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

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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

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 chose 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 opterait 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 desdites 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

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 up the system in Europe"[94] – 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 commiting 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 CO_2 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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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'Fioscari 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 NOx" (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: Oko-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.