

CLIMATE STRATEGIES



Linking Existing and Proposed Greenhouse Gas Emissions Trading Schemes in North America

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Abstract

A number of greenhouse gas emissions trading schemes have been implemented or proposed for Canada, the United States and Mexico. Links among those schemes make sense given the close economic ties between the countries. All of the existing and proposed schemes, except Alberta, include provisions for unilateral use of credits and/or allowances from other schemes with quantity and qualitative restrictions. A federal scheme in the United States is likely to replace state schemes, with the possible exception of a few states with more stringent schemes, especially if states are given a role in implementation of the federal scheme. In Canada provinces that want, and are able, to establish that their schemes are equivalent to the federal scheme could continue to operate. Canada will have to modify its proposed scheme to achieve its expressed desire of linking with regulatory-based emissions trading schemes in the United States and Mexico.

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1 Introduction

The United States was, until recently, the largest emitter of greenhouse gases accounting for over 15% of the global total, Canada ranks about tenth with almost 2% of global emissions and Mexico follows with roughly 1.5% of global emissions.^{i,ii} Canada and Mexico are parties to the Kyoto Protocol, but the United States is not. Canada has a national emissions limitation commitment under the Protocol although this commitment is unlikely to be met. Mexico does not have an emissions limitation commitment.

All three national governments have announced various climate change initiatives, but greenhouse gas emissions continue to rise. Several proposals for emissions trading schemes have been introduced in the US Congress, but none has been passed into law. The Canadian government announced an emissions trading scheme for large emitters to begin in January 2010. Mexico has announced that it plans to implement a binding cap on emissions from cement and oil refining and to launch emissions trading for these sectors by 2012.ⁱⁱⁱ

A number of American states and Canadian provinces have responded to the slow national action by implementing or planning greenhouse gas emissions trading schemes on their own, or in groups. Existing provincial and state schemes are ahead of their respective national emissions trading initiatives. Proposed state and provincial schemes are on roughly the same schedule as the national initiatives. If all of the proposed emissions trading schemes are implemented, overlaps between the national and the state/provincial schemes will need to be addressed.

Links among the various emissions trading schemes implemented in North America are likely given the close economic ties between the three countries. North-south economic links between neighboring states and provinces are often stronger than east-west links within the same country. Thus, regional initiatives by American states have attracted Canadian provinces and Mexican states as observers and participants.

This paper examines potential links among North American emissions trading schemes and between them and schemes in other countries. The next section sets the context by reviewing greenhouse gas emissions and climate change initiatives at the national and state/provincial level. The existing and proposed North American emissions trading schemes are described in section 3. Overlaps between the national and the state/provincial schemes are discussed in section 4. Section 5 discusses potential links by North American schemes with each other and with other schemes. Conclusions are drawn in section 6.

2 Background

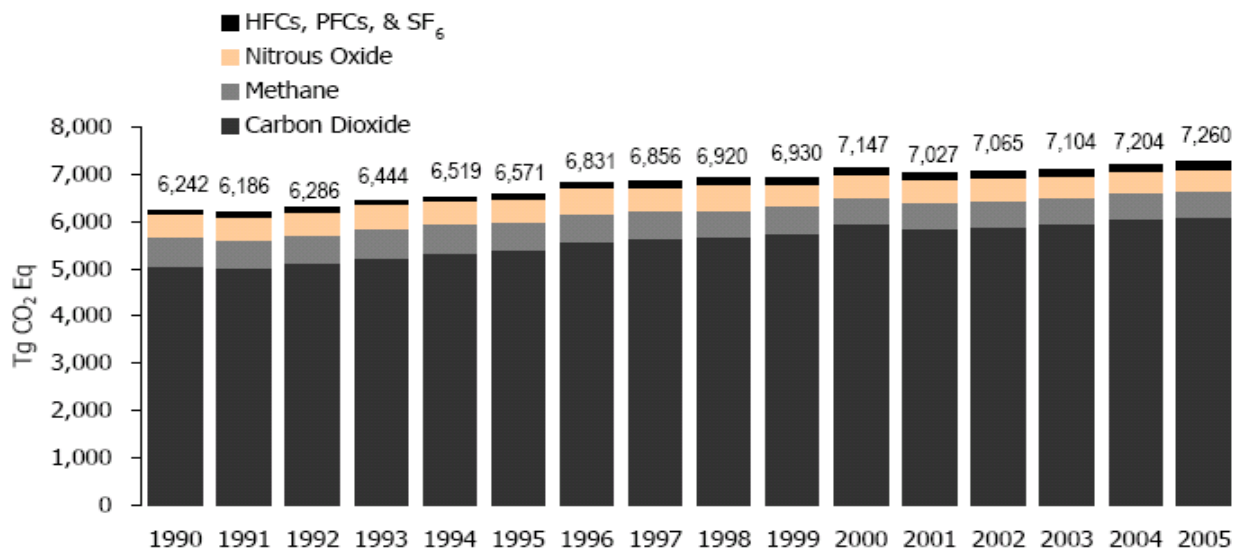


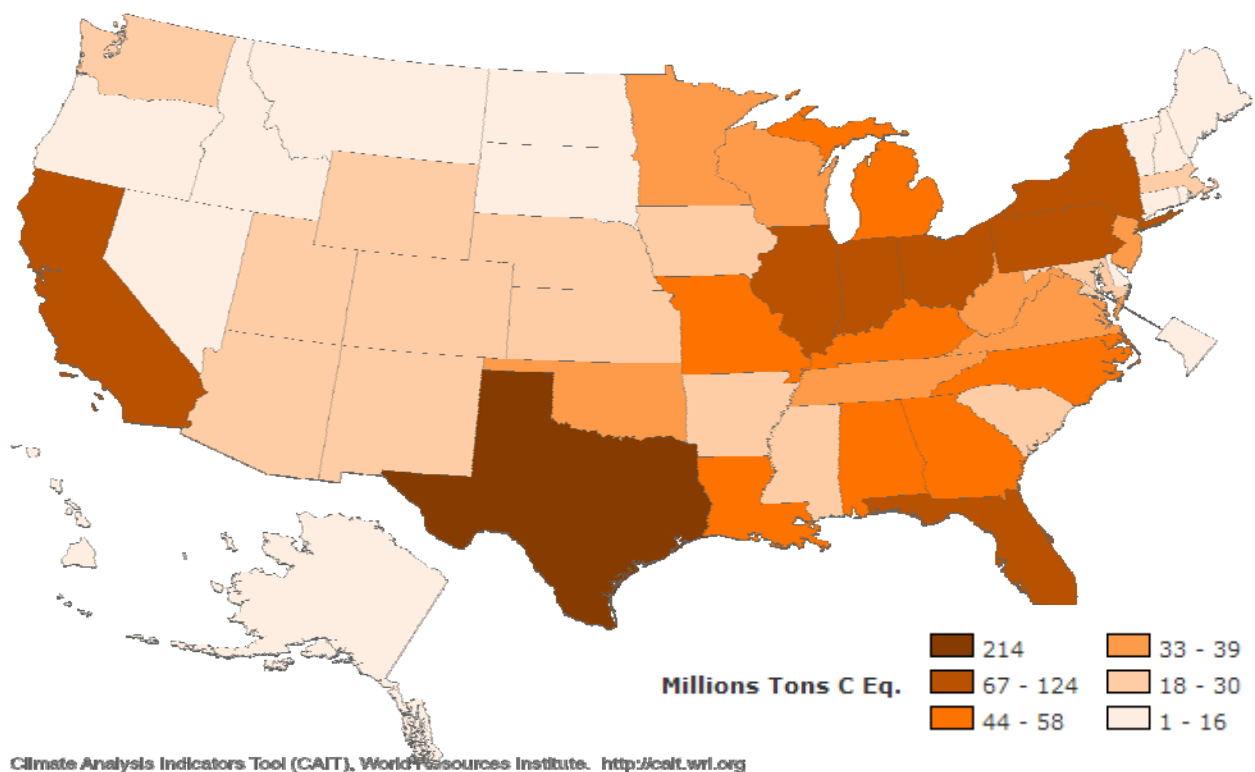
Figure 1: American Greenhouse Gas Emissions (Source: USEPA: April 2007, US GHG Inventory. From Pershing, 2007)

Figure 1 shows that US emissions of greenhouse gases have increased almost without interruption since 1990. The average annual rate of emissions growth between 1990 and 2005 has been 0.95%.

Greenhouse gas emissions by state are shown in Figure 2. The top ten emitters in 2003 were Texas (782 Million tonnes CO₂ equivalent MtCO₂e), California (453), Pennsylvania (301), Ohio (299), Florida (271), Indiana (269), Illinois (268), New York (244), Michigan (212), and Louisiana (210).^v The list includes the most populous states – California, Texas, New York, Florida, Illinois, Pennsylvania, Ohio, and Michigan – as well as states that rely heavily on coal-fired generation – Indiana (95%), Ohio (87%), Michigan (61%), Pennsylvania (57%) – and states with large oil and gas and chemical industries – Texas and Louisiana.

Figure 3 shows the states that have or are preparing climate action plans. Only four of the ten largest emitters – California, Pennsylvania, Illinois and New York – have climate action plans, although two more – Florida and Michigan – are preparing plans.

Twenty states have greenhouse gas emissions targets. The targets for 2020 are shown in Table 1. The most common targets for 2020 are 1990 emissions or 10% below 1990 emissions. Most of the states with targets have additional targets for earlier and/or later dates. Only four of the ten largest emitters – California, Florida, Illinois and New York – have emissions targets.



Climate Analysis Indicators Tool (CAIT), World Resources Institute. <http://cait.wri.org>

Figure 2: Greenhouse Gas Emissions by State

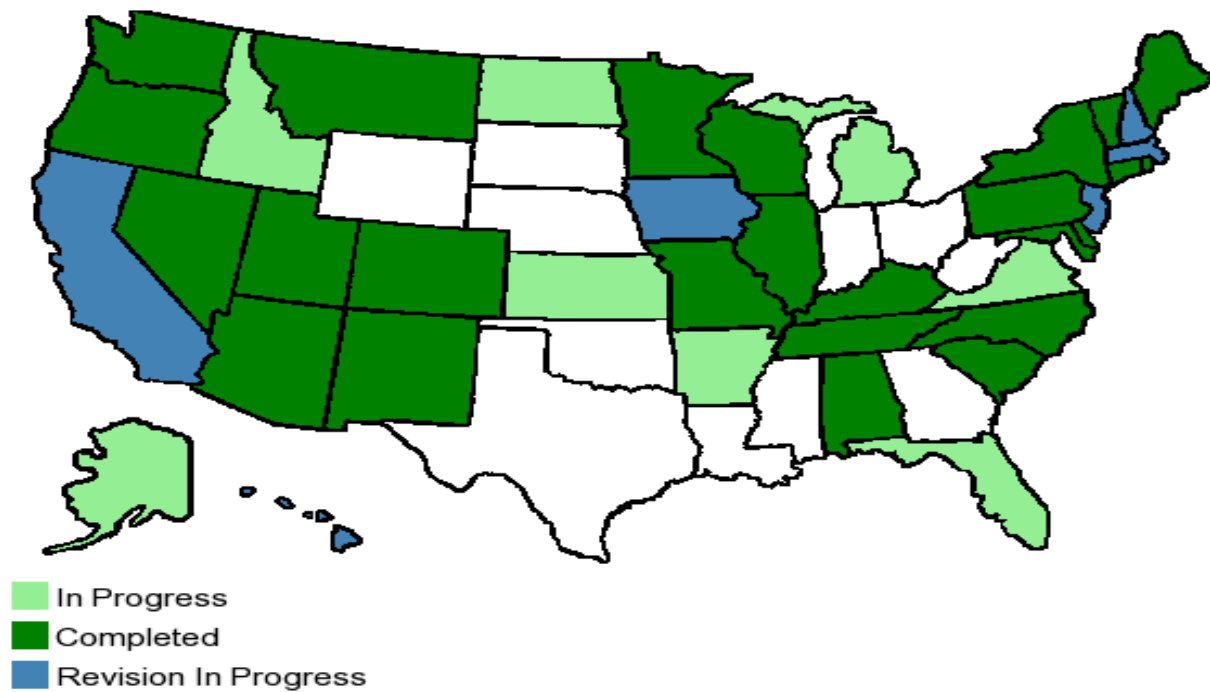


Figure 3: State Climate Action Plans (Source: Pew Center on Global Climate Change, October 2008)

State	2020 Target	State	2020 Target
Arizona	2000	New Hampshire	1990 – 10%
California	1990	New Jersey	1990
Colorado	2005 – 20%	New Mexico	2000 – 10%
Connecticut	1990 – 10%	New York	1990 – 10%
Florida	Below 2000 ^a	Oregon	1990 – 10%
Hawaii	1990	Rhode Island	1990 – 10%
Illinois	1990	Utah	2005
Maine	1990 – 10%	Vermont	1990 – 10%
Massachusetts	1990 – 10%	Virginia	? ^c
Minnesota	2005 – 22.5% ^b	Washington	1990
Notes:			
a: Florida's targets are to reduce electricity sector emissions to 2000 emissions by 2017 and 1990 emissions by 2025.			
b: Minnesota's targets are 15% below 2005 emissions in 2015 and 30% below in 2025			
c: Virginia's target is 30% below business as usual by 2025			
Source: Pew Center on Global Climate Change, October 2008			

Table 1: State Greenhouse Gas Emissions Targets

The announced state actions would lower the rate of growth of emissions in the US, but are not sufficient to reduce emissions. US emissions would be 56% above the 1990 level in 2050 if all state targets are met, rather than 99% above the 1990 level in the absence of the state actions.^{vi}

Canada's greenhouse gas emissions have grown by over 1.4% per year since 1990. The projected emissions for 2010 are 21% above the 1990 level; see Figure 4. To meet Canada's commitment under the Kyoto Protocol – 6% reduction from 1990 emissions – the projected emissions would need to be reduced by almost 30%. A 30% reduction of domestic emissions for 2008-2012 is not feasible. The government has indicated that it will not purchase Kyoto units.^{vii} Therefore, it is very unlikely that Canada will comply with its Kyoto commitment.

Emissions by province/region are shown in Figure 5. Alberta (234 MtCO₂e) is the province with the largest emissions, followed by Ontario (190), Quebec (82), Saskatchewan (72) and British Columbia (62).^{viii} Alberta produces most of the country's fossil fuels, with most of the rest coming from Saskatchewan and British Columbia. The growth of Alberta's emissions reflects the expansion of oil production from tar sands. Ontario and Quebec emissions are high due to their size; over 40% and over 20% of total population and GDP respectively.

Figure 4: Canada's Greenhouse Gas Emissions

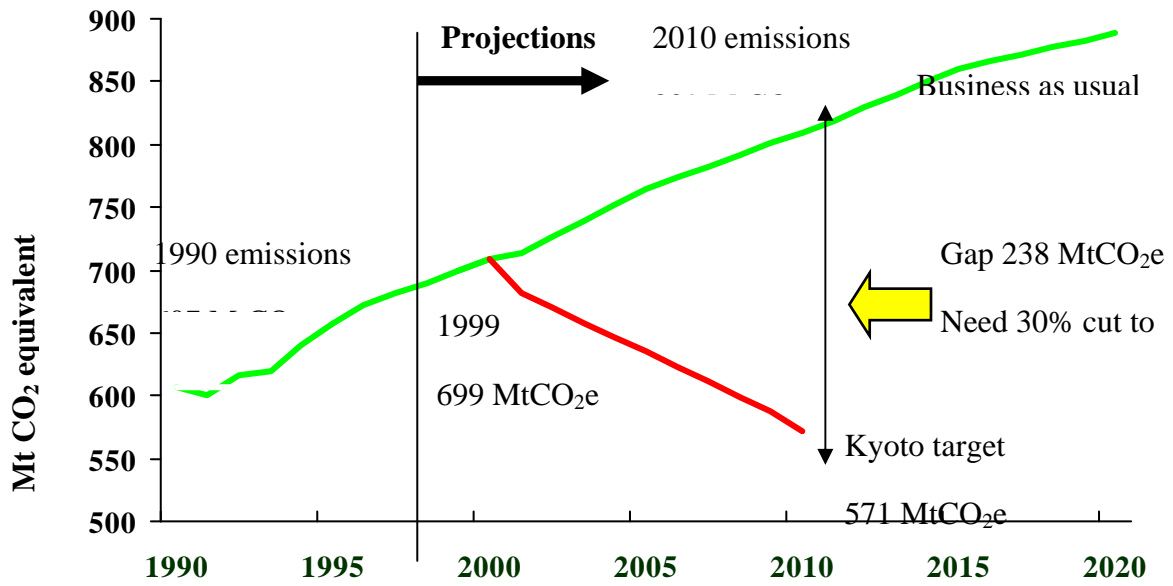
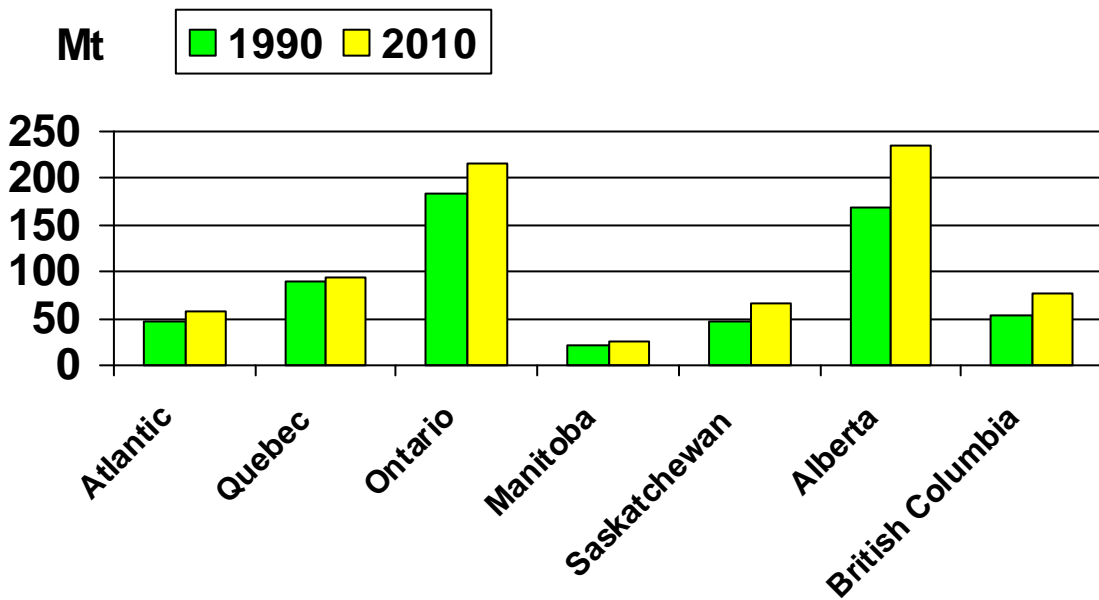


Figure 5: Greenhouse Gas Emissions by Province/Region



The targets and climate change policies of the Canadian government and the provinces are summarized in Table 2. The level of ambition varies widely. British Columbia has among the most ambitious targets and is most advanced in terms of implementing emission

reduction policies. In contrast, some of the east coast provinces have no target and, as yet, no climate change plan.

Canada	Target: 2006 - 20% by 2020 (to roughly 3% below 1990 emissions). An emissions trading scheme for large emitters is proposed to begin 1 January 2010. A variety of other policies are proposed for other sources/sinks.
Alberta	Target: reduce carbon intensity (CO ₂ e/GDP) by 50% from 1990 by 2020 an absolute reduction of 14% from 2005 by 2050. Alberta implemented an emissions trading scheme for large emitters on 1 July 2007. CO ₂ Capture and Storage is expected to be the main mitigation measure.
British Columbia	Target: 1990 – 10% by 2020. British Columbia has identified 40 actions to meet this target. In July 2008 it implemented a revenue neutral carbon tax of C\$10/tCO ₂ rising C\$5/tCO ₂ per year to C\$30/tCO ₂ in 2012.
Manitoba	Target: 1990 – 6% by 2102 (Canada’s Kyoto Protocol commitment). Manitoba has a climate change plan that addresses most economic sectors.
New Brunswick	Target: 1990 emissions in 2012 and 1990 – 10% by 2020. New Brunswick has a climate change plan whose main mitigation actions are energy efficiency, changes to the generation mix, and waste reduction and diversion.
Newfoundland & Labrador	No target. Climate change plan, to be updated in 2008, relies heavily on voluntary and educational programs for most sectors.
Nova Scotia	Target: 1990 – 10% by 2020. A climate change plan was released in 2009.
Ontario	Target: 1990 – 6% by 2014, 1990 – 15% by 2020, and 1990 – 80% by 2050. To achieve its 2014 target, Ontario will close its remaining coal-fired generating plants, invest in transit systems, implement national fuel-efficiency and auto emissions standards, and provide incentives for home energy audits and for municipalities to reduce their greenhouse gas emissions.
Prince Edward Island	No target. Climate change plan has expired and not yet been updated.
Quebec	Target: 1990 – 6 % by 2012. Due to its large hydroelectric generation, transportation is Quebec’s largest source of emissions. It has a comprehensive climate change plan. It implemented a low carbon tax on 1 October 2007.
Saskatchewan	Target: 2004 – 32% by 2020 and 2004 – 80% by 2050. Saskatchewan’s plan consists of five “emission reductions wedges” for energy efficiency, CO ₂ capture and storage, renewable energy, non-CO ₂ emissions, and carbon sequestration by forests and soils.
Sources: Canada, 2007; David Suzuki Foundation, 2006; and provincial government websites.	

Table 2: Climate Change Targets and Policies of the Federal Government and the Provinces

Mexico's greenhouse gas emissions increased at an average annual rate of 2.2% from 1990 to 2002.^{xi} Although Mexico does not have an emissions limitation commitment under the Kyoto Protocol, it has underway, or is planning to implement, emission reduction measures in several sectors.

3 Existing and Proposed Emissions Trading Schemes

North America is characterized by state and provincial initiatives to establish regional emissions trading schemes as well as initiatives to establish national emissions trading schemes. This section summarizes those initiatives.

3.1 Membership of the Regional Emissions Trading Schemes

Three regional emissions trading schemes have been established by the states and provinces as shown in Table 3. There is a small amount of overlap with Manitoba being a member of both the Midwestern Accord and the Western Climate Initiative (WCI) and Kansas being a member of the Midwestern Accord and an observer of the WCI.

In 2001 the premiers of the five eastern provinces (Quebec, New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador) and governors of six New England states (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut) adopted a climate change action plan with the goal of reducing regional greenhouse gas emissions to the 1990 level by 2010 and by at least 10% below the 1990 level by 2020.

Although climate change action has been discussed at their annual meetings since 2001, no regional initiatives have been agreed. The six New England states are all members of the Regional Greenhouse Gas Initiative. Quebec is a member of the Western Climate Initiative. The other provinces prepared climate change plans, but allowed them to lapse and have only recently started to address the issue again.

3.2 Emissions Trading Schemes

3.2.1 Alberta

The province of Alberta implemented an emissions trading scheme effective 1 July 2007. It requires industrial facilities that emit more than 100,000 tonnes of greenhouse gases per year to reduce their emissions *intensity* by 12%. Companies can comply by reducing the emissions intensity of their operations, buying credits for emission reductions or sink enhancements in Alberta, or contributing \$15/tCO_{2e} to the Climate Change and Emissions Management Fund.^{xii}

The Alberta scheme has no provisions for a link of any kind to any other emissions trading scheme. The intensity target, price cap and offset credits, which do not have an additionality requirement, are likely to deter other schemes from establishing a link with the Alberta scheme.

Regional Greenhouse Gas Initiative (RGGI)	Western Climate Initiative (WCI)	Midwestern Regional GHG Reduction Accord
Members	Members	Members
Connecticut	Arizona	Illinois
Delaware	British Columbia	Iowa
Maine	California	Kansas
Maryland	Manitoba	Manitoba
Massachusetts	Montana	Michigan
New Hampshire	New Mexico	Minnesota
New Jersey	Ontario	Wisconsin
New York	Oregon	Observers
Rhode Island	Quebec	Indiana
Vermont	Utah	Ohio
Observers	Washington	South Dakota
Pennsylvania	Observers^a	
	Alaska	
	Colorado	
	Idaho	
	Kansas	
	Nevada	
	Saskatchewan	
	Wyoming	

Note: a: The Mexican states of Baja California, Chihuahua, Coahuila, Nuevo Leon, Sonora, and Tamaulias are also observers.

Sources: Initiative websites: <http://www.rggi.org/states>,
http://www.westernclimateinitiative.org/View_all_Observers.cfm;
<http://www.midwesterngovernors.org/govenergynov.htm> and Pew Center on Global
Climate Change,
http://www.pewclimate.org/what_s_being_done/in_the_states/regional_initiatives.cfm

Table 3: Members and Observers of the Regional Emissions Trading Schemes

3.2.2 Regional Greenhouse Gas Initiative

As shown in Table 3, the Regional Greenhouse Gas Initiative (RGGI) includes ten northeastern states. The scheme covers the CO₂ emissions of electricity generators with a capacity of 25 MW or more and comes into effect on 1 January 2009.^{xiii} The cap is constant from 2009 through 2014 then declines by 2.5%/year for a total reduction of 10% by 2018. At least 25% of the allowances must be sold with revenue being used for consumer benefits such as energy efficiency. Most states plan to auction all of the allowances.

Emission reductions relative to the reference case will be approximately 5 MtonsCO₂e in 2012 and approximately 15 MtonsCO₂e in 2018.^{xiv} Prices have been estimated to increase gradually from US\$2 in 2009 to US\$3.75 in 2018.^{xv} At the initial auction in September 2008, over 12.5 million allowances were sold at a clearing price of \$3.07 per allowance.^{xvi}

Participants can use offset credits to help achieve compliance. Participants are allowed to use credits from specified offset projects in eligible states for up to 3.3% of their compliance obligation.^{xvii} If the allowance price averages more than (2005)\$7, the limit on credit use rises to 5%.^{xviii} If the allowance price averages more than (2005)\$10, the limit on credit use rises to 10% and credits can be units issued by the United Nations Framework Convention on Climate Change (UNFCCC) or an approved emissions trading scheme outside the United States.^{xix}

RGGI, then, has a unilateral link with the mechanisms under the UNFCCC, such as the Clean Development Mechanism (CDM) and Joint Implementation (JI), and with any other approved emissions trading scheme if its allowance price remains above (2005)\$10. That link, of course, would not be used unless the price of RGGI allowances approached the price of the eligible units, such as CERs, ERUs and EUAs.^{xx} Those units currently have prices around (2005)\$20/ton.^{xxi} The RGGI rule does not include a provision for a bilateral link with another emissions trading scheme.

Other schemes might consider establishing a unilateral link with RGGI to access its relatively low cost allowances. But the tiered offset mechanism and three or four year compliance period might deter schemes with annual compliance from linking with RGGI.

3.2.3 Western Climate Initiative

States and provinces that are partners in the Western Climate Initiative (WCI) have agreed to reduce their greenhouse gas emissions to 15% below their 2005 level by 2020. A recommended design for an emission trading scheme was released in September 2008.^{xxii} The scheme will be launched at the start of 2012. There will be annual emissions caps with a three year compliance period.

Initially, the scheme will cover large emitters; sources with annual emissions over 25,000 tCO_{2e}.^{xxiii} Beginning in 2015 coverage will be extended to the emissions associated with fossil fuels sold for transportation, heating and other purposes. At least 10% of the allowances will be auctioned rising to a minimum of 25% by 2020. Allocation rules for free allowances may be coordinated to address competitiveness concerns.

Participants will be allowed to use credits from WCI offsets and allowances from other greenhouse gas emissions trading schemes for compliance.^{xxiv} The maximum use of offsets and allowances from other schemes is 49% of the emission reductions from 2012 to 2020, although individual partners may set lower limits. Allowances and credits issued by any partner will be valid for compliance use in all WCI jurisdictions.

Participants will be able to use CDM credits (CERs) for compliance, although partners may establish additional criteria to ensure they are comparable to WCI offsets. Credits for emission reductions by developed country sources covered by the WCI scheme will not be eligible.^{xxv} Although the design clearly states that allowances from other schemes can be used for compliance, it does not mention the criteria or process for determining the schemes whose allowances can be used.

An analysis of the economic impact of the WCI estimated that the price of an allowance will be between \$18 and \$71 when the scheme starts trading in 2012. Point Carbon reports that a WCI link to RGGI could drive up the price of RGGI allowances.^{xxvi}

In summary, the WCI proposes unilateral links with the CDM, possibly subject to additional criteria, to JI for credits from sources not covered by the WCI, and to other, unspecified, emissions trading schemes. The recommended design does not include a provision for a bilateral link with another emissions trading scheme.

3.2.3.1 British Columbia

British Columbia passed legislation in 2008 to enable implementation of a greenhouse gas emissions trading scheme in the province (British Columbia, 2008). The legislation establishes the framework for an emissions trading scheme and leaves the details to be specified by regulation.^{xxvii} The WCI design could be implemented in this manner. The government may adopt regulations stipulating that other units are accepted as Recognized

Compliance Units (RCUs).^{xxviii} Such RCUs may then be traded by regulated operations or retired for compliance purposes.

British Columbia implemented a carbon tax of C\$10/tCO₂ rising C\$5/tCO₂ per year to C\$30/tCO₂ in 2012. Large sources in British Columbia covered by the WCI will pay the carbon tax on the fossil fuels they purchase. To avoid double regulation of these emissions, the tax on the fossil fuels consumed could be refunded to those entities. The WCI design explicitly recognizes that British Columbia may use its carbon tax to address emissions from transportation fuels and fuel use by residential and commercial sources instead of including those emissions in the trading scheme in 2015.

3.2.3.2 California

California's Global Warming Solutions Act of 2006 set an enforceable target of reducing the state's greenhouse gas emissions to 1990 levels by 2020. It makes the California Air Resources Board (CARB) responsible for adopting the measures needed to achieve the target and allows for the use of market mechanisms.

An Executive Order of the Californian Governor explicitly calls for the development of a "program that permits trading with the European Union (...) and other jurisdictions" (California, Governor of the State of California, 2006). The Market Advisory Committee (MAC) recommended design options for a trading scheme and stated that "[I]inkages with other mandatory GHG trading systems should be encouraged" (MAC, 2007). The CARB's draft plan for meeting the targets includes an emissions trading scheme linked with the WCI scheme (CARB, 2008). The plan was approved in December.^{xxix}

3.2.3.3 Ontario and Quebec

Ontario and Quebec signed a Memorandum of Understanding in June 2008 to work on the development of a cap-and-trade system for greenhouse gas emissions that could be in place as early as 2010 (Ontario, 2008). This collaboration is aimed at making links with broader North American and international cap-and-trade systems and providing an intergovernmental forum between Canadian provinces and territories. Since both are partners in WCI, the design of the scheme is likely to be similar to that of the WCI.

3.2.4 Midwestern Regional Greenhouse Gas Reduction Accord

In November 2007 participating jurisdictions agreed to establish greenhouse gas reduction targets, develop a market-based and multi-sector cap-and-trade scheme to help achieve the targets, and develop and implement other associated mechanisms and policies as needed to achieve the targets.

They agreed that the cap-and-trade scheme should:

- enable linkage to other jurisdictions' schemes to create economies of scale, increase market efficiencies, diversity and liquidity, while reducing costs;
- maximize economic and employment benefits, while minimizing any transitional job losses;
- reduce the shifting of generation and emissions to non-participating states;
- credit past and present actions to reduce greenhouse gas emissions; and
- address potential interaction or integration with a future federal program.

The initial deadline of November 2008 for the design of the cap-and-trade scheme will not be met and the design will not be ready until May 2009 at the earliest. Although no details on the design of the Midwestern scheme are yet available, the ability to link with other schemes is one of the basic criteria for the design.

3.2.5 Florida

The Florida Climate Protection Act, adopted in June 2008, authorizes the Department of Environmental Protection to develop an electric-utility greenhouse gas cap-and-trade scheme. Pending legislative approval of the final plan, the cap-and-trade scheme could begin operation as soon as 1 January 2010. The target will be to reduce electric sector emissions to 2000 levels by 2017, 1990 levels by 2025, and 80 percent below 1990 levels by 2050.

The Governor's Action Team on Energy and Climate Change recommended that Florida advocate a strong federal cap-and-trade program and join one or more of the regional (RGGI or WCI) programs (Florida, 2008).

3.2.6 Canada

Canada is implementing an emissions trading scheme for greenhouse gas emissions by large emitters to take effect on 1 January 2010 (Canada, 2008). The scheme will cover large facilities (those with emissions over 100 kt CO₂/yr) in the following sectors: electricity generation produced by combustion; oil and gas; forest products; smelting and refining; iron and steel; some mining; and cement, lime, and chemicals. The scheme will cover approximately 50% of Canada's greenhouse gas emissions.

Each existing facility will have an intensity allocation (tCO₂/unit of output). The intensity allocation for 2010 will be an 18% reduction from 2006 excluding fixed process emissions. The intensity allocation then drops by 2% per year through 2015. What happens after that is not specified. For a new facility the intensity allocation starts in the fourth year of operation, based on data from its third year of operation, and declines by 2% per year.

To comply with its allocation, a facility can:

- reduce its emissions through abatement actions;
- contribute to a technology fund;
- purchase surplus allowances from other participants;
- purchase emission reduction credits from non-regulated activities;
- purchase credits from the Clean Development Mechanism; and
- use credits for early action by firms that took verified action to reduce their greenhouse gas emissions between 1992 and 2006.^{xxx}

Contributions to the Technology Development Fund are a compliance option through 2017. The share of the total compliance obligation that can be met through contributions declines from 70% in 2010 to 10% in 2017 and zero thereafter. The price rises from C\$15/tCO_{2e} in 2010 to over C\$20/tCO_{2e} after 2013. The fund will invest in a projects expected to educe greenhouse gas emissions within ten years.

Credits will be issued for non-regulated activities where emission reductions can be accurately quantified and verified at a reasonable cost. Examples of possible projects include the capture of landfill gas to generate electricity, energy-efficiency projects, and projects that store carbon in agricultural land. A firm will be allowed to use CERs, with the exception of those originating from forest sink projects, for up to 10% of its target.

In addition to the limited unilateral link to the CDM, Canada will consider linking with state, regional or national regulatory-based emissions trading schemes in the United States. Cooperation on emissions trading with Mexico will also be explored.^{xxxii} Initially, export of allowances and credits from Canada will not be allowed so the scope for bilateral links will be limited. The intensity target and price cap are likely to deter other schemes from establishing a link with the Canadian scheme.

3.2.7 United States

Bills to regulate greenhouse gas emissions have been introduced in the Congress regularly since 1998. Most of the bills include an emissions trading scheme. (Paltsev, et al., 2008) The bill that has advanced furthest was America's Climate Security Act (ACSA); the Boxer substitute amendment to the Lieberman-Warner bill which was defeated in the Senate. While federal initiatives to regulate greenhouse gases are virtually certain in 2009, the nature of those initiatives is unknown given the new president, new chairs for key Congressional committees, and Supreme Court decisions.^{xxxiii} (Hight and Silva-Chávez, 2008)

Several of the recent bills would permit participants to use offset credits and foreign allowances toward their compliance requirements. The ASCA, for example, would have allowed:

- Credits for domestic offsets from agricultural and land-use, land-use change and forestry (LULUCF) activities, and emissions not covered by the emissions trading scheme. Credits issued are limited to 15% of the emissions cap for the year.
- Credits for allowances and credits from other countries up to 5% of the US emissions cap for the year. Allowances must be issued by a foreign government for a scheme with mandatory absolute tonnage limits on emissions that is of comparable stringency. International credits would have to meet the requirements established by the act for US offsets and would not be allowed to come from facilities directly competing with US facilities.
- International forest carbon credits for up to 10% of the US emissions cap for the year. These credits would be awarded for national level reductions in deforestation and forest degradation in countries that have a national forestry baseline.

In total, the bill would therefore allow the use of external units to up to 30% of a year's cap. If the limit on a particular category is not exhausted, it would be possible to use units from other categories. Unused units in each category can be carried over with no restrictions.

The proposal provides a limited unilateral link to emission reduction credits and emission allowances from other countries. The use of such credits and allowances is limited to 5% of the US cap unless there were insufficient domestic or international forest credits to meet their respective caps.

Foreign credits, such as CERs and ERUs, would need to meet the same requirements as domestic offsets. Since domestic offsets will come mainly from the agriculture and forest sectors, most CERs and ERUs will come from different sectors. It is not clear whether foreign credits would be excluded if they come from sectors not eligible to generate domestic offsets. Foreign credits also could not come from facilities that compete directly with American facilities. That could lead to exclusion of some credits from countries that are large trading partners of the US, such as Canada, Mexico and China.

Foreign allowances would need to be issued by a foreign government for a scheme with a mandatory absolute tonnage limit on emissions that is of comparable stringency to the US scheme. That would exclude the Canadian scheme due to its intensity allocation. The EU emissions trading scheme probably would qualify.

There was no provision in the bill for a bilateral link with another emissions trading scheme. Canada has indicated an interest in linking with state, regional or national regulatory-based emissions trading schemes in the United States. The EU probably would not be willing to

link to an American scheme as proposed in the ASCA because the cost containment provisions would keep the price below that in the EU ETS thus leading to large purchases of American allowances by European entities. A large wealth transfer to the US due to less stringent emissions reduction targets is unlikely to be palatable to the EU. (Sterk, 2008).

4 Overlap of National and State/Provincial Emissions Trading Schemes

If all of the proposed emissions trading schemes are implemented, the national schemes would overlap with the state/provincial schemes. It is unlikely that entities in selected states or provinces would be subject to two emissions trading schemes – both a national and a state or provincial scheme. The potential overlap is likely to be resolved differently in the United States and Canada.

4.1 United States

The U.S. Constitution provides that federal law will govern in the case of a conflict with state law. Preemption of state law can occur in at least three distinct circumstances. A federal statute may contain language declaring that the states may not regulate in a particular area (express preemption). A state law that directly conflicts with or frustrates a federal law may be deemed to be preempted by the federal law (implied preemption). Implied preemption may also occur if a court determines that Congress has so pervasively regulated a field that there is no room left for state action (occupying the field). (Litz, 2008)

Jurisdiction for other complex problems has been shared by the federal and state governments. (Litz, 2008) A comprehensive national climate change program, then, is likely to involve a mix of federal and state responsibilities.

If a federal emissions trading scheme is implemented, the possible roles for state governments are limited. (Litz, 2008; Litz and Zyla, 2008) A state could implement more stringent requirements for the same sources. New York, for example, has an emissions trading scheme for SO₂ emissions by electric utilities that applies to the same sources, but is more stringent than, the national acid rain SO₂ trading scheme. (Litz, 2008) This is ineffective since compliance with the state cap leaves sources with surplus federal allowances they can sell to out-of-state sources.

Litz and Zyla recommend that “Congress should allow states ... full or partial control of their federal emissions allowance budgets, the ability to receive allowances for reductions achieved through complementary programs, the ability to petition the federal government to strengthen the program, or the right to opt out of the federal program and into a single more aggressive alternative.”^{xxxiii}

A federal emissions trading scheme is likely apply nationally, but few states, if any, are likely to maintain a state scheme if a federal scheme is implemented. Giving states some control of the state allowance budgets of a federal scheme is a more effective way to address their interests.

4.2 Canada

The national emissions trading scheme is being implemented by regulation under the Canada Environmental Protection Act (CEPA). CEPA allows equivalency agreements with provincial governments. When an equivalency agreement is approved, the federal regulations are suspended, so that only the provincial regime applies. The federal government has indicated that it will seek to establish equivalency agreements with provincial governments.^{xxxiv}

The result would be provincial schemes in provinces that want, and are able, to establish that their schemes are equivalent to the national scheme. The national scheme would apply only in the other provinces.

The legal requirements needed to establish equivalency are not clear. Implementation of the national and provincial emissions trading schemes might lead to legal action to clarify the requirements. It is not clear whether equivalence could be established on the basis of similar design, comparable results or either. Alberta adopted an intensity design similar to the proposed national scheme, in part, to facilitate establishing equivalence. British Columbia, Ontario and Quebec are committed to absolute caps and would need to demonstrate comparable results, if that test of equivalence is allowed.

The federal government plans to move from emission-intensity targets to fixed emission caps between 2020 and 2025. But that transition will take into account developments in other countries, especially the United States.^{xxxv} When, and if, the national scheme moves to an absolute cap, some of the provincial schemes might need to change or lose their equivalency agreements.

In short, a combination of provincial schemes and a national scheme that applies in the remaining provinces is a real possibility initially. But the mix of schemes could change over time.

5 Prospects for Linking North American Emissions Trading Schemes

Given the uncertainty surrounding the implementation of possible national and regional emissions trading schemes, the prospects for linking are best discussed for different scenarios. For the United States linking with foreign schemes is considered for the following scenarios (1) a federal scheme only, (2) a federal scheme together with one or more state schemes, and (3) multiple regional schemes. For Canada linking with foreign schemes is considered for the following scenarios (1) a federal scheme only, (2) a federal scheme and one or more provincial schemes, and (3) a revised federal scheme with a link to a federal scheme in the United States. Sufficient details on Mexico's plans are not available to analyse possible linkages.

5.1 Linking Scenarios for the United States

5.1.1 A Federal Scheme Only

A federal emissions trading scheme would probably establish a declining absolute cap, possibly with some state control over their allowance budgets, and permit the use of foreign allowances and credits subject to quantitative and qualitative restrictions. America's Climate Security Act (ACSA), for example, restricted foreign credits and allowances to between 15% and 30% of the cap depending upon the availability of domestic offsets. Foreign credits had to meet the same requirements as domestic offsets. And foreign allowances had to be issued by a foreign government for a scheme with a mandatory absolute cap of comparable stringency to that of the US scheme.

Such provisions might allow unilateral links with the provincial schemes with absolute caps but not the national scheme in Canada, sectoral schemes in Mexico, the EU ETS, and some CDM, JI or REDD credits.^{xxxvi} That would create an indirect link with the parties to a post-2012 agreement under the UNFCCC. Canada has expressed an interest in linking with a regulatory-based emissions trading scheme in the United States and might modify its proposed scheme to facilitate such a link.

5.1.2 A Federal Scheme Together with One or More State Schemes

Experience with other issues suggests that the federal scheme would apply nationally, but that states could implement more stringent requirements for the same sources. (Litz, 2008) Based on current targets, the WCI might continue to exist and at most ten states might continue to have state schemes.^{xxxvii}

The prospects for linking with the federal scheme would be the same as described in the previous section. Since the state schemes are more stringent than the federal scheme, their linking provisions presumably would be more restrictive – smaller quantities and more stringent qualitative criteria. This may create niche state markets with higher prices for the eligible foreign allowances and credits, but it does not change the federal market for imported units.^{xxxviii}

5.1.3 Multiple Regional Schemes

Assume multiple regional emissions trading schemes, but no federal scheme, are implemented in the United States. Although there could be more schemes, including the Midwestern Regional Greenhouse Gas Reduction Accord, this discussion focuses on RGGI and WCI since they are the only ones for which proposed designs are available.

RGGI participants could purchase credits generated by offsets projects in any state with a cooperating regulatory agency, which could include WCI partner states. The WCI may approve and certify offset projects located throughout the United States, Canada and Mexico. Both schemes share some of the same types of eligible offset projects. Both schemes also propose to allow the use of CDM credits subject to some restrictions. RGGI has a more restrictive quantity limit on the use of offsets than WCI.

Thus, the schemes could be effectively linked to each other and to foreign schemes through their domestic offset and CDM provisions. They would need to agree on the protocols for their respective offset projects.^{xxxix} If there are only a few regional emissions trading schemes, they likely would explore other options for linking as well.

5.2 Linking Scenarios for Canada

5.2.1 A Federal Scheme Only

Canada's proposed federal emissions trading scheme offers limited scope for linking. A firm will be allowed to use CDM credits, with the exception of those originating from forest sink projects, for up to 10% of its target. In addition, Canada will consider linking with state, regional or national regulatory-based emissions trading schemes in the United States and possible schemes in Mexico.

Due to its intensity target, the allowances and credits issued by the Canadian scheme are unlikely to be acceptable to any scheme with an absolute cap including a federal scheme in the United States, RGGI and WCI. The link to the CDM would create an indirect link with many other schemes that also accept some CDM credits.

5.2.2 A Federal Scheme and One or More Provincial Schemes

Canada's federal scheme could enter into equivalency agreements with one or more provincial schemes. The most likely provincial schemes are the existing scheme in Alberta and a possible scheme(s) in British Columbia, Manitoba, Ontario and/or Quebec, all of which are WCI partners. Thus, the provincial scheme(s) in those provinces likely would be similar to the WCI design.

The proposed federal scheme allows trading of allowances and domestic offset credits across Canada. Apart from limited use of CDM credits, it has no provisions for linking with other emissions trading schemes.

The equivalency agreements, presumably, could include provisions for mutual recognition of allowances and offset credits – bilateral links. For example, a British Columbia scheme could agree to accept federal allowances and credits and the federal scheme could agree to accept British Columbia allowances and credits, thus linking the two schemes. It could be argued that such a bilateral link, with no quantitative or qualitative restrictions, must be a requirement of an equivalency agreement otherwise the agreement reduces the market from what it would be under a federal scheme alone.

The Alberta scheme has no provisions for a link of any kind to any other trading scheme and may resist a requirement to link with a federal scheme. The provinces that are WCI partners might prefer not to link with the federal scheme due to its intensity target. Thus, although it could be argued that a bilateral link should be part of an equivalency agreement, political considerations on both sides could limit such links.

Links with schemes outside Canada could be limited as well. The federal scheme, as discussed in the previous section, is unlikely to have a link with any other scheme except for the limited use of CDM credits. Alberta has expressed no interest in linking with any other scheme. The other provincial schemes might wish to have links with other schemes. However, the equivalency agreement includes bilateral federal-provincial links, it might restrict the links to those in the federal scheme because a foreign link for any provincial scheme would then apply indirectly to all federal and provincial schemes.

If the equivalency agreements do not require bilateral links, the result could be a few, largely or completely isolated, emissions trading schemes operating in different provinces. If bilateral links are part of the equivalency agreements, the foreign links are likely to be limited as in the case of a federal scheme only.

5.2.3 A Revised Federal Scheme Linked with a Federal Scheme in the United States

Canada plans to move from emission-intensity targets to fixed emission caps between 2020 and 2025, but might do so earlier to facilitate development of a North American emissions

trading scheme. Since one, perhaps the main, reason for changing the design would be to link with an American (and possibly Mexican) scheme, it is safe to assume that the Canadian scheme at least would include additional linking provisions.

A switch to an absolute cap by the federal scheme could affect provincial schemes with equivalency agreements. Those schemes would need to change to be equivalent to the revised federal scheme. That would entail bigger changes for the Alberta scheme with its intensity targets than for provincial schemes with absolute caps.

6 Conclusions

A number of greenhouse gas emissions trading schemes have been implemented or proposed for Canada, the United States and Mexico. Links among those schemes make sense given the close economic ties between the countries. North-south ties across the national borders are often closer than east-west ties within the same country and this is reflected in the membership of some of the regional schemes.

All of the existing and proposed schemes, except Alberta, include provisions for unilateral use of credits and/or allowances from other schemes. But those provisions all include quantity restrictions and qualitative restrictions, for example that the allowances come from a scheme of comparable stringency.

A federal scheme in the United States is likely to replace state schemes, with the possible exception of a few states with more stringent schemes, especially if states are given a role in implementation of the federal scheme. In Canada provinces that want, and are able, to establish that their schemes are equivalent to the federal scheme could continue to operate.

A federal emissions trading scheme in the US would probably establish a declining absolute cap and permit the use of foreign allowances and credits subject to quantitative and qualitative restrictions. State schemes might create niche markets with higher prices for the eligible foreign allowances and credits, but would not change the federal market. Absent a federal scheme, the regional schemes would likely explore linking options beyond their domestic offset and CDM provisions. Any of these structures might allow unilateral links with the provincial schemes with absolute caps, but not the national scheme, in Canada, sectoral schemes in Mexico, the EU ETS, and some CDM, JI or REDD credits.

Canada's proposed federal emissions trading scheme offers limited scope for linking. If the equivalency agreements with the provincial schemes do not require bilateral links, the result could be a few, largely or completely isolated, emissions trading schemes operating in different provinces. If bilateral links are part of the equivalency agreements, the foreign links are likely to be limited as in the case of a federal scheme only. Canada will have to modify its proposed scheme to achieve its expressed desire of linking with regulatory-based emissions trading schemes in the United States and Mexico.

7 References and Notes

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Notes

ⁱ Data from CAIT for 2004 CO₂ emissions excluding emissions due to land use, land use change and forestry (LULUCF) indicate that the United States is the largest emitter with 21.27% of the global total, Canada ranks 7th with 2.03% and Mexico ranks 13th with 1.43% of the global total. Emissions of all greenhouse gases including LULUCF for 2000 indicate that the United States is the largest emitter with 15.47% of the global total, Canada ranks 10th with 1.84% and Mexico ranks 11th with 1.61% of the global total

ⁱⁱ The Global Carbon Project estimates that China's total fossil CO₂ emissions surpassed those of the US in 2006.

ⁱⁱⁱ Reported by Reuters, Poznan, Poland, December 11, 2008.

^{iv} From Pershing, 2007.

^v Source: <http://cait.wri.org/cait-us.php?page=yearly>. Includes all greenhouse gases, but not LULUCF emissions.

^{vi} Pershing, 2007. The figures may now be different since a few more states have adopted targets during 2008.

^{vii} Canada, 2007, p.14, "The Government of Canada will not purchase credits or otherwise participate in the carbon market."

^{viii} Canada, 2008b.

^{ix} From Drexhage, 2007.

^x From Drexhage, 2007. The Atlantic region includes the provinces of Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

^{xi} Mexico, 2006.

^{xii} For the last six months of 2007 participants complied by contributing almost \$40 million to the Fund (about 2.6 million tCO₂e) and reducing emissions at their own facilities or through emission reduction or sink enhancement projects by about 2.6 million tCO₂e.

^{xiii} There will be approximately 225 participants and the initial cap will be approximately 188 million tons of CO₂.

^{xiv} Updated results, October 11, 2006. Available at: <http://www.rggi.org/about/history/modeling>. Note these are short tone (2,000 pounds) rather than metric tonnes (2,205 pounds).

^{xv} Updated results, October 11, 2006. Available at: <http://www.rggi.org/about/history/modeling>

^{xvi} Point Carbon, 2008. Vol. 3, Issue 20, 8 October 2008.

^{xvii} Eligible project types include: landfill methane capture and destruction; reduction in emissions of SF₆; sequestration of carbon due to afforestation; reduction or avoidance of CO₂ emissions from natural gas, oil, or propane combustion due to end-use energy efficiency in the building sector; and, avoided methane emissions from agricultural manure management. Other project types may be added. The project can be located in any RGGI state or any other US state in which a cooperating regulatory agency has entered into a Memorandum of Understanding with the RGGI states to provide oversight support related to CO₂ emissions offset projects in its jurisdiction.

^{xviii} A twelve month rolling average allowance price equal to or above \$7 adjusted for inflation from 2005 is a “stage one trigger event”.

^{xix} A twelve month rolling average allowance price equal to or greater than \$10 adjusted for inflation from 2005 is a “stage two trigger event”. In that case participants may use “allowances or credits issued pursuant to any governmental mandatory carbon constraining program outside the United States that places a specific tonnage limit on greenhouse gas emissions, or certified greenhouse gas emissions reduction credits issued pursuant to the United Nations Framework Convention on Climate Change (UNFCCC) or protocols adopted through the UNFCCC process”. The compliance period is also extended from three to four years.

^{xx} Certified emission reductions (CERs), emission reduction units (ERUs) and European Union allowances (EUAs) are, respectively, the units of the Clean Development Mechanism (CDM), Joint Implementation (JI), and the European Union emissions trading scheme (EU ETS).

^{xxi} The current prices of these units need to be adjusted to 2005 US dollars and to reduce the quantity from 1 metric tonne to 1 short ton.

^{xxii} See WCI, 2008.

^{xxiii} Coverage will include electricity generated outside the region that is sold in WCI jurisdictions.

^{xxiv} Given the broad coverage of the scheme, offsets are expected to come from soil sequestration, forestry and waste management.

^{xxv} For example, JI credits for emission reductions by electricity generators in developed countries will not be eligible.

^{xxvi} Point Carbon, 2008, Vol. 3, Issue 20, 17 October 2008.

^{xxvii} No regulations have been elaborated to date.

^{xxviii} This could include allowances and credits from other WCI jurisdictions, allowances from other emissions trading schemes, and CDM and other credits accepted by the WCI.

^{xxix} Press Release 08-102 December 11, at <http://www.arb.ca.gov/newsrel/nr121108.htm>.

^{xxx} Firms covered by the emissions trading system that reduced their greenhouse gas emissions between 1992 and 2006 can apply for credits for the reductions achieved. A maximum of 15 MtCO₂ will be allocated, with no more than 5 MtCO₂ to be used in any one year.

^{xxxi} The Conservative Party, which was the governing party when the plan was prepared, states in its election platform that it will aim to create a cap-and-trade system with Mexico and the US to take effect in 2015.

^{xxxii} The President could submit draft legislation to Congress. Members of Congress could propose bills. The Supreme Court could order the Environmental Protection Agency to regulate greenhouse gas emissions under the Clean Air Act in response to its April 2007 decision on the issue.

^{xxxiii} Litz and Zyla, 2008, p. 7.

^{xxxiv} Canada, 2008a, p.iii.

^{xxxv} Canada, 2008a, p. 21.

^{xxxvi} Inclusion of credits for reductions in deforestation and forest degradation (REDD) in developing countries is being considered for a post-2012 agreement under the UNFCCC.

^{xxxvii} The WCI design recommendations state that the proposed design can “stand alone, provide a model for, be integrated into, or be implemented in conjunction with programs that might ultimately emerge from the federal governments of the United States and Canada.” WCI, 2008, pp. 13-14.

^{xxxviii} States in the WCI could import CDM credits, possibly subject to additional criteria, JI for credits from sources not covered by the WCI, and allowances from other, unspecified, emissions trading schemes that meet the established criteria.

^{xxxix} RGGI would need to accept that the WCI includes Canadian and Mexican jurisdictions and that allowances and offset credits from those jurisdictions would affect the quantity of offset credits from American projects that could be sold to RGGI participants. Given the levels of domestic offset credit use allowed – 3.3% and 5% – this may not be a serious concern.