

Cabinet Concept Paper

Ministry: Finance

Date: June 15, 2007

Opportunity: Impose Carbon Tax to Reduce Carbon Emissions

Description: The February 13 Speech from the Throne expanded on government's commitments regarding environmental stewardship by setting an ambitious goal of reducing greenhouse gas (GHG) emissions by at least 33 percent below current levels by 2020. A reduction of this magnitude will require a broad spectrum of approaches including changes in behaviour and the development and adoption of new technology.

One of the options for promoting behavioural change and raising revenue to support the development and adoption of new technology is to impose a broadly based "carbon tax" on the burning of fossil fuels (e.g., coal, motor fuel and natural gas) in proportion to their carbon content and/or CO₂ emissions. The revenue from the carbon tax could be used to fund specific environmental initiatives or reductions in other taxes.

Further work would be required to determine the tax levels required to achieve various CO₂ reduction targets in British Columbia.

However, for illustrative purposes, the Table on the following page compares the impact of a \$50/tonne tax on CO₂ (the initial tax rate proposed by the Green Party of Canada) and the Quebec carbon tax announced on June 7, 2007 to be introduced effective October 1, 2007.¹

¹ The Intergovernmental Panel on Climate Change, 2007 report on net economic costs of damages from climate change estimated the average net economic cost as only \$12US /tonne of CO₂. However, the range of estimates varied significantly with some as high as \$95US/tonne. The Stern Review on the Economics of Climate Change estimated the social cost of carbon to be \$85/tonne of CO₂ (and rising over time). The Green Party of Canada has proposed a \$50 /tonne tax on CO₂. The proposal is to evaluate the impact of the \$50 tax and then increase it, if required, up to \$100/tonne by 2020.



Comparison of \$50/Tonne Carbon Tax and Quebec Carbon Tax				
	\$50/Tonne of CO ₂		Quebec Carbon Tax	
	Tax Rate	Annual Cost	Tax Rate	Annual Cost
Gasoline ¹	12¢/litre	\$240	0.8¢/litre	\$16
Diesel ²	14¢/litre	\$6,700	0.9¢/litre	\$430
Natural Gas ³	\$2.60/GJ	\$170 to \$330	\$0.17/GJ	\$11 to \$22
Home Heating Oil ⁴	15¢/litre	\$190 to \$370	1¢/litre	\$13 to \$25
Coal	\$120/tonne	--	\$8/tonne	--
Total Tax Revenue		\$2.5 billion		\$100 million ⁵
1. Assumes average vehicle travels 20,000 km per year and consumes 10 litres per 100 kilometres. 2. Estimate of impact on semi-trailer trucks assuming average distance travelled is 160,000 km per year and fuel consumption is 30 litres per 100 kilometres. 3. Average residential cost based on estimate of annual consumption in Lower Mainland. 4. Residential volume estimate with approximate annual residential fuel cost and average price over the past year. 5. Impact if proposed Quebec carbon tax was implemented in BC.				

Based on Environment Canada's estimate of GHG emissions in British Columbia in 2005, the estimate of revenue resulting from the broad imposition of a carbon tax at \$50 /tonne is approximately \$2.5 billion.²

Impacts on individual, commercial and industrial users would depend on their ability to reduce consumption, use new technology or substitute other energy inputs and the impact of other tax reductions.

Electricity generated in BC from hydro which is carbon neutral, would be exempt. However, BC Hydro would pay tax on fossil fuels used to produce electricity and could be required to pay tax on the carbon content of imported electricity.

Depending on the carbon tax rate imposed, it would provide an incentive for both individuals and business to reduce fossil fuel use and CO₂ emissions. A carbon tax could also be used during the transition to a cap and trade system to prompt large emitters to reduce emissions prior to being subject to the cap and trade system.

Design Issues: A carbon tax would raise a number of significant design issues.

Source vs. Load: This issue relates primarily to electricity. The issue is whether tax would be imposed where the fuel is burned (at source) or where the energy is used

² GHG emissions in BC from energy consumption are estimated at 55.2 million tonnes, approximately 90 per cent of which is CO₂.

(load). For example, if imposed where burned BC Hydro would pay tax on natural gas burned at Burrard Thermal to produce electricity but no tax would be paid in BC on coal or gas burned in Alberta to produce electricity sold in BC. If imposed on a “load” basis tax would be paid in BC by BC Hydro on the carbon content of electricity generated outside the province and sold in BC.

If multiple jurisdictions introduce carbon taxes, imposing tax at source would be significantly simpler than tracking carbon content of imported electricity. However, if an electricity exporting jurisdiction does not impose a carbon tax taxing at source in BC would result in this electricity entering BC without any tax paid and provide an incentive to source electricity from outside the province.

Interaction with Other Taxes: For various historical reasons water, coal and wood fuel are unconditionally exempt from PST to all purchasers (residential and commercial). Natural gas and fuel oil are exempt for residential use but taxable to commercial purchasers. These discrepancies may have to be reviewed if a carbon tax is introduced.

In addition, purchasers of motor fuel may pay clear fuel rates, lower coloured fuel rates for off-highway use or be exempt from fuel tax (farmers). These differences would also have to be considered when designing a carbon tax.

Benefits:

A carbon tax increases the cost of using CO₂ producing fuels and energy, thereby providing an incentive to reduce fuel and energy use and to develop new technology. Reduced fuel use may require investment in more fuel efficient technology or changes in behaviour (i.e., driving less). A carbon tax also results in increased revenue which can be used to invest in technology improvements and/or reduce other taxes to offset the impact of the carbon tax.

Examples of options for recycling revenue from a carbon tax include:

- Tax shifting to reduce other provincial taxes such as personal and corporate income tax³;
- Protecting lower-income individuals and families through refundable income tax credits or other measures to reduce the impact of the tax;
- Spending initiatives to support purchases of reduced emissions technology (i.e., purchases of fuel efficient vehicles, fuel efficiency upgrades on machinery and equipment, tax concessions for products the support GHG emission reductions);
- Spending initiatives to help reduce energy use (i.e., home retrofitting program support for purchases of heat pumps and/or energy efficient appliances targeted to homes using fossil fuels for heating).

³ Much of the literature on environmental tax shifting recommends taxing negative influences on the environment and using the revenue to reduce taxes on income, labour and capital to reduce the negative impact on the economy.



Carbon taxes can either work alone or in conjunction with a cap and trade system. For example, a carbon tax could be used during the transition to the cap and trade system to ensure large emitters have an incentive to reduce carbon emissions before the cap and trade system is in place. Ultimately, once the cap and trade system is in place, those subject to the system could be exempt from the tax or receive a rebate of a portion of the tax. A carbon tax also provides an incentive for all emitters not subject to the cap and trade to reduce fuel use.

The effectiveness of carbon taxes to reduce GHG emissions depends on the design of the tax. Data on Norway's carbon tax, indicates that the carbon tax was responsible for a 2 per cent reduction in CO₂ emissions from 1990 – 1999⁴. Norway's carbon tax is a per tonne of CO₂ emissions tax that varies by fuel type. While the carbon tax will increase costs to individuals and business, these costs can be offset by changes in behaviour or the use of more fuel efficient technology.

Another jurisdiction that has successfully implemented a carbon tax is the UK. A description of the UK Climate Change Levy is provided in Appendix 1.

Meeting government's GHG emissions targets will require a significant and broad based reduction in carbon emissions. Imposition of a carbon tax would directly support the greenhouse gas emissions reduction targets. It is not possible to determine accurately the impact a tax of \$50 N/tonne of CO₂ would have on fuel consumption, but the tax increases would be quite significant and would likely cause consumers and businesses to change fuel consumption behaviour.

A carbon tax would likely be most supported by those who understand the need for significant market signals to reduce overall fuel and energy use. The tax may also be more acceptable if phased in over time (i.e., 5 year gradual increase) to allow individuals and businesses sufficient opportunity to adjust behaviour to reduce or eliminate the impact of the tax, and if the revenue raised as a result of the tax was recycled in a transparent manner to reduce other taxes. Some support for a carbon tax has already been received in the form of tax suggestions on the Ministry of Finance's Climate Action Tax Ideas e-mail address.

The impact of a carbon tax on greenhouse gas emissions would likely be a gradual decrease as the tax is phased in and people adjust their behaviour to reduce or avoid the tax.

**Execution
Plan:**

To fully develop a carbon tax model for British Columbia would require an analysis of various options for rates, phase in dates, if any, and scope. To mitigate impacts, for example, a \$50 tonne tax could be phased-in over five years beginning in year one at \$10/tonne. .

⁴ Source: Statistics Norway, Discussion paper No. 337, December 2002, "Greenhouse gas emissions in Norway. Do carbon taxes work?"



See Appendix 2 for proposed evaluation criteria.

Fully developing a model that would be integrated with other government initiatives would require working with the Ministry of Energy, Mines and Petroleum Resources and the Ministry of Environment to ensure an understanding of alternatives (i.e., technology, fuel types) and other regulations or standards being proposed. In addition, it would require working with the Climate Change Secretariat to ensure that the proposed tax works in conjunction with the cap and trade system being implemented in British Columbia.

Development of a carbon tax model would take the remainder of 2007. This would primarily involve resources from the Ministry of Finance and the Ministry of Small Business and Revenue but may require additional resources.

A carbon tax could be announced in Budget 2008 and phased in shortly after that. Announcing the carbon tax ahead of time would provide some certainty to individuals and commercial entities and allow them to adjust behaviour to reduce the impact of the carbon tax. Phasing in the carbon tax over time would allow time for some technological advancement to occur, providing alternate options for reducing the impact of the tax, although it is likely that significant changes in technology will take longer than 5 years.

Approval of a carbon tax would constrain the government's ability to introduce or raise other taxes on fuel or energy, with the possible exception of increasing the Innovative Clean Energy Fund Levy.

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Appendix 1

UK Climate Change Levy

Application: The Climate Change Levy came into effect on 1st April 2001 and applies to energy used in the **non-domestic** sector (industry, commerce, and the public sector). The aim of the levy will be to encourage these sectors to improve energy efficiency and reduce emissions of greenhouse gases.

Rates: Rates of levy are:

- **Gas** - 0.15p/kWh;
- **Coal** - 1.17p/kg (equivalent to 0.15p/kWh)'
- **Liquefied petroleum gas** 0.96p/kg (equivalent to 0.07p/kWh);
- **Electricity** - 0.43p/kWh.

Exclusions and Exemptions: The levy does *not* apply to fuels used by the domestic or transport sector, or fuels used for the production of other forms of energy (e.g. electricity generation) or for non-energy purposes. The levy does not apply to energy used by registered charities for non-business uses, and energy used by very small firms, ie those using a *de minimis* (domestic) amount of energy.

The levy does *not* apply to oils, which are already subject to excise duty.

There are also several exemptions from the levy, including:

- Electricity generated from new renewable energy (e.g. solar and wind power);
- Fuel used by good quality combined heat and power schemes ("Good Quality CHP" - certified via the CHP Quality Assurance Program CHPQA);
- Fuels used as a feedstock;
- Electricity used in electrolysis processes, for example, the chlor-alkali process, or primary aluminum smelting

The levy package is expected to lead to reductions in carbon dioxide emissions of at least 2.5 million tonnes of carbon a year by 2010.

Revenue Recycling: The levy was expected to raise around £1 billion in its first full year (2001/02). Revenue from the levy is used to provide cuts in employers' National Insurance Contributions of 0.3 percentage points and provide additional support for energy efficiency schemes and renewable sources of energy. £50 million per annum of revenue will be allocated to these schemes - a major increase from current levels of



funding. There is also a scheme of 100% first year capital allowances for certain energy saving investments, which was expected to be worth up to £70 million in 2001/02. The levy forms a key part of the Government's overall Climate Change Program.

Implementation: The levy was introduced on 1st April 2001. It was announced in the March 1999 Budget to give businesses a full two years time to adjust.

Climate Change Agreements: Special consideration is given to the position of *energy intensive* industries given their energy usage, the requirements of the Integrated Pollution Prevention and Control regime and their exposure to international competition. Consequently, the Government has provided an 80% discount from the levy for those sectors that agree challenging targets for improving their energy efficiency or reducing carbon emissions. There are ten major energy intensive sectors (aluminum, cement, ceramics, chemicals, food & drink, foundries, glass, non-ferrous metals, paper, and steel) and over thirty smaller sectors. Defra has responsibility for the climate change agreements with these sectors. Agreements have been negotiated with the relevant sector trade associations on behalf of the companies within the sectors concerned.

Facilities identified in these agreements were eligible for the 80% Levy discount until 31 March 2003. Eligibility for discount from 1 April 2003 will depend on whether the first targets set in the agreements have been met.

Other Taxes on Energy: Domestic power and fuel are taxed at 5% (VAT).

Where the climate change levy applies to non-domestic power and fuels, the levy is added to bills before the VAT. VAT is 17.5% (with the exception of a few lower or zero rated items).



APPENDIX 2

Proposed Evaluation Criteria for Climate Change Initiatives

The following is an initial set of criteria that could be used to help evaluate the suite of climate change proposals currently before the government. In some cases the criteria may conflict, for example if a very effective and cost efficient initiative imposed significant costs on low income families.

In these situations tradeoffs between the criteria and/or specific mitigation measures may be needed.

Effectiveness in reducing greenhouse gas (GHG) emissions – what is the approximate reduction in GHG emissions that can be expected from the initiative?

- Short term (2012-2016)
- Medium term (2020)
- Long term (2050)
- How sensitive are impacts in 2020 to the timing of the measure? i.e., can it be delayed or advanced without impacting the outcome?

Cost effectiveness – what is the approximate cost per tonne to the economy to realize these reductions? Initially this may need to be a qualitative assessment of the cost (i.e. low medium, or high):

- Distributional Impacts – Who pays the cost of the reduction, both in terms of the initial impact and where the ultimate burden will fall?
- In some cases the costs may be shared , for example where government provides incentives to encourage changes in behaviour the expectation is that the incentives should lever additional expenditures by consumers and/or business.
- Where the cost is on consumers will it fall disproportionately on low income consumers and if so are there ways to mitigate the impact? For example the impact of a carbon tax could be mitigated by a refundable income tax credit.
- How could the measure be altered to change the distribution of impacts?
- Is this measure likely to minimize the cost of achieving the desired outcome?



Availability of viable alternatives - For example, if fuel taxes were increased in the short to medium term consumers may have more alternatives for reducing consumption in terms of fuel efficient vehicles and changing driving patterns than the commercial trucking industry.

Certainty for consumers and business - Does the initiative provide sufficient long term certainty for consumers and business to make the investments necessary to reduce carbon emissions and to encourage technological innovation?

Competitiveness – What are the short and long term implications for British Columbia's competitiveness?

Public Acceptability – How do the affected interest groups and the general public view the initiative?

Integration and interdependencies with other initiatives –Do the proposal complement or have interdependencies with other initiatives. For example, how would a carbon tax interact with the cap and trade system, or with the introduction of fuel efficiency standards?

Administrative and compliance costs – What are the costs to government of developing and administering the initiative and the costs to consumers and business of complying?

Other Implications– are there economic, social or other environmental implications, either benefits or potential disadvantages of the measure? For example in some cases a reduction in GHG emissions may also reduce other emissions.

