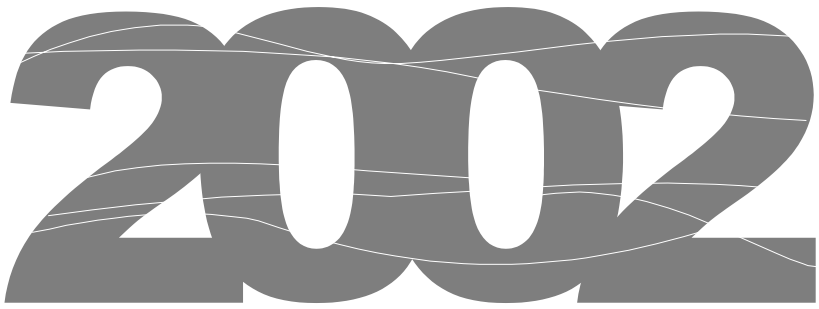
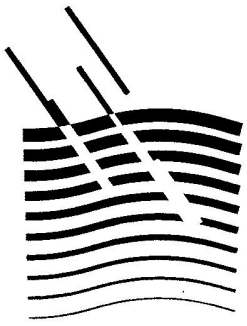


2002 Annual Progress Report

on

The Canada-Wide Acid Rain Strategy for Post-2000



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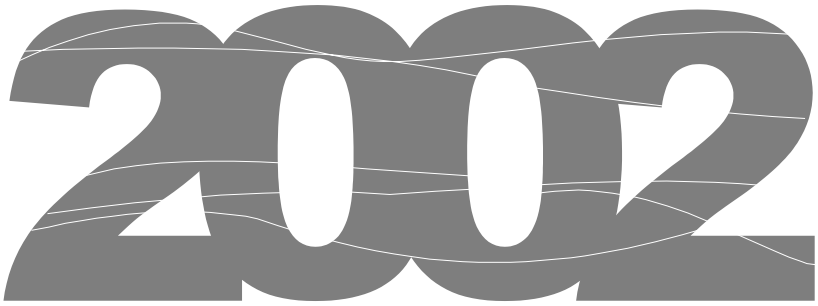
The Canada-Wide Acid Rain Strategy for Post-2000

In October 1998, federal, provincial, and territorial Energy and Environment Ministers signed *The Canada-Wide Acid Rain Strategy for Post 2000*. The primary long-term goal of *The Strategy* is "to meet the environmental threshold of critical loads for acid deposition across Canada". As steps towards the achievement of this goal, *The Strategy* calls for a number of actions, including:

- pursuing further emission reduction commitments from the United States;
- establishing new sulphur dioxide (SO_2) emission reduction targets in eastern Canada;
- preventing pollution, and keeping "clean" areas clean;
- ensuring the adequacy of acid rain science and monitoring programs; and,
- annually reporting on SO_2 and nitrogen oxides (NO_X) emissions and forecasts, on compliance with international commitments, and on progress in implementing *The Strategy*.



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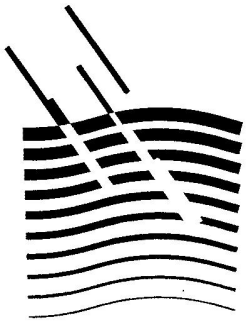

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Introduction

This is the fourth annual report submitted to Energy and Environment Ministers on *The Canada-Wide Acid Rain Strategy for Post-2000. The Strategy* provides a framework for resolving the acid rain problem in eastern Canada and preventing one in western and northern Canada. Annual reporting is a commitment under *The Strategy,* aimed at keeping decision-makers and the public informed on: current and projected sulphur dioxide (SO_2) and nitrogen oxides (NO_X) emission levels in Canada, compliance with international emission reduction commitments, and progress in implementing the commitments in *The Strategy*.

Progress in 2002

1. Pursuing emission reductions in the United States

Canada still has a large acid rain problem in eastern Canada despite almost halving its SO_2 emissions since 1980. Recent atmospheric modelling results[1] suggest that without further significant reductions of SO_2 emissions from the United States, the acid rain problem in Canada will not be resolved. This information builds upon previous emission scenario modelling[2] that formed the basis of the commitment in *The Strategy* that the federal government will aggressively pursue further SO_2 emission reduction commitments in key areas of the United States (US).

The need for further reductions in transboundary acid rain-causing emissions was presented again at the 2002 Canada – US Air Quality Committee (AQC) meeting. As indicated in the 2001 annual progress report on *The Strategy*, Canada will be seeking further reductions from the US through the AQC and its subcommittees. Future discussions of the committees will focus on SO_2 and NO_X emission reductions required to deal with the problem of ambient particulate matter (PM)[3]. Currently, both governments are focussed on implementing the Ozone Annex to the Canada – United States Air Quality Agreement and characterising transboundary contributions of PM and precursors in the border regions.

Part of that characterisation includes determining the impact of the United States *Clear Skies* initiative on ambient PM levels and acidic deposition in Canada. *Clear Skies*, a multi-pollutant proposal for the electricity generating sector, establishes national, federally enforceable emissions limits (caps) for NO_X, SO_2, and mercury

[1] Kaminski, J.W. (2002), Emissions-scenario simulations of new provincial SO_2 reduction targets using the Acid Deposition and Oxidant Model, Canadian Council of Ministers of the Environment Contract No. 222-2002; presented in the 2001 Annual Progress Report on The Canada-Wide Acid Rain Strategy for Post-2000.

[2] AETG (Acidifying Emissions Task Group), "Towards a National Acid Rain Strategy". Report submitted to the National Air Issues Coordinating Committee, Environment Canada, Ottawa, Ontario, 98 pp., October 1997.

[3] The 2002 progress report on the Canada – US Air Quality Agreement highlights current and planned cooperative efforts.

(Hg). Table 1 shows the specific caps and timing for reducing power plant emissions.

Detailed information on the United States proposed legislation for the Clear Skies Initiative, first announced in 2002, is available on the USEPA *Clear Skies* Web site[4]

Table 1 Clear Skies Emission Reduction Caps and Timetable

	Actual Emissions in 2000	First Phase of Reductions	Second Phase of Reductions	Total Reduction at Full Implementation
SO_2	11.2 million tons	4.5 million tons in 2010	3.0 million tons in 2018	73%
NO_X	5.1 million tons	2.1 million tons in 2008	1.7 million tons in 2018	67%
Hg	48 tons	26 tons in 2010	15 tons in 2018	69%

2. Reducing emissions in eastern Canada

A main element of *The Strategy* is to establish new targets and schedules for reducing SO_2 emissions in eastern Canada. To fulfill this commitment, Ontario announced a target of 50% reduction by 2015 (and has proposed to consult on advancing the timeline to 2010); Quebec, a reduction of 40% by 2002, and 50% by 2010; New Brunswick, 30% by 2005 and 50% by 2010; and Nova Scotia, 25% by 2005 and up to 50% by 2010. Jurisdictions are now developing and implementing measures to achieve these reductions.

The Ontario government introduced stringent emissions caps for power stations burning fossil fuel under its Emissions Trading Regulation, effective January 1, 2002, as part of its environmental protection framework for Ontario's electricity sector. When fully implemented in 2007, the caps will reduce limits on smog and acid rain-causing emissions from fossil fuel power plants (NO_X by 53% and SO_2 by 25%). Emissions reduction trading, a market tool that enables air shed emissions to be achieved at least cost[5], is being used to assist the electricity sector in reaching its air quality goals. INCO and Falconbridge (Sudbury Operations) have Clean Air Orders to reduce allowable ground-level concentrations of SO_2 and reduce allowable limits of annual SO_2 emissions by 34%

[4] http://www.epa.gov/air/clearskies/

[5] Emissions reduction trading rewards those emitters having low marginal abatement costs by allowing them to lower their emissions by more than is required, and to then offer those surplus, or extra, reductions for sale. These surplus reductions may be purchased by those emitters having difficulty meeting their obligations under the regulation because of high marginal abatement costs.

after December 2006. In addition, consultations are ongoing with a number of other industrial sectors to set SO_2 and NO_X limits. To reduce NO_X emissions from the transportation sector, Ontario strengthened their NO_X emissions control program by expanding the Drive Clean area to cover all of the southern Ontario smog zone (Windsor to Ottawa), strengthened its Smog Patrol for better enforcement of vehicle emission standards on roads throughout the province, and provided a retail sales tax rebate to encourage the purchase of hybrid-electric automobiles.

In Quebec, despite difficult economic conditions, Noranda Inc. remains committed to reducing 90% of its SO_2 emissions by 2006 from its Horne copper smelter in Rouyn-Noranda. These efforts underlined by Quebec's Minister of the Environment to Noranda's President, are in addition to the 75% reduction already achieved by Noranda at the smelter. As well, the smelter in Murdochville Quebec, also owned by Noranda inc., was closed in April 2002.

The Coleson Cove thermal generating plant refurbishment will see the conversion of New Brunswick's largest source of electrical generation to Orimulsion fuel with the addition of extensive emission control equipment and new burner configuration. Emission rates of SO_2, NO_X, and PM will be reduced by 77%, 70%, and 75%, respectively by 2005. Sulphur dioxide emissions are expected to drop from a 5-year average of 55.5 kt/yr (kilotonnes/year) to a maximum of 21 kt/yr from this facility alone. In addition, major industrial point sources of air emissions are controlled through approvals, normally renewed on a 5-year cycle. New SO_2 emissions caps are being applied to existing facilities as these approvals are renewed. For example, the Irving Oil refinery in Saint John has seen its SO_2 emission cap of 9.5 kt/yr lowered to 8 kt/yr following it's Refinery Upgrade Project which resulted in lower SO_2 emissions.

Nova Scotia is doing some source-apportionment work to delineate the contribution of provincial sources to specific receptor areas to guide emission reduction commitments under their Energy Strategy announced in December 2001.

Numerous government and corporate policies affect the levels of SO_2 and NO_X emissions. Many of the measures developed to reduce SO_2 emissions further could be part of the jurisdictional implementation plans for achieving the Canada-Wide Standards (CWS) for particulate matter.[6]

3. "Keeping Clean Areas Clean" and Pollution Prevention - KCAC – P2

The Strategy includes a commitment to protect vast areas of Canada that do not currently have an acid rain problem ("clean" areas that at present do not exceed critical loads). In 1997[7], acid deposition in the non-SOMA[8], western Canada, the territories, and parts of the eastern provinces generally

[6] As jurisdictions make their implementation plans available, links to jurisdictional websites will be made available through the CCME website: www.ccme.ca/initiatives/standards.html.
[7] The most recent full survey of the status and spatial patterns of fresh water acidification was reported in the 1997 Canadian Acid Rain Assessment.
[8] Sulphur Oxides Management Area designated in the 2nd UN ECE Sulphur Protocol

remained below critical loads for wet sulphate deposition. *The Strategy* also reinforces Canada's commitment, in 1993[9], to pollution prevention (P2) by committing jurisdictions to take steps to minimise the creation of pollutants at new sources, and where appropriate, existing sources.

Ontario uses a permitting and approvals system for new and modified point sources to manage emissions and ensure local air quality is not adversely affected. In 2002, the province proposed an administrative monetary penalties regulation that will assist the Ministry in enforcing environmental legislation without having to go to court over simple infractions. Ontario also introduced an Electricity Pricing, Conservation and Supply Act as a means of encouraging conservation and use of alternative fuels using incentives. In addition, the government is committed to energy conservation in government operations and is encouraging cleaner energy sources for new electricity projects. Public education plays a vital role in Ontario's attack on air pollution and acid rain. Improvements to the Air Quality Index and the on-line emissions reporting registry, OnAIR, plus publicly available access to sulphur levels in gasoline sold in Ontario, will empower the public to take informed and responsible action to reduce acid rain- and smog-causing emissions.

In Quebec, all new industrial projects and significant incineration or fuel combustion projects are subject to an environmental impact assessment study. It must be demonstrated that projects respect both emission standards and ambient air quality criteria, whether these projects are carried out in urban or rural environments. In addition, under the Industrial-Waste Reduction Program, (*Programme de réduction des rejets industriels*), pulp and paper mills, aluminum smelters, cement factories, metallurgy industries, and mines are subject to requirements on emissions characterisation and tracking the environment so appropriate reduction measures ensuring human health protection and the integrity of ecosystems are established, where applicable.

In the Atlantic region, many jurisdictions are taking a multi-pollutant approach, recognising that it is more efficient to deal with a suite of pollutants and several air quality issues simultaneously rather than one at a time or issue-by-issue. In New Brunswick and Nova Scotia, for example, KCAC and P2 actions and programs in support of *The Strategy* are being identified through their implementation planning under the PM and ozone CWS process. The latter program is evolving nationally[10].

In western Canada, Alberta initiated the second five-year assessment that will include a re-evaluation of the status of acid deposition relative to receptor sensitivity and an assessment of the effectiveness of the Alberta Acid Deposition Management Framework. To augment the existing framework, the province is developing a management approach to address the

[9] CCME National Commitment on Pollution Prevention, November 1993

[10] A proposed National Guidance Document on Continuous Improvement – Keeping-Clean-Areas-Clean (CI – KCAC) is intended to provide information and assist jurisdictions across Canada in meeting the KCAC/CI commitments under the CWS for PM and ozone.

local/regional scale acid deposition issue in environmental impact assessment and approval applications. The Clean Air Strategic Alliance's (CASA) Acidifying Emission Management Implementation Project team concluded its third annual evaluation of the management system in Alberta. Also, the NO_X-SO_2 Management Working Group (NSMWG) under the Cumulative Environmental Management Association[11] is developing a management plan (system) for acidifying emissions from the increased industrial activities in the Athabasca Oil Sands Region of northeastern Alberta. A regional acid deposition management plan is expected in 2003. Finally, a new CASA Electricity Project Team was formed to develop an air emissions management approach including standards and performance expectations for the Alberta electricity sector.

4. Reviewing Compliance with International Emission Reduction Commitments

As indicated in Table 2, Canada is meeting or exceeding its international emission reduction obligations for SO_2 and NO_x emissions.

As indicated in last year's progress report, a review of Canada's historical emissions data is underway. The review takes into account the latest emissions estimation methodologies and the addition of emission sources that were not adequately captured in the historical emission summary. Although the base year is being reviewed, Canada is meeting its obligations for reducing emissions under the NO_X protocol, with emissions being at or below the 1987 levels since 1994.

[11] NSMWG is a non-profit multi-stakeholder organization (including government, industry, environmental organization and First Nation representatives) endorsed by Alberta Environment and Alberta Energy and Utilities Board.

Table 2 International Commitments and Compliance for SO_2 and NO_x in 2001

Commitment	Compliance in 2001
1991 Canada–U.S. Air Quality Agreement ● national cap on SO_2 emissions of 3.2 million tonnes by 2000 onward ● reduce national NO_x emissions from stationary sources by 100 kilotonnes below the forecast level of 970 kilotonnes[a] by 2000	● national SO_2 emissions were approximately 2.5 million tones (22% below the cap). ● national NO_x emissions from stationary sources have been reduced by over 100 kilotonnes from forecast levels
1985 UN ECE Sulphur Protocol ● permanent national cap of 3.2 million tonnes of SO_2 by 1993	● national SO_2 emissions were approximately 2.5 million tonnes (22% below the cap).
1994 UN ECE Sulphur Protocol ● regional cap of 1.75 million tonnes of SO_2 by 2000 in the Sulphur Oxide Management Area (SOMA), plus the permanent national cap	● SO_2 emissions in the SOMA were 1.2 million tonnes, or 32% below the SOMA cap.
1988 UN ECE NO_x Protocol ● stabilise NO_X emissions at 1987 levels by 1994[b]	● since 1994, national NO_x emissions were at or below the 1987 levels.

[a] The NO_X/VOC Emission Forecast 90-B from the 1990 NO_X/VOC Management Plan forecast national NO_X emissions to be 970,000 tonnes in 2005.
[b] The Canadian base year (1987) NO_X emissions are under review.

5. Continuing Acid Rain Science

The 1999 annual progress report[12] highlighted the fulfilment of another commitment under *The Strategy* – to assess the adequacy of acid rain science and monitoring. It concluded that the current programs are not adequate to fulfil the requirements of *The Strategy*. Based upon this conclusion and an internal review of costs and funding options for a revitalised program, in March 2000 Environment Canada reinvested resources into its acid rain science and monitoring program. The resources assist Environment Canada, in collaboration with the provinces, to meet its federal commitments under *The Strategy*, and acid rain commitments under the Canada-United States Air Quality Agreement and the UN – ECE Convention on Long Range Transboundary Air Pollution.

The increased funds contribute to meeting critical monitoring and science needs. In particular, the funds: help enhance the Canadian Acid Precipitation Monitoring (CAPMoN) network; monitor surface water quality in Ontario, Quebec, and the Atlantic region; improve estimates of deposition of nitrogen species; research ecosystem recovery processes; and refine estimates of critical loads, with special efforts to determine critical loads for nitrogen deposition.

[12] The 1999 Review of Acid Rain Science Programs in Canada prepared by a scientific team established by the Acid Rain Work Group.

In Ontario, development of modelling assessment capability of atmospheric sulphate deposition using a version of the ADOM model with a simplified chemistry mechanism is underway. In addition, critical loads of acidity have been estimated for approximately 1500 lakes in five regions in south-central Ontario using lake survey information and sulphur deposition estimates, and working with scientists from Trent University and the Norwegian Institute for Water Research. Long-term lake monitoring data generated at Dorset and in the greater Sudbury area has also enabled an assessment of the recovery of aquatic systems resulting from emission reductions, both locally and in eastern North America.

In 2002, Quebec continued to operate its network for weekly measurement of precipitation quality at 34 measuring stations. Data for 1998 and 2001 have been compiled and are now available to partners.

Quebec's efforts on surface water quality have centred on the work of the Conference of New England Governors and the Eastern Canadian Premiers (NEG/ECP). The Water Quality Monitoring Work Group, co-headed by Quebec and New Hampshire, has published the initial results of the analysis of changes in water quality over time at 180 lake sites on NEG/ECP territory, based on data obtained through the collaborative WARNING (Water Acidity Regional Network to Inform Northeastern Governments) network. The report and associated thematic maps are available on the Council of Atlantic Premiers Web site in the NEG/ECP section at http://www.cap-cpma.ca. Water quality (pH, sulphates, and alkalinity) is improving at many sites in Quebec and the Atlantic provinces, but recovery is less pronounced in New England.

In 2002, the Water Quality Monitoring Work Group also released the results of the mapping of critical loads of sulphur and nitrogen in lakes in the NEG/ECP provinces and states using Henriksen's steady state mass balance model. The technical summary, also available at the previously mentioned Web site, indicates that a large area of the 11 member provinces and states is very sensitive to acidification and the critical loads in the aquatic environment are often very low. Exceedances of critical loads occur in a significant portion of the NEG/ECP territory, mostly in Quebec, New Brunswick, and Nova Scotia.

The forest mapping work group of the NEG/ECP Acid Rain Steering Committee has continued to develop a method for evaluating critical loads of nitrogen and sulphur in forests. The first phase testing the method for calculating critical loads in Vermont and Newfoundland has been completed. The next phase, which will extend until late 2004, will produce maps for the entire NEG/ECP area.

The other working groups of the Acid Rain Steering Committee (fine particulate, data exchange, and communications) have continued to collaborate on data sharing and the production of integrated thematic maps for the entire area (quality of wet depositions, ozone mapping, etc.). A symposium on air quality and human health, organized under the auspices of the NEG/ECP, the Quebec Department of the Environment, and the Quebec Department of Health and Social Services, took place in Montreal in May 2002. At this symposium,

it was demonstrated that a number of pollutants (acid aerosols, ozone, and fine particulate) are responsible for health problems in humans.

New Brunswick maintains a regionally representative precipitation monitoring network that collects weekly samples for analyses from 13 sites throughout the province predominately located in rural areas. Daily wet deposition samples are also collected at a CAPMoN site located in Harcourt. The province also periodically monitors approximately 100 lakes in two separate acid sensitive regions (southwest and north central New Brunswick) in order to relate changes in water quality to emission controls and reductions in acid deposition. An analysis of the data for the southwest lakes was published in the journal of Environmental Monitoring and Assessment in the fall of 2003. New Brunswick also contributes to the NEG/ECP Water Quality Monitoring Work Group and also works in conjunction with Environment Canada on their lake acidification monitoring program in Atlantic Canada.

Nova Scotia maintains a CAPMoN site where daily wet deposition samples are collected. The province also collects weekly precipitation samples and monthly lake water samples as part of a multi-partner study at Pockwock Lake near Halifax. The study is investigating nutrient cycling in a forest ecosystem, including nutrient input from precipitation.

Nova Scotia's efforts are also focussed through the NEG/ECP Water Quality Monitoring Work Group and are undertaken in concert with Environment Canada's lake monitoring program, which has tracked acidification trends in Atlantic Canada surface waters since the 1980s. About 30 lakes are monitored in Nova Scotia through the combined efforts of partners in the Water Quality Monitoring Work Group, with Environment Canada's program representing the bulk of the work in the region. A lake water quality monitoring station has recently been established by the Nova Scotia Department of Environment & Labour at Pockwock Lake to contribute to the overall monitoring effort.

Alberta continues to operate the provincial precipitation chemistry network and conducts measurements of dry deposition at various locations in Alberta. As a step in developing a regional management framework for acid-forming emissions in the Athabasca Oil Sands Region, critical loads of acidity for 171 lakes and 96 ponds in the area were calculated using the Henriksen steady-state mass balance model and water sample data. The critical loads from this study were combined with 204 critical loads from previous studies (471 lakes) and compared with predicted potential acid inputs (sulphur + nitrogen deposition - base cation deposition) from five emission and deposition scenarios. Soil acidification critical load maps were developed for the oil sands area of Alberta. Major work components included compilation of model input data from existing sources, application of the Alberta Research Council soil acidification model, sampling of soils (surface organic layers and peats), buffer capacity determination and modeling of organic soil materials, derivation of critical loads from the model results, and development of a database of soil types and their critical loads. Similar soil work has also been done for the Sand Hills area in

southeast Alberta near the Saskatchewan border.

Information emerging from many of these studies and initiatives will be published in the next science assessment report being coordinated by the Meteorological Services of Canada. Work began in 2002 with the identification of lead authors, chapter headings, and outlines, and will be completed in 2004. .

The Assessment will address the following areas:

- review the current status of surface water acidification,
- document the chemical and biological changes that have been observed,
- describe the acidification effects on forests and watershed soils,
- report new information on the role of nitrogen in lake acidification,
- graphically show where and to what extent critical loads for sulphur and nitrogen are being exceeded,
- describe historical trends, current levels and future projections for acid gases,
- map the current emission sources that affect Canadian ecosystems,
- report on any changes to wet and dry acid deposition as a result of current emission control programs in Canada and the US
- predict aquatic effects recovery for various acidifying emission reduction scenarios,
- review of the direct human health effects of sulphates and acid aerosols,
- discuss economics in terms of costs and benefits of acid rain reductions, and
- describe the linkages between acid deposition and other air quality issues and the potential effect of mitigation of acid deposition on these issues.

Current and Projected SO_2 and NO_X Emissions

A review of Canadian emission summaries took place in 2002. As a result of this review, revisions were made to current, historical, and future emissions based on the latest emission estimation methodologies and an improved understanding of emission sources. Table 3 shows updated SO_2 emissions for 1990, 1995 and 2000, by province, and for major sectors, preliminary emissions data for 2001, and forecasts for the years 2005 and 2010.

Table 4 shows emissions and forecasts for NO_x for the years 1995, 2000, 2005, and 2010, however the emissions information shown corresponds to the data published in the 2001 progress report. This is necessary because a revision of the historical, current and projected emission estimates is in progress. The review is taking into account the latest estimation methodologies and the addition of emission sources that were not adequately captured in historical emissions. Revised emission summaries will be available in the coming months.

Table 3 Total SO_2 Emissions by Province and Sector (kilotonnes)

	1994-99 cap	2005 cap	2010/15 cap[c]	1990	1995	2000*	Forecast 2001	Forecast 2005	Forecast 2010
British Columbia									
Upstream oil and gas						86	110	113	116
Non-ferrous mining and smelting						3	13	15	17
Pulp & Paper						16	10	10	10
Transportation						30	25	25	26
Other						14	20	21	22
Total	**N/A**	**N/A**	**N/A**	**152**	**176**	**149**	**178**	**184**	**191**
Alberta									
Upstream oil and gas						223	256	238	230
Oil sands						94	98	117	162
Electric power generation						125	125	129	131
Other						34	35	34	36
Total	**N/A**	**N/A**	**N/A**	**567**	**610**	**476**	**514**	**518**	**559**
Saskatchewan									
Electric power generation						95	119	119	120
Upstream oil and gas						11	10	11	11
Other						15	13	13	13
Total	**N/A**	**N/A**	**N/A**	**88**	**131**	**121**	**142**	**143**	**144**
Manitoba									
Non-ferrous mining and smelting						353	402	432	432
Other						11	11	10	9
Total	**550[a]**	**N/A**	**N/A**	**516**	**365**	**364**	**413**	**442**	**441**
Ontario**									
Non-ferrous mining and smelting						254	264	279	245
Petroleum Refining						60	59	64	67
Other industrial sources						70	70	61	62
Electric power generation						166	150	158	131
Other						40	45	34	32
Total	**885**	**N/A**	**442.5**	**1166**	**604**	**590**	**588**	**596**	**537**
Quebec									
Non-ferrous mining and smelting						143	115	95	75
Aluminum industry						40	45	48	48
Petroleum Refining						15	14	15	15
Pulp and paper						22	25	23	23
Other						76	80	83	60
Total	**500**	**300**	**250**	**383**	**362**	**296**	**279**	**264**	**221**
New Brunswick									
Non-ferrous mining and smelting						12	12	14	14
Pulp and paper						13	13	12	11
Electric power generation						97	110	58	47
Other						18	15	15	15
Total	**175**	**122.5**	**87.5**	**181**	**114**	**140**	**150**	**99**	**87**
Nova Scotia									
Electric power generation						140	134		
Other Industrial						17	20		
Other						10	10		
Total	**189**	**142**	**94.5 [e]**	**178**	**166**	**167**	**164**	**142 [d]**	**94.5 [d]**

Table 3 Total SO_2 Emissions by Province and Sector (kilotonnes) Continued

	1994-99 cap	2005 cap	2010/15 cap[c]	1990	1995	2000*	Forecast 2001	2005	2010
Prince Edward Island									
Electric power generation						1	2	2	2
Other						3	2	2	2
Total	**5**	**N/A**	**N/A**	**4**	**2**	**4**	**4**	**4**	**4**
Newfoundland									
Petroleum refining						25	22	17	17
Iron ore mining						8	6	7	8
Electric power generation						11	12	14	14
Other						11	8	10	10
Total	**45[a]**	**N/A**	**N/A**	**66**	**65**	**55**	**48**	**48**	**49**
Yukon									
Total	**N/A**	**N/A**	**N/A**	**N/A**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Northwest Territories									
Mining and rock quarrying							<0.5	<0.5	<0.5
Upstream oil and gas							1	5	5
Other							1	1	1
Total	**N/A**	**N/A**	**N/A**	**17**	**16**	**<0.5**	**3**	**6**	**7**
Nunavut[b]									
Total	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**<0.5**	**N/A**	**N/A**	**N/A**
SOMA									
Total	**1750**	**1750**	**1750**	**1872**	**1227**	**1149**	**1128**	**1106**	**818**
Canada									
Total	**3200**	**3200**	**3200**	**3260**	**2611**	**2362**	**2483**	**2445**	**2333**

[a] Cap applied to 1994 only
[b] Numbers for Nunavut are included in the NWT totals for all years except 2000
[c] Caps for Quebec, New Brunswick and Nova Scotia are for 2010; cap for Ontario is for 2015[a]
[d] Represents the provincial emission cap; breakdown by sector not available
[e] Nova Scotia's forecast 94.5 kt by 2010 is a reduction target for existing sources and is not meant to be a cap

Note: Numbers may not add due to rounding.
N/A: Not applicable
Source: Data provided by the Emissions and Projections Working Group of the Canadian Council of Ministers of the Environment (CCME) using the latest technical and statistical information available as of September 2003.

* Data for British Columbia, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia, and Newfoundland are actual data provided by each province for 2000. For all other provinces, emissions data in 2000 are based on the latest forecast available.

**Ontario has committed to reducing its SO_2 emissions by 50% from its Eastern Canada Acid Rain Program commitment of 885 kt by 2015. These further reductions are not included in the above projections.

Table 4 Total Anthropogenic NO_x Emissions by Province and Sector (kilotonnes)

				Forecast	
	cap for 1994 and beyond	1995	2000	2005	2010
British Columbia					
Stationary sources			75	73	70
Transportation			214	189	183
Total	**N/A**	**294**	**289**	**262**	**253**
Alberta					
Stationary sources			515	588	694
Transportation			227	167	132
Total	**N/A**	**686**	**742**	**755**	**826**
Saskatchewan					
Stationary sources			91	93	96
Transportation			85	60	53
Total	**N/A**	**173**	**176**	**153**	**149**
Manitoba					
Stationary sources			15	19	17
Transportation			58	40	35
Total	**N/A**	**79**	**73**	**59**	**52**
Ontario *					
Stationary sources			200	166	152
Transportation			355	294	256
Total	**N/A**	**515**	**555**	**460**	**408**
Quebec					
Stationary sources			53	57	60
Transportation			297	219	200
Total	**N/A**	**363**	**350**	**276**	**260**
New Brunswick					
Stationary sources			34	31	28
Transportation			48	39	31
Total	**N/A**	**68**	**82**	**70**	**59**
Nova Scotia					
Stationary sources			42	45	46
Transportation			39	28	25
Total	**N/A**	**76**	**80**	**73**	**71**
Prince Edward Island					
Stationary sources			2	2	2
Transportation			8	6	5
Total	**N/A**	**8**	**10**	**7**	**7**
Newfoundland					
Stationary sources	**N/A**		16	19	22
Transportation			37	33	29
Total		**44**	**53**	**52**	**51**
Yukon					
Stationary sources			2	2	2
Transportation			4	2	2
Total	**N/A**	**5**	**5**	**4**	**4**
Northwest Territories					
Stationary sources			9	16	18
Transportation			3	2	2
Total	**N/A**	**9**	**12**	**18**	**19**
Nunavut[a]					
Stationary sources					
Transportation					
Total	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Canada					
Total	**1987 level**[b]	**2322**	**2427**	**2189**	**2159**

[a] Numbers for Nunavut are included in the NWT totals, but will be reported separately in the future.
[b] 1987 levels are under review

Notes: Stationary sources include both point and area sources
Numbers may not add due to rounding
N/A: Not applicable
Source: The emissions and projections were compiled using the latest technical and statistical information available as of July 2002. Data provided by the Emissions and Projections Working Group of the Canadian Council of Ministers of the Environment (CCME).
More up-to-date data will be available on the Environment Canada website at http://www.ec.gc.ca/pdb/ape/cape_home_e.cfm.

* Through the Anti-Smog Action Plan, Ontario has committed to reducing its NO_X emissions by 45% from its 1990 base level of 659 kt by 2015. Again, these further reductions are not included in the above projections.