British Columbia's Carbon Tax – Strengths and Opportunities

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1. Introduction

There has been considerable debate about B.C.'s carbon tax since it was announced in the 2008 provincial budget. Pembina's high-level assessment of the carbon tax is two-fold:

1) The carbon tax is a strong step forward for climate action in B.C.
2) There are opportunities to strengthen the carbon tax that will need to be acted upon in 2009 and beyond in order for B.C. to achieve (or exceed) its legislated greenhouse gas reduction targets.[1]

To provide detail on these main points, this submission contains the following:

- A review of Pembina's perspective on British Columbia's carbon tax.
- An overview of ways the carbon tax should be strengthened in subsequent budgets.
- Details of some of the opportunities to strengthen the carbon tax in the 2009 budget.

[1] The greenhouse gas reductions target act (Bill 44) established a target of reducing B.C.'s greenhouse gas emissions by 33% below 2007 levels by 2020. The same bill also requires the province to establish legally binding 2012 and 2016 targets by the end of 2008.

2. Pembina's Perspective on B.C.'s Carbon Tax

Pembina continues to support B.C.'s carbon tax as a core policy in the province's efforts to take action on global warming. At its simplest, the carbon tax signals that global warming pollution has a cost and green choices will become increasingly cost-effective as the price on pollution rises. Other types of incentives, regulations and citizen engagement are still essential, but history demonstrates that these complementary measures are unsuccessful on their own; a price on carbon must be at the centre of any successful climate policy for B.C.[2]

Looking specifically at the design of B.C.'s carbon tax, Pembina has supported the policy for three main reasons.

1) Steadily increasing price on pollution

The carbon tax will increase steadily between 2008 and 2012 so that families, businesses, organizations, and communities will have an increasing incentive to reduce their emissions. At the same time, they will also have time to reduce their emissions without facing an unfair burden. Pembina's current analysis suggests that carbon price levels would ideally be at least $30 per tonne by 2009 and at least $75 per tonne by 2020, which is higher than the current schedule in B.C.[3] As discussed in the next section, it will be critical to ensure that the price of B.C.'s carbon tax continues to increase after 2012, and is set at a level high enough to achieve the province's reduction targets.

2) Protection for low-income families

The carbon tax protects low-income families in the first two years of the policy by ensuring that the price impacts are not regressive. According to the Canadian Centre for Policy Alternatives, the carbon tax is moderately progressive in 2008/2009 and neutral with respect to household income distribution in 2009/2010.[4]

3) Broad coverage of emissions sources in B.C.

The carbon tax applies to a relatively large percentage of B.C.'s greenhouse gas emissions, thus ensuring that the incentive to reduce emissions is delivered throughout the economy. Figure 1 shows a breakdown of B.C.'s greenhouse gas emissions in 2006, and the sources currently covered by the carbon tax. Based on data from Environment Canada's most recent greenhouse gas inventory, the carbon tax covers approximately 77% of B.C.'s emissions.[5] The coverage

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2 See for example, Simpson, Jaccard and Rivers. 2007. Hot Air: Meeting Canada's Climate Challenge.

3 C. Demerse, "Carbon Pricing: Efficiently Stimulating Greenhouse Gas Emission Reductions," an excerpt from *Big Steps Forward: Recommendations for Budget 2008* (Drayton, AB: Pembina Institute, 2007), http://pubs.pembina.org/reports/GBC-CarbonPricing.pdf.

4 Canadian Centre for Policy Alternatives, forthcoming publication.

5 The estimate of 77% coverage does not match with the 70% estimate provided in the 2008 provincial budget. At the time this document was submitted, this discrepancy had not been resolved. The likely explanation includes a combination of reasons, including: the budget estimate being based on 2005 data, limited ability to estimate the excluded combustion emissions and included flaring emissions using Environment Canada data.

includes almost all of the emissions from fossil fuel combustion – including those from individuals, businesses, and large industry. The emissions not currently covered are predominantly from non-combustion sources of greenhouse gas emissions such as wastes, agriculture, and industrial process and fugitive emissions. Further information on the data and approach used to produce Figure 1 is available in Appendix 1.

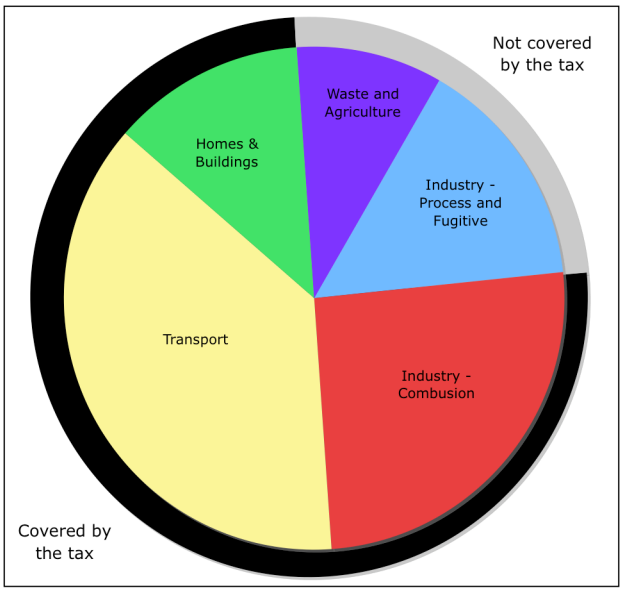

Figure 1 - Coverage of B.C.'s carbon tax (Source: Environment Canada's Greenhouse Gas Inventory – 2006 data. See Appendix 1 for more detail)

In summary, the carbon tax implemented in 2008 is a strong starting point. That starting point needs to be strengthened over time to ensure that the incentive to reduce global warming pollution is sufficient and fair. Specific opportunities to strengthen the carbon tax are discussed in the next section.

3. Opportunities to Strengthen the Carbon Tax

Four key elements of the carbon tax's design will need to be strengthened over time for it to contribute to significant reductions in B.C.'s greenhouse gas emissions in line with the legislated provincial targets. Strengthening the carbon tax will also help build support for meaningful climate action from an increasing proportion of British Columbians. Each of the opportunities is described below. The opportunities are followed by Table 1, which indicates when each opportunity should be acted upon and how they relate to recent recommendations from the climate action team.

1) Increase the price above $30 per tonne after 2012

B.C.'s carbon tax will reach $30 per tonne in 2012, but no commitment has been made to increase the price after 2012. According to the National Round Table on the Environment and Economy (NRTEE), the price on greenhouse gases needs to reach at least $75 per tonne by 2020 to reduce national greenhouse gas pollution to 1990 levels. B.C. has committed to reducing its greenhouse gases to 10 per cent below 1990 levels by 2020, so based on the NRTEE analysis, the price on carbon will need to continue increasing after 2012 at between $5 and $10 per tonne per year. The current carbon legislation requires the carbon price to be set at least three years in advance, so the price for 2013 will need to be set by 2010 at the latest. Ideally, the government will provide a longer-term schedule of increases or an indication of the anticipated medium-term price (2020). Providing this longer-term certainty helps individuals and businesses make decisions with a better understanding of the opportunities.

2) Increase protection for low-income families as the tax increases

The government's current tax cuts and low-income tax credits provide adequate protection to low-income families to ensure that they are not adversely affected by the carbon tax in 2008/2009 or 2009/2010. As the price on carbon continues to increase beyond 2010 to $30 per tonne and then above $30 per tonne after that, it will be critical to ensure that protection for low-income families is scaled up accordingly.

3) Increase access to solutions for families and businesses

As the carbon tax increases, B.C. families and businesses will increasingly be looking for climate friendly solutions. The budget should be used to help make families and businesses more aware of those solutions, and to make those solutions more available and affordable. For example, investments in transit, and incentives for home and building retrofits are areas that will need financial resources. Spending need not be the first approach to increasing access to solutions, because in many cases the regulatory tools that fall outside the scope of the budget will represent more cost-effective approaches (e.g. tail pipe standards for new vehicles). This budget submission does not provide further detail on this opportunity, but the catch-all category of investments in climate solutions is an important complement to the carbon tax.

4) Broaden coverage to additional sources of greenhouse gas emissions

B.C.'s carbon tax puts a price on the greenhouse gas emissions from almost all fossil fuel combustion in the province. Beyond the current coverage, the non-fossil fuel emissions from wastes, agriculture, and industrial process and fugitive emissions could be covered

by the carbon tax once they can be accurately measured. These sources currently account for approximately 23% of B.C.'s greenhouse gas emissions. Based on our analysis, the 2009 budget could be used to add cement, lime, and aluminum process emissions to the carbon tax. The budget could also be used to improve the data quality natural gas venting emissions so that they could be included by 2010. These additions would increase the carbon tax's coverage from 77% to 80% in 2009, and from 80% to 85% in 2010. Further detail on this opportunity is provided in the next section.

Opportunity	Relevant to the 2009 budget	Relevant to subsequent budgets	Alignment with Climate Action Team Recommendations
Increase the price above $30 per tonne after 2012	No	Yes	Aligns with Climate Action Team recommendation 1.1.
Increase protection for low-income families as the tax increases	No	Yes	Aligns with Climate Action Team recommendation 2.
Increase access to solutions for families and businesses	Yes	Yes	Aligns with Climate Action Team recommendation 14 and 20.
Broaden coverage to additional sources of greenhouse gas emissions	Yes	Yes	Aligns with Climate Action Team recommendations 1.2 and 19.

Table 1 – Summary of opportunities to strengthen B.C.'s carbon tax.

4. The Opportunity to Broaden the Carbon Tax's Coverage

B.C.'s carbon tax puts a price on the greenhouse gas emissions from almost all fossil fuel combustion in the province, including those from individuals, businesses, and large industry. The covered sources account for approximately 77% of B.C.'s emissions as depicted in Figure 1.[6] The carbon tax does not apply to the non-fossil fuel emissions from wastes, agriculture, and industrial process and fugitive emissions. These sources currently account for approximately 23% of B.C.'s GHG emissions, and Pembina's perspective is that they should be covered by the carbon tax if they can be accurately measured.

Broadening the carbon tax base makes sense for three reasons:

1) Averting dangerous climate change demands rapid action to reduce greenhouse gas emissions, and additions to the carbon tax base would represent additional near-term progress and help move B.C. towards its emission reduction targets. Waiting for any emissions sources to be dealt with by the Western Climate Initiative's (WCI) cap and trade system means delaying until at least 2012 for that system to be operational, and it is not yet clear how strong a price signal the system will provide to B.C. businesses.
2) Moving quickly to place additional sources under the carbon tax provides an early signal to reduce emissions and potentially helps to build a competitive advantage for B.C. businesses. As long as the carbon tax revenues are recycled in a way that preserves the short-term competitiveness of B.C. businesses (see discussion at the end of this section), those businesses will have at least a two-year head start on companies that are delaying action until the WCI's system is operational. That head start could make the difference between being buyers and sellers in a cap and trade market.
3) Ensuring that all sources of greenhouse gas emissions that can be covered by the carbon tax are included in the tax base sends an unambiguous message that all pollution has a price – regardless of the source. Greenhouse gas emissions impose high costs on society, and it is fair that all polluters pay for those costs.

The important question then, is whether or not the sources can be accurately measured. In addition to addressing this question, Table 2 provides some more detailed information on the emissions sources not currently covered by the carbon tax. Each row details a different emissions source, and the columns provide information on the following:

1) *The percentage of B.C.'s emissions accounted for by each source.* For example, the table shows that the methane gases that are released from landfills and other waste sites account for 5.5% of B.C.'s greenhouse gas emissions.
2) *The ability to accurately measure the emissions from each source*. Some sources of emissions are very diffuse, which makes it very difficult to accurately measure them. If an emissions source is not accurately measured, a carbon tax would lose much of its effectiveness because it would not reward companies and individuals

[6] This estimate does not match with the 70% estimate in the 2008 budget. At the time of submission, the discrepancy had not been resolved. The likely explanation includes a combination of reasons, including: the budget estimate being based on 2005 data, limited ability to estimate the excluded combustion emissions and included flaring emissions using Environment Canada data.

that successfully reduce their emissions.

3) *Whether or not there are opportunities to reduce emissions from each source.* For some products, processes, and services, there may not be currently available alternatives that would lead to reduced emissions. In these relatively rare cases, the price signal is still important because it provides an incentive to find new alternatives that are capable of providing a similar product, process, or service with fewer emissions.
4) *Whether or not the source is covered by carbon pricing systems outside of B.C.* Carbon prices exist around the world, with some of the most notable being the carbon taxes used in Sweden and Norway, and the cap and trade system used in the European Union and in the Northeastern U.S.
5) *Whether or not the source should be covered by the carbon tax.* In addition to saying whether or not the source should be covered by the carbon tax, a recommended year of inclusion is also offered.

As summarized in the final column, the 2009 budget should be used to include the non-fossil fuel emissions from cement, lime, and aluminum production. Natural gas venting emissions are also a good candidate to be added to the carbon tax base, but the data quality will need to be improved first. The 2009 budget should set aside adequate resources to resolve current uncertainties in the emissions from natural gas venting so that they can be added to the tax by 2010 (or 2009 if earlier proves feasible). The remaining sources could be added to the tax in the future, but do not appear to be feasible in 2009. It will also be important to ensure that resources are dedicated to improving the measurement of these sources as well.

Emissions Source	% of B.C.'s emissions *	Ability to accurately measure emissions source	Are there opportunities to reduce emissions from source? +	Covered in carbon pricing systems outside of B.C.	Should the Source Should be Covered?
Non-combustion emissions from cement production	1.9%	Good – Environment Canada has developed a sector-specific guidance manual for the mandatory emissions reporting requirements (http://www.ec.gc.ca/pdb/ghg/guidance/calcu_pro_e.cfm). The Climate Registry also has a reporting protocol.	Yes	Included in the current scope of the EU's cap and trade system.	Yes – 2009
Non-combustion emissions from lime production	0.3%	Good – Environment Canada has developed a sector-specific guidance manual for the mandatory emissions reporting requirements (http://www.ec.gc.ca/pdb/ghg/guidance/calcu_pro_e.cfm). The Climate Registry also has a reporting protocol.	Not currently	Included in the current scope of the EU's cap and trade system.	Yes – 2009
Non-combustion emissions from aluminum production	1.6%	Good – Environment Canada has developed a sector-specific guidance manual for the mandatory emissions reporting requirements (http://www.ec.gc.ca/pdb/ghg/guidance/calcu_pro_e.cfm). The aluminum production process results in carbon dioxide (CO_2) and perfluorocarbons (PFCs). The Climate Registry also has a reporting protocol.	Yes for PFCs, but not currently for CO_2.	Proposed for both the EU's and WCI's cap and trade systems.	Yes – 2009
Natural Gas – Venting (intentional methane releases)	4.9%**	Medium – Emissions can be accurately measured, but because of the varied sources of venting emissions throughout the natural gas supply chain, consistent measurement approaches are not currently in place in B.C.	Yes	Proposed for the WCI's cap and trade system if accurate measurement protocols can be developed.	Yes – 2010
Natural Gas – Un-metered Sources (unintentional methane leaks)	4.0%**	Medium to Poor– No standardized reporting protocols currently exist for these emissions, but accurate measurement of leaks downstream of processing plants should be possible in the near term. Accurate measurement of the emissions from well-heads and collector pipelines will be more challenging. The Western Regional Air Partnership and Climate Registry are developing a reporting protocol that could cover some of this source (http://www.wrapair.org/ClimateChange/GHGProtocol).	Yes	Proposed for WCI's cap and trade system if accurate measurement protocols can be developed.	Unclear
Coal Mining Fugitive Sources	0.8%***	Poor – Continuous monitoring could be used for underground mines, but no protocol is available for open mines.	Unclear	Proposed for WCI's cap and trade system if accurate measurement protocols can be developed.	Unclear
Agriculture	3.9%	Poor – Current estimation methods are not appropriate for individual agricultural operations.	Yes	No	Unclear
Wastes	5.5%	Poor – Current estimation methods are not able to account for the site-specific conditions at a given landfill.	Yes	No	Unclear
Other	An additional 1% of B.C.'s greenhouse gas emissions are categorized under "Solvents" and "Other & Undifferentiated Products" by Environment Canada. These sources have not been included in this analysis.				

* All values are from B.C.'s 2006 emissions as reported in Environment Canada's greenhouse gas inventory

** These values were estimated based on the breakdown in flaring, venting, and un-metered emissions reported for Canada. B.C. statistics are not available from Environment Canada.

*** These values were estimated based on 2001 values, which is the most recent year that coal mining fugitive emissions are disaggregated in Environment Canada's reporting.

\+ Carbon capture and storage is also a potential medium term solution for these emissions sources.

Table 2 – Assessment of the greenhouse gas emissions not currently covered by B.C.'s carbon tax

Figure 2 and Figure 3 show the coverage of the carbon tax if it is broadened as recommended above. Adding the non-combustion emissions from cement, lime, and aluminum production would increase the carbon tax's coverage by 3.8% to give a total coverage of 80% in 2009.[7] Adding the venting emissions would add approximately 5% more to the carbon tax base to a total coverage of 85% in 2010.[8] Further information on the data and approach used to produce these figures is available in Appendix 1.

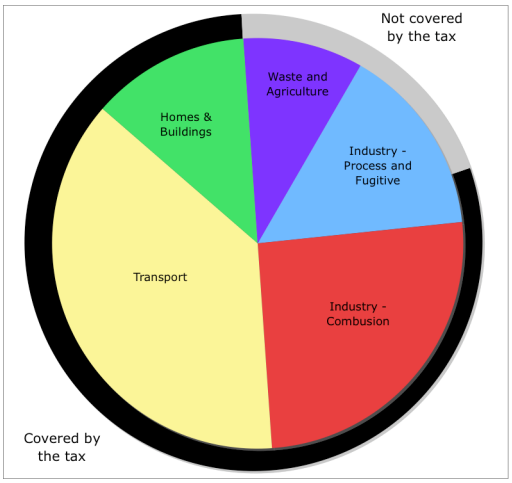

Figure 2 - Coverage of B.C.'s carbon tax if non-fossil fuel emissions from cement, lime, and aluminum are added (Source: Environment Canada's Greenhouse Gas Inventory – 2006 data. See Appendix 1 for more detail)

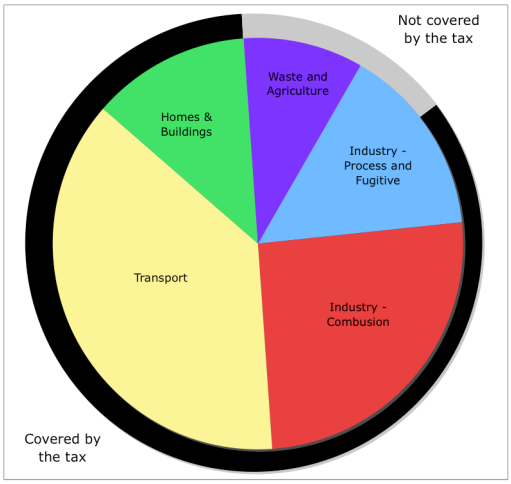

Figure 3 - Coverage of B.C.'s carbon tax if non-fossil fuel emissions from cement, lime and aluminum production, and natural gas venting are added (Source: Environment Canada's Greenhouse Gas Inventory – 2006 data. See Appendix 1 for more detail)

A logical time to add these additional sources to the carbon tax base would be July 1, 2009 (and 2010 for the natural gas venting emissions) when the tax increases to $15 per tonne for the sources already covered. Table 3 shows the potential revenue for each emissions source at the different carbon tax rates.

Emissions Source	Revenue at $15 per tonne (million $)	Revenue at $20 per tonne (million $)	Revenue at $25 per tonne (million $)	Revenue at $30 per tonne (million $)
Cement Production	$18	$24	$30	$36
Lime Production	$3	$3	$4	$5
Aluminum Production	$15	$20	$25	$30
Natural Gas – Venting	$45	$60	$75	$90
Natural Gas – Un-metered Sources	$37	$49	$61	$74
Coal Mining Fugitive Sources	$8	$10	$13	$15
Agriculture	$36	$48	$60	$72
Wastes	$51	$68	$85	$102
Total	$212	$283	$353	$424

Table 3 – Potential revenues from greenhouse gas emissions sources not covered by carbon tax

[7] The estimates of 80% (and 85%) use 77% as the current value for carbon tax coverage. This estimate does not match with the 70% estimate in the 2008 budget. At the time of submission, the discrepancy had not been resolved. The likely explanation includes a combination of reasons, including: the budget estimate being based on 2005 data, limited ability to estimate the excluded combustion emissions and included flaring emissions using Environment Canada data.

[8] The 5% is approximate because Environment Canada does not disaggregate natural gas venting and un-metered sources in the B.C. inventory, so the split has been estimated based on national numbers.

If it is not well designed, applying a carbon price to an economy has the potential to negatively impact the competitiveness of some industries. Whether or not such impacts occur will depend on the nature of the industry, the price on carbon, how broadly that price is applied geographically, and how the revenues are recycled to the economy. The low carbon prices currently scheduled in B.C. means that negative impacts are unlikely, but this issue is worthwhile assessing nonetheless. Any assessment should look at industries on a case-by-case basis, following a rules based approach so that there is a transparent process to determine if an industry's competitiveness is being compromised. If the competitiveness of some industries is found to be negatively impacted, mitigating that impact should not mean offering exemptions from the carbon price signal. The carbon tax revenue offers a better option because it can be recycled in different ways such that overall business tax burdens remain competitive.

5. Key Recommendations for 2009 Budget

In presenting our key recommendations for the 2009 budget, it is important to reiterate Pembina's high-level assessment of the carbon tax:

1) The carbon tax is a strong step forward for climate action in B.C.
2) There are opportunities to strengthen the carbon tax that will need to be acted upon in 2009 and beyond in order for B.C. to achieve (or exceed) its legislated greenhouse gas reduction targets.

With that overall assessment in mind, our key recommendations for the 2009 B.C. budget are:

1) In July 2009, the carbon tax base should be broadened to include non-combustion emissions from cement, lime, and aluminum production (the combustion emissions from these industries are already covered by the tax). This change would add 3.8% of B.C.'s emissions to the carbon tax base and provide an additional $36 million in revenue at $15 per tonne.
2) The 2009 budget should set aside adequate resources to resolve current gaps and uncertainties in the emissions from natural gas venting so that they can be added to the tax by 2010 (or 2009 if earlier proves feasible). This change would eventually add approximately 8.7% of B.C.'s emissions to the carbon tax base and provide an additional $81 million in revenue at $15 per tonne.
3) The remaining sources of emission currently excluded from the carbon tax (wastes – 5.5%, agriculture – 3.9%, and other industrial non-combustion emissions – 5.8%) should be added to the tax in the future if current measurement concerns are resolved. Resolving those issues does not appear to be feasible in 2009, but it will be important to ensure that resources are dedicated to improving the measurement of these sources.

Appendix 1

Data Underlying Figures 1, 2, and 3

	2006 Emissions (kilotonnes)***	Percentage Currently Covered by the Carbon Tax	Percentage Proposed to be Covered in 2009	Percentage Proposed to be Covered in 2010
Industry – Process and Fugitive	8,705	0%	27%	62%
Industry – Combustion*	16,350	100% **	100% **	100% **
Transportation	23,300	100% **	100% **	100% **
Homes and Buildings	7,730	100% **	100% **	100% **
Waste and Agriculture	5,800	0%	0%	0%
Total	61,886	77%	80%	85%

* "Industry – Combustion" includes an estimate of natural gas flaring.

** The 100% coverage overstates the actual coverage, but the Environment Canada data for B.C. is not disaggregated in a way that allows the specific exclusions to be counted. Based on B.C.'s carbon tax legislation, the actual percentages should be close to 100%.

*** All emissions data is taken from the 2006 data in Environment Canada's greenhouse gas inventory.