WORKING GROUP ON CARBON PRICING MECHANISMS

INTERIM REPORT

PRESENTED TO

FEDERAL-PROVINCIAL-TERRITORIAL MINISTERS OF FINANCE

CANADIAN COUNCIL OF MINISTERS OF THE ENVIRONMENT

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I) Introduction

Vancouver Declaration

On March 3, 2016, Canada's First Ministers released the Vancouver Declaration on clean growth and climate change. Broadly, the Vancouver Declaration seeks to build on commitments and actions already taken by provinces and territories and the momentum from the 21st Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) in Paris. The Declaration also seeks to move toward a pan-Canadian framework for clean growth and climate change that will meet or exceed Canada's international greenhouse gas (GHG) emissions targets, and transition to a stronger, more resilient, low-carbon economy – while also improving Canadians' quality of life.

In the Declaration, First Ministers agreed to the following:

1. Increase the level of ambition (regarding GHG reductions);

2. Promote clean economic growth to create jobs;

3. Deliver mitigation actions;

4. Increase action on adaptation and climate resilience; and

5. Enhance cooperation.

In the context of enhancing cooperation, First Ministers agreed to work together to identify measures that governments could take to reduce emissions and grow the economy in the longer term by establishing working groups in four areas: clean technology, innovation and jobs; carbon pricing mechanisms; specific mitigation opportunities; and adaptation and climate resilience. Each working group was to assess impacts on economic and environmental outcomes.

Mandate of the Working Group on Carbon Pricing Mechanisms

The Working Group on Carbon Pricing Mechanisms has been tasked with providing a report with options on the role of carbon pricing mechanisms in meeting Canada's emissions reduction targets, including different design options taking into consideration existing and planned provincial and territorial systems. It is to consider various elements of carbon pricing policy, including coverage, comparability and stringency, as well as market transactions related to mitigation technologies and international trends in carbon pricing and markets.

The Working Group's report is also to consider the effectiveness of various carbon pricing mechanisms in contributing to the certainty of emission reductions and their efficiency at achieving this objective at the lowest possible cost, and take account of particular challenges, such as those facing northern and remote communities. Finally, it is to address issues that are particularly important to industry and investors, such as

predictability, and approaches to address interprovincial and international competitiveness, including carbon leakage.

This work is being jointly overseen by Ministers of Finance and the Canadian Council of Ministers of the Environment, who are both receiving this interim report.

Context

Many experts regard carbon pricing as a necessary policy tool for efficiently reducing GHG emissions, including the World Bank, the Organisation for Economic Cooperation and Development (OECD), the International Monetary Fund (IMF) and Canada's Ecofiscal Commission. Carbon pricing is generally considered to be one of the most efficient policy approaches as it provides flexibility to industry and consumers to identify the least-cost way to reduce their own emissions, and spurs innovation to find new opportunities for emissions reduction. Carbon pricing can also allow for alignment of effort to reduce emissions across jurisdictions, reducing economic distortions and emissions leakage.

The broad-based trend in favour of carbon pricing throughout the world's economies is gaining traction. In fact, a real international movement has emerged in recent years, and is growing in strength. A September 2015 World Bank study concluded that more and more national and sub-national governments that are concerned about the increasing costs and risks associated with climate change have decided to take action and join this movement.

Indeed, the share of the world's GHG emissions that is subject to carbon pricing has tripled over the last decade, and, since January 2012, the number of carbon pricing instruments in operation has almost doubled from 20 to 38. Some 40 countries and 23 provinces, states, regions and/or cities on five continents have already implemented such instruments. Nearly 70 per cent have emissions trading systems (mostly cap-and-trade, but also performance standards systems), while 30 per cent or so use taxes and/or levies. Some governments (14) have combined these two broad families of instruments. Taken together, carbon pricing covers about half of GHG emissions in all these jurisdictions, representing around 7 gigatonnes of CO_2 equivalent (CO_2e) or 12 per cent of worldwide emissions.[1]

Moreover, in December 2015 in Paris, the World Bank officially launched the Carbon Pricing Leadership Coalition (CPLC), which has the mandate to study and share best carbon pricing practices. CPLC membership includes some twenty national governments, including Canada, as well as Alberta, British Columbia, Northwest Territories, Ontario and Quebec. The CPLC was formed following the September 2014 United Nations Climate Summit, where 74 countries and 22 sub-national governments signed a statement entitled "Putting a Price on Carbon."

[1] World Bank, State and Trend of Carbon Pricing 2015.

Earlier, in 2010, the World Bank had also launched the Partnership for Market Readiness (PMR), an initiative to provide funding and technical assistance to developing countries that have taken steps towards the establishment of carbon market mechanisms. Today, the PMR has 13 donor countries, 16 implementing countries and four technical partners, including Quebec and Alberta.

In addition, the IMF has started to place considerable emphasis on providing technical assistance to countries that are interested in pricing carbon in their economies and in reforming their energy and environmental tax systems. The IMF recently published a study affirming that carbon pricing should be at the forefront of all plans aimed at reducing GHG emissions. The OECD, which brings together many of the world's largest economies, including Canada, came to the same conclusion in 2013, stating that carbon taxes and emissions trading systems are the most economical means of lowering GHG emissions and should become the cornerstone of governmental efforts in fighting climate change.

The private sector has also begun to advocate regarding the need to price carbon. In 2014, 350 institutional investors, with assets under management worth more than USD24 trillion, asked governments to implement stable, reliable, ambitious and economically significant carbon pricing in order to redirect investments needed to overcome the challenges posed by climate change, which they perceive as a threat to their investments. More than 1,000 companies and investors, including major oil, gas and insurance companies, have signed the above-mentioned World Bank statement. Incidentally, the International Emissions Trading Association (IETA), which promotes carbon market mechanisms throughout the world, now includes 150 multinationals from developed countries and emerging economies, 17 years after its founding.

Taken together, the studies referenced above suggest that governments, businesses, and non-governmental organizations internationally are coalescing around two conclusions related to carbon pricing: 1) GHGs can no longer be released into the atmosphere on a large scale with impunity; and, 2) putting a price on emissions is an efficient and cost-effective way to create incentives to reduce their production as well as their consumption, and to reflect the value of the important and sometimes irreversible damage they inflict on the economy, human health and safety, infrastructure, the environment and ecosystems.

II) Review of Carbon Pricing Mechanisms

It is now established and recognized that GHG emissions are one of the main negative externalities arising from human economic activity, including both the production and the consumption of goods and services. In general, externalities refer to situations where the effect of production or consumption of goods and services imposes costs or benefits on others which are not reflected in the prices charged for the goods and services being provided. In other words, absent any other legal or regulatory requirements, the agent that causes negative externalities has no incentive to consider and integrate the impacts and costs it imposes on other agents in its business decisions

or household's everyday life. This situation entices this agent to underestimate, or even ignore, the real costs of its actions to society, the economy and the environment.

How Does Carbon Pricing Work?

In order to allow the market to fully internalize negative externalities caused by pollutants and to overcome what he perceived as a market imperfection, the British economist Arthur Cecil Pigou proposed, nearly a century ago, to price these externalities. Since demand for a good is, in most cases, price sensitive, pricing externalities allows the economic agents to respond efficiently. For GHG emissions, this is typically referred to as a carbon price, reflecting the dominant role of carbon dioxide in total GHG effects and the practice of equating emissions of various GHGs on a CO_2e basis.

The main goal of carbon pricing is to reduce emissions by sending a price signal to the economy as a whole and to various economic actors in particular to reduce emissions. The clearer, more consistent, strong and predictable a price signal is in the medium and long term, the greater its efficiency will be as a driver of the change that is needed to transition to a low-carbon economy. By internalizing a carbon price in their daily decision-making, this kind of signal incentivizes companies, investors and consumers to change their behavior. Carbon pricing thus creates economic incentives for economic agents to make more environmentally sustainable strategic choices, to redirect their investments, and to reduce their emissions as well their carbon footprint, notably by substituting carbon intensive goods (such as fossil fuels), for goods that have a lower or no carbon content.

Properly quantifying the carbon price needed to reflect the scale of the negative externality is a significant challenge given the complex global nature of the climate system and the long-term horizons over which emissions affect the system. This quantification is usually referred to as the social cost of carbon, and is typically estimated through economic models. Modelled results have significant uncertainty and variability, and are therefore not typically used directly in setting a carbon price. The price is more often set, either explicitly or through a market, based on the emissions target for a jurisdiction, and evaluation of the economic benefits and risks of policies in the context of policies present in other jurisdictions. Despite uncertainty in what the 'right' price is, carbon pricing is still seen as an efficient tool to encourage emissions reductions and spur innovation.

Raising the carbon content price of goods and services used by companies encourages them to invest in reducing their carbon emissions by, for example: using renewable or low-GHG energy sources; improving their energy efficiency; upgrading their means of production to, among other things, eliminate energy loss; or opting for less polluting alternative solutions. In so doing, carbon pricing can also make clean technology financially more attractive, even necessary, provide for the potential of new market opportunities, and stimulate innovation through green technology research, development and marketing. In addition to encouraging established industries to seek less carbon-intensive methods of operating, carbon pricing can also create demand for

low-carbon technologies, fostering new niche industries, start-ups and job creation, and creating new economic growth engines. In short, carbon pricing has the potential for encouraging companies to rethink their procedures and, if needed, reinvent themselves in the immediate and in the long term.

Carbon pricing also incentivizes consumers to make more environmentally friendly decisions. For example, higher gasoline prices encourage public transit and make electric or hybrid vehicles more attractive alternatives for travel and commuting. Households will also opt for low-carbon solutions for home heating or air conditioning and will consume less energy by improving the insulation of their residence. All of these actions, taken together, help reduce GHG emissions. It is important that governments enable consumers to make low carbon choices at an affordable cost.

For governments that are able to put a price on carbon, it can also represent a source of revenue that can be used in different ways according to the economic realities they face. These issues are discussed in detail later in this report.

Although it is generally considered to be one of the least-cost approaches to reducing GHG emissions, carbon pricing can still represent an additional cost to the economy that must either be absorbed or avoided by consumers and businesses, and which will invariably pose challenges. Thus, the introduction of carbon pricing generally leads to a period of transition that could be more or less long and laborious depending on the sectors covered, the presence or absence of similar policies among competitors, and economic outlook. Governments that put in place carbon pricing must take these factors into account, recognizing that, since the economic, social and environmental costs of climate change impacts will inexorably rise over time if nothing is done to reverse the current trend, it will usually cost less to put a price on carbon now than later. In the long term, emissions reduction measures will help improve competitiveness and profitability for actors that take early action to reduce emissions in a global economy in which the prices of energy and carbon are expected to increase. These issues are further discussed later in the paper.

The speed with which the economic transformation necessary to shift to a low-carbon economy can be made, and therefore the length of the transition period necessary to achieve it, will largely depend on the carbon price level and design, and the reaction of the economy in the short, medium and long term. However, the broader the base (i.e., the more sectors and regions it covers) and the more flexibility in the design to respond to economic cycles, the more policy makers will succeed in calibrating the carbon price to achieve maximum success at the lowest possible cost, and the less its weight will be felt - even disproportionately felt - by the various economic actors.

If carbon pricing instruments are well designed and implemented, they can create opportunities to reduce greenhouse gas emissions at a low cost to the community.

How Can Carbon Be Priced?

Broad-Based Carbon Pricing Mechanisms

There are three main mechanisms that can be used to explicitly apply a broad-based price to carbon: carbon taxes, cap-and-trade as well as performance standards systems.[2] Cap-and-trade systems and performance standard systems can both be considered emissions trading systems. In all systems, carbon is priced such that economic agents are incentivized to reduce emissions whenever the costs of doing so are less than the carbon price. Given the uncertainty in forecasting market responses, carbon pricing systems will differ in terms of the certainty of the emissions outcome and the certainty about the price signal. These uncertainties can be partially addressed through design considerations. Each carbon pricing system has advantages and disadvantages, strengths and weaknesses.

1. Carbon taxes (such as the existing tax in British Columbia) put a price on GHG emissions and allow economic agents to change their behaviour in response to the price, thus determining which GHG reductions will take place. The regulated price creates certainty for actors deciding on whether to invest in emissions reduction technologies, meaning that all actors who are able to reduce emissions at a lower cost to avoid paying the tax are likely to do so. Because uncertainty exists about how economic agents will respond, to achieve a specific emissions reduction goal, governments may need to adjust the price (tax rate) over time.

   Carbon taxes can be applied to GHG emissions from fossil fuel combustion by taxing fuels based on their carbon intensity. A carbon tax could be designed to apply more broadly to also include non-combustion emissions (e.g., venting and industrial processes), which could increase administrative and compliance costs.

2. Cap-and-trade systems (such as the existing Quebec system or Ontario's upcoming system) limit the total amount of GHG emissions by imposing a cap on emissions that is progressively lowered each year over a given period of time, thus providing certainty about the total emissions from a prescribed set of emitters. The broader the coverage, the more efficient cap-and-trade programs become. The allowances are typically distributed to regulated/registered entities through a combination of auction, sales at a fixed floor price, and free allocation. Price controls and the ability to bank allowances can mean that emissions in a given year remain somewhat uncertain, although certainty remains over the different compliance periods.

3. Performance standard systems or baseline-and-credit systems (such as the existing and proposed Alberta system for major emitters) operate by applying intensity targets that set a limit on GHG emissions per production unit, which can be

[2] Hybrid approaches are also possible where different systems are used to cover different sectors or where systems overlap.

analogous to how allowances are freely allocated in a cap-and-trade system. Targets can be set at a facility or product level. Facilities that do not meet their emissions intensity standards can use a variety of compliance instruments, such as purchasing credits issued to more efficient facilities (i.e., that had emissions below the standard), purchasing offset credits, paying a fixed price to government, etc. Under a Performance Standard system, GHG emissions levels are largely dependent on changes in levels of production. Because they do not specify an emissions limit within the standard, performance standards systems do not provide certainty about the overall emissions reduction that will take place.

Emissions trading systems, like cap-and-trade systems or performance standard systems, allow the price of GHG emissions to be determined by a market where entities can trade emissions allowances to find the most efficient reductions. Companies with the ability to reduce their emissions at lower cost sell allowances to companies for whom the cost to reduce emissions is higher.

Other Mechanisms and Systems that Reduce GHG Emissions and Impose a Price on Carbon

Governments have developed many other mechanisms that help reduce GHG emissions and impose a price on carbon. These can include:

- Taxes on motive fuels that impose an explicit price on carbon; and

- Measures that impose an implicit price on carbon like caps on emissions from the electricity sector; renewable portfolio standards, feed-in tariffs and clean energy standards; new technology development and deployment of innovative technologies through research and development (R&D) programs; investment in infrastructure; vehicle efficiency standards; building codes; and, eliminating subsidies to the fossil fuel industry.

Motive Fuel Taxes [To be included as a box in final report]

Canadian governments have a long history of imposing taxes on the purchase of motive fuels, which is a form of carbon taxation, although these taxes have not always been imposed to serve environmental purposes. Table 1 illustrates that motive fuel taxes at both the federal and provincial/territorial levels impose a different price per tonne of CO_2-equivalent. These taxes generally only apply to commonly-used motive fuels and a number of exemptions/reduced rates apply to specific economic sectors.

Table 1: Motive Fuel Taxes and Implied CO_2e Prices Based on Global Warming Factors as Published in National Inventory

	Diesel		Gasoline	
	(cents/litre)	(implied $/tonne of CO_2e)	(cents/litre)	(implied $/tonne of CO_2e)
Newfoundland and Labrador	21.5	79.90	16.5*	70.48*
Prince Edward Island	20.2	75.07	13.1	55.96
Nova Scotia	15.4	57.23	15.5	66.21
New Brunswick	21.5	79.90	15.5	66.21
Quebec	20.2	75.07	19.2	82.01
Ontario	14.3	53.14	14.7	62.79
Manitoba	14.0	52.03	14.0	59.80
Saskatchewan	15.0	55.74	15.0	64.07
Alberta	13.0	48.31	13.0	55.53
British Columbia	15.0	55.74	14.5	61.94
Yukon	7.2	26.76	6.2	26.48
Northwest Territories	9.1	33.82	10.7	45.70
Nunavut	9.1	33.82	6.4	27.34
Federal	**4.0**	**14.86**	**10.0**	**42.71**

*Newfoundland and Labrador announced that its gasoline tax will be increased temporarily to 33 cents per litre (equivalent to $140.96 per tonne of CO_2e), effective June 2, 2016. The new rate on gasoline will be reviewed as part of the province's fall supplemental budget.
Note: these rates do not include regional or city rate variations, which may provide for higher or lower rates than the general rate in each province.

Measures with Implicit Carbon Pricing [To be included as a box in final report]

All Canadian jurisdictions are undertaking at least some initiatives to reduce GHG emissions. Some of these initiatives take the form of regulatory requirements, technology development and deployment, or voluntary actions to reduce emissions.

The Government of Canada has regulatory requirements to reduce emissions associated with coal-fired electricity generation.

Saskatchewan's Petroleum Research Incentive and Enhanced Oil Recovery Royalty encourage industry to develop technology that reduces the environmental footprint of the oil industry, including carbon dioxide enhanced oil recovery in heavy oil. Carbon dioxide is being captured by an oil producer at a commercial ethanol facility and is being stored in a heavy oil reservoir as part of a carbon dioxide enhanced oil recovery project.

As part of its implicit carbon pricing approach, Nova Scotia has placed a hard cap on its electricity sector, reducing electricity emissions by 30 per cent to date, and which aims to achieve 55 per cent reductions by 2030.

Common Challenges for Carbon Pricing

Well-designed carbon pricing mechanisms can provide incentives for reducing emissions cost-effectively as well as for investments in low-carbon research and

technological innovations. However, there are some issues for which broad-based carbon pricing mechanisms may not be sufficient on their own.

- Lack of information. Without sufficient information on low carbon alternatives, emitting sectors and consumers may not be able to respond to price incentives. For example, increased energy efficiency can be a cost-effective way to mitigate GHG emissions, but energy efficiency improvements can go untapped in the absence of relevant information. Labelling programs can help address this issue, for example by informing consumers about the level of energy consumption of appliances.

- Benefits of an investment do not accrue wholly to the investor. This is one reason to provide public support to certain types of research and development. Accordingly, there is a role for government investment in infrastructure that supports low-carbon decision-making, such as public transit and transmission networks to connect clean energy generators to the grid.

- The presence of monopolies and other forms of market power. Economic actors who possess monopoly market power may impede the effectiveness of an explicit carbon price as a GHG emissions reduction tool, as they can simply pass on the additional carbon price to consumers, without fundamentally changing their processes. Consumers may, nonetheless, still react to the price increase by buying less of their products.

- Disconnects between carbon price and energy use. For example, increased electricity prices may not lead a landlord to invest in energy efficiency improvements in a rental property if the tenant pays the heating and power bills. Building codes or incentive measures for landlords to make energy-saving improvements in rental properties, such as the U.K's Landlord's Energy Saving Allowance, can help address this disconnect.

- Demand inelasticity. Some activities may not respond to a carbon price in a timely enough manner unless the price is very high. Transportation is an example, where emission standards for vehicles or low-carbon fuel standards can ensure emission reductions in the shorter term.

- Need for certainty. Regulations may be needed to ensure that certain types of investments are not made or to pursue a specific transformational path. For example, regulations requiring the phase-out of coal-fired electricity generation prevent investments in long-lasting capital stock, and help avoid investment lock-in and stranded assets.

- No access to lower cost, cleaner alternatives. Without access to alternatives, or reasonably-priced alternatives, increased carbon prices may lead to little or no reductions in GHG emissions regardless of the assigned carbon price (e.g., electricity generation and heating fuel in rural, remote and islanded regions).

- Incomplete coverage. It may be impractical to impose carbon pricing on some types of activities. This can be the case for emissions that are hard to quantify (e.g., fugitives) or for some types of diffuse activities for which there is not a practical point at which to impose the carbon price.

- Lack of capital. Some actors may not have access to sufficient capital to respond to the price signal that carbon pricing provides. This can be the case for low-income families that cannot afford to make improvements to vehicles or homes, and for remote communities that do not have access to alternatives to fossil fuels for heating or electricity.

In such cases, there may be a role for complementary measures. Targeted regulations, supported by an underlying carbon price, may be needed for activities that are not amenable to carbon pricing instruments, and to accelerate transformational changes in areas of high price inelasticity. Public investments in R&D and infrastructure, as well as in information programs, can also support transformative low-carbon innovations and enhance the effectiveness of carbon pricing.

Ideally, the resulting suite of policy measures chosen by governments will avoid duplicative measures and minimize the use of inefficient policies. For example, in establishing an explicit carbon pricing mechanism, it is important that the role of existing implicit carbon pricings and other complementary measures for certain sectors be properly assessed and taken into consideration.

III) Main Design Parameters for Broad-Based Pricing Mechanisms

While there are differences in the high level structure of carbon pricing systems, the detailed design of each system can have as much impact on the policy outcomes as the type of system chosen. Many of the same design decisions need to be made, regardless of the type of system chosen.

Coverage of Emissions

Regardless of the broad-based carbon pricing mechanism used or whether the carbon price is determined by the market through an emissions trading system or set by government through a carbon tax, the same GHG emissions can be covered. Generally speaking, the main types of GHGs targeted by imposing a carbon price are those designated by the UNFCCC. Emissions are subsequently converted on the basis of their 100-year Global Warming Potential, or GWP, in order to use CO_2e as a common accounting base. In this way, the price of carbon is applied uniformly and is based on one added tonne of CO_2e to the atmosphere.

- Both a carbon tax and an emissions trading system can be applied across the same economic sectors that are responsible for most GHG emissions (transportation, electricity production, industry, and buildings), so long as the necessary GHG measurement and reporting rules are in place.

- Performance standard with intensity targets are generally used for industrial resource extraction sectors, manufacturing installations and/or electrical production plants.

- Mechanisms such as fuel taxes, or carbon taxes that just apply to motive fuels, only allow for more limited coverage of the economy, usually emissions that are associated with burning gasoline and diesel.

Emissions trading systems normally extend coverage through enabling voluntary reductions in additional sectors not routinely required to measure and report GHGs under reporting rules. This can be the case, for example, in respect of the agriculture and residual materials (waste) sectors.

While emissions quantification is more challenging in these sectors, offset protocols, which should be meeting high environmental quality standards, may be applied to quantify and verify their emissions reductions. These sectors can voluntarily reduce their GHG emissions, quantify the emissions reductions using approved offset quantification protocols, have the reductions independently verified, and offer them, as offset credits, on the market to companies that are subject to these systems.

The cost of offset credits is generally lower than what the companies would need to spend to achieve comparable GHG emissions reductions at their own facilities and may be accepted by the system authority as an instrument that enables them to meet part of their regulatory obligations.

Carbon tax schemes could also include credible offset credits, although additional infrastructure would be needed for their issuance.

Certainties Regarding GHG Emission Reductions or the Price Signal

As previously mentioned, both a carbon tax and emissions trading systems provide the market with a carbon price that incentivises agents to reduce emissions whenever the costs of doing so are less than the carbon price.

Cap-and-trade systems provide the certainty of knowing that GHG emissions from covered sources will not exceed a threshold, the cap, in any given period of time. Market forces determine the price per tonne needed to achieve the desired emissions level. This price uncertainty can make it challenging for firms and individuals to choose which investments will be cost effective in the long-run, and for governments to forecast the proceeds such systems will generate.

In order to reduce price uncertainty, a floor price can be introduced in cap-and-trade systems for use during auctions, below which the government will decline to sell the available emissions allowances. This feature makes it possible to maintain a minimum carbon price, ensuring that the entities covered by the system remain incentivized to invest in greener technologies that emit fewer GHGs. Price spikes can also be

controlled by creating a reserve of emissions allowances that the covered entities can access at a predetermined price, thereby offering a soft price ceiling if certain conditions are met.

A carbon tax provides price certainty as the cost to be paid for each tonne of emissions during a given time period is known; however, the level of GHG emissions achieved by the tax remains uncertain. To meet emission targets, governments need to monitor the impact of the tax on carbon emissions and adjust the rates accordingly. As such, meeting specific short-term emissions targets through a carbon tax can be challenging. In addition, the need to adjust carbon tax rates in response to revealed emissions increases uncertainty about long-term prices.

Performance standard systems can provide some price certainty by setting a ceiling price, with companies able to purchase reserve permits from the government at a set price per tonne. Performance standards can be stand alone or implemented with an emissions trading system. When implemented with an emissions trading system, facilities or firms would have the flexibility to pay the carbon price or purchase offset credits. Achieving a given emissions level, however, is difficult because the system focuses on attaining a given level of emissions intensity, rather than a given level of emissions. In a similar manner to carbon taxes, the price of the reserve permits and stringency of the standards could be adjusted over time to achieve a given emissions target.

Administration Costs and the Burden of Compliance

Broad-based carbon pricing mechanisms will impose administrative costs on both governments and business that need to comply with the requirements of the mechanism. Depending on the complexity of the pricing systems, these costs could be more or less burdensome.

The administrative cost of implementing a carbon tax is typically low compared to the cost of implementing an emissions trading system, especially if the tax simply applies to fossil fuels at standard emissions factors. Historically, Canadian governments already have experience in applying this type of mechanism for motive fuels such as gasoline and diesel, but not other fossil fuels such as natural gas and coal. In order to implement a carbon tax, governments need to determine the coverage, the rate of the tax and how to collect it. They also need to calibrate the rate to the target emissions level on a regular or periodic basis. Complexities may arise from design features aimed at addressing some competitiveness issues, such as for trade-exposed GHG emission intensive industries. If a carbon tax is expanded to include certain non-combustion emissions, administration costs could increase, depending on the coverage.

With respect to a carbon tax applied to fuel combustion carbon emissions, fuel producers, distributors or end-users are required to pay to the government, at a pre-determined time and manner, the amount of tax that corresponds to their production, sales, purchases, or use of fuels, as the case may be. Because of the smaller number

of entities required to comply with the tax system (depending on the stage at which the tax is imposed), the overall administrative cost and burden of compliance is usually lower than under emissions trading systems. If the carbon tax is also applied to industrial process, venting or fugitive emissions, then administrative costs for companies operating in industrial sectors will increase, since they need to measure, verify, and report their emissions.

Implementing an emissions trading system requires a more elaborate administrative structure than that required under a carbon tax applied to emissions from fuel combustion.

- A government must develop laws to regulate system operation, including GHG reporting and audit requirements, its scope and its compliance rules; establish a coverage threshold; and set annual emission caps.

- The system must also be administered, which requires among other things an emissions allowances holding and monitoring register, participant registration, market supervision, and holding auctions.

Beyond administrative costs and independent of the selected mechanism, companies must meet their regulatory obligations by assuming the carbon cost for each tonne of emissions.

- For companies covered by carbon pricing measures issued under regulations, this usually involves a mandatory annual emissions declaration that generally includes a third-party audit to ensure accuracy.

- Companies subject to emissions trading system requirements must provide the government with one emissions allowance for each tonne of GHGs emitted during a compliance period. These emissions allowances could come from receiving free government allocations (e.g., for trade-exposed sectors), through purchasing allowances during a government auction/sale or via a secondary market (including from other regulated entities or from offset credits).

Efficiency and Flexibility of Approaches

Carbon pricing systems encourage emissions reductions from those for whom it is easiest and cheapest to reduce emissions. This is achieved by providing a mechanism where high-cost emitters can choose not to reduce their own emissions – if it is more costly for them to do so than to buy surplus allowances from sources that have reduced their emissions, or pay a fixed price to the government.

Cap-and-trade systems have the advantage of ensuring a jurisdiction will reach a defined GHG emission cap at the lowest cost – where the actual cost of meeting that cap remains uncertain. Economic agents that are able to reduce their GHG emissions at

low cost can sell these reductions to others whose reduction costs are proportionately higher.

Emission trading systems, including cap-and-trade and performance standards, have the potential advantage of including participation from more sectors of the economy by providing non-covered sectors with opportunities to sell reductions on the market by means of offset credits. This benefit is limited however, to sectors that can develop and apply rigorous quantification protocols at a scale to justify the administrative costs.

Carbon taxes generally apply uniformly to all targeted economic agents at a set point in time. They offer the advantage of being more visible and stable with respect to the price signal and of enabling companies to take the precise cost into account in decision making. Under a carbon tax, non-taxed sectors do not have an incentive to reduce their GHG emissions, unless offset credits generated by emissions reductions in these sectors are part of the design and accepted in lieu of paying the tax.

The process of price discovery that may be required to achieve a desired level of GHG emissions can be challenging because governments and covered sectors possess asymmetric information, notably regarding the latter's marginal abatement costs and GHG emission reduction potential. In this context, it can be difficult to set a carbon tax to meet a specific emissions goal, or to predict emissions prices and economic impacts in a cap-and-trade system.

In terms of responsiveness to economic circumstances, cap-and-trade is a carbon pricing mechanism that can be considered counter-cyclical. In other words, if the economy slows down and GHG emissions are falling, the carbon market can react and prices will decrease in response. When the economy improves, the price of carbon will automatically adjust again. While this buffers the overall cost exposure of covered entities, it creates a risk to emissions reduction investments. The value of emissions reduction varies over time and actors will therefore have to incorporate the risk of price drops into their decisions, causing a lag or reduction in the activity taken at a given price – which however could be mitigated by the establishment of a floor price.

Conversely, a fixed price system or carbon tax will not automatically react to economic cycles, which can mean that emission reductions resulting from the price incentive are compounded by emissions reductions caused by declines in economic activity. The certainty of price signal provided is nonetheless a benefit to investors.

As noted above, carbon price controls in all pricing systems ideally need to be designed to cover both inflation and recession and ensure they have an ongoing effect on the behaviors to be modified.

Related Proceeds

Both emissions trading systems and carbon taxes offer the potential for generating substantial proceeds for governments. Although it is relatively straight forward to

estimate revenues from a carbon tax, forecasting anticipated proceeds from an emissions trading system is more difficult. The anticipated level of proceeds under an emissions trading system will mainly depend on the scope of coverage, the stringency of the cap, the availability of banked credits or offsets and the volume of emissions allowances freely allocated. Under a carbon tax, anticipated revenue essentially relies on the scope of coverage, the tax rate, the level of activity in emitting sectors, and the availability of low-cost reduction opportunities.

[Other Design Parameters]

The final report may consider other design parameters, such as transparency and credibility, boundaries and linkages, and complementary policies.

Considerations

Each carbon pricing mechanisms has its advantages and disadvantages. The mechanisms, and the design of the system details chosen by a government will depend mainly on its objectives in the following areas:

- The desired level of certainty around reduction in GHG emissions in a given time frame;
- The desired clarity and strength of the carbon price signal over time, both for covered sectors and companies and for the economy as a whole;
- The desired level of compliance flexibility for covered sectors and companies;
- The interaction with other climate change policies and regulations; and
- The risks to competitiveness of trade exposed sectors and desired mitigation approaches.

What Are Other Countries Doing to Price Carbon?

The most common market-based policies used around the world to reduce GHG emissions are carbon taxes and cap-and-trade systems. In fact, a number of Canada's largest trading partners are using some form of carbon pricing mechanism.

- In the absence of support for new legislation, the United States government is relying on the authorities in the Clean Air Act to regulate GHG emissions via the Clean Power Plan, which sets standards for emissions from power plants, and establishes state-by-state emissions reductions goals, and enables compliance by using a cap and trade system. Various sub-national governments have established emissions trading requirements. Under the WCI, California has an economy-wide cap-and-trade system that is linked with Quebec and soon with Ontario (expected by 2018). In addition, a number of northeastern states regulate CO_2 emissions from

electricity generation under the Regional Greenhouse Gas Initiative which is also a cap-and-trade system.

- China, the world's biggest GHG emitter, has announced that, as of 2017, its seven regional GHG cap-and-trade pilot systems currently in operation will give way to a nationwide system.

Annex 1 provides a listing of international carbon pricing mechanisms, as well as some basic parameters of each system. This sample shows considerable variation in how these policies are implemented, with coverage ranging from 8 per cent of total emissions in Japan to 85 per cent of total emissions in California. The price on carbon also varies across jurisdictions, from between US $1 and US $4 per tonne of carbon dioxide in Mexico to as high as US $168 per tonne of carbon dioxide in Sweden.

The international experience shows that tax and cap-and-trade systems, as well as overlapping cap-and-trade systems, can and do co-exist in the same jurisdiction. Many European countries use a combination of both tax and cap-and-trade systems.

- France and Ireland introduced a carbon tax, while also participating in the European Union Emissions Trading System (EU ETS) in order to increase the carbon emission coverage.

- The United Kingdom introduced a carbon price floor on fossil fuels used in electricity generation to complement its Climate Change Levy on industry, agriculture and the public sector. The United Kingdom also participates in the EU ETS.

- Norwegian greenhouse gas mitigation policies include a carbon dioxide tax, the Pollution Control Act, the Petroleum Act, and the Greenhouse Gas Emissions Trading Act, which collectively cover more than 70 per cent of Norwegian domestic GHGs.

IV) How Can Carbon Pricing Help Canada Meets its GHG Reduction Targets?

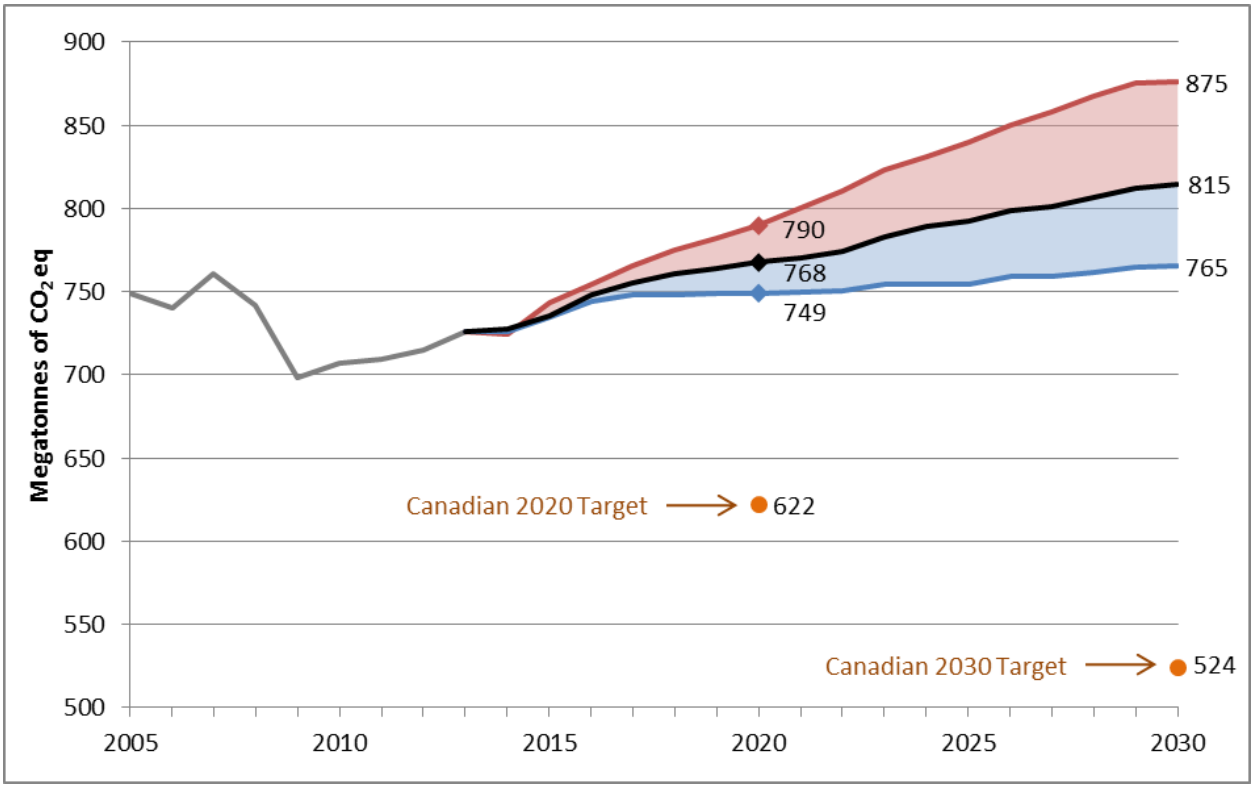
Overview of Canada's Emissions Profile

Through the Vancouver Declaration, First Ministers agreed to "implement GHG mitigation policies in support of meeting or exceeding Canada's 2030 target of a 30% reduction below 2005 levels of emissions, including specific provincial and territorial targets and objectives". Table 2 presents Canada's projected emissions[3] – with three

[3] The data and projection used in this section does not necessarily correspond to those of provinces and territories who compile and produce inventories. There is nonetheless a general consensus that in order to ensure the comparison at the provincial and territorial scale, these data and projections are the only one that can be used at the moment. Work has been undertaken in partnership in order to improve the data and projection.

possible scenarios – based on the National Inventory Report. The range in the figure highlights the sensitivity of emissions to broader economic factors – especially the price of oil. The 2030 target would see Canada's emissions reduced to 524 MT of CO_2e.

Table 2 – Canada's Projected Emission Profile



Based on projections from the National Inventory Report, which generally include policies in place prior to September 2015, Canada's emissions are projected to be 9% above 2005 levels in 2030 and 291 Mt above Canada's target of 30% below 2005 levels in 2030. Inclusion of other measures, including recently announced additional policy measures in Alberta, Ontario and Newfoundland and Labrador are expected to reduce the forecast emissions and gap to the 2030 target.

Illustrative Low Carbon Price Scenario for Canada

In order to demonstrate the potential impacts that carbon pricing mechanisms can have on projected GHG reductions, an illustrative carbon price scenario(s) will be developed in consultation with the working group members. The analysis of this illustrative carbon price scenario is framed by an energy, emissions and economy baseline that is aligned to the reference projection reported in Canada's 2nd Biennial Emissions Report. Under this baseline, greenhouse gas emissions are projected to reach 815 Mt by 2030 (as indicated in Table 2).

The estimates will be produced using Environment and Climate Change Canada's multi-region, multi-sector computable general equilibrium (CGE) model of the Canadian economy (EC-Pro). The EC-PRO is a small open-economy recursive-dynamic CGE model of the Canadian economy that captures characteristics of provincial production and consumption patterns through a detailed input-output table and links provinces via bilateral trade. This section will seek to provide an illustrative output of estimated impacts on GHG emissions as well as distributional impacts.

V) Considerations for Carbon Pricing

While carbon pricing would help meet GHG reduction targets by internalizing the price of carbon into the cost of goods and services, it would also represent an increase in costs facing some producers and consumers. As such, carbon pricing presents several issues that need particular attention.

Revenue Recycling

A carbon pricing mechanism has the potential to raise significant revenues[4]. How the proceeds from carbon pricing are recycled into the economy will therefore be a central determinant of the overall economic and equity impacts of any policy. The design decisions around coverage, stringency, and price in any system will have a significant impact on the revenue collected.

There are three broad policy goals that governments might hope to address using recycled revenues. When comparing various recycling options it is important to consider them in the context of the policy goal they are meant to address. Governments might choose to recycle revenues to:

- Offset equity and competitiveness impacts created by the carbon price;
- Facilitate the transition to a low-carbon and resilient economy, or
- Boost sustainable growth and raise the long-run standard of living of households.

Recycling Options to Address Equity Impacts of Carbon Price

Because carbon pricing works by changing the relative price of goods in the economy, firms and households that rely more on carbon intensive goods will face greater impacts than those that rely less on carbon intensive goods. This creates the incentive for firms and households to internalize the cost of carbon into their decisions and reduce their

[4] Revenue generation from carbon pricing is one component that a government can use in its overall fiscal management. To the extent that carbon pricing will have an impact on other parts of the economy, or revenues from other sources, it may result in reduced revenues elsewhere during the transition to a low carbon economy.

use of carbon intensive goods. However, carbon pricing will systematically impact some subgroups more than others and while the incentives to reduce emissions should be maintained there exists a rationale to use recycled revenues to limit the impacts on subgroups that are impacted more not because of their choices but because of their circumstances. These subgroups could be defined based on income, access to lower-cost options, dependence on emissions-intensive industries, or other metrics.

Household Equity Impacts

The level of CO_2e emissions generated by $1,000 of consumption spending does not differ significantly across income quintiles, suggesting that the carbon intensity of the consumption basket does not significantly vary with income. However, lower income households consume a greater share of their income and are therefore disproportionately affected by carbon pricing. A carbon price and a sales tax will therefore exhibit a similar degree of regressivity across income groups. The regressivity does not come from low-income earners consuming relatively more high-carbon content goods but for the same reason as for a sales tax: since the consumption-income ratio is higher for lower income households (as they save less), taxes paid on consumption will necessarily represent a higher proportion of these households' income.

Generally, sales tax regressivity is addressed through exempting some goods (e.g., basic groceries) and through direct transfers to low income households (e.g., Goods and Services Tax (GST) credit). Another possibility would be to means test subsidies for abatement actions, recognizing that lower income households have less disposable income to invest in energy efficient technology. The need to recycle revenues toward lower income households would be structural rather than transitional.

Furthermore, the recycling of revenues to address equity issues could be implemented though programs specifically designed and focused toward low-income households in order to reduce the proportion of the revenue spent on carbon-intensive goods and services. Alberta's planned carbon levy rebates to low- and middle-income households and British Columbia's low income climate action tax credit are two examples of this type of policy.

[Further work will be needed to quantify how much revenue may be required to address income regressivity.]

[Chart to be included on the incidence of carbon price as a share of income, by various income levels.]

Sectoral Equity Impacts

Carbon pricing works by making carbon-intensive goods more expensive and carbon-intensive firms less competitive. For this reason, many of the competitive and equity impacts across sectors are a necessary product of a functioning carbon pricing system. As the market adjusts to the reality of carbon pricing, the overall make-up of the economy will change. This will create a period of transition where some firms will need

to change production processes and some individuals may need to change employment.

By investing in this transition to address the financial constraints of individuals and firms, governments could potentially limit impacts and speed up the transition to a sustainable low carbon economy. Transitional assistance could include support to adopt lower emitting or energy efficient technology or retraining programs for displaced workers. This will be especially important in communities which are dependent on carbon intensive firms/sectors.

Special consideration could also be given to the competitiveness impacts of carbon pricing on emissions-intensive sectors with limited ability to pass on increased costs related to carbon prices. (See further discussion below.)

Carbon pricing may result in domestic firms with low emissions intensity losing market share to firms in low carbon price jurisdictions with high emissions intensity. Recycling revenues to reduce the competitiveness impacts can potentially improve global climate outcomes. However, any initiative that increases production by emissions intensive domestic firms will make achieving national targets more difficult.

As such, it is important to take considerable care in identifying sectors that may be subject to lost opportunities to foreign competitors as a result of carbon pricing. In addition policies to help alleviate these impacts should either be transitional in nature or tied to the carbon pricing policies of our trading partners.

Recycling Options that Help Transition to a Low Carbon and Resilient Economy

The overall goal of carbon pricing is to reduce emissions. As such, proponents sometimes discuss the virtuous cycle of reinvesting revenues collected by carbon pricing into areas that further reduce emissions or to ensure adaptation and increase resiliency.

That said, carbon pricing itself should provide a robust economic signal that creates the incentives to undertake any abatements that are economical. The impacts of additional incentives to reduce emissions could be less than expected in the cases where individuals and firms might receive incentives for actions they were already going to make because of the price signal; incentives target additional reductions in areas with inefficiently high costs; the incentives interact with the carbon pricing mechanism leading to higher emissions elsewhere in the system (specific to jurisdictions with a cap and trade system).

In theory, the most effective way to leverage recycled revenues to achieve additional emissions reductions would be to target funds at sectors that are not covered by the carbon pricing policy or target them specifically to facilitate the implementation of profitable measures that are not implemented because the market fails to fully value their economic and social benefits.

However:

- In practice, it is only possible to price things that are measurable with some degree of certainty. For this reason, it is difficult to price the emissions associated with some sectors of the economy. Despite this fact, these sectors sometimes have many low cost opportunities to reduce emissions. Recycling revenues to incentivize emissions reductions in these sectors could be justified, although complementary regulations that mandate best practices are a potentially more cost-effective way to incentivize emissions reductions in parts of the economy that are not subject to carbon prices.

- Fighting climate change can be considered a technological problem. The world needs new technologies to be developed in order to maintain (and improve) living standards while reducing the amount of GHGs emitted. Unfortunately, two main market failures lead to an inefficiently small amount of green innovation. The first is the knowledge spillover market failure, where innovators are unable to monetize the full value of their innovation. By making incremental improvements, future innovators benefit from having access to existing innovations but also steal market share from the original product. The second market failure is that the benefits to some types of relevant innovation will be global while a carbon pricing instrument will only change demand within the domestic market. Because Canada is a relatively small market, carbon pricing in Canada would have only a modest impact on global green innovation. To incentivize more green innovation, governments could further fund basic research and/or provide additional support for research and development, subject to the availability of appropriate human resources.

- Certain goods in the economy have a public nature and will not be efficiently provided by the market. Governments generally take it upon themselves to provide these goods (e.g., public transit, parks, police and military, etc.). Carbon pricing has the potential to increase expenditures associated with providing these goods both by increasing their demand and increasing their costs. For instance, governments may be required to expand the public transit system or the electricity grid to extend these services to a larger part of the population. Some public infrastructure may no longer be consistent with a low carbon economy and may require replacement before the end of its useful life. Alternatively, the costs of governments might increase with the need to reduce emissions in their buildings, vehicle fleets and military. Recycled revenues could potentially be used to offset the costs associated with these expenses.

Recycling revenues to accelerate the transition to a low-carbon economy can provide various benefits. Measures assisting firms increase their energy efficiency, help reduce production costs and make firms more competitive, while improving the overall energy security of the jurisdiction. Programs aimed at fostering green innovation also contribute the creation of new technology clusters and green jobs. Reducing fossil fuel combustion also has a positive effect on air quality and on health care public expenditures, not to mention the numerous co-benefits on the security and quality of life that stems from actions aimed at improving active and sustainable means of transportation.

Recycling Options that Achieve Stronger, More Inclusive and Resilient Long-term Economic Growth

Given that governments have many competing policy priorities, revenues from carbon pricing could potentially be directed towards areas that are not directly related to climate change. Directing funds towards policies that achieve stronger, more inclusive and resilient long-term economic growth could be justified regardless of the source of the revenues. Because emissions are partly a function of economic activity, recycling revenues in a way that promotes economic growth will increase the carbon price necessary to achieve a given emissions reduction. However, higher incomes will also have an impact on the ability of households to make investments that lower their emissions.

Most economic modelling indicates that carbon pricing will reduce economic growth, at least in the short run.[5] However, estimates vary widely, and one of the main factors underlying different projections is how the revenues from carbon pricing are recycled. In general, the projections showing the smallest impacts on GDP are the ones in which the revenues from carbon pricing are used to reduce distortionary taxes. By generating revenues through a price on carbon there is the opportunity to adjust the overall tax mix in the economy to increase overall tax competitiveness or make the system more equitable. Tax mix changes could be an efficient way to deal with many of the equity issues above.

[Economic modelling of impacts of revenue recycling using the EC-PRO model to be included here.]

Other priorities might include stimulating the economy and promoting long-term sustainable growth through targeted investments in infrastructure or improving the current or future fiscal balance of the government.

Considerations

To avoid the perception that carbon pricing is a “tax grab”, governments could choose to direct all carbon revenues into a dedicated fund committed to:

1. Revenue neutrality (all revenue from the carbon price is used to lower other sources of revenues, such as in B.C.); or

[5] It also has to be stated that most models fail to fully account for the positive impacts of mitigation and adaptation efforts such as the emergence of new technology sectors that can stem from decarbonisation, as well as the direct benefits on public expenditure, such as those resulting from improved health, or the negative societal costs of carbon associated with carbon-intensive economic activities, which are estimated to be $41/tonne CO_2 in 2016 by Environment and Climate Change Canada.

2. Fiscal neutrality (all revenue from the carbon price is used to either lower other sources of revenue and/or reinvested in new spending associated with climate change, such as in Alberta and Quebec).

Revenue recycling could offset much of the economic cost, correct equity impacts or increase emission reductions and help pay for public infrastructure to support mitigation activities and adaptation to climate change impacts, or a mix of these approaches. However the choice between recycling options requires weighing trade-offs. Different governments at different periods may choose to recycle differently.

Northern and Remote Communities

Unless there are appropriate supporting measures, any carbon pricing mechanism could have disproportional impacts on northern and remote communities, as they face unique challenges compared to the rest of Canada. Northern and remote communities are generally characterized as permanent or long-term settlements that are not connected to the North American electrical grid or natural gas network.

According to the Natural Resources Canada Remote Communities Database, there are roughly 284 remote communities in Canada. These include communities, settlements, villages or cities, as well as long-term commercial outposts and camps for mining, fishing and forestry activities. Approximately 60 per cent are considered to be Indigenous communities (First Nations, Innu, Inuit, Métis).

Given geographical realities, these communities could face additional burdens from carbon pricing mechanisms in the context of transportation costs, generation of electricity, heating costs, as well as impacts on local fuel-intensive industries, such as mining operations.

Transportation

The vast transportation distances and geographical remoteness of northern and remote communities necessitates a heavy reliance on air travel and other motive-fuel vehicles and is the major driver of emissions in the transportation sector. Long-distance medical travel is also necessity for residents living in small, remote communities with limited health care services, as well as for hospital patients requiring medical procedures that are not available locally.

Generation of Electricity

With the exception of a few local hydro grid-tied communities in Yukon, Northwest Territories and Quebec, the vast majority of remote communities across Canada rely on diesel generation for the production of electricity, and there are currently few options for renewable technology substitution (e.g., electricity consumption is far too small to integrate wind energy cost effectively and the technical maximum solar penetration may only displace 2-10 per cent of the annual diesel use). Thus, most of these communities

are characterized by a high degree of dependence on imported fuel and high energy costs.

Community isolation also affects the energy source mix for electricity. Interconnecting most communities to a transmission grid is cost prohibitive due to the shear distance between them and the small population size also prohibits investment into alternatives due to technical and economic challenges of integrating complex multi-source systems into remote communities.

Heating

The majority of homes and buildings in the Territories are heated by diesel or other liquid fuels. In general, reliance on diesel fuel is due to less viable options to ship/transport and consume fuels with lower carbon content (e.g., natural gas, propane, wood pellets). This reliance on diesel is exacerbated by the fact that winters are generally longer and colder in the northern communities, resulting in more days requiring space heating than the average Canadian household. For example, winter temperatures can remain below -40°C for prolonged periods in the Territories, and in other northern communities.

Impacts on Fuel-Intensive Industries

The Northern economy is less diversified than Canada's national economy and the industries that are prevalent are fuel-intensive. For example, mining, quarrying and oil and gas extraction and public administration, accounted for over 40 per cent of the North's GDP in 2011. Further, the transportation and electrical needs for mining can push energy costs to 30 per cent of total operations expenses at a northern mine. While the majority of the industrial sector in the Yukon is currently powered by hydro, industries in NWT and Nunavut rely almost exclusively on diesel electricity generation.

Considerations for Northern and Remote Communities

These challenges that northern and remote communities may face do not necessarily preclude the use of carbon pricing mechanisms, however, it will be important to take into account certain considerations in contemplating carbon pricing mechanisms and the recycling of revenues.

- Remote communities that are heavily reliant on carbon-based fuels would be disproportionally burdened by a carbon pricing. Further, these communities, particularly those above the tree line, have limited opportunities to reduce their consumption of carbon-based fuels by making use of alternative fuels.

- The embedded costs in goods and services such as food and clothing could be as significant as the direct costs from carbon pricing on energy.

- Carbon pricing raises the cost of operations and reduces the competitiveness of fuel intensive industries, such as exploration for, and extraction of minerals, oil and gas,

which operate in a global economy. (This factor is not limited to northern or remote communities.)

- Carbon pricing mechanisms could significantly affect the budgets of governments in northern and remote communities.

Islands and islanded communities, which are not necessarily considered to be northern or remote, may face similar challenges depending on their isolation relative to the mainland. For example, there may be limited access to alternative fuelsor other electrical grids. Further, these communities may face higher transportation costs, and this could have an impact on the cost of all goods and services in those communities.

Considerations for Indigenous Peoples

[This section will be informed by the broader Indigenous engagement process]

Competitiveness Concerns

The application of domestic carbon pricing mechanisms (e.g., a carbon tax or cap-and-trade system) could create competitive pressures for industry in Canada, if other jurisdictions do not impose similar pricing mechanisms. In particular, industry in Canada would face higher direct and indirect costs as a result of domestic carbon pricing, which could reduce their price competitiveness in domestic and foreign markets.

In order to maintain competitiveness, firms may face pressure to reduce production or to move to a jurisdiction that has not yet priced carbon at a comparable level in order to benefit from lower production costs. This could impact jobs and economic activity in Canada and undermine GHG reduction efforts on a global basis by increasing emissions in the other jurisdictions – a situation known as “carbon leakage”.

The extent to which the competitiveness of a firm is negatively impacted by differential carbon pricing is largely determined by two factors: 1) the carbon emissions intensity of the firm’s production, and 2) the market power of the firm, often measured by the extent to which the firm is trade-exposed.

Ultimately, the scale of competitiveness impacts on particular sectors will depend on the specific carbon pricing mechanisms and level of stringency employed, the specific nature of trade patterns, and broader business environment factors. Impacts will also vary by firm, depending on such factors as differences in cost-structures and ability to influence selling price.

[summary of modelling results to be provided in final report]

Policy Tools

There are a variety of policy tools available at different levels of government for addressing potential competitiveness pressures, which could be used in isolation or in conjunction with one another. Broadly speaking, there are three general approaches:

1. Differential treatment for affected sectors, which could include reducing, eliminating or offsetting the cost impact of carbon pricing;

2. Revenue recycling to mitigate competitiveness impacts; and

3. Border tax adjustments which could consist of "carbon tariffs" being applied on the embedded carbon content of imported GHG-intensive goods and a full or partial rebate of the carbon price paid on inputs used in the production of exported goods.

The Final Report will contain more detailed information on competitiveness issues, including detailed considerations related to the policy tools outlined above, and could consider other possible policy tools, as needed.

VI) Evaluating Carbon Pricing in Canada

Domestic Experiences in Carbon Pricing

Some provinces have already moved forward with their own explicit carbon pricing mechanisms, creating a variety of different regimes across Canada. In Canada, both carbon taxes and cap-and-trade systems have been implemented or announced by various provinces. All Canadian governments also have extensive experience with direct pricing of fuels or implicit carbon pricing mechanisms. Annex 2 includes templates describing various carbon pricing profiles in Canada, as completed by the provinces and territories.

Carbon Taxes in Canada

British Columbia introduced a carbon tax in 2008 at a rate of $10 per tonne of CO_2e. This rate was increased by $5 per year up to 2012, reaching $30 per tonne of CO_2e. The tax is revenue neutral, as all the revenue it generates is returned to businesses and individuals in the province through other tax reductions and rebates. The tax applies to all fossil fuel combustion sources in the province, covering about three-quarters of provincial GHG emissions. Specifically, the tax applies to all liquid, gaseous, and solid combustible fuels, including gasoline, diesel, natural gas, coal, propane, home heating fuel, ethanol, and renewable diesel fuel purchases. As these fuels generate different amounts of GHG emissions, the carbon tax is applied at varying rates.

Alberta has also announced that it will be implementing a new carbon levy on transportation and heating fuels, including diesel, gasoline, natural gas and propane. The levy will apply as of January 1, 2017 at a rate of $20 per tonne, and will increase to $30 per tonne on January 1, 2018. The government has also indicated that the funds

will be used to diversify the economy by investing in renewable energy, bioenergy, and technology; spending on green infrastructure like transit; and improving energy efficiency of homes, communities, and businesses. Support will also be provided to households and businesses through lower-income rebates, a reduction in the small business tax rate, and funding to assist coal communities, indigenous communities, and other communities requirement adjustment assistance.

Cap-and-trade Systems in Canada

Quebec introduced a cap-and-trade system in 2013, which covers business emitting 25,000 metric tonnes or more of CO_2e per year and fuel distributors selling more than 200 litres of fuel. The system covers about 85 per cent of Quebec's GHG emissions. Under the system, Quebec sets a cap on emission units that it will put in circulation each year, which will gradually decline over time. Trade-exposed industrial emitters receive most of their emission units free of charge, and the rest are sold at auction, which includes a price floor that increases annually – currently units are trading close to the floor price of about $16 per tonne of CO_2e. All proceeds from the auction go to the Quebec Green Fund and are earmarked for the financing of various initiatives contained in the 2013-2020 Climate Change Action Plan. Since January 1, 2014, Quebec's cap-and-trade system has been linked to California through the Western Climate Initiative (WCI). The linkage enables firms regulated by Quebec's system to purchase and use California's permits for compliance in Quebec, and vice versa.

Ontario' new cap-and-trade regulation – supported by its new *Climate Change Mitigation and Low Carbon Economy Act* – will take effect on July 1, 2016. The first compliance period will begin on January 1, 2017. Similar to Quebec, the program will cover businesses emitting 25,000 tonnes of CO_2e per year, including distributors of heating fuels and suppliers of transportation fuels selling more than 200 litres of fuel. The program is expected to cover between 80 and 85 per cent of Ontario's emissions. Proceeds from the auctions are expected to go to investments to support GHG reduction initiatives, such as home and business energy efficiency, innovation funding, transit, and clean technology. Ontario has announced its intention to link with Quebec and California.

Performance Standard Systems in Canada

Alberta has priced greenhouse gas emissions since July 1, 2007 through the Specified Gas Emitters Regulation, which applies to all facilities that emitted more than 100,000 tonnes CO_2e in any year since 2003. This covered approximately 50 per cent of Alberta's emissions as reported in the National Inventory Report in 2014. This regulation includes compliance flexibility mechanisms for regulated facilities that enable Alberta's carbon offset and emissions performance credit markets, as well as an option to pay a fixed carbon price to government for emissions in excess of facility limits. The price per tonne of emissions started at $15/t CO_2e and was raised to $20/t for 2016 and $30/t for 2017, along with increases in the stringency of facility emissions limits. Revenue collected under the Specified Gas Emitters Regulation is all put into the Climate Change and Emissions Management fund which invests in emissions reduction and climate

change adaptation measures. As of 2018, this will transition to a product-based performance standard system.

[At the time this interim report was prepared, the Newfoundland and Labrador House of Assembly was considering a bill that would regulate large industrial GHG emissions in a manner conceptually similar to that of Alberta. Additional information on this system will be provided in the final report.]

Other Carbon Pricing Systems in Canada

All Canadian governments have also made large-scale use of taxing fuels or putting in place implicit carbon pricing mechanisms. For example, Nova Scotia has designed a set of implicit carbon pricing mechanisms which have reduced its total GHG emissions by almost 30 per cent since 2005. It imposed a hard cap on its electricity sector, to achieve 55 per cent reductions in GHG emissions by 2030. It also adopted a Renewable Portfolio Standard which has resulted in Canada's 2nd-highest level of wind power in its electricity mix (after PEI), and it prescribed more electricity efficiency (now achieving 1 per cent/year load reductions); banned organics from landfills; and invested in Canada's largest expansion of the National Grid in years.

[Placeholder for other implicit carbon pricing measures in the final report]

Evaluation of Current Carbon Pricing Approaches in the pan-Canadian Context

A number of jurisdictions have introduced some form of carbon pricing, whether it is a carbon tax, a cap-and-trade, a performance based standards system, taxes on fuels or implicit carbon pricing tool to reduce GHG emissions. Together, these actions are having an impact on Canada's GHG emissions reduction targets.

There are a number of similarities between the broad-based carbon pricing mechanisms that have been implemented or announced by provinces in Canada. For example, broad-based carbon pricing mechanisms in Canada:

- Attempt to correct a market failure by providing an incentive to businesses to develop and invest in technologies which save energy or reduce emissions, as well as providing an incentive to consumers to choose lower emissions goods and services.

- Take advantage of market efficiencies by providing flexibility on how to achieve emissions reductions.

- Generate revenues for government, which can be used to address potential adverse impacts on lower income individuals and families and business competitiveness.

Those jurisdictions with carbon pricing have designed their systems to meet environmental objectives while recognizing their own unique needs.

As a result, there are multiple regimes in Canada with multiple prices, minimal linkages among systems and a different scope of coverage among jurisdictions. Some jurisdictions have no broad-based carbon pricing regime. There is also access to foreign emissions permits in certain provinces.

Multiple Regimes

There is now a variety of carbon pricing regimes in Canada – both explicit and implicit. Each regime has its own set of criteria, including coverage, reporting requirements, timing of payments (e.g., embedded as a carbon tax or settled at the end of a multi-year compliance period using emissions allowances), the ability to use offset credits, etc. Other jurisdictions have no explicit carbon price at all.

The variety of approaches reflects the unique emissions profiles and unique economic structures of Canada's provinces. Climate policy is not a one size fits all approach.

This multiplicity of regimes may not present concerns for some communities, households and businesses, including some of Canada's largest emitting industries. Indeed, in the electricity sector, which is the [third] largest source of GHG emissions in Canada, provincial systems have minimal linkages and different administrative structures (crown corporations, markets, etc.) and power generating companies generally operate in a single province and need only comply with a single regime.

However, for businesses that operate across the country, the existence of significantly different carbon pricing regimes (or none at all) across provinces can increase their compliance costs.

[This section will be further informed by stakeholder consultations].

Multiple Carbon Prices

The multitude of carbon pricing regimes also creates a range of effective carbon prices (both explicit and implicit) across the country, which impacts the incentive effects faced by businesses and consumers. In the absence of a comparable carbon price across Canada, some low-cost emission reduction opportunities may be missed. In their place, governments and industry may have to rely on higher-cost, less efficient reduction approaches.

Multiple prices (or no price in some cases) also impacts the ability of jurisdictions that have carbon pricing mechanisms to increase their price at a pace that exceeds others out of competitiveness concerns (i.e., if one province chooses to significantly increase its carbon price vis-à-vis other jurisdictions, it could put certain firms at a competitive disadvantage within the country). To the extent that other jurisdictions' lack of similar pricing results in other jurisdictions not increasing their own rates more aggressively,

this will have an impact on Canada's overall emissions reductions. In other words, lack of carbon pricing in some jurisdictions could actually impact other jurisdictions' emissions reductions, creating the same competitiveness concerns inside Canada that exist internationally.

Access to Foreign Permits in Certain Provinces

Some provinces have chosen to access to enable international permits through trade, whereas other provinces have not. For example, Quebec's linkage to the California emissions permit market means that California emission permits can to be used to satisfy Quebec's annual cap-and-trade regulations, (and vice-versa). This linkage provides such provinces access to a broader pool of possibly lower-cost reductions but, as in any partnership, requires agreement among members before making any important changes like imposing a higher carbon price. This linkage will affect the flexibility of these two jurisdictions to unilaterally alter their carbon pricing mechanisms significantly.

[The final report will include a section on the lack of recognition of offsets across Canadian provinces]

VII) Principles for a Pan-Canadian Approach

First Ministers recognized that:

- all governments have an important role in the global effort to reduce GHG emissions, and that a number of provinces and territories have already joined or are exploring entry into regional and international efforts to reduce GHG emissions;

- carbon pricing mechanisms are being used by governments in Canada and globally to address climate change and drive the transition to a low carbon economy;

- provinces and territories have been early leaders in the fight against climate change and have taken proactive steps, such as adopting carbon pricing mechanisms, placing caps on emissions, involvement in international partnerships with other states and regions, closing coal plants, carbon capture and storage projects, renewable energy production (including hydroelectric developments) and targets, and investments in energy efficiency; and

- the federal government has committed to ensuring that the provinces and territories have the flexibility to design their own policies to meet emission reductions targets, including their own carbon pricing mechanisms, supported by federal investments in infrastructure, specific emission reduction opportunities and clean technologies;

and committed to transition to a low carbon economy by adopting a broad range of domestic measures, including carbon pricing mechanisms, adapted to each province's and territory's specific circumstances, in particular the realities of Canada's Indigenous peoples and Arctic and sub-Arctic regions.

In keeping with these commitments of the Vancouver Declaration, the following principles will be used in guiding the development of options for the Working Group on Carbon Pricing Mechanisms:

1. The pan-Canadian framework for Clean Growth and Climate Change should be flexible, and should recognize and further support existing carbon pricing policies already implemented or in development by provinces and territories.

2. Carbon pricing, being widely recognized as an economically efficient policy tool, should be considered as a central component of the Pan-Canadian Framework.

3. Carbon pricing coverage should be applied broadly so that the incentive it provides to reduce greenhouse gas emissions is applied to as many goods and sectors in the economy as possible.

4. Carbon pricing policies should be introduced in a timely manner in order to minimize new investment into assets that will become stranded and maximize cumulative emission reductions.

5. Carbon price increases should occur in a predictable and gradual way to limit economic impacts and allow businesses and households time to plan and adjust with limited uncertainty.

6. Reporting on carbon pricing policies, in terms of coverage, stringency and associated emissions reductions, should be consistent and made on a regular basis, and in a manner that is transparent and verifiable.

7. Carbon pricing policies should minimize competitiveness impacts and carbon leakage. In this regard, carbon pricing policies in Canada, including explicit and implicit pricing mechanisms, should be reasonably comparable in price or stringency across the country to mitigate such impacts between provinces and territories. Those carbon pricing policies should also be designed to mitigate international competitiveness and carbon leakage pressures.

8. Carbon pricing policies, including their revenue recycling components, should strike a balance between applying the polluter-pays principle and avoiding a disproportionate burden on vulnerable groups (i.e., emission-intensive/trade-exposed industries, northern and remote communities, and low income households).

Annex 1 – International Carbon Pricing Mechanisms

Table 3: International Cap-and-Trade Systems

Systems	Jurisdictions	Year in Place	Coverage	Allocation
European Union Emissions Trading System	European Union	2005	45% of total emissions	– 100% auction for electricity production in utilities – Some free allowances for heat production and for industrial participants through benchmarking
Swiss Emissions Trading Scheme	Switzerland	2008	10% of total emissions	– Free allocation based on industry benchmarks – Sectors at risk of carbon leakage receive 100% of the benchmark – Other industry sectors receive a linearly decreasing share of free allowances (80% free in 2013, decreasing to 30% in 2020) – No free allocation for power sector
California Cap-and-Trade Program	California	2012	85% of total emissions	– Auctioning for electricity producers and fossil fuel distributors – A portion of allowances, which declines annually, is freely allocated to aluminum, lime, cement, chemical, petrochemical, metallurgy, mining, pelletizing, pulp, paper, petroleum refining sectors
Regional Greenhouse Gas Initiative	North-East and Mid-Atlantic states in the U.S.	2009	20% of total emissions	– Auctioning

Source: World Bank, *State and Trends of Carbon Pricing 2014*

Table 3: International Cap-and-Trade Systems (continued)

Systems	Jurisdictions	Year in Place	Coverage	Allocation
Kazakhstan Emissions Trading Scheme	Kazakhstan	2013	50% of total emissions	– Free allocation based on grandfathering of historical emissions for the first three years (2013-2015)
New Zealand Emissions Trading Scheme	New Zealand	2008	50% of total emissions	– Auctioning – Free allowances provisions for pre-1990 forest landowners completed
Tokyo Cap-and-Trade Program	Tokyo (Japan)	2010	8% of total emissions in Japan	– Auctioning
Target-Setting Emissions Trading Program in Saitama	Saitama (Japan)	2011		
Kyoto Emissions Trading System	Kyoto (Japan)	2011		
Guandong Pilot Emissions Trading System	Guandong (China)	2013	42% of total emissions in Guangdong	– Auctioning
Shanghai Pilot Emissions Trading System	Shanghai (China)	2013	50% of total emissions in Shanghai	
Tianjin Pilot Emissions Trading System	Tianjin (China)	2013	60% of total emissions in Tianjin	
Beijing Pilot Emissions Trading System	Beijing (China)	2013	50% of total emissions in Beijing	
Shenzhen Pilot Emissions Trading System	Shenzhen (China)	2013	38% of total emissions in Shenzhen	
Hubei Pilot Emissions Trading System	Hubei (China)	2014	35% of total emissions in Hubei	
Republic of Korea Emissions Trading Scheme	Republic of Korea	2015	60% of total emissions	– Free allocation via grandfathering for existing facilities and benchmarking used for new entrants

Source: World Bank, *State and Trends of Carbon Pricing 2014*

Table 4: International Carbon Taxes

Jurisdictions	Year in Place	Coverage	Price
Australia[6]	2012-2014	60% of total emissions	About US$21.54 per tonne of CO_2e in 2013
Denmark	1992	45% of total emissions	About US$31 tonne per CO_2 in 2014
Finland	1990	15% of total emissions	Heating fuels: €35 per tonne of CO_2 in 2013 Liquid traffic fuels: €60 per tonne of CO_2 in 2013
France[7]	2014	35% of total emissions	€14.5 per tonne in 2015
Iceland	2010	50% of total emissions	US$10 per tonne of CO_2 in 2014
Ireland	2010	40% of total emissions	€20 per tonne of CO_2 in 2014
Japan	2012	70% of total emissions	US$3 per tonne of CO_2 in 2014
Mexico	2014	40% of total emissions	Between US$1 and US$4 per tonne of CO_2 in 2014 (depends on the fuel type and usage)
Norway	1991	50% of total emissions	Between US$4 and US$69 per tonne of CO_2in 2014 (depends on the fuel type and usage)
Sweden	1991	25% of total emissions	US$168 per tonne of CO_2 in 2014
Switzerland	2008	30% of total emissions	US$68 per tonne of CO_2 in 2014
United Kingdom	2013	25% of total emissions	£9.55 per tonne of CO_2 in 2014

Source: World Bank, *State and Trends of Carbon Pricing 2014*

[6] On July 1, 2012, Australia introduced a cap-and-trade system for facilities that emitted 25,000 tonnes or more of carbon dioxide equivalent annually. The system was designed for a two-stage implementation, beginning with a fixed carbon price applying to units in the first years, then transitioning as of July 1, 2015 into a cap-and-trade system with unit prices to be set by the market. Before July 1, 2015, the system operated largely like a carbon tax on carbon emissions. However, the whole system was repealed effective July 1, 2014 and as such, units were never traded by the market or their amount capped by the government.

[7] France's carbon tax, or Contribution Climat-Énergie, consists of a 3-year stage increase in existing taxes on fossil fuels. The first increase in 2014 was €7 per tonne of carbon dioxide equivalent but did not apply to motive fuels and heating oil. The second and third increase of €7.5 in 2015 and 2016 apply to all fuels, with the result that France will argue to have a €22 (about CND$31) carbon tax by 2016.