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Des chaînons manquants ? Le Canada et la texture du climat international

La communauté internationale discute depuis des années d'une solution au changement climatique mondial. Malgré cela, les pays n'en sont pas encore arrivés à s'entendre sur un pacte à la fois satisfaisant et détaillé qui traite du problème. Le protocole de Kyoto n'exige aucune contrainte de réduction d'émissions de la part des pays en développement; les États-Unis n'ont pas ratifié ce pacte; et le Canada, pour sa part, l'a ignoré en grande partie. Bien que plusieurs aient souhaité que la conférence des Nations Unies sur les changements climatiques de décembre 2009 à Copenhague conduise au modelage d'un cadre juridique pour une intervention au-delà de 2012, cette rencontre s'est achevée comme suit : les délégués ont pris acte d'une entente qui n'oblige aucunement les pays à des réductions d'émissions obligatoires et ne décrit d'aucune façon comment s'opéreront le financement et la surveillance des démarches des pays en développement.

Sans un pacte clair et distinct, la planète se retrouve devant une panoplie de plans locaux, régionaux et nationaux visant à restreindre l'émission de gaz à effet de serre. La plupart de ces plans se distinguent par un système de plafonnement et échange. Cette décentralisation soulève cependant des défis. Les règles diffèrent d'une juridiction à l'autre, ce qui entraîne des désavantages concurrentiels pour les sociétés qui évoluent, d'une part, sous un système de plafonnement et échange, mais qui d'autre part, transigent sur la place du marché

Missing Linkages? Canada, Cap-and-Trade and the International Climate Architecture

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I. Introduction

In December 2009, nearly 200 countries gathered in Copenhagen to debate a new global climate change agreement. They emerged from the conference with a statement of intention to take action, far from a binding pledge to mitigate greenhouse gas emissions, but rather a step in what will be an iterative process.¹ The result was not surprising. The Kyoto Protocol itself, though signed in 1997, was only brought into force eight years later, with many important details negotiated during the intervening period. So in the absence of a comprehensive successor to Kyoto, the world is left with an array of local, regional and national plans to limit greenhouse gas emissions.

Many of these plans now feature cap-and-trade systems, which are quickly becoming the developed world's preferred mitigation tool.² Yet cap-and-trade is not a flawless solution; in fact, "the more one studies international tradable permit systems to address global climate change, the more one comes to believe that this is the worst possible approach – except, of course, for all the others . . ."³ Indeed, although they provide flexibility for firms charged with making emissions reductions, cap-and-trade systems can be complicated to design and difficult to administer. In practice, they have also varied widely in scope and stringency.⁴ This in turn can complicate the trade of carbon-intensive products and cause firms to relocate in jurisdictions that

have fewer or no limits on greenhouse gas emissions.

In many ways, these hurdles can be solved through regional coordination. By linking cap-and-trade systems together, the cost of compliance in these systems tends to converge, removing some of the incentives for covered firms to relocate, while dissuading countries from erecting trade barriers on carbon-intensive products. Yet linkage can also create equity, sovereignty and environmental concerns that should be carefully managed. In this context, this article discusses (i) the growing diversity of emissions trading systems around the world; (ii) early experiences in linking these systems together; (iii) lessons learned from these experiences; and (iv) a linkage strategy for a future Canadian federal cap-and-trade system.

II. Emissions Trading Systems

A. Overview

Most economists agree that putting a price on greenhouse gas emissions is a flexible and efficient way to reduce them.⁵ One way to price emissions is through a cap-and-trade system, wherein government limits the amount of pollutants that firms covered by the cap can emit. A regulatory agency will then issue allowances to these firms, giving them, collectively, a right to emit up to the capped amount. At the end of a compliance period, covered firms must surrender allowances in an amount equal to their actual emissions during that period.⁶ Because the regulatory agency

issues fewer allowances than covered firms would need if they continued their business as usual, allowances become valuable, encouraging firms to choose the most cost-effective way of reducing their emissions, either by installing pollution abatement equipment or by purchasing allowances or emissions reduction credits from others. Over time, by incrementally reducing the cap, government limits the supply of allowances, increasing their value and making more expensive pollution abatement options economical. Properly designed, a carbon pricing policy can therefore “send a credible long-term price signal sufficient to drive new investment and technology development and change behaviour, while being responsive and adaptive to changing circumstances through time.”⁷

A cousin to cap-and-trade systems, emissions offset systems can also prompt emissions reductions. They do so by crediting voluntary greenhouse gas reduction activities, called offset projects, in relation to counterfactual business as usual baselines. There is no inherent demand within an offset system for these offset credits, so demand instead depends either on voluntary purchasers, which may have reputational or other reasons for investing in the abatement activities, or on the credits being recognized in a cap-and-trade system for compliance purposes.⁸

B. Emissions Trading Systems around the World

Emissions trading systems are not a new phenomenon, having been used most prominently in the United States during the 1990s to reduce sulfur dioxide and nitrogen oxide emissions.⁹ However, now applied to reduce greenhouse gas emissions as well, their use has never been so widespread.¹⁰

Among the best known emissions trading systems are those established by the Kyoto

Protocol.¹¹ The Protocol sets binding greenhouse gas emissions reduction targets for 37 developed countries (called Annex 1 Countries) relative to their 1990 emissions. It also allows these countries to flexibly meet their commitments through three market-based mechanisms. In the first, each Annex 1 Country is issued a number of allowances, called Assigned Amount Units (“AAUs”), together representing the total amount of carbon dioxide equivalent (“CO₂e”) that country can emit. For Kyoto compliance purposes, Annex 1 countries can reduce their actual emissions by purchasing AAUs from others.¹²

The Kyoto Protocol’s two other flexibility mechanisms are emissions offset systems called the Clean Development Mechanism (“CDM”) and Joint Implementation (“JI”). The CDM awards credits, called certified emissions reductions (“CERs”), are for voluntary emission reduction projects in developing countries that have ratified the Protocol. As of December 2009, over 4,200 projects were in the CDM pipeline. By 2012, these projects are expected to generate nearly 3 billion CERs, each representing one tonne of abated CO₂e.¹³ JI is a similar program that issues credits called emission reduction units (“ERUs”) for offset projects carried out in countries with binding Kyoto targets, although most have been undertaken in Eastern Europe.¹⁴ Both CERs and ERUs can be sold to the world market and used by Annex 1 Countries to offset their emissions for the purpose of demonstrating Kyoto compliance.¹⁵ In 2008, the total volume of CDM transactions totaled over US\$32 billion, with another US\$294 million in JI transactions.¹⁶

Various regional systems are operating as well, the largest of which is the European Union Emissions Trading System (“EU ETS”). This system was established as the primary program to achieve the Kyoto

mondial. On s’inquiète également de la menace de « fuites des marchés » qui plane et qui force les industries ciblées à s’installer dans des lieux qui n’attribuent pas de valeur au carbone. Dans le but de contrer ces difficultés, certains pays proposent de dresser des barrières commerciales opposant l’importation de produits à intensité carboniques.

Il est possible d’atténuer tant soit peu ces problèmes en liant les systèmes de plafonnement et échange, c’est-à-dire en permettant aux sociétés couvertes dans un système de manifester leur conformité à ce système en achetant et en désaffectant les quotas d’émissions d’un autre système. Ainsi, en liant les systèmes de plafonnement et échange, le coût de la conformité à ces systèmes se montre enclin à confluer, à éloigner un certain nombre de mesures incitatives encourageant les sociétés couvertes à se réimplanter tout en dissuadant les pays de dresser des barrières commerciales contre les produits à intensité carbonique.

Bien que le gouvernement du Canada étudie les options disponibles pour réduire les gaz à effet de serre, il privilégie de plus en plus l’idée d’attendre et d’adopter un système de plafonnement et échange qui pourrait réfléchir l’éventuel système des États-Unis, et il opérerait même de s’y relier. Mais ce couplage peut causer des problèmes d’égalité, de souveraineté, et soulever des questions environnementales qui exigent chacun une gestion scrupuleuse. Notre texte traite de (i) la pluralité graduelle des systèmes d’échange de quotas d’émissions de par le monde, (ii) des expériences initiales de couplage de ces systèmes, (iii) des leçons tirées des dites expériences, et (iv) d’une stratégie de couplage pour un éventuel système de plafonnement et échange.

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commitment of the EU's then fifteen members, who each sought to reduce emissions by 8% below 1990 levels by 2008-2012. Currently in its second phase, the EU ETS now caps emissions from thousands of industrial facilities and electricity generators in 25 European countries.¹⁷ Although the EU sets basic operating rules for the system, particularly with respect to participation, each state decides how to allocate allowances to covered firms within its jurisdiction, and how to monitor, report and verify their emissions reductions.¹⁸ States currently set out these details in their National Allocation Plans ("NAPs"). Nearly US \$92 billion in allowance and related derivative transactions took place under the EU ETS in 2008.¹⁹

Smaller mandatory and voluntary cap-and-trade systems are also in operation. In 2007, Alberta implemented a system that caps the emissions intensity – that is, the emissions per unit of

industrial output – of certain industrial facilities in the province.²⁰ South of the border, the Regional Greenhouse Gas Initiative ("RGGI"), established by the northeastern U.S. states, now operates a cap-and-trade system to limit CO₂ emissions from electricity generation facilities.²¹ The World Bank reported that US \$248 million in transactions under this system took place in 2008. The New South Wales Greenhouse Gas Reduction Scheme, another mandatory system, has also attracted significant transactional volume, approximately US \$183 million in 2008.²² The Chicago Climate Exchange ("CCX"), meanwhile, is the world's largest voluntary cap-and-trade system, with US \$309 million transacted in 2008.²³ Under this system, member firms make voluntary, but contractually binding, emissions reduction commitments and can purchase credits from other CCX members or from certain designated offset projects. Since 2005, Japan has also operated a Voluntary Emissions Trading System; although its future is uncertain, it may one day form the basis for a compliance system as the country pursues more aggressive long-term emissions reductions.²⁴

Proposed cap-and-trade systems are also proliferating. In North America, the Western Climate Initiative ("WCI") is an initiative comprised of seven U.S. states and four Canadian provinces that have undertaken to establish a regional cap-and-trade program for reducing greenhouse gas emissions by 2012.²⁵ An October 1, 2009 Senate energy and climate change bill – officially called the "Clean Energy Jobs and American Power Act", but known as the Kerry-Boxer bill after its sponsors – did provide for a cap-and-trade system. So, too, did the "American Clean Energy and Security Act of 2009", known as the Waxman-Markey bill, which passed the House of Representatives in June 2009.²⁶ If

brought into force, Waxman-Markey would have established a cap-and-trade system for the country's largest industrial greenhouse gas emitters.²⁷ In Australia, a proposed Australian Carbon Pollution Reduction Scheme has been central to the platform of Prime Minister Kevin Rudd's labor government, though the Senate rejected the bill in December 2009.²⁸ In Canada, the federal government's most recent proposal to limit industrial greenhouse gas emissions was its *Turning the Corner* plan, which proposes an emissions intensity cap-and-trade system.²⁹ However, the federal government has effectively abandoned the *Turning the Corner* plan, adopting instead a wait-and-see policy until U.S. legislation is unveiled. Nevertheless, since 2002, successive federal governments have been proposing limits on large industrial emitters, approximately 700 of which are responsible for about 50% of Canada's annual greenhouse gas emissions.³⁰

Although they have created, and promise to expand, a multi-billion dollar market for allowances and offset credits, the world's existing and proposed emissions trading systems have also "spawned a complex architecture with responsibilities shared among global international bodies"³¹ The challenge is to coordinate this sprawling regionalism.

C. Challenges of Regionalism

On paper, the most administratively efficient cap-and-trade system would be applied similarly in every jurisdiction around the world. Yet early on it was understood that such uniformity would be hard to achieve. Discussing the prospects of a federal cap-and-trade system in the U.S. in 1985, Ackerman and Stewart wrote, "We believe that completely uniform goals are seriously dysfunctional, producing too much control in some regions, too little in others, and completely missing

special problems in still other regions.”³² Their recommendation was to “first construct stronger regional institutions than now exist in the overcentralized federal system.”³³

Despite the merits of such bottom-up institution-building at the international level, where regional capacities vary much more widely than they do within the U.S., the “architects of global trading were blinded by the theoretical benefits that could arise from trading among diverse economies; a universal system, they thought, would also prevent free riding.”³⁴ Yet their vision of a globally harmonized cap-and-trade system never materialized, in large part because the U.S. and China, the world’s two largest emitters, have not committed to binding reductions. As a result, the Kyoto Protocol has thus far prompted coordinated regulation primarily in Europe and significant international offset trading only through the Clean Development Mechanism – far from a truly global system.

The resulting regionalism creates many challenges. First, different regulations in different jurisdictions can create a competitive disadvantage for a firm that is covered by a local cap-and-trade system but that competes in a global market. Its competitors may operate in jurisdictions with weaker caps or no caps at all. A second, related concern of regionalism is the threat of “market leakage”, whereby affected industries relocate in whole or in part to other jurisdictions that do not price carbon; emissions reduced at one site can result in emissions increased at another.³⁵ Studies indicate that leakage on average can reduce 10% to 20% of the benefit an offset project’s reductions.³⁶ In the RGGI, nearly half of the projected emissions reductions could be offset by leakage.³⁷

Despite these concerns, progress on climate change is still “arriving via

fragmented and multi-speed efforts.”³⁸ As regional cap-and-trade systems proliferate, the world seems to have adopted what has been called a “Madisonian Approach to Climate Policy” in reference to James Madison’s vision of U.S. federalism wherein states act as laboratories for policy innovation.³⁹ The hope, then, is that regional cap-and-trade systems may lay an effective foundation for coordinated international regulation – just as U.S. states and Canadian provinces have historically incubated policies that were later nationalized. Ideally, “the strength of a bottom-up approach is its ability to tap stronger national and regional institutions for governance.”⁴⁰ At least for the near future, the problem is how to coordinate various national and regional cap-and-trade systems. Linkage offers a solution.

III. Linkage

A. Overview

The emissions trading systems of two countries, or of several regions, are linked if one system’s allowances can be used by a covered firm in another system for demonstrating compliance in that system.⁴¹ Linkage therefore decreases compliance costs by increasing compliance options, letting firms take advantage of a greater diversity of marginal abatement costs.⁴² In most cases, linkage is best achieved by an international treaty, or by amendments to domestic legislation that would allow one system to recognize allowances or credits from another.⁴³

Allowances prices in linked systems tend to converge. In one-way linkages – for example, if System A is linked to System B, but not *vice versa* – covered firms in System A will buy allowances from System B if they are cheaper than those in System A. This will eventually lead to price

convergence. If System B’s allowances are more expensive, neither trading nor price convergence will occur. In bilateral or multilateral linkages, covered firms will purchase allowances from the lower price system until prices in all systems converge. In practice, this results in greater actual emissions in the initially higher price system, with a corresponding reduction in emissions in the initially lower price system.⁴⁴

A different situation may arise if one system links to another with a regulatory limit on allowance prices, called a price ceiling. In this case, the country with the price ceiling will end up exporting the ceiling to the other system. For example, if the allowance price in System A exceeded the price ceiling in System B, covered firms would purchase allowances from System B until they ran out.⁴⁵ This artificially limits allowance prices in both jurisdictions.

Complications may occur if one linked system imposes absolute limits on greenhouse gas emissions, while the other limits emissions intensity. Due to regulatory efficiencies, linkage tends to lower overall compliance costs while raising overall production, as compared to the counterfactual effect of unlinked systems. As a consequence, the cap on emissions intensity would become relatively more stringent. Alternatively, if allowance prices in the emissions intensity system are initially lower than in the absolute cap system, overall production could fall in the former, making the emissions intensity cap relatively less stringent.⁴⁶

B. Linkage Around the World

i. EU ETS

The EU ETS is a satellite network of linked cap-and-trade systems. It has expanded significantly from its original

fifteen member states, first by adding ten mostly Eastern European members when they acceded to the EU on May 1, 2004. Romania and Bulgaria joined upon a subsequent EU expansion in early 2007. And Norway, Iceland and Liechtenstein joined in early 2008.⁴⁷ Although it affords each member state significant regulatory autonomy, the EU ETS does provide a centralized authority and minimum rules for implementation. In practice, this means that each member state caps emissions from firms in similar industries in an effort to meet collective Kyoto commitments. Covered firms can also purchase and retire allowances from anywhere in the system. As new systems are linked, they take on the EU ETS's standardized practices; for example, when Norway linked its domestic cap-and-trade system to the EU ETS it also increased the number of covered sectors and conformed to various EU ETS rules and procedures.

Subject to these common rules, each country can then decide how it will distribute allowances to covered firms within its borders. Member states also have discretion to implement unique monitoring, reporting and verification ("MRV") practices. Moreover, EU ETS member states have widely different enforcement practices.⁴⁸ This discretion can run contrary to linkage, undermining the consistency necessary for harmonized implementation. At least, it shows that linkage does not mean regulatory uniformity, given the wide variety of administrative capacities and priorities across linked systems.⁴⁹ It may, however, prompt greater coordination among these systems to reduce transaction costs, as has been proposed for the EU ETS.⁵⁰

ii. CDM

If the EU ETS is a satellite network of cap-and-trade systems, the CDM is a

world hub. It has attracted and continues to attract linkage from cap-and-trade systems around the world. In 2004, the European Parliament issued a so-called "Linking Directive" that allowed covered firms, beginning in 2005, to use CERs and ERUs to offset their own emissions, with the hope that doing so would "increase the diversity of low-cost compliance options" while safeguarding the "environmental integrity" of the EU ETS.⁵¹ The Linking Directive allows each member state to decide what percentage of a covered firm's emission reductions can be achieved by purchasing CERs or ERUs, the primary guideline being that this percentage should be small enough to ensure that a "significant element" of the required emissions reductions occur in Europe. Of course such general guidance has left much discretion with member states.⁵²

RGGI is another cap-and-trade system that is linked to the CDM. Under RGGI's Model Rule, which governs its implementation, covered firms can offset up to 10% of their emissions using credits from approved domestic offset projects. If allowance prices exceed a price threshold, firms can also use CERs and certain foreign allowances to meet their cap, though still subject to the 10% limit.⁵³

iii. Indirect Linkages

The EU ETS and CDM linkages described above are direct; the linking jurisdictions have chosen to establish these ties. Indirect linkage can also occur when two jurisdictions link to a common third system. In these situations, allowance prices in systems with no direct ties can affect each other by influencing supply and demand in the third system.⁵⁴ This can easily occur through a linkage hub like the CDM. In fact, it is possible for allowance prices in satellite systems and a common hub to converge fully if

there is a sufficient quantity of low-cost allowances in the hub system.⁵⁵

iv. Proposed Linkages

U.S. Federal Cap-and-Trade System

Many proposals to establish a U.S. federal cap-and-trade system also call for linkage, but in a cautious fashion; according to some, linkage with the EU ETS may be desirable in the long term to reduce overall compliance costs, but in the short term linkage with the CDM offers the lowest cost offset opportunities.⁵⁶ Furthermore, linkage to CDM would not raise domestic allowance prices, because there is no inherent demand in an emissions offset system. Perhaps most importantly, the U.S. could link to the CDM, and indirectly to the EU ETS, even if it decided to put a ceiling on the price of domestic allowances; it is unlikely that the EU ETS would allow a direct link to a system with built-in cost-containment.⁵⁷

Both the Kerry-Boxer and Waxman-Markey bills adopt this general approach, allowing for the generous use of certain "international offsets." In both bills, these offsets can only be awarded for activities that reduce or avoid greenhouse gas emissions, or increase the sequestration of greenhouse gases, in a developing country.⁵⁸ In practice, to reduce the price of domestic compliance with a U.S. cap-and-trade system, these bills would depend heavily on the availability of offset credits generated by projects that reduce emissions from deforestation and forest degradation (called REDD projects) in developing countries.

Western Climate Initiative

States and provinces participating in the WCI, if it takes effect, will be able to allow covered firms to use international offset credits, including CERs and

ERUs, to meet their emissions reduction obligations. In the future, participating jurisdictions may also allow covered firms to use the same allowances from other cap-and-trade systems. The WCI Offset Committee is currently examining the criteria necessary to ensure the integrity of the WCI offset system, should it choose to recognize offset credits earned through other cap-and-trade systems.⁵⁹ Similarly, the Province of Ontario, a WCI partner, is considering whether to credit foreign offset projects itself or to accept credits issued by foreign offset systems that meet Ontario's eligibility criteria.⁶⁰

New Zealand

New Zealand's Ministry of the Environment has indicated that linking the New Zealand Emissions Trading System ("NZETS") to the CDM or other systems can help increase liquidity in an otherwise small market.⁶¹ In addition, empirical research has shown that many New Zealand companies support broad linkages, including to future Australian and U.S. systems, in order to maximize perceived efficiencies. The same research suggests that some Australian companies may oppose linkages that increase their costs of compliance – such as if an Australian system with a price ceiling was linked to a New Zealand system with a higher cost of compliance.⁶² In this scenario, the additional New Zealand demand on lower-cost Australian allowances could drive up their price.

Canadian Federal Government

Depending on whether the U.S. implements a cap-and-trade system, and the shape such a system would take, the Canadian federal government may consider adopting similar practices. In the past, Canadian federal proposals would have allowed covered firms to purchase CERs to meet a portion of

their compliance obligation. That said, this option may become moot if a future Canadian system retains the use of a technology fund, which acts as a safety valve on the price of carbon emitting activities. Previous proposals used a technology fund as a \$15/tonne safety valve for the price of allowances, which would be lower than the recent price of CERs on the international market.⁶³ If future federal proposals retain the use of a technology fund at this price, the World Bank has concluded that it will be "unlikely a substantial demand for [CERs] will materialize in the next ten years or so in Canada."⁶⁴

IV. Lessons Learned

The experiences of current linkages can fairly be extrapolated to different situations.⁶⁵ Indeed, EU ETS member states, like other regions around the world, differ widely in economic circumstances, enforcement culture and administrative capacity.⁶⁶ Furthermore, early lessons from linking to the CDM ought to be revisited, as that system remains the world's largest emissions offset program. Both the EU ETS and CDM experiences are therefore instructive.

A. Advantages

i. Enabling Market Efficiencies

It is generally understood that linking cap-and-trade systems can reduce the overall cost of compliance by providing a greater range of low-cost emissions reduction opportunities for covered firms.⁶⁷ Initially there may be higher prices within one system, but as arbitrage opportunities become available, prices will begin to converge (subject to the idiosyncrasies, discussed above, of particular linkages). For example, secondary CERs, issued for projects that have been registered with the CDM typically trade at about 80% of the price of Phase II EU ETS

allowances.⁶⁸ Primary CERs, which are expected from a CDM project, but retain the risk that they may not be issued, typically trade at a further discount.⁶⁹ As an attendant benefit of broadening the market for allowances, linkage can also improve market liquidity and reduce price volatility.⁷⁰ This is particularly important for thin markets, like those that might appear in New Zealand or Canada.

ii. Minimizing Leakage and Avoiding Trade Barriers

Linkage may also minimize leakage and avoid the imposition of trade barriers. Price convergence removes the incentive for businesses to relocate in the jurisdiction that formerly had lower compliance costs. Of course these businesses may still move to other jurisdictions with little or no regulation. Yet, *vis-à-vis* the linked jurisdictions, the rationale for establishing trade barriers to protect the competitiveness of domestic firms disappears.⁷¹

The prospect of trade barriers is real. Border tax adjustments – essentially tariffs on imports from jurisdictions that have a weaker price on carbon – have been proposed in many corners. French President Nicolas Sarkozy has suggested that his country may consider trade restrictions to preserve the competitiveness of domestic firms.⁷² The U.S. may also include border tax adjustments in a future cap-and-trade system. The Waxman-Markey bill includes provisions that would allow the U.S. government to impose border tax adjustments by 2020 on the import of carbon-intensive products, ostensibly to prevent the leakage of U.S. carbon-intensive industries to other jurisdictions.⁷³ The details of this proposal are not finalized, but the general plan could require firms exporting carbon-intensive goods into the U.S. from a

country without comparable regulations to hold U.S. allowances in an amount that reflects the allowance requirements of covered U.S. firms. The foreign firm could purchase these allowances from any participant in the U.S. system. Because of world demand for access to the U.S. market, such border tax adjustments could prove effective, but could also be effectively nullified through linkage.

iii. Directing Financial Flows

By broadening the demand for low-cost emissions reductions, linkage can also steer financial flows towards countries or regions where those opportunities are most readily available. This was a premise behind the CDM, which sought to uphold the principle, set out in the United Nations Framework Convention on Climate Change, of common but differentiated responsibilities for climate change action among developed and developing countries. By encouraging investment in offset projects in the developing world, the CDM has sought to help those countries develop sustainably.⁷⁴ Linkage therefore offers a mechanism to encourage investment in a region where offset projects predictably have a lower cost.

B. Disadvantages

i. Creating Inequities

Importantly, while linkage can lower overall abatement costs, it does not do so for every covered firm. In fact those regulated by the lower price system may find their compliance costs rise as prices converge.⁷⁵ In addition, different allocation methods across linked jurisdictions may result in the differential treatment of similar firms. For example, the EU ETS allows member states to auction up to 10% of available allowances. Yet there is little uniformity in how states have chosen this percentage. Moreover, because allowance allocation

is often a politically contested issue, it is unlikely that uniform practices will emerge across Europe in the near future.⁷⁶ Consequently, when firms in different linked jurisdictions are in direct competition, different allocation methods can lead to inequitable treatment.

Similar issues have appeared in relation to cap setting. Across linked systems, it is common to have a variety of emissions reduction targets. Covered firms in different jurisdictions often have different marginal abatement costs, which governments take into account when setting their caps.⁷⁷ However, “decisions about the stringency of emissions targets in one country can affect the allowance prices faced in other countries.”⁷⁸ Again the EU ETS provides a telling example. At the end of March 2004, when Germany submitted its proposed National Allocation Plan (“NAP”) to the European Commission, EU ETS allowance prices suddenly dropped; the pool of proposed German allowances was much larger than had been expected. This resulted in a significant loss for firms holding surplus allowances. These concerns have gradually prompted greater administrative control from the European Commission and will likely result in a more centralized EU ETS.⁷⁹

ii. Diverting Financial Flows

Linkage may result in a significant outflow of capital into the state with the lowest allowance prices.⁸⁰ In the first phase of the EU ETS, the United Kingdom, having one of the most stringent emissions caps of all member states, often expressed concern that it had quickly become a large net purchaser of emissions allowances.⁸¹ For other states in the EU ETS, this has been less of a concern, but still a legitimate one: “[m]ost of the allowances issued by individual Members States were surrendered in the same country

and the international transfers were a small percentage of the total, but they were larger than what might have been expected based on national preference.”⁸² Of course, the architects of linkage may intend capital outflows. The CDM, for example, was designed to assist developing countries. Yet even intended outflows can be politically contentious.⁸³

iii. Jeopardizing Environmental Integrity

Linkage can reduce a system’s overall compliance costs but also the integrity of its emissions reductions if the imported allowances or credits are of questionable quality. This risk is often present when a cap-and-trade system links with an offset system. In the latter, credits are awarded for “additional” projects – in other words, projects that reduce emissions relative to a counterfactual business as usual baseline. This concept is referred to as “additionality.” Because of the difficulty in determining the baseline and calculating additionality, many offset projects have not resulted in truly additional emissions reductions. As a result, when credits generated by these projects are used to offset actual emissions under a cap-and-trade system, net emissions in the capped system may actually grow.⁸⁴

[I]f a person buys carbon offsets to ‘neutralize’ the emissions from his car, he can still drive his car in exchange for paying someone to reduce their emissions in his place. If the person buys the offsets from someone who would have reduced their emissions anyway, regardless of the payment, in effect the person has not neutralized his emissions but merely subsidized an activity that would have happened anyway.⁸⁵

In practice, linking to the CDM has involved this risk.⁸⁶ Many commentators

have criticized the CDM for issuing CERs to projects that have not resulted in additional emissions reductions.⁸⁷ For example, for many early projects that claimed to have reduced emissions of HFC-23, a refrigerant and potent greenhouse gas, these reductions were so cheaply obtained that a significant incentive was created for facilities to actually increase their production of the gas in order to realize the benefit of reducing it.⁸⁸ Additionality has also proven especially difficult to calculate for renewable energy projects.⁸⁹ An offset system fraught with integrity concerns can easily infect a linked cap-and-trade system.

iv. Outsourcing Control

Linkage assumes a measure of joint control. For example, before it linked with the EU ETS, Norway had autonomy over its cap-and-trade system, setting

caps and allocating allowances as it saw fit. With linkage, however, Norway surrendered control over allowance prices to the dictates of supply and demand in the larger EU ETS.⁹⁰ Thus, linkage can:

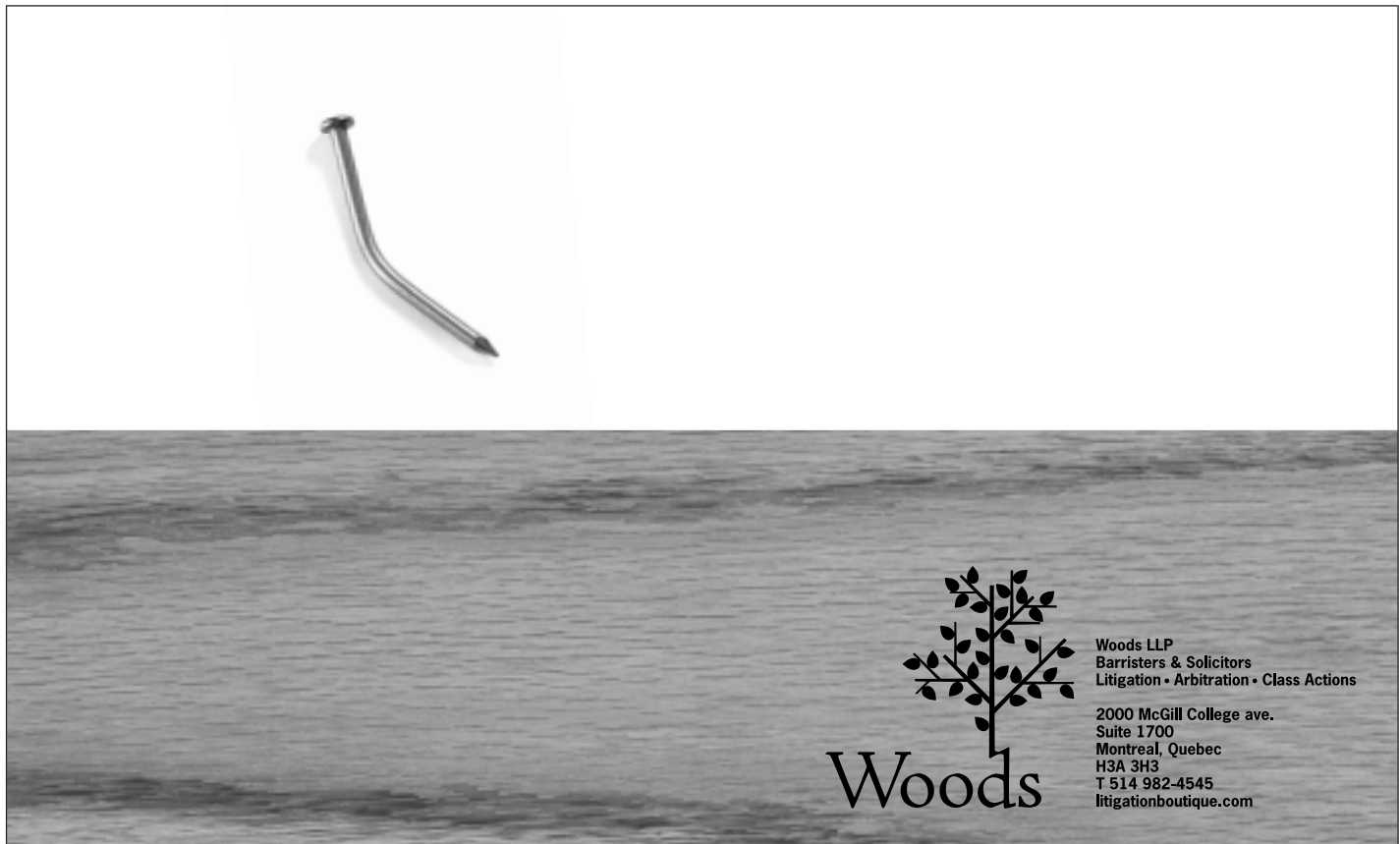
reduce national control over the design and impacts of a domestic tradable permit system. Once a system establishes links, its allowance price and emissions consequences are influenced by developments in the linked system(s) including possibly decisions made by the government(s) overseeing the linked system(s). The degree to which linking reduces a country's control over its domestic system can depend in part on the relative size of the linked systems.⁹¹

This concern is heightened if national policymakers had designed the cap-and-trade system to satisfy the needs

or constraints of certain stakeholders: “Because linking programs means equalizing permit prices, the new price might not meet those needs or constraints.”⁹² Unforeseen events may also affect the price of carbon. In May 2006, for example, verified emissions data revealed that EU emissions were actually much lower than had been projected when setting the EU ETS cap. Some countries, mostly in Eastern Europe, had made significant errors in calculating their baseline emissions. As a result, the price of EU ETS allowances crashed in all linked jurisdictions.⁹³

v. Complicating Administration

Finally, linkage brings with it the need to combine two systems with potentially different administrative institutions and capabilities. The task can be complicated—“there was no end of difficulties in setting



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up the system in Europe⁹⁴ – particularly with respect to gathering emissions data and setting system-wide caps. Over time, technical hurdles are typically overcome, especially as linked systems require firms to report their emissions and develop registries that can track allowance trades.⁹⁵ Yet with such progress inevitably comes additional administrative costs.⁹⁶

V. Linkage for Canada

Pressure is building to develop a globally integrated climate change policy for Canada.⁹⁷ Linkage offers a way forward: “The economic underpinnings of linking are seemingly unassailable: once targets are chosen in a given set of countries, trading enhances economic efficiency and reduces overall costs.”⁹⁸ Yet the analysis does not end there. Linkage entails subtle pitfalls that must be carefully managed: “Because emissions targets inevitably will be revised over time, countries necessarily have to think about how their decisions now will affect other countries’ decisions in the future.”⁹⁹ When considering linkages, the Canadian federal government should therefore assess how to achieve their benefits while avoiding their costs. In the short term, some linkages may prove attractive while others will not.

A. Guiding Principles

i. Achieving Market Efficiencies

Any linkage to a future Canadian cap-and-trade system would quickly affect the cost of compliance for Canadian firms. In a linked Canadian-U.S. system, demand for allowances south of the border would likely determine the price of allowances in Canada. In fact, given the size of a future U.S. market, additional Canadian supply and demand would do little to change the allowances prices of a U.S.-only system. In a linked Canadian-EU ETS system, price convergence may occur above the

initial price of Canadian allowances if the EU ETS continues to set a higher price on carbon than has been proposed by any Canadian federal government. Conversely, a one-way linkage to the CDM could decrease compliance costs for Canadian firms, but only if the federal government drops the proposal for a safety valve that is lower than the price of CERs on the international market. Of these choices, any linkage that raised domestic carbon prices could “discourage Canada from formally committing to emission limits in the first place or to meeting its commitments.”¹⁰⁰ On the other hand, if a U.S. system included a price ceiling, which the Kerry-Boxer bill proposes, a Canadian-U.S. linkage could provide significant efficiencies for Canadian firms. As discussed earlier, the U.S. price ceiling would effectively be exported to the Canadian system.

ii. Minimizing Inequities

If linkage is desirable for market efficiency or other reasons, the federal government should then work to minimize any resulting inequities, acknowledging that while linkage reduces overall costs, “certain groups do lose.”¹⁰¹ In a linkage with a higher price system, covered firms in Canada would pay more for allowances than they would have in an unlinked system. In a linkage to a lower price system, Canadian firms with surplus allowances would receive less for selling those allowances than they would have otherwise. Ultimately the distribution of costs will be a political decision, but one that may be more easily justified than the alternative of an unlinked system. For example, if future Canadian and U.S. systems were unlinked, the two countries could still be pressured to adopt similar emissions reduction targets. Given that Canadian emissions are expected to rise at a faster rate than U.S. emissions, in part because

of Canadian oil sands development, similar targets would require Canada to make relatively greater reductions from business as usual projections – which would in turn drive up allowance prices in Canada.¹⁰² Linkage can mute such disproportional impacts on Canadian firms.

iii. Minimizing Leakage

Linkage may also be a way of avoiding market leakage from Canada. The C.D. Howe Institute has acknowledged that, facing tough emissions limits in Canada, some industries might look elsewhere:

Such leakage, however, would be relatively small: for every 5 megatonnes of CO₂ that is reduced by Canadian industry, only 1 tonne would be leaked abroad. Leakage would be primarily to the United States, rather than to developing countries. Thus, Canada can move forward with tough climate policy without the cooperation of the developing world and with little concern about carbon-intensive production moving there.¹⁰³

Implicit in this statement is that Canada cannot do the same without the cooperation of the United States. Other commentators have suggested that the risk of leakage to developing countries may be more significant than the C.D. Howe Institute suggests, especially if high Canadian allowance prices pressured oil sands companies to ship bitumen to Asia for upgrading.¹⁰⁴

Thus, there is a compelling case for linkage with the U.S. Harmonizing the cap-and-trade systems of the two countries “makes particular sense in emissions-intensive businesses like oil production where all the other major factors of production are already freely traded.”¹⁰⁵ It also makes sense for the trade in energy

intensive goods like steel, cement, oil and electricity; without linkage, such trade “would become significantly distorted, with production migrating to whichever country imposed more lax rules.”¹⁰⁶ Thus, North American linkage could assuage fears that Canadian industry, facing a domestic cap-and-trade system, would relocate to the U.S.

iv. Avoiding Trade Barriers

The potential for U.S. border tax adjustments on carbon-intensive products is likely to motivate the Canadian federal government to act. These tariffs could be avoided by equalizing allowance prices in the two countries, either through linkage or by pegging Canadian allowance prices to those in the U.S., though the latter option could require frequent and politically sensitive adjustments. Countries have so far been reluctant to use carbon tariffs,¹⁰⁷ but that may change over time. A report released by the WTO and the United Nations Environmental Programme acknowledges that “some degree of trade restrictions may be necessary to achieve certain policy objectives, as long as a number of carefully crafted considerations are respected.”¹⁰⁸ Given the propensity of U.S. Congress to protect domestic industries, it is feasible that any future U.S. cap-and-trade system would adopt the approach set out in the Waxman-Markey bill, imposing border tax adjustments on the import of carbon-intensive goods that U.S. firms also produce.¹⁰⁹

v. Maintaining Environmental Integrity

Linkage can lead to a race to the bottom, in which the quest for low-cost emission reductions neglects the quality thereof. The Canadian federal government should therefore seek to ensure that any allowances or offset credits imported into a Canadian system reflect real emissions reductions.

Policing the integrity of imported credits is difficult but can be done.¹¹⁰ In fact, governments can impose various transaction costs – such as monitoring and reporting obligations – to ensure that emissions reductions are real.¹¹¹

To mitigate harm to a future Canadian system, the federal government could also restrict the number of foreign credits that domestic firms can use to offset their emissions. The European Union generally prevents member states from using project-based offset credits for more than 50% of their emissions reduction commitments. In its first compliance period, the WCI proposes to limit the use of offsets and allowances from foreign systems to 49% of a partner jurisdiction’s total emissions reductions.¹¹² Even more stringently, in its most recent proposal, the Canadian federal government would have only allowed covered firms to meet up to 10% of their compliance obligation with CERs.

Environmental integrity can cut another way. The U.S.-based Pew Center on Global Climate Change has stressed the uncertainty of whether recent Canadian proposals, which used intensity-based targets and a safety valve, could effectively link with the EU ETS.¹¹³ A report to the European Parliament has similarly noted that linking the EU ETS to such a system could injure the environmental integrity of the EU ETS by weakening the price signal in the EU ETS and delaying the European transition to low carbon technologies. The report therefore recommends against linking with a Canadian system so long as it retains emissions intensity targets and a safety valve.¹¹⁴ If the Canadian federal government wishes to pursue linkages with robust cap-and-trade systems in the future, it would be wise to abandon intensity targets, as it recently proposed to do by following the U.S. lead on climate

policy.¹¹⁵ It would also be wise to forgo the use of a safety valve, and instead consider more nuanced methods of price control, such as holding back a limited pool of allowances under the cap that could later be distributed to any covered entities that were disproportionately affected by the Canadian regulations.

vi. Managing Capital Flows

Linking to a foreign offset system may be defensible if it promises the greatest reduction of compliance costs for domestic firms. Yet the capital outflows associated with such linkage may also be directed to emissions reduction projects in Canada. In any event, the federal government would benefit from routinely assessing how Canadian capital might respond to potential linkages. The results may be startling. In the first years of the CDM, for example, purchasers of CERs generated by industrial gas reduction projects paid approximately 4.7 billion euros for reductions that in fact cost less than 100 million euros to achieve.¹¹⁶

vii. Confronting Administrative Challenges

Finally, linking a future Canadian cap-and-trade system to a foreign cap-and-trade or offset system will present administrative challenges. Although technical barriers can be overcome, harmonizing the systems’ politicized features may take time. In particular, there are political consequences of setting emissions caps, price ceilings and allowance allocation rules, all of which directly impact the price of carbon. Moreover, when linked systems with a common cap divide available allowances between themselves, they can cause “major ramifications for each country’s revenues as well as the ability of each government to compensate hard-hit domestic players by allocating them

free permits.”¹¹⁷ The Canadian federal government may be willing to surrender administrative control to achieve the benefits of linkage, but should first fully appreciate that doing so may also divest some autonomy, as well as some revenue from allowance auctions, to satisfy domestic stakeholders.

B. Current Proposals

The Canadian federal government has generally acknowledged the attractiveness of linkage. Minister of the Environment Jim Prentice has been aggressive in advocating a Canada-U.S. “bilateral agreement” on greenhouse gas mitigation, something that includes “shared targets and shared timetables, a common carbon market and a price and standards and mandates that are based on science and common sense.”¹¹⁸ In this regard, the federal government has adopted a wait-and-see approach to climate policy, waiting to adopt a cap-and-trade system that is comparable to whatever the U.S. Congress is able to bring into force.¹¹⁹

Yet the federal government’s support for linkage has so far shown little nuance. It appears motivated by a desire to avoid any border tax adjustment that could impair the marketing of Canadian oil sands products. This desire also appears to trump sovereignty concerns.¹²⁰ Yet despite Canada’s avowed interest in working with the U.S., the Obama administration and Congress have sought to develop a cap-and-trade system unilaterally.¹²¹ This is not surprising, given the negligible effect a Canadian linkage would have on a U.S. system. Minister Prentice has therefore suggested that Canada will work to mimic whatever system takes shape in the U.S.¹²² This strategy misses an opportunity, early on, to have a nuanced and public discussion, both domestically and with the U.S., about the costs and benefits of linkage.

VI. Conclusion

Linkage offers many clear benefits, but also affects stakeholders in widely different ways. As a result:

harmonization will not be a one-time event, but an ongoing uncertain and confusing process. These uncertainties can discourage investments that might otherwise be helpful in addressing global warming, as they will make it hard to know what the rules are and to predict their future content. It is hard enough to predict what an individual government will do in the future, but predicting the actions of multiple governments acting partly on their own and partly in response to political pressures for harmony will prove even harder to predict.¹²³

There are lessons to help Canada through this process. The experiences of the EU ETS and CDM are instructive, each offering insights into how best to achieve the market efficiencies associated with linkage while minimizing associated equity, sovereignty and environmental concerns. If Canada can strike the right balance between these factors – as indeed it may do by linking to a future U.S. federal cap-and-trade system – it may lay the foundation for further international cooperation. A survey by Point Carbon, a carbon markets news service, indicated that about 50% of responding subscribers thought that linked Canadian and U.S. federal systems would then link with the EU ETS.¹²⁴ Ultimately this bottom-up approach may be the world’s most robust response to climate change. For as it stands, “[w]e don’t simply need a number of agreements; we need a *system* of agreements.”¹²⁵ Such a system, if built on strong regional institutions and well considered linkages, could eventually become a standalone climate

architecture.¹²⁶ As the EU ETS experience indicates, such a system may even prompt greater centralization, another step toward a truly global system of governance.

ENDNOTES

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¹ Andrew Revkin and John Broder, “A Grudging Accord in Climate Talks” *The New York Times* (19 December 2009), online: <<http://www.nytimes.com/2009/12/20/science/earth/20accord.html>>.

² Judson Jaffe and Robert Stavins, “Linkage of Tradable Permit Systems in International Climate Policy Architecture”, Discussion Paper 08-07 (Cambridge, MA: Harvard Project on International Climate Agreements, September 2008) [Jaffe and Stavins] at 1.

³ *Ibid.* at 17.

⁴ Carlo Carraro and Barbara Buchner, “Regional and Sub-Regional Climate Blocs: A Game-Theoretic Perspective on Bottom-up Climate Regimes”, Series No. 10/WP/2006 (Venice: University Ca’ Foscari of Venice, 2006) at 2.

⁵ Chris Bataille, Benjamin Dachis & Nic Rivers, “Pricing Greenhouse Gas Emissions: The Impact on Canada’s Competitiveness” (Toronto: C.D. Howe Institute, 2009) [C.D. Howe] at 1-13. Carbon taxes can also add a price to greenhouse gas emissions. However, apart from a general aversion to new taxes, policymakers have favoured cap-and-trade systems because international

harmonized taxes are often difficult to implement and less effective at creating a field of specialized institutions that focus on pollution abatement, carbon trading, emissions verification and related services. See Cameron Hepburn, "Carbon Trading: A Review of the Kyoto Mechanisms" (2007) 32 *Annu. Rev. Environ. Resour.* 375 [Hepburn] at 378.

⁶ Jaffe and Stavins, *supra* note 2 at 2.

⁷ National Round Table on the Environment and the Economy, *Achieving 2050: A Carbon Pricing Policy for Canada* (Ottawa: National Round Table on the Environment and the Economy, 2009) at 28.

⁸ Jaffe and Stavins, *supra* note 2 at 3.

⁹ See D. Burtraw et al. "Economics of pollution trading for SO₂ and NO_x" (2005) 30 *Annu. Rev. Environ. Resour.* 253.

¹⁰ Hepburn, *supra* note 5 at 377.

¹¹ United Nations, Kyoto Protocol to the United Nations Framework Convention on Climate Change (1998), online: <<http://unfccc.int/resource/docs/convkp/kpeng.pdf>> [Kyoto Protocol].

¹² *Ibid.*, Article 17.

¹³ Clean Development Mechanism, "CDM: CDM Statistics", online: <<http://cdm.unfccc.int/Statistics/index.html>>.

¹⁴ Jaffe and Stavins, *supra* note 2 at 6-7.

¹⁵ Kyoto Protocol, *supra* note 11, Article 12.

¹⁶ Karan Capoor & Philippe Ambrosi, "State and Trends of the Carbon Market 2009" (Washington: The World Bank, 2009) [World Bank 2009] at 1. This amount includes primary and secondary CER transactions.

¹⁷ European Commission, "Environment – Climate Change – Emissions Trading System", online: <http://ec.europa.eu/environment/climat/emission/index_en.htm>.

¹⁸ Joseph Kruger, Wallace E. Oates and William A. Pizer, "Decentralization in the EU Emissions Trading Scheme and Lessons for Global Policy" (2007) 1 *Rev. of Env. Economics and Policy* 112 [Kruger et al.] at 112.

¹⁹ World Bank 2009, *supra* note 16 at 1.

²⁰ See Specified Gas Emitters Regulation, Alta. Reg. 139/2007.

²¹ Regional Greenhouse Gas Initiative, "Regional Greenhouse Gas Initiative (RGG) CO₂ Budget Trading Program", online: <<http://www.rggi.org/home>>.

²² World Bank 2009, *supra* note 16 at 1. See also Greenhouse Gas Reduction Scheme, "Welcome to the Greenhouse Gas Reduction Scheme", online: <<http://www.greenhousegas.nsw.gov.au>>.

²³ World Bank 2009, *supra* note 16 at 1. See also Chicago Climate Exchange, "Chicago Climate Exchange", online: <<http://www.chicagoclimatex.com>>.

²⁴ Jaffe and Stavins, *supra* note 2 at 4.

²⁵ Western Climate Initiative, "Design Recommendations for the WCI Regional Cap-and-Trade Program" (September 2008), online: <<http://www.westernclimateinitiative.org/document-archives/wci-design-recommendations>> [WCI Design Recommendations]. Currently, Ontario is a full partner, alongside British Columbia, Manitoba, Québec, Arizona, California, Montana, New Mexico, Oregon, Utah and Washington. At the time of writing, the Canadian provinces, California and New Mexico were furthest along in passing the domestic legislation necessary for WCI implementation. Of course, future federal cap-and-trade systems could potentially supplant any regional system developed under the WCI.

²⁶ Clean Energy Jobs and American Power Act, S.1733, 111th Congress, 1st Sess. (2009); American Clean Energy and Security Act, H.R.2454, 111th Congress, 1st Sess., (2009) [Waxman-Markey]. At the time of writing, the Waxman-Markey bill had narrowly passed the House of Representatives, in a 219-212 vote in favor, while the Kerry-Boxer bill was in Senate committee.

²⁷ The Kerry-Boxer bill has a slightly more aggressive short-term target – proposing to cap emissions from covered entities at 20% below 2005 levels by 2020, rather than by 17% as proposed in the Waxman-Markey

bill. Both bills, however, use a long-term target of reducing U.S. greenhouse gas emissions: 83% below 2005 levels by 2050.

²⁸ "Australian Senate rejects Kevin Rudd's climate plan" *BBC News* (2 December 2009), online: <<http://news.bbc.co.uk/2/hi/asia-pacific/8389909.stm>>.

²⁹ Environment Canada, "Turning the Corner: An Action Plan to Reduce Greenhouse Gases and Air Pollution: (10 March 2007), online: <<http://www.ec.gc.ca/default.asp?lang=En&n=4891B242-1>> [Turning the Corner]. At the time of writing, the federal government had abandoned plans to implement this cap-and-trade system in part due to the uncertainty surrounding the U.S. implementation of its own cap-and-trade system.

³⁰ Environment Canada, "Project Green: Moving Forward on Climate Change: A Plan for Honouring our Kyoto Commitment" (Ottawa: Government of Canada, 2005) [Project Green].

³¹ David M. Driesen, "Linkage and Multilevel Governance" (2009) 19 *Duke Journal of Comparative & International Law* 389 [Driesen, Linkage and Governance] at 395.

³² Bruce A. Ackerman and Richard B. Stewart, "Reforming Environmental Law" (1985) 37 *Stanford Law Review* 1333 at 1355.

³³ *Ibid.* at 1358.

³⁴ David G. Victor, Joshua C. House and Sarah Joy, "A Madisonian Approach to Climate Policy" (2005) 309 *Science* 1820 [Victor, House and Joy].

³⁵ Steven F. Bernstein et al., "Introduction: A Globally Integrated Climate Policy for Canada" in Steven F. Bernstein et al., eds., *A Globally Integrated Climate Policy for Canada* (Toronto: University of Toronto Press, 2009) [Bernstein et al.] at 25.

³⁶ Stewart Elgie, "Carbon Offset Trading: A Leaky Sieve or Smart Step?" (2007) 17 *J. Envtl. L & Prac.* 236 at 255. "Activity leakage" occurs when one project decreases emissions by reducing production, while production is increased elsewhere. "Market leakage" occurs where the cost of

an offset project causes production costs to increase, making a similar product produced with higher emissions become more economically attractive.

³⁷ Jaffe and Stavins, *supra* note 2 at 11.

³⁸ Victor, House and Joy, *supra* note 34 at 1820.

³⁹ *Ibid.*

⁴⁰ *Ibid.*

⁴¹ E. Haites as cited in Ralf Schüle, Wolfgang Sterk & Niels Anger, *Options and Implications of Linking the EU ETS with other Emissions Trading Schemes* (Brussels: European Parliament, Policy Department Economy and Science, 2008) [Schüle et al.] 5. In the absence of such coordination, private parties could also attempt to convert units under domestic law to a form acceptable to the country to which they will be sold, although this process would be cumbersome.

⁴² Kruger et al., *supra* note 18 at 119

⁴³ Schüle et al., *supra* note 41 at 17. Broadly speaking, linkage is not a new concept. It has long been advocated as a way to develop global cooperation on international trade. It has often been more practical to link regional trade agreements than negotiate global ones. As a result, regional agreements on intellectual property, environmental protection and investment and competition policies have all prompted agreements under or discussions in the WTO. See Oren Perez, "Multiple Regimes, Issue Linkage, and International Cooperation: Exploring the Role of the World Trade Organization" (January 2006), online: <<http://www.worldtradelaw.net/articles/perezwtorole.pdf>>.

⁴⁴ Jaffe and Stavins, *supra* note 2 at 8.

⁴⁵ Kruger et al., *supra* note 18 at 121.

⁴⁶ *Ibid.* at 122.

⁴⁷ A. Denny Ellerman, "The EU Emission Trading Scheme: A Prototype Global System?", Discussion Paper 08-02 (Cambridge, MA: Harvard Project on International Climate Agreements, August 2008) [Ellerman] at 3.

⁴⁸ Krueger et al., *supra* note 18 at 124.

⁴⁹ *Ibid.*

⁵⁰ European Union, "Questions and Answers on the Commission's proposal to revise the EU Emissions Trading System", MEMO/08/35, Brussels, 23 January 2008 [EU ETS Revisions].

⁵¹ Council Directive 2004/01, Preamble, Amending Directive 2003/87/EC. 2004 O.J. (L 338), 18, 18 (EC) [Linking Directive]. The Linking Directive did not allow credits relating to land use, forestry or nuclear power projects to be used for compliance with the EU ETS.

⁵² David M. Driesen, "Links Between European Emissions Trading and CDM Credits for Renewable Energy and Energy Efficiency Projects" (February 7, 2006), online: <<http://ssrn.com/abstract=881830>>.

⁵³ Jaffe and Stavins, *supra* note 2 at 9.

⁵⁴ *Ibid.* at 8.

⁵⁵ *Ibid.* at 9.

⁵⁶ Robert N. Stavins, "A U.S. Cap-and-Trade System to Address Global Climate Change", Discussion Paper 2007-13 (Cambridge, MA: Harvard University, John F. Kennedy School of Government, October 2007) [Stavins] at 28.

⁵⁷ *Ibid.*

⁵⁸ See e.g. Waxman-Markey, *supra* note 27, s. 744. Under this bill, a developing country is defined as "a country eligible to receive official development assistance according to the income guidelines of the Development Assistance Committee of the Organization for Economic Cooperation and Development."

⁵⁹ Western Climate Initiative, "Western Climate Initiative: 2009-2010 Work Plan" (10 February 2009), online: <<http://www.westernclimateinitiative.org/component/remository/general/workplans/2009-2010-WCI-Work-Plan>>.

⁶⁰ See Ontario, Ministry of the Environment, "Moving Forward: A Greenhouse Cap-and-Trade System for Ontario (June 2009), online: <http://www.ene.gov.on.ca/en/air/climatechange/discussion_paper.pdf>.

⁶¹ Robert Brears, "Companies' Perspectives of the New Zealand Emissions Trading Scheme" (December 1, 2008), online:

<<http://ssrn.com/abstract=1309927>>.

⁶² *Ibid.*

⁶³ K. Capoor & P. Ambrosi, "State and Trends of the Carbon Market 2008" (Washington: The World Bank, May 2008) [World Bank 2008] at 58. The proposed federal price ceiling of \$15/tonne of CO₂e was lower than the price of CERs in 2008.

⁶⁴ *Ibid.* at 58.

⁶⁵ See e.g. Kruger et al., *supra* note 18 at 128, discussing the extrapolation of lessons from the EU ETS to the global level.

⁶⁶ Ellerman, *supra* note 47.

⁶⁷ See e.g. C. Egenhofer, "The Making of the EU Emissions Trading Scheme: Status, prospects and implications for business" 25 *European Management Journal* 453.

⁶⁸ Jaffe and Stavins, *supra* note 2 at 9.

⁶⁹ Hepburn, *supra* note 5 at 382.

⁷⁰ Jaffe and Stavins, *supra* note 2 at 10.

⁷¹ Kruger et al., *supra* note 18 at 122.

⁷² Scott Barrett, "A Portfolio System of Climate Treaties", Discussion Paper 2008-13 (Cambridge, MA: Harvard Project on International Climate Agreements, October 2008) [Barrett] at 5.

⁷³ Waxman-Markey, *supra* note 27.

⁷⁴ United Nations, United Nations Framework Convention on Climate Change (1992), <online: <http://unfccc.int/resource/docs/convkp/conveng.pdf>>.

⁷⁵ Kruger et al., *supra* note 18 at 120.

⁷⁶ *Ibid.* at 125.

⁷⁷ *Ibid.* at 126.

⁷⁸ *Ibid.* at 127.

⁷⁹ EU ETS Revisions, *supra* note 50.

⁸⁰ Kruger et al., *supra* note 18 at 119.

⁸¹ Kruger et al., *supra* note 18 at 127.

⁸² Ellerman, *supra* note 47 at 24.

⁸³ Jaffe and Stavins, *supra* note 2 at 11.

⁸⁴ *Ibid.*

⁸⁵ Deepanshi Chaudry, "A Brief Study of Voluntary Carbon Markets: Recent and Future Trends with Special Focus on India" (July 15, 2008), online: <<http://ssrn.com/abstract=1334905>> at 3.1.1>.

⁸⁶ Driesen, Linkage and Governance, *supra* note 31 at 398.

⁸⁷ Michael Wara, "Is the global carbon market working?" (2007) 445 *Nature* 595.

⁸⁸ *Ibid.*

⁸⁹ Lambert Schneider, "Is the CDM Fulfilling its Environmental and Sustainable Development Objectives? An Evaluation of the CDM and Options for Improvement" (Berlin: Oeko-Institute, November 2007), online: <<http://www.oeko.de/oekodoc/622/2007-162-en.pdf>>.

⁹⁰ Jaffe and Stavins, *supra* note 2 at 11-12.

⁹¹ *Ibid.*

⁹² Kruger et al., *supra* note 18 at 130.

⁹³ Ellerman, *supra* note 47 at 11.

⁹⁴ *Ibid.* at 6.

⁹⁵ International Emissions Trading Association, "Linking EU -- Canada Emission Trading Systems: An Opinion Paper By IETA", online: <http://www.canada-europe.org/en/pdf/Linking_EU_Canada_Emissions_Trading_Systems_Sept_2005.pdf> [IETA].

⁹⁶ Kruger et al., *supra* note 18 at 119.

⁹⁷ See Bernstein et al., *supra* note 35.

⁹⁸ Kruger et al., *supra* note 18 at 122.

⁹⁹ *Ibid.*

¹⁰⁰ Michael A. Levi, "The Canadian Oil Sands Energy Security vs. Climate Change", Council Special Report No. 47 (Council on Foreign Relations Center for Geoeconomic Studies, May 2009) [Levi] at 32.

¹⁰¹ Krueger et al., *supra* note 18 at 123.

¹⁰² Levi, *supra* note 100 at 31.

¹⁰³ C.D. Howe, *supra* note 5.

¹⁰⁴ Levi, *supra* note 100 at 32.

¹⁰⁵ *Ibid.* at 31.

¹⁰⁶ *Ibid.*

¹⁰⁷ Jeffrey Frankel, "Kyoto and Geneva: Linkage of the Climate Change Regime and the Trade Regime" (Cambridge, MA: Harvard University, John F. Kennedy School of Government, October 2004) at 10.

¹⁰⁸ United Nations Environment Programme and World Trade Organization, *Trade and Climate Change: WTO-UNEP Report* (Switzerland: WTO, 2009), online: <http://www.wto.org/english/res_e/booksp_e/trade_climate_change_e.pdf> at xix.

¹⁰⁹ Levi, *supra* note 100 at 30. To date

Congressional proposals would only affect manufactured goods, and not necessarily all Canadian oil sands products.

¹¹⁰ Driesen, Linkage and Governance, *supra* note 31 at 402.

¹¹¹ *Ibid.* at 405. Of course, this option is made more difficult when deciding whether to import credits that are awarded in a different jurisdiction.

¹¹² WCI Design Recommendations, *supra* note 26 at 10.

¹¹³ Denny Ellerman & Paul L. Joskow, "The European Union Emissions Trading Scheme (EU-ETS) Insights and Opportunities" (Massachusetts Institute of Technology, May 2008), online: <<http://www.pewclimate.org/docUploads/EU-ETS%20White%20Paper.pdf>>.

¹¹⁴ Schüle et al., *supra* note 41 at i.

¹¹⁵ Tyson Dyck, "Still following the U.S. lead" *Toronto Star* (13 December 2009), online: <<http://www.thestar.com/comment/article/737867>>.

¹¹⁶ Dreisen, Linkage and Governance, *supra* note 31 at 406. See also Michael Wara and David Victor, "A Realistic Policy on International Carbon Offsets" (Stanford, CA: Stanford University, Freeman Spogli Institute for International Studies, 2008) at 8.

¹¹⁷ Levi, *supra* note 100 at 32.

¹¹⁸ J. Prentice, "Notes for an address to the Canadian Council of Chief Executives" (20 January 2009).

¹¹⁹ Environment Canada, Speaking Notes for the Honourable Jim Prentice (4 December 2009), online: <<http://www.ec.gc.ca/default.asp?lang=En&n=6F2DE1CA-1&news=ED67FED2-F8EA-4217-8927-FEA6A5270A14>>.

¹²⁰ Levi, *supra* note 100 at 31.

¹²¹ The Canadian Press, "Canada not on radar in U.S. climate legislation: expert" *Toronto Star* (26 May 2009).

¹²² "U.S. pressure could alter Canada's greenhouse gas approach" *CBC News* (9 April 2009), online: <<http://www.cbc.ca/technology/story/2009/04/09/tech-090409-prentice-greenhouse-gas.html?ref=rss>>.

¹²³ Driesen, Linkage and Governance,

supra note 31 at 404-5.

¹²⁴ Hepburn, *supra* note 5 at 387. Note that respondents to a Point Carbon survey, while typically educated followers of the carbon market, likely have interests in seeing emissions trading continue.

¹²⁵ Barrett, *supra* note 72 at 1.

¹²⁶ Jaffe and Stavins, *supra* note 2 at 14.