Contribution on climate change to the Canadian National Assessment for the World Summit on Sustainable Development

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1. Summary of key conclusions

- Canada has, to date, failed abjectly in fulfilling its Rio commitment to take a lead in combating climate change.
- Canada has failed to fulfil its Rio commitment to stabilize greenhouse gas (GHG) emissions by a wide margin. Federal and provincial governments admitted they had given up on meeting this commitment by late 1997.
- On current trends, Canada is also set to fail to meet its Kyoto emissions target[1] unless it does so largely through the Kyoto Protocol's international trading mechanisms, a course of action that would not, in our opinion, be compatible with the commitment to take a lead in combating climate change. (The federal government does, however, say that it "intends to meet the majority of our Kyoto targets through domestic action.")
- In view of its high level of per-capita GHG emissions, Canada bears a heightened responsibility for the world's failure to make progress towards the collective Rio commitment to stabilize atmospheric concentrations.
- Governments recognized early and often that Canada needed to implement new policy measures to meet its Rio commitments on climate change. Numerous such measures have been on the table for years, but there been a lack of political will to implement them.
- Canada's performance regarding its Rio commitment to adopt national policies and measures to reduce GHG emissions has been poor because:
  - of the measures that have been implemented, very few have been of the most effective types – regulations and financial incentives;
  - only a small proportion of the measures likely to be needed to successfully control emissions have been implemented.

2. What we know about climate change

The Intergovernmental Panel on Climate Change (IPCC) has recently published updated authoritative findings on the state of knowledge of climate change science and economics. The IPCC's Third Assessment Report[2] (2001) includes these key conclusions:

- The global average temperature increased during the 20th century by about 0.4-0.8 °C. Most of the observed warming over the last 50 years is likely to have been due to emissions of greenhouse gases (GHGs) from human activities.

[1] which we consider to be a Rio commitment given that the Protocol was adopted specifically to help achieve the objectives of the United Nations Framework Convention on Climate Change as opened for signature in Rio.

[2] Findings cited here are found in the *Summaries for Policymakers* available at http://www.ipcc.ch.

- Under "business-as-usual" scenarios in which emissions continue to rise, the global average temperature will rise by 1.4-5.8 °C between 1990 and 2100.
- To stabilize the concentration of GHGs in the atmosphere, global emissions must fall by more than 50% from their 1990 levels, even to achieve very high stabilized concentrations associated with very large environmental impacts.
- Achieving the emission reductions required by the Kyoto Protocol would cause reductions in gross domestic product (GDP) from projected levels in 2010 of about 0.2% to 2% for developed countries. Use of international emissions trading and/or carbon sinks would lower these costs.
- In some cases, reductions in emissions of toxic pollutants that accompany reductions in GHG emissions create benefits that may be comparable to the costs of the GHG reduction measures.
- Increases in global average temperature would increase the disparity in well-being between developed and developing countries. More people are projected to be harmed than benefitted by climate change, even for increases in global average temperature of less than a few °C.

Other recent research has concluded that:

- Canada's average temperature would increase by 5.3-8.8 °C over the 21st century if global emissions follow a mid-range business-as-usual emissions scenario (based on average results from five leading global climate models).[3]
- Attainment of Canada's Kyoto target, including scenarios where the target is achieved entirely through domestic action, would result in a 0-3% reduction in GDP in 2010 compared to business-as-usual (meaning that GDP would grow by "only" 26-30% over the present decade, instead of 30%).[4]

The conclusions regarding average temperature can be put into context by noting that the difference in global average temperature between an ice age and the present day is only about 4-6 °C.[5] This gives a sense of the dramatic, sweeping transformations of the natural environment that will result if anthropogenic climate change is allowed to proceed unfettered.

3. Canada's commitments

The United Nations Framework Convention on Climate Change (UNFCCC) was adopted in May 1992, opened for signature in June 1992 at the Earth Summit in Rio de Janeiro, and ratified by Canada in December 1992. The UNFCCC entered into legal force in March 1994.

Key objectives and requirements of the UNFCCC, all of which represent commitments by Canada, include the following (numbered for reference later in this article).

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[3] Mitchell, T. D., and Hulme, M. (2000), *A country-by-country analysis of past and future warming rates*, *Tyndall Centre Working Paper No. 1*, University of East Anglia, United Kingdom.

[4] National Climate Change Process (2000), *An Assessment Of The Economic And Environmental Implications For Canada Of The Kyoto Protocol*. Available at http://www.nccp.ca.

[5] Hengeveld, H. (1995), *Understanding Atmospheric Change*, Second Edition, Environment Canada, p.18-19.

1. "The ultimate objective of this Convention... is to achieve... stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." (article 2)
2. Industrialized countries accept the "aim of returning individually or jointly to their 1990 levels these anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol" by 2000. (article 4.2(b))
3. "The developed country Parties should take the lead in combating climate change and the adverse effects thereof." (article 3.1)
4. Each industrialized country "shall adopt national policies and take corresponding measures on the mitigation of climate change, by limiting its anthropogenic emissions of greenhouse gases and protecting and enhancing its greenhouse gas sinks and reservoirs." (article 4.2(a))

The first Conference of the Parties to the UNFCCC concluded that industrialized countries' commitments under the Convention were not adequate to fulfill its ultimate objective. As a result, in December 1997, the third Conference of Parties to the UNFCCC adopted the Kyoto Protocol to the UNFCCC. Under the Protocol:

5. Canada committed to reduce its GHG emissions to 6% below their 1990 level during 2008-2012.[6]

While Canada has not yet ratified the Kyoto Protocol, and it has not yet entered into force, the Prime Minister recently indicated his confidence that Canada could ratify the Protocol in 2002.[7] There is a good chance that it will enter into force in the same year. We regard Canada's Kyoto Protocol commitment to be an integral part of its "Rio commitments" given that the Protocol was adopted specifically to help achieve the objectives of the UNFCCC as opened for signature in Rio.

4. Canada's greenhouse gas emissions

Table 1 summarizes Canada's GHG emissions between 1990 and 1998 (the most recent year for which full data has been published).[8] Preliminary data for 1999 indicate that Canada's emissions rose by 15% between 1990 and 1999.[9] Data are not yet available for 2000, but they are expected to continue the rising trend.

[6] Under the Bonn Agreement of July 2001, Canada is allowed to count a generous quantity of carbon sink credits towards meeting its Kyoto emissions target. These carbon sinks are not included in any of the emissions data presented in section 4. They are not, however, large enough to affect any of the conclusions arrived at there.

[7] Prime Minister's Office (July 23, 2001), Statement by the Prime Minister, available at http://pm.gc.ca.

[8] The data sources are Environment Canada (2000), *Trends in Canada's Greenhouse Gas Emissions 1990-1998, Draft*; and Chia Ha, Greenhouse Gas Division, Pollution Data Branch, Environment Canada, personal communication.

[9] Environment Canada (2001), *Canada's Greenhouse Gas Emissions 1990-1999*, media backgrounder, http://www.ec.gc.ca/press/2001/010711_b_e.htm.

Table 1. Canada's GHG Emissions in 1998

	Emissions (megatonnes CO_2E, nearest megatonne)	Proportion of total for Canada	Increase since 1990
Public electricity and heat generation	125	18.0 %	31 %
Fossil fuel production and distribution	112	16.2 %	27 %
Total for energy production and distribution	*237*	*34.2 %*	*29 %*
Other fuel use in industry*	66	9.5 %	2 %
Road vehicles (gasoline)	88	12.7 %	12 %
Road vehicles (diesel)	38	5.4 %	46 %
Other transportation	46	6.6 %	10 %
Total for transportation	*171*	*24.8 %*	*17 %*
Fuel use in buildings	71	10.2 %	–3 %
Industrial processes (non-combustion emissions)	51	7.4 %	–3 %
Agricultural soils (mainly nitrous oxide)	41	6.0 %	–4 %
Livestock	28	4.1 %	13 %
Landfills (biogas)	21	3.1 %	15 %
Other non-energy-related	5	0.7 %	7 %
Total for non-energy-related	*147*	*21.3 %*	*2 %*
TOTAL FOR CANADA	692	100 %	13 %

***** including mining, agriculture, forestry and fisheries

Table 2 summarizes GHG emissions between 1990 and 1998, plus projected changes to 2010, for Canada as well as for each province and territory.[10]

[10] The data sources are Environment Canada (2000), *op. cit.*, for historical emissions; Statistics Canada for population data; and, for projections, National Climate Change Process Analysis and Modelling Group (1999), *Canada's Emissions Outlook, An Update*.

Table 2. Canada's GHG Emissions by Province/Territory

	1998 emissions (mega-tonnes CO_2E)	1998 per capita emissions (tonnes CO_2E)	1998 emissions (% of Canada's total)	Increase in emissions, 1990-1998	Projected increase in emissions, 1990-2010
CANADA	692	22.6	100.0	13 %	27 %
Alberta	200	68.8	29.2	19 %	40 %
Ontario	197	17.3	28.8	8 %	17 %
Québec	89.7	12.2	13.1	1 %	10 %
British Columbia	61.1	15.3	8.9	20 %	*38 %
Saskatchewan	59.5	58.1	8.7	28 %	40 %
Manitoba	22.1	19.4	3.2	6 %	24 %
New Brunswick	20.4	27.1	3.0	27 %	30 %
Nova Scotia	20.1	21.5	2.9	3 %	9 %
Newfoundland	9.80	18.0	1.4	3 %	40 %
Territories	2.22	22.4	0.3	28 %	-
Prince Edward Island	2.01	14.7	0.3	2 %	10 %

***** this is for British Columbia plus the territories

The emission projections in table 2 are based on policies in place in late 1999 and do not take account of events since then. For example, a more recent projection was made for Alberta in August 2001,[11] assuming that all publicly announced oil sands and coal-fired electricity projects go ahead. The new projection shows Alberta's emissions rising by 65% between 1990 and 2010 instead of 40%.

Table 3 shows per-capita GHG emissions for a few industrialized countries and regions.[12]

Table 3. Per-Capita GHG Emissions for Selected Countries/Regions

	1998 per capita emissions (tonnes CO_2E)
Australia	25.5
United States	23.9
Canada	22.6
Russia	†13.0
European Union	10.8
Japan	*10.2

***** for 1997

† for 1996

[11] Personal communication from Paul Hunt, Climate Change Central.

[12] The data source is Hal Turton and Clive Hamilton (2001), *Comprehensive emissions per capita for industrialized countries*, The Australia Institute, available at http://www.tai.org.au.

Tables 1-3 support some key conclusions:

- Canada has failed to fulfil its Rio commitment #2 – stabilization of emissions – by a wide margin. (And having increased its own emissions considerably between 1990 and 2000, there is no evidence that Canada sought, instead, to fulfil this commitment jointly with other industrialized countries.)
- Increases in emissions from energy production and distribution and transportation have been the main causes of Canada's failure to fulfil Rio commitment #2. Within the transportation sector, emissions from trucking have risen especially quickly.
- On current trends, Canada is also set to fail to fulfil its Rio commitment #5 – to meet its Kyoto emissions target – unless it fulfils that commitment largely through the Kyoto Protocol's international trading mechanisms, a course of action that would not, in our opinion, be compatible with commitment #3 – taking a lead in combating climate change. (The federal government does, however, say that it "intends to meet the majority of our Kyoto targets through domestic action."[13])
- Of the five provinces that emit the most GHG emissions, Alberta, British Columbia and Saskatchewan are failing most badly to control their emissions. In each case, fossil-fuel-related primary energy production is the main driver of rising emissions. New oil sands and coal-fired electricity projects in Alberta, which are being encouraged by the provincial government, are particularly notable in this regard.
- Recent emission projections show that government policies currently in place are woefully insufficient to curb emissions growth. We do not believe that full implementation of the *Government of Canada Action Plan 2000 on Climate Change*, adopted since the projections were made, significantly alters this conclusion (see section 5.3).
- Among large countries, Canada has the third highest level of per-capita GHG emissions in the world, more than twice as high as, for example, the European Union. This suggests that Canada bears a heightened responsibility for the world's collective failure to make progress towards Rio commitment #1 – stabilization of atmospheric concentrations – given that global emissions must fall by more than 50% from their 1990 levels to meet that objective.
- It is difficult to avoid the conclusion that Canada has, to date, failed abjectly in fulfilling Rio commitment #3 – taking a lead in combating climate change.

5. Canada's domestic climate change policy, 1992-2001

In this section, we will attempt to understand in more detail why Canada has failed so poorly in meeting its Rio commitments #2 and #3 – stabilization of emissions and taking a lead in combating climate change, and why it has also failed to make adequate progress towards fulfilling commitments #1 and #5 – stabilization of atmospheric concentrations and meeting its Kyoto emissions target. We will do so by examining Canada's performance regarding its Rio commitment #4 – to adopt national policies and measures to reduce GHG emissions.

5.1 Key developments

[13] See, for example, the speech made by Minister of the Environment David Anderson on May 11, 2001, available at http://www.ec.gc.ca/minister/speeches/2001/010511_s_e.htm.

The following list catalogues significant developments in Canada's domestic climate change policy since the Earth Summit in Rio.

Early 1994. *Canada's National Report on Climate Change* is released, "to provide a snapshot of action currently being taken... to meet domestic and international climate change commitments." The Report concludes that "additional measures are needed."

Early 1994. Federal and provincial officials charge a multistakeholder Climate Change Task Group with "the development of a National Action Program to enable Canada to reach its climate change goals." Following deliberations, the Group puts forward 88 potential policy measures.

February 1995. *Canada's National Action Program on Climate Change* is released. The Plan describes many approaches to reducing emissions but announces few specific new measures. Notable among these is the Voluntary Challenge and Registry, a program to encourage private and public sector organizations to limit their net GHG emissions voluntarily.

November 1996. The *Review of Canada's National Action Program on Climate Change* acknowledges that "Canada cannot achieve stabilization [of 2000 emissions at the 1990 level] without significant additional actions."

April 1997. *Canada's Second National Report on Climate Change* claims that government initiatives have reduced Canada's projected emissions in 2000 to only 8% above the 1990 level.

November 12, 1997. Federal, provincial and territorial energy and environment ministers "agreed that it is reasonable to seek to reduce aggregate greenhouse gas emissions in Canada back to 1990 levels by approximately 2010."

December 1997. The Government of Canada announces its position for the international climate negotiations in Kyoto: to reduce greenhouse gas emissions to 3% below the 1990 level by 2010, and a further 5% by 2015. At the conclusion of the negotiations, Canada agrees to the legally-binding target, under the Kyoto Protocol, of reducing its greenhouse gas emissions by 6% from 1990 levels on average during the five-year period 2008-2012.

April 24, 1998. Federal, provincial and territorial ministers of energy and environment approve "a process to develop the National Implementation Strategy on Climate Change," and "the creation of a national climate change secretariat" to oversee this National Climate Change Process. Under this process, 16 multistakeholder Issue Tables are established and mandated to produce "options" for the National Strategy.

November 1999 - March 2000. Final "options reports" are published from the Issue Tables established under the National Climate Change Process. The Tables put forward over 300 potential policy measures.

December 1999. According to *Canada's Emissions Outlook, An Update*, Canada's projected emissions in 2000 are now expected to be 15% above the 1990 level.

February 28, 2000. The 2000 federal budget includes new spending of over $500 million on climate change over the four fiscal years 1999-2003.

Early October, 2000. The federal government and the governments of Québec and British Columbia release plans outlining (but with relatively few details) a large number of new measures they intend to take to address climate change. The *Government of Canada Action Plan 2000 on Climate Change* commits to new spending of "up to" $500 million over five years on measures in all major GHG emitting sectors.

October 16-17, 2000. Federal, provincial and territorial ministers of energy and environment (excluding Ontario) adopt *Canada's National Implementation Strategy on Climate Change* and

Canada's First National Climate Change Business Plan. The *Strategy* describes the general approach that governments will adopt, while the *Plan* describes a large number of measures originating in all jurisdictions except Ontario and Québec. However, it appears to contain no new government measures likely to achieve nationally-significant emission reductions[14] other than those already announced in the federal and British Columbia plans (see previous paragraph).

Before entering into any further analysis, the following conclusions can be drawn.

- Federal and provincial governments have produced an astonishing plethora of National Reports, Action Programs, National Processes, Task Groups, Implementation Strategies, Action or Business Plans. Yet, as we have seen in section 4, the results, in terms of emissions, have been very poor. There has clearly been an excessive ratio of talk to action. There is, in fact, evidence that multistakeholder processes have been used as an excuse to delay action – especially for the two years following the Kyoto conference in December 1997.
- Governments recognized early and often that Canada needed to implement new policy measures to meet its Rio commitments. Numerous such measures have been on the table for years. There has evidently been a lack of political will to implement them (see also section 5.3).
- Governments appear to have been guilty of wishful thinking about the effectiveness of the few measures they have implemented. With only a quarter of the decade left, the official projection of Canada's 1990-2000 emissions increase was still only 8%. Two and half years later, governments acknowledged that the real figure would be nearly twice that.
- By late 1997, after four years of talk and little action, governments were admitting they had given up on meeting Canada's Rio commitment #2 – stabilization of emissions, delaying that objective by a whole additional decade.
- Since the beginning of 2000, the federal government and two provincial governments have significantly stepped up their action to address climate change. It remains, however, highly questionable (see section 5.3) whether the measures announced or implemented will be effective in reducing emissions significantly.

5.2 Effectiveness

One way to try and understand why Canada's governments have been so ineffective in controlling GHG emissions is to examine the nature of the policy measures that they have implemented. In March 2000, the Pembina Institute conducted an evaluation[15] of the extent to which federal and provincial governments had implemented the 88 measures put forward in 1994, at governments' request, by the multistakeholder Climate Change Task Group. These measures cover all the main sources of emissions as well as cross-cutting approaches.

We analysed the 88 measures according to whether they were regulations, financial incentives, voluntary, educational, or research-oriented. We then assessed to what extent each had been implemented over the five years since they were put forward. The results are shown in table 4.

[14] i.e., more than about one megatonne of carbon dioxide equivalent per year (per measure).
[15] Robert Hornung and Matthew Bramley (2000), *Five Years of Failure: Federal and Provincial Government Inaction on Climate Change During a Period of Rising Industrial Emissions* , Pembina Institute, available at http://www.pembina.org/pubs/fiveyears.htm.

Partial marks were given for partial implementation and also arise from measures that are split between two types.

Table 4. Scores by type of measure for implementing the measures recommended by the Climate Change Task Group

Type of measure	Score
Regulation	2.75/13
Financial incentive	3.25/26.5
Voluntary	10.25/18.5
Education	7/19.5
Research	6/10.5
total:	29.25/88

Table 4 shows that regulations or financial incentives, representing 39.5/88 or 45% of the measures, had a very low implementation rate of just 6/39.5 or 15%. The 55% of the measures that were voluntary or limited to education or research, on the other hand, had an implementation rate over three times higher – 23.25/48.5 or 48%.

As we have seen in section 4, the measures implemented apparently had little impact on emissions. It is therefore rather clear that voluntary, educational and research measures are wholly insufficient to meet Canada's climate change challenge. Yet these are precisely the measures that governments favoured, most likely because they are politically easy to implement. Proposed regulatory standards and financial incentives, which we expect would have been far more effective, were mostly not implemented, most likely because their implementation involves upsetting influential interests and is therefore politically challenging.

During this period in which Canada's governments were relying largely on voluntary initiatives to influence GHG emissions, the Voluntary Challenge and Registry (VCR) was the flagship national program to address climate change. The Pembina Institute has verified all the submissions made to the VCR by private sector and/or industrial entities up to June 30, 2000 that reported emissions for 1998.[16] Relevant conclusions, which confirm our assertion of the ineffectiveness of voluntary measures, include the following.

- The VCR has utterly failed to bring about the kinds of emissions reductions that Canada will need to meet its Kyoto commitment. Between 1990 and 1998, a period during which Canada's total emissions rose by 13 percent, companies reporting their emissions to the VCR, which are presumably the Canadian companies most engaged in the climate change issue, have as a group been increasing their emissions substantially. Summary results by sector are shown in table 5.[17]

[16] Matthew Bramley (2000), *Greenhouse Gas Emissions from Industrial Companies in Canada: 1998*, Pembina Institute, available at http://www.pembina.org/pubs/ggas98.htm.

[17] Table 5 shows that companies other than electricity generators that reported their emissions to the VCR increased their emissions by 7% between 1990 and 1998. This statistic includes most of the emissions associated with the generation of purchased electricity, which makes it difficult to compare to national emissions inventory data (table 1). Electricity generators reporting to the VCR, on the other hand, increased their emissions by 21% between 1990 and 1998 (or 24% if electricity generators' offsets had not been subtracted from the emissions shown in table 5). Difficulties of data quality and comparability make it debatable whether companies reporting their emissions to the VCR were any more successful in controlling their emissions than companies not reporting to the VCR. Regardless, it is evident that companies reporting

- Between 1990 and 1998, far more companies experienced large increases in emissions than experienced large decreases. Sixteen companies actually increased their emissions intensity (emissions per unit of production), out of the 58 for which it was possible to do this calculation. These 16 include some of Canada's largest emitters.
- Overall, the level of meaningful participation of Canada's major industrial GHG emitters in the VCR program is inadequate. VCR participants reporting their emissions for 1998 likely represented no more than half of Canada's industrial GHG emissions, and possibly somewhat less than half. Only about one-sixth of participants in the VCR are managing to take the basic step of reporting their emissions. No companies at all from the aluminum, cement, and iron and steel sectors made VCR submissions by June 30, 2000 stating their emissions for 1998. Several major Canadian companies with substantial GHG emissions reported their 1997 emissions to the VCR but then failed to report their 1998 emissions.

Table 5. GHG emissions in 1990, 1997 and 1998 by industrial sector from companies that made a submission to the VCR by June 30, 2000 stating their emissions for all three years.

Sector*	Number of companies	1998 emissions (Mt CO_2E)	1997 emissions (Mt CO_2E)	1990 emissions (Mt CO_2E)	% change 1997-98	% change 1990-98
Electricity generation, total	11	109.1	98.3	90.0	11	21
- excluding Ontario Hydro	*10*	*78.1*	*75.5*	*64.0*	*3*	*22*
Oil and gas production and refining	6	37.7	38.5	34.1	-2	10
Pipelines	4	23.6	23.2	15.4	2	53
Oil and gas production only	9	16.8	16.6	13.9	1	21
Chemicals, total	6	14.7	20.0	21.0	-26	-30
- excluding DuPont Canada	*5*	*9.3*	*9.6*	*9.7*	*-2*	*-4*
Forest products	14	5.3	5.9	6.7	-10	-21
Mining and metals	7	3.2	3.0	2.9	6	10
Natural gas utilities	5	1.9	2.0	1.9	-2	2
Manufacturing	6	0.8	0.9	1.3	-9	-35
TOTAL EXCLUDING ELECTRICITY GENERATION[†]	57	104.1	110.1	97.2	-6	7

* Some of the companies included have operations that span more than one sector; such companies have been assigned to the sector that corresponds (or appears to correspond) to the majority of their emissions.

[†] Most companies include in their corporate emissions total the emissions associated with the generation of the electricity they purchase. This means that the emissions from the electricity generation sector cannot simply be added to the emissions from other sectors.

5.3 Completeness

Another way to try and understand why Canada's governments have been so ineffective in controlling GHG emissions is simply to examine what proportion of policy measures widely recognized to be necessary have been implemented. The Pembina Institute's March 2000

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their emissions to the VCR have as a group been increasing their emissions substantially, in contrast to the emission reductions called for by the Kyoto Protocol.

evaluation[18] of the extent of implementation of the 88 measures put forward in 1994 by the Climate Change Task Group is once again informative. We found that:

- For 37 of the 88 measures, no meaningful action had been taken.
- Only 17 measures had been fully implemented.
- Taking into account partially implemented measures, the total score obtained was 29.25/88 (33%).
- Of the few measures implemented, much of the work had been done at the federal level, with most provinces having done very little.

It must be stressed that provincial governments are central to Canadian action to address climate change, as many of the key sources of GHG emissions fall under their responsibility. In particular, in 1998:[19]

- 25% of Canada's greenhouse gas emissions came from transportation. Provincial governments are responsible (with municipalities) for transportation and land use planning; they are also the primary source of funds for alternatives to the automobile, like public transit.
- 18% of Canada's greenhouse gas emissions came from the production of electricity. Provincial governments are responsible for regulating this industry, and most major electric utilities in Canada are provincial Crown corporations.
- 16% of Canada's greenhouse gas emissions come from fossil fuel exploration, production and transmission – activities regulated primarily by provincial governments.
- 10% of Canada's greenhouse gas emissions come from buildings. Provincial governments are responsible for regulating the building industry through instruments such as building codes.

In September 2001 the Pembina Institute published its second annual assessment[20] of the climate change policy performance of the five provinces that emit the most GHGs, amounting to 89% of Canada's total emissions. In the assessment, we evaluated each provincial government's performance across nine critical areas of potential activity to address climate change, using a total of 38 criteria. Each criterion was used to determine whether or not a provincial government has implemented a specific measure that will likely be an integral component of any successful national effort to address climate change. The measures in question have been under discussion for years in processes like the Climate Change Task Group (1993-94) and the National Climate Change Process (1998-2000). Summary results are shown in table 6.

Table 6. Provincial government performance on climate change policy implementation

	Alberta	British Columbia	Ontario	Québec	Saskat-chewan
Transportation (out of 15)	5.5	7.0	5.5	7.5	3.5
Energy utilities (out of 15)	0.5	3.0	3.5	2.5	1.0
Buildings (out of 15)	2.0	5.5	4.0	5.5	3.5
Industry (out of 15)	5.0	3.0	3.0	2.5	3.5

[18] Robert Hornung and Matthew Bramley (2000), *op. cit*.
[19] Data sources are the same as in section 4.
[20] Matthew Bramley and Leslie-Ann Robertson (2001), *Provincial Government Performance on Climate Change: 2001*, Pembina Institute, available at http://www.pembina.org/pubs/ReportCard2001.htm.

Facilitating emissions trading (out of 10)	2.0	3.0	4.0	3.5	2.0
Government house in order (out of 10)	7.5	8.5	3.5	4.5	6.0
Other sources of GHGs (out of 10)	3.5	3.0	4.5	2.5	3.0
Technology development (out of 5)	3.0	3.0	1.0	2.5	2.0
Enhancing awareness (out of 5)	2.5	3.0	1.5	3.5	1.5
TOTAL (OUT OF 100)	31.5	39.0	30.5	34.5	26.0

Provincial governments are evidently failing badly to put in place comprehensive packages of well-known measures to control GHG emissions.

As mentioned in section 5.1, in October, 2000, the federal government released its *Action Plan 2000 on Climate Change*, outlining new measures in all major GHG emitting sectors. The plan claims to be able to take Canada one-third of the way towards our Kyoto emissions target, when fully implemented (a 65 megatonnes CO_2E reduction in 2010 relative to business-as-usual). Unfortunately, it includes no calculations to back up this claim. As the federal Commissioner of the Environment and Sustainable Development recently concluded in her annual report to Parliament, "It is too early to determine whether [the measures in Action Plan 2000], when fully carried out, will take Canada a third of the way towards its Kyoto target".[21] Informal discussions we have had with a range of experts reveal considerable scepticism as to whether the measures in Action Plan 2000 could achieve emission reductions even close to this amount.

More broadly, the Commissioner confirms that Canada has failed to make "satisfactory progress" towards developing either a "federal portfolio of measures to help meet Canada's climate change commitments", a "national portfolio of measures designed to meet Canada's climate change commitments" or a "formal, results-based implementation plan with performance expectations designed to achieve Canada's climate change commitments".[22]

5.4 Performance regarding Rio commitment on policies and measures

The conclusion from sections 5.2 and 5.3 is clear: Canada's performance regarding its Rio commitment #4 – to adopt national policies and measures to reduce GHG emissions – has been poor because:

- of the measures that have been implemented, very few have been of the most effective types – regulations and financial incentives;
- only a small proportion of the measures likely to be needed to successfully meet Rio commitments #2 and #5 – stabilization of emissions and meeting the Kyoto emissions target – have been implemented.

6. Closing note

In closing, it is pertinent to return to our state of knowledge of climate change science and economics, as summarized in section 2. We saw there that Canada is projected to:

- suffer considerably larger warming that the global average if emissions follow a business-as-usual path;

[21] Commissioner of the Environment and Sustainable Development (2001), 2001 Report, para. 6.80.
[22] Commissioner of the Environment and Sustainable Development, *op. cit.*, Exhibit 6.3.

- suffer, at worst, only a small impact on GDP as a result of meeting its Kyoto emissions target, even if the target were achieved entirely through domestic action.

In other words, Canada is on the front lines of the impacts of climate change, and can easily afford to make a start on addressing the problem by implementing the Kyoto Protocol. These observations make Canada's failure to meet its Rio commitments on climate change all the more deplorable.