

A Carbon Pricing Primer – Cap and Trade and Carbon Tax

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Introduction

Ontario's Minister of the Environment and Climate Change has been mandated by the Premier to develop an updated Ontario Climate Change Strategy to meet the Province's greenhouse gas reduction targets. The Premier has also noted that Ontario will introduce a price on carbon emissions to reduce greenhouse gas emissions in the province.

The Ministry of the Environment and Climate Change (MOECC) recently released a discussion paper to guide consultations on the development of this strategy. The paper sets out the case regarding climate change's effects on Ontario's climate, the sources of greenhouse gas emissions in the province and discusses putting a price on carbon to reduce emissions and meet Ontario's goals of an 80 per cent reduction from 1990 emissions levels by 2050.

The Province's paper notes that greenhouse gas emissions from transportation, industry and buildings in Ontario make up the greatest source of emissions in the province. These are the sectors that will need to be targeted to reduce greenhouse gases if Ontario is to meet its climate change goals. The paper also notes that Ontario's manufacturing sector has undergone a major transformation in the previous decade and is responsible for some of the decline in the emissions the province has seen over that time. With this in mind, more major population centres will likely be more affected by the need to reduce emissions and policies to do so as they produce the greater share. The paper also notes the importance of agriculture and forestry's role as potential 'carbon sinks' areas that can capture carbon to remove it from the atmosphere.

AMO will be providing comments to the Minister on the provincial paper and will share this with members. In the meantime, this document is to help municipal officials understand the carbon pricing and implementation.

Objective of this Primer

This primer gives municipal officials an understanding of how the two major systems to reduce greenhouse gases through carbon pricing work. The pros and cons of each system will need to be front and centre in Ontario's policy decisions to ensure our economy is more efficient and resilient after a price is introduced. It should be noted, however, that there are other instruments beyond pricing of carbon to reduce greenhouse gas emissions and to reach targets. It could be that more than one instrument could be used.

What is Carbon Pricing?

Carbon pricing is a system that assigns a cost to the production of carbon, through the burning of fossil fuels, that releases carbon into the atmosphere. Excess carbon is thought by the majority of scientists to be responsible for trapping heat in earth's atmosphere, raising average temperatures and leading to a more rapidly changing climate and severe weather.

Why do it?

The reliance on fossil fuels such as oil, coal and natural gas for energy for heating, transportation and industrial production generates carbon emissions that trap excess heat in the atmosphere leading to changed climates and severe weather. This has led economists and others to observe that carbon is a by-product of these processes that has environmental and economic (health, infrastructure, tourism, etc.) consequences that are not reflected in the price of the original product.

To correct this, it is suggested that establishing a price on carbon can help lead to more efficient usage of energy as well as a reduction in the greenhouse gases that lead to climate change and severe weather which should slow their pace. This is said to be establishing a signal for the direction of emissions. Many jurisdictions choose between a carbon tax mechanism and a cap and trade mechanism to price carbon, however, it is possible that both policies can be implemented at the same time. In many cases, carbon pricing accompanies other policies such as regulation and direct incentives to reduce greenhouse gas emissions.

What is Cap and Trade?

Cap and Trade mechanisms are a system of carbon pricing that establishes a cap on the amount of emissions in a jurisdiction. This cap is then translated into caps for individual emitters such as refineries, energy generation facilities, large industrial emitters, etc. The cap is translated into credits for each regulated sector and facility in the scheme.

How does it work?

A Cap and Trade system is created when a government imposes an upper limit to the greenhouse gas or carbon emissions of a jurisdiction. This cap is then broken down for individual industries, companies and facilities. The caps usually cover only the largest point source emitters. Generally the caps would also become increasingly stringent over time with limits reducing on a periodic (year-to-year) basis.

As caps are established, the regulated emitters are usually assigned a number of carbon credits related to a measure of greenhouse gases emitted. Often, facilities are asked to establish a baseline for emissions and credits are assigned based on this.

A jurisdiction also needs to create or join a carbon market and assign a price or allow the market to set one for an emissions credit. Companies or facilities that emit above their assigned level must buy extra credits to account for these emissions. Those whose emissions are below their assigned credits are able to sell them to emitters above their limit. In some cases, such as the Kyoto Protocol, emitters are able to get more credits by investing in projects which reduce emissions elsewhere. These credits can then be used to offset their higher emissions.

Where has it been used?

Cap and Trade mechanisms have been used in the Kyoto Protocol, California, New Zealand, Australia and the European Union. Quebec has also established its own market for emissions credits. Also, since the 1980s *Clean Air Act* in the USA, emissions trading has been successful in pollution control and similar schemes have been used in emissions in water. The Tokyo Metropolitan Government also administers a scheme for major emitters within its jurisdiction.

Outcomes

Generally emissions trading has been successful in reducing emissions intensity of the regulated industries. The US *Clean Air Act* has been said to have reduced Sulphur Dioxide (SO₂) emissions and reduced acid rain. In other jurisdictions in relation to carbon emissions, outcomes have been mixed. In some cases, such as New Zealand, the assigning of free credits to industries and grandfathering emissions are said to have had a negligible effect on carbon emissions. In the EU, difficulty in establishing a baseline measure has led to a greater number of credits than emissions. This has resulted in reducing the price of these emissions to zero. However, these challenges have resulted from system designs and assigned credit pricing. Jurisdictions are able to change and amend these as needed.

Pros/cons

Cap and Trade mechanisms allow governments to set a precise reduction target (a cap) and are said to increase industry flexibility in reaching this so that emitters can arrive at their assigned reductions according to their own schedules. The trade in credits also allows some parties to sell their emissions reductions by selling their unused credits, money that can support other programs as long as there is a buyer.

However, these mechanisms do carry an administrative burden for governments to set caps overall and for specific emitters. Jurisdictions must establish thresholds, assign credits, establish or monitor markets and for emitters, monitor emissions and emissions reductions. Regulated emitters must also establish their baselines, their reductions and verify these as well as administer their credit sales and purchases. This can increase the costs of compliance relative to carbon taxes.

Quebec

Quebec instituted a cap and trade system in 2011 to cover large emitting industries. Industries that emit more than 25,000 mega tonnes of carbon dioxide each year are covered in the regulation. The first compliance period was 2013-14 and covered only industrial emitters and energy generation. In late 2014, the provincial government announced that fossil fuels distributors would be added to the system in January 2015. In the first compliance period, the emissions cap for emitters was set at 25 million metric tonnes of CO₂. This will rise to 65 million metric tonnes in 2015 as fossil fuels distributors are added. The cap will drop to 55 million metric tonnes by 2020.

In 2013-14, emissions trading units were distributed free of charge to emitters facing competition from emitters in jurisdictions without a carbon price. Starting this year, the government will begin removing 1-2 per cent of these credits annually to increase the price of the units and at the end of each compliance period, emitters must have enough credits to cover their emissions. The price per carbon trading unit was set at \$10.75 in 2013 and is slated to increase by 5 per cent plus inflation each year. News reports suggest that the addition of gasoline distributors in 2015 could increase the price of fuels by 2 cents/liter. This comes at a time when oil and gasoline prices have declined.

Municipalities are a regulated entity under the Quebec scheme, but it is unclear how many (if any) currently meet the threshold and criteria for inclusion. At present, municipalities are not included in the system but the authority in the regulation exists to include the sector.

How does a Carbon Tax Work?

A carbon tax works by assigning a price to the carbon content of hydrocarbon fuels such as gasoline, jet fuel, natural gas and coal. The United States Energy Information Administration says that about 19.64 lbs (2.35 kg/l) of CO₂ is emitted from burning a gallon of regular gasoline and 22.38 lbs (2.67 kg/l) from a gallon of diesel fuel. A carbon tax is established on each unit of CO₂ burned per unit sold. The long term goal is to deter inefficient use of these fuels and increase conservation/reduction.

Carbon taxes are favoured by many economists for simplicity of administration and their transparency and application to all users. However, some critics note that the tax must be high enough to influence behaviour, can affect low income individuals and families more as they spend a higher proportion of their income on fuels and may not be able to adopt avoidance strategies. Some have also noted that rural residents have limited options to avoid this tax.

Where has it been used?

Finland introduced the world's first carbon tax in 1990. Since that time the tax has been added in some form in: British Columbia, Alberta (major emitters only), Norway, Sweden, New Zealand and Australia (repealed), China, India, Japan (delayed), Taiwan, South Korea (changed to a green research fund with industry participation), Taiwan (delayed), Netherlands, Switzerland, Costa Rica, Boulder Colorado, Montgomery County, Maryland (repealed) and the San Francisco Bay area (delayed).

Outcomes

In Switzerland, the government's carbon tax has been complemented by a voluntary cap and trade scheme. Participation in cap and trade allows emitters to exempt themselves from paying the carbon tax. Switzerland is on track to reduce CO₂ emissions by 8 per cent from 1990 levels, its target under the Kyoto Protocol. Similarly, in Sweden, a carbon tax has been credited with a shift toward biomass energy; and economic growth is said to have been sustained since implementation. Norway's tax is said to be the highest in the Organization of Economic Cooperation and Development (OECD) countries and applied to offshore oil and gas production. While the tax generated revenues upwards of \$1.3B in 2004, the country's emissions have also grown (likely as a result of increased oil and gas production).

Pros/cons

Carbon taxes benefit from their broad application to emissions of CO₂, their transparency and simplicity. These taxes do not require specialized administration, verification or consulting resources to implement. Their breadth is also said to be fairer in their application since all users are impacted and economists believe that they are generally more efficient than cap and trade.

However, carbon taxes do place a greater burden on lower income individuals who may spend a greater proportion of their income on energy and residents of rural, northern or remote communities may have limited opportunities to avoid them. This is why in some cases they have been accompanied by offsets to personal and corporate income taxes (see British Columbia discussion). Finally, it can be difficult to establish a precise reduction through carbon taxes to conform to specific reduction

targets as suggested by the UN Intergovernmental Panel on Climate Change and other scientists and science organizations.

British Columbia

BC is the only jurisdiction in North America to implement a carbon tax scheme. Starting in 2008, the carbon tax has been applied to a broad base of fossil fuels. The tax started at \$10 per tonne of CO₂ and rose gradually to \$30 in 2012. This represents 2.1 cents and 7.2 cents per liter of gasoline, respectively. Since 2010 the tax has also been applied to biodiesel.

The BC tax was also implemented to be revenue neutral: the tax has corresponded with cuts to corporate and personal income taxes at an equivalent rate and low income people have been protected through a rebate.

A five-year review of the tax suggested that it had been successful in reducing fossil fuels consumption by nearly 18 per cent per capita while BC's economic growth kept pace during that time with the Canadian average. In addition, the tax shift is said to be responsible for BC having the lowest income tax rates in the country as of 2012. In 2013, BC's carbon tax generated in excess of \$1B.

While some critics have suggested that the drop in fossil fuel consumption is due to cross border shopping in the US or Alberta, it is uncertain that this has played a major role.

In addition, BC municipalities are required since 2008 to include greenhouse gas reduction targets and policies to reach these in their official plans. Initially, some municipalities were concerned about the impact of carbon taxes and reduction targets on communities, citing a disproportional impact on municipal operations without any benefit of tax reduction. As a result, Union of British Columbia Municipalities (UBCM) resolutions at the time of implementation, requested exemption of rural municipalities and sharing of tax revenues with the municipal sector to pay for infrastructure costs. However, these concerns seem to have subsided as the tax has been implemented, possibly as a result of economic growth continuing.