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Review of the report does not necessarily mean endorsement, and any errors remain the authors' responsibility.

Overview of the North American Climate Policy Landscape at the National and Subnational Levels

Preconference paper for the North American Climate Policy Forum

Table of Contents

Introduction	0
Section I: Overview of Paris Agreement Pledges & Opportunities.....	1
Canada’s Pledge.....	1
United States’ Pledge.....	1
Mexico’s Pledge.....	2
Opportunities for Linking Climate Policy across Countries in the Paris Agreement	3
Section II: Existing National and State-level Policy Landscapes.....	4
Canada.....	4
Recent Federal Policies	4
Sub-national Policies.....	5
United States.....	8
Recent Federal Policies	8
Sub-national Policies.....	10
Mexico.....	11
Federal Policies.....	11
Section III: Existing North American Climate Policy Linkages.....	12
United States – Canada	12
United States – Mexico	13
Mexico – Canada	14
Expanding to a Continental Scope – Recent Joint Statements between the Three North American Nations:.....	14
Conclusion	15

Overview of the North American Climate Policy Landscape at the National and Subnational Levels

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Introduction

The United States, Mexico, and Canada are the world's second, ninth, and eleventh largest greenhouse gas (GHG) emitters, respectively.³ As partners of one of the world's largest free trade zones, these three countries have a long history of economic collaboration, accompanied by a joint commitment to support each other to address environmental issues of continental concern.¹ As Parties to the UN Framework Convention on Climate Change (UNFCCC), each country has now also declared its intent to reduce GHG emissions through pledges delivered through the UNFCCC's Paris Agreement in December 2015. Given this history of collaboration, and provisions included in the Paris Agreement allowing for international emissions trading and emission reduction partnerships, the opportunity to take an efficient, coordinated and market-based approach to GHG reduction efforts in North America is substantial.

At the subnational level, California and Quebec's linked cap-and-trade system shows that jurisdictions with different economic and emission profiles can link their respective carbon markets, provided there is a common set of rules as facilitated through the Western Climate Initiative. In addition, Ontario and Manitoba's announced intentions to join this linked market, and Mexico's and California's 2014 Memorandum of Understanding (MOU) agreeing to increase climate collaboration, demonstrate an appetite at the subnational level to advance a coordinated approach to address climate change.

The current landscape just described is one of sub-national systems; with incomplete cross-jurisdictional linkage. This means that some sectors operating across sub-national jurisdictions with different policy frameworks will face uneven exposure to carbon pricing depending on where they are located in each country. This incomplete linkage has a number of consequences, including policy-induced competitiveness challenges.²

The North American Climate Policy Forum proposes to examine the potential options and implications of linking Canadian, U.S. and Mexican climate change policy, given the existing landscape of national and subnational systems already in place. Research tells us that linking jurisdictional emissions trading systems has the potential to reduce emissions more efficiently than unlinked systems^{3,4}, and could help to lower the transitional costs of decarbonizing the economy.⁵ Research also tells us that the rules adopted, and national regulatory frameworks enacted, will play key roles in determining the potential for linkage to be effective.^{6,7}

This background paper is meant to frame the current policy context as a base of discussion for all participants in the North American Climate Policy Forum. The first section of this paper reviews each country's GHG reduction commitments and describes the international policy linkage opportunities established under the Paris Agreement. The second section gives an overview of the current national policy landscapes, and the third section outlines existing policy linkages between national and subnational jurisdictions in North America.

³ Total GHG Emissions excluding land-use change and forestry (2012 numbers). Data taken from CAIT Climate Data. Retrieved from <http://cait.wri.org/Explorer>. For ranking purposes, we are not counting the European Union as a country.

Following the forum, we will release a companion paper to this one, charting a forward-looking research agenda that will address key questions and knowledge gaps identified during the conference discussions. That paper will identify opportunities and challenges to establishing a coordinated North American climate policy framework.

Section I: Overview of Paris Agreement Pledges & Opportunities

On December 12, 2015, the 195 countries (plus the European Union) that are Party to the U.N. Framework Convention on Climate Change adopted the landmark Paris Agreement. The Agreement dissolves the strict differentiation between developed and developing countries in terms of their obligations to reduce GHG emissions and allows Parties to submit their own emissions reduction actions (Nationally Determined Contributions, or NDCs). NDCs are voluntary commitments but are subject to mandatory reporting and review by the Agreement's signatories. In this section, we review the emissions reduction commitments under the NDC's pledged by the United States, Canada, and Mexico, and opportunities established in the Paris Agreement for linking climate policies internationally.

Canada's Pledge

In May 2015, the Canadian Federal Government submitted its intended NDC to the UNFCCC^b, which included an economy-wide target to reduce GHG emissions by 30% below 2005 levels by 2030.

Since submission of this NDC, Canada has had a federal election, which resulted in a change in the governing party. The new federal government — elected in October 2015 — decided not to revise the already-submitted NDC commitment ahead of the Paris Conference, but instead declared that the target should be seen as a “floor” — that is, a minimum reduction target that the federal government would likely seek to exceed. The new Federal Government also committed to meet and work with Canada's Provincial and Territorial Governments to discuss the level of ambition for Canadian climate change policy, the existing suite of sub-national climate change policies already in place, and the options for new national policies or mitigation strategies that may be adopted in pursuit of a national target.⁸

In line with this, in March 2016 the Prime Minister and provincial and territorial Premiers signed the Vancouver Declaration, agreeing to jointly develop a pan-Canadian framework for clean growth and climate change, and implement mitigation strategies that will enable Canada to meet or exceed its GHG reduction target.

The Vancouver Declaration also includes an agreement to adopt a broad range of mitigation measures, including carbon pricing, but the document does not provide specifics of how a national carbon pricing system would work. Another important outcome of the Vancouver meeting was the creation of working groups to identify options for action in four areas: carbon pricing mechanisms; clean technology, innovation and jobs; specific mitigation opportunities; and adaptation and climate resilience.⁹

United States' Pledge

The United States' intended NDC, submitted in March of 2015, reflects commitments made by President Obama in the 2013 Climate Action Plan.¹⁰ Specifically, the United States pledges to cut emissions by 17% by 2020, then 26-28% by 2025, against a 2005 baseline. Additionally, the commitment aims for deep, economy-wide emissions reductions of 80% or more by 2050. The pledge covers emissions of the full suite

^b United Nations Framework Convention on Climate Change.

of UNFCCC GHG categories, including carbon dioxide, methane, nitrous oxide, perfluorocarbons, hydrofluorocarbons, sulfur hexafluoride, and nitrogen trifluoride.

Many commentators believe that the U.S. pledges can be met without new laws being passed by Congress, but that they will require aggressive implementation of current climate policies and additional executive action.¹¹ Specifically, the U.S. will need to double its rate of emissions reductions from 1.2% per year to 2.3-2.8% per year between 2020-2025. The Obama administration plans to meet its emission reduction targets using the Clean Air Act, the Energy Policy Act, the Energy Independence & Security Act, and by mandating emissions reductions of 40% from Federal government operations by 2025.¹²

Mexico's Pledge

Mexico submitted its intended NDC in March of 2015. The NDC includes two types of mitigation commitments: unconditional and conditional. The unconditional portion — resulting from measures that Mexico will adopt with its own resources — commits Mexico to reduce its GHG and short-lived climate pollutants (SLCP) emissions by 25% by 2030, relative to business as usual (BAU) levels. This target, however, would still result in total emissions in 2030 being higher than 2013 levels.^c This commitment implies a reduction of 22% of GHGs and a 50% reduction of black carbon emissions relative to BAU.¹³

The conditional portion — subject to the availability of additional resources and transfer of technology via a new multilateral climate change agreement — would expand the unconditional reduction commitment from 25% to 40% relative to BAU levels. This would translate into a 36% reduction of GHGs and 70% reduction for black carbon emissions.¹⁴

In addition to a mitigation pledge, Mexico's NDC also includes an adaptation component. This component includes reducing the number of Mexican towns considered "most vulnerable" to climate impacts by 50% by 2030; cutting deforestation rates to 0% by 2030; and decreasing the vulnerability of the population while increasing its adaptive capacity through early warning systems, risk management, as well as hydro meteorological monitoring at every level of government.¹⁵

Paris Emissions Reduction Pledges in North America

	Canada	United States	Mexico
Emissions Reductions (% total GHG in baseline year)	17% by 2020, then 30% by 2030	17% by 2020, then 26-28% by 2025	22% by 2030 (unconditional) 36% by 2030 (conditional)
Target year	2030	2025	2030
Baseline Year	2005	2005	Business as usual levels
Estimated total emissions by target year with pledge (million metric tons of CO ₂ equivalent)	524 Mt. of CO ₂ e	4946.4 Mt. of CO ₂ e (with 28% reduction)	759 Mt. of CO ₂ e unconditional, or 623 Mt. of CO ₂ e conditional
Long Term Goal	Not specified	80% reduction by 2050	50% Reduction by 2050 (based on 2000 levels)

^c Business as usual scenario of emission projections is based on economic growth in the absence of climate change policies starting from 2013 (Mexico's NDC). Total GHG emissions in 2013 were 665 Mt. of CO₂e (2015 Mexico's Biennial Report)

Opportunities for Linking Climate Policy across Countries in the Paris Agreement

Besides setting emissions reduction goals and publishing national pledges, the Paris Agreement (Article 6) also allows countries to collaborate to generate “internationally transferred mitigation outcomes” (ITMOs), in which countries can jointly achieve their emissions reduction goals through mechanisms of their choosing.¹⁶ This could allow for the establishment of international emissions trading and project-based emissions reduction partnerships, which opens the door for trans-national climate policy linkage, through both market and non-market mechanisms. While not explicitly setting up a carbon trading market, ITMOs allow for the development of trading from the bottom-up, in keeping with the basic architecture of the Agreement, which focuses on Party-driven commitments to a global effort to reduce GHG emissions.¹⁷

The establishment of ITMOs allows Parties to “pursue voluntary cooperation in the implementation of their nationally determined contributions to allow for higher ambition in their mitigation and adaptation outcomes”.¹⁸ Cooperative mechanisms, including carbon markets, can be established to generate ITMOs from one country, which will fulfill the emissions reduction commitments of another country. This may take the form of carbon market linkages, emissions reduction projects in other countries funded by ITMO recipient countries, or other non-market mechanisms that are yet to be specified.¹⁹

Significant aspects of the ITMO mechanism established in the Paris Agreement include:

- **Voluntary participation:** No Party can be forced into participating, but also no Party is limited in its ability to participate as either an investor or recipient country. The latter term differs from the Kyoto Protocol’s Clean Development Mechanism, which limited involvement to developed countries investing in emissions reductions projects in developing countries.
- **Not market-specific:** Article 6 clearly encourages the implementation of *either* market-based and non-market mechanisms, addressing the concerns of some Parties regarding the use of markets for emissions reduction. Cooperative endeavors between countries that do not revolve around markets may include technology transfer programs or other types of agreements.
- **Ambition and accountability:** All efforts to establish and trade ITMOs must foster sustainable development, and be used to achieve higher levels of ambition than would otherwise be reached. A share of the proceeds from activities under these mechanisms will also be used to support administrative expenses and assist developing countries most vulnerable to climate change, although the exact details of this process have yet to be determined. Additionally, requirements around accounting and transparency maintain the integrity of any ITMO mechanisms and prevents the double-counting of emissions reductions.
- **Private/public partnerships:** Both public and private entities are encouraged to participate in market and non-market ITMO mechanisms, and the mechanisms should specifically “incentivize and facilitate” participation in GHG reductions by public and private entities. However, private entities are only allowed to participate when authorized by a Party.

The flexibility of approaches in the Paris Agreement allows countries to pursue international and public/private partnerships of any form that will enhance their emissions reductions potential. Particularly, for the North American context, the framework established in the Paris Agreement allows the United States, Canada and Mexico to build off of existing collaboration on climate change policies, such as carbon market linkages, trans-national carbon offset programs, energy efficiency programs, fuel standards, and more.

Section II: Existing National and State-level Policy Landscapes

Canada

While climate change — just like environmental protection — is not specifically mentioned under the Canadian Constitution, it has become an area of shared jurisdiction with action on climate currently undertaken by federal, provincial and territorial governments across the country.²⁰

The new federal government — elected in October 2015 — committed to working with the provinces to develop a pan-Canadian framework on clean growth and climate change. In March 2016, the Prime Minister and provincial and territorial leaders signed the Vancouver Declaration where they agree to implement mitigation measures that will allow Canada to meet or exceed its 2030 reduction target.²¹

To do this, First Ministers^d will explore a broad range of domestic measures that would help Canada transition to a low-carbon economy. This includes carbon pricing mechanisms adapted to the specific circumstances of each province and territory, taking into consideration the realities of Canada's indigenous people and Arctic and sub-Arctic regions.²²

The intended pan-Canadian framework is meant to build on existing provincial and territorial policies, in order to complement the system of sub-national carbon pricing policies currently in place across Canada. Working towards this, the Vancouver Declaration established working groups to identify options for action in four areas: carbon pricing mechanisms; clean technology, innovation and jobs; specific mitigation opportunities; and adaptation and climate resilience. Each working group has a mandate to evaluate impacts of economic and environmental outcomes and report back in time for the next First Ministers meeting scheduled for the fall of 2016. Members from federal, provincial and territorial governments lead and make up these working groups, while also including indigenous peoples in each one of the four groups. The Vancouver Declaration also encourages working groups to seek expert analysis and reports that will help support their findings, as well as engage stakeholders.

Recent Federal Policies

In the context of the 2009 Copenhagen Accord, and subsequent Cancun Agreement of 2010, Canada's previous Federal Government committed to reducing its GHG emissions by 17% by 2020 below 2005 levels. In order to achieve this target, the Government of Canada adopted a sector-by-sector approach, particularly focusing on two of the major sources of GHG emissions in the country: electricity and transportation.²³

Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations

In 2015, the Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations came into effect. These regulations set a stringent performance standard for new coal-fired electricity generation plants (those commissioned after July 2015) and those that have reached the end of their useful life^e — setting a limit of 420 metric tons of CO₂ for each gigawatt-hour of electricity produced from coal per year.

The introduction of these regulations supports a shift to lower or non-emitting types of generation such as high efficiency natural gas, renewable energy, or fossil fuel power with carbon capture and storage technology.²⁴ These regulations are projected to mitigate 3.1 Mt of CO₂ equivalent by 2020 (or 0.4% of total

^d First Ministers is a collective term used to define all Canadian heads of government including Canada's Prime Minister, and provincial and territorial premiers.

^e Which the regulation defines as 45-50 years of age.

2011 emissions), with the expectation that this will increase to 24.9 Mt of CO₂ equivalent (or 3.5% of total 2011 emissions) by 2030 as most of the country's coal-fired power plants reach the end of their useful life.²⁵

Energy Efficiency Regulations

The Government of Canada has established energy efficiency standards for a wide range of energy-consuming products. These regulations apply to products manufactured in or imported into Canada including household appliances, water heaters, heating and air conditioning equipment, lighting products, electronics, and other energy-using products. They are regularly amended to strengthen existing performance standards or introduce standards for new products,²⁶ and are also standardized with the U.S.'s ENERGY STAR's International Partnership labeling standards.²⁷

Fuel-Efficiency Standards

In the transportation sector, the Government of Canada has set progressively more stringent fuel-efficiency standards for passenger automobiles, light-duty trucks, heavy-duty vehicles and engines. It is expected that cumulative action from these regulations will result in GHG emissions from passenger vehicles and light-duty trucks decreasing by up to 50% for the 2025 model compared to 2008.²⁸ Canada worked with the U.S. to develop regulations that are aligned to the EPA's emission standards.

Renewable Fuel Regulations

Federal regulations mandate that gasoline and diesel contain a 5% and 2% content of renewable fuel based on the total volume of gasoline and diesel produced and imported to Canada. The Government of Canada estimates that 7 Mt. of GHG emission reductions have accrued since the regulations came into force in December 2010.²⁹ Several provinces and territories, including British Columbia, Alberta, Saskatchewan, Ontario and Manitoba, have also introduced their own regulations and incentive programs targeting renewable fuels.³⁰

Low-Carbon Economy Fund

Although the exact role the newly-elected federal government will play within a pan-Canadian climate Change framework is yet to be defined, in their recent federal budget the Government proposes to spend over CAD \$2.9 billion (USD \$2.21 billion) over the next two years — starting in 2016-2017 — to establish a Low-Carbon Economy Fund, which will support provincial and territorial actions for incremental GHG reductions — beyond current plans — within the period of Canada's nationally determined target.³¹

Sub-national Policies

Various provinces have introduced, or are preparing to introduce, mechanisms to price carbon.

British Columbia's Carbon Tax

British Columbia became the first province to price carbon by implementing a revenue-neutral tax on carbon emissions in 2008. The tax, which applies to almost all fossil fuels (oil, gas and diesel) based on their carbon content, was first introduced at a rate of CAD \$10 (USD \$7.63) per metric ton of CO₂ and increased annually until reaching a level of CAD \$30 (USD \$22.90) per metric ton of CO₂ in 2012 – where it has remained since.³² The tax covers approximately 70% of B.C.'s GHG emissions.³³ Empirical simulation models suggest that while the tax has reduced emissions in the province by 5-15%, its impact on aggregate economic performance in the province has been negligible.³⁴

British Columbia has recently initiated a review of its 2008 Climate Action Plan (which established the carbon tax). A Climate Leadership Team was appointed in May 2015, and released a series of recommendations in November. A phase of public engagement is now underway, before the release of British Columbia's new Climate Leadership Plan.

Alberta's Climate Leadership Plan

In 2007 Alberta introduced the Specified Gas Emitters Regulation (SGER), which requires large industrial emitters to annually reduce their site-specific emissions intensity. Compliance options include site-specific emissions reductions, purchases of emissions performance credits from other regulated facilities or Alberta-based carbon offset credits, or a contribution to Alberta's Climate Change and Emissions Management Fund (\$20 for every metric ton over the reduction target, increasing to \$30 as of Jan 1, 2017).

In November 2015, Alberta unveiled its new Climate Leadership Plan, which includes a CAD \$20 (USD \$15.27) per metric ton price on carbon starting in 2017 — scheduled to increase to CAD \$30 (USD \$22.90) the following year. In addition, the province also plans to phase-out coal-generated electricity by 2030, reduce methane emissions from the oil and gas sector by 45% by 2025, and legislate an oil sands emissions limit of 100 Mt. per year. Large Industrial Emitters will remain subject to the SGER framework until the end of 2017, at which point the Climate Leadership plan intends to transition from this regulation to a product and sector-based performance standard approach in 2018.³⁵

Quebec's Cap-and-Trade Program

Quebec also implemented a carbon tax in 2007, but this tax has now been superseded by a cap-and-trade regime introduced in the province in 2013. The policy sets a limit on emissions from regulated sectors, but it allows regulated facilities to trade emission allowances. As of February 2016, the cap-and-trade system had a final selling price of CAD \$17.64 (USD \$13.47) per metric ton of CO₂³⁶, and it is projected to cover 62% of emissions.³⁷ In 2013, Quebec officially linked its cap-and-trade system to California's system through the Western Climate Initiative — effectively becoming the largest carbon market in North America.

The Western Climate Initiative

In February 2007, five western U.S. states (Arizona, California, New Mexico, Oregon, and Washington) formed the Western Climate Initiative (WCI) — a voluntary partnership among sub-federal member jurisdictions intent on establishing regional emission reduction targets and a related emissions trading system. Soon after, additional U.S. states and Canadian provinces joined the initiative including Utah and Montana in the United States, and British Columbia, Manitoba, Ontario and Quebec in Canada.

This voluntary partnership developed a common set of guidelines to facilitate mutual cooperation to collectively reduce 15% of emissions by 2020. Contrary to the European Union's Emissions Trading System, the WCI is a non-binding voluntary agreement, which is not mandated by a higher authority and where each participating jurisdiction maintains autonomy to establish its own emission targets.

In 2011, all U.S. states, except California, withdrew from this partnership. None of the Canadian provinces that joined the initiative have formally withdrawn.

Source: Purdon M, Houle D and Lachapelle E. (2014)

Ontario's Cap-and-Trade and Climate Action Plan

Ontario will become the next province to introduce a cap-and-trade regime and has announced its intention to link its program with Quebec and California's cap-and-trade systems under the Western Climate Initiative.³⁸ Legislation was passed in May 2016 that will ensure that revenues raised through the economy-wide cap-and-trade system are invested in green projects designed to reduce GHG emissions.³⁹ Under the Climate Change Mitigation and Low Carbon Economy Act, all cap-and-trade auction proceeds will be deposited in a *Greenhouse Gas Reduction Account*, created to fund green projects including initiatives relating to energy use, land use and buildings, infrastructure, transportation, industry, agriculture and forestry, waste management, education and training, and research and innovation.

Building on this climate change legislation, the provincial government released its new Climate Action Plan on June 8th, 2016. The plan outlines key actions to combat climate change including increasing the use of electric vehicles through rebate programs for the purchase of these types of cars and offering free overnight electric vehicle charging; helping homeowners install low-carbon technologies in their homes; setting lower carbon standards for new buildings; and strengthening climate change policies in the municipal land-use planning process.⁴⁰

Manitoba's Cap-and-Trade Plans

In December 2015, Manitoba signed a MOU with Quebec and Ontario, signalling its intention to join the already linked Quebec-California carbon market. Manitoba's cap-and-trade system is expected to regulate large industrial emitters.⁴¹ However, to date, there is no planned timeline for implementation and it's unclear how Manitoba's recent change in government will impact the carbon pricing commitments of the previous government.

Newfoundland and Labrador's Management of Greenhouse Gas Act

On June 7th, 2016, the Government of Newfoundland and Labrador introduced the Management of Greenhouse Gas Act. For the next two years, large industrial emitters will have to report detailed information about their emissions that will allow the province to set reduction targets. To meet those targets, regulated emitters will have the option to cut emissions, offset emissions, or pay into a technology fund that the provincial government will use to support clean technology projects.⁴² Local large industries account for 43% of the province's GHG emissions.⁴³

Other Actions at the Provincial Level

Apart from the carbon pricing programs described above, there are also other provincial initiatives that have helped drive down emissions in Canada. Ontario phased out its coal-fired electricity generation plants in 2014, and adopted a feed-in-tariff program to encourage greater renewable generation of energy in 2009.⁴⁴ In 2007, Nova Scotia implemented a renewable portfolio standard for energy — requiring 25% of renewable energy supply by 2015 and 40% by 2020. Manitoba has applied an emissions tax — although it only applies to coal — and introduced tax incentives to encourage the generation of biofuels within the province.⁴⁵ In November 2015, Saskatchewan announced that it would aim to generate 50% of its electricity using renewable energy by 2030, mostly from wind, geothermal and solar. In 2014, Saskatchewan's Boundary Dam carbon capture and storage (CCS) project, a \$1.35 billion government-industry project^f became the world's first commercial-scale, coal-fired CCS electricity project. This project is expected to capture 90% of the facility's annual emissions or 1 Mt of CO₂ a year.^{46,47}

^f This partnership includes the Government of Canada, the Government of Saskatchewan, SaskPower and private industry. The utility is provincial crown corporation.

United States

Climate change mitigation policies in the United States operate at both the national and subnational levels. Following stalled Congressional efforts at the end of the last decade to establish a federal economy-wide GHG cap-and-trade program, no new climate change legislation has been passed at the federal level. However, a number of executive actions built off of existing legislation (particularly the Clean Air Act (CAA) of 1963 and its subsequent amendments) have allowed a number of climate change policies to be implemented, without requiring congressional action.

Recent Federal Policies

Clean Power Plan

Power plants are currently the single largest source of carbon emissions in the United States, accounting for nearly 40% of all U.S. carbon dioxide emissions and 30% of all GHG emissions.⁴⁸ Based off of section 111(d) of the Clean Air Act, which directs the Environmental Protection Agency (EPA) to identify and set emissions standards for stationary sources of dangerous air pollutants not regulated elsewhere in the CAA,⁴⁹ the Obama Administration released the Clean Power Plan in 2015 to regulate GHG emissions from the nation's existing power plants. The Clean Power Plan (CPP) directs the EPA to set a national emissions standard based on a *Best System of Emission Reductions* that incorporates factors such as technological feasibility for improving efficiency at existing fossil fuel power plants, the ability to shift the current electricity generation mix from higher to lower emitting sources, and cost. States are then provided with flexibility to determine how they meet their goals: either to achieve the federal emissions rates for coal and gas units, or to reach a mass-based equivalent (tons of emissions) calculated for each state. States are also given flexibility in whether to engage in emission trading across sources within and across states. The CPP rules apply to fossil-fuel-fired electric steam generating units (coal- and oil-fired power plants) and natural gas-fired combined cycles generating units built before 2014.⁹ States are in the process of developing their plans on how they will ensure that the power plants in their state meet the emissions targets by the deadline in 2030.

The Clean Power Plan allows and encourages emissions trading between power plants as a cost-effective way for states to meet emissions reduction goals.⁵⁰ The rules are set up to allow within-state or between-state emissions trading for states that choose similar compliance pathways (i.e. rate-based or mass-based), and the EPA will support states in tracking emissions, allowances and credits to support development of market systems. Additionally, states may rely on other options to cut emissions, including investing in renewable energy, increasing energy efficiency, and moving towards natural gas and nuclear power to shift away from coal-fired power.⁵¹

As of February 2016, the implementation of the Clean Power Plan is currently suspended ("stayed") by the Supreme Court, pending judicial review of the merits of the plan and its legal validity by lower courts. By some accounts, this hold on implementation could last well into 2017 (into the next presidential administration), depending on the length of the appeals process.⁵²

CAFE Fuel Efficiency Standards

The Corporate Average Fuel Economy (CAFE) Standards require vehicle manufacturers to comply with fleet-wide average gas mileage standards set up by the Department of Transportation.⁵³ First enacted in 1975, the fuel standards were raised in 2012 to an average fleet-wide fuel economy of 40.3-41.0 miles per gallon by 2017-2021. The EPA has also issued GHG standards, limiting carbon dioxide emissions to 163

⁹ Fossil fuel powered plants built after 2014 are subject to a separate new source performance standards under Section 111(b) of the CAA. However, states that choose a mass-based plan under the CPP can also choose to include new plants under that cap.

grams/mile by 2025. The 2012 standards also included the first-ever standards for medium- and heavy-duty vehicles. The program includes targeted incentives for alternative fuel vehicles, including electric, fuel cell, and natural gas vehicles.

Renewable Fuels Standards

In addition to fleet-wide mileage standards for car manufacturers, the federal government has also introduced requirements that a certain volume of renewable fuel replace petroleum in transportation, heating, and jet fuel mixes. Refiners or importers of gasoline or diesel fuel are obligated to blend a certain volume of renewable fuels into transportation fuel. Renewable fuels that count under this rule must result in a reduction of GHG emissions, and include corn-based ethanol, biomass-based diesel, cellulosic ethanol, and other advanced biofuels. Currently the long-term goal is to have 36 billion gallons of renewable fuel in circulation by 2022.⁵⁴

Appliance Efficiency Standards

The Department of Energy sets minimum energy conservation standards for more than 60 categories of appliances and equipment, covering 90% of home energy use, 60% of commercial building energy use, and 30% of industrial energy use. The Department of Energy also estimates that the efficiency standards generate substantial costs savings.⁵⁵ In 2009, the government introduced 40 new updates to the standards, which are expected to save consumers an additional USD \$540 billion off of their utility bills through 2030, and keep 2.3 billion metric tons of carbon dioxide out of the atmosphere.⁵⁶

Renewables Tax Credits

The Federal government has established both renewable energy investment and production tax credits. To encourage investment in renewable energy systems, the Renewable Energy Tax Credit program provides tax credits to households that install renewable energy generation systems on existing homes. Taxpayers may claim a credit of 30% of the qualified expenditures for installation of residential renewable energy generation systems, including solar, fuel cell, wind energy, and geothermal systems. The program currently runs through the end of 2016, with solar energy system credits continuing through 2021. To reward production of renewable energy, the Renewable Electricity Production Tax Credit provides tax rebates for the production of electricity from wind, geothermal, biomass, waste gas, qualified hydroelectric, and hydrokinetic sources. The credit applies for ten years after the system is placed in service, and currently runs through the end of 2016 (or the end of 2019 for wind facilities).⁵⁷ In addition to federal renewable energy tax credits, most states also have a variety of tax incentives to encourage renewable energy production and investment.⁵⁸

Fugitive Emissions Standards

In April 2012, the EPA finalized a series of regulations aiming to reduce emissions of volatile organic compounds (VOCs), sulfur dioxide, and air toxics such as benzene from oil and natural gas extraction systems. These regulations require owners and operators to find and repair fugitive emissions leaks in their production systems. In May 2016, the EPA expanded the 2012 rule to cover additional equipment and activities in the oil and gas production chain. The regulations were also expanded to set limits for fugitive methane emissions, which have a global warming potential 25 times higher than carbon dioxide. The new rules are expected to reduce 510,000 short metric tons of methane in 2025, equivalent to reducing 11 million metric tons of carbon dioxide emissions.⁵⁹

Sub-national Policies

California AB32

Titled the Global Warming Solutions Act of 2006, California's AB32 is the most comprehensive emissions reduction legislation at the state level. The law pledges to reduce state GHG emissions to 1990 levels by 2020, a 15% decrease from business-as-usual emissions, and then aims to reach 80% below 1990 levels by 2050. Strategies to reach these goals include implementing low-carbon fuel standards, expanding and strengthening energy efficiency programs and standards, and creating policies and incentives to meet transportation-related GHG emissions targets.⁶⁰ Since 2012, California has also implemented a statewide, multisector cap-and-trade program, which now covers 85% of the state's GHG emissions, primarily from utilities, large industrial plants, and fuel distributors. The emissions cap initially set in 2012 for compliance beginning January 1, 2013, covers approximately 90% of a business' overall emissions, and decreases by 3% annually through 2020. Allowances (the tradable unit associated with each ton of emissions under the cap) can be purchased at a government-run quarterly auction. Between auctions, allowances can be bought on the secondary market, supplied by other entities with excess allowances. Emissions offsets from uncapped sectors (such as forestry) are allowed for up to 8% of a business' compliance obligation. California is also a member of the Western Climate Initiative, which includes British Columbia, Manitoba, Ontario, and Quebec. Quebec became the first province to officially link up to the California emissions trading market in 2013,⁶¹ while Ontario and Manitoba have also committed to linking their future markets with California's.⁶²

Regional Greenhouse Gas Initiative (RGGI)

RGGI is a cap-and-trade program for the electric power sector among nine states in the Northeast United States (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont). Launched in 2009, it was designed to stabilize emissions by 2015, and reduce them 10% below baseline levels by 2018. In 2014, the RGGI system implemented a new and reduced cap of 91 million short metric tons of emissions from the power sector, a roughly 40 percent drop in the emissions cap. Similar to the California cap-and-trade market, states sell emission allowances through auctions, entities can also purchase on the secondary market and covered plants can use offsets to help meet their compliance obligations. Proceeds from the auction of emissions allowances are used to invest in energy efficiency, renewable energy, and other consumer benefit programs.⁶³

State Renewable Portfolio Standards

Twenty-nine states currently have mandatory renewable portfolio standards, which require utilities to generate and sell a specified percentage (or amount, depending on the state) of renewable energy in their energy mix. Additionally, eight states and territories have implemented voluntary renewable energy standards or targets.⁶⁴ While the ambition level of each state's standards varies, Hawaii's targets are the most aggressive, aiming for 100% renewable energy by 2025. To help mitigate costs, several states have also implemented a cost cap, which requires utilities to attain the renewable energy targets, as long as it does not exceed a specified cost.

Energy Efficiency Tax Incentives

Most states, and many local governments, provide consumers with tax incentives for the installation of energy efficiency or renewable energy systems in residences and businesses. Thirty-one U.S. states have some form of tax incentive for the installation of energy efficiency infrastructure, such as solar panels. These tax incentives include property tax credits, personal income tax deductions, to corporate incentives for conservation, to sales tax exemptions for the purchase of energy efficiency measures.⁶⁵

Mexico

In 2012, Mexico adopted the General Law on Climate Change (LGCC)^h — making it one of the first countries to adopt a comprehensive law to address climate change. This law sets aspirational GHG reduction goals, conditional on international support and a global climate change agreement: 2020 emissions to be 30% below a BAU baselineⁱ and 2050 emissions to be 50% below 2000 levels.⁶⁶

Most importantly, this law establishes the institutional structure that supports the alignment and coordination of climate change public policies in Mexico. In line with this, the law sets out guiding instruments for planning national policy around climate change. The first one is the National Climate Change Strategy, which lays out a vision and policy milestones for the next 10, 20 and 40 years, and identifies five strategic pillars to create low-carbon development.

The second planning instrument is the Special Program on Climate Change 2014-2018 (a short-term action plan consistent with the National Climate Change Strategy), which identifies mitigation and adaptation goals, and lays out 5 objectives, 26 strategies and 199 lines of action directed towards reducing emissions in all sectors of the economy.⁶⁷ Most lines of action have a budget allocated by the agency in charge of their enforcement and they must report back on the progress of their lines of action annually.⁶⁸

Federal Policies

Apart from the implementation of the institutional framework and planning instruments set out in the LGCC, the federal government has introduced other programs to contribute to the framework for a low carbon development in the country. A selection of these programs are summarized below.

Carbon Tax

In 2013, the Mexican Congress approved the implementation of a carbon tax on fossil fuels. The tax, which came into force in 2014, covers fossil fuel sales and imports by manufacturers, producers and importers.⁶⁹ The tax is set at MXN \$39.30 (USD \$2.13^j) per metric ton of carbon dioxide and capped at 3% of the price for each fuel. There is also an option for covered entities to use certified emission reduction credits (CERs) from Mexican entities for compliance.⁷⁰ These CERs are generated through Mexican Clean Development Mechanism (CDM) projects.^k

Climate Change Fund

The Mexican government established this fund in 2012. Its assets are made up of federal grants, domestic or foreign donations, contributions from foreign governments and international organizations. The funds are meant to finance projects that contribute to mitigation and adaptation outcomes in line with the National Climate Change Strategy and the Special Program on Climate Change including research, innovation, technological development or technology transfer projects, and in the purchase of CERs registered in the Mexican National Emissions Registry.⁷¹ We could not find publicly available information on the historical or current value of this fund.

^h Ley General del Cambio Climático.

ⁱ Mexico's most recent (2015) climate pledge (22% reduction by 2030) is not consistent with its previous target for 2020 (30% reduction by 2020) brought forward during the Copenhagen and Cancun climate conferences. While this older 2020 pledge was conditional on international support, Mexico's most recent pledge is unconditional.

^j Currency rate as of May 31st, 2016: USD \$1 = MXN \$ 18.4118 (Banco de México)

^k The number of registered Mexican CDM projects amount to 201. From 2005 (CDM's starting year) to June 2014, Mexican projects received 23,868,978 CERs. (Mexico's First Biennial Update Report to the UNFCCC, 2015)

Fuel-efficiency Standards

In 2013, the Mexican government finalized standards regulating carbon dioxide emissions and the fuel economy equivalent for new passenger vehicles including cars, pickup trucks and sport utility vehicles (SUVs). Mexico is the only Latin American country with a mandatory vehicle fuel economy standard.⁷² The regulations apply to vehicle models 2014 to 2016, allowing auto makers to use early action credits for model years 2012 and 2013. The standard is expected to result in a car fleet average fuel economy of 14.6 km/L (34.34 m/g). The design and stringency of the regulation is aligned to the light-duty vehicle standards in Canada and the US⁷³

2013 Energy Reform and the Creation of Clean Energy Certificates

The clean energy reform, enacted in 2013, lays out the foundation for a renewable energy market and cleaner technologies, along with promoting increased energy efficiency in generating, distributing and transmitting electricity. This reform also includes incentives to increase electricity generation from cleaner sources by ensuring that generators have fair and open access to the national transmission network to sell energy on the wholesale market.⁷⁴

One of the most relevant features of this reform is the creation of clean energy certificates, which all qualified suppliers and users must use to cover the mandated clean energy requirement.⁷⁵ These requirements come into force in 2018 and require that at least 5% of total annual energy consumption of regulated firms comes from clean sources.⁷⁶

National Strategy for Reducing Emissions from Deforestation and Forest Degradation (ENAREDD+)

This strategy seeks to reduce incentives that promote deforestation and forest degradation, and has the goal of moving to 0% carbon loss in original forest ecosystems. The strategy is made up of seven components: (1) public policy; (2) financing schemes; (3) institutional arrangements and capacity building; (4) reference levels; (5) monitoring, reporting and verification; (6) safeguards; (7) and communication, social participation and transparency.⁷⁷

The Mexican Forest Fund is the main instrument used to channel funds of the National Forest Commission (CONAFOR). From 2009 to 2012, around \$773.5 million have been committed for REDD+ activities, of which 51% came from international funds (almost exclusively in the form of loans).⁷⁸

Section III: Existing North American Climate Policy Linkages

United States – Canada

Canada and the United States have a long history of collaborating on joint environmental challenges. The two countries have implemented over 40 international agreements for the management and protection of environmental quality and ecosystems in the border area — such as the Air Quality Agreement (1991) and the Great Lakes Water Quality Agreement (1972) signed between the two nations; and there are about 100 such agreements between U.S. states and Canadian provinces.⁷⁹

In the area of climate change, the voluntary partnership between sub-national member jurisdictions through The Western Climate Initiative facilitated the development of a common set of guidelines that ultimately made the linking of California's and Quebec's cap-and-trade systems possible in 2014. This sub-national partnership will also simplify Ontario's and Manitoba's plans to join this already connected market.

Due to the WCI's decentralized nature, California and Quebec were able to establish their own targets and complementary climate regulations independently. This flexibility is important – particularly considering the substantial differences in their economies, emission profiles, the design features of their cap-and-trade systems, including the use of offsets, and their choices regarding use of auction revenues. Nevertheless, harmonization via the WCI is instrumental in that it provides a common set of rules without which integration of these two trading regimes would be impossible. Early analysis suggest that the linkage of California and Quebec's emission trading systems will bring down total costs of reducing emissions.⁸⁰

The WCI-enabled linkage shows that economic conditions, emission profiles and program design do not have to be homogenous to link carbon trading systems. This can serve as an example for other North American jurisdictions, and could provide a blueprint for a linked national or continental carbon pricing mechanism.⁸¹

In line with this, the United States and Canada recently agreed to work together to support carbon-market related provisions of the Paris Agreement, encouraging sub-national government to share lessons learned about the design of carbon pricing systems and other supportive policies and measures, as well as looking to expand collaboration in this area over time.⁸²

Another example of sub-national climate policy collaboration is the New England Governors and Eastern Canadian Premiers' (NEG/ECP) agreement to adopt a 2030 GHG reduction target for the region of 35%-45% below 1990 levels. To achieve this regional target, the NEG/ECP Environment Committee has been tasked with developing a document that identifies possible joint actions across these jurisdictions that will be presented at the upcoming NEG/ECP conference in the summer of 2016.⁸³

At the national level, the federal governments of Canada and the United States continue to work together to align vehicle and engine emission regulations and coordinate their implementation. Under the Agreement between the Government of the United States of America and the Government of Canada on Air Quality (March 31, 1991), the EPA and Environment Canada coordinate to align vehicle, engine, and fuel standards and set GHG regulations for vehicles.⁸⁴ The cooperative efforts include information sharing, technical work-sharing, and scientific collaboration to coordinate vehicle and engine emissions standards.⁸⁵ Other areas of relevant regulatory collaboration include alignment of energy efficiency standards (through the ENERGY STAR International Partnerships program), locomotive emissions, and natural gas use in transportation.⁸⁶

Going forward both federal government leaders have committed to take action to reduce methane emissions by 45% to 50% below 2012 levels by 2025 from the oil and gas sectors and explore additional areas for potential methane reductions.¹ Similarly they've also pledged to reduce the use and emissions of hydrofluorocarbons (HFCs).⁸⁷

United States – Mexico

In 2009, President Obama and former President Calderon announced the establishment of the US-Mexico Bilateral Framework on Clean Energy and Climate Change. This framework focuses on information sharing, establishing a mechanism for political and technical cooperation and information exchange. Areas of focus include renewable energy, energy efficiency, adaptation, market mechanisms, forestry and land use, green

¹ The U.S Environmental protection Agency recently issued three rules to curb emissions of methane, smog forming volatile compounds and toxic air pollutants such as benzene from new, modified and reconstructed oil and gas sources. The agency also issues a request for information that will provide critical information in order to develop regulations to reduce methane emission. Environmental Protection Agency (2016). EPA's Actions to Reduce Methane Emissions from the Oil and Natural Gas Industry: Final Rules and Draft Information Collection Request. Retrieved from <https://www3.epa.gov/airquality/oilandgas/may2016/nsps-overview-fs.pdf>

jobs, low carbon energy technology and capacity building.⁸⁸ In a press release in March 2015, President Obama and President Nieto reaffirmed their joint commitment to addressing climate change, and renewed commitments to coordinate efforts to reach both countries' emissions reduction pledges. A new high-level bilateral clean energy and climate policy task force was announced to deepen regulatory coordination on clean electricity, grid modernization, appliance standards, energy efficiency, black carbon, and vehicle emissions standards.⁸⁹

At the state level, Gov. Jerry Brown of California signed a memorandum of understanding (MOU) with Mexico's Ministry of Environment and Natural Resources in 2014, formally agreeing to cooperate on a range of climate change and environment issues, including pricing carbon, reducing deforestation, and promoting clean vehicles.⁹⁰ The priorities listed in the MOU include increased collaboration and best-practice sharing on reporting of GHG emissions, developing a carbon pricing system and other market-based instruments to address climate change, reducing instances of deforestation, promoting renewable energy, controlling methane & short-term pollutants, and advancing multilateral and subnational actions on climate change, including between California and Mexican states. California is also exploring the use of offset credits from reduced emissions from deforestation and degradation (REDD) activity from subnational jurisdictions in Mexico (e.g., Chiapas) as well as other jurisdictions in other countries as part of its statewide cap-and-trade program.

Mexico – Canada

Canada and Mexico also have a history of environmental collaboration. Since 1990, the two countries have established a number of Agreements and Letters of Intent to collaborate on climate change mitigation and adaptation. Most of these have focused on strengthening dialogue and cooperation on climate change, environment, and natural resources protection.⁹¹

In 2014, Canada announced a contribution of CAD \$2.5 million (USD \$1.9 million) towards the establishment of the Canada-Mexico Climate Change Cooperation Platform. This sum, part of Canada's \$1.2 billion (USD \$0.9 billion) in Fast Start Financing committed in the Copenhagen Accord, is designed to support Mexico's GHG reduction efforts. Specifically, its focus includes: strengthening Mexico's national capacity to carry out climate modelling and analysis; evaluating vulnerability to climate change; strengthening cooperation between Mexico and other Latin American countries on climate change mitigation and adaptation; and development of a virtual platform to track and report on the outcomes of climate financing.⁹²

Expanding to a Continental Scope – Recent Joint Statements between the Three North American Nations:

In February 2016, Canada, the United States, and Mexico signed a memorandum of understanding (MOU) on Climate Change and Energy Collaboration, with the goal of expanding and accelerating the clean energy sector in North America.⁹³ The MOU builds off of the North American Energy Ministers' Working Group on Climate Change and Energy formed in 2015, and focuses on collaboration in energy grid resilience, clean energy technologies, energy efficiency standards, carbon capture and storage, climate change adaptation and resilience, and reducing emissions from the oil and gas sector.⁹⁴ The MOU creates a framework for consultation and cooperation on; sharing publicly-available energy information on a web platform to set the stage for dialogue & comparisons; addressing climate change from energy generation, distribution and use; and acceleration the pace of clean energy innovation as part of a the response to address a shared climate change challenge.⁹⁵

In addition, the three countries are participants of Mission Innovation —a new international initiative aimed at accelerating public and private clean energy innovation to address climate change, make clean energy affordable, promote economic growth, and strengthen energy security. Under this initiative, the

three countries will seek to double their investments in clean energy research and development over the next five years.^m The research and development projects would be designed and managed to attract and leverage private investment in order to advance commercialization of new technologies.⁹⁶

It is also important to mention that subnational jurisdictions — including states, provinces, territories and municipalities — from the three North American countries are also signatories to global climate change action groups as shown below.

Joint commitments at the sub-national level:

Under 2 MOU: This memorandum of understanding (MOU) brings together subnational governments willing to commit to reducing their GHG emissions. The shared goal is to reduce global emissions to 2 tons per capita, or 80% to 95% below 1990 levels by 2050. 23 states, provinces, territories and cities from all three North American countries have signed this MOU. (<http://under2mou.org/>)

The compact of States and Regions: This is reporting mechanism for state, provinces and regions to showcase and analyze their climate efforts. In 2015, 44 government reported their commitments and GHG inventories including seven Canadian provinces and territories, six American states, and two Mexican states (<http://www.theclimategroup.org/what-we-do/programs/compact-of-states-and-regions/>)

The Carbon Pricing leadership (CPL) Coalition: a voluntary partnership of national and subnational governments, business and civil society organizations committed to advancing the carbon pricing agenda by working together towards the long-term objective of a carbon price applied throughout the global economy. Both the Mexican and Canadian governments (along with five Canadian provinces and territories) are signatories to this partnership. The only U.S. partner to date is the state of California (<http://www.carbonpricingleadership.org/leadership-coalition/>)

Conclusion

Canada, the United States, and Mexico have all pledged forward-looking GHG mitigation goals through the Paris Agreement. While each country has a variety of national and subnational climate mitigation policies in place, the framework of the Paris Agreement and existing North American collaborations offer a multitude of opportunities for further collaboration. Building off of efforts in all three countries to implement carbon pricing and carbon markets, increased coordination at the national level can support more impactful collaborations. Additionally, there is a significant opportunity for more knowledge and best-practice sharing between the three North American countries, to further each country's efforts to reduce their contributions to global climate change. Following discussions on the future of collaboration at the North American Policy Forum, we will build off of this current state analysis to discuss feasible opportunities for increased North American climate policy linkages.

^m In the next five year the three countries have committed to spending the following amounts per year: Canada – USD \$590 million; United States USD \$12.83 billion; and Mexico USD \$62 million. (Mission Innovation website, 2016)

ENDNOTES

- ¹ North American Agreement on Environmental Cooperation (1993). Retrieved online from <http://www.cec.org/about-us/NAAEC>
- ² Ecofiscal Commission (2015). *The Way Forward: A Practical Approach to Reducing Canada's Greenhouse Gas Emissions*. Retrieved online from <http://ecofiscal.ca/wp-content/uploads/2015/04/Ecofiscal-Commission-Report-The-Way-Forward-April-2015.pdf>
- ³ Purdon, Houle, et al. (2014). *The Political Economy of California and Quebec's Cap-and-Trade Systems*. Research Report. Sustainable Prosperity
- ⁴ Sustainable Prosperity. (2014). *Gains from (Cap and) Trade Linking Quebec's and California's Carbon Trading Systems*. Issue Summary retrieved online from <http://www.sustainableprosperity.ca/sites/default/files/publications/files/Quebec%20California%20Issue%20Summary%20April%202014.pdf>
- ⁵ Bramley, M., Partington, P.J., Sawyer, D. (2010). *Linking National Cap-and-Trade Systems in North America*. Draft discussion paper released by the International Institute for Sustainable Development and the Pembina Institute. Retrieved online from http://www.iisd.org/sites/default/files/publications/linking_nat_cap_north_america.pdf
- ⁶ Bodansky, D., Hoedl, S., Metcalf, G.E., Stavins R.N. (2014). *Facilitating Linkage of Heterogeneous Regional, National, and Sub-National Climate Policies through a Future International Agreement*. Discussion Paper, Harvard Project on Climate Agreements, Belfer Center for Science and International Affairs, Harvard Kennedy School
- ⁷ NRTEE (National Roundtable on the Economy and the Environment) (2011). *Parallel Paths: Canada-US Climate Policy Choices*. Report. Retrieved online from <http://nrt-trn.ca/climate/climate-prosperity/parallelpaths>
- ⁸ CBC News (November 09, 2015). *Catherine McKenna says Canada won't set emissions target, Tory targets will be 'floor'* Retrieved online from <http://www.cbc.ca/news/politics/catherine-mckenna-paris-talks-tory-target-1.3311482>
- ⁹ Canadian Intergovernmental Governance Secretariat (March 03, 2016). *Vancouver Declaration*. Retrieved online <http://www.scics.gc.ca/english/conferences.asp?a=viewdocument&id=2401>
- ¹⁰ Executive Office of the President (June 2013). *The President's Climate Action Plan*. Retrieved online from <https://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf>
- ¹¹ Evans, Simon (March 31, 2015). *US Climate Pledge Promises to Push for Maximum Ambition*. Carbon Brief. Retrieved online from <http://www.carbonbrief.org/us-climate-pledge-promises-to-push-for-maximum-ambition>
- ¹² Evans, Simon (March 31, 2015). *US Climate Pledge Promises to Push for Maximum Ambition*. Carbon Brief. Retrieved online from <http://www.carbonbrief.org/us-climate-pledge-promises-to-push-for-maximum-ambition>
- ¹³ Gobierno de la República (2016). *Mexico's Intended Nationally Determined Contribution*. Retrieved online from <http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx>
- ¹⁴ Ibid.
- ¹⁵ Ibid.
- ¹⁶ UNFCCC (12 December 2015). *Paris Agreement*. Retrieved online from <http://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf>
- ¹⁷ Marcu, Andrei (2016). *Carbon Market Provisions in the Paris Agreement (Article 6)*. Centre for European Policy Studies. CEPS Special Report. Retrieved online from <https://www.ceps.eu/publications/carbon-market-provisions-paris-agreement-article-6>
- ¹⁸ Ibid 16.
- ¹⁹ Baker & McKenzie (2016). *The Paris Agreement: Putting the First Universal Climate Change Treaty in Context*. Retrieved online from http://www.bakermckenzie.com/files/Uploads/Documents/Environmental/ar_global_climatechangetreaty_jan16.pdf
- ²⁰ Becklumb, Penny (2013). *Federal and Provincial Jurisdiction to Regulate Environmental Issues*. Library of Parliament Background Papers. Retrieved online from <http://www.lop.parl.gc.ca/content/lop/ResearchPublications/2013-86-e.pdf>
- ²¹ Ibid 9.

²² Ibid 9.

²³ Government of Canada (2014). *Canada's Sixth National Report on Climate Change*. Retrieved online from http://ec.gc.ca/cc/16153A64-BDA4-4DBB-A514-B159C5149B55/6458_EC_ID1180-MainBook_high_min%20FINAL-s.pdf

²⁴ Environment and Climate Change Canada (2015). *Current Regulation Reduction of Carbon Dioxide Emissions from Coal-Fired Generation of Electricity Regulations* (SOR/2012-167). Retrieved online from <https://www.ec.gc.ca/lcpe-cepa/eng/regulations/detailReg.cfm?intReg=209>

²⁵ International Institute for Sustainable Development (2014). Policy Brief: *A Climate Gift or a Lump of Coal: The Emission Impacts of Canadian and U.S. Greenhouse Gas Regulations in the Electricity Sector*. Retrieved online from <http://www.iisd.org/sites/default/files/publications/climate-gift-or-lump-of-coal.pdf>

²⁶ Natural Resources Canada (2016). *Guide to Energy Efficiency Regulations*. Retrieved online from <http://www.nrcan.gc.ca/energy/regulations-codes-standards/6863>

²⁷ US EPA. *International Climate Partnerships*. Retrieved online from <https://www3.epa.gov/climatechange/EPAactivities/internationalpartnerships.html>

²⁸ Ibid 23.

²⁹ Environment and Climate Change Canada (2016). *Renewable Fuels Regulations*. Retrieved online from <https://www.ec.gc.ca/energie-energy/default.asp?lang=En&n=OAA71ED2-1>

³⁰ Ibid 23.

³¹ Government of Canada (2016). *Budget 2016: Growing the Middle Class*. Retrieved online from <http://www.budget.gc.ca/2016/docs/plan/budget2016-en.pdf>

³² Sustainable Prosperity (2013). *BC's Carbon Tax Shift after Five Years: Results*. Retrieved online from <http://www.sustainableprosperity.ca/content/bc%E2%80%99s-carbon-tax-shift-after-five-years>

³³ British Columbia Ministry of Finance (2015). *Myths and Facts about the Carbon Tax*. Retrieved online from <http://www.fin.gov.bc.ca/tbs/tp/climate/A6.htm>

³⁴ Murray, B. and Rivers, N (2015). Working Paper: *British Columbia's Revenue-Neutral Carbon Tax: A Review of the Latest "Grand Experiment" in Environmental Policy*. Retrieved online from https://nicholasinstitute.duke.edu/sites/default/files/publications/ni_wp_15-04_full.pdf

³⁵ Alberta Government (2015). *Climate Leadership Plan: Alberta's plan to take action on climate change and protect the province's health, environment and economy*. Retrieved online from <http://www.alberta.ca/climate.cfm>

³⁶ Gouvernement du Québec (2016). *Système de plafonnement et d'échange de droits d'émission de gaz à effet de serre du Québec et programme de plafonnement et d'échange de la Californie: Vente aux enchères conjointe no 6 de février 2016. Rapport sommaire des résultats*. Retrieved online from <http://www.mddelcc.gouv.qc.ca/changements/carbone/ventes-encheres/resultats-vente20160217.pdf>

³⁷ Ecofiscal Commission (2015). *The Way Forward: A Practical Approach to Reducing Canada's Greenhouse Gas Emissions*. Retrieved online from <http://ecofiscal.ca/wp-content/uploads/2015/04/Ecofiscal-Commission-Report-The-Way-Forward-April-2015.pdf>

³⁸ Government of Quebec, Manitoba and Ontario (2015). *Memorandum of Understanding Concerning Concerted Climate Change Actions and Market-based Mechanisms*. Retrieved online from https://www.gov.mb.ca/conservation/climate/pdf/mou_quebec_manitoba_ontario.pdf

³⁹ Government of Ontario (May 18, 2016). *News Release: Ontario Passes Landmark Climate Change Legislation*. Retrieved from <https://news.ontario.ca/ene/en/2016/5/ontario-passes-landmark-climate-change-legislation.html>

⁴⁰ Government of Ontario (2016). *Ontario's Climate Change Action Plan*. Retrieved online from http://www.applications.ene.gov.on.ca/ccap/products/CCAP_ENGLISH.pdf

⁴¹ Government of Manitoba (2015). *Climate Change and Green Jobs Actions – Priority for Manitobans*. Retrieved online from <http://www.gov.mb.ca/conservation/climate/>

⁴² The Telegram (Newspaper in Newfoundland and Labrador) (June 8, 2016). *Government moves to regulate industrial greenhouse gasses*. Retrieved online from <http://www.thetelegram.com/News/Local/2016-06-07/article-4552162/Government-moves-to-regulate-industrial-greenhouse-gasses/1>

⁴³ Government of Newfoundland and Labrador (2016). *Provincial Government Announces Plan for Greenhouse Gas Emissions Reductions*. Retrieved online from <http://www.releases.gov.nl.ca/releases/2016/exec/0607n02.aspx>

⁴⁴ Government of Ontario (2014). *Ontario's Climate Change Update 2014*. Retrieved online from <http://docs.ontario.ca/documents/3618-climate-change-report-2014.html#document/p1>

⁴⁵ Ibid 40.

⁴⁶ Government of Canada (2016). *Second Biennial Report on Climate Change*. Retrieved online from <https://www.ec.gc.ca/GES-GHG/default.asp?lang=En&n=02D095CB-1>

⁴⁷ Natural Resources Canada (2016). *Boundary Dam Integrated Carbon Capture and Storage Demonstration Project*. Retrieved online from <http://www.nrcan.gc.ca/energy/publications/16235>

⁴⁸ US EPA (April 15, 2016). *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2014*. Retrieved online from <https://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2016-Main-Text.pdf>

⁴⁹ Ceronsky, Megan, and Tomas Carbonell (2014). *Section 11(d) of the Clean Air Act: The Legal Foundation for Strong, Flexible & Cost-Effective Carbon Pollution Standards for Existing Power Plants*. Environmental Defense Fund. Retrieved online from https://www.edf.org/sites/default/files/section-111-d-of-the-clean-air-act_the-legal-foundation-for-strong-flexible-cost-effective-carbon-pollution-standards-for-existing-power-plants.pdf

⁵⁰ US EPA, OAR. *FACT SHEET: Overview of the Clean Power Plan*. Retrieved online from <https://www.epa.gov/cleanpowerplan/fact-sheet-overview-clean-power-plan>

⁵¹ Union of Concerned Scientists (February 2016). *The Clean Power Plan: A Climate Game Changer*. Retrieved online from <http://www.ucsusa.org/our-work/global-warming/reduce-emissions/what-is-the-clean-power-plan>

⁵² Kimmell, Ken (10 February 2016). *What the Supreme Court's Ruling Means for the Clean Power Plan (All Is Far from Lost!) - The Equation*. Union of Concerned Scientists. The Equation. Retrieved online from http://blog.ucsusa.org/ken-kimmell/supreme-court-clean-power-plan?_ga=1.173882083.1912278947.1463522234

⁵³ US Department of Transportation (27 August 2014). *Corporate Average Fuel Economy (CAFE) Standards*. Retrieved online from <https://www.transportation.gov/mission/sustainability/corporate-average-fuel-economy-cafe-standards>

⁵⁴ US EPA, OAR. *Renewable Fuel Standard Program*. Retrieved online from <https://www.epa.gov/renewable-fuels-standards-program>

⁵⁵ US Department of Energy (February 2016). *Saving Energy and Money with Appliance and Equipment Standards in the United States*. Retrieved online from <http://energy.gov/sites/prod/files/2016/02/f29/Appliance%20Standards%20Fact%20Sheet%20-%202017-2016.pdf>

⁵⁶ Ibid

⁵⁷ US Department of Energy. *Renewable Electricity Production Tax Credit (PTC)*. Retrieved online from <http://energy.gov/savings/renewable-electricity-production-tax-credit-ptc>

⁵⁸ DSIRE. *Database of State Incentives for Renewables & Efficiency*. Retrieved online from <http://www.dsireusa.org/>

⁵⁹ Damassa, Thomas, Nicholas Bianco, and Taryn Fransen (2012). *GHG Mitigation in the United States: An Overview of the Current Policy Landscape*. World Resources Institute. Retrieved online from http://www.wri.org/sites/default/files/pdf/ghg_mitigation_us_policy_landscape_overview.pdf

⁶⁰ California Air Resources Board (5 August 2014). *Assembly Bill 32 Overview*. Retrieved online from <http://www.arb.ca.gov/cc/ab32/ab32.htm>

⁶¹ Center for Climate and Energy Solutions (C2ES). *California Global Warming Solutions Act (AB 32)*. Retrieved online from <http://www.c2es.org/us-states-regions/action/california/ab32>

⁶² The Canadian Press (December 7, 2015). *Manitoba, Ontario, Quebec sign accord to link cap-and-trade systems*. The Globe and Mail. Retrieved online from <http://www.theglobeandmail.com/news/national/manitoba-ontario-quebec-link-cap-and-trade-systems/article27629453/>

⁶³ U Damassa, Thomas, Nicholas Bianco, and Taryn Fransen (2012). *GHG Mitigation in the United States: An Overview of the Current Policy Landscape*. World Resources Institute. Retrieved online from http://www.wri.org/sites/default/files/pdf/ghg_mitigation_us_policy_landscape_overview.pdf

⁶⁴ Durkay, Jocelyn (March 23, 2016). *State Renewable Portfolio Standards and Goals*. National Conference of State Legislators. Retrieved online from <http://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx>

⁶⁵ Mann, Roberta (15 April 2011). *Federal, State, and Local Tax Policies for Climate Change: Coordination or Cross-Purpose?* Lewis and Clark Law Review. Retrieved online from <https://www.lclark.edu/live/files/8326-lcb152art4mann>

⁶⁶ Gobierno de la República (2015). *First Biennial Update Report to the United Nations Convention on Climate Change – Executive Summary*. Retrieved online from http://unfccc.int/files/national_reports/non-annex_i_parties/ica/technical_support_for_the_ica_process/application/pdf/executive_summary.pdf

⁶⁷ Ibid.

- ⁶⁸ Gobierno de la República (2014). *Program Especial de Cambio Climático*. Retrieved online from http://dof.gob.mx/nota_detalle.php?codigo=5342492&fecha=28/04/2014
- ⁶⁹ Ibid.
- ⁷⁰ Secretaría de Hacienda y Crédito Público. *Impuestos a los combustibles fósiles*. Retrieved online from http://www.sat.gob.mx/fichas_tematicas/reforma_fiscal/Paginas/combustibles_fosiles_2014.aspx
- ⁷¹ Ibid 66.
- ⁷² International Council on Clean Transportation (2013). *Mexico's Light-Duty Vehicle CO2 and Fuel Economy Standards*. Retrieved online from http://www.theicct.org/sites/default/files/publications/ICCTupdate_Mexico_LDVstandards_july2013.pdf
- ⁷³ Ibid.
- ⁷⁴ Ibid 66.
- ⁷⁵ Ibid 66.
- ⁷⁶ Gobierno de México (2016). *Construyendo una nueva etapa de amistad y colaboración*. Retrieved online from <https://www.gob.mx/presidencia/articulos/construyendo-una-nueva-etapa-de-amistad-y-colaboracion>
- ⁷⁷ Ibid 66.
- ⁷⁸ Streck, C., Murray, B., Aquino, A., Durschinger, L., Estrada, M., Parker C., and Zeleke, A. (2015) *Financing Land Use Mitigation: A Practical Guide for Decision Makers*. Prepared with support from cooperative agreement # S-LMAQM-13-CA-1128 with U.S. Department of State. Retrieved online from http://www.winrock.org/wp-content/uploads/2016/05/Winrock-FinancingLandUseMitigation_7-22-2015.pdf
- ⁷⁹ Environmental Protection Agency (2016). *EPA Collaboration with Canada*. Retrieved online from <https://www.epa.gov/international-cooperation/epa-collaboration-canada>
- ⁸⁰ Purdon M, Houle D and Lachapelle E. (2014). *The Political Economy of California and Québec's Cap-and-Trade Systems*. Sustainable Prosperity research report retrieved online from <http://www.sustainableprosperity.ca/sites/default/files/publications/files/QuebecCalifornia%20FINAL.pdf>
- ⁸¹ Sustainable Prosperity (2014). *Gains from (Cap and) Trade Linking Quebec's and California's Carbon Trading Systems*. Issue Summary retrieved online from <http://www.sustainableprosperity.ca/sites/default/files/publications/files/Quebec%20California%20Issue%20Summary%20April%202014.pdf>
- ⁸² Government of Canada (March 2016). *U.S.-Canada Joint Statement on Climate Energy and Arctic Leadership*. Retrieved online from <http://pm.gc.ca/eng/news/2016/03/10/us-canada-joint-statement-climate-energy-and-arctic-leadership>
- ⁸³ The Council of Atlantic Premiers (2015). *39th Annual Conference of New England Governors and Eastern Canadian Premiers Resolution Concerning Climate Change*. Retrieved online from <http://www.cap-cpma.ca/data/Signed%2039-1En.pdf>
- ⁸⁴ US EPA. *International Climate Partnerships*. Retrieved online from <https://www3.epa.gov/climatechange/EPAactivities/internationalpartnerships.html>
- ⁸⁵ Government of Canada (2015). *News Release: Environment Canada and US Environmental Protection Agency taking action together on vehicle emissions*. Retrieved online from <http://news.gc.ca/web/article-en.do?nid=1017539>
- ⁸⁶ United States Department of Commerce (2016). *U.S.-Canada Regulatory Cooperation Council*. Retrieved online from <http://www.trade.gov/rcc/>
- ⁸⁷ Ibid 82.
- ⁸⁸ Office of the Press Secretary (16 April 2009). *US Mexico Announce Bilateral Framework on Clean Energy and Climate Change*. The White House. Retrieved online from <https://www.whitehouse.gov/the-press-office/us-mexico-announce-bilateral-framework-clean-energy-and-climate-change>
- ⁸⁹ Office of the Press Secretary (27 March 2015). *Joint Statement on US-Mexico Climate Policy Cooperation*. The White House. Retrieved online from <https://www.whitehouse.gov/the-press-office/2015/03/27/joint-statement-us-mexico-climate-policy-cooperation>
- ⁹⁰ Andreassen, Jennifer (28 July 2014). *Historic California-Mexico agreement boosts international climate collaboration*. Environmental Defense Fund. Retrieved online from <https://www.edf.org/media/historic-california-mexico-agreement-boosts-international-climate-collaboration>

⁹¹ Environment and Climate Change Canada & Ministry of Environment and Natural Resources of the United Mexican States (2005). *Joint Statement on Strengthened Dialogue and Cooperation on Climate Change*. Retrieved online from http://www.ec.gc.ca/media_archive/press/2005/051208-4_n_e.htm

⁹² Environment and Climate Change Canada (2014). News Release: *Canada-Mexico Climate Change Cooperation*. Retrieved online from <http://ec.gc.ca/default.asp?lang=En&n=976258C6-1&news=243AF319-291B-4526-A563-BE5FF15DD463>

⁹³ International Centre for Trade and Sustainable Development (19 February 2016). *US, Canada, Mexico eye increased collaboration in clean energy*. Retrieved online from <http://www.ictsd.org/bridges-news/biores/news/us-canada-mexico-eye-increased-collaboration-in-clean-energy>

⁹⁴ Natural Resources Canada (25 May 2015). *North American Energy Ministers Establish New Continental Climate Change and Energy Collaboration*. PR Newswire. Retrieved online from <http://www.prnewswire.com/news-releases/north-american-energy-ministers-establish-new-continental-climate-change-and-energy-collaboration-504924671.html>

⁹⁵ Natural Resources Canada (2016). *Memorandum of Understanding*. Retrieved online from <http://webcache.googleusercontent.com/search?q=cache:http://www.nrcan.gc.ca/energy/international/nacei/18102>

⁹⁶ Mission Innovation. *Joint Launch Statement*. Retrieved online from <http://www.mission-innovation.net/wp-content/uploads/2015/11/Mission-Innovation-Joint-Launch-Statement.pdf>