 tons of CO_2 to apply to register as market participants in the ETS.[78]

3.2.4.1 Analysis

The environmental effectiveness of a voluntary ETS is likely to be lower than that of a mandatory one for two main reasons.[79] First, there is bound to be an inconsistency between a demand and an offer.[80] This is because the covered sources in a voluntary ETS prefer to be the sellers rather than the buyers and often adopt only relatively weak targets that they achieve mainly or exclusively

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consumption. As a result of this emission reduction measure, it will receive, for example, one allowance which it can sell to another facility. The supplier in in the upstream ETS will also receive one allowance since its fuel sales will have declined. Therefore, although the emissions reduction measure undertaken in the downstream ETS only reduces emissions by one ton, it frees up two allowances (one in each ETS), leading to an offsetting two-ton increase in emissions.).

[70] 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> at 42 [Boyd et al]. 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 [Gillenwater & Barbour].

[71] *Ibid*.

[72] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 7; Ontario Cap and Trade Regulation, *supra* 16 at ss. 21-27 (referring to Ontario Reporting Regulation).

[73] SGER, *supra* note 5, s.3 and s.4.

[74] *Ibid* at s.7.

[75] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 7.

[76] Ontario Cap and Trade Regulation, *supra* 16 at s. 29.

[77] *Ibid*.

[78] *Ibid* at ss. 36-38.

[79] Sterk et al, *supra* note 54 at 16.

[80] *Ibid*.

through internal emissions reduction actions.[81] Joining such an ETS is hardly attractive to prospective buyers since it leads to low liquidity and prices.[82] 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, i.e. carbon leakage.[83] Voluntary ETSs normally achieve a 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.[84]

Participation in all three ETSs is mandatory; however, the systems also allow for some voluntary participation. Therefore, this feature would not pose any problem for linking.

3.2.5 Opt-in and Opt-out Provisions

Opt-in provisions regulate how new gases, sectors, or activities can be included in the ETS. In contrast, opt-out provisions regulate how participating facilities can be excluded from the ETS. Under the Quebec ETS, non-emitting facilities may register as participants if they are interested in buying and selling allowances.[85] However, opting-out is not allowed under Quebec's ETS.[86]

The Alberta ETS does not expressly include either opt-in or opt-out provisions. The Government of Alberta has indicated that any changes to the ETS will be assessed during the review of the SGER.[87] The Ontario ETS does not provide any opting-in for gases. Only facilities with annual emissions between 10,000 and 25,000 tons of CO_2 may opt into the ETS as a voluntary participant.[88] In addition, facilities that are not mandatory or voluntary participants may also opt into the ETS as a market participant.[89] Both voluntary and market participants are permitted to opt out of the ETS.[90]

3.2.5.1 Analysis

The opt-in provisions are important because they can increase the supply of allowances, motivate abatement efforts in facilities and sectors not originally covered by the ETS, familiarize

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[81] Haites & Mullins, *supra* note 66 at 40.
[82] Sterk et al, *supra* note 54 at 16.
[83] *Ibid* (For example, if participation in an ETS increases the costs of the goods or services, sales by participants would decline while sales by firms outside the ETS would rise thus increasing the emissions of the firms outside the ETS. A participant in the ETS may be able to subcontract to a non-participant for example so that some of the emissions are transferred to non-participant. Such an action would free up allowances for sale but would increase leakage.).
[84] Haites & Mullins, *supra* note 66 at 40.
[85] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 8 (These participants may register on or after May 1, 2012.).
[86] *Ibid* at ss. 15 and 19.
[87] 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 25 [Guidance for Offset Project Developers].
[88] Ontario Cap and Trade Regulation, *supra* 16 at s. 29.
[89] *Ibid* at s. 36.
[90] *Ibid* at ss. 35, 38.

participants with the requirements of the ETS, and potentially reduce compliance costs.[91] While the Alberta ETS does not provide for opting in, both the Quebec and Ontario ETSs do. However, these differences do not pose any obstacle for linking.

In contrast, only the Ontario ETS allows opting-out for voluntary and market participants. As a result, participants might be motivated to opt out of the ETS and possibly physically move to another, less restrictive ETS. This ability to opt out could reduce the scope of the ETS and consequently decrease its efficiency.[92] To prevent this, some restrictions on the opting-out ability of these participants in Ontario might be required. The opting-out facilities should also be subject to other measures to guarantee the environmental effectiveness of the Ontario ETS.

3.3 Emissions Targets

The types of targets adopted by individual ETSs and their stringency may raise a concern for linking ETSs. Two kinds of targets can be adopted by the ETSs: absolute and relative targets. Absolute targets limit the total GHG emissions within a specific period. Total emissions should not exceed the set target. Relative targets are defined as emissions per unit of output or activity. The stringency of targets indicates how much emissions must be reduced compared to historic or projected emissions.

Both the Ontario and Quebec ETSs are based on absolute caps on emissions. Quebec's target is to reduce its GHG emissions to 20% below the 1990 levels by 2020.[93] Ontario's target is to reduce its GHG emissions to 15% below the 1990 levels by 2020, 37% by 2030 and 80% by 2050.[94]

In contrast, the Alberta ETS is based on relative targets. Alberta's target is to reduce its emissions intensity by 20% below the 2003-2005 baseline emissions intensity starting in 2017.[95]

3.3.1 Analysis

3.3.1.1 Type of Targets Adopted: Absolute versus Relative Targets

As for the types of targets adopted, only the Quebec and Ontario ETSs have established absolute emissions reduction targets. Alberta has established relative targets. This feature is likely to hinder the linkage of the Ontario and Quebec ETSs with the Alberta ETS.

Linking ETSs with different targets may actually impair rather than improve the liquidity of the combined ETS.[96] This is because in an ETS with relative targets (the Alberta ETS),

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[91] 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 46 [Ellerman, Joskow & Harrison].

[92] Michael Faure & Marjan Peeters, *Climate Change and European Emissions Trading Lessons for Theory and Practice* (Cheltenham, UK: Edward Elgar Publishing Limited, 2008) at 315 [Faure & Peeters].

[93] This emissions reduction target was adopted by Order in Council 1187-2009 which has force of law. See OC 1187-2009, (2009) GOQ II, 5871(French version only) [OC 1187-2009].

[94] Ontario Climate Change Act, *supra* note 15 at s.6.

[95] SGER, *supra* note 5 at s .4(3).

[96] Sterk et al, *supra* note 54 at 18.

allowances are allocated in two steps: the initial allocation of allowances based on production levels and the adjustment ex post when actual production levels are verified.[97] This may lead to spikes in liquidity at the time of ex post adjustment and also affect an ETS with absolute targets (Ontario and Quebec ETSs).[98]

Moreover, linking the Ontario and Quebec ETSs with absolute targets to the Alberta ETS with relative targets may also raise equity and environmental effectiveness concerns. In an ETS based on relative targets (Alberta ETS), emissions levels are typically linked to economic growth.[99] This means that facilities in such an ETS will qualify for more allowances the more they produce, provided that they do not exceed their relative target.[100] As a result, facilities under such an ETS with relative targets (Alberta ETS) may be motivated to increase their emissions since they will receive more allowances the more they produce, whereas facilities in the ETSs with absolute targets (Ontario and Quebec ETSs) will face higher costs for any increase in emissions.[101] These output increases will inflate the amount of allowances available in the combined ETS.[102] This, in turn, could result in a smaller total emissions reduction.[103]

There are several options to deal with this problem: (i) tax the trade between the linked ETSs; (ii) introduce an exchange rate to adjust for the relative allowance value; (iii) adjust allocation in the ETS with relative targets (Alberta ETS) to account for the changes of growth levels stemming from the linkage of the ETS, and (iv) establishing a gateway.[104] However, all of these options would make the combined scheme more complex and increase the transaction costs.[105] The most desirable solution would be to introduce absolute instead of relative targets.[106] This would not only guarantee the full environmental and cost benefits of emissions trading but would also prevent burdensome adjustment arrangements.[107] However, if relative targets are retained, the most appropriate remedy for an ETS with relative targets (Alberta ETS) would be to set sufficiently strict relative targets to keep them from undermining the environmental effectiveness of the ETSs with absolute targets (the Ontario and Quebec ETSs).[108]

3.3.1.2 Stringency of Emissions Targets

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[97] *Ibid*.
[98] *Ibid*.
[99] *Ibid*. See Faure & Peeters, *supra* note 92 at 312.
[100] Haites & Mullins, *supra* note 66 at 48.
[101] *Ibid*.
[102] *Ibid*.
[103] Faure & Peeters, *supra* note 92 at 312.
[104] 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 [Fisher] (Under gateway mechanism, allawances from an ETS with relative targets will be transfered into other ETSs only as long as total emissions of an ETS based on relative targets does not exceed certain ceiling.).
[105] Sterk et al, *supra* note 54 at 19.
[106] Wolfgang Sterk & Ralf Schuele, "Advancing the Climate Regime Through Linking Domestic Emissions Trading Systems" (2009) 14 Mitig. Adapt. Glob. Change 409 at 421 [Sterk & Schuele].
[107] *Ibid*.
[108] *Ibid*.

Overall, the Quebec emissions reduction targets are numerically stricter than those of Ontario and Alberta. In the event of linking, facilities in an ETS with stricter targets (Quebec ETS) could largely meet their emissions reduction targets by buying allowances from the ETSs with more lenient targets (Ontario and Alberta ETSs).[109] This, in turn, may lead to a significant transfer of wealth from the ETS with a stricter target (Quebec ETS) to the ETSs with more lenient targets (Ontario and Alberta ETSs).[110] This may also provide an incentive to relax its targets or caps in order to become a net seller.[111] To prevent these effects, linked jurisdictions should have comparably ambitious climate policy strategies and a joint vision of medium and long-term emissions trends.[112] It would also be helpful to agree on the joint caps in all linked ETSs to assure all stakeholders that no jurisdiction is intending to take advantage of the others.[113]

3.4 Trading Period

Trading periods are the periods within which allowances that have been issued can be used. The Quebec ETS is composed of three trading periods: 2013-2014, 2015-2017, and 2018-2020.[114] The Ontario ETS is also divided into three trading periods: 2017-2020, 2021-2030, and 2031-2050.[115] In Alberta, on the other hand, the SGER which established the Alberta ETS is subject to a general sunset provision which provides that the regulation will expire on December 31, 2017 unless renewed.[116]

3.4.1 Analysis

All three ETSs have different trading periods. 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.[117] For example, if allowances are available at a lower price in Scheme A at the end of its trading period, they will be sold to Scheme B when its trading period is just starting.[118] Consequently, it will not be necessary to use the allowances issued in Scheme B.[119] Since the trading periods overlap, these surplus allowances will then be available again to facilities from Scheme A during the next trading period.[120] Even if the allocation of allowances does 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

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[109] Faure & Peeters, *supra* note 92 at 312.
[110] Mace et al, *supra* note 62 at 60.
[111] Sterk & Schuele, *supra* note 106 at 418.
[112] *Ibid*.
[113] *Ibid*.
[114] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 3(12).
[115] Ontario Climate Change Act, *supra* note 15 at s.6.
[116] SGER, *supra* note 5 at s. 30.
[117] 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 23 [Ellis & Tirpak].
[118] *Ibid*.
[119] *Ibid*.
[120] *Ibid*. See also 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 16 [Edenhofer, Flachsland & Marschinski].

uncertainty.[121] If this is desirable, the trading periods of the ETSs to be linked should be harmonized.[122]

3.5 Banking

The possibility of banking allowances from one trading period to the next is an important feature for the successful functioning of the ETS. In both Ontario and Quebec, banking of allowances is allowed.[123] Banked allowances will never expire unless retired.[124] The quantity of allowances that covered facilities can bank is subject to holding limits.[125] The Alberta ETS, on the other hand, allows banking of Emissions Performance credits, but not the credits paid into the Climate Change and Emissions Management Fund.[126]

3.5.1 Analysis

Banking allows the participating facilities to overachieve their emissions reduction targets if they expect that future allowance prices will be higher than the current ones.[127] It also provides them with additional flexibility to deal with uncertainties such as future levels of production.[128] Some consider that differences in banking would not pose any serious barriers to linking.[129] Even if an ETS that does not allow banking is linked to an ETS which allows banking, the latter would effectively provide a banking opportunity for all of the covered entities in the combined market.[130] Furthermore, since banking effectively means that there can potentially be more emissions reduced than demanded by a set cap, this should not cause any environmental problems.[131] Since all three ETSs (Ontario, Quebec and Alberta) allow banking, linking of the ETSs should not pose any problems.

However, banking limits in the Ontario and Quebec ETSs may produce costs. This is because these limits may affect the covered facility's ability to bank allowances for use in future trading periods.[132] The best solution to deal with this situation would be to not include the holding

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[121] Edenhofer, Flachsland & Marschinski, *supra* note 120 at 16.
[122] *Ibid*.
[123] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at ss. 32, 37; Ontario Cap and Trade Regulation, *supra* 16 at ss. 39-53.
[124] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at ss. 32, 37; Ontario Cap and Trade Regulation, supra 16 at s. 16.
[125] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 32; Ontario Cap and Trade Regulation, *supra* 16 at ss. 39-53.
[126] SGER, *supra* note 5 at s.8 and 9.
[127] Sterk & Schuele, *supra* note 106 at 419.
[128] *Ibid*.
[129] See generally Sterk & Schuele, *supra* note 106; de Larragan, *supra* note 49; Sterk et al, *supra* note 54.
[130] Sterk et al, *supra* note 54 at 22.
[131] Sterk & Schuele, *supra* note 106 at 419.
[132] Robert N Stavins & Todd Schatzki, "Three Lingering Design Issues Affecting Market Performance in California's GHG Cap-and-Trade Program" (January 29, 2013), online: Analysis Group <http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Three_Cap_and_Trade_Design_Issues.pdf> at 9-10 [Stavins & Schatzki].

limits in both ETSs. However, if these limits are retained, rules specifying holding limits should be modified or more frequent auctions should be employed (see discussion below).

3.6 Borrowing

Borrowing allows a covered facility to delay emissions reduction measures until future trading periods where they might be achieved more cost-effectively.[133] The borrowing of allowances from future trading periods is not permitted in the Alberta and Quebec ETSs.[134] On the other hand, the Ontario ETS allows borrowing of allowances from the future compliance periods.[135]

3.6.1 Analysis

In the case of Alberta and Quebec, this design feature will not pose any problem for linking since both ETSs do not allow borrowing. It may pose a problem, however, in the case of linkage to the Ontario ETS, which allows borrowing from future trading periods. This is generally not seen favorably from an environmental viewpoint for several reasons.[136] First, 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 covered facility ceased to exist before the repayment of the borrowed allowances was due.[137] Second, the covered facilities may be motivated 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.[138]

To maintain the environmental effectiveness of the combined ETS, purchases from the ETS that permits borrowing (Ontario ETS) should be allowed but only after its trading period has been completed and only from the covered entities that did not borrow.[139] The best solution would be to allow the covered facilities 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.[140] This would prevent the Ontario facilities from exporting their borrowed allowances to the Quebec and Alberta ETSs but would also require additional monitoring by the government.

3.7 Registries

Registries track trading units (emissions allowances and offsets) from the point of issuance to ownership, transfer by polluters and other voluntary or general market participants, and to final compliance retirement.

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[133] Sterk et al, *supra* note 54 at 22.
[134] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at ss. 20, 21; SGER, *supra* note 5 at s.8 and 9 (Alberta ETS operates on an annual compliance period.).
[135] Ontario Cap and Trade Regulation, *supra* 16 at s. 42.
[136] Sterk et al, *supra* note 54 at 22.
[137] *Ibid*.
[138] Catherine Boemare & Phillipe Quirion, "Implementing Greenhouse Gas Trading in Europe: Lessons from Economic Literature and International Experiences", (2002) 43 Ecological Economics 213 at 223 [Boemare & Quirion].
[139] Haites & Mullins, *supra* note 66 at 62.
[140] Baron & Bygrave, *supra* note 63 at 30.

Both the Ontario and Quebec ETSs use the Compliance Instrument Tracking System Service, a web-based tool administered by the Western Climate Initiative, Inc. that allows users to track their GHG allowances and credits.[141] Alberta, on the other hand, uses the Alberta Emissions Offset Registry and the Emissions Performance Credits Registry, operated by CSA Group in partnership with the Government of Alberta.[142] These registries track the ownership of carbon offset credits and emissions performance credits as well as ensuring the transparency of these processes.[143]

3.7.1 Analysis

Linking of the different ETSs also requires registries to be sufficiently harmonized to allow a smooth transfer of allowances between them.[144] This, in turn, requires the development of common data exchange standards.[145]

This design feature is unlikely to cause any linking problems in the case of Ontario and Quebec ETSs since both are using the same tracking service - Compliance Instrument Tracking System Service. This is different in Alberta. Linking the Ontario and Quebec ETSs with the Alberta ETS will necessitate an agreement to connect the registries with one another.

3.8 Compliance Framework and Penalties

This requirement is limited to mandatory ETSs because voluntary ETSs do not have non-compliance penalties. Penalties in an ETS can 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 next trading period, or a combination of both.

Both the Ontario and Quebec ETSs require that each covered facility must surrender sufficient allowances following the end of each trading period.[146] In case of non-compliance, both ETSs require a facility to obtain and surrender a number of allowances for every metric ton of CO_2 not covered: three-to-one for each un-surrendered allowance.[147] Note that none of the ETSs allow the substitution of this penalty with a monetary payment. In addition, both ETSs provide for a number of financial and legal penalties of varying degrees to enforce compliance.[148]

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[141] For more details see < https://www.wci-citss.org> (last accessed March 4, 2017).
[142] See <https://www.csaregistries.ca/albertacarbonregistries/home.cfm> (last accessed March 4, 2017).
[143] *Ibid*.
[144] See Sterk et al, *supra* note 54 at 23; 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/38/7/321 81382.pdf> at 28 [Blyth & Bosi].
[145] Blyth & Bosi, *supra* note 144 at 28.
[146] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 22; Ontario Climate Change Act, *supra* note 15 at s.14.
[147] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 22; Ontario Climate Change Act, *supra* note 15 at s.14.
[148] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at ss. 71-73; *Environment Quality Act* (R.S.Q., c. Q-2) [EQA] at ss. 15.13-115.28; Ontario Climate Change Act, *supra* note 15 at s.50-59.

Under the Alberta ETS, a regulated facility that fails to comply with the emissions reduction limits is subject to a fine of $200 CAD per ton that is released over the emissions intensity limit.[149] However, the SGER allows the covered facilities to pay into the Climate Change and Emissions Management Fund to meet 100% of their emissions reduction targets.[150]

3.8.1 Analysis

Both Ontario and Quebec have established comparably strict compliance frameworks. This feature is unlikely to create a barrier to their linkage.

By contrast, in the Alberta ETS, covered facilities that pay into the Climate Change and Emissions Management Fund are exempt from the obligation to cover their excess emissions with allowances or with eligible credits. This payment to the Climate Change and Emissions Management Fund operates as a price cap; participants have no incentive to buy allowances above the penalty.

If the ETSs (Ontario and Quebec ETSs) with strict penalties were linked to an ETS (Alberta ETS) with a price cap, the ETS with the penalty rate would effectively act as a price cap for the whole ETS.[151] As long as the market price of allowances is higher than the price cap, covered facilities in the price cap ETS (Alberta ETS) would have an incentive to sell their allowances to facilities in the other ETSs (Ontario and Quebec ETSs) until prices equalize at the price cap.[152] As a result, the environmental effectiveness of the combined ETSs would suffer since the total emissions would be higher than if the ETSs had operated separately.[153] The most efficient solution to the price cap issue would be to harmonize the non-compliance regimes in all involved ETSs. If such a solution is not possible, there would need to be a limit on the exchange of trading units.[154] For the ETSs with a price cap, the best option would probably be to create a gateway where transfers of allowances from the ETS with a price cap (Alberta ETS) would be restricted once emissions in that ETS exceed a particular level.[155] Apart from higher emissions, these measures may also split the carbon market once the price reaches the price cap, with prices in the price cap ETS (Alberta ETS) staying at the price cap level and the prices in the other ETSs (Ontario and Quebec ETSs) continuing to increase.[156] This would diminish the cost benefits of linking.[157] In this situation, it would be advisable to keep the ETSs separate.[158]

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[149] SGER, *supra* note 5 at s. 28(1).
[150] *Ibid*, s. 8 (As of 2017, price of carbon for facilities that choose to pay into the Climate Change and Emissions Management Fund is $30 per ton.).
[151] Sterk & Schuele, *supra* note 106 at 419.
[152] *Ibid*. See also Sterk et al, *supra* note 54 at 23.
[153] See Blyth & Bosi, *supra* note 144 at 29 f.
[154] Sterk & Schuele, *supra* note 106 at 420.
[155] Sterk et al, *supra* note 54 at 9.
[156] *Ibid*.
[157] *Ibid* at 24.
[158] *Ibid*.

Finally, different compliance regimes in a combined ETS may give rise to a "race to the bottom"[159] This means that if penalties are not comparable across all linked ETSs, non-compliance is likely to be exported to the ETS with the lowest penalty level.[160] Also for this reason, the harmonization of respective compliance regimes should be sought before considering any linking.[161]

In sum, while it is not necessary to have identical non-compliance penalties between linked ETSs, they must be comparable in magnitude, effectiveness and stringency [161]

3.9 Definition and Recognition of Trading Units

There seems to be an 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 as well as the trading rules.[162] This also includes the question of whether trading units from other ETSs can be accepted for trading in the ETS.[163] In addition, the ETSs should preferably have the same quantitative units established by the Kyoto Protocol, namely metric tons of CO_2, in order for them to be compatible for linking.[164] Otherwise, linking ETSs with differing trading units would require an exchange rate.[165]

For the purposes of regulatory compliance, covered facilities in the Alberta, Ontario, and Quebec ETSs may surrender allowances and offsets as compliance instruments.[166] However, only the Quebec and Ontario ETSs allow the use of allowances and credits issued by linked jurisdictions.[167] This is not the case in Alberta, which does not allow the use of out-of-province allowances and credits. Finally, in all three ETSs, allowances and offsets cover the emissions of one metric ton of CO_2 equivalent.[168]

The offset programs in both Ontario and Quebec are also equivalent. In both ETSs, the use of offsets is limited to 8% of their total compliance obligation for each trading period.[169] There is no limit for the use of offsets in Alberta. Like allowances, offsets issued by all three ETSs are fully compatible and once issued are recognized as valid compliance instruments for the ETSs. Furthermore, the offsets themselves must be approved by the respective governments to ensure

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[159] 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 [Peterson].
[160] *Ibid*.
[161] *Ibid*.
[162] Sterk et al, *supra* note 54 at 17.
[163] *Ibid*.
[164] *Ibid*.
[165] Faure & Peeters, *supra* note 92 at 311.
[166] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 37; ; Ontario Climate Change Act, *supra* note 15 at ss. 30, 35.
[167] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 37; ; Ontario Climate Change Act, *supra* note 15 at s. 38.
[168] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 3(5); Ontario Cap and Trade Regulation, *supra* 16 at s. 10; SGER, *supra* note 5 at s. 1(1)(f)(g).
[169] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 20; Ontario Cap and Trade Regulation, *supra* 16 at s. 16.

that emission reductions are real, additional, permanent, enforceable, verifiable, and quantifiable.[170]

Québec's offset protocols are limited to agricultural methane destruction, small landfill site methane destruction, and ODS destruction. Moreover, Québec limits the approved offset projects to those originated in Canada.[171] In addition to general offsets, the Quebec ETS also recognizes early action offsets.[172]

The Alberta ETS allows the use of credits from domestic offsets as well as the use of sinks.[173] At the moment, the Alberta ETS only allows the use of offset credits from project-based emission reductions and removals that occur in Alberta.[174] However, the government of Alberta has announced that it will continue to build on offset work undertaken in other jurisdictions to adapt emissions reduction opportunities to suit Alberta's unique circumstances and will seek alignment between systems as deemed appropriate.[175] Finally, the Alberta ETS does not recognize early action offsets.

As of the time of writing, the Ontario offset regulation has not been released. However, it is expected that it will follow the WCI recommendations closely and will be similar to the one already established in Quebec.[176]

3.9.1 Analysis

For the purposes of regulatory compliance, covered facilities in Alberta, Ontario and Quebec ETSs can surrender allowances and offsets as compliance instruments covering one metric ton of CO_2 equivalent. In this regard, trading between these ETSs would be straightforward.

The recognition of trading units, however, is likely to be central in examining the potential for linking. Only the Alberta ETS accepts credits from sinks. In addition, while Québec accepts credits from offset projects originating in Canada, Alberta limits these credits to offset projects originating in Alberta. Finally, both the Québec and Ontario ETSs allow the use of allowances and

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[170] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at ss. 37, 70.3; SGER, *supra* note 5 at s. 7; (Ontario regulation in regards to offsets had not yet been released at the time of writing.).

[171] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at Appendix D.

[172] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 3(5) (Only covered facilities covered under the first trading period that made investments leading to emissions reductions between 2008 and 2011 could apply for early reduction credits. Emissions reductions in 2008-2011 were compared to a 2005-2007 emissions level. In order to obtain early reduction credits, facilities had to apply for these credits by December 31, 2011. These credits have only been issued once so far, on January 14, 2014.).

[173] For information on Alberta see Alberta Environment and Parks, "Offset Credit System Protocols", online: Alberta Environment and Parks <http://aep.alberta.ca/climate-change/guidelines-legislation/specified-gas-emitters-regulation/offset-credit-system-protocols.aspx> (last visited March 6, 2017).

[174] SGER, *supra* note 5 at s. 7(1)(a).

[175] Technical Guidance for Offset Project Developers, *supra* note 87 at 10.

[176] Ontario Ministry of the Environment and Climate Change, "*Cap and Trade Program Design Options*" (November 2015), online: <http://www.downloads.ene.gov.on.ca/envision/env_reg/er/documents/2015/012-5666_Options.pdf> at 23-25.

offset credits from linked ETSs, whereas Alberta does not allow the use of these credits or allowances.

Linking ETSs with different recognized trading units will affect the total supply of these units in the combined ETS.[177] This can directly and indirectly affect prices.[178] First, if an ETS which does not accept a particular type of unit (Scheme A, e.g. Quebec ETS) is linked to an ETS which accepts these credits (Scheme B, e.g. credits from carbon sinks in Alberta), the covered entities in Scheme B can keep those non-recognized units for their domestic compliance and sell the recognized units in Scheme A.[179] These non-recognized trading units would thus indirectly offset emissions in Scheme A.[180] Second, if Scheme A has already been linked to a third ETS (Scheme C, e.g. California ETS) that is not yet linked to Scheme B (e.g. Alberta ETS), the trading units from Scheme C can also be used to indirectly offset emissions in Scheme B.[181] The political decision in Scheme B about which trading units to accept would thus be bypassed.[182] Furthermore, if the price of the external trading unit is lower than the price of the domestic trading unit, the total amount of units in the combined ETS will be much greater than if these ETSs were not linked and functioned separately.[183]

While all three ETSs may introduce adjustment measures such as the exchange rates, these rates would eventually raise transaction costs while producing only limited effects. The ETSs would be unable to tell whether an incoming trading unit has been freed up by use of a trading unit not recognized in the Ontario, Alberta and Quebec ETSs. To avoid this issue, all three ETSs should harmonize the rules for the recognition of these trading units by including them in or excluding them from the ETSs.

3.10 Allocation

Emissions allowances can be allocated free of charge, auctioned, or a combination of both strategies.

Both the Quebec and Ontario ETSs are similar in their allocation. Quebec and Ontario both distribute parts of their allowances free of charge.[184] The remainder of the allowances are distributed through auctions. Both ETSs provide for quarterly auctions consisting of a single round

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[177] 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].
[178] *Ibid*.
[179] *Ibid*.
[180] *Ibid*.
[181] Sterk et al, *supra* note 54 at 17.
[182] Blyth & Bosi, *supra* note 144 at 20.
[183] *Ibid* at 21 (If the price of external unit is lower than the price of allowances within the domestic ETS, there will be a demand for them. The flow of these external units into an ETS will depend on any restrictions that are incorporated into the provisions of the ETSs.).
[184] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 17 at ss. 39-44; Ontario Cap and Trade Regulation, *supra* 16 at s. 85 (Both ETSs tightly control the number of emissions allowances issued each year.).

of bidding, using sealed bids.[185] While both allow bids in jointly held auctions in Canadian dollars, only the Quebec ETS allows bidding in US dollars.[186] The administration of the auctions in both Quebec and Ontario has been delegated to a non-profit organization, the Western Climate Initiative (WCI), Inc. The Quebec ETS has a floor price starting at $10 for 2012 and allowances rising annually by 5% plus inflation.[187] The Ontario ETS indicated that it would align its floor price with the price in the joint Quebec-California ETS.[188] Both the Quebec and Ontario ETSs have similar auction limits[189] as well as equal treatment for closures and new entrants.[190]

Moreover, both the Ontario and Quebec ETSs incorporate a similar reserve for allowances that will be made available at the reserve sales at predetermined prices.[191] However, in Ontario these allowances are sold by the government, whereas in Quebec they are sold by mutual agreement.[192] Furthermore, in both jurisdictions only covered facilities from the jurisdiction conducting the sales will be able to participate in the reserve sales.[193] Both ETSs fill their respective reserves by withholding a portion of the allowances from the auction each year.[194] In order to purchase allowances from the reserve in both Québec and Ontario, a covered facility must hold no allowances in its general holding account.[195]

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[185] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 49; Ontario Cap and Trade Regulation, *supra* 16 at ss. 58, 62 (Both ETSs provide that emission allowances shall be auctioned up to four times a year.).

[186] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 50; Ontario Cap and Trade Regulation, *supra* 16 at ss. 61, 71.

[187] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 49.

[188] Ontario Cap and Trade Regulation, *supra* 16 at s. 71.

[189] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 50 (No single covered facility can purchase more than 25 % of future year allowances. Any covered facility can purchase no more than 15% of the allowances sold at any current auction, while non-covered facilities can purchase no more than 4%. Furthermore, there is a 40 percent purchase limit on current year allowances for electricity utilities.); Ontario Cap and Trade Regulation, *supra* 16 at s. 69 (A covered participant can acquire a maximum of 25% of allowances through an action. For market participants this limit is 4 %.).

[190] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at ss. 17-19; Ontario Cap and Trade Regulation, *supra* 16 at s. 53 (Under both ETSs, when a covered facility permanently closes, that facility would not receive free allocations infinitely. In addition, both ETSs will treat new entrants in the same way as existing covered facilities.).

[191] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at ss. 6(3), 38, 45, 58 (The percent of allowances withheld from auction in the reserve will be as follows: 4% for years 2015-2017, and 7% for years 2018-2020. These allowances will be divided equally into three equally sized tiers and will be sold at $40, $45 and $50 respectively.); Ontario Cap and Trade Regulation, *supra* 16 at ss. 55, 59 (The percent of allowances withheld from auction in the reserve will be 5% of the Ontario emission allowances created for each year of the compliance period. These allowances will be divided equally into three equally sized tiers and will be sold at a price determined by formula in s. 80 of the Ontario Cap and Trade Regulation.).

[192] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at ss. 56-64; Ontario Cap and Trade Regulation, *supra* 16 at ss. 55, 59.

[193] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 46; Ontario Cap and Trade Regulation, *supra* 16 at s. 59.

[194] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 38; Ontario Cap and Trade Regulation, *supra* 16 at s. 55.

[195] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 56 (This requirement provides allowances to covered facilities that otherwise can't obtain allowances.); Ontario Cap and Trade Regulation, *supra* 16 at s. 78.

Finally, both the Ontario and Quebec ETSs impose the same holding limits, i.e. limits on the number of compliance instruments one party can hold.[196]

On the other hand, since the Alberta ETS is a baseline-and-credit scheme, there are no allowances to be distributed. The government only requires entities to file a current emissions intensity profile and to improve on an annual basis. This is clearly a grandfathering scheme.

3.10.1 Analysis

Free allocation is preferable for a number of reasons. First, it makes strict emissions reduction targets more acceptable than would be politically possible with high levels of auctioning.[197] Second, it helps reduce negative impacts for sectors exposed to international competition by reducing their costs.[198] However, there are also concerns associated with free allocation.

In both the Quebec and Ontario ETSs, allowances to covered facilities are distributed free of charge or through an action. On the other hand, in Alberta, ETS permits are distributed free of charge. As a result, there might be an equity issue if allowances are distributed for free in one ETS and auctioned in another.[199] Because the creation of allowances creates new economic value, facilities in the ETS with free distribution (Alberta ETS) will receive a lump sum subsidy while facilities in the ETSs with auctioning (Ontario and Quebec ETSs) will not.[200] This distortion would occur despite linking, but facilities in the ETSs with auctioning (Quebec and Ontario ETSs) can probably be expected to demand the harmonization of subsequent allocation rules prior to linking.[201]

Auctioning of allowances, on the other hand, offers a number of advantages over free allocation. First, it imposes upfront costs on polluters covered under the ETS because they have to buy allowances for every ton they emit; this is not the case when allowances are distributed for free.[202] This awareness of abatement costs may lead to more efficient decisions.[203] Second, auctioning allows governments to use revenues to assist industries and consumers affected by the ETS, to invest in the development of clean or low-emitting technologies, or to provide financing for other countries' climate change mitigation and adaptation efforts.[204] Third, auctioning provides

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[196] Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, *supra* note 13 at s. 32; Ontario Cap and Trade Regulation, *supra* 16 at ss. 40, 42 (In Both ETSs holding limit is calculated using the same equation: Holding Limit (current year) = 0.1*Base + 0.025*(Annual Allowance Budget – Base.)).
[197] Mace et al, *supra* note 62 at 69.
[198] *Ibid*.
[199] Sterk & Schuele, *supra* note 106 at 418.
[200] *Ibid*.
[201] *Ibid*.
[202] 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 25 [Reinaud & Philibert].
[203] Steffen Brunner et al, "Domestic Emissions Trading Systems" (Paper prepared for the Potsdam Institute for Climate Impact Research, 2011), online: Potsdam Institute for Climate Impact Research <http://www.pik-potsdam.de/members/brunner/publications/domestic-emissions-trading-systems/view> at 237 [Brunner et al].
[204] Cameron Hepburn et al, "Auctioning of EU ETS Phase II Allowances: How and Why?" (2006) 6 Climate Policy 137 at 237 [Hepburn et al].

stronger incentives for technological innovation.[205] Under free allocation, some polluters are buyers and some are sellers, where the sellers have the incentive to keep allowance prices high by avoiding technological innovation.[206] Under auctioning, all sources are buyers.[207] Buyers have an incentive to develop low-carbon technologies and benefit from decreased marginal abatement cost and permit prices.[208]

While auctioning has some advantages over free allocation, a good design is necessary since auctioning can impact not only the carbon price but also the legitimacy of the ETS as a whole.[209]

For example, in the Quebec ETS payments to the auctioneers can be made in Canadian or US dollars, whereas Ontario only allows Canadian currency. These currency differences may increase the administrative and transaction costs and should be harmonized.

In addition, because of the selling of the reserve allowances in Ontario by the government rather than through the market, there is potential for the Ontario government to become an active market player. In the case where the state runs the auctions, the state may attempt to influence the market price by establishing the timing and the volume of auctions relating to market projections; this may create a conflict of interest when the state also controls the auction revenues.[210] Therefore, it may be desirable that there be some form of separation between those establishing the timing of auctions and those making use of the auction revenues under the Ontario ETS.

4. Conclusion

Emissions trading is not a new phenomenon. ETSs have long been used as market-based environmental policy tools for combating climate change in a cost-effective way. Linking ETSs can further increase the overall cost efficiency and provide for international and national cooperation in climate policy, while allowing the jurisdictions involved to preserve some autonomy.

This paper focuses on the possible linkage between the Alberta, Quebec and Ontario ETSs. It specifically examines how each aspect of the design of the ETS identified in the literature reviews is crucial for such linkage and is addressed by the Alberta, Ontario, and Quebec ETSs. The analysis of this linkage suggests that while both the Quebec and Ontario ETSs, as members of the Western Climate Initiative, are similar and could operate after the linkage with equal rigor, this is not the case for the Alberta ETS. To facilitate a full link between all three ETSs, a number of changes will need to be made to their design, especially to the design of the Alberta ETS. Given the fact that the Alberta SGER is set to expire by the end of 2017, the best solution for the Alberta ETS would be to move into a cap-and-trade scheme. This would make linking with the Ontario and Quebec cap-and-trade ETSs easier. Nevertheless, the analysis shows that linkage between the

[205] Brunner et al, *supra* note 204 at 237.
[206] *Ibid*.
[207] *Ibid*.
[208] *Ibid*.
[209] Mace et al, *supra* note 62 at 69.
[210] *Ibid* at 70.

Alberta, Ontario and Quebec ETSs does not require complete harmonization of all three ETSs. It requires only a certain degree of harmonization, meaning that certain differences can exist between the linked ETSs.

In conclusion, there is a growing interest in linking ETSs internationally and nationally. The potential to link between the Alberta, Quebec and Ontario ETSs will depend on the willingness of the provincial governments to sufficiently harmonize their ETSs to facilitate the linkage.

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