



# Publication

## POLICY PERSPECTIVES

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### THE LONG ROAD TO A LOW-CARBON FUTURE

The February 2007 Speech from the Throne and the subsequent release of the new provincial Energy Plan signalled an aggressive new approach to climate change by the British Columbia government. BC has now set medium-term targets to reduce emissions of greenhouse gases (GHGs)<sup>1</sup> that are more ambitious than the targets recently unveiled by the federal government – as well as those adopted by California. Meeting these targets will involve shifts in resource use, energy costs, and patterns of economic activity. This issue of Policy Perspectives looks at climate change mitigation in a BC context and considers strategies to address GHGs in a cost-effective manner without jeopardizing the province's economic growth or competitiveness.

#### BC Throne Speech and Energy Plan Commitments

The provincial government's focus on climate change reflects the growing political attention being given to the issue across much of the world. Against the background of past federal government inaction, a number of provinces have begun to pursue their own climate change initiatives. Alberta has a *Climate Change and Emissions Management Act* (passed in 2002, amended in 2007) and is now implementing a plan to limit industrial GHG emissions over time. Manitoba, Quebec and Ontario are also taking action. British Columbia does not yet have a fleshed out plan, but the government is working to fashion one.

The highlights of the BC government's 2007 Throne Speech commitments touching on climate change are summarized below:

- BC's overall emissions are to be reduced by one-third from 2006 levels by 2020.
- Interim targets will be set for 2012 and 2016.
- Oil and gas sector GHG emissions will be rolled back to 2000 levels by 2016, in part via new measures to limit flaring.
- The province will develop a new "green" Building Code over the next year.
- BC intends to phase in more stringent tailpipe emission standards for new vehicles over the period 2009 to 2016.
- The province is exploring, both with the federal government and several Western states, the development of "a sensible, efficient system for registering, trading, and purchasing carbon offsets and carbon credits." On April 19, 2007, BC joined the Western Regional Climate Change Action Initiative (other members are California,

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<sup>1</sup> There are six greenhouse gases, but for comparison purposes they are normally reported in units of carbon dioxide (CO<sub>2</sub>) equivalent.



Arizona, Oregon, New Mexico, and Washington). The participating jurisdictions propose to develop, within 18 months, a regional carbon trading scheme to assist in reducing their collective GHG emissions.

- The government has promised to make its own operations “carbon neutral” by 2010.
- The BC Ministry Finance has started consultations on “...ways to encourage overall tax savings through shifts in behaviour that are environmentally responsible.”

The revised BC Energy Plan, released in March 2007, includes a number of policy commitments that will also bear on future GHG emissions:

- The province has set a goal to achieve self-sufficiency in electricity by 2016. At present, BC is a net importer of power. Reaching self-sufficiency will require the development of significant new domestic generating capacity.
- Half of BC Hydro’s incremental resource needs to 2020 are to be met through conservation measures – an ambitious goal that points to rising electricity prices going forward.
- Henceforth, BC will require 100% carbon sequestration for coal-fired electricity generating plants, which effectively rules out the development of such plants for the foreseeable future.
- All new electricity generation must meet a zero net greenhouse gas emission standard. And the province will require zero net greenhouse gas emissions from existing thermal generation by 2016.

Finally, the provincial government has made funding allocations for several programs related to climate change. These include a \$25 million Innovative Clean Energy Fund and – in partnership with the federal government – \$89 million for fuel cell buses and related fuelling stations. Additional funding was also set aside in Budget 2007 for new green initiatives in communities.

### **Federal Action Plan to Reduce Greenhouse Gas Emissions and Air Pollution**<sup>2</sup>

Turning to the national scene, in late April the federal government produced its own plan to tackle climate change, having failed to persuade the opposition parties in the House of Commons to support its original *Clean Air Act* introduced last fall. The minority Conservative government has argued that Canada cannot meet its target under the 1997 Kyoto Protocol – namely, to reduce greenhouse gas emissions by 6% below the 1990 level over 2008-2012 – given that emissions have grown uninterruptedly over the past decade and are now at least 35% higher than the Kyoto benchmark. The new federal action plan establishes a more modest but realistic goal to reduce GHG emissions by 150 megatonnes (Mt) of CO<sub>2</sub> equivalent (or 20%) from all sources between 2006 and 2020.<sup>3</sup>

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<sup>2</sup> Apart from greenhouse gases, the federal plan also aims to reduce industrial emissions of several air pollutants. This aspect of the federal plan is not considered here.

<sup>3</sup> Government of Canada, Regulatory Framework for Air Emissions (April 2007).



The government's initial focus is on industrial emissions, which account for half of Canadian GHG emissions. Short-term emission-intensity targets will come into effect for facilities in key industry sectors in 2010 (see Box 1). Emission-intensity refers to the amount of carbon dioxide (CO<sub>2</sub>) produced for a given quantity of industrial output. An improved performance means less CO<sub>2</sub> emitted per unit of output. This does not necessarily translate into a lower level

of emissions for a given industrial facility, since with an intensity-based regulatory regime absolute emissions may still rise if output expands sufficiently. For existing facilities in regulated sectors, the 2010 federal target assumes a 6% annual decrease (i.e., improvement) in emission-intensity from 2007 to 2010, yielding an enforceable 18% emission-intensity reduction by the latter year. For each year thereafter, a further 2% decrease will be required (resulting in a total 26% mandated drop in emission-intensity by 2015). The required reductions only apply to combustion and non-fixed process emissions. Pre-defined fixed process emissions, for which there is no technology to reduce emissions, will be factored into the targets for each regulated industry. For new industrial facilities, the government intends to establish targets based on "clean fuel standards," although what this will entail is not yet clear.

Box 1  
**INDUSTRY SECTORS SUBJECT TO  
FEDERAL GREENHOUSE GAS REGULATION**

- Electricity generation produced by combustion
- Oil and gas
- Forest products (mainly pulp and paper manufacturing)
- Smelting and refining
- Iron and steel
- Some mining
- Chemicals
- Cement and lime

Ottawa's new framework sets out five different options for regulated facilities to meet their mandated GHG mitigation targets: 1) undertaking in-house abatement actions that reduce emissions; 2) paying into a new technology fund at an initial rate of \$15 per tonne of CO<sub>2</sub> emitted; 3) participating in a yet-to-be-defined domestic credit-trading scheme; 4) purchasing "offsets" by investing in domestic projects that lead to verified emission reductions in non-regulated sectors; and 5) investing in foreign offsets in developing countries under the provisions of the Kyoto Protocol Clean Development Mechanism.

This menu of compliance options should enable businesses to determine their least-cost alternative(s) to meet their regulated GHG targets. It should also stimulate technological innovation and commercialization of products that can assist in lowering GHGs over time.

Regulated firms that managed to cut their absolute GHG emissions between 1992 and 2006 are eligible for a one-time "credit for early action" that they can use, bank or trade. Companies will have to submit proof of past GHG reductions in order to access the credit. However, the government is imposing a global cap of 15Mt for the credit. Eligibility for the credit will depend on the size of each firm's GHG reductions and the overall take-up of the credit. The decision to set a low overall cap on the credit for early action works to the disadvantage of industries that have already delivered significant emission reductions. The



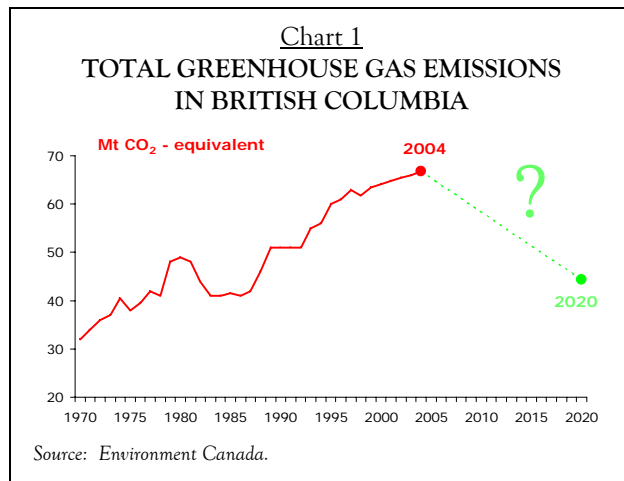
pulp and paper and chemical industries are good examples, as both have slashed their GHG emissions by more than 40% since 1990.

Apart from mandating emission-intensity targets for regulated industries, the federal government also proposes to adopt tougher fuel-efficiency standards for cars and light trucks for the 2011 model year; require the rail sector to achieve emission improvements<sup>4</sup>; support stricter emission standards for shipping through the International Maritime Organization and by cooperating with the US Environmental Protection Agency to reduce marine sulphur emissions; and develop more stringent energy efficiency regulations for a wide range of household and commercial products.

### Trends in BC's Greenhouse Gas Emissions

A glance at the historical record suggests that the GHG reduction targets set by the BC government will be difficult to achieve, particularly in an environment of ongoing economic and population growth. As shown in Chart 1, provincial emissions have increased at a steady pace, climbing from roughly 32 megatonnes (Mt) of CO<sub>2</sub> equivalent in 1970 to 55.3 Mt in 1990, and then to 66.8 Mt in 2004.

The period since 1990 has seen a 30% jump.<sup>5</sup> Using the BC government's Throne Speech GHG goal, emissions would need to drop by about 22 Mt from 2006 in order to achieve a 33% reduction by 2020 (this leaves aside the various factors that would be pushing emissions higher in the meantime). Of interest, only during times of pronounced economic weakness (e.g., the first half of the 1980s and the early 1990s) have emissions (temporarily) declined or stabilized. Population

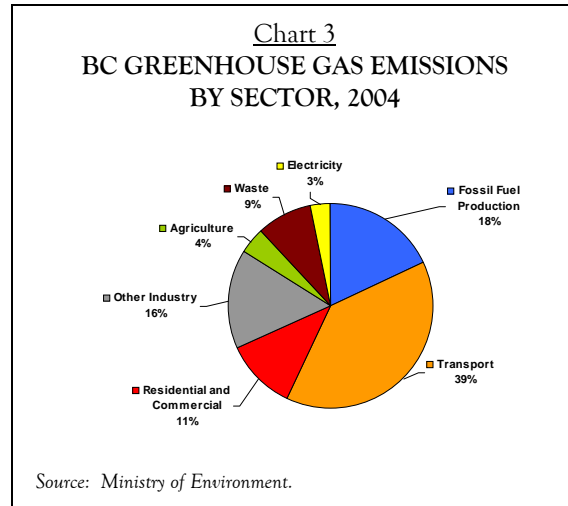
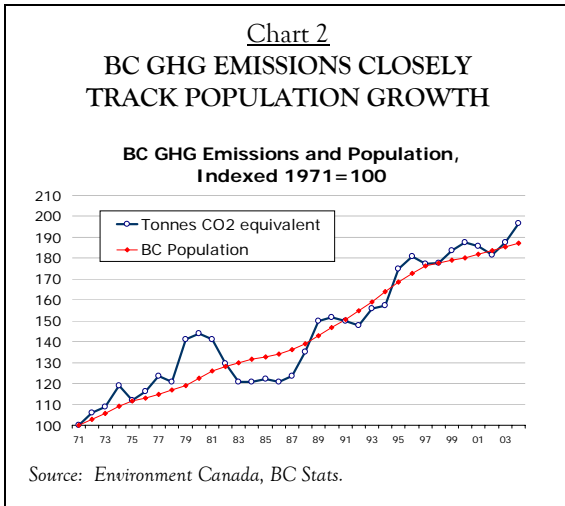


growth and the escalating demands for transportation, housing, energy, and consumer goods and services that flow from it have been the principal driving forces behind the upward trend in emissions. Indeed, as shown in Chart 2, population and GHG emissions growth have been closely correlated.

Transportation accounts for nearly 40% of British Columbia's emissions (Chart 3), half of which is due to passenger cars and light trucks. Waste generates just under one-tenth of emissions, almost all of which is landfill waste. In terms of major industry, the expansion of the upstream oil and gas industry has had a significant impact on GHGs, with emissions

<sup>4</sup> On May 16, the major Canadian railways signed an MOU with Environment Canada calling for GHG reductions over the next several years.

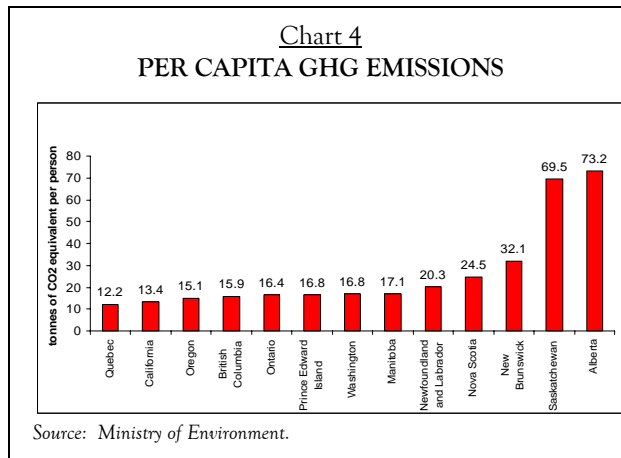
<sup>5</sup> Environment Canada (2006), National Inventory Report – Greenhouse Gas Sources and Sinks in Canada, 1990-2004. All Canadian emissions data cited in this paper are drawn from this report.



from the industry nearly doubling between 1990 and 2004 in tandem with the growth of upstream drilling and production. Manufacturing and other industrial processes produce 16% of the province’s emissions, while another 11% come from the commercial and residential sectors. Note that unlike the situation in many other North American jurisdictions, electricity generation is a minor source of GHGs (3% of the total) thanks to BC’s predominantly hydro-based system.

The composition of BC’s emissions differs from that at the national level and in most other provinces. In particular, transportation is a much bigger source of GHGs in BC than in Canada as a whole (39% versus 25%). And compared to Ontario, Alberta, Saskatchewan, and Nova Scotia, a far smaller share of BC’s emissions is attributable to the electricity sector.

By North American standards BC is already a relatively low GHG emitter on a per person basis (Chart 4). Indeed, using this metric, BC boasts the second lowest emissions of all provinces, at approximately 16 tonnes of CO<sub>2</sub> equivalent per person (2004). This reflects BC’s overwhelming dependence on hydro-electric power and the absence of a large manufacturing sector. Because it is currently a low emitter, is projected to have above-average population growth, and has an unusually large portion of emissions coming from the transportation sector, British Columbia is likely to find it harder and more costly to achieve significant GHG reductions than many other provinces and states in North America.





### **Reducing BC's Emissions: Issues and Opportunities**

BC's goal to reduce overall GHG emissions by one-third by 2020, if met, would bring emissions 10% below their 1990 level, which qualifies as the most aggressive target set to date by any province or state in North America.

The pathways to achieving the province's GHG targets will depend on several factors, such as trends in the economy, shifts in land use and urban density, the pace at which innovative low-carbon technologies are adopted, behavioural changes by consumers and businesses, and the impact of future policy interventions. The areas where BC can deliver relatively quick and/or substantial GHG reductions, given its economic structure and the composition of emissions, may be different from those in other provinces or states.

With Ottawa now taking meaningful action on climate change, a key question for the British Columbia business community is to what extent the province's forthcoming plan will be harmonized/aligned with the federal government's climate change policies and regulatory framework. This is especially important for BC industries that are major emitters and will therefore be subject to the proposed federal emission-intensity targets. At present, there are 35 industrial facilities in the province that are classified as "Large Final Emitters" - i.e., they are each responsible for at least 100,000 Mt of greenhouse gases per year (Box 2).<sup>6</sup> These facilities account for about one-fifth of the province's total emissions. Most are in the energy and pulp and paper sectors. It is clear that all of these facilities will be captured by the federal framework for regulating GHGs. Less clear is whether British Columbia will decide to impose its own, more stringent emission limits on major emitters. At this point, it may make sense to let the federal government to take the lead in regulating emissions from Large Final Emitters located in BC. The province can then concentrate its efforts on other emission sources.

Box 2  
**BC LARGE FINAL EMITTING  
INDUSTRIAL FACILITIES\***

- Pulp and paper (11 facilities)
- Natural gas gathering/transmission (9 facilities)
- Coal mining (4 facilities)
- Cement plants (3 facilities)
- Power generation (3 facilities)
- Refineries (2 facilities)
- Aluminum manufacturing (1 facility)
- Lead/zinc smelting (1 facility)
- Lime production (1 facility)

\* Defined as facilities that emit 100,000 tonnes or more of GHG per year.  
Source: Environment Canada..

A related issue is the nature of any future carbon trading market, in which firms are able to purchase or sell "credits" to emit specified amounts of CO<sub>2</sub> and/or invest in arm's-length projects that lower emissions as a means to offset their own emissions. As noted above, BC has entered into discussions with five Western US states on ways to work together to address climate change, including by creating some type of regional carbon trading system. However,

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<sup>6</sup> In 2004 there were actually 37 Large Final Emitter facilities in BC, but two have since ceased operations.



the federal government's priority appears to be to create a domestic carbon trading regime, with the possibility of extending this beyond Canada's borders deferred for later consideration. Depending on how this matter is handled, BC companies wanting to buy or sell emission credits (or to invest in arm's-length domestic offset projects) could find themselves in a confusing situation if the provincial and federal governments choose different models for the development and geographic scope of a carbon trading market.

An obvious top of mind worry for some BC industries is the prospect of multiple layers of GHG regulation and duplicate reporting and compliance procedures involving both provincial and federal authorities. Fortunately, the Conservative government's new climate change plan provides for the negotiation of "equivalency agreements" with interested provinces prepared to implement GHG standards at least as tough as the applicable federal standards.<sup>7</sup> Once in place, an equivalency agreement would enable a province to administer new standards within its jurisdiction, thus avoiding the unattractive scenario of local companies having to deal with different bureaucratic agencies and rules in respect of their GHG emissions.

Looking forward, we see a number of areas where BC may have opportunities to demonstrate tangible progress in moving to a less carbon-intensive economy over the next few years:

- Following through on the government's proposal to adopt California tailpipe emission standards for new vehicles.
- Making greater use of natural gas engines in place of diesel engines in trucks and buses.
- Pursuing projects to capture methane from landfills.
- Shifting - where feasible - commercial freight from truck to rail (rail has lower GHG emissions per tonne of freight moved).
- Fostering greater density in urban communities through a mix of regulation, incentives and zoning policies.
- Developing the capacity to export "green energy" and bio-energy power to displace thermal-based power currently used in other markets, thereby generating "carbon credits" for the province.
- Implementing public sector policies and private sector incentives to accelerate vehicle fleet turnover (newer vehicles, on average, are less polluting).
- Taking action to "green" the Building Code and to stimulate building retrofits.
- Encouraging further substitution of bio-mass for fossil fuel energy in the pulp and paper and sawmilling industries.

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<sup>7</sup> The federal plan contemplates equivalency agreements covering both GHGs as well as air pollutants.



- Supporting the local adoption and commercialization of innovative, BC-developed technologies and products that can assist in moving to a low-carbon economy.

In the coming years, it is likely that federal and provincial policy-makers will also be exploring other market-based approaches to reducing emissions of GHGs and air pollutants. These may include cap-and trade systems, tax levies that vary with the quantity of emissions, tolls and other forms of “road pricing,” and incentives to adopt new environmental technologies.<sup>8</sup>

While there is certainly a role for market-instruments within the suite of public policies to tackle climate change, as a small, trade-dependent jurisdiction British Columbia must be mindful of its competitive position when considering tax and regulatory measures aimed at reducing GHGs. As British Columbia embarks on the road to a low-carbon future, the best strategy is to coordinate policy development within a wider Canadian/North American context. Climate change, after all, is quintessentially a global problem, and real progress depends on international collaboration over the long haul. Driving energy production and other industrial activity out of BC into other jurisdictions will not result in lower global emissions of greenhouse gases.

Finally, BC policy-makers need to recognize that advances in technology will be critical to breaking the link between economic activity and GHG emissions. As the National Roundtable on the Environment and the Economy emphasized in a recent landmark study, with the gradual perfection and deployment of promising new technologies Canada should be able to slash its GHG emissions by up to 60% by 2050, mainly through increased efficiencies in the use of energy and the capture and sequestration of carbon in the oil and gas and electricity sectors. “The greatest value of re-examining climate change through a long rather than a short-term lens,” the Roundtable concluded, “is that looking to 2050 [allows] a fresh look at the most effective strategies for reducing greenhouse gas emissions in a way that is responsive to Canada’s unique circumstances.”<sup>9</sup>

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<sup>8</sup> For a useful review, see TD Economics, “Market-Based Solutions to Protect the Environment” (March 7, 2007); available at [www.td.com/economics](http://www.td.com/economics)

<sup>9</sup> National Roundtable on the Environment and the Economy, Advice on a Long-Term Strategy on Energy and Climate Change (June 2006), p. 20.