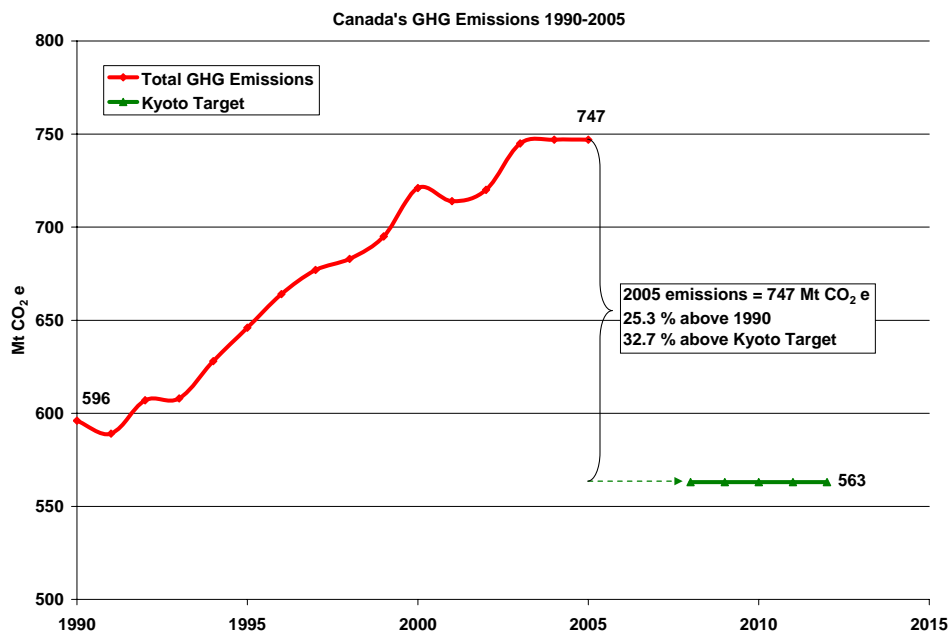


Canada's 2005 Greenhouse Gas Inventory A Summary of Trends

2005 GHG Emission Trends

- Total GHG emissions in Canada in 2005 & 2004 were about 747 Mt CO₂e which represents a slight increase from 2003 levels. Overall, the long term trend indicates emissions in 2005 were 25.3 % above the revised 1990 total of 596Mt and represent a level 32.7% above the Kyoto target.
- The flattening of the growth curve between 2003 and 2005 is due primarily to a significant reduction in emissions from electricity production (reduced coal and increased hydro and nuclear generation), coupled with reduced demand for heating fuels due to warmer winters and a reduced rate of increase in fossil fuel production.
- Long term growth, nevertheless remains large. Between 1990 and 2005 significant increases in oil and gas production, much of which have been provided to the United States, have resulted in a significant increase in the emissions associated with the production and transportation of fuel for export. In 2005, total emissions associated with these exports were 73 Mt, a 162 percent increase over the 1990 level of 28 Mt.



National Inventory

As an Annex I Party (Developed Countries) to the United Nations Framework Convention on Climate Change (UNFCCC), Canada is required on an annual basis to prepare and submit a national inventory of anthropogenic sources and sinks of greenhouse gases in the form of a National Inventory Report (NIR) and a set of Common Reporting Format (CRF) tables. The National Inventory must meet international reporting guidelines and quality standards and is reviewed annually by a UN Expert Review Team.

In addition, Annex I Parties are required to continuously improve the quality of their national greenhouse gas (GHG) inventory. As new information and data become available and more accurate methods developed, previous estimates are updated to provide a consistent and comparable trend in emissions and removals.

This year's inventory covers the 1990 to 2005 period and incorporates updates to last year's submission.

Short Term Comparisons: 2003-2005

Since 2003, growth in GHG emissions has been quite minor (about 2 Mt, or only 0.3%). Though there were some large increases in certain areas (notably Transportation and, to a smaller extent, Agriculture) these were offset by a significant decline in Electricity and Heat Generation. In addition, there was an uncharacteristically small emission increase from the fossil fuel industries.

- Between 2003 and 2005, despite increasing electricity demand, greenhouse gas emissions from generation decreased by over 6 Mt. due to a reduction in emissions from coal-fired generation and an increase in nuclear and hydro electricity production.
- The fossil fuel industries¹, consisting of oil, gas and coal production, refining and transmission showed a rather small (0.5% or 3/4 Mt) growth between 2003 and 2005. During the period, average oil and gas production increased by only 1.2% annually. This appears to reflect the impact of hurricane Katrina on North American markets, as well as decreased synthetic oil production following a nine month shutdown at a major oilsands facility (due to a fire).
- On average, Canadian homes and businesses required lower energy quantities for space heating in the winters of 2005 and 2004 compared to the winter of 2003 due to milder temperatures. In 2005, Heating Degree Days (HDD), an indicator of the necessity for space heating due to the severity of cold weather, were down 5 percent compared to 2003 and 2.2 percent compared to 2004, both on a National basis. This fact almost certainly had an impact on fossil fuel consumption, specifically in the residential and commercial/institutional sectors where emissions declined by a total of 4.4 Mt in the two year period.

Trends in Emissions and Emissions Intensities (1990, 1995, 2000 – 2005)

	1990	1995	2000	2001	2002	2003	2004	2005
Total GHG (Mt)	596	646	721	714	720	745	747	747
<i>Change Since 1990 (%)</i>	<i>N/A</i>	8.3	21.0	19.8	20.9	25.0	25.4	25.3
<i>Annual Change (%)</i>	<i>N/A</i>	2.8	3.7	-0.9	0.9	3.4	0.3	-0.1
GDP (Billions 1997\$)	708	773	946	961	989	1013	1046	1079
<i>Change Since 1990 (%)</i>	<i>N/A</i>	9.2	33.7	35.7	39.8	43.1	47.8	52.5
<i>Annual Change (%)</i>	<i>N/A</i>	2.6	5.5	1.5	3.0	2.4	3.3	3.2
GHG Intensity (Mt/\$B GDP)	0.84	0.84	0.76	0.74	0.73	0.74	0.71	0.69
<i>Change Since 1990 (%)</i>	<i>N/A</i>	-0.8	-9.5	-11.7	-13.5	-12.7	-15.1	-17.8
<i>Annual Change (%)</i>	<i>N/A</i>	0.2	-1.7	-2.4	-2.1	1.0	-2.8	-3.1

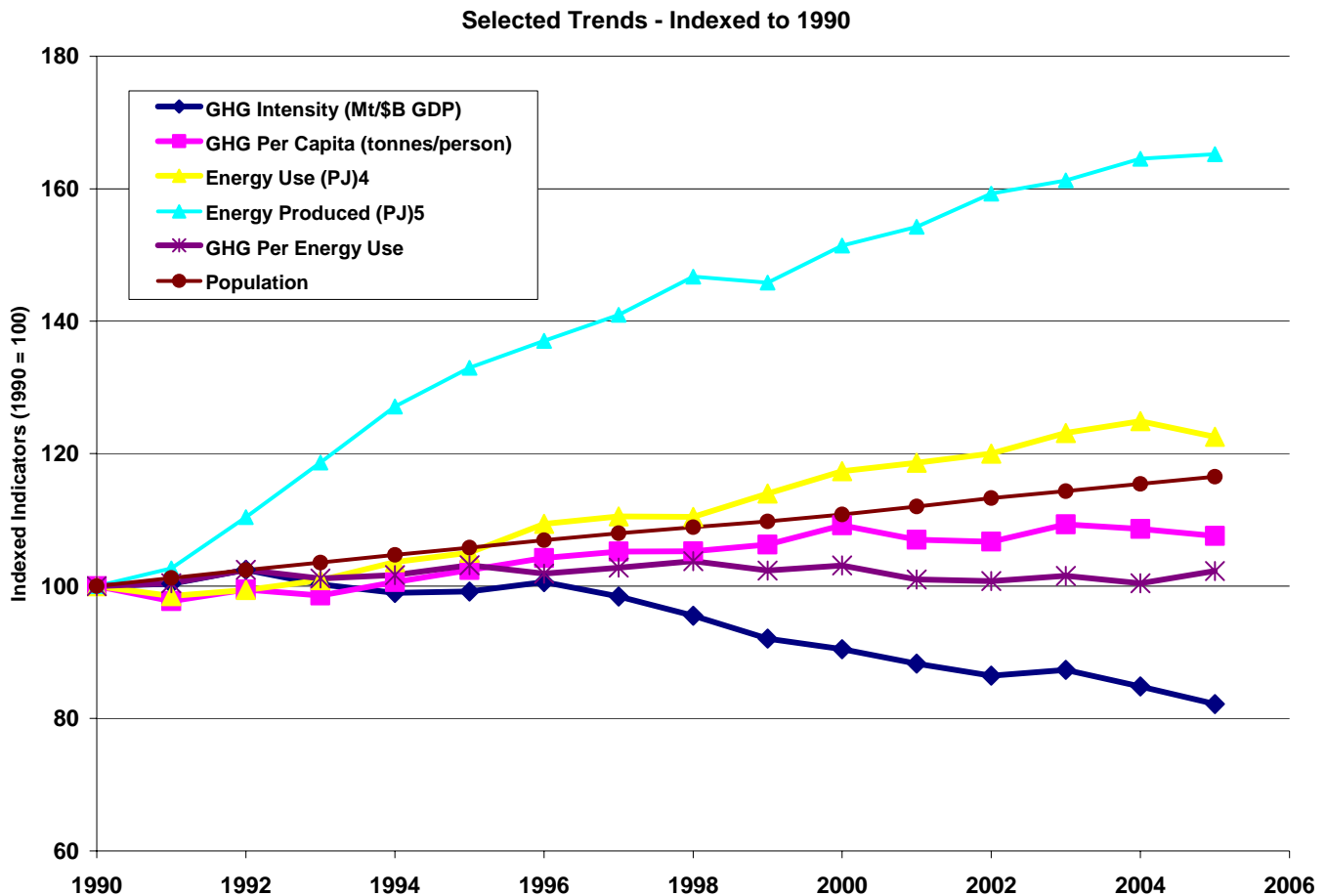
GDP: Industrial Sector Real Gross Domestic Product by NAIC Code - Millions 1997 dollars - Informetrica, 2006

¹ Sum of Petroleum Refining, Fossil Fuel Production, Pipelines (Transportation) and Fugitives.

Long Term Comparisons by Sector: 1990-2005

Sector Trends

- Between 1990 and 2005, the net increase in Canada's annual GHG emissions totaled about 151 Mt. Over the same period, emissions from the Energy Industries and Transportation sector increased by about 137 Mt, accounting for most of the overall increase.



- Within these two energy sub-sectors, the greatest contributors to the overall increase were the 34.9 percent increase in emissions from the Electricity and Steam Generation sub-sector (33.3 Mt), and a 29.2 percent increase from Vehicles (37.0 Mt). Petroleum Industries also contributed significantly, with a total increase in GHG emissions of 56.4 percent between 1990 and 2005. Much of the increase in the Petroleum Industries sector is attributable to the rapid growth in crude oil and natural gas exports to the United States over the period.
- The Industrial Processes, Agriculture and Waste sectors contributed to changes in emissions levels of a 0.2 Mt decrease and 10.8 and 4.8 Mt increase, respectively since 1990.

Energy Industries

- Emissions from Energy Industries (including Fossil Fuel Industries, Electricity and Steam Generation, Mining, Fugitive releases and Combustion emissions from pipelines) rose by about 90.8 Mt between 1990 and 2005. Almost 37 percent of that increase (33.3 Mt) was in Electricity and Steam Generation, a

result of greater electricity demand coupled with continuing increases in the use of coal-fired generation over the period.

- Fugitive releases (e.g. methane leaks from pipelines) contributed just as significantly to GHG emissions. The current estimates show an increase of 23.0 Mt between 1990 and 2005, a growth of about 54 percent. Much of this increase is the result of higher crude oil and natural gas exports.

Transportation Sector

- Emissions in the Transportation sector rose by about 48.8 Mt, or 32.8 percent from 1990 to 2005. Of particular note in this sector is a 23.2 Mt or over 109% increase in the emissions from light duty gasoline trucks, reflecting the growing popularity of sport utility vehicles.
- Emissions from heavy-duty diesel vehicles increased 17.8 Mt over the period, indicative of greater heavy truck transport. Offsetting these increases were reductions in emissions attributed to gasoline and alternatively fueled cars of 6.0 Mt and 1.5 Mt respectively.

Industrial Processes Sector

- Emissions in Industrial Processes sector witnessed an overall decrease of 0.2 Mt, or 0.4% from 1990 to 2005. Although some sub-sectors within this group did show significant increases (e.g., emissions from use of HFCs in refrigeration and air conditioning, as substitutes to Ozone Depleting Substances, grew by 4.4 Mt since 1995 (almost 10 times)), there were some significant reductions offsetting these.
- Emissions of N₂O from Canada's sole adipic acid manufacturing plant decreased by 8.1 Mt due to the installation of N₂O abatement technology. Also, process emissions from the aluminium industry decreased by 1.4 Mt, or 15.1% from 1990 to 2005, due to improved PFC emission control technologies.

Agriculture Sector

- In the Agriculture Sector, the expansion of the beef cattle, swine, and poultry industries, along with increases in the application of synthetic nitrogen fertilizer in the Prairies resulted in a long term emission growth of 10.8 Mt (23.6 percent increase for the agriculture sector, contributing the equivalent of a 7.2 percent to the overall national increase)

Waste Sector

- From 1990 to 2005, GHG emissions from Waste increased by about 4.8 Mt, or 20.7%, surpassing the population growth of 16.5%. This appears largely due to the generation of increasing amounts of land filled waste. This increase would have been larger, had the land fill gas recovery projects and waste diversion programs (composting and recycling) not been implemented in Canada.

Land Use, Land-Use Change and Forestry Sector (not included in national totals)

- The trend in emissions from sources and removals by sinks within the Land Use, Land-Use Change and Forestry sector is driven by the impact of wildfires in the managed forest (significant areas were burned by fires in 1995, 1998, 2002, 2003 and 2004). As a consequence, the inter-annual variability induced by the occurrence of natural disturbances is very high, with net managed forest totals fluctuating between a large sink of -151 Mt CO₂e (1992) and a large source 155 Mt CO₂e (1995). As in previous submissions the overall trend over time remains uncertain due to the very high inter-annual variability in GHG estimates over the reporting period. In 2005, the net flux from this sector amounted to a net sink of 17 Mt.
- The Cropland subcategory includes the effect of agricultural practices on CO₂ emissions and removals



INFORMATION ON GREENHOUSE GAS SOURCES AND SINKS

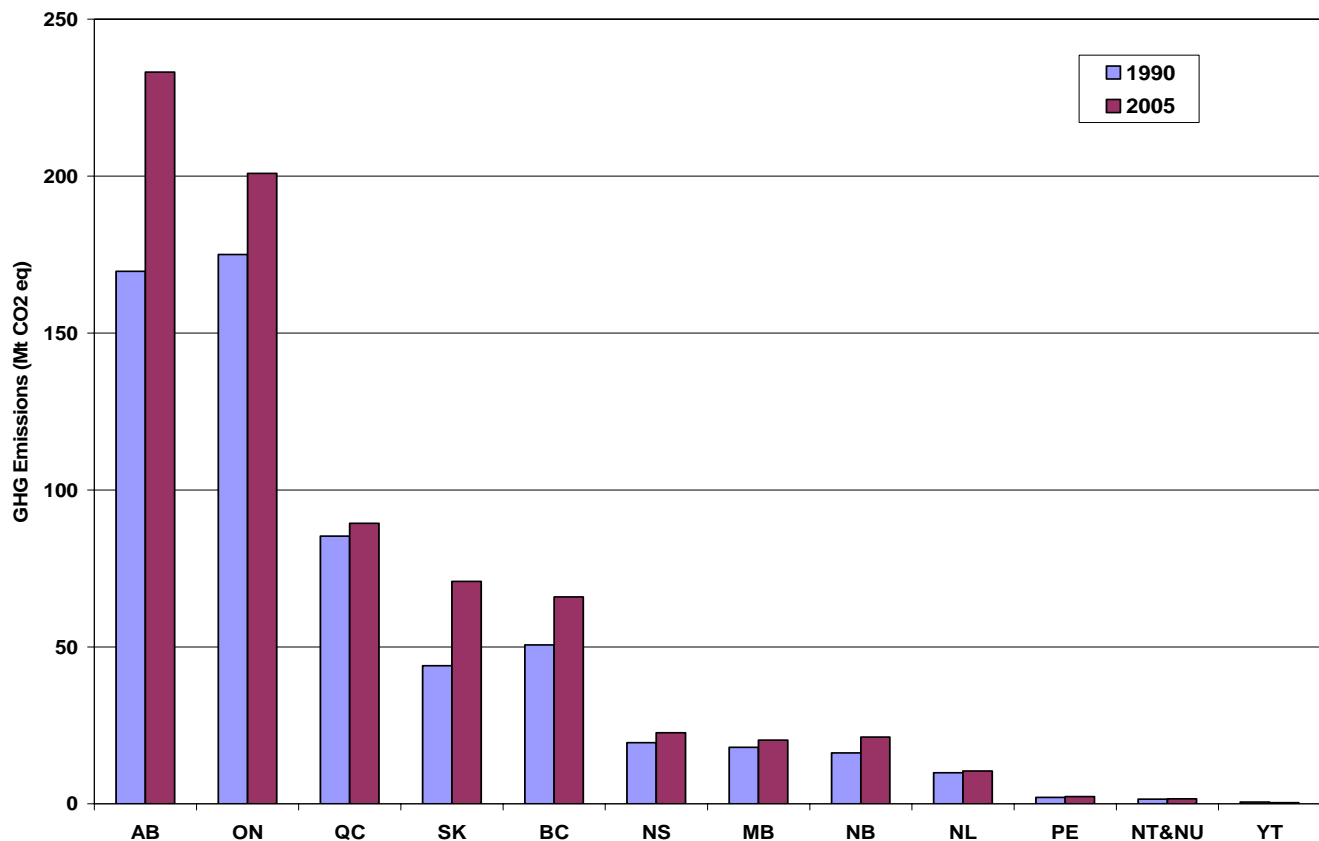
from arable soils and the impact of forest and grassland conversion to cropland. In 2005, C sequestration in arable soils almost exactly offset emissions from lands converted to cropland, for a net flux of 0.05 Mt. The continued adoption of no-till and reduced tillage practices and the reduction of summer-fallow explain the steady trend of increasing removals in cultivated soils.

- Forest losses to cropland, wetlands, and settlements amount to emissions of about 21 Mt in 2005, down from 29 Mt in 1990. Forest and grassland conversion to cropland shows a steady decrease from 17 Mt in 1990 to 10 Mt in 2005.

Provincial/Territorial Greenhouse Gas Emissions

It is important to note that Canada's GHG emissions vary from region to region. This is linked to the distribution of natural resources and heavy industry within the country. While the use of natural resources and industrial products benefits all regions of North America, emissions from their production tend to be concentrated in particular geographic regions. Thus, particular jurisdictions in Canada tend to produce more GHG emissions because of their economic and industrial structure and their relative dependence on fossil fuels for producing energy.

Provincial GHG Emissions - 1990 and 2005





INFORMATION ON GREENHOUSE GAS SOURCES AND SINKS

Sectoral Greenhouse Gas Emission Summary

Source Categories

	1990	2003	2005	2003-2005	1990-2005
	kt CO ₂ eq			Change ²	Change ²
TOTAL¹	596,000	745,000	747,000	0.3%	25.3%
ENERGY	473,000	613,000	609,000	-0.7%	28.6%
a. Stationary Sources	282,000	360,000	346,000	-4.1%	22.6%
Electricity and Heat Generation	95,300	135,000	129,000	-4.7%	34.9%
Fossil Fuel Industries	52,000	74,000	73,000	-0.2%	42.5%
Mining	6,180	15,700	15,600	-0.8%	151.9%
Iron and Steel	6,490	6,370	6,520	2.4%	0.6%
Non Ferrous Metals	3,180	3,200	3,190	-0.3%	0.2%
Chemical	7,090	5,810	5,350	-7.8%	-24.5%
Pulp and Paper	13,600	8,990	7,340	-18.4%	-46.2%
Cement	3,690	4,080	4,580	12.4%	24.1%
Other Manufacturing	20,600	20,800	18,900	-9.2%	-8.3%
Construction	1,880	1,300	1,310	0.4%	-30.5%
Commercial & Institutional	25,800	37,900	36,800	-2.8%	42.5%
Residential	44,000	45,000	42,000	-7.4%	-4.5%
Agriculture & Forestry	2,420	2,210	1,950	-11.9%	-19.6%
b. Transportation	150,000	190,000	200,000	5.6%	32.8%
Domestic Aviation	6,400	7,300	8,700	19.1%	35.3%
Gasoline Automobile	47,200	42,600	41,200	-3.5%	-12.8%
Light Duty Gasoline Trucks	21,300	41,700	44,500	6.8%	108.8%
Heavy Duty Gasoline Vehicles	8,050	6,230	6,510	4.5%	-19.1%
Motorcycles	151	233	260	11.4%	72.0%
Diesel Automobiles	363	408	443	8.5%	21.8%
Light Duty Diesel Vehicles	724	1,930	2,200	14.1%	203.8%
Heavy Duty Diesel Vehicles	21,200	35,000	39,000	11.6%	84.0%
Propane & Natural Gas Vehicles	2,200	820	720	-11.1%	-67.3%
Railways	7,000	6,000	6,000	6.9%	-11.0%
Domestic Marine	5,100	6,200	6,500	5.1%	27.5%
Off Road Gasoline	7,000	8,000	7,000	-7.8%	7.4%
Off Road Diesel	20,000	20,000	20,000	8.9%	56.0%
Pipelines	6,900	9,110	10,100	11.3%	46.9%
c. Fugitives	42,700	65,900	65,700	-0.3%	54.0%
Coal Mining	2,000	700	700	0.0%	-62.1%
Oil	4,180	5,780	5,660	-2.0%	35.4%
Natural Gas	12,900	20,100	20,800	3.8%	61.5%
Venting	19,300	33,700	33,000	-2.0%	71.3%
Flaring	4,400	5,600	5,500	-2.4%	24.4%
INDUSTRIAL PROCESSES	53,500	50,600	53,300	5.4%	-0.4%
a. Mineral Production	8,300	9,100	9,500	4.7%	14.8%
b. Chemical Industry	16,000	7,400	8,900	20.7%	-43.1%
c. Metal Production	19,500	17,200	16,200	-5.6%	-16.7%
d. Consumption of Halocarbons	1,800	6,000	6,100	0.8%	235.2%
e. Other & Undifferentiated Production	8,300	11,000	13,000	15.7%	51.6%
SOLVENT & OTHER PRODUCT USE	170	220	180	-19.6%	1.6%
AGRICULTURE	46,000	54,000	57,000	5.2%	23.6%
a. Enteric Fermentation	18,000	23,000	25,000	8.4%	33.4%
b. Manure Management	6,700	8,100	8,600	5.6%	28.6%
c. Agriculture Soils	21,000	23,000	23,000	1.8%	13.4%
WASTE	23,000	27,000	28,000	3.2%	20.7%
a. Solid Waste Disposal on Land	22,000	26,000	27,000	3.2%	21.9%
b. Wastewater Handling	780	910	930	2.4%	20.1%
c. Waste Incineration	400	230	240	4.3%	-41.0%
LAND USE, LAND-USE CHANGE AND FORESTRY	-120,000	22,000	-17,000	-176.6%	-86.0%
a. Forest Land	-150,000	11,000	-27,000	-341.3%	-82.0%
b. Cropland	14,000	1,400	520	-62.1%	-96.4%
c. Grassland	N/A	N/A	N/A	N/A	N/A
d. Wetlands	5,000	2,000	2,000	-4.4%	-68.5%
e. Settlements	9,000	8,000	8,000	-1.3%	-12.5%

Notes:

¹National totals exclude all GHGs from the Land Use, Land-use Change and Forestry sector.

²Due to **ROUNDING** values may not sum to totals. Percent Change is based on **UNROUNDED** values.