

Fair and Effective Carbon Pricing

Lessons from BC

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by Marc Lee

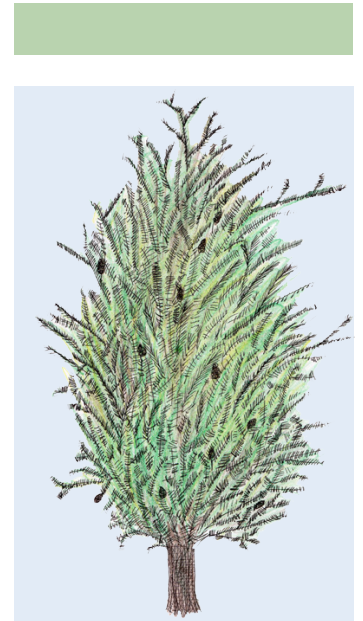
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FAIR AND EFFECTIVE CARBON PRICING: LESSONS FROM BC

By Marc Lee

February 2011, CCPA-BC and Sierra Club BC (revised January 2013)

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CORRECTION, January 8, 2013: The original version of this report, published February 2010, contained an error in Table 2 on page 17. It stated that data were per household when they were per capita. This revised version presents a new table that is per household. Text on page 17 and on page 5 of the summary have been revised accordingly. See www.policynote.ca/correction-to-carbon-pricing-paper for more information.



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Summary

Because BC has among the highest levels of poverty and inequality in Canada, a pressing concern is the potential for unfair impacts of carbon pricing on the poorest—those who have done the least to cause the problem.

CARBON PRICING REFERS TO POLICY MEASURES that make it more expensive to burn fossil fuels or purchase goods and services that emit greenhouse gas emissions in their production. This includes carbon taxes that directly put a price on emissions as well as cap-and-trade programs that set a cap on emissions and allow the price to be determined by the trading of emission permits.

In tandem with regulations, standards and public investments, carbon pricing can create incentives to reduce environmentally harmful activities and induce shifts to cleaner technologies. Carbon pricing can also deliver to governments the revenues needed for aggressive climate action.

BC has started down this path with its Climate Action Plan. The province's carbon tax, its mandate for "carbon neutral" government, and its commitment to the Western Climate Initiative regional cap-and-trade system represent important first steps in carbon pricing.

Because BC has among the highest levels of poverty and inequality in Canada, a pressing concern is the potential for unfair impacts of carbon pricing on the poorest—those who have done the least to cause the problem. People with low incomes have smaller carbon footprints. Higher prices for home heating and transportation (and other carbon-intensive goods and services) hit the budgets of lower-income people harder than those with higher incomes. To avert this regressive outcome, revenues must be used to compensate low- to middle-income households, and invest in complementary climate actions (e.g. expanding public transit networks).

This report considers lessons learned to date from the BC experience, and the next steps required for an effective and equitable carbon pricing strategy. BC's carbon pricing, while it is a positive first step, has serious flaws:

- The carbon tax is too low to significantly reduce emissions;
- Tax cuts and credits have reduced government revenues by more than what the carbon tax brings in, making the tax "revenue negative";

- This drain on the public sector is worsened by requirements that the public sector pay an additional tax (or “offset”) for emissions, leading to reduced public services; and
- Even after tax cuts and credits are figured in, the carbon tax has a disproportionate impact on low-income British Columbians, and most benefits the highest-income households that are also the biggest emitters.

BC CARBON TAX

BC’s carbon tax is currently a modest \$20 per tonne of carbon dioxide—in gasoline terms, about 4.45 cents per litre, although the carbon tax also applies to other fossil fuels such as natural gas. The tax is scheduled to reach \$25 per tonne in July 2011 and \$30 in July 2012. It is not clear whether the tax will continue to increase in future years.

The anticipated impact of the existing tax regime is relatively small. According to modeling done for the BC government, the carbon tax will reduce BC emissions by only 4% of (growing) business-as-usual emissions by 2020. To be effective in reducing emissions, the tax would have to be much higher.

The BC government’s policy of “revenue neutrality” requires all carbon tax revenues to be transferred back to British Columbians in the form of personal and corporate income tax cuts, and credits for low-income households. However, BC’s carbon tax regime has in fact been *revenue negative*—the value of tax cuts and credits has exceeded carbon tax revenues, primarily due to corporate income tax cuts. Budget 2010 projects this drain on public sector revenues to continue over its three-year fiscal planning framework:

- More than half of carbon tax revenues (54%) are going to corporate income tax cuts in 2010/11, compared to one-third in 2008/09. By 2012/13, corporate income tax cuts will equal \$1 billion, which is two-thirds of carbon tax revenues and more than all other climate action expenditures between 2007/08 and 2010/11.
- The low-income credit has not kept pace with the carbon tax, and has shrunk from one-third of revenues in 2008/09 to 19% in 2010/11, and will fall to 12% by 2012/13.
- Personal income tax cuts have shrunk from one-third of revenues in 2008/09 to 24% in 2010/11, and will fall to 15% in 2012/13.

This study uses Statistics Canada’s Social Policy Simulation Database and Model to analyze carbon taxes paid and tax cuts and credits received for households by income group, and finds that:

- In 2010, carbon taxes paid averaged \$386 per household, with a range of \$129 per household in the lowest-income 10% rising to \$795 in the top 10%, and \$1,394 in the top 1% of households.
- The carbon tax as a share of income shows a regressive pattern. In 2010, households in the bottom 10% would pay 1.3% of their income in carbon tax, whereas the top 10% would pay only 0.3%, and the top 1% would pay 0.2%.
- This regressive pattern gets worse between 2010 and 2012 as the carbon tax rises.

BC’s carbon tax regime has been revenue negative—the value of tax cuts and credits has exceeded carbon tax revenues, primarily due to corporate income tax cuts.

- Considering tax cuts and credits returned to households, the top 10%, on average, receive more in tax cuts and credits than paid in carbon tax. The top 1% receive a *net benefit* of 1% of income in 2010, growing to just over 2% in 2012.

CARBON NEUTRAL PUBLIC SECTOR

As of 2010, BC's public sector is required to make offset payments through the Pacific Carbon Trust (PCT) for its emissions in order to become "carbon neutral." Public sector institutions pay \$25 for every tonne of CO₂e emitted, an amount in addition to the carbon tax—meaning many public sector organizations currently face a carbon price of \$45 per tonne.

A key equity concern is that these payments reduce available funds for public services, which in turn will have an adverse and disproportionate impact on (typically, low-income) households. This challenge has been compounded by fiscal restraint in the public sector. Budgets have been cut in most provincial ministries, and education budgets have been effectively frozen, leading to real cuts in services.

Truly reducing emissions in the public sector will require major investments in videoconferencing facilities, energy efficiency upgrades and fuel switching over several years. To date, the provincial government has committed only a small amount of funding for such investments in spite of interest from many public sector bodies. As a result, cuts to real services are being made to pay for carbon offsets.

The PCT, on the other hand, funds mitigation projects only in the private sector. This means reductions in public services that disproportionately benefit the poor could be subsidizing future upgrades to resorts that cater to the affluent; for example, the PCT website showcases five projects in Whistler, including the Western Whistler Resort and Spa.

The top 10%, on average, receive more in tax cuts and credits than paid in carbon tax. The top 1% receive a net benefit of 1% of income in 2010, growing to just over 2% in 2012.

WESTERN CLIMATE INITIATIVE

The Western Climate Initiative is a proposed regional cap-and-trade system, involving four Canadian provinces and seven US states, set to begin in 2012. Unfortunately, the WCI's region-wide target is weak, and carbon offsets can be used for almost half of emission reductions. In spite of this, political obstacles to participation remain in many jurisdictions.

If not properly designed, cap-and-trade systems can enable corporations to garner windfall profits through freely provided pollution permits (as has happened in the European Union Emissions Trading System). Alternatively, if permits are auctioned, governments receive revenues that can be used (like a carbon tax) to address adverse distributional outcomes or to finance other climate action.

BC has not yet specified how it will allocate permits. While there are potential gains for low-to middle-income households if permits are auctioned and revenues spent in a progressive manner, existing high emitters will lobby hard for free permits, and if successful would reap an enormous financial windfall.

RECOMMENDATIONS

Carbon pricing has the potential to play a strong, transformative role in moving BC to a low-carbon society with economic, equity and ecological benefits. However, there are important design details that need to be rectified before turning up the dial. Given the political uncertainty of the WCI coming into effect, we focus on next steps to make BC's carbon tax more effective and equitable.

We recommend the BC government:

- **ESTABLISH AN UPDATED CARBON TAX FRAMEWORK**—Ideally, a carbon tax would be implemented globally or even regionally (North America), but in the absence of agreement, sub-national jurisdictions like BC should press forward. To give an appropriate price signal to businesses and consumers, a medium-term framework out to 2020 is needed.
- **AIM FOR \$200 PER TONNE IN 2020**—Based on modeling of GHG reductions that keep global temperature increase under 2° Celsius, carbon prices should hit \$200 per tonne by 2020. In gasoline terms this would imply a carbon tax of 44.5 cents per litre by 2020, an amount that would put BC gas prices at the levels currently prevailing in Europe. Carbon-intensive luxury items should face a \$200 per tonne tax immediately.
- **EXPAND SECTORAL COVERAGE**—BC's carbon tax currently does not cover GHG emissions in key industrial areas, in particular process emissions associated with cement, lime and aluminum production, and venting and pipeline leakages in the oil and gas sector.
- **COUNT CARBON EMISSIONS FROM TRADE**—The tax should apply to exports of fossil fuels, such as coal and natural gas, which have a large carbon footprint when combusted in other jurisdictions. By the same token, a carbon price on imports would level the playing field for domestic producers.
- **COMPENSATE LOW- TO MIDDLE-INCOME HOUSEHOLDS**—Half of carbon tax revenues should be used to fund a new refundable tax credit that reaches more households than the current low-income credit. We model a scenario where the bottom half of households (up to \$60,000 of income) would receive, on average, more in credits than they pay in carbon tax.
- **USE CARBON TAX REVENUES TO REINFORCE CLIMATE ACTION**—Revenue neutrality provisions should be rescinded, and the other half of carbon tax revenues used to fund major green investments in public transit, retrofit programs for buildings, green jobs programs, forest conservation and other complementary actions.
- **PHASE OUT OFFSETS AND RE-EVALUATE THE PACIFIC CARBON TRUST**—Offsets are not a long-term solution to global warming, and they should be phased out in favour of a rising carbon price applied equally to public and private sectors. The role of the PCT in mitigation strategies across the BC economy should be re-evaluated.

Carbon prices should hit \$200 per tonne by 2020. In gasoline terms this would imply a carbon tax of 44.5 cents per litre by 2020, an amount that would put BC gas prices at the levels currently prevailing in Europe.

The carbon tax is an ideal revenue source to finance a wide range of climate action needed to truly shift BC's economy onto a sustainable path, while simultaneously addressing the equity considerations that arise from such a transition.

- **DEVELOP COMPLEMENTARY REGULATIONS AND STANDARDS**—Carbon pricing alone is not likely to lead to BC achieving its legislated targets, so climate policy must also develop rules for industry and the marketplace that reduce GHG emissions.
- **CONSIDER THE INTERACTION BETWEEN CARBON AND CLEAN ELECTRICITY PRICES**—To avert a danger that looming electricity price increases lead to perverse incentives to shift from clean energy to dirty sources (conversion of electric to natural gas in homes, for example), it is essential that carbon prices rise by relatively more than electricity prices.
- **INVESTIGATE ALTERNATIVE MODELS**—Other possibilities for carbon pricing, such as carbon quotas that would be allocated to households, may have greater appeal once GHG emissions become more scarce, and the right to emit them a matter that necessitates a more equitable allocation than would be achieved by market mechanisms.

BC HAS ALREADY TAKEN IMPORTANT FIRST STEPS on climate action, and this report has drawn lessons from the first few years of carbon pricing policies. But a new round of leadership from BC is needed: climate change is big problem requiring big solutions. The carbon tax is an ideal revenue source to finance a wide range of climate action needed to truly shift BC's economy onto a sustainable path, while simultaneously addressing the equity considerations that arise from such a transition—a model of a more aggressive and equitable approach to carbon pricing for other jurisdictions to follow.

Introduction

BC IS ONE OF THE FIRST NORTH AMERICAN JURISDICTIONS to pursue carbon pricing. BC's Climate Action Plan also includes a mix of regulations, standards, subsidies, and public investment, but carbon pricing—in particular, BC's carbon tax, introduced in 2008—has been front and centre in climate policy. That said, the existing Climate Action Plan is not sufficient to meet BC's legislated GHG reduction target (33% reduction from 2007 level emissions by 2020), and it is notable that the BC government has pursued many other industrial and transportation policies that are contradictory to the spirit and practice of climate action.¹

This paper focuses on carbon pricing in BC, and its implications for equity in a province that has among the highest levels of poverty and inequality in Canada. In BC, the potential for carbon pricing to have adverse impacts that exacerbate inequality makes understanding distributional aspects of carbon pricing a central aspect of climate policy.

This paper updates and extends earlier Climate Justice Project research on the distribution of BC's carbon tax.² The BC experience in three areas of carbon pricing policies is assessed: the BC Carbon Tax; the Carbon Neutral Government commitments; and the proposed Western Climate Initiative (WCI) cap-and-trade system. Most of the attention in the analysis that follows is on the BC carbon tax, which has been in place for almost three years. Offset contributions from broad public sector institutions (as part of the carbon-neutral government program) began as of the 2010 calendar year. The Western Climate Initiative is projected to begin operation in 2012, although there are large political obstacles that remain, and many details around implementation have yet to be announced.

In BC, the potential for carbon pricing to have adverse impacts that exacerbate inequality makes understanding distributional aspects of carbon pricing a central aspect of climate policy.

1 See M. Lee and K. Carlaw, *Climate Justice, Green Jobs and Sustainable Production in BC* (Vancouver: CCPA-BC, September 2010), for an overview of these contradictions.

2 M. Lee and T. Sanger, *Is BC's Carbon Tax Fair? An Analysis of Impacts at Different Income Levels* (Vancouver: CCPA-BC, October 2008).

CLIMATE JUSTICE AND CARBON PRICING

While there is a range of debate about how quickly global temperatures will rise and how the consequences will unfold in the future, there is little doubt among scientists that the world is warming and that the combustion of fossil fuels is the primary cause. Global temperatures have increased by 0.8° Celsius relative to pre-industrial levels, and it is widely agreed that temperature increases above 2° take us into uncharted and dangerous territory. Because of lags between emissions and temperature increases, and the inertia of existing technology and politics, such an increase is already highly likely. Prominent climate scientists like James Hansen have argued that carbon dioxide concentrations in the atmosphere, currently about 390 parts per million, need to peak very soon and then revert to 350 ppm by the end of the century.

The intuition behind carbon pricing is straightforward: we should tax things that we do not want, and making it more expensive will reduce pollution. But there are also basic issues of fairness at stake.

This implies a massive global effort to reduce fossil fuel consumption to zero, as rapidly as possible, to prevent climate catastrophe. How we get there is a matter of much debate. Carbon pricing is widely viewed as a central policy tool for addressing climate change. This is largely based on economic efficiency arguments, although historical experience suggests that tough regulations could provide greater certainty in achieving emission reductions. Public investment to rebuild infrastructure, retrofit housing, deploy clean technologies and retrain workers will also be necessary. Ultimately, these are not either/or matters—all tools in the toolbox will need to be deployed to pull off a green industrial revolution.

The intuition behind carbon pricing is straightforward: we should tax things that we do not want, and making it more expensive will reduce pollution. But there are also basic issues of fairness at stake. Former World Bank Chief Economist Nicholas Stern called climate change the greatest market failure in the history of humankind because there are massive costs associated with climate change that are not paid for by producers or consumers of fossil fuels; instead, billions of people around the world, who have not benefited from the cheap energy provided by fossil fuels, and future generations will pick up the tab in the form of rising sea levels, depleted water resources, and devastating extreme weather events.³

In economics, costs borne by third parties to a market transaction are called externalities. Carbon dioxide and other greenhouse gases (GHGs) are pollutants, which, through their contribution to global warming, impose costs on other people (now and in the future) that are not captured in market prices. This can be remedied by applying a carbon tax that makes prices “tell the truth” about environmental costs. In practice, determining the financial value of the externality is not straightforward, as the risks of climate change such as loss of biodiversity, reduced glaciers and sea ice, greater incidence of extreme weather, etc. are not easily converted into strict monetary terms. And because impacts will largely be on future people, animals and plants, many of which are not currently alive, any cost estimates will be controversial at best.

Nonetheless, a steadily rising price of emitting carbon dioxide (or greenhouse gas emissions) can send a clear signal to consumers and businesses to change their behaviour—by reducing consumption of GHG-intensive goods and services, changing fuel sources, investing in machinery and equipment that is more energy-efficient, or using carbon capture and stor-

3 N. Stern, *The Economics of Climate Change: The Stern Review* (Cambridge, UK: Cambridge University Press, 2006).

age technologies. Carbon pricing is an appealing approach because it facilitates emission reductions at the least economic cost (i.e. from sources that can reduce their emissions most cheaply), in order to achieve a smooth transition. And, if done properly, carbon pricing provides a revenue source from which to finance further climate action through the public sector, such as building rapid transit, developing green jobs, and investing in research and development. Thus, there are broad macroeconomic benefits that could arise from a well-designed carbon-pricing framework.

Carbon taxes and cap-and-trade systems are two stylized variants of carbon pricing. A carbon tax provides greater certainty around the price of GHG emissions, but poses a great deal of uncertainty around actual emission reductions. A cap-and-trade system works in the opposite manner, with emissions targets that grow more stringent over time, and the price of emitting GHGs determined by the auction and trading of permits. In each case, there are many nuances and details in terms of implementation that will affect effectiveness and equity objectives (these are discussed in the analysis that follows).

There is another essential aspect of fairness that arises in the implementation of carbon pricing that must be addressed in policy design. Higher prices for GHG-intensive goods and services will have a regressive impact, meaning a bigger hit to the budgets of low-income households than high-income households. This is another reason why carbon-pricing approaches that generate a revenue stream to government are important, as transfers will be required to compensate low- to middle-income households.⁴

Regulatory mandates will also have an impact on market prices to the extent that they pose additional costs for production of goods and services that are passed forward to consumers. Indeed, almost any action that reduces emissions (including subsidies for housing retrofits, feed-in tariffs for clean electricity generation, and public investments) will have an impact on relative prices of activities that are carbon-intensive. For example, an expansion of public transit reduces the cost of taking transit relative to driving, even though the direct costs of driving per se may not have increased.

These price impacts mean that we must actively consider the distributional impact of carbon pricing and other climate policies, in particular as they relate to low-income households. One important advantage of carbon taxes (or cap-and-trade systems where permits to pollute are auctioned) is that they generate revenues that can be used to compensate low-income households, directly through financial payment or indirectly through provision of public services and investments, such as energy efficiency programs or public transit improvements. Regulatory approaches, on the other hand, pose additional public expenditures for implementation, monitoring and enforcement—without the benefit of a revenue source (except for fines for misbehaviour) to compensate low-income households. Well-designed regulation and standards in the marketplace should be seen as complementary to (rather than a substitute for) carbon pricing.

One important advantage of carbon taxes (or cap-and-trade systems where permits to pollute are auctioned) is that they generate revenues that can be used to compensate low-income households, directly through financial payment or indirectly through provision of public services and investments, such as energy efficiency programs or public transit improvements.

4 The regressive nature of environmental taxes and policy responses to compensate low-income households is discussed in Chapter 10, Environmental Taxation, of The Mirrlees Review: J. Mirrlees, S. Adam, T. Besley, R. Blundell, S. Bond, R. Chote, M. Gammie, P. Johnson, G. Myles and J. Poterba (eds), *Dimensions of Tax Design: the Mirrlees Review*, (Oxford University Press, April 2010), <http://www.ifs.org.uk/mirrleesreview/design/ch10.pdf>.

The BC Carbon Tax

The BC carbon tax covers about 73% of domestic GHG emissions. The remaining 27% come from non-combustion sources, including industrial processes; these will need to be included to have a truly comprehensive system that covers all emissions.

BC'S CARBON TAX BEGAN MODESTLY, at \$10 per tonne of carbon dioxide equivalent (CO₂e), as of July 2008. The tax has been rising \$5 per tonne per year, and as of July 1, 2010 reached \$20 per tonne (about 4.45 cents per litre of gasoline). The tax is scheduled to reach \$30 per tonne in July 2012, although it is not clear whether the tax will continue to increase after June 2013.⁵

For transportation activities, the carbon tax adds to previously existing federal and provincial fuel taxes.⁶ As of July 1, 2010, provincial motor fuel taxes range from a general rate of 14.5 cents per litre of gasoline (15 cents per litre of diesel fuel) to 18 cents per litre (18.5 cents for diesel) in the Capital Regional District, and 23.5 cents per litre (24 cents for diesel) in Metro Vancouver.⁷ There is a federal excise tax on gasoline of 10 cents per litre, plus GST on the purchase price. Unlike Ontario, BC's new Harmonized Sales Tax exempts motor fuels from the provincial portion of the HST (7%); this means that Ontario's portion of the HST is a much higher tax per litre than BC's carbon tax (for motor fuels only).

The BC carbon tax has a broader base than fuel taxes, and covers all fossil fuels combusted in the province, or about 73% of BC's domestic GHG emissions.⁸ The remaining 27% represent emissions from non-combustion sources, including industrial processes in the production of cement, lime and aluminum; "fugitive" emissions from coal and oil and gas extraction; agriculture emissions (manure and fertilizers); and landfills. These outstanding areas will need to be covered by the carbon tax, the Western Climate Initiative, or be regulated in order to have

5 With a change in leadership or in government, it is also possible the carbon tax will be scrapped entirely.

6 Indeed, the implementation of carbon tax is based on the BC Motor Fuel Tax Act. Detailed information on BC's carbon tax is available in BC Ministry of Finance, *BC Budget and Fiscal Plan 2008* (Victoria, 2008), http://www.bcbudget.gov.bc.ca/2008/bfp/2008_Budget_Fiscal_Plan.pdf.

7 BC Ministry of Finance, *Financial and Economic Review 2010* (Victoria, July 2010).

8 The Pembina Institute report, *Putting a Price on Climate Pollution* (October 2010), estimates 73% coverage, based on natural gas flaring emissions that are covered by the carbon tax but are included in the fugitive category of the inventory (personal communication from Matt Horne).

a truly comprehensive system that covers all emissions.⁹ In addition, the tax is not applied to international aviation and shipping, nor to exports (i.e. emissions from combustion of BC fossil fuel exports in importing jurisdictions) or imports (i.e. the embedded emissions in goods produced outside BC, but consumed within the province).

The anticipated impact of the existing tax regime on GHG emissions is relatively small. According to modeling done for the BC government, the carbon tax will reduce BC emissions by 3 million tonnes relative to business-as-usual (BAU) in 2020 (approximately 4% of 2020 emissions).¹⁰ To put this number in context, meeting BC's legislated target of a one-third reduction in GHG emissions (at 2007 levels) by 2020 requires a reduction relative to BAU of 40 million tonnes. On the other hand, the tax is supposed to start small, and the modeling reflects only the existing tax at \$30 from July 2012 forward. To be effective, the tax would have to be much higher, a point we return to at the end of the paper.

REVENUE NEUTRALITY IN RETROSPECT

BC's carbon tax is supposed to be “revenue neutral”—meaning all carbon tax revenues are “recycled” back to taxpayers through:

- (i) Personal income tax cuts—a 5% reduction in personal income tax rates in the first two tax brackets (this applies to income above \$11,000 and under \$71,719 in 2010);
- (ii) Corporate income tax cuts—the general CIT rate was reduced from 12% to 11% as of July 1, 2008, to 10.5% as of January 1, 2010, and to 10% as of January 1, 2011;
- (iii) Low-Income Climate Action Tax Credit—in 2010, the credit is worth \$105 per year for adults and \$31.50 for children;¹¹ and
- (iv) Northern and Rural Homeowner benefit—as of 2010, carbon tax revenues provide an additional \$200 to homeowners living outside of the Capital, Greater Vancouver and Fraser Valley Regional Districts.
- (v) In addition (not listed in Table 1), are rebates of carbon tax to local governments and school boards that have signed the Climate Action Charter (more on this below). In May 2010, local governments received \$2.9 million in returned carbon tax for 2009.¹²

The anticipated impact of the existing tax regime on GHG emissions is relatively small. According to modeling done for the BC government, the carbon tax will reduce BC emissions by 3 million tonnes relative to business-as-usual in 2020 (approximately 4% of 2020 emissions).

9 Landfill gases are currently regulated, although if emissions could be accurately measured they could also form part of the carbon tax base. See Ministry of Environment website: http://www.env.gov.bc.ca/epd/codes/landfill_gas/.

10 Government of British Columbia, *Climate Action Plan* (Victoria: Climate Action Secretariat, Office of the Premier, June 2008).

11 The low-income credit piggybacks on the federal GST credit. Like the GST credit, the low-income credit is, technically speaking, a *tax benefit*. That is, it is calculated for the current year based on the previous year's tax return. For example, an individual's 2007 tax return determines eligibility and amounts payable for the July 1, 2008 to June 30, 2009 year. This is different from a tax credit, refundable or not, that subtracts from tax payable in the same tax year (e.g. 2006 credit claimed on 2006 tax form).

12 BC Ministry of Community and Rural Development, “\$2.9 million in carbon taxes returned to green communities,” news release (May 4, 2010). Amounts for school boards have not been made publicly available.

Table 1: BC carbon tax revenues and expenditures

	2008/09	2009/10	2010/11	2011/12	2012/13
	millions of dollars				
	actual		forecast		
Carbon tax revenue	306	542	740	950	1,166
Personal income tax cuts	107	206	207	215	226
Corporate income tax cuts	100	370	467	664	1,001
Low-income credit	106	153	168	179	182
Northern and rural benefit			20	83	85
Total tax expenditures	313	729	862	1,141	1,494
Source: BC Budget 2011, pp. 45-46.					

BC's carbon tax regime has not been revenue neutral, but revenue negative, and this is primarily due to a growing share of revenues going to corporate income tax cuts.

As Table 1 shows, BC's carbon tax regime has not been revenue neutral, but revenue negative, and this is primarily due to a growing share of revenues going to corporate income tax cuts. Budget 2011 shows that combined personal and corporate income tax cuts and the low-income credit have been larger than carbon tax revenues in each of the two completed fiscal years and according to projections for the fiscal planning framework (Table 1). A modest shortfall of \$7 million in 2008/09 swelled to \$187 million in 2009/10, with carbon tax revenues of \$542 million while tax cuts and credits cost \$729 million.¹³ For a government concerned about its deficit, and that has imposed massive spending restraint on the public sector, a commitment to tax cuts that far exceed carbon tax revenues is bizarre.¹⁴

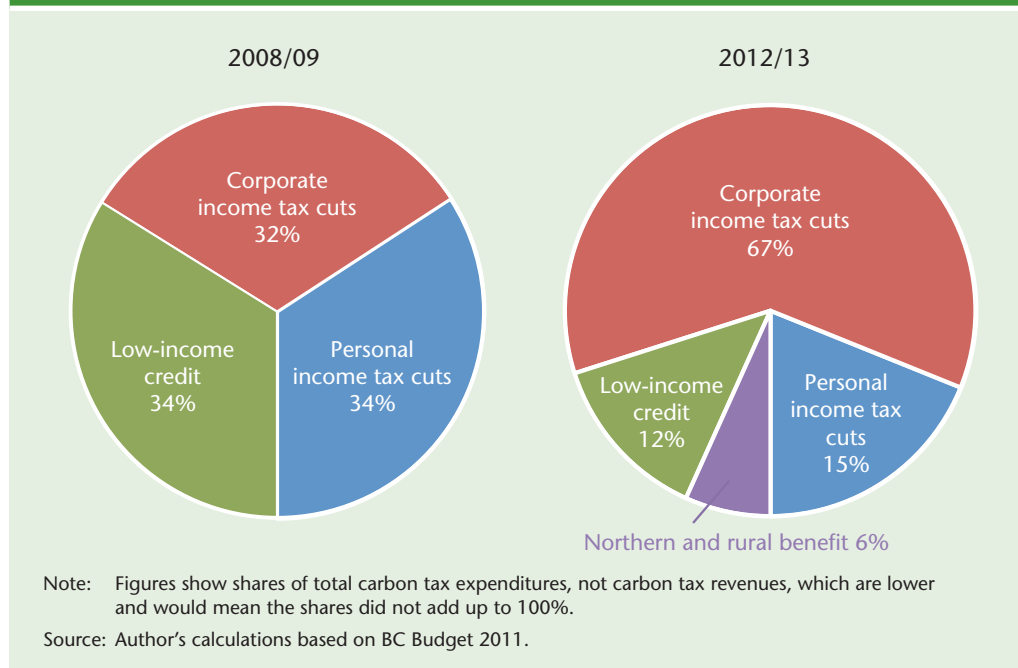
Looking forward, budget projections show that the trend of deficits on the carbon account continues, reaching a net loss of \$328 million in 2012/13. In response, the budget does not scale back corporate income tax cuts, which will cost \$1 billion that year, an amount greater than all other climate action expenditures between 2007/08 and 2010/11. The carbon tax has been used to justify a cut in the general corporate income tax rate from 12% in the first half of 2008 to 10% in 2011, and a cut in the small business tax rate from 4.5% to zero by 2012. Moreover, this comes at a time when BC businesses received a \$2 billion tax cut through the implementation of the Harmonized Sales Tax (which, as noted above, exempts motor vehicle fuels from its tax base).

Corporate tax cuts are now absorbing a substantial share of carbon tax revenues and recycling measures. In 2010/11, they capture more than half of carbon tax revenues (54%), compared to one-third in 2008/09. By 2012/13, the estimated value of corporate income tax cuts will equal 67% of revenues. In contrast, neither the low-income credit nor personal income tax cuts have increased in line with the carbon tax (although a small increase in the

¹³ 2008/09 and 2009/10 figures from BC Budget 2010, p. 105.

¹⁴ Another possible explanation is the impact of the 2008/09 recession. However, both carbon tax revenues and the foregone revenues from tax cuts would fall due to the recession. For this explanation to hold, carbon tax revenues would have to be more responsive (elastic) to the drop in economic activity than personal and corporate income tax revenues. Given the magnitude of the disparity, this seems unlikely.

Figure 1: Share of carbon tax expenditures



low-income credit is scheduled for July 2011). The low-income credit has shrunk from one-third of revenues in 2008/09 to 19% in 2010/11, and will fall to 12% by 2012/13. Personal income tax cuts have shrunk from one-third of revenues in 2008/09 to 24% in 2010/11 and will fall to 15% in 2012/13.¹⁵

If there is a current bias toward deficits on the carbon tax account, that can only get worse over time. This is because as the carbon tax rises, at some point carbon tax revenues will begin to fall as people respond to the growing cost of emitting GHGs. While such a point may be a long way off, this is a bad basis for public finance, as eventually taxes that were cut must again be raised to cover needed expenditures (or alternatively, spending must be reduced).

Neither the low-income credit nor personal income tax cuts have increased in line with the carbon tax. The low-income credit has shrunk from one-third of revenues in 2008/09 to 19% in 2010/11, and will fall to 12% by 2012/13.

¹⁵ Note that these percentages are of revenues, and revenues are less than recycling measures, so percentages do not add up to 100%. PIT rates in the bottom two brackets were reduced in 2008, and do not change as the tax grows. The foregone revenues represented by PIT cuts, however, will grow as the income tax base grows.

EQUITY CONSIDERATIONS

On average, each British Columbian produces three and a half tonnes of direct CO₂-equivalent greenhouse gases per year (resulting from fossil fuels used in the home and for transportation), and just over 10 tonnes per person if we add in indirect emissions (those embodied in other goods and services consumed by households). However, there is a disparity across income groups in emissions. A person in the bottom quintile produces about 30% fewer emissions than the average British Columbian, while someone in the top quintile produces 27% more emissions than the average.¹⁶

A person in the bottom quintile produces about 30% fewer emissions than the average British Columbian, while someone in the top quintile produces 27% more emissions than the average. Put another way, emissions per person in the top quintile are almost double those of the bottom quintile.

Put another way, emissions per person in the top quintile are almost double those of the bottom quintile. While it is important that all households contribute to emission reductions, arguably some households should shoulder a greater responsibility. High-income families have a much easier time reducing their emissions by changing consumption patterns and upgrading their homes and vehicles to be more energy efficient. Low-income households, in comparison, may have greater difficulty reducing consumption because their emissions are already relatively low, but perhaps more importantly, they may be challenged in making the capital investments needed to get ahead of the curve.

Structural factors that lead to emissions also need to be considered, including urban form (low-density suburbs have higher per capita emissions than high-density central cities), home size, insulation, existing stock of appliances, etc. Households will have some discretionary control over their direct emissions (for example, lowering winter household temperature, or driving less), but a large amount of emissions may be beyond their immediate control. For example, renters in apartment buildings will have more difficulty reducing heat or making investments in energy efficiency upgrades, and people living in suburban or rural areas will be much more automobile dependent for their mobility.

Relative to income, a carbon tax, like sales or consumption taxes, will have a regressive pattern—that is, low-income individuals and families will pay a greater share of their income to the tax because they consume all of their available income (and more, due to household debt), and pay a greater proportion of their household budgets for energy. Higher-income households will pay more tax in absolute dollars because they consume more, but will pay a smaller share of that income to the tax. By comparison, income taxes are generally progressive because higher income people pay a greater share of their income to the tax.

From a distributional perspective, how the proceeds of the carbon tax are used is perhaps more important—in particular, the low-income credit. Currently, the credit is worth \$105 for adults and \$31.50 for children (slightly higher than the \$100 for adults and \$30 for children when the carbon tax was introduced in July 2008). The credit is phased out above incomes of \$30,000 for individuals and \$35,000 for families. The credit will be increased to \$115.50 per adult and \$34.50 per child, as of July 2011—meaning the carbon tax itself will have increased 150% (from \$10 to \$25 per tonne) but the low-income credit will only have increased by 15.5%.

The result is an increasingly regressive carbon tax regime compared to 2008, when one-third of revenues were allocated to a low-income credit (the remainder going to personal and corporate income tax cuts). Previous Climate Justice Project research, drawing on data from

16 M. Lee, *By Our Own Emissions: The Distribution of GHGs in BC* (Vancouver: CCPA-BC, April 2010).

Statistics Canada's Survey of Household Spending, estimated that households in the bottom 40% of the distribution were slightly better off in the first year after the carbon tax was introduced, with credits exceeding taxes paid.¹⁷ The July 2009 increase to \$15 a tonne wiped out those gains because the low-income credit barely increased in value (from \$100 per adult to \$105), while the carbon tax grew by 50%. And the July 2010 increase will make the whole regime regressive—meaning a bigger hit to low-income families relative to their income; they will be absolutely worse off even after considering the credits.

Using Statistics Canada's Social Policy Simulation Database and Model, this report derives more detailed estimates for the distributional impact of BC's carbon tax and revenue recycling regime (see the Technical Appendix for details on methodology). The analysis breaks BC households into 10 equal sized groups (or deciles) ranked from lowest income to highest income. In addition, because there are large differences within the top decile, we provide estimates for the top 1% of households and next 4%.

Carbon taxes paid averaged \$386 per household, with a range of \$129 per household in the lowest-income 10% rising to \$795 in the top 10%, and \$1,394 in the top 1% of households (Table 2). As a share of income, the carbon tax is still relatively small for all groups, but shows a clearly regressive pattern (Figure 2). In 2010 the carbon tax accounts for 1.3% of income for

From a distributional perspective, how the proceeds of the carbon tax are used is perhaps more important—in particular, the low-income credit.

Table 2: BC carbon taxes and tax expenditures per household, by decile, 2010

	Income range	Carbon tax	Low-income credit	Personal income tax cut	Corporate income tax cut	Net carbon tax	
						No CIT cut	With CIT cut
dollars per household							
Bottom decile	1–16,536	129	122	0	5	7	1
D2	16,537–26,047	190	135	10	15	46	31
D3	26,048–36,071	268	167	23	47	78	31
D4	36,072–46,865	287	122	53	83	112	29
D5	46,866–59,278	333	89	75	69	168	99
D6	59,279–73,920	394	55	114	63	224	162
D7	73,921–88,778	414	43	142	96	229	133
D8	88,779–109,591	510	45	177	106	287	181
D9	109,592–144,152	543	53	215	252	276	23
Top decile	144,153–Max	795	45	271	1,716	479	(1,237)
All		386	88	108	244	190	(53)
Next 4%	178,956–358,613	792	35	282	1,387	476	(912)
Top 1%	358,614–Max	1,394	29	266	9,637	1,098	(8,539)
Note:	Households (as opposed to individuals) are used as the unit of analysis. This leads to some allocations that may seem counter-intuitive: in the case of the low-income credit, there are some households with high incomes that include one or more persons who qualify for the credit, because of the way the credit is calculated, so on average even the top 1% show positive value for the low-income credit; similarly, there are some households with low incomes that benefit from corporate income tax cuts due to their equity holdings. Some numbers do not sum precisely due to rounding.						
Source: Author's calculations based on SPSP/M and BC Budget 2011.							

17 M. Lee and T. Sanger 2008, *supra* note 2.

These figures show the impact of the carbon tax for BC households from lowest to highest income deciles (each representing 10% of households), with the top decile further broken down to show the top 1% and the next 4%.

Figure 2 shows carbon tax as a share of income in 2010 and 2012, and a relatively bigger hit to lower-income households.

Figure 3 adds in the impact of personal income tax cuts and the low-income credit, which reduce the impact of the carbon tax for all groups.

Figure 4 also adds the corporate income tax cuts, and shows that the total regime is regressive, and leads to net benefits (tax cuts and credits greater than carbon taxes paid) for the top 10%.

Figure 2: Carbon tax as share of total income

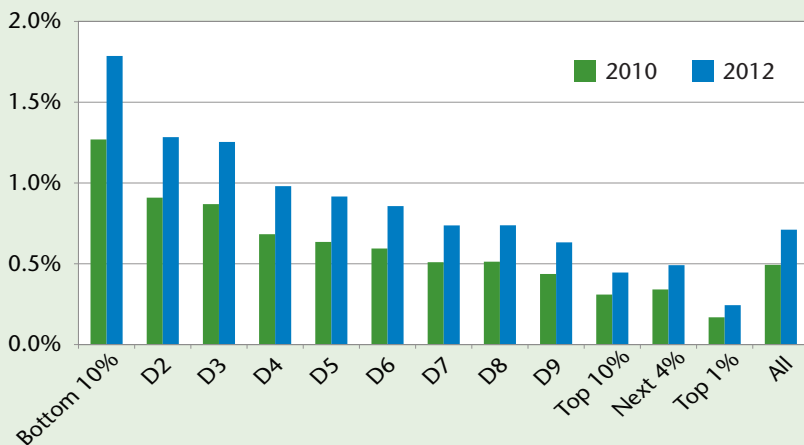


Figure 3: Carbon tax less low-income credit and personal income tax cuts as share of total income

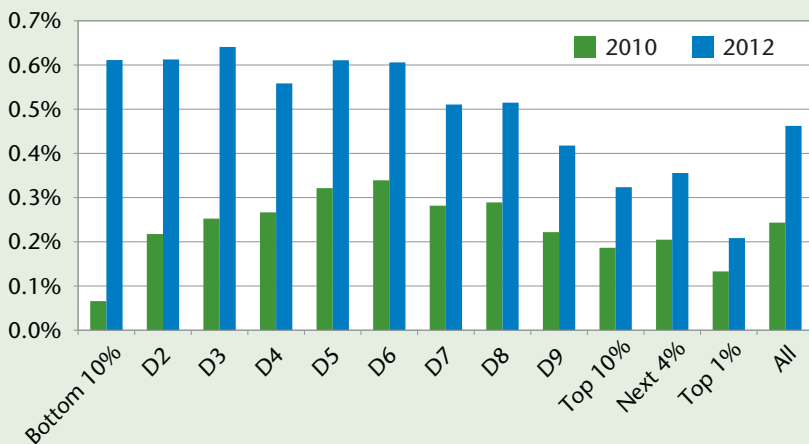
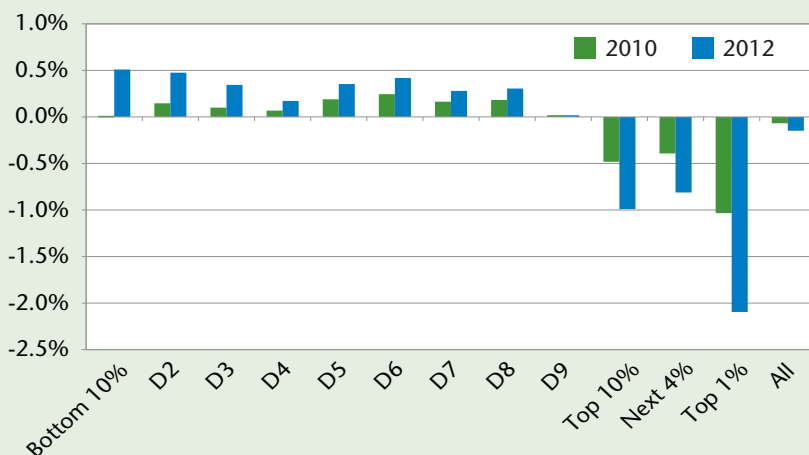


Figure 4: Carbon tax less personal income tax cuts, corporate income tax cuts, and low-income credit



Notes: Percentages are calculated for households, which include all people living in the same dwelling unit (whether or not they are family), and are based on total income, which includes market income (wages and salaries and investment income) plus transfer income (federal and provincial income transfers such as the CCTB, OAS, EI and social assistance). See Appendix for more details.

Source: Author's calculations based on Statistics Canada Social Policy Simulation Database and Model, and BC Budget 2011.

the bottom 10%, rising to 1.8% of income in 2012. The change in carbon tax between 2010 and 2012 is less noticeable the higher up the distribution one goes. The top 10% paid carbon taxes of 0.3% of income in 2010, and will rise to 0.45% of income in 2012.

Figure 3 shows carbon tax net of PIT cuts and low-income credit. The pattern is modestly progressive through the bottom half of the distribution in 2010, then modestly regressive in the second half. By 2012, however, the pattern is essentially regressive throughout the distribution. Low-income households do not benefit much from PIT cuts, and even more so given the increase in the basic personal exemption (i.e. the threshold for paying BC income tax) to \$11,000.

The SPSPD/M does not make estimates for corporate taxes. However, we can allocate CIT cuts across income groups based on shares of dividend and capital gains income.¹⁸ CIT cuts, predictably, benefit high-income households disproportionately, and the net carbon tax is much more noticeably regressive at the top of the distribution. Figure 4 shows that the top 10% on average are net beneficiaries of the carbon tax regime—that is, they receive tax cuts and credits in excess of carbon tax paid. This masks inequality within the top 10%, however, as the regime is effectively a wash for the bottom half of this group, while the top 1% receive a benefit of 1% of income in 2010, growing to more than 2% in 2012.

This analysis shows that the low-income credit is the most beneficial expenditure in terms of compensating the poorest households for the impact of the carbon tax. Personal income tax cuts have little benefit to the poor and much greater benefit to households further up the income ladder. Corporate income tax cuts, however, concentrate benefits at the very top of the income distribution—even when that income is not paid out to shareholders as dividends, tax cuts still represent gains in wealth for the richest in society. There is little reason to believe that corporate income tax cuts will have positive economic benefits that “trickle down” to other households.

The top 10% on average are net beneficiaries of the carbon tax regime—that is, they receive tax cuts and credits in excess of carbon tax paid.

18 This analysis assumes all corporate income tax cuts stay in BC. Allowing for additional profits flowing to corporate shareholders outside of BC does not change the conclusions of the analysis below, but does point to another flaw of the current regime in that a portion of CIT cuts leak out of BC.

Carbon Neutral Public Sector

The equity concern with the public sector purchasing carbon offsets is that these payments reduce available funds for core public services, and this will have an adverse and disproportionate impact on (typically, low-income) households.

CARBON PRICING ALSO MANIFESTS FOR BC'S PUBLIC SECTOR through the requirement that (after measuring and reducing emissions, wherever possible) organizations make offset payments in order to become "carbon neutral." Offsets are an increasingly popular means of "meeting" emission reduction targets by purchasing credits from third parties who are engaged in other mitigation activities. The equity concern with regard to offsets is that these payments reduce available funds for core public services, and this will have an adverse and disproportionate impact on (typically, low-income) households.

Offsets tend to be in the areas of fuel substitution (e.g. from coal to natural gas), tree planting, shifts in agricultural practices, and emissions capture in landfills, although there is pressure to expand the scope of such projects. But offsets have proven to be controversial, in large part due to difficulties in validating, monitoring and enforcing emission reduction projects. In particular, for an offset to be real, it must support "additional" emission reductions than what would have occurred anyway. If we accept the target of 350 ppm by 2100 (as per James Hansen and others) to prevent runaway climate change, then near-zero emissions must be reached by mid-century, and beyond that we will need extensive tree planting and other measures to suck up CO₂ from the atmosphere (currently, about 390 ppm today). This means that no offset project is truly additional, unless it is a new technology that can pull CO₂ from the air and store it permanently underground. That said, any particular "offset" project may or may not be worthwhile in terms of reducing GHG emissions; the point is that they should not be used to justify emissions elsewhere as being "carbon neutral."

Nonetheless, the BC government has mandated carbon neutrality for public sector bodies as of 2010, and has established incentives for local governments to do so by 2012. After attempts to reduce emissions directly, remaining emissions will be "offset" through payments to the Pacific Carbon Trust, a Crown corporation established in 2008 to deliver BC-based GHG offsets. The government has committed \$24 million to launch the PCT.

The PCT will receive \$25 for every tonne of CO₂e emitted by public sector institutions. This amount is in addition to the carbon tax, meaning many public sector organizations currently face a carbon price of \$45 per tonne.¹⁹ A Climate Action Revenue Incentive (CARI) program was created to rebate carbon tax revenues back to school boards and municipalities that sign a Climate Action Charter committing them to carbon neutrality. Other parts of the public sector are not part of the CARI program, and the program is not applicable to the additional \$25 per tonne offset requirements (although school bus emissions are exempted from offset payments).

Local governments are not technically part of the carbon neutral public sector drive; they are not legally required to be carbon neutral. However, they are eligible to receive a rebate on carbon taxes paid through CARI, and in signing on to the Climate Action Charter they effectively commit to carbon neutrality by 2012. Local governments are not required to pay for their offsets through the PCT, and will be able to put their offset funds into alternatives that finance local emission reduction projects.²⁰ This has raised some questions about the quality of projects that may arise.²¹ In addition, solid waste emissions are excluded from offset payments.

There is evidence that public sector institutions are indeed responding to this price signal. In 2009, only business travel in core government activities was subjected to carbon neutral requirements. Those emissions fell from 25,809 tonnes in 2008 to 10,123 tonnes in 2009 due to cutbacks on travel and increased use of videoconferencing. The 2007 Greenhouse Gas Reduction Targets Act requires that these emissions be offset, implying a \$250,000 contribution to the PCT for offset projects.²²

In 2011, institutions in the broader public sector must pay for offsets resulting from their 2010 emissions. This has led to a wide range of mitigation activities, described anecdotally in the government's 2009 Carbon Neutral Update. However, just as a reduction of government travel was facilitated by investments in videoconferencing facilities, other major investments in efficiency upgrades and technology will be required in other parts of the public sector to substantially reduce emissions. These investments will take several years, and funding them should be a top priority of the provincial government.

This challenge has been compounded by fiscal restraint in the public sector. Budgets have been cut in most provincial ministries, and education budgets have been effectively frozen, leading to real cuts in services. Only health care has seen a budget increase, although barely enough to keep up with cost pressures in the system.²³ Thus, there are important equity issues tied to the extent that carbon offsets displace public services (a situation exacerbated by the revenue negative nature of the carbon tax).

BC's public sector purchases carbon credits through the Pacific Carbon Trust, a Crown corporation established in 2008. These payments to the PCT fund mitigation projects in the private sector, some of dubious benefit.

19 It is possible that the \$25 per tonne amount will increase in the future, as cheaper offset projects are exhausted.

20 A. MacLeod, "Local governments may use own projects to meet carbon neutral goal" in *The Hook* (2010), <http://thetyee.ca/Blogs/TheHook/BC-Politics/2010/09/27/CarbonNeutral/>.

21 J. MacNab, "BC Announcement Raises Concerns About Offset Standards" Pembina Institute blog (October 6, 2010), <http://www.pembina.org/blog/415>.

22 BC Ministry of Environment, *Carbon Neutral Update 2009* (Victoria: Climate Action Secretariat, June 2010).

23 See BC Budget commentary by Iglia Ivanova, *BC's Shrinking Public Sector* (Vancouver: CCPA-BC, February 25, 2010), <http://www.policyalternatives.ca/publications/reports/bcs-shrinking-public-sector>.

The main source of capital funding to support energy efficiency upgrades in the public sector is the Public Sector Energy Conservation Agreement, which is currently in the final year of \$75 million available over three years.²⁴ The PSECA reports success in funding emission reduction projects over the past two years. But according to one report, “applications exceeded the available funding by a considerable margin”—meaning large numbers of potential projects that would reduce public sector GHG emissions are not being funded, and therefore must pay PCT offsets.²⁵

In the case of schools, the BC government’s recent decision to cut back the annual capital grant from all school districts has meant school boards have less capacity to make capital investments to get ahead of the curve on GHG emissions. Indeed, by cutting this grant, some smaller school boards lost grants awarded through Solar BC for solar water heating systems because they no longer had matching funds. Such cuts represent a huge lost opportunity because schools could easily accelerate projects that would reduce their emissions—and therefore their payments to the PCT—if capital funds were made available.²⁶

The BC government’s recent decision to cut back the annual capital grant from all school districts has meant school boards have less capacity to make capital investments to get ahead of the curve on GHG emissions.

In the absence of capital spending to proactively spur emissions reductions, offset payments will trigger reduced expenditures across the public sector. In school boards, a province-wide total is not known, but amounts are not trivial: “Vancouver has budgeted \$290,000. Coquitlam expects to pay about \$300,000. A spokesperson for Surrey schools told *The Tyee* the district will pay about \$500,000.”²⁷ The four large BC universities are facing a combined offset bill in excess of \$2 million.²⁸ Given the financial implications, a full public disclosure of BC public sector emissions and anticipated PCT contributions is needed.

Under current arrangements, payments to the PCT fund mitigation projects in the private sector. For example, the PCT website showcases projects that have funded energy efficiency measures of dubious benefit (five projects in Whistler are profiled, including the Western Whistler Resort and Spa, and two at Sun Peaks). In other words, reductions in public services that disproportionately benefit the poor could be subsidizing future upgrades to resorts that cater to the affluent.

If PCT funds were available to the public sector, mitigation projects in hospitals, schools and universities could be supported to reinforce the carbon neutral government mandate. These could, for example, include supporting urban agriculture projects on school property, conversion of fleets to electric vehicles, and implementation of renewable energy systems. A competitive process for public sector mitigation projects is one option that would avert the flow of funds from the public sector to private sector via the PCT, while accelerating climate action in the public sector. It is not obvious that the PCT is needed at all in order for these projects to happen. Ultimately, a level playing field between the public and private sectors is desirable, with both facing the same carbon price signal.

24 The PSECA also involves the federal government, BC Hydro, Fortis BC and Terasen Gas. For details see the BC Ministry, Climate Action Secretariate website “Public Sector Energy Conservation Agreement” at <http://www.env.gov.bc.ca/cas/mitigation/pseca.html>.

25 C. Killian, “Confused and Deflated: School Carbon Offsets Perplex Administrators,” in *The Tyee* (November 24, 2010), <http://thetyee.ca/News/2010/11/24/SchoolOffsets/>.

26 Personal communication with Vancouver School Board official.

27 C. Killian 2010, *supra* note 25.

28 University estimates from university administrators panel discussion at Pacific Institute for Climate Solutions conference, *Future Grid*, June 15–16, 2010 in Vancouver, BC. \$2 million number cited from *PICS News*, Summer 2010.

Western Climate Initiative

THE TECHNICAL EASE OF IMPLEMENTATION of BC's carbon tax—announced in February 2008, implemented July 2008—is one key advantage of a carbon tax approach. In contrast, the Western Climate Initiative, a proposed regional cap-and-trade system involving four Canadian provinces and seven US states, has been in development for several years, and still faces political hurdles in many member jurisdictions.

Apart from political complications, cap-and-trade systems have a number of design issues that must be addressed in order for them to be effective.²⁹ For supporters, the appeal of cap-and-trade is the cap; a carbon tax increases price over time, but is uncertain about the quantity of emission reductions that will be delivered. The cap in a cap-and-trade system may be weak relative to what climate science tells us is necessary, and the coverage of sectors of the economy may be incomplete. It may also provide loopholes by allowing targets to be met through the purchase of offsets.

The WCI's Detailed Design Summary, released in July 2010, leaves much to be desired. The WCI will be implemented in two phases: in 2012 it will cover large emitters, and in 2015 will expand to cover transportation and buildings. But while the coverage of the WCI across sectors is fairly comprehensive, the WCI's region-wide target is weak—a minimum 15% below 2005 levels by 2020, a weaker target than in BC. More importantly, carbon offsets can be used for up to 49% of emission reductions, and a number of other provisions allow more “flexibility” in meeting targets.³⁰

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29 Cap-and-trade systems can be very complicated, and only some of the major design issues are discussed in this section. A technical report, *Achieving 2050: A Carbon Pricing Policy for Canada* (April 2009, for the National Round Table on the Environment and the Economy, Chapter 5), reviews in-depth the design considerations for carbon pricing.

30 Western Climate Initiative, *Design for the WCI Regional Program* (July 2010). See Figure 4 on page 13 for a list of “flexibility” provisions.

In BC, compliance with emission targets will be over three-year periods, a measure intended to smooth out annual fluctuations and provide flexibility in meeting targets. It is anticipated that the carbon tax will continue to cover residential and commercial buildings and transportation (in lieu of the WCI), while the cap-and-trade system will cover facilities with emissions greater than 25,000 tonnes per year, including electricity generation, fossil fuel production and other industries. This coverage builds on areas not currently covered by the BC carbon tax, such as industrial processes, fugitive emissions and imports of fossil-fuel derived electricity from non-WCI jurisdictions (in the case of BC, coal-fired power imported from Alberta would be covered).³¹

While the coverage of the WCI across sectors is fairly comprehensive, the WCI's region-wide target is weak—a minimum 15% below 2005 levels by 2020, a weaker target than in BC. More importantly, carbon offsets can be used for up to 49% of emission reductions, and a number of other provisions allow more “flexibility” in meeting targets.

One major design concern, with major implications for fairness, in cap-and-trade systems is the potential for windfall profits to particular companies or sectors. This is because new rules may confer an implicit advantage (a private hydropower generator, for example), but also by deliberate gaming of the system to boost profits. Another source of windfall profits is from the free allocation of permits. If permits are auctioned, governments receive revenues that can be used (like a carbon tax) to address adverse distributional outcomes or to finance other climate action. But where allowances are given away for free, as in the European Union Emissions Trading System, companies have passed forward the economic value of the permits (the opportunity cost of selling them) to consumers, leading to windfall profits.³²

The allocation of permits in WCI will be up to each jurisdiction, and BC has not yet specified how it will allocate permits. The choice of allocation method will have profound distributional impacts. There are potential gains for low- to middle-income households if permits are auctioned and revenues spent in a progressive manner. In this manner, a cap-and-trade system would resemble the carbon tax. However, existing high emitters should be expected to lobby hard for free permits based on current levels of pollution or production, and if successful they would reap an enormous financial windfall.

These design concerns are part and parcel of the politics of delivering a cap-and-trade system. Moves to create a US-wide system failed the test of the US Congress in 2009 despite much worse design compromises. Although the WCI will presumably start in 2012, with some sectors not covered until 2015, it has not achieved legislative success in many member states. With less than a year to go, the prospects for a WCI on the scale promoted are not particularly likely—at the time of writing, Washington, Oregon, Arizona, Utah and Montana appear to be out of the running for a 2012 start date.³³ A best case scenario would include California, New Mexico, Manitoba, Ontario and Quebec along with BC.

If the WCI does not go ahead, BC could continue to develop measures that expand the coverage of carbon pricing—process emissions from the aluminum, lime and cement industries, for example, that are not covered by the carbon tax should be covered. BC should also contemplate hard caps for large industrial emitters to accelerate climate action.

31 BC Ministry of Environment, *Emissions Trading Regulation Consultation Paper* (October 22, 2010).

32 A study by Point Carbon Advisory Services, *EU ETS Phase II—The Potential and Scale of Windfall Profits in the Power Sector*, for the World Wildlife Federation (March 2008) estimated windfall profits of between 23 and 71 billion euros during the second period of the EU ETS (2008-2012).

33 Personal communication with Matt Horne, Pembina Institute.

Next Steps for Carbon Pricing in BC

CARBON PRICING HAS THE POTENTIAL to play a strong, positive role in moving BC to a low- or zero-carbon society with economic, equity and ecological benefits. However, there are important design details that need to be rectified before turning up the dial. Below are a series of recommendations to the BC government, based on the analysis above, to make carbon pricing in BC more effective and equitable.

1. Establish an updated carbon tax framework

Given the political uncertainty of the WCI coming into effect, we focus on next steps for BC's carbon tax. Carbon taxes are less susceptible to design flaws and gaming than cap-and-trade systems, and provide a guaranteed revenue source to fund climate action. Ideally, a carbon tax would be implemented globally or even regionally (North America), but in the absence of agreement, sub-national jurisdictions like BC should press forward.

The BC carbon tax is scheduled to increase to \$25 per tonne in July 2011 and \$30 in July 2012, but the BC government has given no indication about future directions for the tax. Some degree of clarity on the future path of the carbon tax after 2012 is needed. BC Budget 2011 assumes the carbon tax will stay at \$30 per tonne in 2013. To give an appropriate price signal to businesses and consumers, a medium-term framework out to 2020 is desirable.

2. Aim for \$200 per tonne in 2020

To be effective, carbon taxes need to be much higher than the current \$20 per tonne, or even the \$30 per tonne in July 2012. And in pragmatic terms, there is substantial gap between current emission levels and BC's legislated one-third reduction in GHG emissions (relative to 2007 levels) by 2020.

Given the political uncertainty of the WCI coming into effect, we focus on next steps for BC's carbon tax. Carbon taxes are less susceptible to design flaws and gaming than cap-and-trade systems, and provide a guaranteed revenue source to fund climate action.

Modeling for the David Suzuki Foundation and Pembina Institute by Mark Jaccard and Associates concluded that carbon prices need to hit \$200 per tonne by 2020 to be consistent with GHG reductions likely to keep global temperature increase under 2° Celsius (assuming commitments from the rest of the world).³⁴ In gasoline terms this would imply a carbon tax of 44.5 cents per litre by 2020 (currently 4.45 cents). While a substantial increase, this would put BC gas prices at the levels currently prevailing in Europe.³⁵ The modeling finds small adverse economic impacts of carbon pricing (growth of GDP between 2010 and 2020 of 2.1% per year with climate action, compared to 2.4% per year under business-as-usual conditions).

Carbon prices need to hit \$200 per tonne by 2020 to be consistent with GHG reductions likely to keep global temperature increase under 2° Celsius. In gasoline terms this would imply a carbon tax of 44.5 cents per litre by 2020 (currently 4.45 cents). While a substantial increase, this would put BC gas prices at the levels currently prevailing in Europe.

There may also be a number of luxury items, consumed by the wealthy or that represent frivolous combustion of fossil fuels, for which a \$200 tax could be applied immediately. Business class air travel would seem to be an obvious target for a luxury carbon tax, as well as high-emission vehicles like most SUVs. Gratuitous consumption could include yachts, jet-skis, all-terrain vehicles, dune buggies and snowmobiles, which would have a co-benefit in terms of noise reduction. Since most of these burn gasoline, it would be difficult to apply a luxury carbon tax at the pump, so the tax may need to be applied at the time of purchase or through annual license fees.

3. Expand sectoral coverage

BC's carbon tax currently covers 73% of BC's GHG emissions, but does not cover emissions in key industrial areas, in particular process emissions associated with cement, lime and aluminum production, and venting and pipeline leakages in the oil and gas sector. The Pembina Institute reports an example of perverse subsidization that results from incomplete coverage of all emissions:

*B.C.'s carbon tax covers most sources of greenhouse gas emissions, but non-combustion industrial sources that are now being accurately measured and reported are not being taxed. For example, only 27% of the emissions from EnCana's proposed Cabin Gas processing plant would be covered by the carbon tax. The remaining 73% would not be covered because they are non-combustion emissions. At \$20 per tonne, this loophole would amount to a \$31 million subsidy to EnCana.*³⁶

The scope of the carbon tax should be expanded to cover all possible GHG emissions in the province. For industrial process emissions (aluminum, cement and lime production) that are to be covered by the Western Climate Initiative, an equivalent carbon tax should be applied immediately, and maintained after 2012 should the WCI not get off the ground.

Coverage of about 86% of BC emissions could be expected from the BC carbon tax if these sectors were covered. This would have amount to an additional \$130 in carbon tax revenues in 2010/11. About 14% of emissions—from landfills, agriculture and deforestation—are not

34 Pembina Institute and David Suzuki Foundation, *Climate Leadership, Economic Prosperity: Final report on an economic study of greenhouse gas targets and policies for Canada* (2009). Analysis is for Canada, although the authors endorse a \$200 per tonne carbon price for BC in the absence of national action (personal communications). The report specifies a carbon price only, not specifically a carbon tax or cap-and-trade system.

35 Interestingly, BC's 2020 GHG target would put the province where European countries are today in terms of GHG emissions per capita.

36 M. Horne and J. MacNab, *Putting a Price on Climate Pollution* (Pembina Institute, September 2010).

easily covered by a carbon tax, largely due to measurement issues. These emissions should be regulated in the short term, but could potentially be covered by the carbon tax in the future.

4. Count carbon emissions from trade

The carbon tax should apply to exports of fossil fuels, which have a large carbon footprint but are combusted in other jurisdictions (by accounting convention, they do not count in BC's GHG inventory). Emissions in other jurisdictions from the export of BC coal and natural gas are more than double the emissions from combustion of fossil fuels in BC.³⁷ A similar regime has existed in BC in the case of softwood lumber disputes with the US, and this experience could be a model for carbon exports. The provincial government could agree to reduce or eliminate its carbon export taxes if importing jurisdictions raised carbon taxes or otherwise implemented equivalent carbon pricing.

By the same token, a carbon price on imports would level the playing field to avert a shift to imported goods that do not face carbon prices at the production stage. This is potentially difficult constitutional terrain as the federal government sets external tariffs, but it should be within the mandate of a provincial government to apply an excise tax on GHGs embedded in imports. A BC government proposal to include emissions from fossil-fuel-derived electricity under BC's WCI commitments suggests this is possible (although there may be some challenging measurement issues in moving forward). This part of the carbon tax could be reduced in accordance with the application of carbon pricing in the exporting jurisdiction.

5. Compensate low- to middle-income households

A \$200 carbon tax by 2020 would represent a steep price increase, and that is why it is important to get the details right around how the proceeds of the tax are redistributed. The need for low- to middle-income households to adapt implies a significantly increased share of carbon tax revenues going to a new refundable credit. We model a scenario where half of carbon tax revenues are allocated toward a new credit would allow for higher credits at the low end and a broader phase-out period so that more households in the middle-income range would benefit as well (see sidebar, *A Model Carbon Tax in 2020*).

Adverse distributional dynamics will only serve to undermine support for a carbon tax. Technically, one-quarter of revenues allocated to the existing low-income credit would offset the tax paid by the bottom decile, whereas one-third of revenues going to the credit would offset the carbon tax for the bottom two deciles. Thus, one-third of revenues should go to the credit, at a minimum. A target of one-half of revenues would have a larger benefit for the lowest-income households and ensure no net carbon tax is paid for a greater share of households.

Also, planning toward BC's participation in the Western Climate Initiative should be for auctioned permits to avert windfall profits, and provide a source of revenue to address adverse distributional outcomes and complementary climate actions.

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37 M. Lee, *Peddling GHGs: What is the Carbon Footprint of BC's Fossil Fuel Exports?* (Vancouver: CCPA-BC, July 2010).

6. Use carbon tax revenues to reinforce climate action

As it rises, the carbon tax is an excellent source of revenues to transition BC to a low- or zero-carbon society. The other half of carbon tax revenues should be allocated to targeted investment incentives or public expenditures that reinforce climate action. Front-loading green investments should be a top priority:

- Expansion of public transit is an obvious area of investment, as people resent carbon taxes when they have no other options for their mobility, and such investments cannot happen without coordinated action from governments.
- Building retrofit programs could also be greatly expanded, with an emphasis on programs for low-income energy efficiency investments and conversion of rental housing stock. Community-level energy projects, like district heating, could also be supported. Capital funding for mitigation projects in public sector buildings and transportation should also be strongly supported.
- Green jobs programs to develop skills for a wide range of new work through traditional education, re-training and apprenticeships are another priority area, and these programs hold great potential to create decent work for traditionally disadvantaged populations.
- Forest conservation locks down carbon in living matter, and can sequester additional carbon over time.

As it rises, the carbon tax is an excellent source of revenues to transition BC to a low- or zero-carbon society. Revenue neutrality provisions should be rescinded.

In other words, revenue neutrality provisions should be rescinded. Shifting away from a frame of “putting money back in people’s pockets” and towards one that emphasizes the tax as a focal point for collective action on climate change would likely improve public opinion around the tax (a non-trivial point as the tax rises).³⁸ Cutting corporate taxes is the worst possible way of using carbon tax revenues. This is because of the intense concentration of ownership of capital at the top of the income distribution, and also because shareholders outside BC, who pay no carbon tax, benefit from corporate tax cuts. While it might make sense to provide targeted tax credits for green investments, across-the-board corporate tax cuts essentially reward the worst offenders when it comes to greenhouse gas emissions.

7. Phase out offsets and re-evaluate the Pacific Carbon Trust

As argued above, offsets are not a long-term solution to global warming, and they should be phased out. A rising carbon price should apply equally to public and private sectors, rather than the current situation where the public sector is paying a higher carbon price due to mandated offsets. In this context, the role of the PCT in mitigation strategies across the BC economy should be re-evaluated. The PCT could be a vehicle for supporting high-quality

38 Shane Gunster argues that the BC government believed it could sell a carbon tax only as a revenue-neutral “tax shift”; that is, if it financed tax reductions elsewhere. By promoting the tax using an individualistic tax-cutting frame the BC government undercut potential support for the carbon tax, Gunster argues, whereas “polls on carbon taxes consistently find that support rises significantly when revenues from the tax are directly invested in energy efficiency, alternative energy or other environmental initiatives.” S. Gunster, “Self-interest, sacrifice and climate change: (Re)framing the BC carbon tax” in *The Environmental Politics of Sacrifice*, M. Maniates and J. Meyer (eds.), (Massachusetts Institute of Technology, 2010).

Imagine BC in 2020: Emissions have been reduced by one-third relative to 2007 levels, and a big part of achieving that reduction was the BC carbon tax, amended in 2011 to be more effective and fair. The tax has hit \$200 per tonne and covers 86% of domestic emissions, or just under 39,000 kt CO₂e.

This vision would yield revenues of \$7.8 billion making it the single largest source of tax revenue (although if the tax is more successful, by reducing emissions more than one-third, revenues will be lower).

Table 3 outlines a scenario, based on the estimates made in the BC carbon tax section, for carbon tax revenues, with half of those revenues flowed back to households through the low-income credit. This scenario is designed to have a longer phase-out period, so that the bottom half of households are net beneficiaries with credits received larger than carbon taxes paid, and 80% of households receive credits (on average). All households in the top half of the income distribution would pay net carbon tax. For each group, any particular household could achieve better outcomes by reducing their consumption of GHG-intensive goods and services.

This is just one scenario; there are many other possibilities. The credit system could comprise a greater or lesser share of revenues, though it would generally have to be at least one-third of revenues in order to offset the impact of the tax for the bottom deciles. And the credit system could be designed in a way to offset more of the carbon tax paid by the middle deciles (or could even provide a uniform per person grant to all irrespective of income). The main point is to ensure a progressive distribution results from carbon pricing policies in BC.

In addition, the other half or revenues (not shown) would be spent on supportive climate action. This amounts to almost \$4 billion per year in support of public transit improvements, building retrofits and green jobs programs.¹

Note: Not included here are revenues should the carbon tax be applied to exports of natural gas and coal from BC (based on their carbon content). Assuming current production levels and that higher prices would lead the volume of those exports to also decline by one-third (in line with domestic emissions), this could lead to an additional \$15.6 billion in carbon tax revenues.

Table 3: A carbon tax scenario of \$200 per tonne in 2020

Decline	Carbon tax per household*	Credit per household	Net carbon tax
D1	\$1,329	\$2,753	\$(1,424)
D2	\$1,918	\$2,752	\$(833)
D3	\$2,733	\$3,230	\$(497)
D4	\$2,913	\$3,280	\$(367)
D5	\$3,398	\$3,480	\$(82)
D6	\$4,003	\$2,158	\$1,845
D7	\$4,217	\$1,368	\$2,849
D8	\$5,161	\$579	\$4,582
D9	\$5,530	\$-	\$5,530
D10	\$8,037	\$-	\$8,037
All	\$3,918	\$1,959	\$1,959
Next 4% (P95–99)	\$8,007	\$-	\$8,007
Top 1% (P99)	\$14,113	\$-	\$14,113
Note: *Projections for 2020 are based on 2010 incomes and prices, i.e. they do not assume any income growth or inflation, in order to illustrate the tax and recycling regime.			
Source: Author's calculations based on BC GHG Inventory, SPSPD/M.			

¹ This formulation of half of revenues allocated to credits and half to climate action is similar to what has been proposed in the CCPA's Alternative Federal Budget for many years.

mitigation projects in public and private sectors; alternatively, such projects could be funded directly from the public sector.

Land owners, First Nations, communities and environmental groups are increasingly looking to PCT offsets as a mechanism for financing conservation of forests. Such initiatives are much-needed, and should be supported with public funds; however, they should not be used to allow polluters to delay action to reduce emissions.

8. Develop complementary regulations and standards

Carbon pricing alone is not likely to lead to BC achieving its legislated targets, so climate policy must also develop rules for industry and the marketplace that reduce GHG emissions. Emission reductions can be accelerated by implementing complementary regulations. Modeling for the National Roundtable on Environment and Economy cites buildings and transportation as two sectors that would benefit from regulation, as these areas are slower to respond to higher carbon prices relative to other sectors. Complementary regulations can thus accelerate climate action.³⁹

BC's requirement that any coal-burning electricity plant implement carbon capture and storage is an example of a complementary regulation. In other sectors of the economy, well-designed regulations can achieve emission reductions quickly. Rising standards for fuel or energy efficiency, for example, can remove the most polluting goods, services or technologies from the marketplace, while maintaining flexibility at the level of the producer. Some areas like emissions from landfills may be better addressed through regulation, due to difficulties in measurement. In other cases, bans on certain activities or products (such as chlorofluorocarbons, a GHG used as refrigerant) may be the most effective and efficient approaches.

Carbon pricing alone is not likely to lead to BC achieving its legislated targets, so climate policy must also develop rules for industry and the marketplace that reduce GHG emissions.

9. Consider the interaction between carbon and clean electricity prices

Decisions around electricity generation are particularly important to ensure a transition to clean power that is used by households and businesses. A number of factors are pushing BC toward higher electricity prices. BC is proposing an approach, a “feed-in tariff,” which would pay a (potentially large) premium for new clean electricity supply, and will be reflected in higher prices for all categories of consumers. There is also pressure to increase electricity prices to support greater conservation of energy by households and businesses.

BC has among the lowest electricity prices in North America, but also among the greenest sources of electricity generation through its hydroelectric power assets, and it is not at all obvious that BC needs such new generation capacity. Nonetheless, a danger is that hydro price hikes could lead to a perverse shift from clean energy to dirty sources (conversion of electricity to natural gas space heating in homes, for example). It is essential that carbon prices rise by relatively more than electricity prices. Carbon pricing, in this sense, is an alternative to feed-in tariffs by making fossil fuels more expensive rather than subsidizing low-carbon electricity generation (that often has other environmental impacts).

³⁹ National Roundtable on Environment and Economy, *Getting to 2050: Canada's Transition to a Low-Emission Future* (Ottawa, 2008), <http://www.nrtee-trnee.com/eng/publications/getting-to-2050/index-getting-to-2050.php>.

10. Investigate alternative models

There are many possibilities for carbon pricing. A “cap-and-dividend” approach recommended for the US would auction pollution permits and redistribute the proceeds on an equal per capita basis.⁴⁰ This concept (with one-quarter of revenues allocated to climate action, and the remainder returned as a dividend) was put forward to US Congress in 2009/10,⁴¹ and while rejected, demonstrates some political will to consider alternative carbon pricing models.

Another intriguing approach to carbon pricing is a carbon quota system that would allocate to households (or individuals within a household) a share of an annual (and shrinking each year) carbon budget. Such a system has been recommended by George Monbiot⁴² and was endorsed by a UK Parliamentary Committee.⁴³ One interesting distributional aspect of a carbon quotas framework is that because high-income families lead much more carbon-intensive lifestyles than low-income families, they would have to buy quota from households that had an excess—that is, the system is inherently redistributive, while providing greater certainty about GHG reductions than a carbon tax.

While there are many details that would have to be worked out, these alternative approaches may have greater appeal once GHG emissions become more scarce, and the right to emit them a matter that necessitates a more equitable allocation than would be achieved by market mechanisms.

BC HAS ALREADY TAKEN IMPORTANT FIRST STEPS on climate action, and this report has drawn lessons from the first few years of carbon pricing policies. BC should draw inspiration from actions already undertaken in Europe. When it comes to good urban planning, transportation and taking action on climate change, Europe has a lot to teach us. Indeed, BC has already made a legislative commitment (to reduce greenhouse gas emissions by one-third by 2020) that would put us where the average European country is today.

The carbon tax is an ideal revenue source to finance a wide range of climate action needed to truly shift BC's economy onto a sustainable path, while simultaneously addressing the equity considerations that arise from such a transition.

40 J. Boyce and M. Riddle, *Cap and Dividend: How to Curb Global Warming while protecting the Incomes of American Families* (Amherst: Political Economy Research Institute, November 2007).

41 For a summary of the bill, see Pew Center on Global Climate Change, *Summary of the CLEAR Act (Cantwell-Collins)* at <http://www.pewclimate.org/federal/congress/111/clear-act-cantwell-collins>.

42 G. Monbiot, *Heat: How to Stop the Planet Burning* (London: Penguin Books, 2006).

43 UK House of Commons Environmental Audit Committee, *Personal Carbon Trading*, Fifth Report of Session 2007–08 (May 13, 2008).

DATA CALCULATIONS IN THIS PAPER draw on modeling done using Statistics Canada's Social Policy Simulation Database and Model. The SPSPD/M contains a detailed database of 100,000 representative individuals in 40,000 families, drawn from tax, census and survey data sources. It also is an accounting model that analyzes the impact of legislated or proposed programs on the taxes paid by and transfers received by individuals and families. Version 18.0 of the SPSPD/M was employed in this paper.

According to the Statistics Canada website: "The Social Policy Simulation Database and Model (SPSPD/M) is a micro computer-based product designed to assist those interested in analyzing the financial interactions of governments and individuals in Canada. It can help one to assess the cost implications or income redistributive effects of changes in the personal taxation and cash transfer system. The SPSPD is a non-confidential, statistically representative database of individuals in their family context, with enough information on each individual to compute taxes paid to and cash transfers received from government. The SPSPM is a static accounting model which processes each individual and family on the SPSPD, calculates taxes and transfers using legislated or proposed programs and algorithms, and reports on the results."

That said, the author is fully responsible for the results of SPSPD/M simulations used in this paper. This analysis builds on that developed by Lee and Sanger (2008), which was based on detailed expenditure data from Statistics Canada's Survey of Household Spending, but was only available at the quintile (20% grouping) level. The SPSPD/M allows for much finer breakdowns of the distribution of BC households.

SPSPD/M was used to estimate carbon tax, low-income credit and PIT cuts by income group (deciles, top 1% and next 4%) for calendar years 2010, 2011 and 2012. The income concept used is total income, which includes market income (wages and salaries and investment income) plus transfer income (federal and provincial income transfers such as the CCTB, OAS, EI and social assistance). Estimates are for households, which includes all people living in the same dwelling unit (whether or not they are family). Because of differences in household size, unattached individuals tend to be closer to the bottom of the distribution and families with multiple income earners higher up.

Distributional runs through SPSPD/M understate total carbon tax revenues. From J. Jones at Statistics Canada: "The reason total carbon tax dollars from our model is lower than the budget is because we only capture household spending. Household spending is defined in our model by the current personal expenditures data we receive from the national accounts (input-output data specifically). This means that we exclude the other final demand sectors, which are mainly capital expenditures such as machinery, equipment and construction as well as exports." (personal communication)

Relative to estimates in BC Budget 2011, the SPSPD/M overstates the total value of PIT cuts and Low-Income Credit. Totals were adjusted to conform with budget estimates by using shares of totals attributable to each income group from SPSPD/M runs, but allocating total amounts for each category from Budget 2011 (pp. 45-46). Due to differences in calendar year and fiscal year, 2010/11 amounts are allocated to 2010, and so forth.

The SPSPD/M does not allow for modeling of corporate income tax cuts, but does allow for distribution of dividend income. Estimates of corporate income tax cuts by income group took total corporate income cut amounts in Budget 2011, and allocated them to income groups in accordance with dividend income. This is because in a tax incidence analysis, all taxes and expenditures must ultimately be linked back to an individual, and in the case of corporate income tax, this represents the owners of BC corporations.



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Sierra Club BC is a non-profit environmental organization whose mission is to protect British Columbia's rich tapestry of species and ecosystems, especially in light of global warming. For more than 40 years, the Sierra Club of BC has been a leader in many successful campaigns to safeguard BC wilderness and wildlife. We advocate the responsible use of BC's natural resources while promoting a modern, equitable economy that sustains our planet in every way.

THE CLIMATE JUSTICE PROJECT

The Climate Justice Project is a multi-year initiative led by CCPA and the University of British Columbia in collaboration with a large team of academics and community groups from across BC. The project connects the two great "inconvenient truths" of our time: climate change and rising inequality. Its overarching aim is to develop a concrete policy strategy that would see BC meet its targets for reducing greenhouse gas emissions, while simultaneously ensuring that inequality is reduced, and that societal and industrial transitions are just and equitable.



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The Canadian Centre for Policy Alternatives is an independent, non-partisan research institute concerned with issues of social and economic justice. Founded in 1980, it is one of Canada's leading progressive voices in public policy debates. The CCPA is a registered non-profit charity and depends on the support of its more than 10,000 members across Canada.

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