

## **Fair Share, Green Share: A proposal for regulating greenhouse gases from Canadian industry**

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There is a strong consensus in Canada that greenhouse gas (GHG) emissions from industrial facilities must be regulated, to turn round the growth in these emissions and move towards deep reductions. Regulated GHG targets for industry must begin to apply in 2008 at the latest, because that is the year when Canada must start meeting its Kyoto target for GHG emissions.

### **Objectives**

A regulatory system for industrial GHG emissions must meet six key objectives:

1. **Environmental fairness.** It must implement the polluter pays principle, so that both industry as a whole and distinct sectors of industry make a contribution to meeting Canada's Kyoto obligations that is in keeping with their contribution to emissions and emissions growth.
2. **Economic feasibility.** It must implement the ability-to-pay principle, taking into account sectors' varying situations regarding international competition and profitability, so as to maximize emission reductions while minimizing economic disruption.
3. **Environmental integrity.** It must ensure that targets represent a clear environmental outcome and that all compliance options represent real, near-term emission reductions, so that targets mean what they say and no shortfalls are created that become a burden for taxpayers.
4. **Urgent action.** It must put a price on emissions that is high enough to stimulate large-scale deployment of low-emission technologies in Canada, starting now, to secure the substantial progress towards deep emission reductions that will be needed by 2020 to ensure such reductions can be achieved by 2050.<sup>2</sup>
5. **Geographic balance.** It must provide an acceptable balance between international emission reductions that minimize the short-term costs of meeting Canada's obligations,

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<sup>2</sup> To play an adequate role in preventing dangerous climate change, Canada needs reduce its GHG emissions to 80% below the 1990 level by 2050. See *The Case for Deep Reductions* (David Suzuki Foundation and Pembina Institute, November 2005).

and domestic and regionally focused investments that put Canada on track towards a low-emissions future.

6. **Certainty.** It must be designed both for the short and longer term: to provide industry with sufficient certainty about costs, now and into the future, for rational investment decisions to be made; to produce a clear environmental outcome; and to avoid the uncertainty and delays that would occur if government had to redesign the system after just a few years.

## **Emissions**

Heavy industry can be divided into three broad sectors: electricity generation, upstream oil and gas, and the energy-consuming industries (including oil refining). This is a useful division because each of these sectors is in a quite distinct situation regarding emissions growth and ability-to-pay. The table shows emissions from these three sectors between 1990 and 2010. The numbers are based on the best publicly available information, but this area is plagued by a lack of transparency on the part of the federal government; some uncertainties and inconsistencies therefore remain.

### **Heavy industry emissions (Mt CO<sub>2</sub>e<sup>3</sup>)<sup>4</sup>**

	<b>Electricity generation</b>	<b>Upstream oil and gas</b>	<b>Energy-consuming industries</b>	<b>Total</b>
1990	95	84	100	278
2000	131	125	94	350
2004	128	133	94	355
2010 business-as-usual	138	145	105	388
1990 – 6%	89	79	94	261
“Kyoto gap”	49	66	12	127
“Kyoto gap” (% reduction)	36%	46%	11%	33%

The “Kyoto gap” in the table is the difference between business-as-usual emissions in 2010 and 6% below the 1990 emissions level (which, when applied to Canada’s total emissions, is our Kyoto Protocol target). Canada’s total emissions in 2004 were 758 Mt,<sup>5</sup> of which heavy industry’s share (355 Mt) was 47%.

<sup>3</sup> megatonnes of carbon dioxide equivalent

<sup>4</sup> Emissions for electricity generation and upstream oil and gas in 1990, 2000 and 2004 are taken from Environment Canada’s *National Inventory Report 1990–2004*, tables A9-1 and A10-1 (“upstream fossil fuel industry”). Total emissions for all years are those for “large final emitters” as presented in Exhibit 1.10 of the *2006 Report of the Commissioner of the Environment and Sustainable Development*. The latter are slightly approximate, as they are presented only graphically. Emissions for the energy-consuming sectors for 1990, 2000 and 2004 are deduced by subtracting those for electricity generation and upstream oil and gas from the totals. Emissions for 2010 represent business-as-usual projections used for the Martin government’s “Project Green” (*Moving Forward on Climate Change: A Plan for Honouring our Kyoto Commitment*, April 2005), taken from a document released to the Pembina Institute under the Access to Information Act, adjusted by (i) estimating that 23 Mt of total oil and gas emissions are from downstream oil and gas and (ii) removing 6 Mt of electricity emissions to bring the total to the same level as provided by the Environment Commissioner.

<sup>5</sup> *National Inventory Report 1990–2004* (Environment Canada, 2006).

## **Proposal**

We propose a regulatory system for industrial GHG emissions with the following features:

- Targets expressed in terms of emissions (not emissions intensity) and implemented initially as free allocations of emission allowances.
- Targets for the 2008–12 period set at 6% below the 1990 emissions level for each of the electricity generation, upstream oil and gas, and energy-consuming sectors (as per the third-last line of the table above).
- Targets assigned to individual facilities in such a way that facilities starting up since 1990 receive a fair allocation of allowances relative to facilities that were already operating in 1990.<sup>6</sup>
- Four compliance options in addition to on-site emission reductions:
  - Purchase of domestic offset credits generated from projects that meet a strict test for additionality.<sup>7</sup>
  - Purchase of international credits certified under the Kyoto Protocol, representing real emission reductions from specific projects (not so-called “hot air credits”); or allowances from the European Union’s Emission Trading Scheme (which are also valid for meeting Kyoto targets).
  - Payments at a rate of \$30/tonne CO<sub>2</sub>e to an independently administered Greenhouse Gas Reduction Trust, mandated to reinvest all revenues in domestic offset credits representing near-term emission reductions from projects located such that revenues stay in their province of origin.<sup>8,9</sup>
  - Purchase of surplus allowances from regulated facilities that surpass their targets.
- An announcement by government (not written into law) of an intention, starting in 2013, to:
  - gradually reduce the total amount of allowances so that the amount allocated in 2020 will be in the vicinity of 25% below the 1990 emissions level for each of the three sectors referred to above;

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<sup>6</sup> Facilities in existence in 1990 would therefore receive an amount of allowances somewhat less than 6% below the 1990 emissions level, depending on the number of new facilities in the sector.

<sup>7</sup> Projects that would likely have occurred in the absence of the ability to earn credits – e.g. , because they resulted from another provincial or federal government program or regulation – would not meet the test. Additionality testing would need to be at least as stringent as in the Kyoto Protocol’s Clean Development Mechanism.

<sup>8</sup> The Trust will likely have to pay more than \$30/tonne on average to acquire a sufficient amount of offset credits in a province such as Alberta where one can expect a strong demand for the \$30/tonne compliance option. It is proposed that the federal government make up the resulting emission reduction shortfall by purchasing international project-based Kyoto credits (not “hot air” credits) and donating them to the Trust.

<sup>9</sup> Initially, the Trust could invest directly in emission reductions from projects that meet a strict test for additionality, without waiting for a domestic offset credit system to be set up.

- limit purchases of international credits as needed such that the market price for domestic credits is at least \$30 per tonne CO<sub>2</sub>e, and by 2020 at least \$50<sup>10</sup> per tonne; and
- auction, instead of providing free-of-charge, a steadily increasing proportion of allowances, subject to industry's ability-to-pay, and with auction revenues reserved for reinvestment in further GHG emission reductions.

For the 2008–12 Kyoto compliance period, the proposed targets add up to an average 127 Mt reduction in annual industrial emissions, relative to business-as-usual levels – as per the table above. This represents almost half of the estimated 270 Mt reduction in Canada's total annual emissions (relative to business-as-usual levels) needed for the country to meet its Kyoto target.<sup>11</sup>

The overall 127 Mt reduction can be compared to the 95 Mt reduction in heavy industry emissions below business-as-usual levels that was expected from the federal government's 2002 climate change plan.<sup>12</sup>

## ***Proposal compared to objectives***

### **Environmental fairness**

The proposal meets this objective by requiring heavy industry as a whole to contribute to achieving Canada's Kyoto target in proportion to its share of emissions: heavy industry accounts for close to half of Canada's emissions and would contribute close to half the reductions needed to meet the target.

The proposal also ensures environmental fairness by requiring the most emission reductions (relative to business-as-usual levels) from the sectors contributing the most to emissions growth post-1990. Conversely, using 1990 as the reference point for target-setting ensures that the sectors that best succeeded in controlling their emissions post-1990 receive credit for their early action. 1990 is the internationally accepted base year for emission reduction commitments because of its proximity to 1992, the year when the international community agreed, by adopting the United Nations Framework Convention on Climate Change, the objective of putting an end to the accumulation of GHGs in the atmosphere.

By requiring reductions in actual emissions (rather than emissions intensity), the proposal meets the federal Environment Commissioner's recent call for the government to "reconcile the need to reduce greenhouse gas emissions against expected growth in the oil and gas sector."<sup>13</sup> And the transition to auctioning of allowances in the longer term will allow eventual full implementation of the polluter pays principle.

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<sup>10</sup> in constant dollars

<sup>11</sup> The 270 Mt estimate can be found in *Moving Forward on Climate Change: A Plan for Honouring our Kyoto Commitment* (Government of Canada, April 2005).

<sup>12</sup> *2006 Report of the Commissioner of the Environment and Sustainable Development*, chapter 1.

<sup>13</sup> *2006 Report of the Commissioner of the Environment and Sustainable Development*, chapter 0.

## Economic feasibility

The proposal meets this objective because it distinguishes sectors according to their ability to pay.

Relative to business-as-usual, the target for the **energy-consuming industries** is modest. The proposed emission reduction of 11% relative to business-as-usual is close to the 12% reduction proposed by the Martin government that was broadly accepted by industry.<sup>14</sup> These industries could face difficulty in taking on a more stringent target as they are relatively mobile and exposed to international competition from countries that are not yet limiting GHG emissions.

The **electricity generation** sector can manage a more stringent target because the need to generate electricity relatively close to the consumer means the sector has little vulnerability to international competition. In addition, electricity prices in Canada are often regulated. For both these reasons, the sector generally has the option of sharing a portion of increased costs with consumers. But these costs should be reduced by widespread government support for electricity conservation, low-impact renewable electricity (both of which can be deployed rapidly) and cogeneration – helping reduce the quantity of emission reductions that electricity producers will have to pay for themselves (as well as providing several other social benefits).

Even in the absence of such support, if 100% of the emission reductions proposed for this sector were imposed on coal-fired generators, this would still represent a lesser emission reduction requirement than the “clean as gas” standard that the Government of Alberta is imposing on new coal-fired facilities.<sup>15</sup>

But assuming that there were such government support, and that coal phase-out in Ontario proceeded rapidly, the cost to the remaining coal-fired generators would be between about 0.63 and 1.26 cents per kilowatt-hour (kWh)<sup>16,17</sup> – which can be compared to an average residential

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<sup>14</sup> Although the target proposed here is for emissions, unlike the previous government’s target, which was expressed in terms of emissions intensity, both are measured relative to a business-as-usual projection and therefore comparable, as long as actual future production levels do not deviate much from those in the projection.

<sup>15</sup> The “clean as gas” standard requires new coal-fired facilities to offset GHG emissions down to the level of a natural gas combined-cycle facility. See <http://www3.gov.ab.ca/env/climate/accomplishments.html>.

<sup>16</sup> It is plausible that 10 Mt of reductions in annual emissions could be achieved on average over 2008–12 from coal phase-out in Ontario plus at least a further 5 Mt of reductions from coal-fired electricity as a result of government support for conservation, low-impact renewable electricity and cogeneration in the rest of Canada. If we assume that business-as-usual emissions from coal-fired electricity will be about the same in 2010 as they were in 2004 (96 Mt, from Environment Canada’s *National Inventory Report 1990–2004*), then for the purpose of calculating costs to generators, the 49 Mt (see table) of proposed emission reductions below a business-as-usual level of 96 Mt become 34 Mt of reductions below a level of 81 Mt. This would represent an offset of 0.42 kg/kWh from a typical coal-fired emissions rate of 1 kg/kWh. Achieving this offset by purchasing international project-based Kyoto credits at \$15/tonne (see following footnote) or making payments of \$30/tonne to the Greenhouse Gas Reduction Trust would result in a cost range of 0.63 to 1.26 cents/kWh.

<sup>17</sup> According to testimony by Andrei Marcu of the International Emissions Trading Association to the House of Commons Standing Committee on Environment and Sustainable Development (November 23, 2006), the recent average price of project-based Kyoto credits has been \$12/tonne, and that this might rise by 10–15% with Canadian participation in the market.

price of electricity in Canada of 8.8 cents/kWh in 2004.<sup>18</sup> This cost would be less if it were shared with gas-fired generators.

The **upstream oil and gas** sector also has relatively little vulnerability to international competition because its profit margins are large and because resources such as oil sands cannot be moved to a different country. The sector therefore has a considerable capacity to absorb increased costs without significant economic disruption. And even though the proposed emission reduction of 46% relative to business-as-usual seems large, it is similar to the 50% reduction that Shell Canada has voluntarily committed to achieve by 2010 for its first oil sands operation.<sup>19</sup> The cost to an oil sands producer would be between about \$US0.58 and \$US1.16 per barrel,<sup>20</sup> a small amount compared to recent variations in crude oil prices.

### **Environmental integrity**

The proposal meets this objective by setting targets in terms of actual emissions and ensuring that all options for compliance with targets represent real, near-term emission reductions. The proposal avoids emissions intensity targets, which fail to provide a clear environmental outcome and act as a subsidy for increased production. It also avoids loopholes such as payments into “technology investment funds” – which would generate only questionable amounts of reductions far into the future – or offset credits granted to non-additional projects (projects that would have happened anyway, even without receiving credits).

### **Urgent action (to cut domestic emissions)**

The proposal meets this objective by including a guaranteed \$30/tonne domestic offset option and by signalling that the domestic emissions price will start to rise above \$30/tonne after 2012. The value of \$30/tonne is not arbitrary: it has been chosen to reflect the understanding that an emissions price upwards of \$30/tonne is needed to stimulate large-scale deployment of low-emission technologies such as carbon capture and sequestration.<sup>21</sup> At the same time, an emissions price limited to this level keeps the cost to industry of meeting targets at a manageable level (see above).

The reduction in the total amount of allowances by 2020 to about 25% below the 1990 emissions level is designed to be consistent with the Pembina Institute’s conclusion that Canada needs to reduce its total net GHG emissions in 2020 to 25% below the 1990 level in order to be on track for the 80% reduction needed by 2050.<sup>22</sup> The relatively modest increase in the market price for

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<sup>18</sup> *Energy Use Data Handbook, 1990 and 1998 to 2004* (Natural Resources Canada, 2006).

<sup>19</sup> *Sustainable Choices, Stakeholder Voices – 2005 Sustainable Development Report* (Shell Canada, 2006).

<sup>20</sup> The proposed 46% emission reductions below business-as-usual levels would represent an offset of 46 kg/barrel from a typical emissions rate of 100 kg/barrel. Achieving this offset by purchasing international project-based Kyoto credits at \$15/tonne (see earlier footnote) or making payments of \$30/tonne to the Greenhouse Gas Reduction Trust would result in a cost range of \$US0.58 to \$US1.16 per barrel (using an exchange rate of \$1=\$US0.85).

<sup>21</sup> According to the Intergovernmental Panel on Climate Change’s Special Report on Carbon Dioxide Capture and Storage (*Summary for Policymakers*, 2005), “CCS systems begin to deploy at a significant level when CO<sub>2</sub> prices begin to reach approximately 25–30 US\$/tCO<sub>2</sub>”. This has been confirmed in discussions between the author and Canadian oil sands industry representatives.

<sup>22</sup> *The Case for Deep Reductions* (David Suzuki Foundation and Pembina Institute, November 2005).

domestic credits to at least \$50 per tonne by 2020 is intended to drive the rapid deployment of an increasingly broad range of low-GHG technologies.

### **Geographic balance**

The proposal meets this objective via the guaranteed \$30/tonne compliance option that will ensure revenues stay in their province of origin, as an alternative to investing in domestic offset projects elsewhere or in international projects. Providing this reasonably priced, regionally focused compliance option should both intensify domestic action to cut emissions and satisfy commonly expressed concerns about avoiding transfers of wealth within Canada or out of Canada. At the same time, those that choose to make use of lower-priced international credits will face no limits on doing so until 2012 (limits would be imposed subsequently).

### **Certainty**

The proposal meets this objective in three ways. It provides the “price certainty” requested by industry by initially limiting the cost of emission reductions to \$30/tonne and signalling that the price of emissions will gradually rise after 2012. It provides “quantity certainty” in the form of a clear outcome for actual emissions levels. And the proposal seeks to maximize broader “regulatory certainty” by including indicative information about targets and prices out to 2020 and by adopting a design (targets expressed in terms of actual emissions and implemented as free allocations of allowances) that will be robust for the long term. This design avoids the complicated transition between intensity and actual emissions that has been proposed by the Harper government, and is necessary to enable the gradual introduction of auctioning of allowances after 2012.