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August 25, 2015

Ontario Energy Board
P.O. Box. 2319
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4

Attention: Kristen Walli, Board Secretary

Dear Ms. Walli:

Re: Ontario Sustainable Energy Association's ("OSEA") Responses to Transcript Undertakings
Board File No. EB-2015-0029/EB-2015-0049

Please find enclosed 2 copies of Responses to Transcript Undertakings JT3.10 – JT3.13 from Mr. Young given during the Technical Conference on August 17, 2015.

Yours truly,

Joanna Vince

Encl.

cc. Nicole Risse, Executive Director, OSEA
Intervenors

Document #: 884777

Ontario Sustainable Energy Association

Undertakings of Mr. Young to Ms. DeMarco

Undertaking JT3.10

OSEA to reproduce the question as asked in its entirety, with the fullness of the charts that were asked for specifically

Response

Ref: Paragraphs 9, 10, 13 and 21

Preamble: In the above references, Mr. Young speaks to greenhouse gas (GHG) emissions and Ontario's electricity sector and indicates: "*Sustainable energy approaches are critical to both energy conservation and environmental protection. Despite progress in specific areas, significant programmatic, institutional and regulatory processes and practices within many key organizations in the energy sector have had limited progress on these two matters. With respect to greenhouse gas emissions, Ontario's challenge is moving beyond phasing out coal and reducing the carbon content of applications such as heating and transportation.*"

a) Please provide, in the following chart format, the information on energy conservation and greenhouse gas emissions applicable to various programs initiatives and sectors and all supporting primary resources and documentation.

i. Energy Conservation

Energy conservation measure	Resulting energy saved (MWh or GJ, as applicable)	Corresponding GHG emissions factor	Corresponding GHG emissions reduced over the defined period of time	Cost to end-use customer (corresponding rate or bill increase over applicable period ($)
Gas DSM (a) EGD 2005-2015 (b) EGD 2010-2015 (c) Union 2005-2015 (d) Union 2010-2015				
Electricity CDM (a) OPA/IESO programs (b) LDC Programs				

(c) Customer Initiatives				
Phase-out of coal-fired electricity in Ontario				
All other energy conservation programs and regulatory measures in Ontario				

ii. GHG Emissions

Relevant sector of Ontario economy	Total GHG emissions from sector in 2005 (MT) and contribution to Ontario's total economy-wide GHG emissions in 2005(%)	In each of (a) 2010 (b) 2014 and (c) 2015: total GHG emissions from sector in (MT) and contribution to Ontario's total economy-wide GHG emissions (%)	Corresponding GHG emissions reduced over the 2005 to 2015 period	Cost to end-use customer (the published rate or bill increase over the applicable period ($))
Electricity				
Transportation				
Industry (a) process emissions (b) energy combustion emissions				
Buildings				
Agriculture				
Waste				

a) The Environmental Commissioner of Ontario has the legislative authority to report on conservation results as well as progress in meeting Ontario's greenhouse gas emissions reductions. The references provided in my evidence cited the Environmental Commissioner's latest report. It is unnecessary to transcribe the data from the report into the chart form when the report is readily available to the public.

Undertaking JT3.11

OSEA to provide pinpoint references to those reports that are being relied upon; and to provide the information in three final columns.

Response

As set out in Mr. Young's evidence, the report relied on is the Environmental Commissioner of Ontario's report, "Feeling the Heating: Greenhouse Gas Progress Report 2015". Information requested about GHG emissions can be found at pages 12, 14 and 15.

The Environmental Commissioner of Ontario's report relied on the "Environment Canada, National Inventory Report – Greenhouse Gas Sources and Sinks in Canada 1990-2013 (2015)" as the source of data.

The Environment Canada National Inventory Report cited by the Environmental Commissioner of Ontario is attached for reference. Refer to Table A10-12 for Ontario's 1990-2013 GHG Emissions listed by sector (page 54) and Table A11-7 for Ontario's 1990-2013 GHG Emissions for electricity generation (page 78). This information can be used by APPrO to compare GHG emissions over various years. Similar conservation reports are available at http://eco.on.ca/category/ecr/.

An increase or decrease in emissions could result from a number of initiatives, some of which may be unrelated to DSM programs. This is outside the scope of the evidence provided.

Undertaking JT3.12

OSEA to provide an equipment list

Response

Mr. Young's evidence refers to a "typical efficiency of less than 40 per cent" [emphasis added].

The IESO does not publish the detailed performance data including primary fuel input and thermal output utilization,[1] which are necessary to determine overall operational energy efficiency of gas or nuclear power plant operation within Ontario.

Because information specific to Ontario is not published or available, Mr. Young considered the efficiencies of operations in other jurisdiction. See Exhibit M.OSEA.APPRO.3,(c)(iii) for efficiencies in the United States of America and the U.K.

In addition, Mr. Young reviewed specifications of equipment vendors and industry groups. Refer to the attached Siemens brochure indicating typical efficiencies for turbines and generators using fossil fuels. Further, refer to a publication prepared by the Canadian Nuclear Safety Commission setting out typical efficiencies of nuclear power plants.[2]

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1 http://reports.ieso.ca/public/GenOutputCapability/PUB_GenOutputCapability.xml

2 Canadian Nuclear Safety Commission, *CANDU Fundamentals*, (June 6 2003) online: <https://canteach.candu.org/Content%20Library/20040700.pdf> at pp 95-99.

Undertaking JT3.13

OSEA to provide the calculation for a cost of $12 Billion to cover 8,000 megawatts of power to CHP using existing natural gas demand and producing electricity with that, based on data from the CHP handbook

Response

The $12 Billion cost estimate is derived by multiplying an estimated 8,000 MW capacity by $1.5 Million/MW CAPEX cost estimate as outlined in the “Catalog [sic] of CHP Technologies” (referenced in Exhibit M.OSEA.APPrO.3).

Environment Canada Environnement Canada

National Inventory Report

1990–2013

GREENHOUSE GAS SOURCES AND SINKS IN CANADA

The Canadian Government's Submission to the UN Framework Convention on Climate Change

Part 3

Canada

En81-4/2013E-PDF
ISSN: 1719-0487

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Aussi disponible en français

List of Acronyms, Abbreviations and Units

AAC	Aluminum Association of Canada
AAFC	Agriculture and Agri-Food Canada
AC	air conditioning
AEDT	Aviation Environmental Design Tool
AER	Alberta Energy Regulator
AGEM	Aviation Greenhouse Gas Emission Model
AIA	Association de l'industrie d'aluminium du Québec
Al	aluminium
Al_2O_3	alumina
API	American Petroleum Institute
ASH	manure ash content
Asha	Ash content in baked anodes
Ashp	Ash content in pitch
ATV	all-terrain vehicle
AWMS	animal waste management system
BADA	Base of Aircraft Data
B_0	maximum methane production potential
BC	average binder content in paste
BOF	basic oxygen furnace
BOD_5	five-day biochemical oxygen demand
BSM	emissions of benzene-soluble matter
C	carbon
CAC	Criteria Air Contaminant (for Land Use, Land-use Change and Forestry Sector)
CAC	Cement Association of Canada (for Industrial Proccesses and Product Use Sector)
CaC_2	calcium carbide
$CaCO_3$	calcium carbonate; limestone
$CaMg(CO_3)_2$	dolomite (also $CaCO_3$•$MgCO_3$)
CanFI	Canada's National Forest Inventory
CANSIM	Statistics Canada's key socioeconomic database
CanSIS	Canadian Soil Information System
CanWEA	Canadian Wind Energy Association
CaO	lime; quicklime; calcined limestone
CAPP	Canadian Association of Petroleum Producers
CBM	Carbon Budget Model
CBM-CFS3	Carbon Budget Model for the Canadian Forest Sector, version 3
CC	baked anode consumption per tonne of aluminium
CEA	Canadian Electricity Association
CEPA 1999	*Canadian Environmental Protection Act, 1999*
CESI	Canadian Environmental Sustainability Indicators
CF_4	carbon tetrafluoride
C_2F_6	carbon hexafluoride
CFC	chlorofluorocarbon
CFS	Canadian Forest Service
CGA	Canadian Gas Association
CH_3OH	methanol
CH_4	methane
C_2H_6	ethane
C_3H_8	propane
C_4H_{10}	butane
C_2H_4	ethylene

C_6H_6	benzene
$CHCl_3$	chloroform
CIEEDAC	Canadian Industrial Energy End-Use Data Analysis Centre
CKD	cement kiln dust
CLRTAP	Convention on Long-range Transboundary Air Pollution
CO	carbon monoxide
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
COD	chemical oxygen demand
CORINAIR	Core Inventory of Air Emissions in Europe
CPPI	Canadian Petroleum Products Institute
CRF	Common Reporting Format
CRW	crown cover area growth rate
CSPA	Canadian Steel Producers Association
CTS	crop and tillage system
CVS	Canadian Vehicle Survey
DE	digestible energy
DEF	diesel exhaust fluid
DM	dry matter
DMI	dry matter intake
DOC	dissolved organic carbon (for LULUCF Sector)
DOC	degradable organic carbon (for Waste Sector)
DOCF	degradable organic carbon dissimilated
DOM	dead organic matter
EAF	electric arc furnace
EC	Environment Canada
EDC	ethylene dichloride
EF	emission factor
EF_{BASE}	base emission factor
EMEP	European Monitoring and Evaluation Programme
EO	Earth Observation
EPA	Environmental Protection Agency (United States)
EPGTD	Electric Power Generation, Transmission and Distribution
eq	equivalent
ERCB	Energy Resources Conservation Board
ERS	Economic Research Service (USDA)
ERT	Expert Review Team
EU	European Union
FAA	Federal Aviation Administration (United States)
FAACS	Feasibility Assessment of Afforestation for Carbon Sequestration
FCR	fuel consumption ratio
FGD	flue gas desulphurization
FLCL	forest land converted to cropland
FLWL	forest land converted to wetland
FOCA	Federal Office of Civil Aviation
FOI	Swedish Defence Research Agency
F_{TILL}	tillage ratio factor
GCD	great-circle distance
GCV	gross calorific value
GDP	gross domestic product
GE	gross energy
GHG	greenhouse gas
GHGRP	Greenhouse Gas Reporting Program

GIS	geographic information system
GO	gross output
Gt	gigatonne
GRI	Gas Research Institute
GTIS	Global Trade Information Services
GVWR	gross vehicle weight rating
GWP	global warming potential
H_2	hydrogen
H_2O	water
H_2S	hydrogen sulphide
HCFC	hydrochlorofluorocarbon
HCl	hydrochloric acid
HDD	heating degree-day
HDDV	heavy-duty diesel vehicle
HDGV	heavy-duty gasoline vehicle
HE	harvest emissions
HF	hydrogen fluoride
HFC	hydrofluorocarbon
HHV	higher heating value
HNO_3	nitric acid
HQ	Hydro-Québec
HRAI	Heating, Refrigeration and Air Conditioning Institute of Canada
HSS	horizontal stud Søderberg
HWP	harvested wood products
HWP-C	carbon stored in harvested wood products
IAI	International Aluminium Institute
ICAO	International Civil Aviation Organization
IE	included elsewhere
IEA	International Energy Agency
IESO	Independent Electricity System Operator
I/M	inspection and maintenance
Impa	fluorine and other impurities
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Proccesses and Product Use
IT	intensive tillage
KAR	kilometre accumulation rate
K_2CO_3	potassium carbonate
kg	kilogram
kha	kilohectare
kt	kilotonne
kWh	kilowatt-hour
L_0	methane generation potential
LDDT	light-duty diesel truck
LDDV	light-duty diesel vehicle
LDGT	light-duty gasoline truck
LDGV	light-duty gasoline vehicle
LFG	landfill gas
LHV	lower heating value
LMC	land management change
LPG	liquefied petroleum gases
LTO	landing and takeoff
LULUCF	Land Use, Land-use Change and Forestry
m	metre

MARS	Monitoring, Accounting and Reporting System
MC	motorcycle
MCF	methane conversion factor (Agriculture)
MCF	methane correction factor (Waste)
Mg	magnesium; also megagram
$MgCO_3$	magnesite; magnesium carbonate
MGEM	Mobile Greenhouse Gas Emission Model
MgO	magnesia; dolomitic lime
Mha	megahectare, equivalent to a million hectares
MI	Manufactured Items
MMIC	Motorcycle & Moped Industry Council
MODTF	Modeling and Database Task Force
mol	mole
MP	total aluminum production
MS	manure system distribution factor
MSW	municipal solid waste
Mt	megatonne
MTOW	maximum takeoff weight
MW	megawatt
N	nitrogen
N_2	nitrogen gas
Na_2CO_3	sodium carbonate; soda ash
Na_3AlF_6	cryolite
NA	not applicable
N/A	not available
NAICS	North American Industry Classification System
NAP	National Action Plan
NCASI	National Council for Air and Stream Improvement
NCV	net calorific value
NE	not estimated
NEB	National Energy Board
NEU	non-energy use
NFI	National Forest Inventory
NFR	nomenclature for reporting
NGL	natural gas liquid
NH_3	ammonia
NH_4^+	ammonium
NH_4NO_3	ammonium nitrate
NIR	National Inventory Report
NMVOC	non-methane volatile organic compound
N_2O	nitrous oxide
NO	nitric oxide; also used for not occurring
NO_2	nitrogen dioxide
NO_3^-	nitrate
NO_x	nitrogen oxides
NOC	Nitrous Oxide of Canada
NPRI	National Pollutant Release Inventory
NRCan	Natural Resources Canada
NSCR	non-selective catalytic reduction
NT	no tillage
O_2	oxygen
ODS	ozone-depleting substance
OECD	Organisation for Economic Co-operation and Development

OEM	original equipment manufacturer
OS/HOU	oil sands and heavy oil upgrading
PC	paste consumption
PFC	perfluorocarbon
PIRD	Pollutant Inventories and Reporting Division
PJ	petajoule
POP	persistent organic pollutant
P/PE	precipitation/potential evapotranspiration
PTRC	Petroleum Technology Research Centre
QA	quality assurance
QC	quality control
RA	reference approach
RESD	*Report on Energy Supply and Demand in Canada*
RPP	refined petroleum product
RT	reduced tillage
RTI	Research Triangle Institute
SA	sectoral approach
Sa	sulphur content in baked anodes
SAGE	System for assessing Aviation's Global Emissions
SBR	styrene-butadiene
Sc	sulphur content in calcinated coke
SCR	selective catalytic reduction
SF_6	sulphur hexafluoride
SIC	Standard Industrial Classification
SiC	silicon carbide
SLC	Soil Landscapes of Canada
SMR	steam methane reforming
SO_2	sulphur dioxide
SO_x	sulphur oxides
SOC	soil organic carbon
Sp	sulphur content in pitch
SUV	sport utility vehicle
t	tonne
TWh	terrawatt-hour
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
UPCIS	Use Patterns and Controls Implementation Section
UOG	upstream oil and gas
UTC	urban tree crown
USDA	United States Department of Agriculture
VCM	vinyl chloride monomer
VKT	vehicle kilometres travelled
VSS	vertical stud Søderberg
VS	volatile solids
WMO	World Meteorological Organization

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Annex 8

Rounding Protocol

A rounding protocol has been developed for the emission and removal estimates in order to reflect their uncertainty levels. The accuracy of a value is reflected by presenting the emission and removal estimates rounded to an appropriate number of significant figures based on the uncertainty of the category in question. The number of significant figures to which each source and sink category has been rounded, using the rounding rules provided in this protocol, can be found in Table A8–1.

A large number of the uncertainty ranges that are used for the various categories were developed using Monte Carlo analysis, as performed by ICF Consulting (ICF Consulting 2004, 2005), using the 2001 inventory estimates submitted in the NIR 2003. Default uncertainty values published by the IPCC (IPCC/OECD/IEA 1997; IPCC 2001) and those resulting from expert elicitation were also utilized for some ranges. Since 2004-2005, many methodological changes, refinements and updates, including updates to the uncertainty parameters themselves, have been made. The uncertainty ranges have been calculated around the mean values established by these analyses.

For a more complete description of the analysis of uncertainty in Canada's emission estimates, please refer to Annex 2, which includes tables of current uncertainty values. Recent updates to uncertainty estimates are provided in the respective sectoral chapters.

The following uncertainty values have been used to establish the number of significant figures to which the estimates have been rounded:

- uncertainty greater than 50%: one significant figure;
- uncertainty between 10% and 50%: two significant figures: and
- uncertainty equal to or less than 10%: three significant figures.

All calculations, including the summing of emission totals, were made using unrounded data. The rounding protocol was applied only after the calculations had been completed. The reader should also note that formatting in Annex 9 and Annex 10 limits the maximum number of decimal places and, therefore, even though a zero entry is recorded, some emissions may exist in that category (zero emissions are identified with a dash "-"). Because of these procedures, individual values in the emission tables may not add up to the subtotals and/or overall totals.

Table A8–1 Number of Significant Figures Applied to GHG Summary Tables

Greenhouse Gas Categories		Number of Significant Figures							
		CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	NF_3	TOTAL
TOTAL		**3**	**2**	**2**	**2**	**2**	**2**	**1**	**3**
ENERGY		**3**	**2**	**1**					**3**
a.	Stationary Combustion Sources	3	1	1					3
	Public Electricity and Heat Production	3	2	1					3
	Petroleum Refining Industries	3	1	1					2
	Mining and Upstream Oil and Gas Production	3	2	1					3
	Manufacturing Industries	3	1	1					3
	Iron and Steel	3	1	1					3
	Non Ferrous Metals	3	1	1					3
	Chemical	3	2	1					3
	Pulp and Paper	3	1	1					3
	Cement	3	2	1					3
	Other Manufacturing	3	2	1					3
	Construction	3	2	1					3
	Commercial & Institutional	3	2	1					3
	Residential	3	1	1					3
	Agriculture & Forestry	3	2	2					3
b.	Transport	3	1	1					3
	Domestic Aviation	3	1	1					2
	Road Transportation	3	1	2					3
	Light-duty Gasoline Vehicles	3	2	2					3
	Light-duty Gasoline Trucks	3	2	2					3
	Heavy-duty Gasoline Vehicles	3	2	2					3
	Motorcycles	3	2	2					3
	Light-duty Diesel Vehicles	3	1	1					3
	Light-duty Diesel Trucks	3	1	1					3
	Heavy-duty Diesel Vehicles	3	1	1					3
	Propane & Natural Gas Vehicles	3	1	1					2
	Railways	3	1	1					2
	Domestic Navigation	3	1	1					2
	Other Transportation	3	1	1					2
	Off-road Gasoline	3	1	1					2
	Off-road Diesel	3	1	1					2
	Pipelines Transport	3	2	1					3
c.	Fugitive Sources	2	2	1					2
	Coal Mining		1						1
	Oil and Natural Gas	2	2	1					2
	Oil	2	2	1					2
	Natural Gas	2	2						2
	Venting	2	2						2
	Flaring	2	2	1					2
d.	CO_2 Transport and Storage	1							1
INDUSTRIAL PROCESSES AND PRODUCT USE		**3**	**2**	**3**	**2**	**2**	**2**		**3**
a.	Mineral Products	2							2
	Cement Production	2							2
	Lime Production	3							3
	Mineral Product Use	2							2
b.	Chemical Industry	2	2	2					2
	Ammonia Production	3							3
	Nitric Acid Production			2					2
	Adipic Acid Production			2					2
	Petrochemical and Carbon Black Production		2	2					2
c.	Metal Production	3				3	3		3
	Iron and Steel Production	3							3
	Aluminium Production	3				3	3		3
	SF_6 Used in Magnesium Smelters and Casters						3		3
d.	Production and Consumption of Halocarbons, and SF_6 and NF_3				2	2	2	1	2
e.	Non-Energy Products from Fuels and Solvent Use	2							2
f.	Other Product Manufacture and Use	1		2					2
AGRICULTURE			**2**	**1**					**2**
a.	Enteric Fermentation		2						2
b.	Manure Management		2	3					2
c.	Agricultural Soils			2					2
	Direct Sources			2					2
	Indirect Sources			1					1
d.	Field Burning of Agricultural Residues		1	1					1
e.	Liming, Urea Application and Other Carbon-Containing Fertilizers	1							1
WASTE		**2**	**2**	**1**					**2**
a.	Solid Waste Disposal on Land		2						2
b.	Wastewater Handling		2	1					2
c.	Waste Incineration	2	1	1					2
LAND USE, LAND-USE CHANGE AND FORESTRY		**2**	**2**	**2**					**2**
a.	Forest Land	2	2	2					2
b.	Cropland	2	1	1					2
c.	Grassland		1	1					1
d.	Wetlands	1	1	1					1
e.	Settlements	1	1	1					1
f.	Harvested Wood Products	2							2

A8

Annex 9

Canada's Greenhouse Gas Emission Tables, 1990–2013

This annex contains summary tables (Table A9–1 to Table A9–26) illustrating national GHG emissions by year, by gas, and by sector.

Table A9–1 GHG Source/Sink Category Description

GHG Source/Sink Categories	
ENERGY	
a. Stationary Combustion Sources	
Public Electricity and Heat Production	Emissions from fuel consumed by utility electricity generation and steam production (for sale)
Petroleum Refining Industries	Emissions from fuel consumed by petroleum refining industries
Mining and Upstream Oil and Gas Production	Emissions from fuel consumed by: - Metal and non-metal mines, coal mines, stone quarries, and gravel pits - Oil and gas extraction industries - Mineral exploration and contract drilling operations
Manufacturing Industries	Emissions from fuel consumed by the following industries: - Iron and Steel (steel foundries, casting and rolling mills) - Non-ferrous metals (aluminium, magnesium and other production) - Chemical (fertilizer manufacturing, organic and inorganic chemical manufacturing) - Pulp and Paper (primarily pulp, paper, and paper product manufacturers) - Cement and other non-metallic mineral production - Other manufacturing industries not listed (such as automobile manufacturing, textiles, food and beverage industries)
Construction	Emissions from fuels consumed by the construction industry – buildings, highways etc.
Commercial & Institutional	Emissions from fuel consumed by: - Service industries related to mining, communication, wholesale and retail trade, finance and insurance, real estate, education, etc.) - Federal, provincial and municipal establishments - National Defence and Canadian Coast Guard - Train stations, airports and warehouses
Residential	Emissions from fuel consumed for personal residences (homes, apartment hotels, condominiums and farm houses)
Agriculture & Forestry	Emissions from fuel consumed by: - Forestry and logging service industry - Agricultural, hunting and trapping industry (excluding food processing, farm machinery manufacturing, and repair)
b. Transportation	Emissions resulting from the:
Domestic Aviation	- Consumption of fossil fuels by aircrafts flying domestically with Canadian purchased fuel
Road Transportation	- Consumption of fossil fuels (including non-CO_2 emissions from ethanol and biodiesel) by vehicles licensed to operate on roads
Railways	- Consumption of fossil fuels (including non-CO_2 emissions from biodiesel) by Canadian railways
Domestic Navigation	- Consumption of fossil fuels (including non-CO_2 emissions from ethanol and biodiesel) by Canadian registered marine vessels fuelled domestically
Others – Off-road	- Consumption of fossil fuels (including non-CO_2 emissions from ethanol and biodiesel) by combustion devices not licensed to operate on roads
Others – Pipeline Transport	- Transportation and distribution of crude oil, natural gas and other products
c. Fugitive Sources	Intentional and unintentional releases of greenhouse gases from the following activities:
Coal Mining	- Underground and surface mining, abandoned underground coal mines
Oil and Natural Gas	- Conventional and unconventional oil and gas exploration, production, transportation, and distribution
d. CO_2 Transport and Storage	Intentional and unintentional releases of greenhouse gases from the transport and storage of carbon dioxide
INDUSTRIAL PROCESSES AND PRODUCT USE	**Emissions resulting from the following process activities:**
a. Mineral Products	- Production of cement and lime; use of soda ash, limestone & dolomite, and magnesite
b. Chemical Industry	- Production of ammonia, nitric acid, adipic acid, carbide, carbon black, ethylene dichloride, ethylene, methanol and styrene
c. Metal Production	- Production of aluminum, iron and steel production, magnesium production and casting
d. Production and Consumption of Halocarbons, SF_6 and NF_3	- By-product production of HFC-23; use of HFCs and/or PFCs in air conditioning units, refrigeration units, fire extinguishers, aerosol cans, solvents, foam blowing, semiconductor manufacturing and electronics industry; use of SF_6 in electrical equipment and semiconductor manufacturing; use of NF_3 in semiconductor manufacturing
e. Non-Energy Products from Fuels and Solvent Use	- Non-energy use of fossil fuels mostly in chemical/petrochemical activities, including solvents and lubricants
f. Other Product Manufacture and Use	- Emissions resulting from the use of N_2O as an anaesthetic and propellant; emissions from the use of urea in selective catalytic reduction (SCR) equipped vehicles
AGRICULTURE	**Emissions resulting from the:**
a. Enteric Fermentation	- Eructation of CH_4 during the digestion of plant material by (mainly) ruminants
b. Manure Management	- Release of CH_4 and N_2O due to microbial activity during the storage of feces, urine and bedding materials from the cleaning of barns and pens - Indirect N_2O emissions from volatilization and leaching of nitrogen from animal manure during storage
c. Agricultural Soils	
Direct sources	- Direct N_2O emissions from Synthetic fertilizer, manure on cropland, pasture range and paddock, crop residue, tillage, summer-fallow, irrigation and cultivation of organic soils
Indirect Sources	- Indirect N_2O emissions from volatilization and leaching of animal manure nitrogen, synthetic fertilizer nitrogen and crop residue nitrogen
d. Field Burning of Agricultural Residues	- CH_4 and N_2O emissions from crop residue burning
e. Liming, Urea Application and Other Carbon-containing Fertilizers	- Direct emissions of CO_2 from the application of lime, urea and other fertilizers containing carbon
WASTE	**Emissions resulting from:**
a. Solid Waste Disposal on Land	- Municipal solid waste management sites (landfills) and dedicated wood waste landfills
b. Wastewater Handling	- Wastewater treatment
c. Waste Incineration	- Municipal solid waste, sewage sludge and hazardous waste incineration
LAND USE, LAND-USE CHANGE AND FORESTRY	**Emissions and removals resulting from:**
a. Forest Land	- Managed forests and lands converted to forests; includes growth, natural and anthropogenic disturbances (fire, harvest, insects)
b. Cropland	- Management practices on lands in annual crops, summerfallow and perennial crops (forage, specialty crops, orchards); immediate and residual emissions from lands converted to cropland
c. Grassland	- Managed agricultural grassland
d. Wetlands	- Peatlands disturbed for peat extraction, or land flooded from hydro reservoir development
e. Settlements	- Forest and grassland converted to built-up land (settlements, transport infrastructure, oil & gas infrastructure, mining, etc); urban tree growth
f. Harvested Wood Products	- Use and disposal of harvested wood products manufactured from wood coming from forest harvest and forest conversion activities in Canada

Table A9–2 Canada's 1990–2013 GHG Emissions by Sector

Greenhouse Gas Categories	1990	2000	2005	2009	2010	2011	2012	2013
				kt CO_2 eq.				
TOTAL[1]	613 000	745 000	749 000	699 000	707 000	709 000	715 000	726 000
ENERGY	485 000	606 000	601 000	563 000	573 000	576 000	577 000	588 000
a. Stationary Combustion Sources	**288 000**	**355 000**	**344 000**	**318 000**	**318 000**	**321 000**	**320 000**	**325 000**
Public Electricity and Heat Production	94 500	131 000	124 000	100 000	102 000	94 500	89 000	87 500
Petroleum Refining Industries	17 000	17 000	20 000	19 000	18 000	17 000	19 000	18 000
Mining and Upstream Oil and Gas Production	41 100	63 400	67 800	77 800	79 800	81 600	90 500	93 600
Manufacturing Industries	56 200	56 200	48 700	40 500	41 300	44 900	44 500	46 100
Iron and Steel	4 970	6 230	5 570	4 300	4 450	5 290	5 510	5 560
Non Ferrous Metals	3 320	3 590	3 620	2 850	2 990	3 310	2 930	3 200
Chemical	8 260	10 800	8 320	8 870	9 910	11 100	11 000	11 400
Pulp and Paper	14 600	12 600	8 660	6 410	5 990	6 260	6 040	6 520
Cement	3 960	4 630	5 430	4 480	4 070	4 290	4 050	3 890
Other Manufacturing	21 200	18 200	17 100	13 500	13 900	14 600	15 100	15 500
Construction	1 880	1 080	1 450	1 220	1 510	1 440	1 460	1 440
Commercial and Institutional	25 800	33 100	32 100	29 600	28 200	30 100	28 200	28 900
Residential	48 900	49 700	47 700	47 100	44 700	47 800	44 200	45 800
Agriculture and Forestry	2 410	2 570	2 110	2 550	2 900	3 460	3 560	3 580
b. Transport[2]	**148 000**	**182 000**	**195 000**	**190 000**	**200 000**	**199 000**	**199 000**	**204 000**
Domestic Aviation	7 200	7 700	7 600	6 500	6 500	6 200	7 300	7 500
Road Transportation	97 700	119 000	132 000	133 000	135 000	134 000	134 000	137 000
Light-Duty Gasoline Vehicles	45 900	42 400	40 500	40 100	40 400	38 900	38 600	39 400
Light-Duty Gasoline Trucks	20 500	36 700	43 100	42 900	43 300	41 600	41 700	42 900
Heavy-Duty Gasoline Vehicles	7 530	5 530	6 610	6 990	7 100	6 770	6 940	7 310
Motorcycles	155	164	258	269	275	267	271	279
Light-Duty Diesel Vehicles	473	470	579	706	756	795	832	877
Light-Duty Diesel Trucks	708	1 680	1 940	2 050	2 110	2 070	2 160	2 210
Heavy-Duty Diesel Vehicles	20 200	31 100	38 000	39 400	40 600	42 400	42 100	42 900
Propane and Natural Gas Vehicles	2 200	1 100	730	790	780	820	880	720
Railways	7 000	6 600	6 700	5 100	6 600	7 600	7 600	7 400
Domestic Navigation	5 100	5 200	6 700	6 700	7 000	5 900	5 800	5 300
Other Transportation	31 000	43 000	43 000	38 000	44 000	46 000	45 000	47 000
Off-Road Gasoline	7 900	8 900	8 400	7 400	8 100	8 200	7 800	8 500
Off-Road Diesel	16 000	23 000	24 000	25 000	30 000	32 000	31 000	32 000
Pipeline Transport	6 910	11 300	10 200	6 360	5 720	5 650	5 730	6 390
c. Fugitive Sources	**49 000**	**70 000**	**61 000**	**56 000**	**55 000**	**56 000**	**57 000**	**59 000**
Coal Mining	3 000	2 000	2 000	1 000	2 000	2 000	2 000	2 000
Oil and Natural Gas	46 000	68 000	59 000	54 000	53 000	54 000	56 000	57 000
Oil	5 000	6 500	6 400	5 900	6 000	6 200	6 800	7 200
Natural Gas	13 000	18 000	14 000	13 000	12 000	12 000	12 000	13 000
Venting	23 000	38 000	34 000	31 000	30 000	31 000	32 000	32 000
Flaring	4 600	5 700	5 300	4 900	4 700	4 900	4 900	5 400
d. CO_2 Transport and Storage	-	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE	**55 100**	**53 400**	**58 800**	**49 100**	**50 700**	**50 900**	**55 000**	**52 200**
a. Mineral Products	**8 700**	**10 000**	**10 000**	**7 300**	**8 000**	**8 200**	**8 800**	**8 100**
Cement Production	5 800	7 200	7 600	5 400	6 000	6 100	6 600	6 000
Lime Production	1 760	1 870	1 710	1 190	1 370	1 430	1 450	1 320
Mineral Product Use	1 200	1 200	1 000	720	540	670	770	780
b. Chemical Industry	**14 000**	**5 100**	**6 500**	**4 200**	**3 600**	**4 100**	**4 200**	**4 500**
Ammonia Production	2 770	2 960	2 710	2 400	2 490	2 880	3 000	3 480
Nitric Acid Production	970	1 200	1 200	1 100	1 100	1 100	1 100	990
Adipic Acid Production	10 000	870	2 500	640	-	-	-	-
Petrochemical and Carbon Black Production[3]	130	110	90	68	68	69	71	84
c. Metal Production	**23 500**	**23 100**	**20 100**	**15 700**	**16 100**	**16 900**	**16 600**	**14 500**
Iron and Steel Production	10 200	11 500	10 200	8 030	9 030	9 860	9 840	7 530
Aluminum Production	10 300	8 890	8 680	7 540	6 870	6 810	6 470	6 720
SF_6 Used in Magnesium Smelters and Casters	2 960	2 660	1 230	184	182	183	248	213
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**1 200**	**3 800**	**5 400**	**5 800**	**5 900**	**6 100**	**6 400**	**6 600**
e. Non-Energy Products from Fuels and Solvent Use	**7 400**	**11 000**	**16 000**	**16 000**	**17 000**	**15 000**	**19 000**	**18 000**
f. Other Product Manufacture and Use	**170**	**430**	**360**	**250**	**240**	**260**	**330**	**300**
AGRICULTURE	**49 000**	**59 000**	**62 000**	**58 000**	**57 000**	**56 000**	**58 000**	**60 000**
a. Enteric Fermentation	**23 000**	**28 000**	**31 000**	**27 000**	**26 000**	**25 000**	**25 000**	**25 000**
b. Manure Management	**7 600**	**9 200**	**9 900**	**8 700**	**8 500**	**8 400**	**8 400**	**8 400**
c. Agriculture Soils	**17 000**	**19 000**	**19 000**	**20 000**	**21 000**	**20 000**	**22 000**	**24 000**
Direct Sources	14 000	16 000	15 000	16 000	17 000	17 000	18 000	20 000
Indirect Sources	3 000	4 000	4 000	4 000	4 000	4 000	4 000	5 000
d. Field Burning of Agricultural Residues	**200**	**100**	**50**	**50**	**30**	**30**	**40**	**50**
e. Liming, Urea Application and Other Carbon-containing Fertilizers	**1 000**	**2 000**	**1 000**	**2 000**	**2 000**	**2 000**	**2 000**	**3 000**
WASTE	**24 000**	**26 000**	**28 000**	**28 000**	**27 000**	**26 000**	**26 000**	**25 000**
a. Solid Waste Disposal on Land	**22 000**	**25 000**	**26 000**	**27 000**	**25 000**	**25 000**	**24 000**	**24 000**
b. Wastewater Handling	**870**	**950**	**980**	**1 000**	**1 000**	**1 000**	**1 000**	**1 100**
c. Waste Incineration	**730**	**740**	**690**	**640**	**660**	**640**	**710**	**550**
LAND USE, LAND-USE CHANGE AND FORESTRY	-87 000	-77 000	16 000	-7 900	81 000	82 000	60 000	-15 000
a. Forest Land	**-250 000**	**-250 000**	**-140 000**	**-140 000**	**-65 000**	**-69 000**	**-94 000**	**-160 000**
b. Cropland	**10 000**	**-2 100**	**-8 400**	**-8 700**	**-8 400**	**-8 000**	**-7 700**	**-7 400**
c. Grassland	**600**	**1 000**	**900**	**400**	**300**	**600**	**2 000**	**700**
d. Wetlands	**6 000**	**4 000**	**4 000**	**4 000**	**4 000**	**4 000**	**4 000**	**4 000**
e. Settlements	**4 000**	**4 000**	**4 000**	**4 000**	**4 000**	**4 000**	**4 000**	**4 000**
f. Harvested Wood Products	**140 000**	**170 000**	**160 000**	**130 000**	**150 000**	**150 000**	**150 000**	**150 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

Table A9–3 2013 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	570 000	4 300	110 000	140	41 000	6 400	1 600	430	0.2	726 000
ENERGY	524 000	2 100	54 000	30	10 000	-	-	-	-	588 000
a. Stationary Combustion Sources	**315 000**	**300**	**7 000**	**10**	**3 000**	**-**	**-**	**-**	**.**	**325 000**
Public Electricity and Heat Production	86 800	5.9	150	2	500	-	-	-	-	87 500
Petroleum Refining Industries	18 300	0.2	6	0.1	40	-	-	-	-	18 000
Mining and Upstream Oil and Gas Production	90 900	85	2 100	2	600	-	-	-	-	93 600
Manufacturing Industries	45 400	3	70	2	600	-	-	-	-	46 100
Iron and Steel	5 510	0.2	5	0.2	50	-	-	-	-	5 560
Non Ferrous Metals	3 190	0.06	1	0.04	10	-	-	-	-	3 200
Chemical	11 400	0.22	5.6	0.2	60	-	-	-	-	11 400
Pulp and Paper	6 190	1	30	1	300	-	-	-	-	6 520
Cement	3 860	0.23	5.7	0.06	20	-	-	-	-	3 890
Other Manufacturing	15 300	0.72	18	0.6	200	-	-	-	-	15 500
Construction	1 430	0.03	0.64	0.04	10	-	-	-	-	1 440
Commercial and Institutional	28 700	0.55	14	0.6	200	-	-	-	-	28 900
Residential	39 900	200	5 000	3	900	-	-	-	-	45 800
Agriculture and Forestry	3 550	0.06	1.6	0.09	27	-	-	-	-	3 580
b. Transport[2]	**196 000**	**30**	**700**	**20**	**7 000**	**-**	**-**	**-**	**-**	**204 000**
Domestic Aviation	7 440	0.3	8	0.2	60	-	-	-	-	7 500
Road Transportation	134 000	10	200	8.3	2 500	-	-	-	-	137 000
Light-Duty Gasoline Vehicles	38 600	3.3	83	2.5	740	-	-	-	-	39 400
Light-Duty Gasoline Trucks	42 000	3.7	92	2.6	760	-	-	-	-	42 900
Heavy-Duty Gasoline Vehicles	7 120	0.28	6.9	0.61	180	-	-	-	-	7 310
Motorcycles	274	0.11	2.7	0.01	1.5	-	-	-	-	279
Light-Duty Diesel Vehicles	855	0.02	0.4	0.07	20	-	-	-	-	877
Light-Duty Diesel Trucks	2 160	0.06	1	0.2	50	-	-	-	-	2 210
Heavy-Duty Diesel Vehicles	42 100	2	40	2	700	-	-	-	-	42 900
Propane and Natural Gas Vehicles	697	0.6	20	0.01	4	-	-	-	-	720
Railways	6 540	0.4	9	3	800	-	-	-	-	7 400
Domestic Navigation	5 050	0.4	10	0.9	300	-	-	-	-	5 300
Other Transportation	43 100	20	400	10	4 000	-	-	-	-	47 000
Off-Road Gasoline	8 140	10	300	0.2	60	-	-	-	-	8 500
Off-Road Diesel	28 800	2	40	10	4 000	-	-	-	-	32 000
Pipeline Transport	6 190	6.2	150	0.2	50	-	-	-	-	6 390
c. Fugitive Sources	**13 000**	**1 800**	**45 000**	**0.2**	**50**	**-**	**-**	**-**	**-**	**59 000**
Coal Mining	-	70	2 000	-	-	-	-	-	-	2 000
Oil and Natural Gas	13 000	1 700	44 000	0.2	50	-	-	-	-	57 000
Oil	210	280	6 900	0.1	30	-	-	-	-	7 200
Natural Gas	73	500	12 000	-	-	-	-	-	-	13 000
Venting	8 100	950	24 000	-	-	-	-	-	-	32 000
Flaring	4 800	20	510	0.04	10	-	-	-	-	5 400
d. CO_2 Transport and Storage	**0.09**	-	-	-	-	**-**	**-**	**-**	**-**	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE	42 400	3	76	4.19	1 250	6 400	1 600	430	.	52 200
a. Mineral Products	**8 100**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8 100**
Cement Production	6 000	-	-	-	-	-	-	-	-	6 000
Lime Production	1 320	-	-	-	-	-	-	-	-	1 320
Mineral Product Use	780	-	-	-	-	-	-	-	-	780
b. Chemical Industry	**3 500**	**3**	**76**	**3.3**	**990**	**-**	**-**	**-**	**-**	**4 500**
Ammonia Production	3 480	-	-	-	-	-	-	-	-	3 480
Nitric Acid Production	-	-	-	3.3	990	-	-	-	-	990
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
Petrochemical and Carbon Black Production[3]	-	3	76	0.03	8.4	-	-	-	-	84
c. Metal Production	**12 700**	**-**	**-**	**-**	**-**	**-**	**1 590**	**219**	**-**	**14 500**
Iron and Steel Production	7 530	-	-	-	-	-	-	-	-	7 530
Aluminum Production	5 120	-	-	-	-	-	1 590	5.39	-	6 720
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	213	-	213
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**6 400**	**23**	**210**	**0.2**	**6 600**
e. Non-Energy Products from Fuels and Solvent Use	**18 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**18 000**
f. Other Product Manufacture and Use	**50**	**-**	**-**	**0.86**	**260**	**-**	**-**	**-**	**-**	**300**
AGRICULTURE	-	1 200	29 000	100	30 000	-	-	-	-	60 000
a. Enteric Fermentation	**-**	**1 000**	**25 000**	**-**	**-**	**-**	**-**	**-**	**-**	**25 000**
b. Manure Management	**-**	**150**	**3 700**	**15.9**	**4 730**	**-**	**-**	**-**	**-**	**8 400**
c. Agriculture Soils	**-**	**-**	**-**	**81**	**24 000**	**-**	**-**	**-**	**-**	**24 000**
Direct Sources	-	-	-	66	20 000	-	-	-	-	20 000
Indirect Sources	-	-	-	20	5 000	-	-	-	-	5 000
d. Field Burning of Agricultural Residues	-	2	40	0.04	10	-	-	-	-	50
e. Liming, Urea Application and Other Carbon-containing Fertilizers	3 000	-	-	-	-	-	-	-	-	3 000
WASTE	400	970	24 000	3	800	-	-	-	.	25 000
a. Solid Waste Disposal on Land	**-**	**950**	**24 000**	**-**	**-**	**-**	**-**	**-**	**-**	**24 000**
b. Wastewater Handling	**-**	**16**	**390**	**2**	**700**	**-**	**-**	**-**	**-**	**1 100**
c. Waste Incineration	**400**	**0.1**	**3**	**0.5**	**100**	**-**	**-**	**-**	**-**	**550**
LAND USE, LAND-USE CHANGE AND FORESTRY	-24 000	250	6 300	10	3 100	-	-	-	.	-15 000
a. Forest Land	**-170 000**	**220**	**5 500**	**9.2**	**2 800**	**-**	**-**	**-**	**-**	**-160 000**
b. Cropland	**-7 600**	**5**	**100**	**0.2**	**70**	**-**	**-**	**-**	**-**	**-7 400**
c. Grassland	**-**	**20**	**500**	**0.5**	**200**	**-**	**-**	**-**	**-**	**700**
d. Wetlands	**4 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**4 000**	**6**	**100**	**0.2**	**60**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**150 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**150 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

Table A9–4 2012 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**562 000**	**4 200**	**110 000**	**130**	**39 000**	**6 200**	**1 800**	**440**	**0.2**	**715 000**
ENERGY	514 000	2 100	52 000	30	10 000	-	-	-	-	577 000
a. Stationary Combustion Sources	**310 000**	**300**	**7 000**	**10**	**3 000**	**-**	**-**	**-**	**-**	**320 000**
Public Electricity and Heat Production	88 300	6.5	160	2	600	-	-	-	-	89 000
Petroleum Refining Industries	18 600	0.2	6	0.1	40	-	-	-	-	19 000
Mining and Upstream Oil and Gas Production	87 900	80	2 000	2	600	-	-	-	-	90 500
Manufacturing Industries	43 900	2	60	2	600	-	-	-	-	44 500
Iron and Steel	5 450	0.2	6	0.2	50	-	-	-	-	5 510
Non Ferrous Metals	2 920	0.05	1	0.04	10	-	-	-	-	2 930
Chemical	10 900	0.21	5.3	0.2	60	-	-	-	-	11 000
Pulp and Paper	5 750	1	30	0.9	300	-	-	-	-	6 040
Cement	4 030	0.23	5.8	0.06	20	-	-	-	-	4 050
Other Manufacturing	14 900	0.64	16	0.5	200	-	-	-	-	15 100
Construction	1 450	0.03	0.63	0.04	10	-	-	-	-	1 460
Commercial and Institutional	28 000	0.53	13	0.6	200	-	-	-	-	28 200
Residential	38 300	200	5 000	3	900	-	-	-	-	44 200
Agriculture and Forestry	3 530	0.06	1.6	0.1	28	-	-	-	-	3 560
b. Transport[2]	**191 000**	**30**	**700**	**20**	**7 000**	**-**	**-**	**-**	**-**	**199 000**
Domestic Aviation	7 200	0.3	9	0.2	60	-	-	-	-	7 300
Road Transportation	131 000	10	200	9.1	2 700	-	-	-	-	134 000
Light-Duty Gasoline Vehicles	37 700	3.3	84	2.9	870	-	-	-	-	38 600
Light-Duty Gasoline Trucks	40 700	3.7	92	3	890	-	-	-	-	41 700
Heavy-Duty Gasoline Vehicles	6 760	0.27	6.8	0.58	170	-	-	-	-	6 940
Motorcycles	267	0.11	2.7	0.01	1.5	-	-	-	-	271
Light-Duty Diesel Vehicles	812	0.02	0.4	0.07	20	-	-	-	-	832
Light-Duty Diesel Trucks	2 100	0.05	1	0.2	50	-	-	-	-	2 160
Heavy-Duty Diesel Vehicles	41 400	2	40	2	700	-	-	-	-	42 100
Propane and Natural Gas Vehicles	862	0.7	20	0.02	5	-	-	-	-	880
Railways	6 790	0.4	9	3	800	-	-	-	-	7 600
Domestic Navigation	5 530	0.4	10	1	300	-	-	-	-	5 800
Other Transportation	40 700	20	400	10	4 000	-	-	-	-	45 000
Off-Road Gasoline	7 500	9	200	0.2	50	-	-	-	-	7 800
Off-Road Diesel	27 700	2	40	10	3 000	-	-	-	-	31 000
Pipeline Transport	5 540	5.6	140	0.1	40	-	-	-	-	5 730
c. Fugitive Sources	**13 000**	**1 800**	**44 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**57 000**
Coal Mining	-	60	2 000	-	-	-	-	-	-	2 000
Oil and Natural Gas	13 000	1 700	43 000	0.1	40	-	-	-	-	56 000
Oil	220	260	6 600	0.1	30	-	-	-	-	6 800
Natural Gas	72	490	12 000	-	-	-	-	-	-	12 000
Venting	8 400	930	23 000	-	-	-	-	-	-	32 000
Flaring	4 500	18	450	0.02	6	-	-	-	-	4 900
d. CO_2 Transport and Storage	**0.09**	-	-	-	-	**-**	**-**	**-**	**-**	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE	45 200	2.7	69	4.71	1 400	6 200	1 800	440	-	55 000
a. Mineral Products	**8 800**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8 800**
Cement Production	6 600	-	-	-	-	-	-	-	-	6 600
Lime Production	1 450	-	-	-	-	-	-	-	-	1 450
Mineral Product Use	770	-	-	-	-	-	-	-	-	770
b. Chemical Industry	**3 000**	**2.7**	**69**	**3.7**	**1 100**	**-**	**-**	**-**	**-**	**4 200**
Ammonia Production	3 000	-	-	-	-	-	-	-	-	3 000
Nitric Acid Production	-	-	-	3.7	1 100	-	-	-	-	1 100
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
Petrochemical and Carbon Black Production[3]	-	2.7	69	0.01	2.1	-	-	-	-	71
c. Metal Production	**14 600**	**-**	**-**	**-**	**-**	**-**	**1 760**	**253**	**-**	**16 600**
Iron and Steel Production	9 840	-	-	-	-	-	-	-	-	9 840
Aluminum Production	4 710	-	-	-	-	-	1 760	4.78	-	6 470
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	248	-	248
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**6 200**	**41**	**180**	**0.2**	**6 400**
e. Non-Energy Products from Fuels and Solvent Use	**19 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**19 000**
f. Other Product Manufacture and Use	**40**	**-**	**-**	**1**	**300**	**-**	**-**	**-**	**-**	**330**
AGRICULTURE	-	1 200	29 000	90	30 000	-	-	-	-	58 000
a. Enteric Fermentation	**-**	**1 000**	**25 000**	-	-	**-**	**-**	**-**	**-**	**25 000**
b. Manure Management	**-**	**150**	**3 600**	**15.9**	**4 750**	**-**	**-**	**-**	**-**	**8 400**
c. Agriculture Soils	**-**	**-**	**-**	**74**	**22 000**	**-**	**-**	**-**	**-**	**22 000**
Direct Sources	-	-	-	60	18 000	-	-	-	-	18 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
d. Field Burning of Agricultural Residues	-	1	30	0.03	9	-	-	-	-	40
e. Liming, Urea Application and Other Carbon-containing Fertilizers	2 000	-	-	-	-	-	-	-	-	2 000
WASTE	500	970	24 000	3	900	-	-	-	-	26 000
a. Solid Waste Disposal on Land	**-**	**950**	**24 000**	-	-	**-**	**-**	**-**	**-**	**24 000**
b. Wastewater Handling	**-**	**15**	**390**	**2**	**700**	**-**	**-**	**-**	**-**	**1 000**
c. Waste Incineration	**500**	**0.1**	**3**	**0.7**	**200**	**-**	**-**	**-**	**-**	**710**
LAND USE, LAND-USE CHANGE AND FORESTRY	42 000	480	12 000	19	5 700	-	-	-	-	60 000
a. Forest Land	**-110 000**	**420**	**10 000**	**18**	**5 200**	**-**	**-**	**-**	**-**	**-94 000**
b. Cropland	**-7 900**	**5**	**100**	**0.2**	**70**	**-**	**-**	**-**	**-**	**-7 700**
c. Grassland	-	**50**	**1 000**	**1**	**400**	**-**	**-**	**-**	**-**	**2 000**
d. Wetlands	**4 000**	-	-	-	-	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**4 000**	**6**	**100**	**0.2**	**70**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**150 000**	-	-	-	-	**-**	**-**	**-**	**-**	**150 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding

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Table A9–5 2011 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**559 000**	**4 200**	**100 000**	**130**	**38 000**	**5 900**	**1 700**	**400**	**0.2**	**709 000**
ENERGY	515 000	2 000	50 000	40	10 000	-	-	-	-	576 000
a. Stationary Combustion Sources	**311 000**	**300**	**7 000**	**9**	**3 000**	**-**	**-**	**-**	**-**	**321 000**
Public Electricity and Heat Production	93 800	6.6	170	2	600	-	-	-	-	94 500
Petroleum Refining Industries	17 300	0.2	6	0.1	40	-	-	-	-	17 000
Mining and Upstream Oil and Gas Production	79 200	75	1 900	2	500	-	-	-	-	81 600
Manufacturing Industries	44 200	2	60	2	600	-	-	-	-	44 900
Iron and Steel	5 240	0.2	6	0.2	50	-	-	-	-	5 290
Non Ferrous Metals	3 290	0.06	1	0.04	10	-	-	-	-	3 310
Chemical	11 000	0.21	5.3	0.2	60	-	-	-	-	11 100
Pulp and Paper	5 960	1	30	0.9	300	-	-	-	-	6 260
Cement	4 270	0.2	4.9	0.05	20	-	-	-	-	4 290
Other Manufacturing	14 400	0.6	15	0.5	200	-	-	-	-	14 600
Construction	1 420	0.03	0.62	0.04	10	-	-	-	-	1 440
Commercial and Institutional	29 900	0.57	14	0.7	200	-	-	-	-	30 100
Residential	41 900	200	5 000	3	900	-	-	-	-	47 800
Agriculture and Forestry	3 430	0.06	1.5	0.09	27	-	-	-	-	3 460
b. Transport[2]	**191 000**	**30**	**700**	**30**	**8 000**	**-**	**-**	**-**	**-**	**199 000**
Domestic Aviation	6 150	0.3	8	0.2	50	-	-	-	-	6 200
Road Transportation	130 000	10	300	10	3 000	-	-	-	-	134 000
Light-Duty Gasoline Vehicles	37 800	3.4	86	3.3	1 000	-	-	-	-	38 900
Light-Duty Gasoline Trucks	40 400	3.7	93	3.5	1 100	-	-	-	-	41 600
Heavy-Duty Gasoline Vehicles	6 600	0.28	6.9	0.55	160	-	-	-	-	6 770
Motorcycles	263	0.11	2.7	0.01	1.5	-	-	-	-	267
Light-Duty Diesel Vehicles	776	0.02	0.4	0.06	20	-	-	-	-	795
Light-Duty Diesel Trucks	2 020	0.05	1	0.2	50	-	-	-	-	2 070
Heavy-Duty Diesel Vehicles	41 600	2	40	2	700	-	-	-	-	42 400
Propane and Natural Gas Vehicles	801	0.7	20	0.02	5	-	-	-	-	820
Railways	6 730	0.4	9	3	800	-	-	-	-	7 600
Domestic Navigation	5 540	0.4	10	1	300	-	-	-	-	5 900
Other Transportation	42 000	20	400	10	4 000	-	-	-	-	46 000
Off-Road Gasoline	7 880	10	200	0.2	50	-	-	-	-	8 200
Off-Road Diesel	28 600	2	40	10	4 000	-	-	-	-	32 000
Pipeline Transport	5 470	5.5	140	0.1	40	-	-	-	-	5 650
c. Fugitive Sources	**13 000**	**1 700**	**42 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**56 000**
Coal Mining	-	60	2 000	-	-	-	-	-	-	2 000
Oil and Natural Gas	13 000	1 600	41 000	0.1	40	-	-	-	-	54 000
Oil	210	240	5 900	0.1	30	-	-	-	-	6 200
Natural Gas	70	480	12 000	-	-	-	-	-	-	12 000
Venting	8 400	900	22 000	-	-	-	-	-	-	31 000
Flaring	4 500	18	450	0.03	7	-	-	-	-	4 900
d. CO_2 Transport and Storage	**0.09**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE	41 400	2.7	67	4.56	1 360	5 900	1 700	400	-	50 900
a. Mineral Products	**8 200**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8 200**
Cement Production	6 100	-	-	-	-	-	-	-	-	6 100
Lime Production	1 430	-	-	-	-	-	-	-	-	1 430
Mineral Product Use	670	-	-	-	-	-	-	-	-	670
b. Chemical Industry	**2 900**	**2.7**	**67**	**3.8**	**1 100**	**-**	**-**	**-**	**-**	**4 100**
Ammonia Production	2 880	-	-	-	-	-	-	-	-	2 880
Nitric Acid Production	-	-	-	3.8	1 100	-	-	-	-	1 100
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
Petrochemical and Carbon Black Production[3]	-	2.7	67	0.01	2.2	-	-	-	-	69
c. Metal Production	**14 900**	**-**	**-**	**-**	**-**	**-**	**1 670**	**256**	**-**	**16 900**
Iron and Steel Production	9 860	-	-	-	-	-	-	-	-	9 860
Aluminum Production	5 070	-	-	-	-	-	1 670	73.2	-	6 810
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	183	-	183
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**5 900**	**20**	**140**	**0.2**	**6 100**
e. Non-Energy Products from Fuels and Solvent Use	**15 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**15 000**
f. Other Product Manufacture and Use	**20**	**-**	**-**	**0.8**	**240**	**-**	**-**	**-**	**-**	**260**
AGRICULTURE	-	1 200	29 000	80	30 000	-	-	-	-	56 000
a. Enteric Fermentation	**-**	**1 000**	**25 000**	**-**	**-**	**-**	**-**	**-**	**-**	**25 000**
b. Manure Management	**-**	**150**	**3 700**	**15.9**	**4 720**	**-**	**-**	**-**	**-**	**8 400**
c. Agriculture Soils	**-**	**-**	**-**	**69**	**20 000**	**-**	**-**	**-**	**-**	**20 000**
Direct Sources	-	-	-	56	17 000	-	-	-	-	17 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
d. Field Burning of Agricultural Residues	-	0.9	20	0.02	7	-	-	-	-	30
e. Liming, Urea Application and Other Carbon-containing Fertilizers	2 000	-	-	-	-	-	-	-	-	2 000
WASTE	460	1 000	25 000	3	800	-	-	-	-	26 000
a. Solid Waste Disposal on Land	**-**	**990**	**25 000**	**-**	**-**	**-**	**-**	**-**	**-**	**25 000**
b. Wastewater Handling	**-**	**15**	**380**	**2**	**700**	**-**	**-**	**-**	**-**	**1 000**
c. Waste Incineration	**460**	**0.1**	**3**	**0.6**	**200**	**-**	**-**	**-**	**-**	**640**
LAND USE, LAND-USE CHANGE AND FORESTRY	63 000	510	13 000	21	6 400	-	-	-	-	82 000
a. Forest Land	**-87 000**	**480**	**12 000**	**20**	**6 100**	**-**	**-**	**-**	**-**	**-69 000**
b. Cropland	**-8 200**	**5**	**100**	**0.2**	**70**	**-**	**-**	**-**	**-**	**-8 000**
c. Grassland	**-**	**20**	**500**	**0.5**	**100**	**-**	**-**	**-**	**-**	**600**
d. Wetlands	**4 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**4 000**	**6**	**200**	**0.2**	**70**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**150 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**150 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

Table A9–6 2010 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**556 000**	**4 200**	**100 000**	**130**	**38 000**	**5 700**	**1 900**	**440**	**0.2**	**707 000**
ENERGY	513 000	2 000	49 000	40	10 000	-	-	-	-	573 000
a. Stationary Combustion Sources	**309 000**	**300**	**7 000**	**9**	**3 000**	**-**	**-**	**-**	**-**	**318 000**
Public Electricity and Heat Production	101 000	5.9	150	2	600	-	-	-	-	102 000
Petroleum Refining Industries	18 000	0.2	6	0.1	40	-	-	-	-	18 000
Mining and Upstream Oil and Gas Production	77 500	74	1 900	2	500	-	-	-	-	79 800
Manufacturing Industries	40 700	2	60	2	500	-	-	-	-	41 300
Iron and Steel	4 400	0.2	5	0.2	50	-	-	-	-	4 450
Non Ferrous Metals	2 970	0.06	2	0.05	10	-	-	-	-	2 990
Chemical	9 850	0.19	4.8	0.2	50	-	-	-	-	9 910
Pulp and Paper	5 690	1	30	0.9	300	-	-	-	-	5 990
Cement	4 050	0.2	5	0.05	10	-	-	-	-	4 070
Other Manufacturing	13 700	0.61	15	0.5	200	-	-	-	-	13 900
Construction	1 500	0.03	0.65	0.04	10	-	-	-	-	1 510
Commercial and Institutional	28 000	0.53	13	0.6	200	-	-	-	-	28 200
Residential	38 800	200	5 000	3	900	-	-	-	-	44 700
Agriculture and Forestry	2 870	0.05	1.3	0.08	23	-	-	-	-	2 900
b. Transport[2]	**191 000**	**30**	**700**	**30**	**8 000**	**-**	**-**	**-**	**-**	**200 000**
Domestic Aviation	6 420	0.3	8	0.2	60	-	-	-	-	6 500
Road Transportation	132 000	10	300	11	3 300	-	-	-	-	135 000
Light-Duty Gasoline Vehicles	39 100	3.6	90	3.9	1 200	-	-	-	-	40 400
Light-Duty Gasoline Trucks	42 000	3.9	97	4.3	1 300	-	-	-	-	43 300
Heavy-Duty Gasoline Vehicles	6 920	0.3	7.4	0.56	170	-	-	-	-	7 100
Motorcycles	271	0.11	2.7	0.01	1.5	-	-	-	-	275
Light-Duty Diesel Vehicles	738	0.01	0.4	0.06	20	-	-	-	-	756
Light-Duty Diesel Trucks	2 060	0.05	1	0.2	50	-	-	-	-	2 110
Heavy-Duty Diesel Vehicles	39 900	2	40	2	700	-	-	-	-	40 600
Propane and Natural Gas Vehicles	763	0.7	20	0.02	5	-	-	-	-	780
Railways	5 880	0.3	8	2	700	-	-	-	-	6 600
Domestic Navigation	6 700	0.5	10	1	300	-	-	-	-	7 000
Other Transportation	40 300	20	400	10	3 000	-	-	-	-	44 000
Off-Road Gasoline	7 770	10	200	0.2	50	-	-	-	-	8 100
Off-Road Diesel	27 000	1	40	10	3 000	-	-	-	-	30 000
Pipeline Transport	5 530	5.6	140	0.2	40	-	-	-	-	5 720
c. Fugitive Sources	**13 000**	**1 700**	**41 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**55 000**
Coal Mining	-	60	2 000	-	-	-	-	-	-	2 000
Oil and Natural Gas	13 000	1 600	40 000	0.1	40	-	-	-	-	53 000
Oil	220	230	5 800	0.1	30	-	-	-	-	6 000
Natural Gas	68	490	12 000	-	-	-	-	-	-	12 000
Venting	8 600	850	21 000	-	-	-	-	-	-	30 000
Flaring	4 200	17	440	0.03	9	-	-	-	-	4 700
d. CO_2 Transport and Storage	**0.09**	-	-	-	-	**-**	**-**	**-**	**-**	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE	41 300	2.7	66	4.34	1 290	5 700	1 900	440	.	50 700
a. Mineral Products	**8 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8 000**
Cement Production	6 000	-	-	-	-	-	-	-	-	6 000
Lime Production	1 370	-	-	-	-	-	-	-	-	1 370
Mineral Product Use	540	-	-	-	-	-	-	-	-	540
b. Chemical Industry	**2 500**	**2.7**	**66**	**3.6**	**1 100**	**-**	**-**	**-**	**-**	**3 600**
Ammonia Production	2 490	-	-	-	-	-	-	-	-	2 490
Nitric Acid Production	-	-	-	3.6	1 100	-	-	-	-	1 100
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
Petrochemical and Carbon Black Production[3]	-	2.7	66	0.01	2.1	-	-	-	-	68
c. Metal Production	**14 000**	**-**	**-**	**-**	**-**	**-**	**1 850**	**254**	**-**	**16 100**
Iron and Steel Production	9 030	-	-	-	-	-	-	-	-	9 030
Aluminum Production	4 950	-	-	-	-	-	1 850	72.7	-	6 870
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	182	-	182
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**5 700**	**12**	**180**	**0.2**	**5 900**
e. Non-Energy Products from Fuels and Solvent Use	**17 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**17 000**
f. Other Product Manufacture and Use	**9**	**-**	**-**	**0.78**	**230**	**-**	**-**	**-**	**-**	**240**
AGRICULTURE	-	1 200	30 000	90	30 000	-	-	-	-	57 000
a. Enteric Fermentation	**-**	**1 000**	**26 000**	-	-	**-**	**-**	**-**	**-**	**26 000**
b. Manure Management	**-**	**150**	**3 700**	**16.2**	**4 820**	**-**	**-**	**-**	**-**	**8 500**
c. Agriculture Soils	**-**	**-**	**-**	**70**	**21 000**	**-**	**-**	**-**	**-**	**21 000**
Direct Sources	-	-	-	56	17 000	-	-	-	-	17 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
d. Field Burning of Agricultural Residues	-	1	30	0.03	8	-	-	-	-	30
e. Liming, Urea Application and Other Carbon-containing Fertilizers	2 000	-	-	-	-	-	-	-	-	2 000
WASTE	470	1 000	25 000	3	800	-	-	-	.	27 000
a. Solid Waste Disposal on Land	**-**	**1 000**	**25 000**	-	-	**-**	**-**	**-**	**-**	**25 000**
b. Wastewater Handling	**-**	**15**	**380**	**2**	**600**	**-**	**-**	**-**	**-**	**1 000**
c. Waste Incineration	**470**	**0.1**	**3**	**0.6**	**200**	**-**	**-**	**-**	**-**	**660**
LAND USE, LAND-USE CHANGE AND FORESTRY	63 000	500	13 000	21	6 300	-	-	-	.	81 000
a. Forest Land	**-83 000**	**480**	**12 000**	**20**	**6 000**	**-**	**-**	**-**	**-**	**-65 000**
b. Cropland	**-8 600**	**5**	**100**	**0.2**	**70**	**-**	**-**	**-**	**-**	**-8 400**
c. Grassland	**-**	**10**	**200**	**0.3**	**80**	**-**	**-**	**-**	**-**	**300**
d. Wetlands	**4 000**	**0.5**	**10**	**0.02**	**6**	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**4 000**	**6**	**100**	**0.2**	**60**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**150 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**150 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

Table A9–7 2009 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**545 000**	**4 300**	**110 000**	**130**	**38 000**	**5 700**	**2 500**	**370**	**0.2**	**699 000**
ENERGY	**504 000**	**2 000**	**49 000**	**30**	**10 000**	-	-	-	-	**563 000**
a. Stationary Combustion Sources	**308 000**	**300**	**7 000**	**9**	**3 000**	-	-	-	-	**318 000**
Public Electricity and Heat Production	99 300	5.2	130	2	600	-	-	-	-	100 000
Petroleum Refining Industries	19 000	0.3	7	0.1	40	-	-	-	-	19 000
Mining and Upstream Oil and Gas Production	75 400	76	1 900	2	500	-	-	-	-	77 800
Manufacturing Industries	39 900	2	60	2	500	-	-	-	-	40 500
Iron and Steel	4 250	0.2	5	0.2	40	-	-	-	-	4 300
Non Ferrous Metals	2 830	0.06	2	0.04	10	-	-	-	-	2 850
Chemical	8 820	0.18	4.4	0.2	50	-	-	-	-	8 870
Pulp and Paper	6 110	1	30	0.9	300	-	-	-	-	6 410
Cement	4 460	0.21	5.2	0.05	20	-	-	-	-	4 480
Other Manufacturing	13 400	0.56	14	0.5	100	-	-	-	-	13 500
Construction	1 210	0.02	0.53	0.03	9	-	-	-	-	1 220
Commercial and Institutional	29 400	0.56	14	0.6	200	-	-	-	-	29 600
Residential	41 500	200	5 000	3	800	-	-	-	-	47 100
Agriculture and Forestry	2 530	0.05	1.1	0.07	21	-	-	-	-	2 550
b. Transport[2]	**182 000**	**30**	**700**	**20**	**7 000**	-	-	-	-	**190 000**
Domestic Aviation	6 400	0.4	9	0.2	60	-	-	-	-	6 500
Road Transportation	129 000	10	300	12	3 600	-	-	-	-	133 000
Light-Duty Gasoline Vehicles	38 700	3.6	91	4.3	1 300	-	-	-	-	40 100
Light-Duty Gasoline Trucks	41 400	3.9	98	4.9	1 400	-	-	-	-	42 900
Heavy-Duty Gasoline Vehicles	6 820	0.3	7.6	0.53	160	-	-	-	-	6 990
Motorcycles	265	0.1	2.6	0.0	1.5	-	-	-	-	269
Light-Duty Diesel Vehicles	689	0.01	0.3	0.06	20	-	-	-	-	706
Light-Duty Diesel Trucks	2 000	0.05	1	0.2	50	-	-	-	-	2 050
Heavy-Duty Diesel Vehicles	38 700	2	40	2	600	-	-	-	-	39 400
Propane and Natural Gas Vehicles	767	0.7	20	0.02	5	-	-	-	-	790
Railways	4 550	0.3	6	2	600	-	-	-	-	5 100
Domestic Navigation	6 430	0.5	10	1	300	-	-	-	-	6 700
Other Transportation	35 300	20	400	9	3 000	-	-	-	-	38 000
Off-Road Gasoline	7 100	9	200	0.2	50	-	-	-	-	7 400
Off-Road Diesel	22 000	1	30	9	3 000	-	-	-	-	25 000
Pipeline Transport	6 160	6.2	150	0.2	50	-	-	-	-	6 360
c. Fugitive Sources	**14 000**	**1 700**	**42 000**	**0.1**	**40**	-	-	-	-	**56 000**
Coal Mining	-	60	1 000	-	-	-	-	-	-	1 000
Oil and Natural Gas	14 000	1 600	41 000	0.1	40	-	-	-	-	54 000
Oil	210	230	5 700	0.1	30	-	-	-	-	5 900
Natural Gas	67	510	13 000	-	-	-	-	-	-	13 000
Venting	9 000	870	22 000	-	-	-	-	-	-	31 000
Flaring	4 400	18	460	0.04	10	-	-	-	-	4 900
d. CO_2 Transport and Storage	**0.09**	-	-	-	-	-	-	-	-	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE	**38 500**	**2.6**	**66**	**6.69**	**1 990**	**5 700**	**2 500**	**370**	.	**49 100**
a. Mineral Products	**7 300**	-	-	-	-	-	-	-	-	**7 300**
Cement Production	5 400	-	-	-	-	-	-	-	-	5 400
Lime Production	1 190	-	-	-	-	-	-	-	-	1 190
Mineral Product Use	720	-	-	-	-	-	-	-	-	720
b. Chemical Industry	**2 400**	**2.6**	**66**	**5.9**	**1 700**	-	-	-	-	**4 200**
Ammonia Production	2 400	-	-	-	-	-	-	-	-	2 400
Nitric Acid Production	-	-	-	3.7	1 100	-	-	-	-	1 100
Adipic Acid Production	-	-	-	2.1	640	-	-	-	-	640
Petrochemical and Carbon Black Production[3]	-	2.6	66	0.01	1.9	-	-	-	-	68
c. Metal Production	**13 100**	-	-	-	-	-	**2 500**	**198**	-	**15 700**
Iron and Steel Production	8 030	-	-	-	-	-	-	-	-	8 030
Aluminum Production	5 030	-	-	-	-	-	2 500	13.1	-	7 540
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	184	-	184
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	-	-	-	-	-	**5 700**	**11**	**180**	**0.2**	**5 800**
e. Non-Energy Products from Fuels and Solvent Use	**16 000**	-	-	-	-	-	-	-	-	**16 000**
f. Other Product Manufacture and Use	**2**	-	-	**0.84**	**250**	-	-	-	-	**250**
AGRICULTURE	-	**1 200**	**31 000**	**90**	**30 000**	-	-	-	-	**58 000**
a. Enteric Fermentation	-	**1 100**	**27 000**	-	-	-	-	-	-	**27 000**
b. Manure Management	-	**150**	**3 700**	**16.7**	**4 970**	-	-	-	-	**8 700**
c. Agriculture Soils	-	-	-	**68**	**20 000**	-	-	-	-	**20 000**
Direct Sources	-	-	-	55	16 000	-	-	-	-	16 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
d. Field Burning of Agricultural Residues	-	2	40	0.04	10	-	-	-	-	50
e. Liming, Urea Application and Other Carbon-containing Fertilizers	2 000	-	-	-	-	-	-	-	-	2 000
WASTE	**460**	**1 100**	**27 000**	**3**	**800**	-	-	-	.	**28 000**
a. Solid Waste Disposal on Land	-	**1 100**	**27 000**	-	-	-	-	-	-	**27 000**
b. Wastewater Handling	-	**15**	**370**	**2**	**600**	-	-	-	-	**1 000**
c. Waste Incineration	**460**	**0.1**	**3**	**0.6**	**200**	-	-	-	-	**640**
LAND USE, LAND-USE CHANGE AND FORESTRY	**-18 000**	**280**	**7 000**	**12**	**3 500**	-	-	-	.	**-7 900**
a. Forest Land	**-150 000**	**260**	**6 400**	**11**	**3 200**	-	-	-	-	**-140 000**
b. Cropland	**-8 900**	**5**	**100**	**0.2**	**70**	-	-	-	-	**-8 700**
c. Grassland	-	**10**	**300**	**0.3**	**100**	-	-	-	-	**400**
d. Wetlands	**4 000**	**0.6**	**10**	**0.02**	**7**	-	-	-	-	**4 000**
e. Settlements	**4 000**	**6**	**100**	**0.2**	**70**	-	-	-	-	**4 000**
f. Harvested Wood Products	**130 000**	-	-	-	-	-	-	-	-	**130 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

Table A9–8 2008 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**579 000**	**4 400**	**110 000**	**140**	**42 000**	**5 500**	**2 600**	**640**	**0.2**	**741 000**
ENERGY	533 000	2 100	52 000	40	10 000	-	-	-	-	596 000
a. Stationary Combustion Sources	**330 000**	**300**	**7 000**	**10**	**3 000**	**-**	**-**	**-**	**-**	**340 000**
Public Electricity and Heat Production	115 000	5.5	140	2	700	-	-	-	-	116 000
Petroleum Refining Industries	19 500	0.3	7	0.1	40	-	-	-	-	20 000
Mining and Upstream Oil and Gas Production	73 800	81	2 000	2	500	-	-	-	-	76 300
Manufacturing Industries	44 600	3	70	2	600	-	-	-	-	45 200
Iron and Steel	5 720	0.3	7	0.2	60	-	-	-	-	5 790
Non Ferrous Metals	3 770	0.09	2	0.06	20	-	-	-	-	3 790
Chemical	8 740	0.17	4.3	0.2	40	-	-	-	-	8 790
Pulp and Paper	5 980	1	30	0.9	300	-	-	-	-	6 290
Cement	4 870	0.23	5.8	0.06	20	-	-	-	-	4 900
Other Manufacturing	15 500	0.63	16	0.5	200	-	-	-	-	15 700
Construction	1 370	0.02	0.59	0.03	10	-	-	-	-	1 380
Commercial and Institutional	29 600	0.56	14	0.6	200	-	-	-	-	29 800
Residential	43 400	200	5 000	3	900	-	-	-	-	49 200
Agriculture and Forestry	2 610	0.05	1.1	0.07	22	-	-	-	-	2 630
b. Transport[2]	**188 000**	**30**	**700**	**30**	**8 000**	**-**	**-**	**-**	**-**	**197 000**
Domestic Aviation	7 270	0.4	9	0.2	60	-	-	-	-	7 300
Road Transportation	129 000	10	300	13	3 900	-	-	-	-	133 000
Light-Duty Gasoline Vehicles	38 300	3.7	93	4.8	1 400	-	-	-	-	39 900
Light-Duty Gasoline Trucks	40 900	4	99	5.5	1 700	-	-	-	-	42 700
Heavy-Duty Gasoline Vehicles	6 710	0.33	8.3	0.52	150	-	-	-	-	6 870
Motorcycles	262	0.1	2.6	0.0	1.4	-	-	-	-	266
Light-Duty Diesel Vehicles	642	0.01	0.3	0.05	20	-	-	-	-	657
Light-Duty Diesel Trucks	1 990	0.05	1	0.2	50	-	-	-	-	2 030
Heavy-Duty Diesel Vehicles	38 900	2	40	2	600	-	-	-	-	39 500
Propane and Natural Gas Vehicles	860	0.8	20	0.02	5	-	-	-	-	880
Railways	7 040	0.4	10	3	900	-	-	-	-	7 900
Domestic Navigation	6 220	0.5	10	1	300	-	-	-	-	6 600
Other Transportation	39 200	20	400	10	3 000	-	-	-	-	43 000
Off-Road Gasoline	7 140	9	200	0.2	50	-	-	-	-	7 400
Off-Road Diesel	24 700	1	30	10	3 000	-	-	-	-	28 000
Pipeline Transport	7 280	7.3	180	0.2	60	-	-	-	-	7 520
c. Fugitive Sources	**15 000**	**1 800**	**44 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**59 000**
Coal Mining	-	60	2 000	-	-	-	-	-	-	2 000
Oil and Natural Gas	15 000	1 700	43 000	0.1	40	-	-	-	-	57 000
Oil	210	230	5 800	0.1	30	-	-	-	-	6 000
Natural Gas	66	520	13 000	-	-	-	-	-	-	13 000
Venting	9 800	930	23 000	-	-	-	-	-	-	33 000
Flaring	4 700	22	540	0.02	6	-	-	-	-	5 200
d. CO_2 Transport and Storage	**0.09**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE	44 300	3.1	77	13	3 880	5 500	2 600	640	-	57 000
a. Mineral Products	**9 400**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**9 400**
Cement Production	7 000	-	-	-	-	-	-	-	-	7 000
Lime Production	1 540	-	-	-	-	-	-	-	-	1 540
Mineral Product Use	890	-	-	-	-	-	-	-	-	890
b. Chemical Industry	**2 800**	**3.1**	**77**	**12**	**3 500**	**-**	**-**	**-**	**-**	**6 400**
Ammonia Production	2 810	-	-	-	-	-	-	-	-	2 810
Nitric Acid Production	-	-	-	4.1	1 200	-	-	-	-	1 200
Adipic Acid Production	-	-	-	7.8	2 300	-	-	-	-	2 300
Petrochemical and Carbon Black Production[3]	-	3.1	77	0.01	2	-	-	-	-	79
c. Metal Production	**15 800**	**-**	**-**	**-**	**-**	**-**	**2 590**	**438**	**-**	**18 900**
Iron and Steel Production	10 700	-	-	-	-	-	-	-	-	10 700
Aluminum Production	5 170	-	-	-	-	-	2 590	3.57	-	7 760
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	435	-	435
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**5 500**	**13**	**210**	**0.2**	**5 700**
e. Non-Energy Products from Fuels and Solvent Use	**16 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**16 000**
f. Other Product Manufacture and Use	**0.0**	**-**	**-**	**1.1**	**330**	**-**	**-**	**-**	**-**	**330**
AGRICULTURE	-	1 300	32 000	90	30 000	-	-	-	-	61 000
a. Enteric Fermentation	**-**	**1 100**	**29 000**	**-**	**-**	**-**	**-**	**-**	**-**	**29 000**
b. Manure Management	**-**	**150**	**3 800**	**17.5**	**5 210**	**-**	**-**	**-**	**-**	**9 100**
c. Agriculture Soils	**-**	**-**	**-**	**71**	**21 000**	**-**	**-**	**-**	**-**	**21 000**
Direct Sources	-	-	-	57	17 000	-	-	-	-	17 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
d. Field Burning of Agricultural Residues	-	2	40	0.04	10	-	-	-	-	50
e. Liming, Urea Application and Other Carbon-containing Fertilizers	2 000	-	-	-	-	-	-	-	-	2 000
WASTE	480	1 100	27 000	3	800	-	-	-	-	28 000
a. Solid Waste Disposal on Land	**-**	**1 100**	**26 000**	**-**	**-**	**-**	**-**	**-**	**-**	**26 000**
b. Wastewater Handling	**-**	**15**	**370**	**2**	**600**	**-**	**-**	**-**	**-**	**1 000**
c. Waste Incineration	**480**	**0.1**	**3**	**0.6**	**200**	**-**	**-**	**-**	**-**	**670**
LAND USE, LAND-USE CHANGE AND FORESTRY	-24 000	210	5 200	8.5	2 500	-	-	-	-	-16 000
a. Forest Land	**-160 000**	**180**	**4 500**	**7.6**	**2 300**	**-**	**-**	**-**	**-**	**-160 000**
b. Cropland	**-9 300**	**5**	**100**	**0.2**	**70**	**-**	**-**	**-**	**-**	**-9 100**
c. Grassland	**-**	**10**	**400**	**0.4**	**100**	**-**	**-**	**-**	**-**	**500**
d. Wetlands	**4 000**	**0.5**	**10**	**0.02**	**7**	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**4 000**	**6**	**200**	**0.2**	**70**	**-**	**-**	**-**	**-**	**5 000**
f. Harvested Wood Products	**140 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**140 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

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Table A9–9 2007 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**598 000**	**4 600**	**110 000**	**140**	**40 000**	**5 400**	**2 500**	**730**	**0.2**	**761 000**
ENERGY	549 000	2 100	53 000	40	10 000	-	-	-	-	614 000
a. Stationary Combustion Sources	**346 000**	**300**	**7 000**	**10**	**3 000**	**-**	**-**	**-**	**.**	**356 000**
Public Electricity and Heat Production	123 000	5.4	140	2	700	-	-	-	-	123 000
Petroleum Refining Industries	20 600	0.3	7	0.1	40	-	-	-	-	21 000
Mining and Upstream Oil and Gas Production	77 200	88	2 200	2	500	-	-	-	-	79 900
Manufacturing Industries	47 100	3	70	2	600	-	-	-	-	47 800
Iron and Steel	5 950	0.3	7	0.2	60	-	-	-	-	6 020
Non Ferrous Metals	3 790	0.09	2	0.06	20	-	-	-	-	3 810
Chemical	8 660	0.17	4.3	0.1	40	-	-	-	-	8 710
Pulp and Paper	7 400	1	30	1	300	-	-	-	-	7 750
Cement	5 010	0.24	5.9	0.06	20	-	-	-	-	5 040
Other Manufacturing	16 300	0.7	17	0.6	200	-	-	-	-	16 400
Construction	1 390	0.02	0.6	0.03	10	-	-	-	-	1 400
Commercial and Institutional	30 200	0.59	15	0.7	200	-	-	-	-	30 400
Residential	44 100	200	5 000	3	800	-	-	-	-	49 800
Agriculture and Forestry	2 600	0.05	1.1	0.07	21	-	-	-	-	2 630
b. Transport[2]	**189 000**	**30**	**800**	**30**	**9 000**	**-**	**-**	**-**	**-**	**198 000**
Domestic Aviation	7 680	0.3	9	0.2	70	-	-	-	-	7 800
Road Transportation	129 000	10	300	15	4 400	-	-	-	-	134 000
Light-Duty Gasoline Vehicles	38 600	3.9	97	5.5	1 600	-	-	-	-	40 400
Light-Duty Gasoline Trucks	41 100	4.1	100	6.4	1 900	-	-	-	-	43 100
Heavy-Duty Gasoline Vehicles	6 660	0.35	8.7	0.51	150	-	-	-	-	6 820
Motorcycles	261	0.1	2.6	0.0	1.4	-	-	-	-	265
Light-Duty Diesel Vehicles	607	0.01	0.3	0.05	10	-	-	-	-	622
Light-Duty Diesel Trucks	1 980	0.05	1	0.2	50	-	-	-	-	2 030
Heavy-Duty Diesel Vehicles	39 300	2	40	2	600	-	-	-	-	39 900
Propane and Natural Gas Vehicles	815	0.7	20	0.02	5	-	-	-	-	840
Railways	6 640	0.4	9	3	800	-	-	-	-	7 500
Domestic Navigation	6 440	0.5	10	1	400	-	-	-	-	6 800
Other Transportation	38 700	20	500	10	3 000	-	-	-	-	42 000
Off-Road Gasoline	7 830	9	200	0.2	50	-	-	-	-	8 100
Off-Road Diesel	22 700	1	30	9	3 000	-	-	-	-	26 000
Pipeline Transport	8 180	8.2	200	0.2	70	-	-	-	-	8 450
c. Fugitive Sources	**15 000**	**1 800**	**45 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**60 000**
Coal Mining	-	60	2 000	-	-	-	-	-	-	2 000
Oil and Natural Gas	15 000	1 700	44 000	0.1	40	-	-	-	-	58 000
Oil	220	250	6 100	0.1	30	-	-	-	-	6 400
Natural Gas	63	530	13 000	-	-	-	-	-	-	13 000
Venting	9 500	950	24 000	-	-	-	-	-	-	33 000
Flaring	4 900	20	510	0.02	5	-	-	-	-	5 400
d. CO_2 Transport and Storage	**0.09**	-	-	-	-	**-**	**-**	**-**	**-**	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE	46 500	3.4	84	9.53	2 840	5 400	2 500	730	.	58 100
a. Mineral Products	**10 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**10 000**
Cement Production	7 800	-	-	-	-	-	-	-	-	7 800
Lime Production	1 590	-	-	-	-	-	-	-	-	1 590
Mineral Product Use	850	-	-	-	-	-	-	-	-	850
b. Chemical Industry	**2 600**	**3.4**	**84**	**8.5**	**2 500**	**-**	**-**	**-**	**-**	**5 200**
Ammonia Production	2 570	-	-	-	-	-	-	-	-	2 570
Nitric Acid Production	-	-	-	3.7	1 100	-	-	-	-	1 100
Adipic Acid Production	-	-	-	4.8	1 400	-	-	-	-	1 400
Petrochemical and Carbon Black Production[3]	-	3.4	84	0.01	2	-	-	-	-	86
c. Metal Production	**16 200**	**-**	**-**	**-**	**-**	**-**	**2 520**	**501**	**-**	**19 200**
Iron and Steel Production	11 100	-	-	-	-	-	-	-	-	11 100
Aluminum Production	5 100	-	-	-	-	-	2 520	11.9	-	7 630
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	489	-	489
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**5 400**	**11**	**230**	**0.2**	**5 700**
e. Non-Energy Products from Fuels and Solvent Use	**18 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**18 000**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**1.1**	**310**	**-**	**-**	**-**	**-**	**310**
AGRICULTURE	-	1 300	33 000	80	30 000	-	-	-	-	60 000
a. Enteric Fermentation	**-**	**1 200**	**29 000**	**-**	**-**	**-**	**-**	**-**	**-**	**29 000**
b. Manure Management	**-**	**160**	**4 000**	**18**	**5 360**	**-**	**-**	**-**	**-**	**9 400**
c. Agriculture Soils	**-**	**-**	**-**	**66**	**20 000**	**-**	**-**	**-**	**-**	**20 000**
Direct Sources	-	-	-	53	16 000	-	-	-	-	16 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
d. Field Burning of Agricultural Residues	-	1	30	0.03	9	-	-	-	-	40
e. Liming, Urea Application and Other Carbon-containing Fertilizers	2 000	-	-	-	-	-	-	-	-	2 000
WASTE	460	1 100	27 000	3	800	-	-	-	.	28 000
a. Solid Waste Disposal on Land	**-**	**1 100**	**27 000**	**-**	**-**	**-**	**-**	**-**	**-**	**27 000**
b. Wastewater Handling	**-**	**14**	**360**	**2**	**600**	**-**	**-**	**-**	**-**	**1 000**
c. Waste Incineration	**460**	**0.1**	**2**	**0.6**	**200**	**-**	**-**	**-**	**-**	**640**
LAND USE, LAND-USE CHANGE AND FORESTRY	19 000	340	8 500	14	4 200	-	-	-	.	31 000
a. Forest Land	**-120 000**	**310**	**7 800**	**13**	**3 900**	**-**	**-**	**-**	**-**	**-110 000**
b. Cropland	**-9 400**	**5**	**100**	**0.3**	**80**	**-**	**-**	**-**	**-**	**-9 200**
c. Grassland	**-**	**10**	**300**	**0.3**	**100**	**-**	**-**	**-**	**-**	**400**
d. Wetlands	**4 000**	-	-	-	-	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**4 000**	**7**	**200**	**0.3**	**80**	**-**	**-**	**-**	**-**	**5 000**
f. Harvested Wood Products	**140 000**	-	-	-	-	**-**	**-**	**-**	**-**	**140 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

\- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

Table A9–10 2006 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**575 000**	**4 600**	**120 000**	**130**	**39 000**	**5 400**	**3 000**	**1 500**	**0.2**	**740 000**
ENERGY	526 000	2 200	54 000	40	10 000	-	-	-	-	591 000
a. Stationary Combustion Sources	**325 000**	**300**	**7 000**	**10**	**3 000**	**-**	**-**	**-**	**-**	**335 000**
Public Electricity and Heat Production	118 000	5.7	140	2	700	-	-	-	-	118 000
Petroleum Refining Industries	20 400	0.3	8	0.1	40	-	-	-	-	20 000
Mining and Upstream Oil and Gas Production	68 800	84	2 100	2	500	-	-	-	-	71 400
Manufacturing Industries	45 900	3	70	2	600	-	-	-	-	46 700
Iron and Steel	5 500	0.3	7	0.2	60	-	-	-	-	5 560
Non Ferrous Metals	3 430	0.07	2	0.05	10	-	-	-	-	3 450
Chemical	8 820	0.18	4.4	0.2	50	-	-	-	-	8 870
Pulp and Paper	7 120	1	40	1	300	-	-	-	-	7 490
Cement	5 720	0.22	5.5	0.06	20	-	-	-	-	5 740
Other Manufacturing	15 400	0.67	17	0.5	200	-	-	-	-	15 500
Construction	1 390	0.02	0.6	0.03	10	-	-	-	-	1 400
Commercial and Institutional	29 100	0.54	14	0.6	200	-	-	-	-	29 300
Residential	39 900	200	5 000	3	800	-	-	-	-	45 600
Agriculture and Forestry	2 050	0.04	0.87	0.06	17	-	-	-	-	2 070
b. Transport[2]	**185 000**	**30**	**800**	**30**	**9 000**	**-**	**-**	**-**	**-**	**195 000**
Domestic Aviation	7 750	0.3	8	0.2	70	-	-	-	-	7 800
Road Transportation	128 000	10	300	16	4 700	-	-	-	-	133 000
Light-Duty Gasoline Vehicles	38 700	4	99	6	1 800	-	-	-	-	40 600
Light-Duty Gasoline Trucks	41 100	4.1	100	7	2 100	-	-	-	-	43 300
Heavy-Duty Gasoline Vehicles	6 580	0.35	8.8	0.48	140	-	-	-	-	6 730
Motorcycles	258	0.11	2.7	0.0	1.4	-	-	-	-	262
Light-Duty Diesel Vehicles	571	0.01	0.3	0.05	10	-	-	-	-	585
Light-Duty Diesel Trucks	1 930	0.05	1	0.2	50	-	-	-	-	1 980
Heavy-Duty Diesel Vehicles	38 200	2	40	2	600	-	-	-	-	38 900
Propane and Natural Gas Vehicles	773	0.7	20	0.02	5	-	-	-	-	800
Railways	6 200	0.3	8	3	800	-	-	-	-	7 000
Domestic Navigation	5 830	0.4	10	1	400	-	-	-	-	6 200
Other Transportation	37 400	20	500	9	3 000	-	-	-	-	40 000
Off-Road Gasoline	7 430	9	200	0.2	50	-	-	-	-	7 700
Off-Road Diesel	20 500	1	30	8	3 000	-	-	-	-	23 000
Pipeline Transport	9 390	9.4	230	0.3	70	-	-	-	-	9 700
c. Fugitive Sources	**16 000**	**1 800**	**46 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**62 000**
Coal Mining	-	60	1 000	-	-	-	-	-	-	1 000
Oil and Natural Gas	16 000	1 800	44 000	0.1	40	-	-	-	-	60 000
Oil	190	250	6 200	0.1	30	-	-	-	-	6 400
Natural Gas	61	540	13 000	-	-	-	-	-	-	14 000
Venting	9 900	970	24 000	-	-	-	-	-	-	34 000
Flaring	5 500	23	580	0.02	5	-	-	-	-	6 100
d. CO_2 Transport and Storage	**0.09**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE	46 900	3.4	84	8.96	2 670	5 400	3 000	1 500	-	59 500
a. Mineral Products	**10 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**10 000**
Cement Production	7 700	-	-	-	-	-	-	-	-	7 700
Lime Production	1 630	-	-	-	-	-	-	-	-	1 630
Mineral Product Use	970	-	-	-	-	-	-	-	-	970
b. Chemical Industry	**2 800**	**3.4**	**84**	**7.9**	**2 400**	**-**	**-**	**-**	**-**	**5 200**
Ammonia Production	2 780	-	-	-	-	-	-	-	-	2 780
Nitric Acid Production	-	-	-	4	1 200	-	-	-	-	1 200
Adipic Acid Production	-	-	-	3.9	1 200	-	-	-	-	1 200
Petrochemical and Carbon Black Production[3]	-	3.4	84	0.01	4.1	-	-	-	-	88
c. Metal Production	**16 300**	**-**	**-**	**-**	**-**	**-**	**2 980**	**1 350**	**-**	**20 600**
Iron and Steel Production	11 200	-	-	-	-	-	-	-	-	11 200
Aluminum Production	5 090	-	-	-	-	-	2 980	12.5	-	8 080
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	1 340	-	1 340
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**5 400**	**10**	**180**	**0.2**	**5 500**
e. Non-Energy Products from Fuels and Solvent Use	**17 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**17 000**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**1.1**	**320**	**-**	**-**	**-**	**-**	**320**
AGRICULTURE	-	1 400	35 000	80	20 000	-	-	-	-	61 000
a. Enteric Fermentation	**-**	**1 200**	**30 000**	**-**	**-**	**-**	**-**	**-**	**-**	**30 000**
b. Manure Management	**-**	**170**	**4 300**	**18.5**	**5 510**	**-**	**-**	**-**	**-**	**9 800**
c. Agriculture Soils	**-**	**-**	**-**	**63**	**19 000**	**-**	**-**	**-**	**-**	**19 000**
Direct Sources	-	-	-	51	15 000	-	-	-	-	15 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
d. Field Burning of Agricultural Residues	-	2	40	0.04	10	-	-	-	-	50
e. Liming, Urea Application and Other Carbon-containing Fertilizers	1 000	-	-	-	-	-	-	-	-	1 000
WASTE	480	1 100	27 000	3	800	-	-	-	-	29 000
a. Solid Waste Disposal on Land	**-**	**1 100**	**27 000**	**-**	**-**	**-**	**-**	**-**	**-**	**27 000**
b. Wastewater Handling	**-**	**14**	**360**	**2**	**600**	**-**	**-**	**-**	**-**	**990**
c. Waste Incineration	**480**	**0.09**	**2**	**0.6**	**200**	**-**	**-**	**-**	**-**	**670**
LAND USE, LAND-USE CHANGE AND FORESTRY	27 000	390	9 800	16	4 800	-	-	-	-	42 000
a. Forest Land	**-120 000**	**350**	**8 600**	**15**	**4 300**	**-**	**-**	**-**	**-**	**-100 000**
b. Cropland	**-9 800**	**5**	**100**	**0.3**	**70**	**-**	**-**	**-**	**-**	**-9 600**
c. Grassland	**-**	**40**	**900**	**0.9**	**300**	**-**	**-**	**-**	**-**	**1 000**
d. Wetlands	**4 000**	**0.1**	**4**	**0.01**	**2**	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**4 000**	**7**	**200**	**0.3**	**80**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**150 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**150 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

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Table A9–11 2005 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**580 000**	**4 700**	**120 000**	**140**	**41 000**	**5 300**	**3 800**	**1 400**	**0.2**	**749 000**
ENERGY	534 000	2 200	54 000	40	10 000	-	-	-	-	601 000
a. Stationary Combustion Sources	**334 000**	**300**	**7 000**	**10**	**3 000**	**-**	**-**	**-**	**-**	**344 000**
Public Electricity and Heat Production	123 000	5.6	140	3	700	-	-	-	-	124 000
Petroleum Refining Industries	20 200	0.3	9	0.2	50	-	-	-	-	20 000
Mining and Upstream Oil and Gas Production	65 200	84	2 100	2	500	-	-	-	-	67 800
Manufacturing Industries	48 000	3	70	2	700	-	-	-	-	48 700
Iron and Steel	5 500	0.3	6	0.2	60	-	-	-	-	5 570
Non Ferrous Metals	3 600	0.08	2	0.05	20	-	-	-	-	3 620
Chemical	8 280	0.17	4.2	0.1	40	-	-	-	-	8 320
Pulp and Paper	8 270	2	40	1	400	-	-	-	-	8 660
Cement	5 400	0.21	5.3	0.06	20	-	-	-	-	5 430
Other Manufacturing	16 900	0.63	16	0.5	200	-	-	-	-	17 100
Construction	1 440	0.03	0.62	0.03	10	-	-	-	-	1 450
Commercial and Institutional	31 900	0.59	15	0.7	200	-	-	-	-	32 100
Residential	41 900	200	5 000	3	800	-	-	-	-	47 700
Agriculture and Forestry	2 090	0.04	0.89	0.06	18	-	-	-	-	2 110
b. Transport[2]	**185 000**	**30**	**800**	**30**	**9 000**	**-**	**-**	**-**	**-**	**195 000**
Domestic Aviation	7 570	0.3	8	0.2	70	-	-	-	-	7 600
Road Transportation	126 000	10	300	17	5 100	-	-	-	-	132 000
Light-Duty Gasoline Vehicles	38 400	4.1	100	6.7	2 000	-	-	-	-	40 500
Light-Duty Gasoline Trucks	40 600	4.2	110	7.9	2 400	-	-	-	-	43 100
Heavy-Duty Gasoline Vehicles	6 460	0.37	9.2	0.46	140	-	-	-	-	6 610
Motorcycles	254	0.11	2.7	0.0	1.4	-	-	-	-	258
Light-Duty Diesel Vehicles	565	0.01	0.3	0.05	10	-	-	-	-	579
Light-Duty Diesel Trucks	1 890	0.05	1	0.2	40	-	-	-	-	1 940
Heavy-Duty Diesel Vehicles	37 400	2	40	2	600	-	-	-	-	38 000
Propane and Natural Gas Vehicles	708	0.7	20	0.01	4	-	-	-	-	730
Railways	5 920	0.3	8	2	700	-	-	-	-	6 700
Domestic Navigation	6 320	0.5	10	1	400	-	-	-	-	6 700
Other Transportation	39 300	20	500	9	3 000	-	-	-	-	43 000
Off-Road Gasoline	8 150	10	200	0.2	50	-	-	-	-	8 400
Off-Road Diesel	21 300	1	30	9	3 000	-	-	-	-	24 000
Pipeline Transport	9 830	9.8	250	0.3	80	-	-	-	-	10 200
c. Fugitive Sources	**15 000**	**1 800**	**46 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**61 000**
Coal Mining	-	70	2 000	-	-	-	-	-	-	2 000
Oil and Natural Gas	15 000	1 800	45 000	0.1	40	-	-	-	-	59 000
Oil	170	250	6 200	0.1	30	-	-	-	-	6 400
Natural Gas	57	550	14 000	-	-	-	-	-	-	14 000
Venting	9 900	970	24 000	-	-	-	-	-	-	34 000
Flaring	4 800	21	530	0.01	4	-	-	-	-	5 300
d. CO_2 Transport and Storage	**0.09**	-	-	-	-	**-**	**-**	**-**	**-**	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE	44 100	3.4	85	13.8	4 120	5 300	3 800	1 400	-	58 800
a. Mineral Products	**10 000**	-	-	-	-	-	-	-	-	**10 000**
Cement Production	7 600	-	-	-	-	-	-	-	-	7 600
Lime Production	1 710	-	-	-	-	-	-	-	-	1 710
Mineral Product Use	1 000	-	-	-	-	-	-	-	-	1 000
b. Chemical Industry	**2 700**	**3.4**	**85**	**13**	**3 800**	**-**	**-**	**-**	**-**	**6 500**
Ammonia Production	2 710	-	-	-	-	-	-	-	-	2 710
Nitric Acid Production	-	-	-	4	1 200	-	-	-	-	1 200
Adipic Acid Production	-	-	-	8.5	2 500	-	-	-	-	2 500
Petrochemical and Carbon Black Production[3]	-	3.4	85	0.02	5.7	-	-	-	-	90
c. Metal Production	**15 100**	-	-	-	-	-	**3 830**	**1 250**	-	**20 100**
Iron and Steel Production	10 200	-	-	-	-	-	-	-	-	10 200
Aluminum Production	4 840	-	-	-	-	-	3 830	16.7	-	8 680
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	1 230	-	1 230
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	-	-	-	-	-	**5 300**	**10**	**170**	**0.2**	**5 400**
e. Non-Energy Products from Fuels and Solvent Use	**16 000**	-	-	-	-	-	-	-	-	**16 000**
f. Other Product Manufacture and Use	-	-	-	**1.2**	**360**	-	-	-	-	**360**
AGRICULTURE	-	1 400	36 000	80	20 000	-	-	-	-	62 000
a. Enteric Fermentation	-	**1 300**	**31 000**	-	-	-	-	-	-	**31 000**
b. Manure Management	-	**170**	**4 300**	**18.9**	**5 620**	-	-	-	-	**9 900**
c. Agriculture Soils	-	-	-	**63**	**19 000**	-	-	-	-	**19 000**
Direct Sources	-	-	-	51	15 000	-	-	-	-	15 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
d. Field Burning of Agricultural Residues	-	1	40	0.04	10	-	-	-	-	50
e. Liming, Urea Application and Other Carbon-containing Fertilizers	1 000	-	-	-	-	-	-	-	-	1 000
WASTE	490	1 100	27 000	3	800	-	-	-	-	28 000
a. Solid Waste Disposal on Land	-	**1 100**	**26 000**	-	-	-	-	-	-	**26 000**
b. Wastewater Handling	-	**14**	**350**	**2**	**600**	-	-	-	-	**980**
c. Waste Incineration	**490**	**0.09**	**2**	**0.7**	**200**	-	-	-	-	**690**
LAND USE, LAND-USE CHANGE AND FORESTRY	5 300	300	7 500	12	3 600	-	-	-	-	16 000
a. Forest Land	**-150 000**	**260**	**6 500**	**11**	**3 300**	-	-	-	-	**-140 000**
b. Cropland	**-8 600**	**5**	**100**	**0.2**	**70**	-	-	-	-	**-8 400**
c. Grassland	-	**30**	**700**	**0.7**	**200**	-	-	-	-	**900**
d. Wetlands	**4 000**	**1**	**40**	**0.06**	**20**	-	-	-	-	**4 000**
e. Settlements	**4 000**	**6**	**200**	**0.2**	**70**	-	-	-	-	**4 000**
f. Harvested Wood Products	**160 000**	-	-	-	-	-	-	-	-	**160 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

Table A9–12 2004 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**587 000**	**4 700**	**120 000**	**140**	**43 000**	**5 000**	**3 500**	**2 300**	**0.2**	**758 000**
ENERGY	540 000	2 300	56 000	40	10 000	-	-	-	-	609 000
a. Stationary Combustion Sources	**344 000**	**300**	**8 000**	**10**	**3 000**	**-**	**-**	**-**	**.**	**354 000**
Public Electricity and Heat Production	124 000	5.6	140	3	800	-	-	-	-	125 000
Petroleum Refining Industries	21 600	0.4	9	0.2	50	-	-	-	-	22 000
Mining and Upstream Oil and Gas Production	67 100	98	2 400	2	500	-	-	-	-	70 000
Manufacturing Industries	50 500	3	80	2	700	-	-	-	-	51 200
Iron and Steel	5 780	0.3	6	0.2	60	-	-	-	-	5 850
Non Ferrous Metals	3 540	0.08	2	0.05	20	-	-	-	-	3 560
Chemical	9 130	0.19	4.7	0.2	50	-	-	-	-	9 180
Pulp and Paper	9 860	2	40	1	400	-	-	-	-	10 300
Cement	5 430	0.25	6.3	0.07	20	-	-	-	-	5 460
Other Manufacturing	16 800	0.64	16	0.5	200	-	-	-	-	16 900
Construction	1 410	0.03	0.61	0.03	9	-	-	-	-	1 420
Commercial and Institutional	33 600	0.61	15	0.7	200	-	-	-	-	33 800
Residential	42 700	200	5 000	3	900	-	-	-	-	48 800
Agriculture and Forestry	2 200	0.04	0.92	0.06	17	-	-	-	-	2 210
b. Transport[2]	**181 000**	**30**	**800**	**30**	**9 000**	**-**	**-**	**-**	**-**	**191 000**
Domestic Aviation	7 460	0.3	7	0.2	70	-	-	-	-	7 500
Road Transportation	124 000	10	300	19	5 600	-	-	-	-	130 000
Light-Duty Gasoline Vehicles	39 400	4.4	110	7.6	2 300	-	-	-	-	41 700
Light-Duty Gasoline Trucks	39 300	4.3	110	8.6	2 600	-	-	-	-	41 900
Heavy-Duty Gasoline Vehicles	6 560	0.4	10	0.45	130	-	-	-	-	6 710
Motorcycles	247	0.11	2.7	0.0	1.3	-	-	-	-	251
Light-Duty Diesel Vehicles	561	0.01	0.3	0.04	10	-	-	-	-	574
Light-Duty Diesel Trucks	1 810	0.05	1	0.1	40	-	-	-	-	1 850
Heavy-Duty Diesel Vehicles	35 800	2	40	2	500	-	-	-	-	36 300
Propane and Natural Gas Vehicles	841	0.7	20	0.02	5	-	-	-	-	860
Railways	5 560	0.3	8	2	700	-	-	-	-	6 200
Domestic Navigation	6 610	0.5	10	1	400	-	-	-	-	7 000
Other Transportation	37 300	20	500	9	3 000	-	-	-	-	40 000
Off-Road Gasoline	8 760	10	300	0.2	60	-	-	-	-	9 100
Off-Road Diesel	20 200	1	30	8	2 000	-	-	-	-	23 000
Pipeline Transport	8 270	8.3	210	0.2	70	-	-	-	-	8 550
c. Fugitive Sources	**16 000**	**1 900**	**48 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**63 000**
Coal Mining	-	60	1 000	-	-	-	-	-	-	1 000
Oil and Natural Gas	16 000	1 800	46 000	0.1	40	-	-	-	-	62 000
Oil	180	260	6 600	0.1	30	-	-	-	-	6 800
Natural Gas	51	540	14 000	-	-	-	-	-	-	14 000
Venting	10 000	1 000	26 000	-	-	-	-	-	-	36 000
Flaring	5 100	18	450	0.02	5	-	-	-	-	5 500
d. CO_2 Transport and Storage	**0.09**	-	-	-	-	**-**	**-**	**-**	**-**	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE	44 200	4.2	100	15.3	4 550	5 000	3 500	2 300	.	59 700
a. Mineral Products	**10 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**10 000**
Cement Production	7 500	-	-	-	-	-	-	-	-	7 500
Lime Production	1 780	-	-	-	-	-	-	-	-	1 780
Mineral Product Use	970	-	-	-	-	-	-	-	-	970
b. Chemical Industry	**2 900**	**4.2**	**100**	**14**	**4 200**	**-**	**-**	**-**	**-**	**7 200**
Ammonia Production	2 930	-	-	-	-	-	-	-	-	2 930
Nitric Acid Production	-	-	-	4	1 200	-	-	-	-	1 200
Adipic Acid Production	-	-	-	10	3 000	-	-	-	-	3 000
Petrochemical and Carbon Black Production[3]	-	4.2	100	0.02	5.7	-	-	-	-	110
c. Metal Production	**14 800**	**-**	**-**	**-**	**-**	**-**	**3 510**	**2 120**	**-**	**20 400**
Iron and Steel Production	10 500	-	-	-	-	-	-	-	-	10 500
Aluminum Production	4 220	-	-	-	-	-	3 510	30.4	-	7 770
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 090	-	2 090
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**5 000**	**10**	**220**	**0.2**	**5 200**
e. Non-Energy Products from Fuels and Solvent Use	**16 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**16 000**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**1.3**	**390**	**-**	**-**	**-**	**-**	**390**
AGRICULTURE	-	1 400	35 000	80	20 000	-	-	-	-	61 000
a. Enteric Fermentation	**-**	**1 200**	**31 000**	-	-	**-**	**-**	**-**	**-**	**31 000**
b. Manure Management	**-**	**170**	**4 300**	**18.5**	**5 500**	**-**	**-**	**-**	**-**	**9 800**
c. Agriculture Soils	**-**	**-**	**-**	**65**	**19 000**	**-**	**-**	**-**	**-**	**19 000**
Direct Sources	-	-	-	52	16 000	-	-	-	-	16 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
d. Field Burning of Agricultural Residues	-	1	30	0.03	8	-	-	-	-	40
e. Liming, Urea Application and Other Carbon-containing Fertilizers	1 000	-	-	-	-	-	-	-	-	1 000
WASTE	500	1 100	26 000	3	800	-	-	-	.	28 000
a. Solid Waste Disposal on Land	**-**	**1 000**	**26 000**	-	-	**-**	**-**	**-**	**-**	**26 000**
b. Wastewater Handling	**-**	**14**	**350**	**2**	**600**	**-**	**-**	**-**	**-**	**980**
c. Waste Incineration	**500**	**0.09**	**2**	**0.7**	**200**	**-**	**-**	**-**	**-**	**700**
LAND USE, LAND-USE CHANGE AND FORESTRY	79 000	600	15 000	25	7 300	-	-	-	.	100 000
a. Forest Land	**-84 000**	**560**	**14 000**	**23**	**7 000**	**-**	**-**	**-**	**-**	**-63 000**
b. Cropland	**-7 400**	**5**	**100**	**0.3**	**80**	**-**	**-**	**-**	**-**	**-7 200**
c. Grassland	**-**	**30**	**700**	**0.7**	**200**	**-**	**-**	**-**	**-**	**900**
d. Wetlands	**4 000**	**1**	**20**	**0.04**	**10**	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**4 000**	**6**	**200**	**0.2**	**70**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**160 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**160 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

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Table A9–13 2003 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**588 000**	**4 700**	**120 000**	**130**	**40 000**	**4 700**	**3 500**	**2 700**	**0.2**	**756 000**
ENERGY	544 000	2 300	57 000	40	10 000	-	-	-	-	614 000
a. Stationary Combustion Sources	**352 000**	**300**	**8 000**	**10**	**3 000**	**-**	**-**	**-**	**-**	**363 000**
Public Electricity and Heat Production	131 000	5.4	140	3	800	-	-	-	-	132 000
Petroleum Refining Industries	20 100	0.3	7	0.2	50	-	-	-	-	20 000
Mining and Upstream Oil and Gas Production	68 900	110	2 700	2	500	-	-	-	-	72 100
Manufacturing Industries	48 900	3	70	2	600	-	-	-	-	49 600
Iron and Steel	5 490	0.2	6	0.2	60	-	-	-	-	5 550
Non Ferrous Metals	3 530	0.08	2	0.05	20	-	-	-	-	3 550
Chemical	8 330	0.17	4.3	0.1	40	-	-	-	-	8 380
Pulp and Paper	10 100	1	40	1	300	-	-	-	-	10 400
Cement	4 970	0.22	5.6	0.06	20	-	-	-	-	4 990
Other Manufacturing	16 500	0.59	15	0.5	100	-	-	-	-	16 700
Construction	1 340	0.02	0.58	0.03	9	-	-	-	-	1 350
Commercial and Institutional	34 900	0.64	16	0.7	200	-	-	-	-	35 100
Residential	44 200	200	5 000	3	900	-	-	-	-	50 500
Agriculture and Forestry	2 280	0.04	0.97	0.06	17	-	-	-	-	2 300
b. Transport[2]	**176 000**	**30**	**800**	**30**	**10 000**	**-**	**-**	**-**	**-**	**187 000**
Domestic Aviation	6 960	0.3	8	0.2	60	-	-	-	-	7 000
Road Transportation	120 000	10	300	20	5 900	-	-	-	-	126 000
Light-Duty Gasoline Vehicles	39 500	4.7	120	8.4	2 500	-	-	-	-	42 100
Light-Duty Gasoline Trucks	37 700	4.2	110	9.1	2 700	-	-	-	-	40 500
Heavy-Duty Gasoline Vehicles	6 220	0.41	10	0.41	120	-	-	-	-	6 350
Motorcycles	229	0.1	2.6	0.0	1.3	-	-	-	-	232
Light-Duty Diesel Vehicles	517	0.01	0.3	0.04	10	-	-	-	-	529
Light-Duty Diesel Trucks	1 740	0.04	1	0.1	40	-	-	-	-	1 780
Heavy-Duty Diesel Vehicles	33 500	1	40	2	500	-	-	-	-	34 000
Propane and Natural Gas Vehicles	798	0.7	20	0.02	5	-	-	-	-	820
Railways	5 410	0.3	7	2	700	-	-	-	-	6 100
Domestic Navigation	6 210	0.5	10	1	300	-	-	-	-	6 500
Other Transportation	37 600	20	500	9	3 000	-	-	-	-	41 000
Off-Road Gasoline	8 590	10	300	0.2	60	-	-	-	-	8 900
Off-Road Diesel	20 200	1	30	8	2 000	-	-	-	-	23 000
Pipeline Transport	8 830	8.8	220	0.2	70	-	-	-	-	9 120
c. Fugitive Sources	**16 000**	**1 900**	**48 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**64 000**
Coal Mining	-	60	1 000	-	-	-	-	-	-	1 000
Oil and Natural Gas	16 000	1 900	47 000	0.1	40	-	-	-	-	63 000
Oil	170	260	6 500	0.1	30	-	-	-	-	6 700
Natural Gas	51	550	14 000	-	-	-	-	-	-	14 000
Venting	10 000	1 000	26 000	-	-	-	-	-	-	37 000
Flaring	5 300	15	370	0.01	4	-	-	-	-	5 600
d. CO_2 Transport and Storage	**0.09**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE	42 000	3.7	93	9.04	2 690	4 700	3 500	2 700	.	55 600
a. Mineral Products	**9 800**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**9 800**
Cement Production	7 200	-	-	-	-	-	-	-	-	7 200
Lime Production	1 650	-	-	-	-	-	-	-	-	1 650
Mineral Product Use	910	-	-	-	-	-	-	-	-	910
b. Chemical Industry	**2 600**	**3.7**	**93**	**7.6**	**2 300**	**-**	**-**	**-**	**-**	**5 000**
Ammonia Production	2 630	-	-	-	-	-	-	-	-	2 630
Nitric Acid Production	-	-	-	4.1	1 200	-	-	-	-	1 200
Adipic Acid Production	-	-	-	3.5	1 000	-	-	-	-	1 000
Petrochemical and Carbon Black Production[3]	-	3.7	93	0.02	5.6	-	-	-	-	98
c. Metal Production	**14 900**	**-**	**-**	**-**	**-**	**-**	**3 480**	**2 440**	**-**	**20 900**
Iron and Steel Production	10 400	-	-	-	-	-	-	-	-	10 400
Aluminum Production	4 580	-	-	-	-	-	3 480	67.2	-	8 130
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 370	-	2 370
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**4 700**	**8.2**	**220**	**0.2**	**4 900**
e. Non-Energy Products from Fuels and Solvent Use	**15 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**15 000**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**1.4**	**430**	**-**	**-**	**-**	**-**	**430**
AGRICULTURE	-	1 400	34 000	80	20 000	-	-	-	-	60 000
a. Enteric Fermentation	**-**	**1 200**	**30 000**	**-**	**-**	**-**	**-**	**-**	**-**	**30 000**
b. Manure Management	**-**	**170**	**4 200**	**18.1**	**5 390**	**-**	**-**	**-**	**-**	**9 600**
c. Agriculture Soils	**-**	**-**	**-**	**63**	**19 000**	**-**	**-**	**-**	**-**	**19 000**
Direct Sources	-	-	-	50	15 000	-	-	-	-	15 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
d. Field Burning of Agricultural Residues	-	4	100	0.1	30	-	-	-	-	100
e. Liming, Urea Application and Other Carbon-containing Fertilizers	2 000	-	-	-	-	-	-	-	-	2 000
WASTE	460	1 000	26 000	3	800	-	-	-	.	27 000
a. Solid Waste Disposal on Land	**-**	**1 000**	**26 000**	**-**	**-**	**-**	**-**	**-**	**-**	**26 000**
b. Wastewater Handling	**-**	**14**	**350**	**2**	**600**	**-**	**-**	**-**	**-**	**970**
c. Waste Incineration	**460**	**0.08**	**2**	**0.6**	**200**	**-**	**-**	**-**	**-**	**650**
LAND USE, LAND-USE CHANGE AND FORESTRY	6 000	470	12 000	19	5 700	-	-	-	.	23 000
a. Forest Land	**-140 000**	**420**	**11 000**	**18**	**5 300**	**-**	**-**	**-**	**-**	**-120 000**
b. Cropland	**-6 200**	**5**	**100**	**0.2**	**70**	**-**	**-**	**-**	**-**	**-6 000**
c. Grassland	**-**	**40**	**900**	**0.9**	**300**	**-**	**-**	**-**	**-**	**1 000**
d. Wetlands	**4 000**	**0.7**	**20**	**0.03**	**8**	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**4 000**	**6**	**100**	**0.2**	**60**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**140 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**140 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

Table A9–14 2002 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**571 000**	**4 700**	**120 000**	**130**	**38 000**	**4 400**	**3 500**	**3 000**	**0.2**	**738 000**
ENERGY	529 000	2 400	59 000	40	10 000	-	-	-	-	600 000
a. Stationary Combustion Sources	**342 000**	**400**	**9 000**	**10**	**3 000**	**-**	**-**	**-**	**.**	**354 000**
Public Electricity and Heat Production	127 000	4.7	120	2	700	-	-	-	-	127 000
Petroleum Refining Industries	19 100	0.3	7	0.2	50	-	-	-	-	19 000
Mining and Upstream Oil and Gas Production	65 700	110	2 800	2	500	-	-	-	-	68 900
Manufacturing Industries	51 000	3	70	2	600	-	-	-	-	51 700
Iron and Steel	5 820	0.3	6	0.2	60	-	-	-	-	5 880
Non Ferrous Metals	3 520	0.07	2	0.05	20	-	-	-	-	3 530
Chemical	9 270	0.18	4.6	0.2	50	-	-	-	-	9 320
Pulp and Paper	10 700	1	30	1	300	-	-	-	-	11 000
Cement	4 940	0.22	5.6	0.06	20	-	-	-	-	4 970
Other Manufacturing	16 800	0.8	20	0.6	200	-	-	-	-	17 000
Construction	1 260	0.02	0.55	0.03	9	-	-	-	-	1 270
Commercial and Institutional	33 700	0.61	15	0.7	200	-	-	-	-	33 900
Residential	42 000	200	6 000	3	1 000	-	-	-	-	49 100
Agriculture and Forestry	2 140	0.04	1	0.06	18	-	-	-	-	2 160
b. Transport[2]	**171 000**	**30**	**900**	**30**	**9 000**	**-**	**-**	**-**	**-**	**181 000**
Domestic Aviation	6 860	0.3	8	0.2	60	-	-	-	-	6 900
Road Transportation	118 000	10	300	19	5 800	-	-	-	-	124 000
Light-Duty Gasoline Vehicles	39 800	4.8	120	8.6	2 500	-	-	-	-	42 500
Light-Duty Gasoline Trucks	36 500	4.1	100	8.8	2 600	-	-	-	-	39 200
Heavy-Duty Gasoline Vehicles	6 050	0.44	11	0.37	110	-	-	-	-	6 170
Motorcycles	209	0.1	2.5	0.0	1.1	-	-	-	-	213
Light-Duty Diesel Vehicles	505	0.01	0.3	0.04	10	-	-	-	-	517
Light-Duty Diesel Trucks	1 700	0.04	1	0.1	40	-	-	-	-	1 740
Heavy-Duty Diesel Vehicles	32 100	1	40	2	500	-	-	-	-	32 600
Propane and Natural Gas Vehicles	827	0.7	20	0.02	5	-	-	-	-	850
Railways	5 350	0.3	7	2	700	-	-	-	-	6 000
Domestic Navigation	5 360	0.4	10	1	400	-	-	-	-	5 700
Other Transportation	36 200	20	500	7	2 000	-	-	-	-	39 000
Off-Road Gasoline	8 440	10	200	0.2	50	-	-	-	-	8 700
Off-Road Diesel	17 200	0.9	20	7	2 000	-	-	-	-	19 000
Pipeline Transport	10 600	11	260	0.3	80	-	-	-	-	10 900
c. Fugitive Sources	**16 000**	**2 000**	**49 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**65 000**
Coal Mining	-	60	2 000	-	-	-	-	-	-	2 000
Oil and Natural Gas	16 000	1 900	47 000	0.1	40	-	-	-	-	63 000
Oil	180	250	6 300	0.1	30	-	-	-	-	6 500
Natural Gas	49	550	14 000	-	-	-	-	-	-	14 000
Venting	10 000	1 100	27 000	-	-	-	-	-	-	37 000
Flaring	5 000	11	290	0.01	4	-	-	-	-	5 300
d. CO_2 Transport and Storage	**0.09**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE	40 100	4	99	9.35	2 790	4 400	3 500	3 000	.	53 900
a. Mineral Products	**9 800**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**9 800**
Cement Production	7 200	-	-	-	-	-	-	-	-	7 200
Lime Production	1 670	-	-	-	-	-	-	-	-	1 670
Mineral Product Use	940	-	-	-	-	-	-	-	-	940
b. Chemical Industry	**2 600**	**4**	**99**	**8.1**	**2 400**	**-**	**-**	**-**	**-**	**5 100**
Ammonia Production	2 630	-	-	-	-	-	-	-	-	2 630
Nitric Acid Production	-	-	-	4.1	1 200	-	-	-	-	1 200
Adipic Acid Production	-	-	-	4	1 200	-	-	-	-	1 200
Petrochemical and Carbon Black Production[3]	-	4	99	0.02	5.5	-	-	-	-	100
c. Metal Production	**14 900**	**-**	**-**	**-**	**-**	**-**	**3 440**	**2 880**	**-**	**21 200**
Iron and Steel Production	10 400	-	-	-	-	-	-	-	-	10 400
Aluminum Production	4 420	-	-	-	-	-	3 440	76.5	-	7 930
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 800	-	2 800
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**4 400**	**25**	**140**	**0.2**	**4 500**
e. Non-Energy Products from Fuels and Solvent Use	**13 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**13 000**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**1.2**	**370**	**-**	**-**	**-**	**-**	**370**
AGRICULTURE	-	1 300	34 000	80	20 000	-	-	-	-	58 000
a. Enteric Fermentation	**-**	**1 200**	**29 000**	**-**	**-**	**-**	**-**	**-**	**-**	**29 000**
b. Manure Management	**-**	**170**	**4 200**	**17.9**	**5 340**	**-**	**-**	**-**	**-**	**9 600**
c. Agriculture Soils	**-**	**-**	**-**	**57**	**17 000**	**-**	**-**	**-**	**-**	**17 000**
Direct Sources	-	-	-	46	14 000	-	-	-	-	14 000
Indirect Sources	-	-	-	10	3 000	-	-	-	-	3 000
d. Field Burning of Agricultural Residues	-	3	90	0.09	30	-	-	-	-	100
e. Liming, Urea Application and Other Carbon-containing Fertilizers	2 000	-	-	-	-	-	-	-	-	2 000
WASTE	530	1 000	26 000	3	800	-	-	-	.	27 000
a. Solid Waste Disposal on Land	**-**	**1 000**	**25 000**	**-**	**-**	**-**	**-**	**-**	**-**	**25 000**
b. Wastewater Handling	**-**	**14**	**340**	**2**	**600**	**-**	**-**	**-**	**-**	**970**
c. Waste Incineration	**530**	**0.08**	**2**	**0.7**	**200**	**-**	**-**	**-**	**-**	**750**
LAND USE, LAND-USE CHANGE AND FORESTRY	81 000	700	17 000	29	8 600	-	-	-	.	110 000
a. Forest Land	**-81 000**	**650**	**16 000**	**28**	**8 200**	**-**	**-**	**-**	**-**	**-56 000**
b. Cropland	**-4 800**	**5**	**100**	**0.3**	**80**	**-**	**-**	**-**	**-**	**-4 600**
c. Grassland	**-**	**30**	**800**	**0.9**	**300**	**-**	**-**	**-**	**-**	**1 000**
d. Wetlands	**4 000**	**0.0**	**0.03**	**0.0**	**0.01**	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**4 000**	**6**	**100**	**0.2**	**60**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**160 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**160 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

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Table A9–15 2001 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**565 000**	**4 800**	**120 000**	**130**	**39 000**	**3 900**	**4 000**	**2 600**	**0.2**	**735 000**
ENERGY	525 000	2 500	62 000	40	10 000	-	-	-	-	599 000
a. Stationary Combustion Sources	**339 000**	**300**	**9 000**	**10**	**3 000**	**-**	**-**	**-**	**.**	**351 000**
Public Electricity and Heat Production	132 000	5	130	2	700	-	-	-	-	132 000
Petroleum Refining Industries	18 000	0.3	7	0.2	60	-	-	-	-	18 000
Mining and Upstream Oil and Gas Production	62 600	110	2 800	1	400	-	-	-	-	65 900
Manufacturing Industries	51 400	3	70	2	600	-	-	-	-	52 100
Iron and Steel	4 970	0.2	6	0.2	60	-	-	-	-	5 030
Non Ferrous Metals	3 780	0.08	2	0.06	20	-	-	-	-	3 800
Chemical	9 770	0.2	5	0.2	50	-	-	-	-	9 830
Pulp and Paper	11 400	1	30	1	300	-	-	-	-	11 700
Cement	4 570	0.17	4.2	0.05	20	-	-	-	-	4 590
Other Manufacturing	17 000	0.74	18	0.6	200	-	-	-	-	17 200
Construction	1 020	0.02	0.44	0.03	8	-	-	-	-	1 030
Commercial and Institutional	32 200	0.63	16	0.7	200	-	-	-	-	32 500
Residential	39 900	200	6 000	3	900	-	-	-	-	46 500
Agriculture and Forestry	2 220	0.04	1	0.06	18	-	-	-	-	2 240
b. Transport[2]	**170 000**	**30**	**800**	**30**	**9 000**	**-**	**-**	**-**	**-**	**180 000**
Domestic Aviation	7 050	0.4	9	0.2	60	-	-	-	-	7 100
Road Transportation	116 000	10	300	19	5 700	-	-	-	-	122 000
Light-Duty Gasoline Vehicles	39 600	4.9	120	8.6	2 600	-	-	-	-	42 300
Light-Duty Gasoline Trucks	34 900	3.9	99	8.4	2 500	-	-	-	-	37 500
Heavy-Duty Gasoline Vehicles	6 180	0.47	12	0.36	110	-	-	-	-	6 300
Motorcycles	184	0.1	2.4	0.0	1	-	-	-	-	187
Light-Duty Diesel Vehicles	478	0.01	0.3	0.04	10	-	-	-	-	489
Light-Duty Diesel Trucks	1 620	0.04	1	0.1	40	-	-	-	-	1 660
Heavy-Duty Diesel Vehicles	31 800	1	40	1	400	-	-	-	-	32 300
Propane and Natural Gas Vehicles	1 120	0.9	20	0.02	7	-	-	-	-	1 100
Railways	5 820	0.3	8	2	700	-	-	-	-	6 500
Domestic Navigation	5 340	0.4	10	1	300	-	-	-	-	5 700
Other Transportation	36 100	20	500	8	2 000	-	-	-	-	39 000
Off-Road Gasoline	8 420	10	200	0.2	50	-	-	-	-	8 700
Off-Road Diesel	17 700	1	20	7	2 000	-	-	-	-	20 000
Pipeline Transport	10 000	10	250	0.3	80	-	-	-	-	10 300
c. Fugitive Sources	**16 000**	**2 100**	**52 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**68 000**
Coal Mining	-	70	2 000	-	-	-	-	-	-	2 000
Oil and Natural Gas	16 000	2 000	50 000	0.1	40	-	-	-	-	66 000
Oil	170	260	6 600	0.1	30	-	-	-	-	6 800
Natural Gas	51	620	16 000	-	-	-	-	-	-	16 000
Venting	10 000	1 100	28 000	-	-	-	-	-	-	38 000
Flaring	5 000	9	220	0.01	4	-	-	-	-	5 200
d. CO_2 Transport and Storage	**0.09**	-	-	-	-	**-**	**-**	**-**	**-**	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE	38 500	4.1	100	8.11	2 420	3 900	4 000	2 600	.	51 500
a. Mineral Products	**9 600**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**9 600**
Cement Production	7 000	-	-	-	-	-	-	-	-	7 000
Lime Production	1 640	-	-	-	-	-	-	-	-	1 640
Mineral Product Use	970	-	-	-	-	-	-	-	-	970
b. Chemical Industry	**2 600**	**4.1**	**100**	**6.8**	**2 000**	**-**	**-**	**-**	**-**	**4 700**
Ammonia Production	2 600	-	-	-	-	-	-	-	-	2 600
Nitric Acid Production	-	-	-	4.1	1 200	-	-	-	-	1 200
Adipic Acid Production	-	-	-	2.6	770	-	-	-	-	770
Petrochemical and Carbon Black Production[3]	-	4.1	100	0.02	5.4	-	-	-	-	110
c. Metal Production	**14 800**	**-**	**-**	**-**	**-**	**-**	**4 010**	**2 290**	**-**	**21 100**
Iron and Steel Production	10 600	-	-	-	-	-	-	-	-	10 600
Aluminum Production	4 200	-	-	-	-	-	4 010	41.9	-	8 260
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 250	-	2 250
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**3 900**	**37**	**260**	**0.2**	**4 200**
e. Non-Energy Products from Fuels and Solvent Use	**11 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**11 000**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**1.4**	**400**	**-**	**-**	**-**	**-**	**400**
AGRICULTURE	-	1 300	33 000	80	20 000	-	-	-	-	58 000
a. Enteric Fermentation	**-**	**1 200**	**29 000**	**-**	**-**	**-**	**-**	**-**	**-**	**29 000**
b. Manure Management	**-**	**160**	**4 100**	**17.9**	**5 330**	**-**	**-**	**-**	**-**	**9 400**
c. Agriculture Soils	**-**	**-**	**-**	**60**	**18 000**	**-**	**-**	**-**	**-**	**18 000**
Direct Sources	-	-	-	48	14 000	-	-	-	-	14 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
d. Field Burning of Agricultural Residues	-	3	90	0.09	30	-	-	-	-	100
e. Liming, Urea Application and Other Carbon-containing Fertilizers	1 000	-	-	-	-	-	-	-	-	1 000
WASTE	550	1 000	25 000	3	800	-	-	-	.	27 000
a. Solid Waste Disposal on Land	**-**	**990**	**25 000**	**-**	**-**	**-**	**-**	**-**	**-**	**25 000**
b. Wastewater Handling	**-**	**14**	**340**	**2**	**600**	**-**	**-**	**-**	**-**	**960**
c. Waste Incineration	**550**	**0.08**	**2**	**0.7**	**200**	**-**	**-**	**-**	**-**	**770**
LAND USE, LAND-USE CHANGE AND FORESTRY	-80 000	180	4 500	7.1	2 100	-	-	-	.	-73 000
a. Forest Land	**-230 000**	**140**	**3 500**	**5.8**	**1 700**	**-**	**-**	**-**	**-**	**-230 000**
b. Cropland	**-3 200**	**6**	**200**	**0.3**	**90**	**-**	**-**	**-**	**-**	**-2 900**
c. Grassland	**-**	**30**	**700**	**0.8**	**200**	**-**	**-**	**-**	**-**	**1 000**
d. Wetlands	**4 000**	**0.0**	**0.03**	**0.0**	**0.01**	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**3 000**	**5**	**100**	**0.2**	**60**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**150 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**150 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

\- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

Table A9–16 2000 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**572 000**	**4 900**	**120 000**	**130**	**40 000**	**3 600**	**5 000**	**2 900**	**0.2**	**745 000**
ENERGY	530 000	2 500	64 000	40	10 000	-	-	-	-	606 000
a. Stationary Combustion Sources	**343 000**	**400**	**9 000**	**10**	**3 000**	**-**	**-**	**-**	**.**	**355 000**
Public Electricity and Heat Production	131 000	5	120	2	700	-	-	-	-	131 000
Petroleum Refining Industries	17 200	0.3	7	0.2	60	-	-	-	-	17 000
Mining and Upstream Oil and Gas Production	60 100	110	2 800	1	400	-	-	-	-	63 400
Manufacturing Industries	55 500	3	70	2	600	-	-	-	-	56 200
Iron and Steel	6 160	0.3	7	0.2	60	-	-	-	-	6 230
Non Ferrous Metals	3 580	0.07	2	0.05	20	-	-	-	-	3 590
Chemical	10 800	0.22	5.4	0.2	60	-	-	-	-	10 800
Pulp and Paper	12 300	2	40	1	400	-	-	-	-	12 600
Cement	4 610	0.17	4.3	0.05	20	-	-	-	-	4 630
Other Manufacturing	18 100	0.49	12	0.4	100	-	-	-	-	18 200
Construction	1 080	0.02	0.46	0.03	8	-	-	-	-	1 080
Commercial and Institutional	32 800	0.61	15	0.7	200	-	-	-	-	33 100
Residential	42 700	200	6 000	3	1 000	-	-	-	-	49 700
Agriculture and Forestry	2 550	0.04	1.1	0.06	18	-	-	-	-	2 570
b. Transport[2]	**172 000**	**40**	**900**	**30**	**9 000**	**-**	**-**	**-**	**-**	**182 000**
Domestic Aviation	7 640	0.4	9	0.2	70	-	-	-	-	7 700
Road Transportation	113 000	10	300	18	5 500	-	-	-	-	119 000
Light-Duty Gasoline Vehicles	39 700	5.2	130	8.5	2 500	-	-	-	-	42 400
Light-Duty Gasoline Trucks	34 200	4	99	8.1	2 400	-	-	-	-	36 700
Heavy-Duty Gasoline Vehicles	5 440	0.5	12	0.27	81	-	-	-	-	5 530
Motorcycles	161	0.09	2.3	0.0	0.9	-	-	-	-	164
Light-Duty Diesel Vehicles	459	0.01	0.3	0.04	10	-	-	-	-	470
Light-Duty Diesel Trucks	1 640	0.04	1	0.1	40	-	-	-	-	1 680
Heavy-Duty Diesel Vehicles	30 700	1	30	1	400	-	-	-	-	31 100
Propane and Natural Gas Vehicles	1 070	1	20	0.02	6	-	-	-	-	1 100
Railways	5 880	0.3	8	2	700	-	-	-	-	6 600
Domestic Navigation	4 890	0.3	9	1	300	-	-	-	-	5 200
Other Transportation	39 900	20	600	9	3 000	-	-	-	-	43 000
Off-Road Gasoline	8 560	10	300	0.2	60	-	-	-	-	8 900
Off-Road Diesel	20 400	1	30	8	2 000	-	-	-	-	23 000
Pipeline Transport	11 000	11	270	0.3	90	-	-	-	-	11 300
c. Fugitive Sources	**16 000**	**2 100**	**54 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**70 000**
Coal Mining	-	70	2 000	-	-	-	-	-	-	2 000
Oil and Natural Gas	16 000	2 100	52 000	0.1	40	-	-	-	-	68 000
Oil	130	250	6 300	0.1	30	-	-	-	-	6 500
Natural Gas	54	700	17 000	-	-	-	-	-	-	18 000
Venting	10 000	1 100	28 000	-	-	-	-	-	-	38 000
Flaring	5 600	7	170	0.01	3	-	-	-	-	5 700
d. CO_2 Transport and Storage	**0.09**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE	39 400	4.2	110	8.34	2 490	3 600	5 000	2 900	.	53 400
a. Mineral Products	**10 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**10 000**
Cement Production	7 200	-	-	-	-	-	-	-	-	7 200
Lime Production	1 870	-	-	-	-	-	-	-	-	1 870
Mineral Product Use	1 200	-	-	-	-	-	-	-	-	1 200
b. Chemical Industry	**3 000**	**4.2**	**110**	**6.9**	**2 100**	**-**	**-**	**-**	**-**	**5 100**
Ammonia Production	2 960	-	-	-	-	-	-	-	-	2 960
Nitric Acid Production	-	-	-	4	1 200	-	-	-	-	1 200
Adipic Acid Production	-	-	-	2.9	870	-	-	-	-	870
Petrochemical and Carbon Black Production[3]	-	4.2	110	0.02	6	-	-	-	-	110
c. Metal Production	**15 400**	**-**	**-**	**-**	**-**	**-**	**4 950**	**2 700**	**-**	**23 100**
Iron and Steel Production	11 500	-	-	-	-	-	-	-	-	11 500
Aluminum Production	3 900	-	-	-	-	-	4 950	45.1	-	8 890
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 660	-	2 660
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**3 600**	**37**	**200**	**0.2**	**3 800**
e. Non-Energy Products from Fuels and Solvent Use	**11 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**11 000**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**1.5**	**430**	**-**	**-**	**-**	**-**	**430**
AGRICULTURE	-	1 300	33 000	80	20 000	-	-	-	-	59 000
a. Enteric Fermentation	**-**	**1 100**	**28 000**	**-**	**-**	**-**	**-**	**-**	**-**	**28 000**
b. Manure Management	**-**	**160**	**4 000**	**17.4**	**5 180**	**-**	**-**	**-**	**-**	**9 200**
c. Agriculture Soils	**-**	**-**	**-**	**65**	**19 000**	**-**	**-**	**-**	**-**	**19 000**
Direct Sources	-	-	-	52	16 000	-	-	-	-	16 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
d. Field Burning of Agricultural Residues	-	4	100	0.1	30	-	-	-	-	100
e. Liming, Urea Application and Other Carbon-containing Fertilizers	2 000	-	-	-	-	-	-	-	-	2 000
WASTE	530	1 000	25 000	3	800	-	-	-	.	26 000
a. Solid Waste Disposal on Land	**-**	**990**	**25 000**	**-**	**-**	**-**	**-**	**-**	**-**	**25 000**
b. Wastewater Handling	**-**	**14**	**350**	**2**	**600**	**-**	**-**	**-**	**-**	**950**
c. Waste Incineration	**530**	**0.07**	**2**	**0.7**	**200**	**-**	**-**	**-**	**-**	**740**
LAND USE, LAND-USE CHANGE AND FORESTRY	-80 000	100	2 600	3.9	1 200	-	-	-	.	-77 000
a. Forest Land	**-250 000**	**62**	**1 600**	**2.6**	**780**	**-**	**-**	**-**	**-**	**-250 000**
b. Cropland	**-2 300**	**5**	**100**	**0.3**	**80**	**-**	**-**	**-**	**-**	**-2 100**
c. Grassland	**-**	**30**	**800**	**0.8**	**200**	**-**	**-**	**-**	**-**	**1 000**
d. Wetlands	**4 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**3 000**	**5**	**100**	**0.2**	**60**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**170 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**170 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding

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Table A9–17 1999 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**549 000**	**4 800**	**120 000**	**140**	**40 000**	**3 000**	**5 400**	**2 400**	**0.2**	**722 000**
ENERGY	508 000	2 600	64 000	40	10 000	-	-	-	-	584 000
a. Stationary Combustion Sources	**321 000**	**400**	**9 000**	**10**	**3 000**	**-**	**-**	**-**	**.**	**333 000**
Public Electricity and Heat Production	119 000	4	100	2	700	-	-	-	-	120 000
Petroleum Refining Industries	17 200	0.3	7	0.2	50	-	-	-	-	17 000
Mining and Upstream Oil and Gas Production	56 300	110	2 800	1	400	-	-	-	-	59 400
Manufacturing Industries	55 200	3	70	2	600	-	-	-	-	55 900
Iron and Steel	6 280	0.3	7	0.2	60	-	-	-	-	6 350
Non Ferrous Metals	3 680	0.07	2	0.05	20	-	-	-	-	3 700
Chemical	11 100	0.23	5.7	0.2	60	-	-	-	-	11 200
Pulp and Paper	12 200	2	40	1	400	-	-	-	-	12 600
Cement	4 430	0.16	3.9	0.05	20	-	-	-	-	4 450
Other Manufacturing	17 500	0.48	12	0.4	100	-	-	-	-	17 600
Construction	1 160	0.02	0.5	0.03	10	-	-	-	-	1 170
Commercial and Institutional	28 900	0.53	13	0.6	200	-	-	-	-	29 100
Residential	40 400	200	6 000	3	1 000	-	-	-	-	47 600
Agriculture and Forestry	2 660	0.04	1.1	0.06	18	-	-	-	-	2 680
b. Transport[2]	**171 000**	**40**	**900**	**30**	**9 000**	**-**	**-**	**-**	**-**	**181 000**
Domestic Aviation	7 730	0.4	9	0.2	70	-	-	-	-	7 800
Road Transportation	112 000	10	300	18	5 500	-	-	-	-	118 000
Light-Duty Gasoline Vehicles	40 000	5.3	130	8.7	2 600	-	-	-	-	42 800
Light-Duty Gasoline Trucks	33 400	3.9	97	7.9	2 400	-	-	-	-	35 900
Heavy-Duty Gasoline Vehicles	5 360	0.53	13	0.25	73	-	-	-	-	5 440
Motorcycles	144	0.09	2.3	0.0	0.82	-	-	-	-	147
Light-Duty Diesel Vehicles	439	0.01	0.3	0.03	10	-	-	-	-	449
Light-Duty Diesel Trucks	1 540	0.04	1	0.1	40	-	-	-	-	1 570
Heavy-Duty Diesel Vehicles	29 900	1	30	1	400	-	-	-	-	30 300
Propane and Natural Gas Vehicles	1 470	1	30	0.03	9	-	-	-	-	1 500
Railways	5 690	0.3	8	2	700	-	-	-	-	6 400
Domestic Navigation	4 720	0.3	8	1	300	-	-	-	-	5 100
Other Transportation	40 100	20	600	8	2 000	-	-	-	-	43 000
Off-Road Gasoline	9 160	10	300	0.2	60	-	-	-	-	9 500
Off-Road Diesel	18 800	1	30	8	2 000	-	-	-	-	21 000
Pipeline Transport	12 200	12	310	0.3	100	-	-	-	-	12 600
c. Fugitive Sources	**16 000**	**2 200**	**54 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**70 000**
Coal Mining	-	70	2 000	-	-	-	-	-	-	2 000
Oil and Natural Gas	16 000	2 100	52 000	0.1	40	-	-	-	-	69 000
Oil	130	250	6 200	0.1	30	-	-	-	-	6 400
Natural Gas	53	780	19 000	-	-	-	-	-	-	19 000
Venting	11 000	1 100	27 000	-	-	-	-	-	-	37 000
Flaring	5 400	8.2	200	0.01	3	-	-	-	-	5 600
d. CO_2 Transport and Storage	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE	39 400	4.1	100	10.8	3 200	3 000	5 400	2 400	.	53 500
a. Mineral Products	**9 900**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**9 900**
Cement Production	7 100	-	-	-	-	-	-	-	-	7 100
Lime Production	1 920	-	-	-	-	-	-	-	-	1 920
Mineral Product Use	960	-	-	-	-	-	-	-	-	960
b. Chemical Industry	**3 000**	**4.1**	**100**	**9.4**	**2 800**	**-**	**-**	**-**	**-**	**5 900**
Ammonia Production	3 000	-	-	-	-	-	-	-	-	3 000
Nitric Acid Production	-	-	-	3.8	1 100	-	-	-	-	1 100
Adipic Acid Production	-	-	-	5.6	1 700	-	-	-	-	1 700
Petrochemical and Carbon Black Production[3]	-	4.1	100	0.02	6.7	-	-	-	-	110
c. Metal Production	**15 400**	**-**	**-**	**-**	**-**	**-**	**5 340**	**2 220**	**-**	**23 000**
Iron and Steel Production	11 500	-	-	-	-	-	-	-	-	11 500
Aluminum Production	3 950	-	-	-	-	-	5 340	51.1	-	9 340
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 160	-	2 160
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**3 000**	**28**	**200**	**0.2**	**3 200**
e. Non-Energy Products from Fuels and Solvent Use	**11 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**11 000**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**1.3**	**390**	**-**	**-**	**-**	**-**	**390**
AGRICULTURE	-	1 300	32 000	80	20 000	-	-	-	-	58 000
a. Enteric Fermentation	**-**	**1 100**	**28 000**	**-**	**-**	**-**	**-**	**-**	**-**	**28 000**
b. Manure Management	**-**	**160**	**3 900**	**16.9**	**5 050**	**-**	**-**	**-**	**-**	**8 900**
c. Agriculture Soils	**-**	**-**	**-**	**65**	**19 000**	**-**	**-**	**-**	**-**	**19 000**
Direct Sources	-	-	-	53	16 000	-	-	-	-	16 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
d. Field Burning of Agricultural Residues	-	5	100	0.1	30	-	-	-	-	100
e. Liming, Urea Application and Other Carbon-containing Fertilizers	2 000	-	-	-	-	-	-	-	-	2 000
WASTE	480	1 000	25 000	3	800	-	-	-	.	26 000
a. Solid Waste Disposal on Land	**-**	**990**	**25 000**	**-**	**-**	**-**	**-**	**-**	**-**	**25 000**
b. Wastewater Handling	**-**	**15**	**360**	**2**	**600**	**-**	**-**	**-**	**-**	**960**
c. Waste Incineration	**480**	**0.06**	**1**	**0.6**	**200**	**-**	**-**	**-**	**-**	**660**
LAND USE, LAND-USE CHANGE AND FORESTRY	-25 000	330	8 300	14	4 100	-	-	-	.	-12 000
a. Forest Land	**-190 000**	**300**	**7 400**	**13**	**3 700**	**-**	**-**	**-**	**-**	**-180 000**
b. Cropland	**-990**	**6**	**100**	**0.3**	**90**	**-**	**-**	**-**	**-**	**-750**
c. Grassland	**-**	**20**	**600**	**0.6**	**200**	**-**	**-**	**-**	**-**	**800**
d. Wetlands	**5 000**	**2**	**40**	**0.07**	**20**	**-**	**-**	**-**	**-**	**5 000**
e. Settlements	**3 000**	**5**	**100**	**0.2**	**60**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**160 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**160 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

Table A9–18 1998 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**534 000**	**4 900**	**120 000**	**140**	**43 000**	**2 400**	**6 500**	**2 400**	**0.3**	**709 000**
ENERGY	493 000	2 600	65 000	40	10 000	-	-	-	-	570 000
a. Stationary Combustion Sources	**309 000**	**400**	**9 000**	**10**	**3 000**	**-**	**-**	**-**	**.**	**321 000**
Public Electricity and Heat Production	122 000	4	99	2	700	-	-	-	-	123 000
Petroleum Refining Industries	18 200	0.3	7	0.2	50	-	-	-	-	18 000
Mining and Upstream Oil and Gas Production	45 200	86	2 100	1	300	-	-	-	-	47 700
Manufacturing Industries	54 200	3	70	2	600	-	-	-	-	54 800
Iron and Steel	6 180	0.3	7	0.2	60	-	-	-	-	6 250
Non Ferrous Metals	3 870	0.08	2	0.06	20	-	-	-	-	3 890
Chemical	10 800	0.22	5.5	0.2	60	-	-	-	-	10 800
Pulp and Paper	11 800	1	40	1	300	-	-	-	-	12 200
Cement	4 160	0.15	3.9	0.05	20	-	-	-	-	4 180
Other Manufacturing	17 400	0.48	12	0.4	100	-	-	-	-	17 500
Construction	1 110	0.02	0.47	0.03	10	-	-	-	-	1 120
Commercial and Institutional	27 300	0.5	13	0.6	200	-	-	-	-	27 500
Residential	38 600	300	7 000	3	1 000	-	-	-	-	46 100
Agriculture and Forestry	2 580	0.04	1.1	0.06	17	-	-	-	-	2 600
b. Transport[2]	**167 000**	**40**	**900**	**30**	**9 000**	**-**	**-**	**-**	**-**	**176 000**
Domestic Aviation	7 360	0.4	9	0.2	70	-	-	-	-	7 400
Road Transportation	109 000	10	300	18	5 200	-	-	-	-	115 000
Light-Duty Gasoline Vehicles	39 100	5.4	130	8.6	2 600	-	-	-	-	41 800
Light-Duty Gasoline Trucks	31 400	3.7	91	7.4	2 200	-	-	-	-	33 700
Heavy-Duty Gasoline Vehicles	5 820	0.64	16	0.23	69	-	-	-	-	5 910
Motorcycles	147	0.11	2.6	0.0	0.86	-	-	-	-	151
Light-Duty Diesel Vehicles	421	0.01	0.3	0.03	10	-	-	-	-	430
Light-Duty Diesel Trucks	1 540	0.04	1	0.1	40	-	-	-	-	1 580
Heavy-Duty Diesel Vehicles	29 300	1	30	1	400	-	-	-	-	29 700
Propane and Natural Gas Vehicles	1 740	1	30	0.03	10	-	-	-	-	1 800
Railways	5 380	0.3	7	2	700	-	-	-	-	6 000
Domestic Navigation	4 890	0.3	9	1	300	-	-	-	-	5 200
Other Transportation	39 400	20	600	8	2 000	-	-	-	-	42 000
Off-Road Gasoline	9 750	10	300	0.2	60	-	-	-	-	10 000
Off-Road Diesel	17 500	1	20	7	2 000	-	-	-	-	20 000
Pipeline Transport	12 100	12	300	0.3	100	-	-	-	-	12 500
c. Fugitive Sources	**18 000**	**2 200**	**55 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**73 000**
Coal Mining	-	80	2 000	-	-	-	-	-	-	2 000
Oil and Natural Gas	18 000	2 100	53 000	0.1	40	-	-	-	-	71 000
Oil	120	250	6 300	0.1	30	-	-	-	-	6 400
Natural Gas	59	800	20 000	-	-	-	-	-	-	20 000
Venting	10 000	1 100	27 000	-	-	-	-	-	-	37 000
Flaring	7 100	9	230	0.02	5	-	-	-	-	7 400
d. CO_2 Transport and Storage	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE	38 200	3.6	91	21	6 260	2 400	6 500	2 400	.	55 800
a. Mineral Products	**9 700**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**9 700**
Cement Production	6 800	-	-	-	-	-	-	-	-	6 800
Lime Production	1 850	-	-	-	-	-	-	-	-	1 850
Mineral Product Use	1 100	-	-	-	-	-	-	-	-	1 100
b. Chemical Industry	**3 100**	**3.6**	**91**	**20**	**5 900**	**-**	**-**	**-**	**-**	**9 100**
Ammonia Production	3 100	-	-	-	-	-	-	-	-	3 100
Nitric Acid Production	-	-	-	3.3	1 000	-	-	-	-	1 000
Adipic Acid Production	-	-	-	16	4 900	-	-	-	-	4 900
Petrochemical and Carbon Black Production[3]	-	3.6	91	0.02	7.2	-	-	-	-	98
c. Metal Production	**15 200**	**-**	**-**	**-**	**-**	**-**	**6 450**	**2 160**	**-**	**23 800**
Iron and Steel Production	11 200	-	-	-	-	-	-	-	-	11 200
Aluminum Production	3 980	-	-	-	-	-	6 450	56.4	-	10 500
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 100	-	2 100
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**2 400**	**22**	**200**	**0.3**	**2 600**
e. Non-Energy Products from Fuels and Solvent Use	**10 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**10 000**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**1.3**	**390**	**-**	**-**	**-**	**-**	**390**
AGRICULTURE	-	1 300	32 000	80	20 000	-	-	-	-	58 000
a. Enteric Fermentation	**-**	**1 100**	**28 000**	**-**	**-**	**-**	**-**	**-**	**-**	**28 000**
b. Manure Management	**-**	**150**	**3 900**	**16.7**	**4 960**	**-**	**-**	**-**	**-**	**8 800**
c. Agriculture Soils	**-**	**-**	**-**	**64**	**19 000**	**-**	**-**	**-**	**-**	**19 000**
Direct Sources	-	-	-	52	16 000	-	-	-	-	16 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
d. Field Burning of Agricultural Residues	-	6	200	0.2	50	-	-	-	-	200
e. Liming, Urea Application and Other Carbon-containing Fertilizers	2 000	-	-	-	-	-	-	-	-	2 000
WASTE	530	980	25 000	3	800	-	-	-	.	26 000
a. Solid Waste Disposal on Land	**-**	**970**	**24 000**	**-**	**-**	**-**	**-**	**-**	**-**	**24 000**
b. Wastewater Handling	**-**	**15**	**380**	**2**	**600**	**-**	**-**	**-**	**-**	**960**
c. Waste Incineration	**530**	**0.06**	**2**	**0.7**	**200**	**-**	**-**	**-**	**-**	**730**
LAND USE, LAND-USE CHANGE AND FORESTRY	94 000	800	20 000	33	9 900	-	-	-	.	120 000
a. Forest Land	**-69 000**	**760**	**19 000**	**32**	**9 600**	**-**	**-**	**-**	**-**	**-41 000**
b. Cropland	**300**	**6**	**200**	**0.3**	**90**	**-**	**-**	**-**	**-**	**540**
c. Grassland	**-**	**20**	**500**	**0.5**	**200**	**-**	**-**	**-**	**-**	**700**
d. Wetlands	**4 000**	**0.9**	**20**	**0.04**	**10**	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**3 000**	**5**	**100**	**0.2**	**50**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**160 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**160 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

Table A9–19 1997 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**524 000**	**4 800**	**120 000**	**160**	**47 000**	**1 900**	**6 400**	**1 800**	**0.3**	**701 000**
ENERGY	485 000	2 500	64 000	40	10 000	-	-	-	-	560 000
a. Stationary Combustion Sources	**305 000**	**300**	**8 000**	**9**	**3 000**	**-**	**-**	**-**	**.**	**316 000**
Public Electricity and Heat Production	109 000	3.2	81	2	600	-	-	-	-	110 000
Petroleum Refining Industries	18 500	0.3	8	0.2	60	-	-	-	-	19 000
Mining and Upstream Oil and Gas Production	42 200	73	1 800	1	300	-	-	-	-	44 300
Manufacturing Industries	57 200	3	60	2	600	-	-	-	-	57 800
Iron and Steel	6 120	0.3	7	0.2	60	-	-	-	-	6 180
Non Ferrous Metals	3 880	0.08	2	0.06	20	-	-	-	-	3 900
Chemical	10 200	0.21	5.3	0.2	50	-	-	-	-	10 200
Pulp and Paper	12 900	1	40	1	300	-	-	-	-	13 300
Cement	4 010	0.12	3	0.05	10	-	-	-	-	4 030
Other Manufacturing	20 100	0.43	11	0.4	100	-	-	-	-	20 200
Construction	1 240	0.02	0.51	0.03	10	-	-	-	-	1 250
Commercial and Institutional	29 900	0.54	14	0.6	200	-	-	-	-	30 100
Residential	43 700	200	6 000	3	1 000	-	-	-	-	50 800
Agriculture and Forestry	2 900	0.04	1.1	0.07	20	-	-	-	-	2 920
b. Transport[2]	**163 000**	**40**	**900**	**30**	**9 000**	**-**	**-**	**-**	**-**	**173 000**
Domestic Aviation	7 070	0.3	8	0.2	60	-	-	-	-	7 100
Road Transportation	107 000	10	300	17	5 100	-	-	-	-	112 000
Light-Duty Gasoline Vehicles	40 400	5.7	140	8.8	2 600	-	-	-	-	43 200
Light-Duty Gasoline Trucks	29 200	3.4	86	6.9	2 000	-	-	-	-	31 300
Heavy-Duty Gasoline Vehicles	5 730	0.71	18	0.19	56	-	-	-	-	5 800
Motorcycles	125	0.1	2.5	0.0	0.74	-	-	-	-	129
Light-Duty Diesel Vehicles	406	0.01	0.3	0.03	9	-	-	-	-	416
Light-Duty Diesel Trucks	1 400	0.04	0.9	0.1	30	-	-	-	-	1 430
Heavy-Duty Diesel Vehicles	27 500	1	30	1	300	-	-	-	-	27 900
Propane and Natural Gas Vehicles	1 800	1	30	0.04	10	-	-	-	-	1 800
Railways	5 580	0.3	8	2	700	-	-	-	-	6 300
Domestic Navigation	4 250	0.3	7	1	300	-	-	-	-	4 600
Other Transportation	39 700	20	600	8	2 000	-	-	-	-	43 000
Off-Road Gasoline	8 630	10	300	0.2	60	-	-	-	-	8 900
Off-Road Diesel	18 900	1	30	8	2 000	-	-	-	-	21 000
Pipeline Transport	12 200	12	310	0.3	100	-	-	-	-	12 600
c. Fugitive Sources	**16 000**	**2 200**	**55 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**71 000**
Coal Mining	-	90	2 000	-	-	-	-	-	-	2 000
Oil and Natural Gas	16 000	2 100	52 000	0.1	40	-	-	-	-	69 000
Oil	120	260	6 500	0.1	30	-	-	-	-	6 600
Natural Gas	47	740	18 000	-	-	-	-	-	-	18 000
Venting	10 000	1 100	27 000	-	-	-	-	-	-	38 000
Flaring	5 600	7.8	200	0.01	3	-	-	-	-	5 800
d. CO_2 Transport and Storage	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE	37 800	3.8	95	36.1	10 700	1 900	6 400	1 800	.	58 700
a. Mineral Products	**9 600**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**9 600**
Cement Production	6 600	-	-	-	-	-	-	-	-	6 600
Lime Production	1 860	-	-	-	-	-	-	-	-	1 860
Mineral Product Use	1 100	-	-	-	-	-	-	-	-	1 100
b. Chemical Industry	**2 800**	**3.8**	**95**	**35**	**11 000**	**-**	**-**	**-**	**-**	**13 000**
Ammonia Production	2 800	-	-	-	-	-	-	-	-	2 800
Nitric Acid Production	-	-	-	3.4	1 000	-	-	-	-	1 000
Adipic Acid Production	-	-	-	32	9 500	-	-	-	-	9 500
Petrochemical and Carbon Black Production[3]	-	3.8	95	0.03	8.1	-	-	-	-	100
c. Metal Production	**14 900**	**-**	**-**	**-**	**-**	**-**	**6 350**	**1 650**	**-**	**22 900**
Iron and Steel Production	11 000	-	-	-	-	-	-	-	-	11 000
Aluminum Production	3 930	-	-	-	-	-	6 350	56.4	-	10 300
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	1 600	-	1 600
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**1 900**	**23**	**180**	**0.3**	**2 100**
e. Non-Energy Products from Fuels and Solvent Use	**11 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**11 000**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.74**	**220**	**-**	**-**	**-**	**-**	**220**
AGRICULTURE	-	1 300	32 000	80	20 000	-	-	-	-	57 000
a. Enteric Fermentation	**-**	**1 100**	**28 000**	**-**	**-**	**-**	**-**	**-**	**-**	**28 000**
b. Manure Management	**-**	**150**	**3 800**	**16.4**	**4 880**	**-**	**-**	**-**	**-**	**8 700**
c. Agriculture Soils	**-**	**-**	**-**	**63**	**19 000**	**-**	**-**	**-**	**-**	**19 000**
Direct Sources	-	-	-	51	15 000	-	-	-	-	15 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
d. Field Burning of Agricultural Residues	-	6	100	0.1	40	-	-	-	-	200
e. Liming, Urea Application and Other Carbon-containing Fertilizers	2 000	-	-	-	-	-	-	-	-	2 000
WASTE	500	970	24 000	3	700	-	-	-	.	26 000
a. Solid Waste Disposal on Land	**-**	**960**	**24 000**	**-**	**-**	**-**	**-**	**-**	**-**	**24 000**
b. Wastewater Handling	**-**	**16**	**390**	**2**	**600**	**-**	**-**	**-**	**-**	**960**
c. Waste Incineration	**500**	**0.05**	**1**	**0.6**	**200**	**-**	**-**	**-**	**-**	**680**
LAND USE, LAND-USE CHANGE AND FORESTRY	-92 000	110	2 800	4.4	1 300	-	-	-	.	-88 000
a. Forest Land	**-260 000**	**84**	**2 100**	**3.5**	**1 000**	**-**	**-**	**-**	**-**	**-260 000**
b. Cropland	**1 600**	**6**	**200**	**0.3**	**90**	**-**	**-**	**-**	**-**	**1 900**
c. Grassland	**-**	**20**	**400**	**0.4**	**100**	**-**	**-**	**-**	**-**	**600**
d. Wetlands	**4 000**	**0.1**	**4**	**0.01**	**2**	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**3 000**	**5**	**100**	**0.2**	**50**	**-**	**-**	**-**	**-**	**3 000**
f. Harvested Wood Products	**160 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**160 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

\- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

Table A9–20 1996 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**510 000**	**4 700**	**120 000**	**160**	**48 000**	**1 400**	**6 500**	**1 800**	**0.3**	**685 000**
ENERGY	471 000	2 500	62 000	40	10 000	-	-	-	-	544 000
a. Stationary Combustion Sources	**298 000**	**300**	**8 000**	**9**	**3 000**	**-**	**-**	**-**	**-**	**309 000**
Public Electricity and Heat Production	97 800	2.6	66	2	500	-	-	-	-	98 400
Petroleum Refining Industries	18 700	0.3	8	0.2	60	-	-	-	-	19 000
Mining and Upstream Oil and Gas Production	43 600	77	1 900	1	300	-	-	-	-	45 800
Manufacturing Industries	57 000	3	60	2	600	-	-	-	-	57 700
Iron and Steel	6 100	0.3	7	0.2	60	-	-	-	-	6 170
Non Ferrous Metals	4 000	0.08	2	0.06	20	-	-	-	-	4 020
Chemical	9 860	0.21	5.1	0.2	50	-	-	-	-	9 920
Pulp and Paper	13 100	1	30	1	300	-	-	-	-	13 500
Cement	4 100	0.18	4.6	0.05	20	-	-	-	-	4 120
Other Manufacturing	19 800	0.42	11	0.4	100	-	-	-	-	20 000
Construction	1 260	0.02	0.52	0.03	10	-	-	-	-	1 270
Commercial and Institutional	29 400	0.53	13	0.6	200	-	-	-	-	29 600
Residential	47 000	300	6 000	3	1 000	-	-	-	-	54 400
Agriculture and Forestry	2 910	0.04	1.1	0.07	20	-	-	-	-	2 930
b. Transport[2]	**158 000**	**40**	**900**	**30**	**8 000**	**-**	**-**	**-**	**-**	**167 000**
Domestic Aviation	7 020	0.3	8	0.2	60	-	-	-	-	7 100
Road Transportation	102 000	10	300	16	4 800	-	-	-	-	107 000
Light-Duty Gasoline Vehicles	40 500	5.9	150	8.7	2 600	-	-	-	-	43 200
Light-Duty Gasoline Trucks	26 700	3.2	81	6.2	1 800	-	-	-	-	28 600
Heavy-Duty Gasoline Vehicles	5 830	0.77	19	0.16	48	-	-	-	-	5 890
Motorcycles	119	0.11	2.7	0.0	0.72	-	-	-	-	122
Light-Duty Diesel Vehicles	406	0.01	0.3	0.03	9	-	-	-	-	415
Light-Duty Diesel Trucks	1 280	0.03	0.8	0.1	30	-	-	-	-	1 310
Heavy-Duty Diesel Vehicles	25 500	1	30	0.9	300	-	-	-	-	25 800
Propane and Natural Gas Vehicles	1 940	1	30	0.04	10	-	-	-	-	2 000
Railways	5 500	0.3	8	2	700	-	-	-	-	6 200
Domestic Navigation	4 170	0.3	7	1	300	-	-	-	-	4 500
Other Transportation	38 600	20	600	8	2 000	-	-	-	-	41 000
Off-Road Gasoline	9 190	10	300	0.2	60	-	-	-	-	9 500
Off-Road Diesel	17 300	0.9	20	7	2 000	-	-	-	-	19 000
Pipeline Transport	12 100	12	300	0.3	100	-	-	-	-	12 500
c. Fugitive Sources	**16 000**	**2 100**	**53 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**69 000**
Coal Mining	-	90	2 000	-	-	-	-	-	-	2 000
Oil and Natural Gas	16 000	2 000	50 000	0.1	40	-	-	-	-	66 000
Oil	120	250	6 200	0.1	30	-	-	-	-	6 300
Natural Gas	52	750	19 000	-	-	-	-	-	-	19 000
Venting	10 000	1 000	25 000	-	-	-	-	-	-	36 000
Flaring	5 400	7.7	190	0.01	3	-	-	-	-	5 600
d. CO_2 Transport and Storage	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE	36 800	4	99	41.3	12 300	1 400	6 500	1 800	-	58 900
a. Mineral Products	**8 900**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8 900**
Cement Production	6 100	-	-	-	-	-	-	-	-	6 100
Lime Production	1 800	-	-	-	-	-	-	-	-	1 800
Mineral Product Use	1 000	-	-	-	-	-	-	-	-	1 000
b. Chemical Industry	**2 800**	**4**	**99**	**41**	**12 000**	**-**	**-**	**-**	**-**	**15 000**
Ammonia Production	2 800	-	-	-	-	-	-	-	-	2 800
Nitric Acid Production	-	-	-	3.6	1 100	-	-	-	-	1 100
Adipic Acid Production	-	-	-	37	11 000	-	-	-	-	11 000
Petrochemical and Carbon Black Production[3]	-	4	99	0.03	7.8	-	-	-	-	110
c. Metal Production	**15 000**	**-**	**-**	**-**	**-**	**-**	**6 480**	**1 620**	**-**	**23 100**
Iron and Steel Production	11 200	-	-	-	-	-	-	-	-	11 200
Aluminum Production	3 860	-	-	-	-	-	6 480	56.4	-	10 400
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	1 560	-	1 560
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	-	-	-	-	-	**1 400**	**27**	**150**	**0.3**	**1 600**
e. Non-Energy Products from Fuels and Solvent Use	**10 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**10 000**
f. Other Product Manufacture and Use	-	-	-	**0.7**	**210**	**-**	**-**	**-**	**-**	**210**
AGRICULTURE	-	1 300	32 000	80	20 000	-	-	-	-	57 000
a. Enteric Fermentation	**-**	**1 100**	**28 000**	-	-	**-**	**-**	**-**	**-**	**28 000**
b. Manure Management	**-**	**150**	**3 800**	**16.3**	**4 850**	**-**	**-**	**-**	**-**	**8 700**
c. Agriculture Soils	**-**	**-**	**-**	**64**	**19 000**	**-**	**-**	**-**	**-**	**19 000**
Direct Sources	-	-	-	52	16 000	-	-	-	-	16 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
d. Field Burning of Agricultural Residues	-	5	100	0.1	40	-	-	-	-	200
e. Liming, Urea Application and Other Carbon-containing Fertilizers	1 000	-	-	-	-	-	-	-	-	1 000
WASTE	540	960	24 000	3	800	-	-	-	-	25 000
a. Solid Waste Disposal on Land	**-**	**940**	**24 000**	-	-	**-**	**-**	**-**	**-**	**24 000**
b. Wastewater Handling	**-**	**16**	**400**	**2**	**600**	**-**	**-**	**-**	**-**	**950**
c. Waste Incineration	**540**	**0.4**	**9**	**0.8**	**200**	**-**	**-**	**-**	**-**	**780**
LAND USE, LAND-USE CHANGE AND FORESTRY	-48 000	260	6 400	11	3 100	-	-	-	-	-38 000
a. Forest Land	**-220 000**	**230**	**5 800**	**9.7**	**2 900**	**-**	**-**	**-**	**-**	**-210 000**
b. Cropland	**2 900**	**6**	**200**	**0.3**	**100**	**-**	**-**	**-**	**-**	**3 200**
c. Grassland	-	**20**	**400**	**0.4**	**100**	**-**	**-**	**-**	**-**	**500**
d. Wetlands	**4 000**	-	-	-	-	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**3 000**	**4**	**100**	**0.2**	**50**	**-**	**-**	**-**	**-**	**3 000**
f. Harvested Wood Products	**160 000**	-	-	-	-	**-**	**-**	**-**	**-**	**160 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

Table A9–21 1995 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**494 000**	**4 600**	**110 000**	**150**	**46 000**	**960**	**6 300**	**2 300**	**0.3**	**664 000**
ENERGY	457 000	2 300	59 000	30	10 000	-	-	-	-	526 000
a. Stationary Combustion Sources	**289 000**	**300**	**9 000**	**9**	**3 000**	**-**	**-**	**-**	**.**	**300 000**
Public Electricity and Heat Production	98 300	3	74	2	600	-	-	-	-	98 900
Petroleum Refining Industries	16 000	0.3	7	0.2	50	-	-	-	-	16 000
Mining and Upstream Oil and Gas Production	44 000	78	1 900	1	300	-	-	-	-	46 200
Manufacturing Industries	55 400	3	60	2	600	-	-	-	-	56 100
Iron and Steel	5 730	0.3	7	0.2	60	-	-	-	-	5 800
Non Ferrous Metals	3 220	0.06	2	0.04	10	-	-	-	-	3 230
Chemical	10 200	0.21	5.2	0.2	50	-	-	-	-	10 300
Pulp and Paper	12 500	1	40	1	300	-	-	-	-	12 900
Cement	4 120	0.18	4.5	0.05	20	-	-	-	-	4 140
Other Manufacturing	19 600	0.41	10	0.4	100	-	-	-	-	19 700
Construction	1 170	0.02	0.48	0.03	9	-	-	-	-	1 180
Commercial and Institutional	28 800	0.52	13	0.6	200	-	-	-	-	29 000
Residential	42 300	300	6 000	3	1 000	-	-	-	-	49 800
Agriculture and Forestry	2 740	0.04	1.1	0.07	20	-	-	-	-	2 770
b. Transport[2]	**154 000**	**40**	**900**	**30**	**8 000**	**-**	**-**	**-**	**-**	**162 000**
Domestic Aviation	6 570	0.4	9	0.2	60	-	-	-	-	6 600
Road Transportation	103 000	10	300	16	4 600	-	-	-	-	108 000
Light-Duty Gasoline Vehicles	41 500	6.3	160	8.7	2 600	-	-	-	-	44 200
Light-Duty Gasoline Trucks	25 800	3.2	80	5.8	1 700	-	-	-	-	27 600
Heavy-Duty Gasoline Vehicles	6 240	0.87	22	0.14	43	-	-	-	-	6 310
Motorcycles	123	0.12	3.1	0.0	0.76	-	-	-	-	127
Light-Duty Diesel Vehicles	423	0.01	0.3	0.03	10	-	-	-	-	433
Light-Duty Diesel Trucks	1 290	0.03	0.8	0.1	30	-	-	-	-	1 320
Heavy-Duty Diesel Vehicles	26 100	1	30	0.8	200	-	-	-	-	26 400
Propane and Natural Gas Vehicles	2 060	1	30	0.04	10	-	-	-	-	2 100
Railways	5 630	0.3	8	2	700	-	-	-	-	6 300
Domestic Navigation	4 060	0.3	7	1	300	-	-	-	-	4 400
Other Transportation	33 900	20	500	6	2 000	-	-	-	-	36 000
Off-Road Gasoline	7 550	9	200	0.2	50	-	-	-	-	7 800
Off-Road Diesel	14 700	0.8	20	6	2 000	-	-	-	-	16 000
Pipeline Transport	11 700	12	290	0.3	100	-	-	-	-	12 000
c. Fugitive Sources	**15 000**	**2 000**	**49 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**64 000**
Coal Mining	-	90	2 000	-	-	-	-	-	-	2 000
Oil and Natural Gas	15 000	1 900	47 000	0.1	40	-	-	-	-	62 000
Oil	120	240	6 000	0.1	30	-	-	-	-	6 100
Natural Gas	39	680	17 000	-	-	-	-	-	-	17 000
Venting	9 600	950	24 000	-	-	-	-	-	-	33 000
Flaring	5 100	7.5	190	0.01	3	-	-	-	-	5 300
d. CO_2 Transport and Storage	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE	35 100	3.9	97	38.6	11 500	960	6 300	2 300	.	56 300
a. Mineral Products	**9 200**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**9 200**
Cement Production	6 500	-	-	-	-	-	-	-	-	6 500
Lime Production	1 860	-	-	-	-	-	-	-	-	1 860
Mineral Product Use	890	-	-	-	-	-	-	-	-	890
b. Chemical Industry	**2 900**	**3.9**	**97**	**38**	**11 000**	**-**	**-**	**-**	**-**	**14 000**
Ammonia Production	2 940	-	-	-	-	-	-	-	-	2 940
Nitric Acid Production	-	-	-	3.2	960	-	-	-	-	960
Adipic Acid Production	-	-	-	35	10 000	-	-	-	-	10 000
Petrochemical and Carbon Black Production[3]	-	3.9	97	0.03	8.3	-	-	-	-	100
c. Metal Production	**15 000**	**-**	**-**	**-**	**-**	**-**	**6 310**	**2 070**	**-**	**23 400**
Iron and Steel Production	11 300	-	-	-	-	-	-	-	-	11 300
Aluminum Production	3 640	-	-	-	-	-	6 310	56.4	-	10 000
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 010	-	2 010
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**960**	**35**	**210**	**0.3**	**1 200**
e. Non-Energy Products from Fuels and Solvent Use	**8 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8 000**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.69**	**200**	**-**	**-**	**-**	**-**	**200**
AGRICULTURE	-	1 200	31 000	80	20 000	-	-	-	-	56 000
a. Enteric Fermentation	**-**	**1 100**	**27 000**	**-**	**-**	**-**	**-**	**-**	**-**	**27 000**
b. Manure Management	**-**	**150**	**3 800**	**16.2**	**4 830**	**-**	**-**	**-**	**-**	**8 600**
c. Agriculture Soils	**-**	**-**	**-**	**61**	**18 000**	**-**	**-**	**-**	**-**	**18 000**
Direct Sources	-	-	-	50	15 000	-	-	-	-	15 000
Indirect Sources	-	-	-	10	3 000	-	-	-	-	3 000
d. Field Burning of Agricultural Residues	-	6	100	0.1	40	-	-	-	-	200
e. Liming, Urea Application and Other Carbon-containing Fertilizers	1 000	-	-	-	-	-	-	-	-	1 000
WASTE	580	960	24 000	3	800	-	-	-	.	25 000
a. Solid Waste Disposal on Land	**-**	**950**	**24 000**	**-**	**-**	**-**	**-**	**-**	**-**	**24 000**
b. Wastewater Handling	**-**	**16**	**390**	**2**	**500**	**-**	**-**	**-**	**-**	**940**
c. Waste Incineration	**580**	**0.4**	**9**	**0.9**	**300**	**-**	**-**	**-**	**-**	**840**
LAND USE, LAND-USE CHANGE AND FORESTRY	150 000	960	24 000	40	12 000	-	-	-	.	190 000
a. Forest Land	**-26 000**	**930**	**23 000**	**39**	**12 000**	**-**	**-**	**-**	**-**	**9 500**
b. Cropland	**4 000**	**7**	**200**	**0.4**	**100**	**-**	**-**	**-**	**-**	**4 300**
c. Grassland	**-**	**9**	**200**	**0.2**	**70**	**-**	**-**	**-**	**-**	**300**
d. Wetlands	**4 000**	**0.01**	**0.3**	**0.0**	**0.2**	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**3 000**	**4**	**100**	**0.2**	**50**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**170 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**170 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

Table A9–22 1994 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**482 000**	**4 400**	**110 000**	**150**	**45 000**	**-**	**6 900**	**2 400**	**0.3**	**646 000**
ENERGY	446 000	2 200	56 000	30	10 000	-	-	-	-	512 000
a. Stationary Combustion Sources	**282 000**	**400**	**9 000**	**9**	**3 000**	**-**	**-**	**-**	**.**	**293 000**
Public Electricity and Heat Production	94 900	2.5	64	2	500	-	-	-	-	95 500
Petroleum Refining Industries	15 700	0.3	6	0.2	50	-	-	-	-	16 000
Mining and Upstream Oil and Gas Production	42 500	76	1 900	1	300	-	-	-	-	44 700
Manufacturing Industries	53 700	3	60	2	600	-	-	-	-	54 300
Iron and Steel	5 970	0.3	7	0.2	60	-	-	-	-	6 040
Non Ferrous Metals	3 420	0.07	2	0.05	10	-	-	-	-	3 440
Chemical	9 950	0.2	5.1	0.2	50	-	-	-	-	10 000
Pulp and Paper	12 600	1	40	1	300	-	-	-	-	13 000
Cement	4 040	0.2	5.1	0.05	20	-	-	-	-	4 060
Other Manufacturing	17 700	0.38	9.6	0.3	100	-	-	-	-	17 800
Construction	1 390	0.02	0.58	0.03	10	-	-	-	-	1 400
Commercial and Institutional	27 300	0.52	13	0.6	200	-	-	-	-	27 500
Residential	43 500	300	7 000	4	1 000	-	-	-	-	51 400
Agriculture and Forestry	2 530	0.04	1.1	0.06	19	-	-	-	-	2 540
b. Transport[2]	**150 000**	**30**	**800**	**20**	**7 000**	**-**	**-**	**-**	**-**	**158 000**
Domestic Aviation	6 190	0.3	8	0.2	60	-	-	-	-	6 300
Road Transportation	102 000	10	300	15	4 400	-	-	-	-	107 000
Light-Duty Gasoline Vehicles	42 100	6.6	160	8.5	2 500	-	-	-	-	44 800
Light-Duty Gasoline Trucks	25 000	3.2	81	5.4	1 600	-	-	-	-	26 700
Heavy-Duty Gasoline Vehicles	6 690	0.96	24	0.16	48	-	-	-	-	6 760
Motorcycles	127	0.13	3.2	0.0	0.78	-	-	-	-	131
Light-Duty Diesel Vehicles	440	0.01	0.3	0.03	10	-	-	-	-	450
Light-Duty Diesel Trucks	1 130	0.03	0.7	0.08	30	-	-	-	-	1 150
Heavy-Duty Diesel Vehicles	24 600	1	30	0.7	200	-	-	-	-	24 900
Propane and Natural Gas Vehicles	1 890	1	30	0.04	10	-	-	-	-	1 900
Railways	6 210	0.3	8	3	800	-	-	-	-	7 000
Domestic Navigation	4 350	0.3	7	1	300	-	-	-	-	4 700
Other Transportation	31 000	20	500	6	2 000	-	-	-	-	33 000
Off-Road Gasoline	7 000	8	200	0.2	50	-	-	-	-	7 300
Off-Road Diesel	13 500	0.7	20	6	2 000	-	-	-	-	15 000
Pipeline Transport	10 500	10	260	0.3	90	-	-	-	-	10 800
c. Fugitive Sources	**14 000**	**1 900**	**46 000**	**0.1**	**40**	**-**	**-**	**-**	**-**	**61 000**
Coal Mining	-	100	3 000	-	-	-	-	-	-	3 000
Oil and Natural Gas	14 000	1 800	44 000	0.1	40	-	-	-	-	58 000
Oil	110	220	5 500	0.1	30	-	-	-	-	5 700
Natural Gas	36	650	16 000	-	-	-	-	-	-	16 000
Venting	9 300	880	22 000	-	-	-	-	-	-	31 000
Flaring	4 900	7.3	180	0.01	3	-	-	-	-	5 100
d. CO_2 Transport and Storage	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE	33 900	4	100	39.1	11 600	-	6 900	2 400	.	55 000
a. Mineral Products	**8 500**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8 500**
Cement Production	5 700	-	-	-	-	-	-	-	-	5 700
Lime Production	1 850	-	-	-	-	-	-	-	-	1 850
Mineral Product Use	930	-	-	-	-	-	-	-	-	930
b. Chemical Industry	**3 000**	**4**	**100**	**38**	**11 000**	**-**	**-**	**-**	**-**	**15 000**
Ammonia Production	3 030	-	-	-	-	-	-	-	-	3 030
Nitric Acid Production	-	-	-	3.1	920	-	-	-	-	920
Adipic Acid Production	-	-	-	35	11 000	-	-	-	-	11 000
Petrochemical and Carbon Black Production[3]	-	4	100	0.03	9	-	-	-	-	110
c. Metal Production	**14 700**	**-**	**-**	**-**	**-**	**-**	**6 890**	**2 240**	**-**	**23 800**
Iron and Steel Production	10 900	-	-	-	-	-	-	-	-	10 900
Aluminum Production	3 770	-	-	-	-	-	6 890	56.3	-	10 700
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 180	-	2 180
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**-**	**0.05**	**210**	**0.3**	**210**
e. Non-Energy Products from Fuels and Solvent Use	**7 700**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7 700**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.57**	**170**	**-**	**-**	**-**	**-**	**170**
AGRICULTURE	-	1 200	30 000	80	20 000	-	-	-	-	54 000
a. Enteric Fermentation	**-**	**1 000**	**26 000**	**-**	**-**	**-**	**-**	**-**	**-**	**26 000**
b. Manure Management	**-**	**140**	**3 600**	**15.5**	**4 610**	**-**	**-**	**-**	**-**	**8 200**
c. Agriculture Soils	**-**	**-**	**-**	**60**	**18 000**	**-**	**-**	**-**	**-**	**18 000**
Direct Sources	-	-	-	49	15 000	-	-	-	-	15 000
Indirect Sources	-	-	-	10	3 000	-	-	-	-	3 000
d. Field Burning of Agricultural Residues	-	6	100	0.1	40	-	-	-	-	200
e. Liming, Urea Application and Other Carbon-containing Fertilizers	1 000	-	-	-	-	-	-	-	-	1 000
WASTE	550	960	24 000	3	800	-	-	-	.	25 000
a. Solid Waste Disposal on Land	**-**	**950**	**24 000**	**-**	**-**	**-**	**-**	**-**	**-**	**24 000**
b. Wastewater Handling	**-**	**16**	**390**	**2**	**500**	**-**	**-**	**-**	**-**	**930**
c. Waste Incineration	**550**	**0.3**	**8**	**0.8**	**200**	**-**	**-**	**-**	**-**	**780**
LAND USE, LAND-USE CHANGE AND FORESTRY	-50 000	320	7 900	13	3 800	-	-	-	.	-38 000
a. Forest Land	**-220 000**	**280**	**6 900**	**12**	**3 400**	**-**	**-**	**-**	**-**	**-210 000**
b. Cropland	**5 100**	**8**	**200**	**0.4**	**100**	**-**	**-**	**-**	**-**	**5 400**
c. Grassland	**-**	**30**	**700**	**0.8**	**200**	**-**	**-**	**-**	**-**	**1 000**
d. Wetlands	**4 000**	**0.0**	**0.0**	**0.0**	**0.0**	**-**	**-**	**-**	**-**	**4 000**
e. Settlements	**4 000**	**4**	**100**	**0.2**	**50**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**160 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**160 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

Table A9–23 1993 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**467 000**	**4 200**	**110 000**	**140**	**42 000**	**-**	**7 500**	**2 400**	**0.3**	**625 000**
ENERGY	431 000	2 100	54 000	30	10 000	-	-	-	-	495 000
a. Stationary Combustion Sources	**276 000**	**300**	**9 000**	**9**	**3 000**	**-**	**-**	**-**	**.**	**287 000**
Public Electricity and Heat Production	92 700	2.5	62	2	500	-	-	-	-	93 200
Petroleum Refining Industries	16 800	0.3	7	0.2	50	-	-	-	-	17 000
Mining and Upstream Oil and Gas Production	40 900	73	1 800	0.9	300	-	-	-	-	43 000
Manufacturing Industries	50 300	2	60	2	500	-	-	-	-	50 900
Iron and Steel	5 350	0.3	6	0.2	60	-	-	-	-	5 420
Non Ferrous Metals	2 830	0.06	1	0.04	10	-	-	-	-	2 840
Chemical	8 480	0.17	4.3	0.1	40	-	-	-	-	8 530
Pulp and Paper	12 700	1	30	1	300	-	-	-	-	13 000
Cement	3 440	0.13	3.2	0.04	10	-	-	-	-	3 460
Other Manufacturing	17 500	0.38	9.5	0.4	100	-	-	-	-	17 600
Construction	1 380	0.02	0.59	0.03	10	-	-	-	-	1 390
Commercial and Institutional	27 900	0.51	13	0.6	200	-	-	-	-	28 100
Residential	42 800	300	7 000	3	1 000	-	-	-	-	50 400
Agriculture and Forestry	3 020	0.05	1.3	0.07	21	-	-	-	-	3 050
b. Transport[2]	**143 000**	**30**	**800**	**20**	**7 000**	**-**	**-**	**-**	**-**	**151 000**
Domestic Aviation	5 920	0.3	8	0.2	50	-	-	-	-	6 000
Road Transportation	96 400	10	300	14	4 100	-	-	-	-	101 000
Light-Duty Gasoline Vehicles	42 600	6.9	170	8	2 400	-	-	-	-	45 200
Light-Duty Gasoline Trucks	23 300	3.1	79	4.8	1 400	-	-	-	-	24 800
Heavy-Duty Gasoline Vehicles	6 220	0.94	24	0.16	47	-	-	-	-	6 290
Motorcycles	134	0.13	3.4	0.0	0.83	-	-	-	-	139
Light-Duty Diesel Vehicles	451	0.01	0.3	0.03	10	-	-	-	-	461
Light-Duty Diesel Trucks	952	0.03	0.6	0.07	20	-	-	-	-	974
Heavy-Duty Diesel Vehicles	20 800	1	30	0.6	200	-	-	-	-	21 000
Propane and Natural Gas Vehicles	1 990	1	30	0.04	10	-	-	-	-	2 000
Railways	6 010	0.3	8	2	700	-	-	-	-	6 700
Domestic Navigation	4 190	0.3	7	1	300	-	-	-	-	4 500
Other Transportation	30 300	20	500	6	2 000	-	-	-	-	33 000
Off-Road Gasoline	6 520	8	200	0.1	40	-	-	-	-	6 800
Off-Road Diesel	13 700	0.7	20	6	2 000	-	-	-	-	15 000
Pipeline Transport	10 000	10	250	0.3	80	-	-	-	-	10 400
c. Fugitive Sources	**13 000**	**1 800**	**44 000**	**0.1**	**30**	**-**	**-**	**-**	**-**	**57 000**
Coal Mining	-	100	3 000	-	-	-	-	-	-	3 000
Oil and Natural Gas	13 000	1 700	42 000	0.1	30	-	-	-	-	54 000
Oil	110	220	5 400	0.1	30	-	-	-	-	5 600
Natural Gas	34	610	15 000	-	-	-	-	-	-	15 000
Venting	8 000	830	21 000	-	-	-	-	-	-	29 000
Flaring	4 700	6.8	170	0.01	3	-	-	-	-	4 800
d. CO_2 Transport and Storage	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE	33 600	3.9	97	33.2	9 900	-	7 500	2 400	.	53 400
a. Mineral Products	**7 400**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7 400**
Cement Production	4 800	-	-	-	-	-	-	-	-	4 800
Lime Production	1 800	-	-	-	-	-	-	-	-	1 800
Mineral Product Use	790	-	-	-	-	-	-	-	-	790
b. Chemical Industry	**2 900**	**3.9**	**97**	**33**	**9 700**	**-**	**-**	**-**	**-**	**13 000**
Ammonia Production	2 920	-	-	-	-	-	-	-	-	2 920
Nitric Acid Production	-	-	-	3.4	1 000	-	-	-	-	1 000
Adipic Acid Production	-	-	-	29	8 700	-	-	-	-	8 700
Petrochemical and Carbon Black Production[3]	-	3.9	97	0.03	7.7	-	-	-	-	110
c. Metal Production	**15 700**	**-**	**-**	**-**	**-**	**-**	**7 460**	**2 170**	**-**	**25 300**
Iron and Steel Production	11 800	-	-	-	-	-	-	-	-	11 800
Aluminum Production	3 910	-	-	-	-	-	7 460	56.3	-	11 400
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 110	-	2 110
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**-**	**0.05**	**210**	**0.3**	**210**
e. Non-Energy Products from Fuels and Solvent Use	**7 600**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7 600**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.51**	**150**	**-**	**-**	**-**	**-**	**150**
AGRICULTURE	-	1 100	29 000	70	20 000	-	-	-	-	52 000
a. Enteric Fermentation	**-**	**1 000**	**25 000**	**-**	**-**	**-**	**-**	**-**	**-**	**25 000**
b. Manure Management	**-**	**140**	**3 600**	**14.9**	**4 450**	**-**	**-**	**-**	**-**	**8 000**
c. Agriculture Soils	**-**	**-**	**-**	**58**	**17 000**	**-**	**-**	**-**	**-**	**17 000**
Direct Sources	-	-	-	48	14 000	-	-	-	-	14 000
Indirect Sources	-	-	-	10	3 000	-	-	-	-	3 000
d. Field Burning of Agricultural Residues	-	5	100	0.1	40	-	-	-	-	200
e. Liming, Urea Application and Other Carbon-containing Fertilizers	1 000	-	-	-	-	-	-	-	-	1 000
WASTE	520	960	24 000	2	700	-	-	-	.	25 000
a. Solid Waste Disposal on Land	**-**	**940**	**24 000**	**-**	**-**	**-**	**-**	**-**	**-**	**24 000**
b. Wastewater Handling	**-**	**15**	**390**	**2**	**500**	**-**	**-**	**-**	**-**	**910**
c. Waste Incineration	**520**	**0.3**	**8**	**0.7**	**200**	**-**	**-**	**-**	**-**	**750**
LAND USE, LAND-USE CHANGE AND FORESTRY	-58 000	280	7 000	11	3 400	-	-	-	.	-48 000
a. Forest Land	**-230 000**	**250**	**6 300**	**11**	**3 100**	**-**	**-**	**-**	**-**	**-220 000**
b. Cropland	**6 300**	**9**	**200**	**0.4**	**100**	**-**	**-**	**-**	**-**	**6 600**
c. Grassland	**-**	**10**	**300**	**0.3**	**100**	**-**	**-**	**-**	**-**	**400**
d. Wetlands	**6 000**	**0.2**	**4**	**0.01**	**2**	**-**	**-**	**-**	**-**	**6 000**
e. Settlements	**4 000**	**5**	**100**	**0.2**	**50**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**160 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**160 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

Table A9–24 1992 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**468 000**	**4 100**	**100 000**	**140**	**41 000**	**830**	**7 600**	**2 600**	**0.3**	**623 000**
ENERGY	434 000	2 000	51 000	30	9 000	-	-	-	-	493 000
a. Stationary Combustion Sources	**282 000**	**300**	**8 000**	**9**	**3 000**	**-**	**-**	**-**	**-**	**293 000**
Public Electricity and Heat Production	102 000	2.3	57	2	600	-	-	-	-	102 000
Petroleum Refining Industries	16 200	0.3	7	0.2	50	-	-	-	-	16 000
Mining and Upstream Oil and Gas Production	38 500	73	1 800	0.9	300	-	-	-	-	40 600
Manufacturing Industries	52 500	2	60	2	500	-	-	-	-	53 000
Iron and Steel	5 250	0.3	7	0.2	60	-	-	-	-	5 320
Non Ferrous Metals	2 940	0.06	2	0.04	10	-	-	-	-	2 950
Chemical	8 550	0.17	4.3	0.1	40	-	-	-	-	8 600
Pulp and Paper	12 700	1	30	1	300	-	-	-	-	13 000
Cement	3 380	0.1	2.4	0.04	10	-	-	-	-	3 390
Other Manufacturing	19 600	0.43	11	0.4	100	-	-	-	-	19 700
Construction	1 740	0.03	0.74	0.06	20	-	-	-	-	1 760
Commercial and Institutional	26 900	0.49	12	0.5	200	-	-	-	-	27 100
Residential	40 800	300	6 000	3	1 000	-	-	-	-	48 100
Agriculture and Forestry	3 220	0.05	1.2	0.08	24	-	-	-	-	3 250
b. Transport[2]	**140 000**	**30**	**800**	**20**	**6 000**	**-**	**-**	**-**	**-**	**147 000**
Domestic Aviation	6 250	0.3	8	0.2	60	-	-	-	-	6 300
Road Transportation	94 000	10	400	12	3 500	-	-	-	-	97 900
Light-Duty Gasoline Vehicles	42 700	7.2	180	6.9	2 100	-	-	-	-	44 900
Light-Duty Gasoline Trucks	21 600	3.1	79	4	1 200	-	-	-	-	22 800
Heavy-Duty Gasoline Vehicles	6 350	0.99	25	0.17	49	-	-	-	-	6 430
Motorcycles	138	0.14	3.4	0.0	0.85	-	-	-	-	142
Light-Duty Diesel Vehicles	448	0.01	0.3	0.03	10	-	-	-	-	459
Light-Duty Diesel Trucks	803	0.02	0.5	0.06	20	-	-	-	-	821
Heavy-Duty Diesel Vehicles	19 400	1	30	0.6	200	-	-	-	-	19 600
Propane and Natural Gas Vehicles	2 640	2	40	0.05	10	-	-	-	-	2 700
Railways	6 030	0.3	8	2	700	-	-	-	-	6 800
Domestic Navigation	4 800	0.3	8	1	300	-	-	-	-	5 100
Other Transportation	28 700	20	400	6	2 000	-	-	-	-	31 000
Off-Road Gasoline	6 330	7	200	0.1	40	-	-	-	-	6 600
Off-Road Diesel	12 800	0.7	20	5	2 000	-	-	-	-	14 000
Pipeline Transport	9 580	9.6	240	0.3	80	-	-	-	-	9 890
c. Fugitive Sources	**12 000**	**1 700**	**42 000**	**0.1**	**30**	**-**	**-**	**-**	**-**	**54 000**
Coal Mining	-	90	2 000	-	-	-	-	-	-	2 000
Oil and Natural Gas	12 000	1 600	39 000	0.1	30	-	-	-	-	52 000
Oil	110	220	5 400	0.1	30	-	-	-	-	5 500
Natural Gas	30	580	15 000	-	-	-	-	-	-	15 000
Venting	7 700	780	19 000	-	-	-	-	-	-	27 000
Flaring	4 300	6.1	150	0.01	3	-	-	-	-	4 500
d. CO_2 Transport and Storage	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE	32 500	4	99	36.1	10 800	830	7 600	2 600	.	54 400
a. Mineral Products	**7 500**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7 500**
Cement Production	4 800	-	-	-	-	-	-	-	-	4 800
Lime Production	1 800	-	-	-	-	-	-	-	-	1 800
Mineral Product Use	950	-	-	-	-	-	-	-	-	950
b. Chemical Industry	**2 500**	**4**	**99**	**36**	**11 000**	**-**	**-**	**-**	**-**	**13 000**
Ammonia Production	2 500	-	-	-	-	-	-	-	-	2 500
Nitric Acid Production	-	-	-	3.5	1 000	-	-	-	-	1 000
Adipic Acid Production	-	-	-	32	9 600	-	-	-	-	9 600
Petrochemical and Carbon Black Production[3]	-	4	99	0.02	7	-	-	-	-	110
c. Metal Production	**15 500**	**-**	**-**	**-**	**-**	**-**	**7 580**	**2 350**	**-**	**25 400**
Iron and Steel Production	12 200	-	-	-	-	-	-	-	-	12 200
Aluminum Production	3 270	-	-	-	-	-	7 580	56.3	-	10 900
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 290	-	2 290
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**830**	**0.05**	**210**	**0.3**	**1 000**
e. Non-Energy Products from Fuels and Solvent Use	**7 100**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7 100**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.46**	**140**	**-**	**-**	**-**	**-**	**140**
AGRICULTURE	-	1 100	28 000	70	20 000	-	-	-	-	50 000
a. Enteric Fermentation	**-**	**980**	**24 000**	**-**	**-**	**-**	**-**	**-**	**-**	**24 000**
b. Manure Management	**-**	**140**	**3 600**	**14.7**	**4 390**	**-**	**-**	**-**	**-**	**8 000**
c. Agriculture Soils	**-**	**-**	**-**	**56**	**17 000**	**-**	**-**	**-**	**-**	**17 000**
Direct Sources	-	-	-	46	14 000	-	-	-	-	14 000
Indirect Sources	-	-	-	10	3 000	-	-	-	-	3 000
d. Field Burning of Agricultural Residues	-	5	100	0.1	40	-	-	-	-	200
e. Liming, Urea Application and Other Carbon-containing Fertilizers	1 000	-	-	-	-	-	-	-	-	1 000
WASTE	530	940	24 000	3	800	-	-	-	.	25 000
a. Solid Waste Disposal on Land	**-**	**920**	**23 000**	**-**	**-**	**-**	**-**	**-**	**-**	**23 000**
b. Wastewater Handling	**-**	**15**	**380**	**2**	**500**	**-**	**-**	**-**	**-**	**900**
c. Waste Incineration	**530**	**0.5**	**10**	**0.8**	**200**	**-**	**-**	**-**	**-**	**780**
LAND USE, LAND-USE CHANGE AND FORESTRY	-110 000	140	3 400	5.1	1 500	-	-	-	.	-100 000
a. Forest Land	**-280 000**	**82**	**2 000**	**3.4**	**1 000**	**-**	**-**	**-**	**-**	**-270 000**
b. Cropland	**7 700**	**10**	**300**	**0.5**	**100**	**-**	**-**	**-**	**-**	**8 100**
c. Grassland	**-**	**40**	**900**	**1**	**300**	**-**	**-**	**-**	**-**	**1 000**
d. Wetlands	**6 000**	**0.7**	**20**	**0.03**	**9**	**-**	**-**	**-**	**-**	**6 000**
e. Settlements	**4 000**	**5**	**100**	**0.2**	**50**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**150 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**150 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding

Table A9–25 1991 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**453 000**	**3 900**	**98 000**	**140**	**41 000**	**1 100**	**8 000**	**3 700**	**0.3**	**605 000**
ENERGY	419 000	1 900	48 000	30	9 000	-	-	-	-	476 000
a. Stationary Combustion Sources	**272 000**	**300**	**8 000**	**9**	**3 000**	**-**	**-**	**-**	**.**	**283 000**
Public Electricity and Heat Production	95 300	1.7	42	2	500	-	-	-	-	95 900
Petroleum Refining Industries	16 000	0.3	7	0.2	50	-	-	-	-	16 000
Mining and Upstream Oil and Gas Production	36 500	70	1 700	0.9	300	-	-	-	-	38 500
Manufacturing Industries	53 400	2	60	2	500	-	-	-	-	54 000
Iron and Steel	4 920	0.3	6	0.2	60	-	-	-	-	4 980
Non Ferrous Metals	2 700	0.06	1	0.04	10	-	-	-	-	2 710
Chemical	8 600	0.17	4.3	0.1	40	-	-	-	-	8 650
Pulp and Paper	13 800	1	30	1	300	-	-	-	-	14 100
Cement	3 410	0.08	2	0.04	10	-	-	-	-	3 420
Other Manufacturing	20 000	0.42	11	0.4	100	-	-	-	-	20 100
Construction	1 620	0.03	0.68	0.05	20	-	-	-	-	1 630
Commercial and Institutional	26 300	0.5	12	0.5	200	-	-	-	-	26 500
Residential	39 600	300	7 000	3	1 000	-	-	-	-	47 300
Agriculture and Forestry	2 720	0.04	1.1	0.06	18	-	-	-	-	2 740
b. Transport[2]	**136 000**	**30**	**800**	**20**	**6 000**	**-**	**-**	**-**	**-**	**143 000**
Domestic Aviation	6 240	0.4	9	0.2	60	-	-	-	-	6 300
Road Transportation	92 200	10	300	11	3 400	-	-	-	-	95 900
Light-Duty Gasoline Vehicles	42 500	7.2	180	6.7	2 000	-	-	-	-	44 700
Light-Duty Gasoline Trucks	20 200	3	74	3.7	1 100	-	-	-	-	21 300
Heavy-Duty Gasoline Vehicles	6 650	1.1	27	0.18	53	-	-	-	-	6 730
Motorcycles	142	0.14	3.5	0.0	0.88	-	-	-	-	146
Light-Duty Diesel Vehicles	450	0.01	0.3	0.03	10	-	-	-	-	460
Light-Duty Diesel Trucks	729	0.02	0.5	0.05	20	-	-	-	-	745
Heavy-Duty Diesel Vehicles	19 200	1	30	0.6	200	-	-	-	-	19 400
Propane and Natural Gas Vehicles	2 280	1	40	0.04	10	-	-	-	-	2 300
Railways	5 760	0.3	8	2	700	-	-	-	-	6 500
Domestic Navigation	4 950	0.4	9	1	300	-	-	-	-	5 300
Other Transportation	27 000	20	400	6	2 000	-	-	-	-	29 000
Off-Road Gasoline	6 510	8	200	0.1	40	-	-	-	-	6 700
Off-Road Diesel	13 100	0.7	20	5	2 000	-	-	-	-	15 000
Pipeline Transport	7 410	7.4	190	0.2	60	-	-	-	-	7 650
c. Fugitive Sources	**11 000**	**1 500**	**39 000**	**0.1**	**30**	**-**	**-**	**-**	**-**	**50 000**
Coal Mining	-	100	3 000	-	-	-	-	-	-	3 000
Oil and Natural Gas	11 000	1 400	36 000	0.1	30	-	-	-	-	47 000
Oil	100	200	5 000	0.1	30	-	-	-	-	5 100
Natural Gas	28	540	14 000	-	-	-	-	-	-	14 000
Venting	6 900	680	17 000	-	-	-	-	-	-	24 000
Flaring	4 300	5.6	140	0.01	2	-	-	-	-	4 400
d. CO_2 Transport and Storage	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE	32 900	4.4	110	36.2	10 800	1 100	8 000	3 700	.	56 600
a. Mineral Products	**7 800**	-	-	-	-	-	-	-	-	**7 800**
Cement Production	4 700	-	-	-	-	-	-	-	-	4 700
Lime Production	1 790	-	-	-	-	-	-	-	-	1 790
Mineral Product Use	1 200	-	-	-	-	-	-	-	-	1 200
b. Chemical Industry	**2 800**	**4.4**	**110**	**36**	**11 000**	**-**	**-**	**-**	**-**	**14 000**
Ammonia Production	2 750	-	-	-	-	-	-	-	-	2 750
Nitric Acid Production	-	-	-	3.4	1 000	-	-	-	-	1 000
Adipic Acid Production	-	-	-	32	9 600	-	-	-	-	9 600
Petrochemical and Carbon Black Production[3]	-	4.4	110	0.02	7	-	-	-	-	120
c. Metal Production	**15 100**	-	-	-	-	-	**8 030**	**3 480**	-	**26 600**
Iron and Steel Production	11 900	-	-	-	-	-	-	-	-	11 900
Aluminum Production	3 150	-	-	-	-	-	8 030	56.3	-	11 200
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	3 420	-	3 420
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	-	-	-	-	-	**1 100**	**0.06**	**210**	**0.3**	**1 300**
e. Non-Energy Products from Fuels and Solvent Use	**7 300**	-	-	-	-	-	-	-	-	**7 300**
f. Other Product Manufacture and Use	-	-	-	**0.55**	**160**	-	-	-	-	**160**
AGRICULTURE	-	1 100	27 000	70	20 000	-	-	-	-	49 000
a. Enteric Fermentation	-	**930**	**23 000**	-	-	-	-	-	-	**23 000**
b. Manure Management	-	**140**	**3 500**	**14.1**	**4 190**	-	-	-	-	**7 700**
c. Agriculture Soils	-	-	-	**56**	**17 000**	-	-	-	-	**17 000**
Direct Sources	-	-	-	46	14 000	-	-	-	-	14 000
Indirect Sources	-	-	-	10	3 000	-	-	-	-	3 000
d. Field Burning of Agricultural Residues	-	6	100	0.2	40	-	-	-	-	200
e. Liming, Urea Application and Other Carbon-containing Fertilizers	1 000	-	-	-	-	-	-	-	-	1 000
WASTE	510	930	23 000	2	700	-	-	-	.	24 000
a. Solid Waste Disposal on Land	-	**910**	**23 000**	-	-	-	-	-	-	**23 000**
b. Wastewater Handling	-	**15**	**380**	**2**	**500**	-	-	-	-	**890**
c. Waste Incineration	**510**	**0.5**	**10**	**0.7**	**200**	-	-	-	-	**740**
LAND USE, LAND-USE CHANGE AND FORESTRY	-66 000	290	7 300	12	3 500	-	-	-	.	-55 000
a. Forest Land	**-230 000**	**250**	**6 200**	**10**	**3 100**	-	-	-	-	**-220 000**
b. Cropland	**8 900**	**10**	**300**	**0.5**	**200**	-	-	-	-	**9 300**
c. Grassland	-	**20**	**600**	**0.6**	**200**	-	-	-	-	**800**
d. Wetlands	**6 000**	**0.5**	**10**	**0.02**	**6**	-	-	-	-	**6 000**
e. Settlements	**4 000**	**5**	**100**	**0.2**	**50**	-	-	-	-	**4 000**
f. Harvested Wood Products	**140 000**	-	-	-	-	-	-	-	-	**140 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding

Table A9–26 1990 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[5]	PFCs[5]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL[1]	**463 000**	**3 800**	**96 000**	**140**	**42 000**	**970**	**7 600**	**3 200**	**0.3**	**613 000**
ENERGY	429 000	1 900	47 000	30	9 000	-	-	-	-	485 000
a. Stationary Combustion Sources	**277 000**	**300**	**9 000**	**9**	**3 000**	**-**	**-**	**-**	**.**	**288 000**
Public Electricity and Heat Production	94 000	1.8	45	2	500	-	-	-	-	94 500
Petroleum Refining Industries	17 000	0.3	7	0.2	50	-	-	-	-	17 000
Mining and Upstream Oil and Gas Production	38 900	74	1 900	0.9	300	-	-	-	-	41 100
Manufacturing Industries	55 600	2	60	2	500	-	-	-	-	56 200
Iron and Steel	4 900	0.2	6	0.2	60	-	-	-	-	4 970
Non Ferrous Metals	3 310	0.07	2	0.05	10	-	-	-	-	3 320
Chemical	8 220	0.17	4.1	0.1	40	-	-	-	-	8 260
Pulp and Paper	14 200	1	30	1	300	-	-	-	-	14 600
Cement	3 940	0.12	2.9	0.05	10	-	-	-	-	3 960
Other Manufacturing	21 000	0.45	11	0.4	100	-	-	-	-	21 200
Construction	1 860	0.03	0.78	0.05	20	-	-	-	-	1 880
Commercial and Institutional	25 700	0.49	12	0.5	100	-	-	-	-	25 800
Residential	41 100	300	7 000	3	1 000	-	-	-	-	48 900
Agriculture and Forestry	2 390	0.04	0.97	0.06	16	-	-	-	-	2 410
b. Transport[2]	**141 000**	**30**	**800**	**20**	**6 000**	**-**	**-**	**-**	**-**	**148 000**
Domestic Aviation	7 090	0.5	10	0.2	70	-	-	-	-	7 200
Road Transportation	94 300	10	400	10	3 100	-	-	-	-	97 700
Light-Duty Gasoline Vehicles	43 900	7.7	190	6.2	1 800	-	-	-	-	45 900
Light-Duty Gasoline Trucks	19 400	3	76	3.2	950	-	-	-	-	20 500
Heavy-Duty Gasoline Vehicles	7 440	1.2	31	0.21	62	-	-	-	-	7 530
Motorcycles	150	0.15	3.7	0.0	0.93	-	-	-	-	155
Light-Duty Diesel Vehicles	463	0.01	0.3	0.03	10	-	-	-	-	473
Light-Duty Diesel Trucks	693	0.02	0.5	0.05	10	-	-	-	-	708
Heavy-Duty Diesel Vehicles	20 000	1	30	0.6	200	-	-	-	-	20 200
Propane and Natural Gas Vehicles	2 180	1	30	0.04	10	-	-	-	-	2 200
Railways	6 220	0.3	8	3	800	-	-	-	-	7 000
Domestic Navigation	4 740	0.3	8	1	300	-	-	-	-	5 100
Other Transportation	28 700	20	400	6	2 000	-	-	-	-	31 000
Off-Road Gasoline	7 660	9	200	0.2	50	-	-	-	-	7 900
Off-Road Diesel	14 300	0.8	20	6	2 000	-	-	-	-	16 000
Pipeline Transport	6 680	6.7	170	0.2	50	-	-	-	-	6 910
c. Fugitive Sources	**12 000**	**1 500**	**37 000**	**0.1**	**30**	**-**	**-**	**-**	**-**	**49 000**
Coal Mining	-	100	3 000	-	-	-	-	-	-	3 000
Oil and Natural Gas	12 000	1 400	34 000	0.1	30	-	-	-	-	46 000
Oil	95	190	4 800	0.1	30	-	-	-	-	5 000
Natural Gas	26	520	13 000	-	-	-	-	-	-	13 000
Venting	7 000	650	16 000	-	-	-	-	-	-	23 000
Flaring	4 500	5.5	140	0.01	3	-	-	-	-	4 600
d. CO_2 Transport and Storage	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE	31 800	4.7	120	38.4	11 500	970	7 600	3 200	.	55 100
a. Mineral Products	**8 700**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8 700**
Cement Production	5 800	-	-	-	-	-	-	-	-	5 800
Lime Production	1 760	-	-	-	-	-	-	-	-	1 760
Mineral Product Use	1 200	-	-	-	-	-	-	-	-	1 200
b. Chemical Industry	**2 800**	**4.7**	**120**	**38**	**11 000**	**-**	**-**	**-**	**-**	**14 000**
Ammonia Production	2 770	-	-	-	-	-	-	-	-	2 770
Nitric Acid Production	-	-	-	3.3	970	-	-	-	-	970
Adipic Acid Production	-	-	-	35	10 000	-	-	-	-	10 000
Petrochemical and Carbon Black Production[3]	-	4.7	120	0.02	7	-	-	-	-	130
c. Metal Production	**12 900**	**-**	**-**	**-**	**-**	**-**	**7 560**	**3 020**	**-**	**23 500**
Iron and Steel Production	10 200	-	-	-	-	-	-	-	-	10 200
Aluminum Production	2 710	-	-	-	-	-	7 560	56.3	-	10 300
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 960	-	2 960
d. Production and Consumption of Halocarbons, SF_6 and NF_3[4]	**-**	**-**	**-**	**-**	**-**	**970**	**0.06**	**210**	**0.3**	**1 200**
e. Non-Energy Products from Fuels and Solvent Use	**7 400**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7 400**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.58**	**170**	**-**	**-**	**-**	**-**	**170**
AGRICULTURE	-	1 100	27 000	70	20 000	-	-	-	-	49 000
a. Enteric Fermentation	**-**	**910**	**23 000**	**-**	**-**	**-**	**-**	**-**	**-**	**23 000**
b. Manure Management	**-**	**140**	**3 500**	**13.8**	**4 120**	**-**	**-**	**-**	**-**	**7 600**
c. Agriculture Soils	**-**	**-**	**-**	**58**	**17 000**	**-**	**-**	**-**	**-**	**17 000**
Direct Sources	-	-	-	48	14 000	-	-	-	-	14 000
Indirect Sources	-	-	-	10	3 000	-	-	-	-	3 000
d. Field Burning of Agricultural Residues	-	7	200	0.2	50	-	-	-	-	200
e. Liming, Urea Application and Other Carbon-containing Fertilizers	1 000	-	-	-	-	-	-	-	-	1 000
WASTE	510	910	23 000	2	700	-	-	-	.	24 000
a. Solid Waste Disposal on Land	**-**	**890**	**22 000**	**-**	**-**	**-**	**-**	**-**	**-**	**22 000**
b. Wastewater Handling	**-**	**15**	**380**	**2**	**500**	**-**	**-**	**-**	**-**	**870**
c. Waste Incineration	**510**	**0.5**	**10**	**0.7**	**200**	**-**	**-**	**-**	**-**	**730**
LAND USE, LAND-USE CHANGE AND FORESTRY	-94 000	180	4 400	7.2	2 100	-	-	-	.	-87 000
a. Forest Land	**-250 000**	**140**	**3 500**	**5.9**	**1 700**	**-**	**-**	**-**	**-**	**-250 000**
b. Cropland	**9 800**	**10**	**300**	**0.6**	**200**	**-**	**-**	**-**	**-**	**10 000**
c. Grassland	**-**	**20**	**500**	**0.5**	**200**	**-**	**-**	**-**	**-**	**600**
d. Wetlands	**6 000**	**0.3**	**8**	**0.01**	**4**	**-**	**-**	**-**	**-**	**6 000**
e. Settlements	**4 000**	**5**	**100**	**0.2**	**50**	**-**	**-**	**-**	**-**	**4 000**
f. Harvested Wood Products	**140 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**140 000**

Notes:
1. National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
2. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
3. The Petrochemical and Carbon Black Production category includes CH_4 and N_2O emissions; CO_2 emissions are included in Non-Energy Products from Fuels and Solvent Use.
4. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
5. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding

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Annex 10

Provincial/Territorial Greenhouse Gas Emission Tables, 1990–2013

Summary tables illustrating GHG emissions (for GHG categories, see Table A10–1) by province/territory, sector, and year are included in this annex (Table A10–1 to Table A10–28). To account for the creation of Nunavut in 1999, a time series from 1999–2013 is provided for both Nunavut and the Northwest Territories (Table A10–24 and Table A10–26) and the years 1990–1998 are presented as a combined region in Table A10–28.

Although the UNFCCC reporting guidelines require that only national-level detail be reported, provincial- and territorial-level detail is important, owing to the regional differences in emission levels and trends. Note that provincial and territorial emission estimates may not necessarily sum to the national totals due to rounding and suppression of confidential data. For example, provincial and territorial emission totals do not include consumption of PFCs and SF_6 (e.g., refrigeration, air conditioning and semiconductor manufacturing).

The reader should also note that many provinces develop independent inventories of provincial GHG emissions, in some cases making use of alternate methodologies, data inputs and/or inclusions/omissions of GHG source categories. While Canada is developing a national emissions inventory consistent with IPCC guidelines and international obligations, provincial governments may elect to develop an inventory structure in accordance with specific provincial needs. Environment Canada encourages collaboration with provinces for quality assurance and continuous improvement of this annual National Inventory Report. The Department is striving to ensure consistency between different estimates, as some provincial GHG estimates presented in this report used to develop the national estimates may differ from those developed by provincial governments.

Table A10–1 GHG Source/Sink Category Description

GHG Source/Sink Categories		
ENERGY		
a.	**Stationary Combustion Sources**	
	Public Electricity and Heat Production	Emissions from fuel consumed by utility electricity generation and steam production (for sale)
	Petroleum Refining Industries	Emissions from fuel consumed by petroleum refining industries
	Mining and Upstream Oil and Gas Production	Emissions from fuel consumed by: - Metal and non-metal mines, coal mines, stone quarries, and gravel pits - Oil and gas extraction industries - Mineral exploration and contract drilling operations
	Manufacturing Industries	Emissions from fuel consumed by the following industries: - Iron and Steel (steel foundries, casting and rolling mills) - Non-ferrous metals (aluminium, magnesium and other production) - Chemical (fertilizer manufacturing, organic and inorganic chemical manufacturing) - Pulp and Paper (primarily pulp, paper, and paper product manufacturers) - Cement and other non-metallic mineral production - Other manufacturing industries not listed (such as automobile manufacturing, textiles, food and beverage industries)
	Construction	Emissions from fuels consumed by the construction industry – buildings, highways etc.
	Commercial & Institutional	Emissions from fuel consumed by: - Service industries related to mining, communication, wholesale and retail trade, finance and insurance, real estate, education, etc.) - Federal, provincial and municipal establishments - National Defence and Canadian Coast Guard - Train stations, airports and warehouses
	Residential	Emissions from fuel consumed for personal residences (homes, apartment hotels, condominiums and farm houses)
	Agriculture & Forestry	Emissions from fuel consumed by: - Forestry and logging service industry - Agricultural, hunting and trapping industry (excluding food processing, farm machinery manufacturing, and repair)
	Residential	Emissions from fuel consumed for perwsonal residences (homes, apartment hotels, condominiums and farm houses)
	Agriculture & Forestry	Emissions from fuel consumed by: - Forestry and logging service industry - Agricultural, hunting and trapping industry (excluding food processing, farm machinery manufacturing, and repair)
b.	**Transportation**	Emissions resulting from the:
	Domestic Aviation	- Consumption of fossil fuels by aircrafts flying domestically with Canadian purchased fuel
	Road Transportation	- Consumption of fossil fuels (including non-CO_2 emissions from ethanol and biodiesel) by vehicles licensed to operate on roads
	Railways	- Consumption of fossil fuels (including non-CO_2 emissions from biodiesel) by Canadian railways
	Domestic Navigation	- Consumption of fossil fuels (including non-CO_2 emissions from ethanol and biodiesel) by Canadian registered marine vessels fuelled domestically
	Others – Off-road	- Consumption of fossil fuels (including non-CO_2 emissions from ethanol and biodiesel) by combustion devices not licensed to operate on roads
	Others – Pipeline Transport	- Transportation and distribution of crude oil, natural gas and other products
c.	**Fugitive Sources**	Intentional and unintentional releases of greenhouse gases from the following activities:
	Coal Mining	- Underground and surface mining, abandoned underground coal mines
	Oil and Natural Gas	- Conventional and unconventional oil and gas exploration, production, transportation, and distribution
d.	**CO_2 Transport and Storage**	Intentional and unintentional releases of greenhouse gases from the transport and storage of carbon dioxide
INDUSTRIAL PROCESSES AND PRODUCT USE		**Emissions resulting from the following process activities:**
a.	Mineral Products	Production of cement and lime; use of soda ash, limestone & dolomite, and magnesite
b.	Chemical Industry	Production of ammonia, nitric acid, adipic acid, carbide, carbon black, ethylene dichloride, ethylene, methanol and styrene
c.	Metal Production	Production of aluminum, iron and steel production, magnesium production and casting
d.	Production and Consumption of Halocarbons, SF_6 and NF_3	By-product production of HFC-23; use of HFCs and/or PFCs in air conditioning units, refrigeration units, fire extinguishers, aerosol cans, solvents, foam blowing, semiconductor manufacturing and electronics industry; use of SF_6 in electrical equipment and semiconductor manufacturing; use of NF_3 in semiconductor manufacturing
e.	Non-Energy Products from Fuels and Solvent Use	Non-energy use of fossil fuels mostly in chemical/petrochemical activities, including solvents and lubricants
f.	Other Product Manufacture and Use	Emissions resulting from the use of N_2O as an anaesthetic and propellant; emissions from the use of urea in selective catalytic reduction (SCR) equipped vehicles
AGRICULTURE		**Emissions resulting from the:**
a.	Enteric Fermentation	Eructation of CH_4 during the digestion of plant material by (mainly) ruminants
b.	Manure Management	- Release of CH_4 and N_2O due to microbial activity during the storage of feces, urine and bedding materials from the cleaning of barns and pens - Indirect N_2O emissions from volatilization and leaching of nitrogen from animal manure during storage
c.	Agricultural Soils	
	Direct sources	Direct N_2O emissions from Synthetic fertilizer, manure on cropland, pasture range and paddock, crop residue, tillage, summerfallow, irrigation and cultivation of organic soils
	Indirect Sources	Indirect N_2O emissions from volatilization and leaching of animal manure nitrogen, synthetic fertilizer nitrogen and crop residue nitrogen
d.	Field Burning of Agricultural Residues	CH_4 and N_2O emissions from crop residue burning
e.	Liming, Urea Application and Other Carbon-containing Fertilizers	Direct emissions of CO_2 from the application of lime, urea and other fertilizers containing carbon
WASTE		**Emissions resulting from:**
a.	Solid Waste Disposal on Land	Municipal solid waste management sites (landfills) and dedicated wood waste landfills
b.	Wastewater Handling	Wastewater treatment
c.	Waste Incineration	Municipal solid waste, sewage sludge and hazardous waste incineration

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Table A10–2 1990–2013 GHG Emission Summary for Newfoundland and Labrador

Greenhouse Gas Categories		1990	2000	2005	2009	2010	2011	2012	2013
	kt CO_2 equivalent								
TOTAL		**9 750**	**9 290**	**10 300**	**10 200**	**9 800**	**9 820**	**9 180**	**8 640**
ENERGY		**8 840**	**8 260**	**9 290**	**9 140**	**8 770**	**8 740**	**8 170**	**7 660**
a.	**Stationary Combustion Sources**	**5 680**	**4 610**	**4 870**	**4 780**	**4 250**	**4 180**	**3 900**	**3 830**
	Public Electricity and Heat Production	1 650	823	865	829	747	865	851	866
	Petroleum Refining Industries	1 000	1 000	910	1 100	970	790	990	850
	Mining and Upstream Oil and Gas Production	1 160	1 460	1 890	1 970	1 600	1 500	1 220	1 370
	Manufacturing Industries	506	245	279	87.9	76.7	79.3	84.9	76.7
	Construction	33	10.5	23.6	8.72	11.2	15	9.27	6.39
	Commercial and Institutional	320	311	356	199	257	262	202	199
	Residential	970	679	543	621	581	646	537	455
	Agriculture and Forestry	24.5	47	8.11	8.17	11.5	17.6	11.2	8.32
b.	**Transport**[1]	**3 110**	**3 350**	**3 520**	**3 740**	**3 940**	**4 070**	**3 740**	**3 270**
	Domestic Aviation	190	190	210	180	190	180	230	230
	Road Transportation	1 650	1 780	1 920	2 070	2 140	2 200	2 250	2 200
	Light-Duty Gasoline Vehicles	760	637	601	648	653	667	699	650
	Light-Duty Gasoline Trucks	434	652	758	822	831	852	895	835
	Heavy-Duty Gasoline Vehicles	108	46.1	54.2	61.6	62.9	65.2	69.2	65.2
	Motorcycles	5.2	3.68	4.12	4.68	4.78	4.94	5.24	4.94
	Light-Duty Diesel Vehicles	2.31	1.33	1.57	1.93	2.06	2.33	2.57	2.49
	Light-Duty Diesel Trucks	5.59	14.3	19.3	20.4	20.6	22.3	23.4	21.8
	Heavy-Duty Diesel Vehicles	339	422	481	512	565	582	550	615
	Propane and Natural Gas Vehicles	1.4	0.92	0.31	0.46	0.46	0.46	0.46	0.62
	Railways	-	-	-	-	1.5	-	-	-
	Domestic Navigation	700	690	590	760	860	590	420	240
	Other Transportation	570	690	800	740	750	1 100	850	600
	Off-Road Gasoline	140	100	x	x	x	x	x	x
	Off-Road Diesel	420	590	740	590	580	830	470	330
	Pipeline Transport	-	-	x	x	x	x	x	x
c.	**Fugitive Sources**	**41**	**310**	**910**	**610**	**580**	**490**	**520**	**560**
	Coal Mining	-	-	-	-	-	-	-	-
	Oil and Natural Gas	41	310	910	610	580	490	520	560
d.	**CO_2 Transport and Storage**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE		**86.6**	**132**	**137**	**143**	**158**	**191**	**144**	**157**
a.	**Mineral Products**	**64**	**1.7**	**1.5**	**1.1**	**0.8**	**0.75**	**1**	**1.1**
	Cement Production	60	-	-	-	-	-	-	-
	Lime Production	-	-	-	-	-	-	-	-
	Mineral Products Use	3.4	1.7	1.5	1.1	0.8	0.75	1	1.1
b.	**Chemical Industry**[2]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Adipic Acid Production	-	-	-	-	-	-	-	-
c.	**Metal Production**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Iron and Steel Production	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	**0.91**	**47**	**65**	**72**	**75**	**79**	**84**	**88**
e.	**Non-Energy Products from Fuels and Solvent Use**	**19**	**76**	**64**	**66**	**79**	**110**	**54**	**63**
f.	**Other Product Manufacture and Use**	**3.6**	**7.4**	**5.8**	**3.9**	**3.7**	**3.9**	**5**	**4.5**
AGRICULTURE		**57**	**69**	**73**	**81**	**95**	**110**	**140**	**140**
a.	**Enteric Fermentation**	**25**	**27**	**35**	**37**	**36**	**35**	**35**	**36**
b.	**Manure Management**	**19**	**20**	**25**	**27**	**26**	**26**	**26**	**26**
c.	**Agriculture Soils**	**10**	**10**	**13**	**15**	**15**	**14**	**14**	**13**
	Direct Sources	8.3	8.5	11	12	12	12	11	11
	Indirect Sources	2	2	3	3	3	3	3	3
d.	**Field Burning of Agricultural Residues**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**3**	**10**	**-**	**2**	**20**	**40**	**60**	**60**
WASTE		**770**	**830**	**840**	**850**	**780**	**780**	**730**	**680**
a.	**Solid Waste Disposal on Land**	**730**	**790**	**800**	**810**	**740**	**740**	**700**	**650**
b.	**Wastewater Handling**	**37**	**34**	**33**	**33**	**34**	**34**	**34**	**34**
c.	**Waste Incineration**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
x Indicates data has been suppressed to respect confidentiality
Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

Table A10–3 2013 GHG Emission Summary for Newfoundland and Labrador

Greenhouse Gas Categories		Greenhouse Gases									
		CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[4]	PFCs[4]	SF_6	NF_3	TOTAL
	Global Warming Potential			25		298			22 800	17 200	
	Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL		**7 360**	**40**	**1 000**	**0.62**	**190**	**87**	**-**	**1.4**	**-**	**8 640**
ENERGY		7 230	12	290	0.5	100	-	-	-	-	7 660
a.	**Stationary Combustion Sources**	**3 590**	**8**	**200**	**0.1**	**40**	**-**	**-**	**-**	**-**	**3 830**
	Public Electricity and Heat Production	861	0.01	0.3	0.02	5	-	-	-	-	866
	Petroleum Refining Industries	848	0.02	0.4	0.01	3	-	-	-	-	850
	Mining and Upstream Oil and Gas Production	1 310	1.7	44	0.04	10	-	-	-	-	1 370
	Manufacturing Industries	76.1	0.0	0.03	0.0	0.6	-	-	-	-	76.7
	Construction	6.36	0.0	0.0	0.0	0.03	-	-	-	-	6.39
	Commercial and Institutional	197	0.0	0.06	0.01	2	-	-	-	-	199
	Residential	285	6	100	0.07	20	-	-	-	-	455
	Agriculture and Forestry	8.29	0.0	0.0	0.0	0.03	-	-	-	-	8.32
b.	**Transport[1]**	**3 160**	**0.5**	**10**	**0.3**	**100**	**-**	**-**	**-**	**-**	**3 270**
	Domestic Aviation	230	0.01	0.2	0.01	2	-	-	-	-	230
	Road Transportation	2 160	0.2	4	0.12	36	-	-	-	-	2 200
	Light-Duty Gasoline Vehicles	639	0.06	1.4	0.03	9.9	-	-	-	-	650
	Light-Duty Gasoline Trucks	820	0.08	1.9	0.05	13	-	-	-	-	835
	Heavy-Duty Gasoline Vehicles	63.5	0.0	0.05	0.01	1.6	-	-	-	-	65.2
	Motorcycles	4.87	0.0	0.04	0.0	0.03	-	-	-	-	4.94
	Light-Duty Diesel Vehicles	2.43	0.0	0.0	0.0	0.06	-	-	-	-	2.49
	Light-Duty Diesel Trucks	21.2	0.0	0.01	0.0	0.5	-	-	-	-	21.8
	Heavy-Duty Diesel Vehicles	604	0.03	0.6	0.03	10	-	-	-	-	615
	Propane and Natural Gas Vehicles	0.61	0.0	0.01	0.0	0.0	-	-	-	-	0.62
	Railways	-	-	-	-	-	-	-	-	-	-
	Domestic Navigation	220	0.02	0.4	0.08	20	-	-	-	-	240
	Other Transportation	555	0.3	8	0.1	40	-	-	-	-	600
	Off-Road Gasoline	x	x	x	x	x	-	-	-	-	x
	Off-Road Diesel	294	0.02	0.4	0.1	40	-	-	-	-	330
	Pipeline Transport	x	x	x	x	x	-	-	-	-	x
c.	**Fugitive Sources**	**480**	**3.2**	**81**	**0.01**	**2**	**-**	**-**	**-**	**-**	**560**
	Coal Mining	-	-	-	-	-	-	-	-	-	-
	Oil and Natural Gas	480	3.2	81	0.01	2	-	-	-	-	560
d.	**CO_2 Transport and Storage**	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE		64.3	-	-	0.01	3.84	87	-	1.4	-	157
a.	**Mineral Products**	**1.1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.1**
	Cement Production	-	-	-	-	-	-	-	-	-	-
	Lime Production	-	-	-	-	-	-	-	-	-	-
	Mineral Products Use	1.1	-	-	-	-	-	-	-	-	1.1
b.	**Chemical Industry[2]**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c.	**Metal Production**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3[3]**	**-**	**-**	**-**	**-**	**-**	**87**	**-**	**1.4**	**-**	**88**
e.	**Non-Energy Products from Fuels and Solvent Use**	**63**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**63**
f.	**Other Product Manufacture and Use**	**0.6**	**-**	**-**	**0.01**	**3.8**	**-**	**-**	**-**	**-**	**4.5**
AGRICULTURE		100	1.9	47	0.09	30	-	-	-	-	140
a.	**Enteric Fermentation**	**-**	**1.4**	**36**	**-**	**-**	**-**	**-**	**-**	**-**	**36**
b.	**Manure Management**	**-**	**0.47**	**12**	**0.05**	**14.4**	**-**	**-**	**-**	**-**	**26**
c.	**Agriculture Soils**	**-**	**-**	**-**	**0.05**	**13**	**-**	**-**	**-**	**-**	**13**
	Direct Sources	-	-	-	0.04	11	-	-	-	-	11
	Indirect Sources	-	-	-	0.01	3	-	-	-	-	3
d.	**Field Burning of Agricultural Residues**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**60**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**60**
WASTE		-	27	670	0.03	10	-	-	-	-	680
a.	**Solid Waste Disposal on Land**	**-**	**26**	**650**	**-**	**-**	**-**	**-**	**-**	**-**	**650**
b.	**Wastewater Handling**	**-**	**0.96**	**24**	**0.03**	**10**	**-**	**-**	**-**	**-**	**34**
c.	**Waste Incineration**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes:

1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
4. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

x Indicates data has been suppressed to respect confidentiality

Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

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Table A10–4 1990–2013 GHG Emission Summary for Prince Edward Island

Greenhouse Gas Categories		1990	2000	2005	2009	2010	2011	2012	2013
kt CO_2 equivalent									
TOTAL		**2 000**	**2 190**	**2 120**	**1 980**	**2 030**	**2 100**	**2 110**	**1 800**
ENERGY		**1 480**	**1 590**	**1 490**	**1 450**	**1 530**	**1 590**	**1 580**	**1 310**
a.	**Stationary Combustion Sources**	**772**	**756**	**635**	**652**	**678**	**754**	**703**	**567**
	Public Electricity and Heat Production	104	53	4.76	6.03	1.59	1.23	10.8	3.92
	Petroleum Refining Industries	-	-	-	-	-	-	-	-
	Mining and Upstream Oil and Gas Production	0.89	7.53	x	x	x	0.16	-	-
	Manufacturing Industries	55.2	136	144	130	171	142	187	114
	Construction	11.1	6.68	x	x	x	x	x	x
	Commercial and Institutional	160	179	120	52.4	47.6	86.4	74.2	75
	Residential	423	342	331	438	408	484	410	359
	Agriculture and Forestry	18.5	31.9	24	17.8	29.5	30.5	17.5	12.5
b.	**Transport**[1]	**703**	**837**	**851**	**802**	**847**	**838**	**873**	**742**
	Domestic Aviation	17	11	14	18	18	16	19	20
	Road Transportation	512	584	620	620	614	512	596	564
	Light-Duty Gasoline Vehicles	245	229	217	206	211	163	204	189
	Light-Duty Gasoline Trucks	114	195	235	226	231	179	226	209
	Heavy-Duty Gasoline Vehicles	51.7	17.6	23.9	23.9	24.8	19.4	24.7	23.2
	Motorcycles	1.04	1.42	2.74	2.73	2.83	2.21	2.82	2.64
	Light-Duty Diesel Vehicles	2.36	1.83	x	x	x	2.38	x	x
	Light-Duty Diesel Trucks	3.19	7.23	9.12	8.64	8.85	9.25	9.15	8.38
	Heavy-Duty Diesel Vehicles	93.7	130	130	151	133	137	127	130
	Propane and Natural Gas Vehicles	1.1	0.77	x	x	x	-	x	x
	Railways	-	-	-	-	-	-	-	-
	Domestic Navigation	89	85	100	81	110	140	95	71
	Other Transportation	83	160	120	84	110	170	160	87
	Off-Road Gasoline	44	75	78	58	71	x	x	x
	Off-Road Diesel	39	83	x	x	x	94	69	32
	Pipeline Transport	-	-	x	x	x	x	x	x
c.	**Fugitive Sources**	**-**	**-**	**0.0**	**-**	**-**	**0.0**	**-**	**-**
	Coal Mining	-	-	-	-	-	-	-	-
	Oil and Natural Gas	-	-	0.0	-	-	0.0	-	-
d.	**CO_2 Transport and Storage**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE		**4.48**	**21**	**28.1**	**28.8**	**28.4**	**29.5**	**30.3**	**31.3**
a.	**Mineral Products**	**0.34**	**0.69**	**0.88**	**1**	**0.66**	**0.62**	**0.6**	**0.6**
	Cement Production	-	-	-	-	-	-	-	-
	Lime Production	-	-	-	-	-	-	-	-
	Mineral Products Use	0.34	0.69	0.88	1	0.66	0.62	0.6	0.6
b.	**Chemical Industry**[2]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Adipic Acid Production	-	-	-	-	-	-	-	-
c.	**Metal Production**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Iron and Steel Production	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	**-**	**16**	**24**	**25**	**26**	**27**	**27**	**29**
e.	**Non-Energy Products from Fuels and Solvent Use**	**3.3**	**2.4**	**1.3**	**1.4**	**0.99**	**1.3**	**0.85**	**0.99**
f.	**Other Product Manufacture and Use**	**0.81**	**1.9**	**1.6**	**1**	**1**	**1.1**	**1.4**	**1.2**
AGRICULTURE		**410**	**450**	**470**	**360**	**340**	**340**	**360**	**320**
a.	**Enteric Fermentation**	**150**	**150**	**140**	**120**	**120**	**120**	**120**	**120**
b.	**Manure Management**	**61**	**63**	**63**	**46**	**45**	**45**	**44**	**44**
c.	**Agriculture Soils**	**190**	**230**	**260**	**190**	**170**	**170**	**200**	**150**
	Direct Sources	160	190	210	160	140	140	160	130
	Indirect Sources	40	40	50	30	30	30	30	30
d.	**Field Burning of Agricultural Residues**	**0.09**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**5**	**5**	**5**	**4**	**3**	**3**	**2**	**2**
WASTE		**110**	**130**	**140**	**140**	**140**	**140**	**140**	**140**
a.	**Solid Waste Disposal on Land**	**96**	**110**	**120**	**110**	**120**	**110**	**110**	**110**
b.	**Wastewater Handling**	**6.2**	**8**	**8.1**	**8**	**8**	**8.1**	**8.2**	**8.4**
c.	**Waste Incineration**	**11**	**12**	**12**	**12**	**13**	**13**	**13**	**13**

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
x Indicates data has been suppressed to respect confidentiality
Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

Table A10–5 2013 GHG Emission Smmary for Prince Edward Island

Greenhouse Gas Categories		Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[4]	PFCs[4]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL	**1 230**	**13**	**320**	**0.72**	**210**	**29**	**-**	**-**	**-**	**1 800**
ENERGY	**1 210**	**2.6**	**64**	**0.1**	**30**	**-**	**-**	**-**	**-**	**1 310**
a. Stationary Combustion Sources	**496**	**2**	**60**	**0.03**	**9**	**-**	**-**	**-**	**-**	**567**
Public Electricity and Heat Production	3.9	0.0	0.0	0.0	0.02	-	-	-	-	3.92
Petroleum Refining Industries	-	-	-	-	-	-	-	-	-	-
Mining and Upstream Oil and Gas Production	-	-	-	-	-	-	-	-	-	-
Manufacturing Industries	113	0.0	0.07	0.0	0.6	-	-	-	-	114
Construction	x	x	x	x	x	-	-	-	-	x
Commercial and Institutional	74.5	0.0	0.02	0.0	0.5	-	-	-	-	75
Residential	289	2	60	0.03	8	-	-	-	-	359
Agriculture and Forestry	12.5	0.0	0.0	0.0	0.06	-	-	-	-	12.5
b. Transport[1]	**717**	**0.1**	**3**	**0.07**	**20**	**-**	**-**	**-**	**-**	**742**
Domestic Aviation	19.7	0.0	0.01	0.0	0.2	-	-	-	-	20
Road Transportation	553	0.05	1	0.03	10	-	-	-	-	564
Light-Duty Gasoline Vehicles	185	0.02	0.44	0.01	3.5	-	-	-	-	189
Light-Duty Gasoline Trucks	205	0.02	0.53	0.01	3.8	-	-	-	-	209
Heavy-Duty Gasoline Vehicles	22.6	0.0	0.03	0.0	0.53	-	-	-	-	23.2
Motorcycles	2.61	0.0	0.02	0.0	0.01	-	-	-	-	2.64
Light-Duty Diesel Vehicles	x	x	x	x	x	-	-	-	-	x
Light-Duty Diesel Trucks	8.18	0.0	0.01	0.0	0.2	-	-	-	-	8.38
Heavy-Duty Diesel Vehicles	128	0.01	0.1	0.01	2	-	-	-	-	130
Propane and Natural Gas Vehicles	x	x	x	x	x	-	-	-	-	x
Railways	-	-	-	-	-	-	-	-	-	-
Domestic Navigation	62.7	0.0	0.09	0.03	8	-	-	-	-	71
Other Transportation	81.3	0.07	2	0.01	4	-	-	-	-	87
Off-Road Gasoline	x	x	x	x	x	-	-	-	-	x
Off-Road Diesel	28.8	0.0	0.04	0.01	4	-	-	-	-	32
Pipeline Transport	x	x	x	x	x	-	-	-	-	x
c. Fugitive Sources	-	-	-	-	-	-	-	-	-	-
Coal Mining	-	-	-	-	-	-	-	-	-	-
Oil and Natural Gas	-	-	-	-	-	-	-	-	-	-
d. CO_2 Transport and Storage	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE	**1.73**	**-**	**-**	**0.0**	**1.06**	**29**	**-**	**-**	**-**	**31.3**
a. Mineral Products	**0.6**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.6**
Cement Production	-	-	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-	-	-
Mineral Products Use	0.6	-	-	-	-	-	-	-	-	0.6
b. Chemical Industry[2]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
Aluminum Production	-	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[3]	**-**	**-**	**-**	**-**	**-**	**29**	**-**	**-**	**-**	**29**
e. Non-Energy Products from Fuels and Solvent Use	**0.99**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.99**
f. Other Product Manufacture and Use	**0.1**	**-**	**-**	**0.0**	**1.1**	**-**	**-**	**-**	**-**	**1.2**
AGRICULTURE	**-**	**5.6**	**140**	**0.6**	**200**	**-**	**-**	**-**	**-**	**320**
a. Enteric Fermentation	**-**	**4.9**	**120**	**-**	**-**	**-**	**-**	**-**	**-**	**120**
b. Manure Management	**-**	**0.76**	**19**	**0.09**	**25.3**	**-**	**-**	**-**	**-**	**44**
c. Agriculture Soils	**-**	**-**	**-**	**0.51**	**150**	**-**	**-**	**-**	**-**	**150**
Direct Sources	-	-	-	0.43	130	-	-	-	-	130
Indirect Sources	-	-	-	0.08	30	-	-	-	-	30
d. Field Burning of Agricultural Residues	**-**	**0.01**	**0.1**	**0.0**	**0.04**	**-**	**-**	**-**	**-**	**0.2**
e. Liming, Urea Application and Other Carbon-containing Fertilizers	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
WASTE	**12**	**4.8**	**120**	**0.01**	**4**	**-**	**-**	**-**	**-**	**140**
a. Solid Waste Disposal on Land	**-**	**4.6**	**110**	**-**	**-**	**-**	**-**	**-**	**-**	**110**
b. Wastewater Handling	**-**	**0.23**	**5.7**	**0.01**	**3**	**-**	**-**	**-**	**-**	**8.4**
c. Waste Incineration	**12**	**-**	**-**	**0.01**	**2**	**-**	**-**	**-**	**-**	**13**

Notes:

1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
4. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

x Indicates data has been suppressed to respect confidentiality

Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

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Table A10–6 1990–2013 GHG Emission Summary for Nova Scotia

Greenhouse Gas Categories		1990	2000	2005	2009	2010	2011	2012	2013
	kt CO_2 equivalent								
TOTAL		**20 200**	**22 700**	**24 000**	**21 000**	**20 700**	**21 400**	**19 600**	**18 300**
ENERGY		**18 300**	**20 800**	**22 200**	**19 600**	**19 200**	**19 900**	**18 000**	**16 700**
a.	**Stationary Combustion Sources**	**11 700**	**14 500**	**15 700**	**14 100**	**13 500**	**13 600**	**12 300**	**11 500**
	Public Electricity and Heat Production	6 930	9 540	10 800	9 450	8 860	8 520	7 680	7 310
	Petroleum Refining Industries	610	550	1 100	890	770	700	870	750
	Mining and Upstream Oil and Gas Production	85.3	420	326	314	413	628	525	527
	Manufacturing Industries	777	731	554	648	586	540	523	413
	Construction	49.6	28.1	48.7	25.3	26	23.8	20.6	10.4
	Commercial and Institutional	797	924	1 260	815	783	922	661	642
	Residential	2 380	2 030	1 550	1 930	1 960	2 190	1 960	1 770
	Agriculture and Forestry	104	236	96.3	70.1	81.6	110	70.5	38.5
b.	**Transport**[1]	**4 910**	**5 610**	**6 070**	**5 040**	**5 360**	**5 880**	**5 340**	**4 920**
	Domestic Aviation	280	310	260	220	220	210	240	250
	Road Transportation	3 130	3 510	3 800	3 660	3 750	3 830	3 670	3 530
	Light-Duty Gasoline Vehicles	1 580	1 300	1 290	1 210	1 230	1 270	1 210	1 130
	Light-Duty Gasoline Trucks	679	1 180	1 310	1 240	1 270	1 320	1 260	1 180
	Heavy-Duty Gasoline Vehicles	166	90.7	112	111	114	120	116	109
	Motorcycles	10	7.6	9.33	9.25	9.55	10	9.66	9.12
	Light-Duty Diesel Vehicles	23.3	19.5	24.2	26	27.9	30.8	32.2	31.5
	Light-Duty Diesel Trucks	23.5	47.4	52.9	49.2	50.3	53	53	49.4
	Heavy-Duty Diesel Vehicles	641	859	994	1 010	1 040	1 020	988	1 020
	Propane and Natural Gas Vehicles	7.5	4.2	4.9	5.4	5.2	4.2	3.5	3.2
	Railways	66	74	120	120	140	170	130	110
	Domestic Navigation	620	680	850	450	490	530	410	330
	Other Transportation	820	1 000	1 000	590	760	1 100	880	700
	Off-Road Gasoline	330	410	280	110	150	310	350	130
	Off-Road Diesel	490	620	730	400	530	820	530	570
	Pipeline Transport	-	-	34.6	77.8	74.6	2.95	3.93	3.93
c.	**Fugitive Sources**	**1 700**	**700**	**480**	**420**	**410**	**390**	**390**	**360**
	Coal Mining	2 000	600	400	300	300	300	300	300
	Oil and Natural Gas	51	140	130	120	120	110	100	86
d.	**CO_2 Transport and Storage**	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE		**318**	**426**	**476**	**328**	**420**	**482**	**479**	**538**
a.	**Mineral Products**	**190**	**230**	**250**	**100**	**200**	**200**	**210**	**190**
	Cement Production	180	230	250	100	190	190	210	190
	Lime Production	-	-	-	-	-	-	-	-
	Mineral Products Use	8.2	3.1	3	2.2	1.7	1.7	1.7	1.7
b.	**Chemical Industry**[2]	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-
c.	**Metal Production**	-	-	-	-	-	-	-	-
	Iron and Steel Production	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	**23**	**110**	**160**	**160**	**170**	**180**	**170**	**190**
e.	**Non-Energy Products from Fuels and Solvent Use**	**100**	**66**	**52**	**59**	**49**	**100**	**89**	**150**
f.	**Other Product Manufacture and Use**	**5.6**	**13**	**11**	**7**	**6.7**	**7.1**	**9**	**7.9**
AGRICULTURE		**550**	**570**	**550**	**480**	**460**	**450**	**450**	**450**
a.	**Enteric Fermentation**	**250**	**240**	**230**	**200**	**190**	**190**	**190**	**190**
b.	**Manure Management**	**150**	**160**	**180**	**150**	**140**	**130**	**130**	**130**
c.	**Agriculture Soils**	**110**	**120**	**130**	**120**	**110**	**110**	**110**	**100**
	Direct Sources	92	99	110	96	94	88	94	85
	Indirect Sources	20	20	30	20	20	20	20	20
d.	**Field Burning of Agricultural Residues**	**0.03**	**0.1**	**0.1**	**0.05**	**0.05**	**0.06**	**0.04**	**0.04**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**40**	**40**	**10**	**10**	**10**	**10**	**10**	**20**
WASTE		**980**	**900**	**720**	**620**	**610**	**590**	**600**	**610**
a.	**Solid Waste Disposal on Land**	**900**	**830**	**660**	**550**	**540**	**530**	**540**	**550**
b.	**Wastewater Handling**	**50**	**53**	**53**	**53**	**53**	**53**	**53**	**53**
c.	**Waste Incineration**	**26**	**15**	**13**	**13**	**12**	**11**	**10**	**11**

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
x Indicates data has been suppressed to respect confidentiality
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Table A10–7 2013 GHG Emission Summary for Nova Scotia

Greenhouse Gas Categories		Greenhouse Gases									
		CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[4]	PFCs[4]	SF_6	NF_3	TOTAL
	Global Warming Potential			25		298			22 800	17 200	
	Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL		**16 200**	**62**	**1 500**	**1.5**	**440**	**150**	**-**	**36**	**-**	**18 300**
ENERGY		**15 800**	**28**	**700**	**0.8**	**300**	**-**	**-**	**-**	**-**	**16 700**
a.	**Stationary Combustion Sources**	**11 000**	**20**	**400**	**0.3**	**90**	**-**	**-**	**-**	**-**	**11 500**
	Public Electricity and Heat Production	7 270	0.26	6.6	0.1	30	-	-	-	-	7 310
	Petroleum Refining Industries	754	0.01	0.2	0.0	0.6	-	-	-	-	750
	Mining and Upstream Oil and Gas Production	494	1.2	29	0.01	4	-	-	-	-	527
	Manufacturing Industries	402	0.04	1	0.03	9	-	-	-	-	413
	Construction	10.4	0.0	0.0	0.0	0.06	-	-	-	-	10.4
	Commercial and Institutional	637	0.01	0.22	0.01	4	-	-	-	-	642
	Residential	1 390	10	300	0.2	50	-	-	-	-	1 770
	Agriculture and Forestry	38.3	0.0	0.01	0.0	0	-	-	-	-	38.5
b.	**Transport[1]**	**4 750**	**0.5**	**10**	**0.5**	**200**	**-**	**-**	**-**	**-**	**4 920**
	Domestic Aviation	249	0.01	0.2	0.01	2	-	-	-	-	250
	Road Transportation	3 460	0.3	6	0.19	56	-	-	-	-	3 530
	Light-Duty Gasoline Vehicles	1 110	0.1	2.4	0.06	17	-	-	-	-	1 130
	Light-Duty Gasoline Trucks	1 160	0.11	2.7	0.06	18	-	-	-	-	1 180
	Heavy-Duty Gasoline Vehicles	106	0.0	0.09	0.01	2.8	-	-	-	-	109
	Motorcycles	8.99	0.0	0.08	0.0	0.05	-	-	-	-	9.12
	Light-Duty Diesel Vehicles	30.7	0.0	0.01	0.0	0.7	-	-	-	-	31.5
	Light-Duty Diesel Trucks	48.2	0.0	0.03	0.0	1	-	-	-	-	49.4
	Heavy-Duty Diesel Vehicles	997	0.04	1	0.06	20	-	-	-	-	1 020
	Propane and Natural Gas Vehicles	3.18	0.0	0.03	0.0	0.02	-	-	-	-	3.2
	Railways	93.9	0.01	0.1	0.04	10	-	-	-	-	110
	Domestic Navigation	309	0.02	0.5	0.08	20	-	-	-	-	330
	Other Transportation	630	0.2	5	0.2	60	-	-	-	-	700
	Off-Road Gasoline	122	0.1	4	0.0	0.8	-	-	-	-	130
	Off-Road Diesel	505	0.03	0.7	0.2	60	-	-	-	-	570
	Pipeline Transport	3.8	0.0	0.1	0.0	0.03	-	-	-	-	3.93
c.	**Fugitive Sources**	**53**	**12**	**310**	**0.0**	**0.8**	**-**	**-**	**-**	**-**	**360**
	Coal Mining	-	10	300	-	-	-	-	-	-	300
	Oil and Natural Gas	53	1.3	32	0.0	0.8	-	-	-	-	86
d.	**CO_2 Transport and Storage**	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE		**345**	**-**	**-**	**0.02**	**6.86**	**150**	**-**	**36**	**-**	**538**
a.	**Mineral Products**	**190**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**190**
	Cement Production	190	-	-	-	-	-	-	-	-	190
	Lime Production	-	-	-	-	-	-	-	-	-	-
	Mineral Products Use	1.7	-	-	-	-	-	-	-	-	1.7
b.	**Chemical Industry[2]**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c.	**Metal Production**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3[3]**	**-**	**-**	**-**	**-**	**-**	**150**	**-**	**36**	**-**	**190**
e.	**Non-Energy Products from Fuels and Solvent Use**	**150**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**150**
f.	**Other Product Manufacture and Use**	**1**	**-**	**-**	**0.02**	**6.9**	**-**	**-**	**-**	**-**	**7.9**
AGRICULTURE		**-**	**11**	**260**	**0.6**	**200**	**-**	**-**	**-**	**-**	**450**
a.	**Enteric Fermentation**	**-**	**7.8**	**190**	**-**	**-**	**-**	**-**	**-**	**-**	**190**
b.	**Manure Management**	**-**	**2.8**	**70**	**0.21**	**62.3**	**-**	**-**	**-**	**-**	**130**
c.	**Agriculture Soils**	**-**	**-**	**-**	**0.35**	**100**	**-**	**-**	**-**	**-**	**100**
	Direct Sources	-	-	-	0.29	85	-	-	-	-	85
	Indirect Sources	-	-	-	0.06	20	-	-	-	-	20
d.	**Field Burning of Agricultural Residues**	**-**	**0.0**	**0.03**	**0.0**	**0.01**	**-**	**-**	**-**	**-**	**0.04**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**20**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**20**
WASTE		**9.8**	**23**	**580**	**0.06**	**20**	**-**	**-**	**-**	**-**	**610**
a.	**Solid Waste Disposal on Land**	**-**	**22**	**550**	**-**	**-**	**-**	**-**	**-**	**-**	**550**
b.	**Wastewater Handling**	**-**	**1.4**	**35**	**0.06**	**20**	**-**	**-**	**-**	**-**	**53**
c.	**Waste Incineration**	**9.8**	**-**	**-**	**0.01**	**1**	**-**	**-**	**-**	**-**	**11**

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
4. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
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Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

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Table A10–8 1990–2013 GHG Emission Summary for New Brunswick

Greenhouse Gas Categories		1990	2000	2005	2009	2010	2011	2012	2013
kt CO_2 equivalent									
TOTAL		**16 500**	**21 300**	**20 600**	**18 700**	**18 700**	**18 800**	**16 900**	**15 700**
ENERGY		**15 100**	**19 500**	**18 900**	**16 500**	**16 100**	**16 900**	**14 800**	**13 100**
a.	**Stationary Combustion Sources**	**10 900**	**14 100**	**13 300**	**11 900**	**10 800**	**10 600**	**9 480**	**8 730**
	Public Electricity and Heat Production	6 030	9 010	8 100	7 080	5 360	4 950	4 080	4 220
	Petroleum Refining Industries	1 100	1 700	2 300	2 300	2 800	2 500	2 400	2 500
	Mining and Upstream Oil and Gas Production	126	132	158	88.8	147	260	204	58.6
	Manufacturing Industries	1 640	1 550	1 210	1 010	891	905	873	874
	Construction	68.6	41.7	5.56	19.2	54.4	19	13.7	8.98
	Commercial and Institutional	580	586	577	395	502	748	817	312
	Residential	1 310	989	965	883	979	1 080	958	667
	Agriculture and Forestry	52.9	65	31.8	62	113	116	85.4	56.9
b.	**Transport**[1]	**4 090**	**5 340**	**5 310**	**4 450**	**5 090**	**6 070**	**5 110**	**4 160**
	Domestic Aviation	140	120	120	98	100	86	100	110
	Road Transportation	2 970	3 680	3 890	3 710	3 900	3 980	3 870	3 470
	Light-Duty Gasoline Vehicles	1 320	1 150	1 070	999	1 050	1 080	1 050	943
	Light-Duty Gasoline Trucks	657	1 090	1 220	1 150	1 210	1 250	1 220	1 100
	Heavy-Duty Gasoline Vehicles	166	90.1	128	126	134	139	138	125
	Motorcycles	7.15	6.83	10.6	10.4	11	11.5	11.4	10.3
	Light-Duty Diesel Vehicles	14.9	11.8	13.3	14	15.4	17.5	18	16.7
	Light-Duty Diesel Trucks	23.3	43.5	49	45.5	47.9	52.2	51.5	45.9
	Heavy-Duty Diesel Vehicles	776	1 270	1 400	1 370	1 440	1 430	1 380	1 230
	Propane and Natural Gas Vehicles	5.1	6.8	0.62	0.77	0.62	0.77	0.62	0.46
	Railways	130	230	290	260	310	x	x	x
	Domestic Navigation	270	400	420	320	400	x	x	x
	Other Transportation	580	910	590	62	380	1 100	500	110
	Off-Road Gasoline	190	150	x	x	x	x	x	x
	Off-Road Diesel	390	760	430	-	290	730	180	-
	Pipeline Transport	-	-	x	x	x	x	x	x
c.	**Fugitive Sources**	**60**	**130**	**220**	**200**	**210**	**200**	**200**	**190**
	Coal Mining	1	0.4	0.3	0.3	-	-	-	-
	Oil and Natural Gas	60	130	220	200	210	200	200	190
d.	**CO_2 Transport and Storage**	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE		**166**	**391**	**326**	**981**	**1 340**	**873**	**950**	**1 580**
a.	**Mineral Products**	**88**	**120**	**94**	**47**	**54**	**57**	**57**	**52**
	Cement Production	-	-	-	-	-	-	-	-
	Lime Production	76.4	103	85.6	40.9	49	51.1	51.7	47.2
	Mineral Products Use	12	14	8.7	6	5.5	5.7	5	5.2
b.	**Chemical Industry**[2]	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-
c.	**Metal Production**	-	-	-	-	-	-	-	-
	Iron and Steel Production	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	**0.68**	**81**	**110**	**120**	**120**	**120**	**130**	**130**
e.	**Non-Energy Products from Fuels and Solvent Use**	**72**	**180**	**110**	**810**	**1 200**	**690**	**760**	**1 400**
f.	**Other Product Manufacture and Use**	**4.6**	**11**	**8.4**	**5.6**	**5.5**	**6**	**7.7**	**6.8**
AGRICULTURE		**530**	**580**	**580**	**510**	**500**	**470**	**520**	**470**
a.	**Enteric Fermentation**	**210**	**200**	**200**	**180**	**180**	**180**	**170**	**170**
b.	**Manure Management**	**92**	**98**	**96**	**83**	**82**	**78**	**78**	**79**
c.	**Agriculture Soils**	**170**	**190**	**230**	**180**	**170**	**160**	**190**	**150**
	Direct Sources	140	160	190	150	140	140	160	120
	Indirect Sources	30	30	40	30	30	30	30	20
d.	**Field Burning of Agricultural Residues**	**0.03**	**0.02**	**0.02**	**0.02**	**0.03**	**0.01**	**0.02**	**0.02**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**70**	**80**	**50**	**60**	**60**	**60**	**70**	**80**
WASTE		**750**	**800**	**800**	**730**	**740**	**630**	**610**	**570**
a.	**Solid Waste Disposal on Land**	**720**	**760**	**770**	**700**	**710**	**600**	**580**	**540**
b.	**Wastewater Handling**	**29**	**31**	**31**	**31**	**31**	**31**	**32**	**31**
c.	**Waste Incineration**	-	-	-	-	-	-	-	-

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
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Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

Table A10–9 2013 GHG Emission Summary for New Brunswick

Greenhouse Gas Categories		Greenhouse Gases									
		CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[4]	PFCs[4]	SF_6	NF_3	TOTAL
	Global Warming Potential			25		298			22 800	17 200	
	Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL		**14 100**	**41**	**1 000**	**1.3**	**400**	**130**	**-**	**0.91**	**-**	**15 700**
ENERGY		**12 600**	**10**	**260**	**0.7**	**200**	**-**	**-**	**-**	**-**	**13 100**
a.	**Stationary Combustion Sources**	**8 430**	**9**	**200**	**0.3**	**80**	**-**	**-**	**-**	**-**	**8 730**
	Public Electricity and Heat Production	4 190	0.31	7.8	0.06	20	-	-	-	-	4 220
	Petroleum Refining Industries	2 530	0.04	1	0.02	6	-	-	-	-	2 500
	Mining and Upstream Oil and Gas Production	58.2	0.0	0.02	0.0	0.4	-	-	-	-	58.6
	Manufacturing Industries	846	0.1	3	0.08	20	-	-	-	-	874
	Construction	8.94	0.0	0.0	0.0	0.04	-	-	-	-	8.98
	Commercial and Institutional	309	0.01	0.13	0.01	2	-	-	-	-	312
	Residential	433	8	200	0.09	30	-	-	-	-	667
	Agriculture and Forestry	56.5	0.0	0.02	0.0	0.32	-	-	-	-	56.9
b.	**Transport**[1]	**4 040**	**0.4**	**10**	**0.4**	**100**	**-**	**-**	**-**	**-**	**4 160**
	Domestic Aviation	111	0.01	0.2	0.0	1	-	-	-	-	110
	Road Transportation	3 400	0.3	6	0.2	59	-	-	-	-	3 470
	Light-Duty Gasoline Vehicles	925	0.09	2.1	0.05	16	-	-	-	-	943
	Light-Duty Gasoline Trucks	1 080	0.11	2.7	0.06	18	-	-	-	-	1 100
	Heavy-Duty Gasoline Vehicles	122	0.0	0.11	0.01	3.1	-	-	-	-	125
	Motorcycles	10.2	0.0	0.09	0.0	0.06	-	-	-	-	10.3
	Light-Duty Diesel Vehicles	16.3	0.0	0.01	0.0	0.4	-	-	-	-	16.7
	Light-Duty Diesel Trucks	44.8	0.0	0.03	0.0	1	-	-	-	-	45.9
	Heavy-Duty Diesel Vehicles	1 210	0.05	1	0.07	20	-	-	-	-	1 230
	Propane and Natural Gas Vehicles	0.46	0.0	0.01	0.0	0.0	-	-	-	-	0.46
	Railways	x	x	x	x	x	-	-	-	-	x
	Domestic Navigation	x	x	x	x	x	-	-	-	-	x
	Other Transportation	102	0.1	3	0.0	0.7	-	-	-	-	110
	Off-Road Gasoline	x	x	x	x	x	-	-	-	-	x
	Off-Road Diesel	-	-	-	-	-	-	-	-	-	-
	Pipeline Transport	x	x	x	x	x	-	-	-	-	x
c.	**Fugitive Sources**	**150**	**1.1**	**28**	**0.01**	**4**	**-**	**-**	**-**	**-**	**190**
	Coal Mining	-	-	-	-	-	-	-	-	-	-
	Oil and Natural Gas	150	1.1	28	0.01	4	-	-	-	-	190
d.	**CO_2 Transport and Storage**	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE		**1 440**	**-**	**-**	**0.02**	**5.51**	**130**	**-**	**0.91**	**-**	**1 580**
a.	**Mineral Products**	**52**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**52**
	Cement Production	-	-	-	-	-	-	-	-	-	-
	Lime Production	47.2	-	-	-	-	-	-	-	-	47.2
	Mineral Products Use	5.2	-	-	-	-	-	-	-	-	5.2
b.	**Chemical Industry**[2]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c.	**Metal Production**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	**-**	**-**	**-**	**-**	**-**	**130**	**-**	**0.91**	**-**	**130**
e.	**Non-Energy Products from Fuels and Solvent Use**	**1 400**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1 400**
f.	**Other Product Manufacture and Use**	**1**	**-**	**-**	**0.02**	**5.5**	**-**	**-**	**-**	**-**	**6.8**
AGRICULTURE		**100**	**8.5**	**210**	**0.6**	**200**	**-**	**-**	**-**	**-**	**470**
a.	**Enteric Fermentation**	**-**	**6.9**	**170**	**-**	**-**	**-**	**-**	**-**	**-**	**170**
b.	**Manure Management**	**-**	**1.6**	**40**	**0.13**	**38.9**	**-**	**-**	**-**	**-**	**79**
c.	**Agriculture Soils**	**-**	**-**	**-**	**0.49**	**150**	**-**	**-**	**-**	**-**	**150**
	Direct Sources	-	-	-	0.41	120	-	-	-	-	120
	Indirect Sources	-	-	-	0.08	20	-	-	-	-	20
d.	**Field Burning of Agricultural Residues**	**-**	**0.0**	**0.02**	**0.0**	**0.01**	**-**	**-**	**-**	**-**	**0.02**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**80**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**80**
WASTE		**-**	**22**	**560**	**0.05**	**10**	**-**	**-**	**-**	**-**	**570**
a.	**Solid Waste Disposal on Land**	**-**	**22**	**540**	**-**	**-**	**-**	**-**	**-**	**-**	**540**
b.	**Wastewater Handling**	**-**	**0.69**	**17**	**0.05**	**10**	**-**	**-**	**-**	**-**	**31**
c.	**Waste Incineration**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes:

1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
4. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

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Table A10–10 1990–2013 GHG Emission Summary for Quebec

Greenhouse Gas Categories		1990	2000	2005	2009	2010	2011	2012	2013
kt CO_2 equivalent									
TOTAL		**89 800**	**89 700**	**90 200**	**87 600**	**82 700**	**84 200**	**81 600**	**82 600**
ENERGY		**60 700**	**63 000**	**62 700**	**62 700**	**59 000**	**59 900**	**58 300**	**58 800**
a.	**Stationary Combustion Sources**	**32 300**	**30 600**	**28 400**	**26 400**	**23 300**	**23 500**	**22 600**	**23 600**
	Public Electricity and Heat Production	1 500	572	622	651	430	405	488	371
	Petroleum Refining Industries	3 400	3 200	3 700	3 600	1 900	2 300	2 200	2 200
	Mining and Upstream Oil and Gas Production	824	998	318	1 600	1 210	486	655	1 080
	Manufacturing Industries	12 300	11 300	10 300	8 110	8 170	9 090	9 260	9 840
	Construction	458	191	308	388	420	343	364	362
	Commercial and Institutional	4 240	5 550	5 250	5 180	4 890	4 890	3 980	4 080
	Residential	9 310	8 430	7 650	6 450	5 820	5 630	5 310	5 280
	Agriculture and Forestry	291	263	292	413	450	399	406	405
b.	**Transport**[1]	**28 000**	**31 900**	**33 900**	**35 900**	**35 400**	**36 100**	**35 300**	**34 900**
	Domestic Aviation	820	730	740	620	620	620	740	730
	Road Transportation	20 800	25 100	27 800	27 700	27 800	27 600	27 600	27 300
	Light-Duty Gasoline Vehicles	11 900	11 300	10 700	10 600	10 600	10 400	10 300	10 200
	Light-Duty Gasoline Trucks	3 750	6 560	7 770	7 750	7 750	7 570	7 540	7 480
	Heavy-Duty Gasoline Vehicles	585	545	863	902	912	901	905	907
	Motorcycles	32.3	47.6	81.4	85	86	84.8	85.2	85.3
	Light-Duty Diesel Vehicles	186	181	223	263	279	297	309	318
	Light-Duty Diesel Trucks	194	360	363	366	369	376	376	371
	Heavy-Duty Diesel Vehicles	4 020	6 140	7 740	7 650	7 730	8 000	8 070	7 900
	Propane and Natural Gas Vehicles	110	36	34	26	31	30	38	44
	Railways	570	810	710	940	850	900	940	880
	Domestic Navigation	1 400	1 300	1 300	1 800	1 400	1 000	850	960
	Other Transportation	4 300	3 900	3 400	4 900	4 800	5 900	5 200	5 100
	Off-Road Gasoline	1 400	1 300	1 400	1 400	1 400	1 800	1 400	1 500
	Off-Road Diesel	2 900	2 500	1 600	3 300	3 300	4 000	3 600	3 300
	Pipeline Transport	26.1	108	338	229	156	152	201	228
c.	**Fugitive Sources**	**430**	**500**	**390**	**360**	**340**	**290**	**280**	**260**
	Coal Mining	-	-	-	-	-	-	-	-
	Oil and Natural Gas	430	500	390	360	340	290	280	260
d.	**CO_2 Transport and Storage**	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE		**14 500**	**12 100**	**12 400**	**10 100**	**9 860**	**11 000**	**10 300**	**10 800**
a.	**Mineral Products**	**1 900**	**2 000**	**2 100**	**1 600**	**1 800**	**1 800**	**2 000**	**1 800**
	Cement Production	1 400	1 200	1 300	1 100	1 200	1 200	1 400	1 200
	Lime Production	272	430	465	353	423	441	446	408
	Mineral Products Use	250	300	290	180	120	150	180	180
b.	**Chemical Industry**[2]	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-
c.	**Metal Production**	**10 900**	**8 090**	**7 560**	**6 330**	**6 070**	**6 010**	**5 630**	**6 000**
	Iron and Steel Production	-	17	-	22	35.1	36.3	30.8	16.2
	Aluminum Production	8 660	6 870	7 460	6 290	6 020	5 960	5 580	5 960
	SF_6 Used in Magnesium Smelters and Casters	2 280	1 210	103	19.7	13	12.3	15.5	21.7
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	**37**	**760**	**1 100**	**1 200**	**1 200**	**1 300**	**1 300**	**1 400**
e.	**Non-Energy Products from Fuels and Solvent Use**	**1 500**	**1 200**	**1 600**	**840**	**710**	**1 800**	**1 300**	**1 500**
f.	**Other Product Manufacture and Use**	**43**	**100**	**85**	**59**	**56**	**60**	**77**	**68**
AGRICULTURE		**7 700**	**7 700**	**7 900**	**7 800**	**7 800**	**7 700**	**8 000**	**7 800**
a.	**Enteric Fermentation**	**3 300**	**3 200**	**3 300**	**3 100**	**3 000**	**3 000**	**2 900**	**2 900**
b.	**Manure Management**	**1 700**	**1 800**	**1 800**	**1 700**	**1 700**	**1 700**	**1 700**	**1 700**
c.	**Agriculture Soils**	**2 500**	**2 400**	**2 600**	**2 800**	**2 900**	**2 800**	**3 100**	**3 000**
	Direct Sources	2 100	2 100	2 200	2 400	2 400	2 300	2 600	2 500
	Indirect Sources	400	400	400	400	400	400	500	400
d.	**Field Burning of Agricultural Residues**	**0.4**	**0.2**	**0.3**	**0.2**	**0.3**	**0.2**	**0.2**	**0.2**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**200**	**300**	**200**	**200**	**200**	**200**	**300**	**300**
WASTE		**6 900**	**6 900**	**7 200**	**7 000**	**6 000**	**5 600**	**5 100**	**5 300**
a.	**Solid Waste Disposal on Land**	**6 300**	**6 400**	**6 700**	**6 500**	**5 400**	**5 100**	**4 600**	**4 900**
b.	**Wastewater Handling**	**270**	**240**	**240**	**250**	**250**	**260**	**260**	**260**
c.	**Waste Incineration**	**340**	**260**	**270**	**250**	**270**	**260**	**300**	**130**

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
x Indicates data has been suppressed to respect confidentiality
Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

Table A10–11 2013 GHG Emission Summary for Quebec

Greenhouse Gas Categories		Greenhouse Gases									
		CO_2	CH_4	CH_4	N_2O	N_2O	$HFCs^4$	$PFCs^4$	SF_6	NF_3	TOTAL
	Global Warming Potential			25		298			22 800	17 200	
	Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL		**63 300**	**450**	**11 000**	**18**	**5 400**	**1 300**	**1 200**	**93**	.	**82 600**
ENERGY		**54 900**	**97**	**2 400**	**5**	**1 000**	-	-	-	.	**58 800**
a.	**Stationary Combustion Sources**	**20 900**	**90**	**2 000**	**2**	**500**	-	-	-	.	**23 600**
	Public Electricity and Heat Production	364	0.04	1.1	0.02	6	-	-	-	.	371
	Petroleum Refining Industries	2 170	0.04	0.9	0.02	7	-	-	-	.	2 200
	Mining and Upstream Oil and Gas Production	1 070	0.03	0.67	0.02	5	-	-	-	.	1 080
	Manufacturing Industries	9 720	0.5	10	0.4	100	-	-	-	.	9 840
	Construction	359	0.01	0.17	0.01	2	-	-	-	.	362
	Commercial and Institutional	4 050	0.08	2	0.09	30	-	-	-	.	4 080
	Residential	2 750	90	2 000	1	300	-	-	-	.	5 280
	Agriculture and Forestry	399	0.01	0.16	0.02	5.5	-	-	-	.	405
b.	**Transport[1]**	**33 800**	**4**	**100**	**3**	**1 000**	-	-	-	.	**34 900**
	Domestic Aviation	720	0.03	0.9	0.02	6	-	-	-	.	730
	Road Transportation	26 800	2	50	1.5	440	-	-	-	.	27 300
	Light-Duty Gasoline Vehicles	10 000	0.87	22	0.53	160	-	-	-	.	10 200
	Light-Duty Gasoline Trucks	7 350	0.68	17	0.38	110	-	-	-	.	7 480
	Heavy-Duty Gasoline Vehicles	883	0.03	0.76	0.08	23	-	-	-	.	907
	Motorcycles	84.1	0.03	0.73	0.0	0.46	-	-	-	.	85.3
	Light-Duty Diesel Vehicles	310	0.01	0.2	0.03	8	-	-	-	.	318
	Light-Duty Diesel Trucks	362	0.01	0.2	0.03	9	-	-	-	.	371
	Heavy-Duty Diesel Vehicles	7 760	0.3	8	0.4	100	-	-	-	.	7 900
	Propane and Natural Gas Vehicles	42.3	0.06	1	0.0	0.3	-	-	-	.	44
	Railways	780	0.04	1	0.3	100	-	-	-	.	880
	Domestic Navigation	897	0.06	2	0.2	60	-	-	-	.	960
	Other Transportation	4 630	2	50	1	400	-	-	-	.	5 100
	Off-Road Gasoline	1 470	2	40	0.03	10	-	-	-	.	1 500
	Off-Road Diesel	2 940	0.2	4	1	400	-	-	-	.	3 300
	Pipeline Transport	220	0.22	5.5	0.01	2	-	-	-	.	228
c.	**Fugitive Sources**	**180**	**2.8**	**71**	**0.02**	**5**	-	-	-	.	**260**
	Coal Mining	-	-	-	-	-	-	-	-	.	-
	Oil and Natural Gas	180	2.8	71	0.02	5	-	-	-	.	260
d.	**CO_2 Transport and Storage**	-	-	-	-	-	-	-	-	.	-
INDUSTRIAL PROCESSES AND PRODUCT USE		**8 090**	-	-	**0.2**	**59.4**	**1 300**	**1 200**	**93**	.	**10 800**
a.	**Mineral Products**	**1 800**	-	-	-	-	-	-	-	.	**1 800**
	Cement Production	1 200	-	-	-	-	-	-	-	.	1 200
	Lime Production	408	-	-	-	-	-	-	-	.	408
	Mineral Products Use	180	-	-	-	-	-	-	-	.	180
b.	**Chemical Industry[2]**	-	-	-	-	-	-	-	-	.	-
	Adipic Acid Production	-	-	-	-	-	-	-	-	.	-
c.	**Metal Production**	**4 790**	-	-	-	-	-	**1 190**	**27**	.	**6 000**
	Iron and Steel Production	16.2	-	-	-	-	-	-	-	.	16.2
	Aluminum Production	4 770	-	-	-	-	-	1 190	5.38	.	5 960
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	21.7	.	21.7
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3[3]**	-	-	-	-	-	**1 300**	-	**66**	.	**1 400**
e.	**Non-Energy Products from Fuels and Solvent Use**	**1 500**	-	-	-	-	-	-	-	.	**1 500**
f.	**Other Product Manufacture and Use**	**9**	-	-	**0.2**	**59**	-	-	-	.	**68**
AGRICULTURE		-	**150**	**3 900**	**10**	**4 000**	-	-	-	.	**7 800**
a.	**Enteric Fermentation**	-	**120**	**2 900**	-	-	-	-	-	.	**2 900**
b.	**Manure Management**	-	**39**	**970**	**2.44**	**727**	-	-	-	.	**1 700**
c.	**Agriculture Soils**	-	-	-	**9.9**	**3 000**	-	-	-	.	**3 000**
	Direct Sources	-	-	-	8.4	2 500	-	-	-	.	2 500
	Indirect Sources	-	-	-	1	400	-	-	-	.	400
d.	**Field Burning of Agricultural Residues**	-	**0.01**	**0.1**	**0.0**	**0.05**	-	-	-	.	**0.2**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**300**	-	-	-	-	-	-	-	.	**300**
WASTE		**94**	**200**	**5 000**	**0.6**	**200**	-	-	-	.	**5 300**
a.	**Solid Waste Disposal on Land**	-	**200**	**4 900**	-	-	-	-	-	.	**4 900**
b.	**Wastewater Handling**	-	**4.3**	**110**	**0.5**	**200**	-	-	-	.	**260**
c.	**Waste Incineration**	**94**	**0.1**	**3**	**0.1**	**30**	-	-	-	.	**130**

Notes:

1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
4. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

x Indicates data has been suppressed to respect confidentiality

Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

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Table A10–12 1990–2013 GHG Emission Summary for Ontario

Greenhouse Gas Categories		1990	2000	2005	2009	2010	2011	2012	2013
kt CO_2 equivalent									
TOTAL		**182 000**	**211 000**	**211 000**	**171 000**	**178 000**	**175 000**	**171 000**	**171 000**
ENERGY		**133 000**	**167 000**	**163 000**	**131 000**	**137 000**	**135 000**	**129 000**	**131 000**
a.	**Stationary Combustion Sources**	**83 800**	**106 000**	**96 600**	**70 000**	**73 900**	**72 200**	**69 400**	**68 400**
	Public Electricity and Heat Production	25 800	43 400	34 500	14 900	19 800	14 200	14 200	10 900
	Petroleum Refining Industries	6 100	6 800	6 900	6 400	6 400	6 000	6 400	6 100
	Mining and Upstream Oil and Gas Production	593	505	613	654	819	804	906	622
	Manufacturing Industries	22 000	20 300	19 000	15 100	15 000	16 300	16 100	16 100
	Construction	571	440	637	462	553	411	429	428
	Commercial and Institutional	9 140	13 100	12 800	11 400	10 900	11 800	10 900	11 900
	Residential	18 800	20 100	21 200	20 100	19 400	21 000	18 800	20 700
	Agriculture and Forestry	775	907	1 030	1 040	1 100	1 640	1 670	1 640
b.	**Transport**[1]	**48 200**	**60 400**	**64 800**	**59 000**	**61 300**	**61 000**	**58 500**	**61 200**
	Domestic Aviation	2 200	2 400	2 200	1 900	1 900	1 900	2 200	2 300
	Road Transportation	35 300	42 400	47 400	45 900	46 700	45 900	44 900	46 100
	Light-Duty Gasoline Vehicles	18 800	16 900	16 600	16 000	16 200	15 800	15 200	15 700
	Light-Duty Gasoline Trucks	7 540	13 600	16 800	16 200	16 300	15 900	15 300	15 800
	Heavy-Duty Gasoline Vehicles	1 630	1 100	1 360	1 380	1 420	1 390	1 360	1 420
	Motorcycles	44.6	40.2	67.2	68.6	70.3	69.2	67.3	70.3
	Light-Duty Diesel Vehicles	151	158	197	252	274	292	301	323
	Light-Duty Diesel Trucks	143	359	423	431	438	429	417	432
	Heavy-Duty Diesel Vehicles	6 450	9 890	11 700	11 100	11 500	11 700	11 800	12 000
	Propane and Natural Gas Vehicles	550	380	350	410	420	450	510	360
	Railways	1 800	1 700	1 600	1 200	1 300	1 300	1 300	1 300
	Domestic Navigation	950	800	880	610	1 100	800	1 000	1 200
	Other Transportation	7 900	13 000	13 000	9 400	10 000	11 000	9 200	10 000
	Off-Road Gasoline	2 300	3 700	3 700	3 100	3 400	3 200	1 700	2 700
	Off-Road Diesel	3 300	5 700	6 000	5 100	6 000	7 000	6 600	6 500
	Pipeline Transport	2 280	3 640	3 070	1 220	897	896	844	959
c.	**Fugitive Sources**	**1 600**	**1 500**	**1 500**	**1 500**	**1 400**	**1 400**	**1 300**	**1 300**
	Coal Mining	-	-	-	-	-	-	-	-
	Oil and Natural Gas	1 600	1 500	1 500	1 500	1 400	1 400	1 300	1 300
d.	**CO_2 Transport and Storage**	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE		**30 300**	**24 800**	**28 100**	**20 700**	**22 000**	**20 800**	**22 600**	**20 500**
a.	**Mineral Products**	**4 100**	**5 000**	**4 900**	**3 300**	**3 500**	**3 600**	**3 900**	**3 600**
	Cement Production	2 400	3 600	3 700	2 500	2 700	2 700	2 900	2 700
	Lime Production	1 090	906	797	519	572	596	604	551
	Mineral Products Use	640	550	380	320	230	300	370	380
b.	**Chemical Industry**[2]	**10 000**	**870**	**2 500**	**640**	-	-	-	-
	Adipic Acid Production	10 000	870	2 500	640	-	-	-	-
c.	**Metal Production**	**10 900**	**12 900**	**11 300**	**8 170**	**9 160**	**9 990**	**10 000**	**7 710**
	Iron and Steel Production	10 200	11 500	10 200	8 000	8 990	9 820	9 810	7 520
	Aluminum Production	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	687	1 450	1 130	164	168	170	232	191
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	**1 000**	**1 500**	**2 000**	**2 100**	**2 100**	**2 200**	**2 300**	**2 300**
e.	**Non-Energy Products from Fuels and Solvent Use**	**3 900**	**4 400**	**7 200**	**6 400**	**7 100**	**4 900**	**6 200**	**6 700**
f.	**Other Product Manufacture and Use**	**64**	**160**	**140**	**97**	**93**	**98**	**130**	**110**
AGRICULTURE		**11 000**	**10 000**	**10 000**	**10 000**	**11 000**	**10 000**	**9 900**	**10 000**
a.	**Enteric Fermentation**	**4 400**	**4 300**	**4 300**	**3 700**	**3 700**	**3 600**	**3 600**	**3 600**
b.	**Manure Management**	**2 100**	**2 200**	**2 300**	**1 900**	**1 900**	**1 900**	**1 900**	**1 900**
c.	**Agriculture Soils**	**3 900**	**3 600**	**3 600**	**4 500**	**4 800**	**4 300**	**4 200**	**4 600**
	Direct Sources	3 300	3 100	3 100	3 900	4 100	3 700	3 600	3 900
	Indirect Sources	600	600	500	700	700	600	600	700
d.	**Field Burning of Agricultural Residues**	**4**	**2**	**0.6**	**0.5**	**0.5**	**0.3**	**0.4**	**0.3**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**200**	**300**	**200**	**200**	**200**	**200**	**200**	**200**
WASTE		**7 500**	**8 600**	**9 600**	**9 400**	**9 100**	**9 300**	**9 200**	**9 000**
a.	**Solid Waste Disposal on Land**	**7 100**	**8 000**	**9 000**	**8 800**	**8 500**	**8 700**	**8 600**	**8 400**
b.	**Wastewater Handling**	**230**	**280**	**300**	**310**	**310**	**310**	**310**	**320**
c.	**Waste Incineration**	**260**	**330**	**290**	**290**	**280**	**270**	**270**	**280**

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
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Table A10–13 2013 GHG Emission Summary for Ontario

Greenhouse Gas Categories		Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[4]	PFCs[4]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL	**144 000**	**620**	**16 000**	**28**	**8 400**	**2 300**	**-**	**250**	**-**	**171 000**
ENERGY	**126 000**	**110**	**2 600**	**8**	**2 000**	**-**	**-**	**-**	**-**	**131 000**
a. Stationary Combustion Sources	**66 400**	**60**	**1 000**	**2**	**600**	**-**	**-**	**-**	**-**	**68 400**
Public Electricity and Heat Production	10 800	2	51	0.3	80	-	-	-	-	10 900
Petroleum Refining Industries	6 090	0.05	1	0.03	9	-	-	-	-	6 100
Mining and Upstream Oil and Gas Production	614	0.01	0.24	0.03	8	-	-	-	-	622
Manufacturing Industries	16 000	0.6	20	0.5	100	-	-	-	-	16 100
Construction	424	0.01	0.18	0.01	4	-	-	-	-	428
Commercial and Institutional	11 800	0.23	5.8	0.3	80	-	-	-	-	11 900
Residential	19 100	50	1 000	1	300	-	-	-	-	20 700
Agriculture and Forestry	1 630	0.03	0.76	0.04	12	-	-	-	-	1 640
b. Transport[1]	**59 200**	**8**	**200**	**6**	**2 000**	**-**	**-**	**-**	**-**	**61 200**
Domestic Aviation	2 240	0.08	2	0.06	20	-	-	-	-	2 300
Road Transportation	45 200	3	80	2.8	840	-	-	-	-	46 100
Light-Duty Gasoline Vehicles	15 300	1.2	29	1	300	-	-	-	-	15 700
Light-Duty Gasoline Trucks	15 500	1.2	29	0.95	280	-	-	-	-	15 800
Heavy-Duty Gasoline Vehicles	1 380	0.05	1.2	0.12	37	-	-	-	-	1 420
Motorcycles	69.1	0.03	0.84	0.0	0.41	-	-	-	-	70.3
Light-Duty Diesel Vehicles	315	0.01	0.2	0.03	8	-	-	-	-	323
Light-Duty Diesel Trucks	422	0.01	0.3	0.03	10	-	-	-	-	432
Heavy-Duty Diesel Vehicles	11 800	0.5	10	0.7	200	-	-	-	-	12 000
Propane and Natural Gas Vehicles	357	0.2	6	0.01	2	-	-	-	-	360
Railways	1 180	0.07	2	0.5	100	-	-	-	-	1 300
Domestic Navigation	1 210	0.1	3	0.1	30	-	-	-	-	1 200
Other Transportation	9 330	5	100	2	700	-	-	-	-	10 000
Off-Road Gasoline	2 640	3	80	0.06	20	-	-	-	-	2 700
Off-Road Diesel	5 760	0.3	8	2	700	-	-	-	-	6 500
Pipeline Transport	928	0.92	23	0.03	8	-	-	-	-	959
c. Fugitive Sources	**290**	**42**	**1 000**	**0.02**	**7**	**-**	**-**	**-**	**-**	**1 300**
Coal Mining	-	-	-	-	-	-	-	-	-	-
Oil and Natural Gas	290	42	1 000	0.02	7	-	-	-	-	1 300
d. CO_2 Transport and Storage	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE	**17 900**	**-**	**-**	**0.33**	**98.6**	**2 300**	**-**	**250**	**-**	**20 500**
a. Mineral Products	**3 600**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3 600**
Cement Production	2 700	-	-	-	-	-	-	-	-	2 700
Lime Production	551	-	-	-	-	-	-	-	-	551
Mineral Products Use	380	-	-	-	-	-	-	-	-	380
b. Chemical Industry[2]	-	-	-	-	-	-	-	-	-	-
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**7 520**	**-**	**-**	**-**	**-**	**-**	**-**	**191**	**-**	**7 710**
Iron and Steel Production	7 520	-	-	-	-	-	-	-	-	7 520
Aluminum Production	-	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	191	-	191
d. Production and Consumption of Halocarbons, SF_6 and NF_3[3]	**-**	**-**	**-**	**-**	**-**	**2 300**	**-**	**62**	**-**	**2 300**
e. Non-Energy Products from Fuels and Solvent Use	**6 700**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6 700**
f. Other Product Manufacture and Use	**10**	**-**	**-**	**0.33**	**99**	**-**	**-**	**-**	**-**	**110**
AGRICULTURE	**-**	**180**	**4 500**	**20**	**6 000**	**-**	**-**	**-**	**-**	**10 000**
a. Enteric Fermentation	**-**	**140**	**3 600**	**-**	**-**	**-**	**-**	**-**	**-**	**3 600**
b. Manure Management	**-**	**35**	**870**	**3.47**	**1 040**	**-**	**-**	**-**	**-**	**1 900**
c. Agriculture Soils	**-**	**-**	**-**	**15**	**4 600**	**-**	**-**	**-**	**-**	**4 600**
Direct Sources	-	-	-	13	3 900	-	-	-	-	3 900
Indirect Sources	-	-	-	2	700	-	-	-	-	700
d. Field Burning of Agricultural Residues	**-**	**0.01**	**0.2**	**0.0**	**0.07**	**-**	**-**	**-**	**-**	**0.3**
e. Liming, Urea Application and Other Carbon-containing Fertilizers	**200**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**200**
WASTE	**200**	**340**	**8 500**	**1**	**300**	**-**	**-**	**-**	**-**	**9 000**
a. Solid Waste Disposal on Land	**-**	**340**	**8 400**	**-**	**-**	**-**	**-**	**-**	**-**	**8 400**
b. Wastewater Handling	**-**	**2.4**	**60**	**0.9**	**300**	**-**	**-**	**-**	**-**	**320**
c. Waste Incineration	**200**	**0.01**	**0.3**	**0.3**	**80**	**-**	**-**	**-**	**-**	**280**

Notes:

1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
4. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

x Indicates data has been suppressed to respect confidentiality

Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

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Table A10–14 1990–2013 GHG Emission for Manitoba

Greenhouse Gas Categories		1990	2000	2005	2009	2010	2011	2012	2013
	kt CO_2 equivalent								
TOTAL		**18 700**	**21 100**	**20 700**	**19 900**	**19 600**	**19 400**	**20 700**	**21 400**
ENERGY		**12 700**	**13 200**	**12 500**	**11 700**	**11 300**	**11 600**	**12 800**	**13 000**
a.	**Stationary Combustion Sources**	**5 040**	**5 530**	**4 610**	**4 610**	**3 970**	**3 940**	**3 910**	**4 290**
	Public Electricity and Heat Production	523	1 010	338	192	87.3	119	109	115
	Petroleum Refining Industries	-	-	-	-	-	-	-	-
	Mining and Upstream Oil and Gas Production	79.9	22	115	268	176	103	111	122
	Manufacturing Industries	1 190	1 240	1 440	1 430	1 250	1 220	1 250	1 190
	Construction	63.4	61.9	85.8	76.6	106	113	109	124
	Commercial and Institutional	1 400	1 670	1 420	1 390	1 200	1 230	1 190	1 400
	Residential	1 740	1 470	1 160	1 130	1 060	1 120	1 110	1 280
	Agriculture and Forestry	42.6	63.8	45.6	114	79.7	37.7	42.6	48.2
b.	**Transport**[1]	**7 200**	**7 290**	**7 690**	**6 760**	**7 060**	**7 250**	**8 500**	**8 220**
	Domestic Aviation	480	550	560	460	470	420	480	490
	Road Transportation	3 790	4 450	4 720	4 900	5 210	5 120	5 600	5 720
	Light-Duty Gasoline Vehicles	1 630	1 320	1 150	1 090	1 160	1 120	1 300	1 320
	Light-Duty Gasoline Trucks	856	1 500	1 640	1 550	1 660	1 610	1 860	1 910
	Heavy-Duty Gasoline Vehicles	345	214	231	229	248	243	284	294
	Motorcycles	7.19	4.45	8.32	8.24	8.93	8.74	10.2	10.6
	Light-Duty Diesel Vehicles	14.6	10.7	11.1	13.6	15.4	15.7	18.6	19.8
	Light-Duty Diesel Trucks	40.5	90.9	101	111	120	118	135	137
	Heavy-Duty Diesel Vehicles	836	1 270	1 560	1 880	1 980	1 990	1 980	2 010
	Propane and Natural Gas Vehicles	62	37	14	17	13	10	12	14
	Railways	610	320	300	530	x	x	x	x
	Domestic Navigation	0.02	1.2	2.4	6	x	x	x	x
	Other Transportation	2 300	2 000	2 100	860	750	1 000	1 800	1 400
	Off-Road Gasoline	460	440	380	330	450	340	690	690
	Off-Road Diesel	1 000	690	1 100	440	290	630	1 100	640
	Pipeline Transport	848	829	601	102	17.9	32.3	13.2	102
c.	**Fugitive Sources**	**450**	**410**	**210**	**300**	**300**	**370**	**430**	**450**
	Coal Mining	-	-	-	-	-	-	-	-
	Oil and Natural Gas	450	410	210	300	300	370	430	450
d.	**CO_2 Transport and Storage**	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE		**459**	**609**	**659**	**662**	**823**	**840**	**682**	**701**
a.	**Mineral Products**	**220**	**80**	**69**	**56**	**62**	**66**	**69**	**64**
	Cement Production	150	-	-	-	-	-	-	-
	Lime Production	58.1	68.9	58.8	44.7	53.6	55.8	56.5	51.6
	Mineral Products Use	11	11	10	12	8.4	10	13	13
b.	**Chemical Industry**[2]	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-
c.	**Metal Production**	-	-	-	-	-	-	-	-
	Iron and Steel Production	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	**4.3**	**150**	**200**	**200**	**210**	**220**	**220**	**230**
e.	**Non-Energy Products from Fuels and Solvent Use**	**230**	**370**	**380**	**390**	**540**	**550**	**380**	**390**
f.	**Other Product Manufacture and Use**	**6.9**	**16**	**13**	**9.1**	**8.8**	**9.6**	**12**	**11**
AGRICULTURE		**4 800**	**6 400**	**6 500**	**6 400**	**6 400**	**5 800**	**6 000**	**6 700**
a.	**Enteric Fermentation**	**1 900**	**2 700**	**3 300**	**2 800**	**2 700**	**2 500**	**2 400**	**2 500**
b.	**Manure Management**	**490**	**720**	**880**	**790**	**790**	**770**	**760**	**780**
c.	**Agriculture Soils**	**2 100**	**2 700**	**2 100**	**2 600**	**2 700**	**2 300**	**2 600**	**3 100**
	Direct Sources	1 700	2 100	1 600	2 000	2 100	1 800	2 000	2 500
	Indirect Sources	400	600	500	600	600	500	600	700
d.	**Field Burning of Agricultural Residues**	**200**	**80**	**10**	**20**	**20**	**10**	**20**	**20**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**100**	**200**	**200**	**200**	**200**	**200**	**200**	**300**
WASTE		**730**	**940**	**1 000**	**1 100**	**1 100**	**1 100**	**1 100**	**1 000**
a.	**Solid Waste Disposal on Land**	**700**	**900**	**990**	**1 100**	**1 100**	**1 100**	**1 100**	**1 000**
b.	**Wastewater Handling**	**36**	**40**	**41**	**42**	**42**	**42**	**43**	**43**
c.	**Waste Incineration**	-	-	-	-	-	-	-	-

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
x Indicates data has been suppressed to respect confidentiality
Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

Table A10–15 2013 GHG Emission Summary for Manitoba

Greenhouse Gas Categories		Greenhouse Gases									
		CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[4]	PFCs[4]	SF_6	NF_3	TOTAL
	Global Warming Potential			25		298			22 800	17 200	
	Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL		**12 900**	**180**	**4 400**	**13**	**3 800**	**230**	**-**	**1.1**	**-**	**21 400**
ENERGY		**12 200**	**18**	**460**	**1**	**300**	**-**	**-**	**-**	**-**	**13 000**
a.	**Stationary Combustion Sources**	**4 150**	**4**	**90**	**0.1**	**40**	**-**	**-**	**-**	**-**	**4 290**
	Public Electricity and Heat Production	115	0.01	0.21	0.0	0.6	-	-	-	-	115
	Petroleum Refining Industries	-	-	-	-	-	-	-	-	-	-
	Mining and Upstream Oil and Gas Production	119	0.0	0.04	0.01	2	-	-	-	-	122
	Manufacturing Industries	1 180	0.05	1	0.04	10	-	-	-	-	1 190
	Construction	123	0.0	0.06	0.0	0.7	-	-	-	-	124
	Commercial and Institutional	1 390	0.03	0.67	0.03	9	-	-	-	-	1 400
	Residential	1 170	4	90	0.06	20	-	-	-	-	1 280
	Agriculture and Forestry	47.2	0.0	0.02	0.0	0.94	-	-	-	-	48.2
b.	**Transport**[1]	**7 940**	**1**	**40**	**0.8**	**200**	**-**	**-**	**-**	**-**	**8 220**
	Domestic Aviation	487	0.02	0.5	0.01	4	-	-	-	-	490
	Road Transportation	5 610	0.4	10	0.33	98	-	-	-	-	5 720
	Light-Duty Gasoline Vehicles	1 300	0.13	3.3	0.08	24	-	-	-	-	1 320
	Light-Duty Gasoline Trucks	1 870	0.2	4.9	0.1	31	-	-	-	-	1 910
	Heavy-Duty Gasoline Vehicles	287	0.01	0.32	0.02	7.1	-	-	-	-	294
	Motorcycles	10.4	0.0	0.09	0.0	0.06	-	-	-	-	10.6
	Light-Duty Diesel Vehicles	19.3	0.0	0.01	0.0	0.5	-	-	-	-	19.8
	Light-Duty Diesel Trucks	134	0.0	0.09	0.01	3	-	-	-	-	137
	Heavy-Duty Diesel Vehicles	1 980	0.08	2	0.1	30	-	-	-	-	2 010
	Propane and Natural Gas Vehicles	13.8	0.01	0.1	0.0	0.08	-	-	-	-	14
	Railways	x	x	x	x	x	-	-	-	-	x
	Domestic Navigation	x	x	x	x	x	-	-	-	-	x
	Other Transportation	1 330	1	20	0.3	80	-	-	-	-	1 400
	Off-Road Gasoline	663	0.8	20	0.02	5	-	-	-	-	690
	Off-Road Diesel	568	0.03	0.8	0.2	70	-	-	-	-	640
	Pipeline Transport	98.4	0.1	2.5	0.0	0.8	-	-	-	-	102
c.	**Fugitive Sources**	**120**	**13**	**330**	**0.0**	**0.07**	**-**	**-**	**-**	**-**	**450**
	Coal Mining	-	-	-	-	-	-	-	-	-	-
	Oil and Natural Gas	120	13	330	0.0	0.07	-	-	-	-	450
d.	**CO_2 Transport and Storage**	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE		**461**	**-**	**-**	**0.03**	**9.22**	**230**	**-**	**1.1**	**-**	**701**
a.	**Mineral Products**	**64**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**64**
	Cement Production	-	-	-	-	-	-	-	-	-	-
	Lime Production	51.6	-	-	-	-	-	-	-	-	51.6
	Mineral Products Use	13	-	-	-	-	-	-	-	-	13
b.	**Chemical Industry**[2]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c.	**Metal Production**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	**-**	**-**	**-**	**-**	**-**	**230**	**-**	**1.1**	**-**	**230**
e.	**Non-Energy Products from Fuels and Solvent Use**	**390**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**390**
f.	**Other Product Manufacture and Use**	**2**	**-**	**-**	**0.03**	**9.2**	**-**	**-**	**-**	**-**	**11**
AGRICULTURE		**-**	**120**	**2 900**	**10**	**3 000**	**-**	**-**	**-**	**-**	**6 700**
a.	**Enteric Fermentation**	**-**	**99**	**2 500**	**-**	**-**	**-**	**-**	**-**	**-**	**2 500**
b.	**Manure Management**	**-**	**17**	**420**	**1.21**	**360**	**-**	**-**	**-**	**-**	**780**
c.	**Agriculture Soils**	**-**	**-**	**-**	**10**	**3 100**	**-**	**-**	**-**	**-**	**3 100**
	Direct Sources	-	-	-	8.2	2 500	-	-	-	-	2 500
	Indirect Sources	-	-	-	2	700	-	-	-	-	700
d.	**Field Burning of Agricultural Residues**	**-**	**0.6**	**20**	**0.02**	**5**	**-**	**-**	**-**	**-**	**20**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**300**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**300**
WASTE		**-**	**41**	**1 000**	**0.08**	**20**	**-**	**-**	**-**	**-**	**1 000**
a.	**Solid Waste Disposal on Land**	**-**	**40**	**1 000**	**-**	**-**	**-**	**-**	**-**	**-**	**1 000**
b.	**Wastewater Handling**	**-**	**0.78**	**20**	**0.08**	**20**	**-**	**-**	**-**	**-**	**43**
c.	**Waste Incineration**	-	-	-	-	-	-	-	-	-	-

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
4. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
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Table A10–16 1990–2013 GHG Emission Summary from Saskatchewan

Greenhouse Gas Categories		1990	2000	2005	2009	2010	2011	2012	2013
kt CO_2 equivalent									
TOTAL		**45 000**	**68 100**	**69 500**	**70 200**	**69 800**	**69 200**	**71 700**	**74 800**
ENERGY		**36 300**	**55 800**	**55 100**	**56 700**	**57 100**	**56 000**	**57 600**	**59 500**
a.	**Stationary Combustion Sources**	**20 300**	**27 000**	**27 600**	**29 400**	**29 600**	**29 100**	**29 300**	**29 700**
	Public Electricity and Heat Production	11 200	14 600	15 300	16 500	16 300	15 700	16 200	16 000
	Petroleum Refining Industries	620	630	780	950	1 100	980	1 200	1 100
	Mining and Upstream Oil and Gas Production	4 150	6 750	7 540	7 420	7 710	8 010	7 490	7 810
	Manufacturing Industries	792	1 100	533	556	628	705	808	882
	Construction	70.4	49.1	42	49.1	70.8	55.7	37.3	35.7
	Commercial and Institutional	985	1 650	1 490	1 610	1 380	1 280	1 110	1 200
	Residential	2 180	1 980	1 660	1 830	1 970	1 820	1 770	1 890
	Agriculture and Forestry	296	272	257	533	531	615	661	772
b.	**Transport**[1]	**9 330**	**11 200**	**11 800**	**14 300**	**15 000**	**14 400**	**15 200**	**16 600**
	Domestic Aviation	260	220	190	180	190	190	220	230
	Road Transportation	4 100	5 700	5 870	7 050	7 290	7 210	7 590	7 770
	Light-Duty Gasoline Vehicles	1 240	1 330	1 080	1 330	1 370	1 270	1 380	1 450
	Light-Duty Gasoline Trucks	902	1 790	1 810	2 240	2 310	2 140	2 330	2 450
	Heavy-Duty Gasoline Vehicles	596	372	360	462	481	449	493	524
	Motorcycles	2.29	6.14	7.33	9.41	9.81	9.15	10	10.7
	Light-Duty Diesel Vehicles	10.1	10.6	11.2	16	17.2	16.7	18.7	20.4
	Light-Duty Diesel Trucks	58.4	209	233	306	319	300	329	346
	Heavy-Duty Diesel Vehicles	1 230	1 950	2 360	2 670	2 770	3 020	3 030	2 960
	Propane and Natural Gas Vehicles	65	26	11	12	11	10	13	9.7
	Railways	590	410	x	x	x	x	x	x
	Domestic Navigation	0.1	-	x	x	x	x	x	x
	Other Transportation	4 400	4 900	5 300	6 600	6 900	6 300	6 900	7 900
	Off-Road Gasoline	1 200	690	920	1 300	1 500	980	1 500	1 600
	Off-Road Diesel	1 600	1 900	2 500	3 000	3 200	3 300	3 300	4 300
	Pipeline Transport	1 590	2 340	1 900	2 290	2 170	2 070	2 040	2 030
c.	**Fugitive Sources**	**6 700**	**18 000**	**16 000**	**13 000**	**12 000**	**12 000**	**13 000**	**13 000**
	Coal Mining	20	20	20	20	20	20	20	20
	Oil and Natural Gas	6 700	18 000	16 000	13 000	12 000	12 000	13 000	13 000
d.	**CO_2 Transport and Storage**	**-**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE		**318**	**640**	**789**	**712**	**725**	**891**	**829**	**877**
a.	**Mineral Products**	**98**	**16**	**12**	**12**	**8.5**	**12**	**18**	**18**
	Cement Production	88	-	-	-	-	-	-	-
	Lime Production	-	-	-	-	-	-	-	-
	Mineral Products Use	10	16	12	12	8.5	12	18	18
b.	**Chemical Industry**[2]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Adipic Acid Production	-	-	-	-	-	-	-	-
c.	**Metal Production**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Iron and Steel Production	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	**1.8**	**140**	**180**	**200**	**200**	**210**	**220**	**230**
e.	**Non-Energy Products from Fuels and Solvent Use**	**210**	**470**	**580**	**490**	**510**	**660**	**580**	**620**
f.	**Other Product Manufacture and Use**	**6.2**	**14**	**11**	**7.8**	**7.9**	**9.1**	**12**	**12**
AGRICULTURE		**7 900**	**11 000**	**13 000**	**12 000**	**11 000**	**11 000**	**12 000**	**13 000**
a.	**Enteric Fermentation**	**3 300**	**4 700**	**6 100**	**5 200**	**4 900**	**4 800**	**4 900**	**4 800**
b.	**Manure Management**	**790**	**1 100**	**1 400**	**1 200**	**1 200**	**1 100**	**1 200**	**1 200**
c.	**Agriculture Soils**	**3 500**	**4 700**	**4 700**	**4 900**	**4 500**	**4 900**	**5 600**	**6 600**
	Direct Sources	2 900	3 700	3 700	3 900	3 500	3 800	4 400	5 100
	Indirect Sources	600	900	1 000	1 000	1 000	1 000	1 000	1 000
d.	**Field Burning of Agricultural Residues**	**70**	**50**	**30**	**30**	**20**	**20**	**20**	**30**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**200**	**400**	**400**	**600**	**600**	**600**	**700**	**900**
WASTE		**590**	**750**	**820**	**860**	**890**	**900**	**920**	**850**
a.	**Solid Waste Disposal on Land**	**550**	**710**	**780**	**820**	**840**	**860**	**870**	**810**
b.	**Wastewater Handling**	**40**	**42**	**41**	**42**	**43**	**43**	**44**	**45**
c.	**Waste Incineration**	**0.51**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
x Indicates data has been suppressed to respect confidentiality
Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

Table A10–17 2013 GHG Emission Summary for Saskatchewan

Greenhouse Gas Categories		Greenhouse Gases									
		CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[4]	PFCs[4]	SF_6	NF_3	TOTAL
	Global Warming Potential			25		298			22 800	17 200	
	Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL		**48 300**	**710**	**18 000**	**28**	**8 300**	**220**	**-**	**0.91**	**-**	**74 800**
ENERGY		46 800	470	12 000	3	900	-	-	-	-	59 500
a.	**Stationary Combustion Sources**	**29 200**	**10**	**300**	**0.7**	**200**	**-**	**-**	**-**	**-**	**29 700**
	Public Electricity and Heat Production	15 900	1	26	0.4	100	-	-	-	-	16 000
	Petroleum Refining Industries	1 130	0.02	0.5	0.02	5	-	-	-	-	1 100
	Mining and Upstream Oil and Gas Production	7 510	9.8	250	0.2	60	-	-	-	-	7 810
	Manufacturing Industries	866	0.06	2	0.05	10	-	-	-	-	882
	Construction	35.4	0.0	0.02	0.0	0.2	-	-	-	-	35.7
	Commercial and Institutional	1 190	0.02	0.59	0.03	8	-	-	-	-	1 200
	Residential	1 820	2	50	0.06	20	-	-	-	-	1 890
	Agriculture and Forestry	767	0.01	0.35	0.02	4.6	-	-	-	-	772
b.	**Transport**[1]	**15 800**	**5**	**100**	**2**	**700**	**-**	**-**	**-**	**-**	**16 600**
	Domestic Aviation	229	0.02	0.5	0.01	2	-	-	-	-	230
	Road Transportation	7 620	0.6	20	0.45	130	-	-	-	-	7 770
	Light-Duty Gasoline Vehicles	1 420	0.16	4.1	0.09	27	-	-	-	-	1 450
	Light-Duty Gasoline Trucks	2 410	0.28	7.1	0.13	39	-	-	-	-	2 450
	Heavy-Duty Gasoline Vehicles	512	0.03	0.74	0.04	11	-	-	-	-	524
	Motorcycles	10.5	0.0	0.1	0.0	0.06	-	-	-	-	10.7
	Light-Duty Diesel Vehicles	19.9	0.0	0.01	0.0	0.5	-	-	-	-	20.4
	Light-Duty Diesel Trucks	337	0.01	0.2	0.03	8	-	-	-	-	346
	Heavy-Duty Diesel Vehicles	2 900	0.1	3	0.2	50	-	-	-	-	2 960
	Propane and Natural Gas Vehicles	9.43	0.01	0.2	0.0	0.06	-	-	-	-	9.7
	Railways	x	x	x	x	x	-	-	-	-	x
	Domestic Navigation	x	x	x	x	x	-	-	-	-	x
	Other Transportation	7 330	4	100	2	500	-	-	-	-	7 900
	Off-Road Gasoline	1 560	2	50	0.04	10	-	-	-	-	1 600
	Off-Road Diesel	3 820	0.2	5	2	500	-	-	-	-	4 300
	Pipeline Transport	1 960	2	51	0.05	20	-	-	-	-	2 030
c.	**Fugitive Sources**	**1 800**	**450**	**11 000**	**0.02**	**6**	**-**	**-**	**-**	**-**	**13 000**
	Coal Mining	-	0.7	20	-	-	-	-	-	-	20
	Oil and Natural Gas	1 800	450	11 000	0.02	6	-	-	-	-	13 000
d.	**CO_2 Transport and Storage**	**0.09**	-	-	-	-	-	-	-	-	**0.09**
INDUSTRIAL PROCESSES AND PRODUCT USE		644	-	-	0.03	8.08	220	-	0.91	-	877
a.	**Mineral Products**	**18**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**18**
	Cement Production	-	-	-	-	-	-	-	-	-	-
	Lime Production	-	-	-	-	-	-	-	-	-	-
	Mineral Products Use	18	-	-	-	-	-	-	-	-	18
b.	**Chemical Industry**[2]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c.	**Metal Production**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	**-**	**-**	**-**	**-**	**-**	**220**	**-**	**0.91**	**-**	**230**
e.	**Non-Energy Products from Fuels and Solvent Use**	**620**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**620**
f.	**Other Product Manufacture and Use**	**3**	**-**	**-**	**0.03**	**8.1**	**-**	**-**	**-**	**-**	**12**
AGRICULTURE		1 000	210	5 200	20	7 000	-	-	-	-	13 000
a.	**Enteric Fermentation**	**-**	**190**	**4 800**	**-**	**-**	**-**	**-**	**-**	**-**	**4 800**
b.	**Manure Management**	**-**	**14**	**340**	**2.71**	**809**	**-**	**-**	**-**	**-**	**1 200**
c.	**Agriculture Soils**	**-**	**-**	**-**	**22**	**6 600**	**-**	**-**	**-**	**-**	**6 600**
	Direct Sources	-	-	-	17	5 100	-	-	-	-	5 100
	Indirect Sources	-	-	-	5	1 000	-	-	-	-	1 000
d.	**Field Burning of Agricultural Residues**	**-**	**0.9**	**20**	**0.02**	**7**	**-**	**-**	**-**	**-**	**30**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**900**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**900**
WASTE		-	33	830	0.07	20	-	-	-	-	850
a.	**Solid Waste Disposal on Land**	**-**	**32**	**810**	**-**	**-**	**-**	**-**	**-**	**-**	**810**
b.	**Wastewater Handling**	**-**	**0.96**	**24**	**0.07**	**20**	**-**	**-**	**-**	**-**	**45**
c.	**Waste Incineration**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes:

1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
4. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

x Indicates data has been suppressed to respect confidentiality

Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

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Table A10–18 1990–2013 GHG Emission Summary for Alberta

Greenhouse Gas Categories		1990	2000	2005	2009	2010	2011	2012	2013
kt CO_2 equivalent									
TOTAL		**175 000**	**232 000**	**234 000**	**235 000**	**243 000**	**247 000**	**258 000**	**267 000**
ENERGY		**153 000**	**202 000**	**201 000**	**204 000**	**212 000**	**215 000**	**223 000**	**233 000**
a.	**Stationary Combustion Sources**	**96 900**	**128 000**	**130 000**	**134 000**	**137 000**	**141 000**	**146 000**	**152 000**
	Public Electricity and Heat Production	39 800	50 300	52 000	48 900	49 100	48 800	44 700	46 700
	Petroleum Refining Industries	2 900	2 900	4 000	3 200	3 500	3 500	4 100	4 300
	Mining and Upstream Oil and Gas Production	31 000	48 900	51 000	57 900	60 000	61 300	70 200	72 900
	Manufacturing Industries	10 500	11 700	8 990	9 330	10 500	11 700	11 200	12 200
	Construction	238	175	170	120	163	255	282	301
	Commercial and Institutional	5 040	5 460	5 620	5 640	5 550	5 910	6 240	6 270
	Residential	6 910	8 550	7 670	8 810	8 390	8 910	8 820	8 840
	Agriculture and Forestry	477	366	240	248	195	213	205	209
b.	**Transport**[1]	**22 600**	**30 700**	**34 800**	**35 500**	**40 500**	**40 000**	**41 300**	**44 200**
	Domestic Aviation	1 100	1 300	1 300	1 300	1 300	1 200	1 400	1 500
	Road Transportation	13 600	16 700	19 700	21 600	22 000	21 500	22 500	23 700
	Light-Duty Gasoline Vehicles	4 550	3 780	3 580	3 730	3 830	3 520	3 700	3 960
	Light-Duty Gasoline Trucks	3 340	5 580	6 680	6 940	7 120	6 560	6 890	7 390
	Heavy-Duty Gasoline Vehicles	1 620	1 210	1 680	1 830	1 900	1 770	1 880	2 030
	Motorcycles	24.7	27.4	37.2	40.6	42.1	39.1	41.5	44.9
	Light-Duty Diesel Vehicles	32.4	23.5	30.9	36.7	39.3	39.3	44	47.8
	Light-Duty Diesel Trucks	176	466	625	648	670	644	699	732
	Heavy-Duty Diesel Vehicles	3 230	5 360	6 960	8 250	8 340	8 800	9 100	9 370
	Propane and Natural Gas Vehicles	640	270	120	110	83	95	96	95
	Railways	1 800	1 800	x	1 300	2 200	x	x	x
	Domestic Navigation	0.32	-	x	7.9	7.9	x	x	x
	Other Transportation	6 100	11 000	11 000	11 000	15 000	15 000	14 000	16 000
	Off-Road Gasoline	1 500	1 400	1 000	520	500	410	510	900
	Off-Road Diesel	3 300	6 700	6 700	9 300	13 000	13 000	12 000	13 000
	Pipeline Transport	1 300	2 730	3 210	1 570	1 560	1 680	1 820	2 140
c.	**Fugitive Sources**	**34 000**	**43 000**	**36 000**	**34 000**	**34 000**	**35 000**	**36 000**	**37 000**
	Coal Mining	400	300	300	300	400	300	300	300
	Oil and Natural Gas	33 000	43 000	36 000	34 000	34 000	34 000	36 000	37 000
d.	**CO_2 Transport and Storage**	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE		**6 080**	**9 560**	**11 500**	**11 500**	**11 700**	**12 300**	**15 300**	**13 500**
a.	**Mineral Products**	**1 100**	**1 400**	**1 500**	**1 100**	**1 200**	**1 200**	**1 300**	**1 200**
	Cement Production	790	1 000	1 100	830	910	910	990	900
	Lime Production	104	146	120	91.4	110	114	116	106
	Mineral Products Use	210	240	250	160	140	170	160	160
b.	**Chemical Industry**[2]	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-
c.	**Metal Production**	-	-	-	-	-	-	-	-
	Iron and Steel Production	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	**1.6**	**460**	**700**	**820**	**820**	**850**	**880**	**920**
e.	**Non-Energy Products from Fuels and Solvent Use**	**5 000**	**7 700**	**9 300**	**9 600**	**9 700**	**10 000**	**13 000**	**11 000**
f.	**Other Product Manufacture and Use**	**16**	**42**	**37**	**28**	**27**	**31**	**41**	**40**
AGRICULTURE		**14 000**	**19 000**	**20 000**	**18 000**	**17 000**	**17 000**	**18 000**	**19 000**
a.	**Enteric Fermentation**	**7 800**	**11 000**	**12 000**	**10 000**	**9 600**	**9 400**	**9 500**	**9 600**
b.	**Manure Management**	**1 800**	**2 500**	**2 600**	**2 300**	**2 200**	**2 100**	**2 100**	**2 200**
c.	**Agriculture Soils**	**4 200**	**4 800**	**4 600**	**4 600**	**5 000**	**5 400**	**5 700**	**6 100**
	Direct Sources	3 400	3 800	3 600	3 600	3 900	4 200	4 500	4 800
	Indirect Sources	800	1 000	1 000	1 000	1 000	1 000	1 000	1 000
d.	**Field Burning of Agricultural Residues**	**4**	**0.2**	**0.7**	**0.4**	**0.4**	**0.7**	**0.6**	**1**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**300**	**400**	**400**	**600**	**600**	**600**	**700**	**800**
WASTE		**1 300**	**1 500**	**1 900**	**2 100**	**2 000**	**2 000**	**2 100**	**2 300**
a.	**Solid Waste Disposal on Land**	**1 200**	**1 400**	**1 800**	**2 000**	**1 900**	**1 900**	**2 000**	**2 100**
b.	**Wastewater Handling**	**68**	**86**	**95**	**110**	**110**	**110**	**110**	**120**
c.	**Waste Incineration**	**11**	**33**	**33**	**7.4**	**17**	**22**	**43**	**46**

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
x Indicates data has been suppressed to respect confidentiality
Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

Table A10–19 2013 GHG Emission Summary for Alberta

Greenhouse Gas Categories		Greenhouse Gases									
		CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[4]	PFCs[4]	SF_6	NF_3	TOTAL
	Global Warming Potential			25		298			22 800	17 200	
	Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL		**212 000**	**1 700**	**44 000**	**36**	**11 000**	**920**	**-**	**3.6**	**-**	**267 000**
ENERGY		**199 000**	**1 200**	**31 000**	**10**	**3 000**	**-**	**-**	**-**	**-**	**233 000**
a.	**Stationary Combustion Sources**	**149 000**	**70**	**2 000**	**3**	**900**	**-**	**-**	**-**	**-**	**152 000**
	Public Electricity and Heat Production	46 400	2	51	0.9	300	-	-	-	-	46 700
	Petroleum Refining Industries	4 280	0.04	1	0.04	10	-	-	-	-	4 300
	Mining and Upstream Oil and Gas Production	71 100	54	1 400	1	400	-	-	-	-	72 900
	Manufacturing Industries	12 000	0.5	10	0.4	100	-	-	-	-	12 200
	Construction	297	0.01	0.13	0.01	3	-	-	-	-	301
	Commercial and Institutional	6 230	0.12	2.9	0.1	40	-	-	-	-	6 270
	Residential	8 540	9	200	0.3	80	-	-	-	-	8 840
	Agriculture and Forestry	208	0.0	0.1	0.0	1.5	-	-	-	-	209
b.	**Transport[1]**	**41 900**	**6**	**100**	**7**	**2 000**	**-**	**-**	**-**	**-**	**44 200**
	Domestic Aviation	1 520	0.06	1	0.04	10	-	-	-	-	1 500
	Road Transportation	23 200	2	40	1.3	390	-	-	-	-	23 700
	Light-Duty Gasoline Vehicles	3 890	0.39	9.7	0.22	67	-	-	-	-	3 960
	Light-Duty Gasoline Trucks	7 270	0.7	17	0.35	100	-	-	-	-	7 390
	Heavy-Duty Gasoline Vehicles	1 980	0.07	1.9	0.17	50	-	-	-	-	2 030
	Motorcycles	44.3	0.02	0.39	0.0	0.25	-	-	-	-	44.9
	Light-Duty Diesel Vehicles	46.6	0.0	0.02	0.0	1	-	-	-	-	47.8
	Light-Duty Diesel Trucks	714	0.02	0.5	0.06	20	-	-	-	-	732
	Heavy-Duty Diesel Vehicles	9 210	0.4	10	0.5	200	-	-	-	-	9 370
	Propane and Natural Gas Vehicles	92.2	0.1	3	0.0	0.6	-	-	-	-	95
	Railways	x	x	x	x	x	-	-	-	-	x
	Domestic Navigation	x	x	x	x	x	-	-	-	-	x
	Other Transportation	14 400	4	90	5	1 000	-	-	-	-	16 000
	Off-Road Gasoline	869	1	30	0.02	6	-	-	-	-	900
	Off-Road Diesel	11 500	0.6	20	5	1 000	-	-	-	-	13 000
	Pipeline Transport	2 070	2	51	0.05	20	-	-	-	-	2 140
c.	**Fugitive Sources**	**7 500**	**1 200**	**29 000**	**0.07**	**20**	**-**	**-**	**-**	**-**	**37 000**
	Coal Mining	-	10	300	-	-	-	-	-	-	300
	Oil and Natural Gas	7 500	1 200	29 000	0.07	20	-	-	-	-	37 000
d.	**CO_2 Transport and Storage**	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE		**12 600**	**-**	**-**	**0.1**	**29.3**	**920**	**-**	**3.6**	**-**	**13 500**
a.	**Mineral Products**	**1 200**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1 200**
	Cement Production	900	-	-	-	-	-	-	-	-	900
	Lime Production	106	-	-	-	-	-	-	-	-	106
	Mineral Products Use	160	-	-	-	-	-	-	-	-	160
b.	**Chemical Industry[2]**	-	-	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c.	**Metal Production**	-	-	-	-	-	-	-	-	-	-
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3[3]**	-	-	-	-	-	**920**	-	**3.6**	-	**920**
e.	**Non-Energy Products from Fuels and Solvent Use**	**11 000**	-	-	-	-	-	-	-	-	**11 000**
f.	**Other Product Manufacture and Use**	**10**	-	-	**0.1**	**29**	-	-	-	-	**40**
AGRICULTURE		**1 000**	**410**	**10 000**	**30**	**7 000**	**-**	**-**	**-**	**-**	**19 000**
a.	**Enteric Fermentation**	-	**380**	**9 600**	-	-	-	-	-	-	**9 600**
b.	**Manure Management**	-	**29**	**720**	**4.82**	**1 440**	-	-	-	-	**2 200**
c.	**Agriculture Soils**	-	-	-	**20**	**6 100**	-	-	-	-	**6 100**
	Direct Sources	-	-	-	16	4 800	-	-	-	-	4 800
	Indirect Sources	-	-	-	4	1 000	-	-	-	-	1 000
d.	**Field Burning of Agricultural Residues**	-	**0.03**	**0.8**	**0.0**	**0.2**	-	-	-	-	**1**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**800**	-	-	-	-	-	-	-	-	**800**
WASTE		**29**	**85**	**2 100**	**0.3**	**90**	**-**	**-**	**-**	**-**	**2 300**
a.	**Solid Waste Disposal on Land**	-	**84**	**2 100**	-	-	-	-	-	-	**2 100**
b.	**Wastewater Handling**	-	**1.6**	**40**	**0.3**	**80**	-	-	-	-	**120**
c.	**Waste Incineration**	**29**	**0.0**	**0.07**	**0.06**	**20**	-	-	-	-	**46**

Notes:

1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
4. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

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Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

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Table A10–20 1990–2013 GHG Emission Summary for British Columbia

Greenhouse Gas Categories		1990	2000	2005	2009	2010	2011	2012	2013
kt CO_2 equivalent									
TOTAL		**51 900**	**64 900**	**64 400**	**60 700**	**60 200**	**60 500**	**61 900**	**62 800**
ENERGY		**42 400**	**52 400**	**52 100**	**49 000**	**49 000**	**49 500**	**51 100**	**52 200**
a.	**Stationary Combustion Sources**	**19 500**	**22 600**	**21 700**	**20 700**	**20 200**	**21 600**	**21 900**	**22 100**
	Public Electricity and Heat Production	807	1 940	1 340	1 340	1 230	779	508	832
	Petroleum Refining Industries	1 200	420	500	580	630	520	570	520
	Mining and Upstream Oil and Gas Production	2 690	3 530	5 410	7 130	7 360	8 110	8 720	8 770
	Manufacturing Industries	6 520	7 850	6 360	4 040	4 060	4 180	4 290	4 430
	Construction	307	76.7	112	63.1	81.9	188	191	162
	Commercial and Institutional	2 850	3 460	3 030	2 760	2 510	2 830	2 820	2 590
	Residential	4 740	4 970	4 840	4 750	3 980	4 760	4 430	4 370
	Agriculture and Forestry	323	319	72.6	46.7	307	278	385	383
b.	**Transport**[1]	**18 800**	**24 200**	**25 100**	**23 400**	**24 000**	**22 500**	**23 900**	**24 800**
	Domestic Aviation	1 300	1 600	1 600	1 300	1 200	1 100	1 300	1 300
	Road Transportation	11 500	14 800	15 500	15 700	15 600	15 300	14 700	15 900
	Light-Duty Gasoline Vehicles	3 770	4 420	4 200	4 140	3 970	3 640	3 610	3 880
	Light-Duty Gasoline Trucks	2 160	4 490	4 780	4 740	4 550	4 180	4 160	4 470
	Heavy-Duty Gasoline Vehicles	2 250	1 840	1 790	1 850	1 790	1 660	1 660	1 810
	Motorcycles	19.4	17.8	29.1	30	29	26.9	26.9	29.2
	Light-Duty Diesel Vehicles	34.7	51.3	64	78.8	83.5	81.6	84.9	93.7
	Light-Duty Diesel Trucks	40.5	72.7	59.1	63.5	63.9	59.3	59.8	64.2
	Heavy-Duty Diesel Vehicles	2 460	3 630	4 420	4 580	4 900	5 470	4 860	5 400
	Propane and Natural Gas Vehicles	790	330	190	210	220	210	210	180
	Railways	1 400	1 300	430	450	520	680	690	540
	Domestic Navigation	1 000	1 200	2 500	2 700	2 700	2 300	2 700	2 200
	Other Transportation	3 500	5 200	5 000	3 300	3 900	3 100	4 600	4 800
	Off-Road Gasoline	360	500	450	260	350	430	730	400
	Off-Road Diesel	2 300	3 000	3 600	2 200	2 700	1 800	3 100	3 400
	Pipeline Transport	863	1 670	998	876	843	813	806	936
c.	**Fugitive Sources**	**4 100**	**5 700**	**5 300**	**4 900**	**4 900**	**5 400**	**5 200**	**5 400**
	Coal Mining	800	800	1 000	800	900	900	1 000	1 000
	Oil and Natural Gas	3 300	4 900	4 400	4 200	3 900	4 500	4 200	4 300
d.	**CO_2 Transport and Storage**	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE		**2 870**	**4 670**	**4 350**	**3 980**	**3 700**	**3 450**	**3 630**	**3 440**
a.	**Mineral Products**	**870**	**1 400**	**1 500**	**1 100**	**1 200**	**1 200**	**1 300**	**1 200**
	Cement Production	650	1 100	1 300	910	990	990	1 100	980
	Lime Production	162	218	181	137	165	172	174	159
	Mineral Products Use	62	58	51	32	25	25	21	22
b.	**Chemical Industry**[2]	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-
c.	**Metal Production**	**1 670**	**2 030**	**1 220**	**1 250**	**848**	**848**	**886**	**759**
	Iron and Steel Production	-	-	-	-	-	-	-	-
	Aluminum Production	1 670	2 030	1 220	1 250	847	847	885	758
	SF_6 Used in Magnesium Smelters and Casters	-	0.68	1.46	0.57	0.53	0.52	0.55	0.56
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	**57**	**560**	**820**	**910**	**930**	**930**	**990**	**1 000**
e.	**Non-Energy Products from Fuels and Solvent Use**	**260**	**630**	**780**	**710**	**710**	**450**	**450**	**460**
f.	**Other Product Manufacture and Use**	**20**	**57**	**47**	**33**	**32**	**34**	**43**	**39**
AGRICULTURE		**2 400**	**2 700**	**2 900**	**2 300**	**2 300**	**2 300**	**2 200**	**2 300**
a.	**Enteric Fermentation**	**1 400**	**1 700**	**1 800**	**1 400**	**1 400**	**1 300**	**1 300**	**1 400**
b.	**Manure Management**	**430**	**510**	**530**	**470**	**460**	**460**	**450**	**460**
c.	**Agriculture Soils**	**500**	**450**	**480**	**430**	**450**	**440**	**410**	**470**
	Direct Sources	400	340	360	330	350	340	320	370
	Indirect Sources	100	100	100	100	100	100	90	100
d.	**Field Burning of Agricultural Residues**	-	-	-	-	-	-	-	-
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**30**	**40**	**20**	**10**	**10**	**30**	**20**	**20**
WASTE		**4 300**	**5 100**	**5 100**	**5 400**	**5 300**	**5 300**	**5 000**	**4 800**
a.	**Solid Waste Disposal on Land**	**4 100**	**4 800**	**4 900**	**5 200**	**5 100**	**5 100**	**4 800**	**4 600**
b.	**Wastewater Handling**	**96**	**130**	**130**	**130**	**140**	**140**	**140**	**140**
c.	**Waste Incineration**	**81**	**87**	**79**	**70**	**67**	**66**	**64**	**62**

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
x Indicates data has been suppressed to respect confidentiality
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Table A10–21 2013 GHG Emission Summary for British Columbia

Greenhouse Gas Categories		Greenhouse Gases									
		CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[4]	PFCs[4]	SF_6	NF_3	TOTAL
	Global Warming Potential			25		298			22 800	17 200	
	Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL		**49 200**	**400**	**10 000**	**7.1**	**2 100**	**980**	**410**	**42**	.	**62 800**
ENERGY		**47 200**	**150**	**3 700**	**4**	**1 000**	-	-	-	.	**52 200**
a.	**Stationary Combustion Sources**	**20 900**	**30**	**800**	**1**	**300**	-	-	-	.	**22 100**
	Public Electricity and Heat Production	814	0.18	4.5	0.05	10	-	-	-	.	832
	Petroleum Refining Industries	518	0.01	0.2	0.0	0.9	-	-	-	.	520
	Mining and Upstream Oil and Gas Production	8 260	18	440	0.2	70	-	-	-	.	8 770
	Manufacturing Industries	4 240	0.8	20	0.6	200	-	-	-	.	4 430
	Construction	161	0.0	0.07	0.0	1	-	-	-	.	162
	Commercial and Institutional	2 580	0.05	1.3	0.05	20	-	-	-	.	2 590
	Residential	3 930	10	400	0.2	70	-	-	-	.	4 370
	Agriculture and Forestry	381	0.01	0.18	0.01	2.2	-	-	-	.	383
b.	**Transport**[1]	**23 700**	**3**	**70**	**3**	**1 000**	-	-	-	.	**24 800**
	Domestic Aviation	1 310	0.07	2	0.04	10	-	-	-	.	1 300
	Road Transportation	15 500	1	30	1.3	400	-	-	-	.	15 900
	Light-Duty Gasoline Vehicles	3 760	0.31	7.8	0.39	120	-	-	-	.	3 880
	Light-Duty Gasoline Trucks	4 320	0.34	8.6	0.47	140	-	-	-	.	4 470
	Heavy-Duty Gasoline Vehicles	1 760	0.07	1.7	0.15	44	-	-	-	.	1 810
	Motorcycles	28.7	0.01	0.34	0.0	0.16	-	-	-	.	29.2
	Light-Duty Diesel Vehicles	91.4	0.0	0.05	0.01	2	-	-	-	.	93.7
	Light-Duty Diesel Trucks	62.6	0.0	0.04	0.01	2	-	-	-	.	64.2
	Heavy-Duty Diesel Vehicles	5 310	0.2	6	0.3	90	-	-	-	.	5 400
	Propane and Natural Gas Vehicles	175	0.2	5	0.0	1	-	-	-	.	180
	Railways	478	0.03	0.7	0.2	60	-	-	-	.	540
	Domestic Navigation	2 100	0.2	4	0.3	100	-	-	-	.	2 200
	Other Transportation	4 330	2	40	1	400	-	-	-	.	4 800
	Off-Road Gasoline	382	0.5	10	0.01	3	-	-	-	.	400
	Off-Road Diesel	3 040	0.2	4	1	400	-	-	-	.	3 400
	Pipeline Transport	907	0.89	22	0.02	7	-	-	-	.	936
c.	**Fugitive Sources**	**2 600**	**110**	**2 800**	**0.0**	**1**	-	-	-	.	**5 400**
	Coal Mining	-	40	1 000	-	-	-	-	-	.	1 000
	Oil and Natural Gas	2 600	68	1 700	0.0	1	-	-	-	.	4 300
d.	**CO_2 Transport and Storage**	-	-	-	-	-	-	-	-	.	-
INDUSTRIAL PROCESSES AND PRODUCT USE		**1 980**	-	-	**0.11**	**33.4**	**980**	**410**	**42**	.	**3 440**
a.	**Mineral Products**	**1 200**	-	-	-	-	-	-	-	.	**1 200**
	Cement Production	980	-	-	-	-	-	-	-	.	980
	Lime Production	159	-	-	-	-	-	-	-	.	159
	Mineral Products Use	22	-	-	-	-	-	-	-	.	22
b.	**Chemical Industry**[2]	-	-	-	-	-	-	-	-	.	-
	Adipic Acid Production	-	-	-	-	-	-	-	-	.	-
c.	**Metal Production**	**351**	-	-	-	-	-	**407**	**0.56**	.	**759**
	Iron and Steel Production	-	-	-	-	-	-	-	-	.	-
	Aluminum Production	351	-	-	-	-	-	407	0.01	.	758
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	0.56	.	0.56
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	-	-	-	-	-	**980**	-	**41**	.	**1 000**
e.	**Non-Energy Products from Fuels and Solvent Use**	**460**	-	-	-	-	-	-	-	.	**460**
f.	**Other Product Manufacture and Use**	**5**	-	-	**0.11**	**33**	-	-	-	.	**39**
AGRICULTURE		-	**64**	**1 600**	**2**	**700**	-	-	-	.	**2 300**
a.	**Enteric Fermentation**	-	**54**	**1 400**	-	-	-	-	-	.	**1 400**
b.	**Manure Management**	-	**9.4**	**230**	**0.75**	**224**	-	-	-	.	**460**
c.	**Agriculture Soils**	-	-	-	**1.6**	**470**	-	-	-	.	**470**
	Direct Sources	-	-	-	1.2	370	-	-	-	.	370
	Indirect Sources	-	-	-	0.3	100	-	-	-	.	100
d.	**Field Burning of Agricultural Residues**	-	-	-	-	-	-	-	-	.	-
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**20**	-	-	-	-	-	-	-	.	**20**
WASTE		**54**	**190**	**4 700**	**0.3**	**90**	-	-	-	.	**4 800**
a.	**Solid Waste Disposal on Land**	-	**190**	**4 600**	-	-	-	-	-	.	**4 600**
b.	**Wastewater Handling**	-	**2.1**	**53**	**0.3**	**90**	-	-	-	.	**140**
c.	**Waste Incineration**	**54**	-	-	**0.03**	**8**	-	-	-	.	**62**

Notes:

1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
4. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

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Table A10–22 1990–2013 GHG Emission Summary for Yukon

Greenhouse Gas Categories		1990	2000	2005	2009	2010	2011	2012	2013
kt CO_2 equivalent									
TOTAL		**539**	**507**	**467**	**353**	**350**	**390**	**400**	**358**
ENERGY		**536**	**497**	**453**	**339**	**334**	**374**	**383**	**341**
a.	**Stationary Combustion Sources**	**220**	**249**	**203**	**133**	**135**	**153**	**145**	**117**
	Public Electricity and Heat Production	94.4	22.3	23.1	17.2	18.8	27.8	18.6	17.7
	Petroleum Refining Industries	-	-	-	-	-	-	-	-
	Mining and Upstream Oil and Gas Production	8.84	136	84.9	16.8	25.4	19.4	20.5	4.95
	Manufacturing Industries	6.03	-	-	17	14.8	14.8	14.5	15
	Construction	3.55	2.63	1.58	1.53	1.82	1.72	1.54	1.54
	Commercial and Institutional	77	51.4	35.3	54.4	43.1	60.7	64.3	56.9
	Residential	29.5	35.8	49.7	25.7	30.7	28.8	25.2	21
	Agriculture and Forestry	1.09	1.11	8.27	-	-	-	-	-
b.	**Transport**[1]	**315**	**240**	**241**	**196**	**189**	**209**	**228**	**224**
	Domestic Aviation	34	32	34	35	39	39	47	45
	Road Transportation	181	158	145	120	115	124	130	130
	Light-Duty Gasoline Vehicles	80.3	48.3	29	20	19.6	18.1	19.2	19.6
	Light-Duty Gasoline Trucks	30.7	38.1	31.2	21.6	21.1	19.6	20.9	21.3
	Heavy-Duty Gasoline Vehicles	10.1	6.47	4.97	3.53	3.52	3.29	3.54	3.63
	Motorcycles	0.51	0.33	0.27	0.2	0.2	0.18	0.2	0.2
	Light-Duty Diesel Vehicles	0.78	0.46	0.32	0.23	0.24	0.23	0.25	0.27
	Light-Duty Diesel Trucks	0.62	2.44	x	x	x	x	x	x
	Heavy-Duty Diesel Vehicles	56.2	60.8	76.3	72	67.7	79.5	83.4	82.2
	Propane and Natural Gas Vehicles	1.5	1.2	x	x	x	x	x	x
	Railways	-	-	x	x	x	x	x	x
	Domestic Navigation	-	-	x	x	x	x	x	x
	Other Transportation	100	50	61	42	35	47	50	49
	Off-Road Gasoline	11	12	x	x	x	x	x	x
	Off-Road Diesel	90	38	58	40	34	x	x	x
	Pipeline Transport	-	-	x	x	x	x	x	x
c.	**Fugitive Sources**	**-**	**7.8**	**10**	**9.8**	**11**	**11**	**10**	**0.09**
	Coal Mining	-	-	-	-	-	-	-	-
	Oil and Natural Gas	-	7.8	10	9.8	11	11	10	0.09
d.	**CO_2 Transport and Storage**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE		**1.68**	**6.96**	**9.82**	**11.2**	**11.7**	**12.6**	**13.2**	**13.1**
a.	**Mineral Products**	**0.13**	**-**	**-**	**-**	**-**	**-**	**0.0**	**0.0**
	Cement Production	-	-	-	-	-	-	-	-
	Lime Production	-	-	-	-	-	-	-	-
	Mineral Products Use	0.13	-	-	-	-	-	0.0	0.0
b.	**Chemical Industry**[2]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Adipic Acid Production	-	-	-	-	-	-	-	-
c.	**Metal Production**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Iron and Steel Production	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	**-**	**6.2**	**9.2**	**10**	**11**	**11**	**12**	**12**
e.	**Non-Energy Products from Fuels and Solvent Use**	**1.4**	**0.35**	**0.28**	**0.56**	**0.85**	**1.1**	**1.1**	**0.42**
f.	**Other Product Manufacture and Use**	**0.17**	**0.43**	**0.36**	**0.25**	**0.25**	**0.28**	**0.37**	**0.34**
AGRICULTURE		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
a.	**Enteric Fermentation**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
b.	**Manure Management**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c.	**Agriculture Soils**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Direct Sources	-	-	-	-	-	-	-	-
	Indirect Sources	-	-	-	-	-	-	-	-
d.	**Field Burning of Agricultural Residues**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE		**2**	**2.8**	**3.2**	**3.5**	**3.6**	**3.7**	**3.8**	**3.9**
a.	**Solid Waste Disposal on Land**	**0.74**	**1.4**	**1.7**	**1.9**	**2**	**2.1**	**2.1**	**2.2**
b.	**Wastewater Handling**	**1.3**	**1.5**	**1.5**	**1.6**	**1.6**	**1.7**	**1.7**	**1.7**
c.	**Waste Incineration**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

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Table A10–23 2013 GHG Emission Summary for Yukon

Greenhouse Gas Categories		Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[4]	PFCs[4]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL	**332**	**0.15**	**3.7**	**0.03**	**10**	**12**	**-**	**-**	**-**	**358**
ENERGY	**331**	**0.02**	**0.51**	**0.03**	**9**	**-**	**-**	**-**	**-**	**341**
a. Stationary Combustion Sources	**116**	**0.0**	**0.05**	**0.01**	**1**	**-**	**-**	**-**	**-**	**117**
Public Electricity and Heat Production	16.9	0.0	0.02	0.0	0.8	-	-	-	-	17.7
Petroleum Refining Industries	-	-	-	-	-	-	-	-	-	-
Mining and Upstream Oil and Gas Production	4.85	0.0	0.0	0.0	0.1	-	-	-	-	4.95
Manufacturing Industries	15	0.0	0.0	0.0	0.05	-	-	-	-	15
Construction	1.53	0.0	0.0	0.0	0.02	-	-	-	-	1.54
Commercial and Institutional	56.5	0.0	0.02	0.0	0.4	-	-	-	-	56.9
Residential	20.9	0.0	0.01	0.0	0.1	-	-	-	-	21
Agriculture and Forestry	-	-	-	-	-	-	-	-	-	-
b. Transport[1]	**216**	**0.01**	**0.4**	**0.03**	**8**	**-**	**-**	**-**	**-**	**224**
Domestic Aviation	44.6	0.0	0.09	0.0	0.4	-	-	-	-	45
Road Transportation	128	0.01	0.2	0.01	2.1	-	-	-	-	130
Light-Duty Gasoline Vehicles	19.3	0.0	0.05	0.0	0.33	-	-	-	-	19.6
Light-Duty Gasoline Trucks	20.9	0.0	0.06	0.0	0.33	-	-	-	-	21.3
Heavy-Duty Gasoline Vehicles	3.54	0.0	0.0	0.0	0.09	-	-	-	-	3.63
Motorcycles	0.2	0.0	0.0	0.0	0.0	-	-	-	-	0.2
Light-Duty Diesel Vehicles	0.26	0.0	0.0	0.0	0.01	-	-	-	-	0.27
Light-Duty Diesel Trucks	x	x	x	x	x	-	-	-	-	x
Heavy-Duty Diesel Vehicles	80.9	0.0	0.08	0.0	1	-	-	-	-	82.2
Propane and Natural Gas Vehicles	x	x	x	x	x	-	-	-	-	x
Railways	x	x	x	x	x	-	-	-	-	x
Domestic Navigation	x	x	x	x	x	-	-	-	-	x
Other Transportation	43.4	0.0	0.07	0.02	5	-	-	-	-	49
Off-Road Gasoline	x	x	x	x	x	-	-	-	-	x
Off-Road Diesel	x	x	x	x	x	-	-	-	-	x
Pipeline Transport	x	x	x	x	x	-	-	-	-	x
c. Fugitive Sources	**0.0**	**0.0**	**0.09**	**-**	**-**	**-**	**-**	**-**	**-**	**0.09**
Coal Mining	-	-	-	-	-	-	-	-	-	-
Oil and Natural Gas	0.0	0.0	0.09	-	-	-	-	-	-	0.09
d. CO_2 Transport and Storage	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE	**0.5**	**-**	**-**	**0.0**	**0.27**	**12**	**-**	**-**	**-**	**13.1**
a. Mineral Products	**0.0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.0**
Cement Production	-	-	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-	-	-
Mineral Products Use	0.0	-	-	-	-	-	-	-	-	0.0
b. Chemical Industry[2]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
Aluminum Production	-	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[3]	**-**	**-**	**-**	**-**	**-**	**12**	**-**	**-**	**-**	**12**
e. Non-Energy Products from Fuels and Solvent Use	**0.42**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.42**
f. Other Product Manufacture and Use	**0.07**	**-**	**-**	**0.0**	**0.27**	**-**	**-**	**-**	**-**	**0.34**
AGRICULTURE	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
a. Enteric Fermentation	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
b. Manure Management	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Agriculture Soils	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Direct Sources	-	-	-	-	-	-	-	-	-	-
Indirect Sources	-	-	-	-	-	-	-	-	-	-
d. Field Burning of Agricultural Residues	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Liming, Urea Application and Other Carbon-containing Fertilizers	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE	**-**	**0.13**	**3.2**	**0.0**	**0.7**	**-**	**-**	**-**	**-**	**3.9**
a. Solid Waste Disposal on Land	**-**	**0.09**	**2.2**	**-**	**-**	**-**	**-**	**-**	**-**	**2.2**
b. Wastewater Handling	**-**	**0.04**	**1**	**0.0**	**0.7**	**-**	**-**	**-**	**-**	**1.7**
c. Waste Incineration	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes:

1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
4. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

x Indicates data has been suppressed to respect confidentiality

Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

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Table A10–24 1999–2013 GHG Emission Summary for Northwest Territories

Greenhouse Gas Categories		1990	2000	2005	2009	2010	2011	2012	2013
	kt CO_2 equivalent								
TOTAL		**1 230**	**1 500**	**1 660**	**1 240**	**1 360**	**1 430**	**1 560**	**1 460**
ENERGY		**1 220**	**1 480**	**1 640**	**1 220**	**1 340**	**1 420**	**1 550**	**1 440**
a.	**Stationary Combustion Sources**	**603**	**863**	**724**	**657**	**657**	**634**	**769**	**710**
	Public Electricity and Heat Production	91.6	111	98.7	69.2	66.7	x	x	x
	Petroleum Refining Industries	-	-	-	-	-	-	-	-
	Mining and Upstream Oil and Gas Production	235	469	381	364	402	370	451	388
	Manufacturing Industries	-	-	x	x	x	x	x	x
	Construction	0.83	0.28	x	x	x	x	x	x
	Commercial and Institutional	192	168	141	110	101	102	162	162
	Residential	83.9	114	101	114	87.7	95.6	88	91.5
	Agriculture and Forestry	0.02	0.13	1.54	-	-	-	-	-
b.	**Transport**[1]	**605**	**598**	**898**	**552**	**672**	**769**	**755**	**710**
	Domestic Aviation	130	150	240	140	120	120	140	130
	Road Transportation	225	221	254	212	188	243	229	204
	Light-Duty Gasoline Vehicles	39	39.5	25.3	36.1	37.6	38.2	38.9	32.4
	Light-Duty Gasoline Trucks	27.9	27.7	22.3	31.9	33.1	33.7	34.4	28.7
	Heavy-Duty Gasoline Vehicles	3.43	3.87	2.95	4.5	4.68	4.81	4.91	4.14
	Motorcycles	0.23	0.25	0.23	0.34	0.35	0.36	0.37	0.32
	Light-Duty Diesel Vehicles	0.38	0.42	0.3	0.48	0.51	0.53	0.56	0.48
	Light-Duty Diesel Trucks	1.44	1.68	x	x	x	x	x	x
	Heavy-Duty Diesel Vehicles	152	147	201	136	109	162	147	136
	Propane and Natural Gas Vehicles	1.1	0.58	x	x	x	x	x	x
	Railways	3.3	3.9	x	x	x	9.7	x	x
	Domestic Navigation	4.5	-	x	x	x	0.3	x	x
	Other Transportation	250	230	400	200	360	390	370	360
	Off-Road Gasoline	23	28	16	23	20	19	27	17
	Off-Road Diesel	220	190	380	170	340	370	350	340
	Pipeline Transport	4.54	5.7	2.76	2.53	2.53	1.92	2.53	2.25
c.	**Fugitive Sources**	**14**	**21**	**18**	**14**	**15**	**14**	**24**	**20**
	Coal Mining	-	-	-	-	-	-	-	-
	Oil and Natural Gas	14	21	18	14	15	14	24	20
d.	**CO_2 Transport and Storage**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE		**6.15**	**8.6**	**10.1**	**9.37**	**8.97**	**9.43**	**9.57**	**10.3**
a.	**Mineral Products**	**0.01**	**0.04**	**0.16**	**0.07**	**0.03**	**0.04**	**0.02**	**0.02**
	Cement Production	-	-	-	-	-	-	-	-
	Lime Production	-	-	-	-	-	-	-	-
	Mineral Products Use	0.01	0.04	0.16	0.07	0.03	0.04	0.02	0.02
b.	**Chemical Industry**[2]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Adipic Acid Production	-	-	-	-	-	-	-	-
c.	**Metal Production**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Iron and Steel Production	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	**3.2**	**3.9**	**5.8**	**6.7**	**6.5**	**6.6**	**6.8**	**7**
e.	**Non-Energy Products from Fuels and Solvent Use**	**2.4**	**4.1**	**3.6**	**2.3**	**2.1**	**2.4**	**2.3**	**2.8**
f.	**Other Product Manufacture and Use**	**0.53**	**0.57**	**0.49**	**0.33**	**0.32**	**0.38**	**0.49**	**0.44**
AGRICULTURE		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
a.	**Enteric Fermentation**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
b.	**Manure Management**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c.	**Agriculture Soils**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Direct Sources	-	-	-	-	-	-	-	-
	Indirect Sources	-	-	-	-	-	-	-	-
d.	**Field Burning of Agricultural Residues**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE		**5.1**	**5.2**	**6**	**6.3**	**6.4**	**6.5**	**6.6**	**6.7**
a.	**Solid Waste Disposal on Land**	**2.4**	**2.5**	**3.1**	**3.4**	**3.5**	**3.5**	**3.6**	**3.7**
b.	**Wastewater Handling**	**2.8**	**2.8**	**3**	**2.9**	**2.9**	**2.9**	**2.9**	**3**
c.	**Waste Incineration**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
x Indicates data has been suppressed to respect confidentiality
Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

Table A10–25 2013 GHG Emission Summary for Northwest Territories

Greenhouse Gas Categories		Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[4]	PFCs[4]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL	**1 370**	**0.66**	**17**	**0.2**	**58**	**7**	**-**	**-**	**-**	**1 460**
ENERGY	**1 370**	**0.43**	**11**	**0.2**	**60**	**-**	**-**	**-**	**-**	**1 440**
a. Stationary Combustion Sources	**695**	**0.02**	**0.6**	**0.05**	**10**	**-**	**-**	**-**	**-**	**710**
Public Electricity and Heat Production	x	x	x	x	x	-	-	-	-	x
Petroleum Refining Industries	-	-	-	-	-	-	-	-	-	-
Mining and Upstream Oil and Gas Production	378	0.02	0.43	0.03	10	-	-	-	-	388
Manufacturing Industries	x	x	x	x	x	-	-	-	-	x
Construction	x	x	x	x	x	-	-	-	-	x
Commercial and Institutional	161	0.0	0.06	0.0	1	-	-	-	-	162
Residential	91.1	0.0	0.03	0.0	0.4	-	-	-	-	91.5
Agriculture and Forestry	-	-	-	-	-	-	-	-	-	-
b. Transport[1]	**665**	**0.06**	**1**	**0.1**	**40**	**-**	**-**	**-**	**-**	**710**
Domestic Aviation	131	0.01	0.3	0.0	1	-	-	-	-	130
Road Transportation	201	0.01	0.3	0.01	3.3	-	-	-	-	204
Light-Duty Gasoline Vehicles	31.8	0.0	0.09	0.0	0.55	-	-	-	-	32.4
Light-Duty Gasoline Trucks	28.2	0.0	0.08	0.0	0.43	-	-	-	-	28.7
Heavy-Duty Gasoline Vehicles	4.05	0.0	0.01	0.0	0.08	-	-	-	-	4.14
Motorcycles	0.31	0.0	0.0	0.0	0.0	-	-	-	-	0.32
Light-Duty Diesel Vehicles	0.47	0.0	0.0	0.0	0.01	-	-	-	-	0.48
Light-Duty Diesel Trucks	x	x	x	x	x	-	-	-	-	x
Heavy-Duty Diesel Vehicles	133	0.01	0.1	0.01	2	-	-	-	-	136
Propane and Natural Gas Vehicles	x	x	x	x	x	-	-	-	-	x
Railways	x	x	x	x	x	-	-	-	-	x
Domestic Navigation	x	x	x	x	x	-	-	-	-	x
Other Transportation	322	0.04	0.9	0.1	40	-	-	-	-	360
Off-Road Gasoline	16.5	0.02	0.5	0.0	0.1	-	-	-	-	17
Off-Road Diesel	304	0.02	0.4	0.1	40	-	-	-	-	340
Pipeline Transport	2.15	0.0	0.0	0.0	0.1	-	-	-	-	2.25
c. Fugitive Sources	**11**	**0.34**	**8.6**	**0.0**	**0.01**	**-**	**-**	**-**	**-**	**20**
Coal Mining	-	-	-	-	-	-	-	-	-	-
Oil and Natural Gas	11	0.34	8.6	0.0	0.01	-	-	-	-	20
d. CO_2 Transport and Storage	-	-	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE	**2.97**	**-**	**-**	**0.0**	**0.32**	**7**	**-**	**-**	**-**	**10.3**
a. Mineral Products	**0.02**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.02**
Cement Production	-	-	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-	-	-
Mineral Products Use	0.02	-	-	-	-	-	-	-	-	0.02
b. Chemical Industry[2]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
Aluminum Production	-	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[3]	**-**	**-**	**-**	**-**	**-**	**7**	**-**	**-**	**-**	**7**
e. Non-Energy Products from Fuels and Solvent Use	**2.8**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.8**
f. Other Product Manufacture and Use	**0.1**	**-**	**-**	**0.0**	**0.32**	**-**	**-**	**-**	**-**	**0.44**
AGRICULTURE	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
a. Enteric Fermentation	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
b. Manure Management	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Agriculture Soils	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Direct Sources	-	-	-	-	-	-	-	-	-	-
Indirect Sources	-	-	-	-	-	-	-	-	-	-
d. Field Burning of Agricultural Residues	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Liming, Urea Application and Other Carbon-containing Fertilizers	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE	**-**	**0.23**	**5.8**	**0.0**	**0.8**	**-**	**-**	**-**	**-**	**6.7**
a. Solid Waste Disposal on Land	**-**	**0.15**	**3.7**	**-**	**-**	**-**	**-**	**-**	**-**	**3.7**
b. Wastewater Handling	**-**	**0.09**	**2.1**	**0.0**	**0.8**	**-**	**-**	**-**	**-**	**3**
c. Waste Incineration	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
4. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
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Table A10–26 1999–2013 GHG Emission Summary for Nunavut

Greenhouse Gas Categories		1990	2000	2005	2009	2010	2011	2012	2013
	kt CO_2 equivalent								
TOTAL		**261**	**382**	**345**	**433**	**421**	**227**	**229**	**221**
ENERGY		**256**	**377**	**338**	**425**	**414**	**219**	**221**	**212**
a.	**Stationary Combustion Sources**	**109**	**92.9**	**133**	**125**	**125**	**76.2**	**76.5**	**71.7**
	Public Electricity and Heat Production	109	80.6	125	125	125	x	x	x
	Petroleum Refining Industries	-	-	-	-	-	x	x	x
	Mining and Upstream Oil and Gas Production	-	0.77	0.26	x	x	-	-	-
	Manufacturing Industries	-	-	x	x	x	x	x	x
	Construction	-	-	x	x	x	x	x	x
	Commercial and Institutional	-	6.17	8.22	-	-	-	-	-
	Residential	-	5.38	-	-	-	-	-	-
	Agriculture and Forestry	-	-	-	-	-	-	-	-
b.	**Transport**[1]	**147**	**284**	**205**	**300**	**288**	**143**	**144**	**140**
	Domestic Aviation	110	130	140	110	120	120	140	140
	Road Transportation	20.4	25.3	25.4	30	33.2	13.2	7.49	0.65
	Light-Duty Gasoline Vehicles	4.14	5.3	3.79	4.64	4.6	-	-	-
	Light-Duty Gasoline Trucks	8.98	12.6	11.4	14	13.8	-	-	-
	Heavy-Duty Gasoline Vehicles	0.14	0.19	0.19	0.28	0.31	-	-	-
	Motorcycles	0.02	0.03	0.03	0.04	0.04	-	-	-
	Light-Duty Diesel Vehicles	0.04	0.06	0.06	0.07	0.07	-	-	-
	Light-Duty Diesel Trucks	0.49	0.72	0.75	0.87	0.88	-	-	-
	Heavy-Duty Diesel Vehicles	5.48	5.87	8.6	9.64	12.8	12.4	6.84	-
	Propane and Natural Gas Vehicles	1.1	0.58	0.65	0.46	0.65	0.77	0.65	0.65
	Railways	-	-	x	x	x	x	x	x
	Domestic Navigation	-	-	x	x	x	x	x	x
	Other Transportation	16	130	41	160	140	5.9	-	-
	Off-Road Gasoline	-	2.2	-	0.9	0.53	-	-	-
	Off-Road Diesel	16	130	41	160	140	x	x	x
	Pipeline Transport	-	-	x	x	x	x	x	x
c.	**Fugitive Sources**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Coal Mining	-	-	-	-	-	-	-	-
	Oil and Natural Gas	-	-	-	-	-	-	-	-
d.	**CO_2 Transport and Storage**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE		**1.41**	**1.67**	**2.38**	**2.78**	**2.79**	**3**	**3.33**	**3.59**
a.	**Mineral Products**	**0.01**	**0.04**	**0.16**	**0.07**	**0.03**	**0.04**	**0.02**	**0.02**
	Cement Production	-	-	-	-	-	-	-	-
	Lime Production	-	-	-	-	-	-	-	-
	Mineral Products Use	0.01	0.04	0.16	0.07	0.03	0.04	0.02	0.02
b.	**Chemical Industry**[2]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Adipic Acid Production	-	-	-	-	-	-	-	-
c.	**Metal Production**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Iron and Steel Production	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3**[3]	**1**	**1.2**	**1.9**	**2.5**	**2.5**	**2.7**	**3**	**3.3**
e.	**Non-Energy Products from Fuels and Solvent Use**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
f.	**Other Product Manufacture and Use**	**0.35**	**0.39**	**0.34**	**0.24**	**0.23**	**0.24**	**0.3**	**0.26**
AGRICULTURE		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
a.	**Enteric Fermentation**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
b.	**Manure Management**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c.	**Agriculture Soils**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Direct Sources	-	-	-	-	-	-	-	-
	Indirect Sources	-	-	-	-	-	-	-	-
d.	**Field Burning of Agricultural Residues**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE		**3.4**	**3.6**	**4.2**	**4.8**	**4.9**	**5.1**	**5.2**	**5.4**
a.	**Solid Waste Disposal on Land**	**1.6**	**1.7**	**2.2**	**2.6**	**2.7**	**2.8**	**2.9**	**3**
b.	**Wastewater Handling**	**1.8**	**1.9**	**2.1**	**2.2**	**2.3**	**2.3**	**2.3**	**2.4**
c.	**Waste Incineration**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
x Indicates data has been suppressed to respect confidentiality
Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

Table A10–27 2013 GHG Emission Summary for Nunavut

Greenhouse Gas Categories		Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[4]	PFCs[4]	SF_6	NF_3	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO_2 eq.	kt	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.	kt CO_2 eq.
TOTAL	**208**	**0.2**	**4.9**	**0.02**	**5.1**	**3.3**	**-**	**-**	**-**	**221**
ENERGY	**207**	**0.01**	**0.17**	**0.01**	**4**	**-**	**-**	**-**	**-**	**212**
a. Stationary Combustion Sources	**68.6**	**0.0**	**0.08**	**0.01**	**3**	**-**	**-**	**-**	**-**	**71.7**
Public Electricity and Heat Production	x	x	x	x	x	-	-	-	-	x
Petroleum Refining Industries	x	x	x	x	x	-	-	-	-	x
Mining and Upstream Oil and Gas Production	-	-	-	-	-	-	-	-	-	-
Manufacturing Industries	x	x	x	x	x	-	-	-	-	x
Construction	x	x	x	x	x	-	-	-	-	x
Commercial and Institutional	-	-	-	-	-	-	-	-	-	-
Residential	-	-	-	-	-	-	-	-	-	-
Agriculture and Forestry	-	-	-	-	-	-	-	-	-	-
b. Transport[1]	**139**	**0.0**	**0.09**	**0.0**	**1**	**-**	**-**	**-**	**-**	**140**
Domestic Aviation	138	0.0	0.08	0.0	1	-	-	-	-	140
Road Transportation	0.64	0.0	0.01	0.0	0.0	-	-	-	-	0.65
Light-Duty Gasoline Vehicles	-	-	-	-	-	-	-	-	-	-
Light-Duty Gasoline Trucks	-	-	-	-	-	-	-	-	-	-
Heavy-Duty Gasoline Vehicles	-	-	-	-	-	-	-	-	-	-
Motorcycles	-	-	-	-	-	-	-	-	-	-
Light-Duty Diesel Vehicles	-	-	-	-	-	-	-	-	-	-
Light-Duty Diesel Trucks	-	-	-	-	-	-	-	-	-	-
Heavy-Duty Diesel Vehicles	-	-	-	-	-	-	-	-	-	-
Propane and Natural Gas Vehicles	0.64	0.0	0.01	0.0	0.0	-	-	-	-	0.65
Railways	x	x	x	x	x	-	-	-	-	x
Domestic Navigation	x	x	x	x	x	-	-	-	-	x
Other Transportation	-	-	-	-	-	-	-	-	-	-
Off-Road Gasoline	-	-	-	-	-	-	-	-	-	-
Off-Road Diesel	x	x	x	x	x	-	-	-	-	x
Pipeline Transport	x	x	x	x	x	-	-	-	-	x
c. Fugitive Sources	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Coal Mining	-	-	-	-	-	-	-	-	-	-
Oil and Natural Gas	-	-	-	-	-	-	-	-	-	-
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**0.02**	**-**	**-**	**0.0**	**0.26**	**3.3**	**-**	**-**	**-**	**3.59**
a. Mineral Products	**0.02**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.02**
Cement Production	-	-	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-	-	-
Mineral Products Use	0.02	-	-	-	-	-	-	-	-	0.02
b. Chemical Industry[2]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
Aluminum Production	-	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[3]	**-**	**-**	**-**	**-**	**-**	**3.3**	**-**	**-**	**-**	**3.3**
e. Non-Energy Products from Fuels and Solvent Use	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.0**	**0.26**	**-**	**-**	**-**	**-**	**0.26**
AGRICULTURE	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
a. Enteric Fermentation	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
b. Manure Management	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Agriculture Soils	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Direct Sources	-	-	-	-	-	-	-	-	-	-
Indirect Sources	-	-	-	-	-	-	-	-	-	-
d. Field Burning of Agricultural Residues	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Liming, Urea Application and Other Carbon-containing Fertilizers	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE	**-**	**0.19**	**4.7**	**0.0**	**0.7**	**-**	**-**	**-**	**-**	**5.4**
a. Solid Waste Disposal on Land	**-**	**0.12**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**3**
b. Wastewater Handling	**-**	**0.07**	**1.7**	**0.0**	**0.7**	**-**	**-**	**-**	**-**	**2.4**
c. Waste Incineration	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.
4. IPCC's *Fourth Assessment Report* provides global warming potentials (GWPs) for the various species of HFCs and PFCs. Chapter 1, Table 1-1 of this report provides a list of GWPs used.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
x Indicates data has been suppressed to respect confidentiality
Note that the 2013 estimates are based on preliminary energy data; these data, though the best available information at the time of publication, are subject to revision in the next submission year.

Table A10–28 1990–1998 GHG Emission Summary for Northwest Territories and Nunavut

Greenhouse Gas Categories		1990	1991	1992	1993	1994	1995	1996	1997	1998
kt CO_2 equivalent										
TOTAL		**1 640**	**1 600**	**1 400**	**1 680**	**1 840**	**1 970**	**1 920**	**1 740**	**1 580**
ENERGY		**1 630**	**1 580**	**1 390**	**1 650**	**1 730**	**1 880**	**1 910**	**1 720**	**1 560**
a.	**Stationary Combustion Sources**	**921**	**991**	**853**	**950**	**1 010**	**1 160**	**1 030**	**981**	**740**
	Public Electricity and Heat Production	163	163	132	142	146	162	124	135	181
	Petroleum Refining Industries	7.5	5.8	7	5.1	12	10	4	-	-
	Mining and Upstream Oil and Gas Production	311	237	129	172	244	357	305	294	262
	Manufacturing Industries	25.8	16.3	18.4	8.33	13.5	20	-	-	-
	Construction	5.72	5.29	5.68	3.15	3.74	20.6	0.68	0.7	0.53
	Commercial and Institutional	250	367	357	389	401	474	405	371	207
	Residential	155	188	192	229	188	117	195	181	88.7
	Agriculture and Forestry	2.48	8.99	12	2.04	2.04	0.01	-	0.01	0.02
b.	**Transport[1]**	**616**	**486**	**448**	**604**	**659**	**654**	**819**	**732**	**814**
	Domestic Aviation	240	210	220	230	240	220	230	230	230
	Road Transportation	120	105	103	116	137	148	164	159	224
	Light-Duty Gasoline Vehicles	32.9	31.6	31.4	39.7	41.4	36.9	39.5	40	38.8
	Light-Duty Gasoline Trucks	14.2	14.6	15.4	20.6	23.6	22.7	25.9	29.3	28.9
	Heavy-Duty Gasoline Vehicles	4.69	3.91	3.56	4.29	3.72	3.57	3.8	3.53	3.51
	Motorcycles	0.21	0.2	0.2	0.25	0.26	0.23	0.26	0.27	0.23
	Light-Duty Diesel Vehicles	0.32	0.31	0.31	0.39	0.4	0.36	0.39	0.39	0.38
	Light-Duty Diesel Trucks	0.24	0.26	0.29	0.4	0.51	0.5	0.94	1.65	1.66
	Heavy-Duty Diesel Vehicles	66.2	52.6	49	47.6	60.9	79.8	90.5	81.2	148
	Propane and Natural Gas Vehicles	1.5	1.5	2.9	2.3	5.9	4	2.3	2.2	2.2
	Railways	2.6	2	2.1	2.2	1.5	2.5	1.2	2.7	2.4
	Domestic Navigation	0.15	0.24	0.59	0.51	0.11	71	-	-	-
	Other Transportation	250	170	130	250	280	210	420	340	360
	Off-Road Gasoline	52	42	43	62	60	46	62	63	38
	Off-Road Diesel	200	130	83	190	220	170	360	280	320
	Pipeline Transport	-	-	-	-	2.3	0.14	0.09	0.04	-
c.	**Fugitive Sources**	**97**	**100**	**89**	**94**	**65**	**65**	**60**	**12**	**10**
	Coal Mining	-	-	-	-	-	-	-	-	-
	Oil and Natural Gas	97	100	89	94	65	65	60	12	10
d.	**CO_2 Transport and Storage**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE		**3.4**	**11.7**	**2.53**	**24.7**	**104**	**85.7**	**1.98**	**2.73**	**2.99**
a.	**Mineral Products**	**-**	**-**	**-**	**-**	**0.02**	**0.02**	**0.04**	**-**	**-**
	Cement Production	-	-	-	-	-	-	-	-	-
	Lime Production	-	-	-	-	-	-	-	-	-
	Mineral Products Use	-	-	-	-	0.02	0.02	0.04	-	-
b.	**Chemical Industry[2]**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Adipic Acid Production	-	-	-	-	-	-	-	-	-
c.	**Metal Production**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Iron and Steel Production	-	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-	-
	SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-
d.	**Production and Consumption of Halocarbons, SF_6 and NF_3[3]**	**-**	**-**	**-**	**-**	**-**	**0.7**	**1.3**	**1.9**	**2.1**
e.	**Non-Energy Products from Fuels and Solvent Use**	**3**	**11**	**2.2**	**24**	**100**	**85**	**0.2**	**0.37**	**0.03**
f.	**Other Product Manufacture and Use**	**0.37**	**0.36**	**0.3**	**0.34**	**0.38**	**0.46**	**0.47**	**0.5**	**0.86**
AGRICULTURE		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
a.	**Enteric Fermentation**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
b.	**Manure Management**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c.	**Agriculture Soils**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Direct Sources	-	-	-	-	-	-	-	-	-
	Indirect Sources	-	-	-	-	-	-	-	-	-
d.	**Field Burning of Agricultural Residues**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e.	**Liming, Urea Application and Other Carbon-containing Fertilizers**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE		**5.9**	**6.2**	**6.5**	**6.8**	**7.1**	**7.4**	**7.7**	**8**	**8.2**
a.	**Solid Waste Disposal on Land**	**2**	**2.2**	**2.3**	**2.5**	**2.7**	**2.9**	**3.2**	**3.4**	**3.7**
b.	**Wastewater Handling**	**3.9**	**4.1**	**4.2**	**4.2**	**4.4**	**4.5**	**4.5**	**4.6**	**4.6**
c.	**Waste Incineration**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes:
1. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
2. Emissions from the Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use within the provincial/territorial tables as CO_2 eq values.
3. Emission estimates from consumption of PFCs and NF_3, as well as emissions of SF_6 from semi-conductor manufacturing, are only available at the national level. HFC and PFC consumption began in 1995;
HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

- Indicates no emissions
0.0 Indicates emissions truncated due to rounding
x Indicates data has been suppressed to respect confidentiality

Annex 11

Electricity in Canada: Summary and Intensity Tables

This annex presents detailed greenhouse gas (GHG) information related to the generation of electricity by the Public Electricity and Heat Production category (IPCC Category 1.A.1.a), on a national and provincial level.

The Canadian electricity generation industry produces electricity by transforming the energy in falling water, coal, natural gas, refined petroleum products (RPPs), other miscellaneous fuels, biomass, nuclear, wind and solar resources. The process of supplying electricity to the public involves not only power generation at the plant, but also distribution through the electricity grid. The efficiency of the transmission system has an impact on the amount of electricity available to consumers. GHG emission estimates and electricity generation values are therefore based on activities that occur at the generating plant, and efforts have been made to include the impact of the transmission and distribution infrastructure (including sulphur hexafluoride (SF6) emissions associated with switchgear and other electrical equipment, which is accounted for in the Industrial Processes and Product Use Sector).

The electricity generation industry in Canada is composed of entities whose main activity is the production of electricity (main activity producers) and those who generate either partially or wholly for their own use (autoproducers). Main activity producers sell their electricity to the grid, and can be either public or private generators. Autoproducers are generally private companies that are generating electricity either to feed their operations or as a by-product of their operation. They may sell some or all of their electricity to the grid.

The analysis in this section only includes main activity producers. This analysis relies on a variety of data sources; fuel consumption and electricity production data are published by Statistics Canada in the *Report on Energy Supply and Demand in Canada* (RESD) (Statistics Canada 57-003-X), in the publication *Electric Power Generation, Transmission and Distribution* (EPGTD) (Statistics Canada 57-202-X) and online via CANSIM (Tables 127-0006,127-0007 and 127-0008).

Electricity generation intensity values were derived for each fuel type using GHG emission estimates and electricity generation data. The methodology used to develop the GHG emissions is discussed in Chapter 3 and Annex 3.1 of this report. GHG emissions are based on the total fuel consumed by the public utility sector, as provided in the RESD,[1] while generation data are from CANSIM (2005–2013) and the EPGTD publication (1990–2004).

A "consumption intensity" indicator was also derived to reflect the GHG emissions intensity of electricity as it is delivered to the consumer, as opposed to deliveries to the electricity grid as in the case of the generation intensity indicator. Accordingly, electric energy losses in transmission and distribution are subtracted from overall total electricity generation, while SF_6 emissions associated with equipment used in electricity transmission and distribution are added to overall total GHG emissions. The electric energy losses in transmission and distribution are taken to be the utility sector's share of "unallocated energy," as presented in Table A11–1 to Table A11–13 and calculated from data provided by CANSIM 127-0008. Likewise, the SF_6 emission values are based on the electric utility sector's share of total SF_6 emissions from equipment used in electricity transmission and distribution.

Electricity intensity values for Canada, the provinces and the territories are provided in Table A11–1 to Table A11–13.

1 Occasionally, Statistics Canada revises some of its historic data, which can affect the values provided in Table A11–1 to Table A11–13.

Table A11–1 Electricity Generation and GHG Emission Details for Canada[1]

	1990	2000	2005	2009	2010	2011	2012	2013[2]
	Greenhouse Gas Emissions[3]							
	kt CO_2 eq							
Combustion	**94 700**	**132 000**	**127 000**	**102 300**	**103 000**	**95 600**	**89 700**	**88 300**
Coal	80 500	108 000	97 400	77 800	78 700	68 600	63 300	63 800
Natural Gas	2 720	13 800	15 300	14 900	18 600	21 700	21 500	19 400
Other Fuels[4]	11 500	10 490	14 100	9 630	5 870	5 310	4 930	5 070
Other Emissions[5]	**–**	**27.3**	**52**	**73**	**54**	**61**	**82**	**63**
Overall Total[6,7]	**94 700**	**132 000**	**127 000**	**102 000**	**103 000**	**95 700**	**89 800**	**88 300**
	Electricity Generation[8,9]							
	GWh							
Combustion	**101 000**	**146 000**	**140 000**	**113 000**	**117 000**	**119 000**	**107 000**	**104 000**
Coal	82 200	106 000	93 900	73 600	74 300	70 200	60 200	60 900
Natural Gas	4 140	26 600	29 800	28 400	33 600	41 500	39 400	35 600
Other Fuels	14 800	13 400	16 700	11 000	8 650	7 170	7 140	7 900
Refined Petroleum Products	14 700	10 600	10 800	5 400	3 010	2 310	2 320	2 150
Biomass	14.4	1 830	1 780	2 080	2 310	2 150	1 990	2 050
Other	91	960	4 100	3 500	3 300	2 700	2 800	3 700
Steam from Waste Heat	**–**	**–**	**32.4**	**5 520**	**7 090**	**6 440**	**7 530**	**7 110**
Nuclear	**68 800**	**68 700**	**86 800**	**85 000**	**85 500**	**88 300**	**89 500**	82 400
Hydro	**263 000**	**323 000**	**327 000**	**334 000**	**321 000**	**342 000**	**345 000**	357 000
Other Renewables[10]	**26.2**	**264**	**1 580**	**6 610**	**8 780**	**10 370**	**11 500**	11 800
Other Generation[11]	**–**	**–**	**–**	**1 920**	**2 980**	**2 510**	**2 720**	2 440
Overall Total[7]	**433 000**	**539 000**	**556 000**	**546 000**	**542 000**	**568 000**	**563 000**	565 000
	Greenhouse Gas Intensity[12]							
	g GHG / kWh electricity generated							
CO_2 intensity (g CO_2 / kWh)	**220**	**240**	**220**	**180**	**190**	**170**	**160**	**150**
CH_4 intensity (g CH_4 / kWh)	**0.004**	**0.009**	**0.01**	**0.009**	**0.01**	**0.01**	**0.01**	**0.01**
N_2O intensity (g N_2O / kWh)	**0.004**	**0.005**	**0.005**	**0.004**	**0.004**	**0.003**	**0.003**	**0.003**
Generation Intensity (g CO_2 eq / kWh)[7]	**220**	**240**	**220**	**180**	**190**	**170**	**160**	150
Unallocated Energy (GWh)[13,14]	**31 000**	**42 000**	**37 000**	**57 000**	**52 000**	**57 000**	**46 000**	**29 000**
SF_6 Emissions (kt CO_2 eq)[15]	**200**	**200**	**160**	**180**	**180**	**140**	**180**	**210**
Consumption Intensity (g CO_2 eq / kWh)[16]	**240**	**260**	**240**	**210**	**210**	**190**	**170**	160

Notes:
1. Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 - Electric Power Generation.
2. Preliminary data.
3. Emissions based on data taken from the *Report on Energy Supply and Demand in Canada*, Catalogue No. 57-003-X, Statistics Canada.
4. Includes GHG emissions from the combustion of refined petroleum products (light fuel oil, heavy fuel oil, and diesel), petroleum coke, still gas and other fuels not easily categorized.
5. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
6. GHG emissions from the flooding of land for hydro dams are not included.
7. Totals may not add up to overall total due to rounding.
8. Taken from CANSIM Tables 127-0006 and 127-0007 (for 2005-2013).
9. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-X, Statistics Canada (for 1990-2004).
10. Other Renewables - includes electricity generation by wind, tidal and solar.
11. NAICS category 221119, Other Electric Power Generation.
12. Intensity values have been rounded so as to present the estimated level of accuracy.
13. Adapted from Statistics Canada CANSIM Table 127-0008 (2005-2013) or Cat. No. 57-202-X (1990-2004).
14. Includes transmission line losses, metering differences and other losses.
15. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
16. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation

0 Indicates emissions or electricity generation value less than 0.1

Table A11–2 Electricity Generation and GHG Emission Details for Newfoundland and Labrador[1]

	1990	2000	2005	2009	2010	2011	2012	2013[2]
	Greenhouse Gas Emissions[3]							
	kt CO_2 eq							
Combustion	**1 650**	**823**	**865**	**829**	**747**	**866**	**851**	866
Coal	–	–	–	–	–	–	–	–
Natural Gas	–	–	–	–	–	–	–	–
Other Fuels[4]	1 650	823	865	829	747	866	851	866
Other Emissions[5]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Overall Total[6,7]	**1 650**	**823**	**865**	**829**	**747**	**866**	**851**	866
	Electricity Generation[8,9]							
	GWh							
Combustion	**2 090**	**1 020**	**1 360**	**1 060**	**916**	**1 009**	**970**	**1 090**
Coal	–	–	–	–	–	–	–	–
Natural Gas	–	–	–	–	–	–	–	–
Other Fuels	2 090	1 020	1 360	1 060	916	1 009	970	1 090
Steam from Waste Heat	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Hydro	**34 300**	**41 800**	**38 900**	**35 900**	**39 400**	**39 100**	**41 300**	40 500
Other Renewables[10]	**0**	**–**	**–**	**102**	**183**	**198**	**195**	192
Other Generation[11]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Overall Total[7]	**36 400**	**42 800**	**40 300**	**37 100**	**40 500**	**40 300**	**42 500**	41 800
	Greenhouse Gas Intensity[12]							
	g GHG / kWh electricity generated							
CO_2 intensity (g CO_2 / kWh)	**45**	**19**	**21**	**22**	**18**	**21**	**20**	**21**
CH_4 intensity (g CH_4 / kWh)	**0.0006**	**0.0002**	**0.0003**	**0.0003**	**0.0003**	**0.0004**	**0.0003**	**0.0003**
N_2O intensity (g N_2O / kWh)	**0.001**	**0.0005**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.0**
Generation Intensity (g CO_2 eq / kWh)[7]	**45**	**19**	**21**	**22**	**18**	**21**	**20**	21
Unallocated Energy (GWh)[13,14]	**990**	**1300**	**810**	**1100**	**1300**	**1300**	**1300**	**1400**
SF_6 Emissions (kt CO_2 eq)[15]	**0.94**	**0.92**	**0.50**	**0.92**	**0.54**	**0.83**	**1.0**	**1.4**
Consumption Intensity (g CO_2 eq / kWh)[16]	**46**	**20**	**22**	**23**	**19**	**22**	**21**	21

Notes:
1. Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 - Electric Power Generation.
2. Preliminary data.
3. Emissions based on data taken from the *Report on Energy Supply and Demand in Canada*, Catalogue No. 57-003-X, Statistics Canada.
4. Includes GHG emissions from the combustion of refined petroleum products (light fuel oil, heavy fuel oil, and diesel), petroleum coke, still gas and other fuels not easily categorized.
5. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
6. GHG emissions from the flooding of land for hydro dams are not included.
7. Totals may not add up to overall total due to rounding.
8. Taken from CANSIM Tables 127-0006 and 127-0007 (for 2005-2013).
9. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-X, Statistics Canada (for 1990-2004).
10. Other Renewables - includes electricity generation by wind, tidal and solar.
11. NAICS category 221119, Other Electric Power Generation.
12. Intensity values have been rounded so as to present the estimated level of accuracy.
13. Adapted from Statistics Canada CANSIM Table 127-0008 (2005-2013) or Cat. No. 57-202-X (1990-2004).
14. Includes transmission line losses, metering differences and other losses.
15. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
16. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation

0 Indicates emissions or electricity generation value less than 0.1

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Table A11–3 Electricity Generation and GHG Emission Details for Prince Edward Island[1]

	1990	2000	2005	2009	2010	2011	2012	2013[2]
	Greenhouse Gas Emissions[3]							
	kt CO_2 eq							
Combustion	**104**	**53.0**	**4.76**	**6.04**	**1.59**	**1.23**	**10.8**	3.9
Coal	–	–	–	–	–	–	–	–
Natural Gas	–	–	–	–	–	–	–	–
Other Fuels[4]	104	53.0	4.76	6.04	1.59	1.23	10.8	3.9
Other Emissions[5]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Overall Total[6,7]	**104**	**53.0**	**4.76**	**6.04**	**1.59**	**1.23**	**10.8**	3.9
	Electricity Generation[8,9]							
	GWh							
Combustion	**81.1**	**48.1**	**6.31**	**7.32**	**3.78**	**4.81**	**14.5**	**8.2**
Coal	–	–	–	–	–	–	–	–
Natural Gas	–	–	–	–	–	–	–	–
Other Fuels	81.1	48.1	6.31	7.32	3.78	4.81	14.5	8.2
Steam from Waste Heat	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Hydro	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Other Renewables[10]	**–**	**–**	**40.1**	**347**	**458**	**488**	**468**	499
Other Generation[11]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Overall Total[7]	**81.1**	**48.1**	**46.4**	**355**	**461**	**492**	**482**	507
	Greenhouse Gas Intensity[12]							
	g GHG / kWh electricity generated							
CO_2 intensity (g CO_2 / kWh)	**1 300**	**1 100**	**100**	**17**	**3.4**	**2.5**	**22**	**8**
CH_4 intensity (g CH_4 / kWh)	**0.02**	**0.01**	**0.001**	**0.0002**	**0.00004**	**0.00006**	**0.0005**	**0.0002**
N_2O intensity (g N_2O / kWh)	**0.03**	**0.02**	**0.002**	**0.0003**	**0.0001**	**0.0001**	**0.0004**	**0.0001**
Generation Intensity (g CO_2 eq / kWh)[7]	**1 300**	**1 100**	**100**	**17**	**3.4**	**2.5**	**22**	8
Unallocated Energy (GWh)[13,14]	**unk**	**unk**	**unk**	**22**	**8.6**	**21**	**20**	**20**
SF_6 Emissions (kt CO_2 eq)[15]	**0**	**0**	**–**	**–**	**–**	**0**	**0**	**0**
Consumption Intensity (g CO_2 eq / kWh)[16]	*	*	*	*	*	*	*	*

Notes:
1. Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 - Electric Power Generation.
2. Preliminary data.
3. Emissions based on data taken from the *Report on Energy Supply and Demand in Canada*, Catalogue No. 57-003-X, Statistics Canada.
4. Includes GHG emissions from the combustion of refined petroleum products (light fuel oil, heavy fuel oil, and diesel), petroleum coke, still gas and other fuels not easily categorized.
5. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
6. GHG emissions from the flooding of land for hydro dams are not included.
7. Totals may not add up to overall total due to rounding.
8. Taken from CANSIM Tables 127-0006 and 127-0007 (for 2005-2013).
9. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-X, Statistics Canada (for 1990-2004).
10. Other Renewables - includes electricity generation by wind, tidal and solar.
11. NAICS category 221119, Other Electric Power Generation.
12. Intensity values have been rounded so as to present the estimated level of accuracy.
13. Adapted from Statistics Canada CANSIM Table 127-0008 (2005-2013) or Cat. No. 57-202-X (1990-2004).
14. Includes transmission line losses, metering differences and other losses.
15. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
16. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
0 Indicates emissions or electricity generation value less than 0.1
unk Indicates unknown as appropriate data were unavailable
* Due to the high level of imports from New Brunswick, values for New Brunswick are more indicative of GHG consumption intensity.

Table A11–4 Electricity Generation and GHG Emission Details for Nova Scotia[1]

	1990	2000	2005	2009	2010	2011	2012	2013[2]
	Greenhouse Gas Emissions[3]							
	kt CO_2 eq							
Combustion	**6 940**	**9 670**	**11 000**	**9 770**	**8 860**	**8 520**	**7 680**	7 310
Coal	x	8 260	5 470	6 750	6 410	6 170	5 170	5 160
Natural Gas	–	–	x	x	x	x	x	x
Other Fuels[4]	x	1 420	x	x	x	x	x	x
Other Emissions[5]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Overall Total[6,7]	**6 940**	**9 670**	**11 000**	**9 770**	**8 860**	**8 520**	**7 680**	7 310
	Electricity Generation[8,9]							
	GWh							
Combustion	**8 440**	**10 500**	**11 100**	**10 200**	**10 300**	**9 500**	**9 210**	**8 770**
Coal	6 020	8 850	6 770	6 960	6 790	6 020	5 390	5 500
Natural Gas	–	–	181	1 610	2 270	2 430	2 260	1 370
Other Fuels	2 430	1 610	4 110	1 660	1 270	1 050	1 560	1 890
Steam from Waste Heat	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Hydro	**1 120**	**887**	**1 040**	**1 040**	**969**	**1 070**	**806**	964
Other Renewables[10]	**26.1**	**0**	**113**	**184**	**414**	**809**	**827**	780
Other Generation[11]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Overall Total[7]	**9 590**	**11 300**	**12 200**	**11 500**	**11 700**	**11 400**	**10 800**	10 500
	Greenhouse Gas Intensity[12]							
	g GHG / kWh electricity generated							
CO_2 intensity (g CO_2 / kWh)	**720**	**840**	**880**	**820**	**750**	**740**	**700**	**690**
CH_4 intensity (g CH_4 / kWh)	**0.007**	**0.009**	**0.02**	**0.03**	**0.04**	**0.04**	**0.04**	**0.03**
N_2O intensity (g N_2O / kWh)	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
Generation Intensity (g CO_2 eq / kWh)[7]	**720**	**840**	**880**	**820**	**760**	**750**	**710**	690
Unallocated Energy (GWh)[13,14]	**580**	**830**	**770**	**710**	**670**	**640**	**1 200**	**600**
SF_6 Emissions (kt CO_2 eq)[15]	**23**	**23**	**29**	**17**	**27**	**33**	**22**	**36**
Consumption Intensity (g CO_2 eq / kWh)[16]	**770**	**910**	**940**	**880**	**800**	**800**	**800**	740

Notes:
1. Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 - Electric Power Generation.
2. Preliminary data.
3. Emissions based on data taken from the *Report on Energy Supply and Demand in Canada*, Catalogue No. 57-003-X, Statistics Canada.
4. Includes GHG emissions from the combustion of refined petroleum products (light fuel oil, heavy fuel oil, and diesel), petroleum coke, still gas and other fuels not easily categorized.
5. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
6. GHG emissions from the flooding of land for hydro dams are not included.
7. Totals may not add up to overall total due to rounding.
8. Taken from CANSIM Tables 127-0006 and 127-0007 (for 2005-2013).
9. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-X, Statistics Canada (for 1990-2004).
10. Other Renewables - includes electricity generation by wind, tidal and solar.
11. NAICS category 221119, Other Electric Power Generation.
12. Intensity values have been rounded so as to present the estimated level of accuracy.
13. Adapted from Statistics Canada CANSIM Table 127-0008 (2005-2013) or Cat. No. 57-202-X (1990-2004).
14. Includes transmission line losses, metering differences and other losses.
15. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
16. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation

0 Indicates emissions or electricity generation value less than 0.1

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Table A11–5 Electricity Generation and GHG Emission Details for New Brunswick[1]

	1990	2000	2005	2009	2010	2011	2012	2013[2]
	Greenhouse Gas Emissions[3]							
	kt CO_2 eq							
Combustion	**6 030**	**9 010**	**8 100**	**7 080**	**5 360**	**4 950**	**4 080**	4 220
Coal	1 180	3 170	2 940	2 330	2 110	x	x	x
Natural Gas	–	–	x	x	x	x	x	x
Other Fuels[4]	4 840	5 840	x	x	x	1 620	1 330	1 150
Other Emissions[5]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Overall Total[6,7]	**6 030**	**9 010**	**8 100**	**7 080**	**5 360**	**4 950**	**4 080**	4 220
	Electricity Generation[8,9]							
	GWh							
Combustion	**7 630**	**11 000**	**12 100**	**8 660**	**6 220**	**6 040**	**5 160**	**5 310**
Coal	1 270	3 820	2 920	2 770	2 080	2 340	1 900	2 250
Natural Gas	–	–	1 970	1 840	1 840	1 960	1 780	1 770
Other Fuels	6 360	7 210	7 210	4 050	2 300	1 740	1 490	1 290
Steam from Waste Heat	**–**	**–**	**–**	**617**	**681**	**666**	**551**	**581**
Nuclear	**5 340**	**3 960**	**4 380**	**–**	**–**	**–**	**414**	4 481
Hydro	**3 460**	**3 220**	**3 820**	**2 970**	**3 330**	**3 840**	**2 860**	3 400
Other Renewables[10]	**–**	**–**	**–**	**270**	**389**	**693**	**733**	737
Other Generation[11]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Overall Total[7]	**16 400**	**18 200**	**20 300**	**12 500**	**10 600**	**11 200**	**9 700**	14 500
	Greenhouse Gas Intensity[12]							
	g GHG / kWh electricity generated							
CO_2 intensity (g CO_2 / kWh)	**360**	**490**	**400**	**560**	**500**	**440**	**420**	**290**
CH_4 intensity (g CH_4 / kWh)	**0.004**	**0.005**	**0.01**	**0.03**	**0.03**	**0.03**	**0.03**	**0.02**
N_2O intensity (g N_2O / kWh)	**0.007**	**0.009**	**0.007**	**0.009**	**0.008**	**0.007**	**0.007**	**0.004**
Generation Intensity (g CO_2 eq / kWh)[7]	**370**	**490**	**400**	**570**	**510**	**440**	**420**	290
Unallocated Energy (GWh)[13,14]	**990**	**1 300**	**1 100**	**530**	**390**	**160**	**unk**	**443**
SF_6 Emissions (kt CO_2 eq)[15]	**0.71**	**0.70**	**–**	**0.50**	**0.35**	**0.61**	**0.53**	**0.82**
Consumption Intensity (g CO_2 eq / kWh)[16]	**390**	**530**	**420**	**590**	**520**	**450**	**unk**	300

Notes:
1. Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 - Electric Power Generation.
2. Preliminary data.
3. Emissions based on data taken from the *Report on Energy Supply and Demand in Canada*, Catalogue No. 57-003-X, Statistics Canada.
4. Includes GHG emissions from the combustion of refined petroleum products (light fuel oil, heavy fuel oil, and diesel), petroleum coke, still gas and other fuels not easily categorized.
5. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
6. GHG emissions from the flooding of land for hydro dams are not included.
7. Totals may not add up to overall total due to rounding.
8. Taken from CANSIM Tables 127-0006 and 127-0007 (for 2005-2013).
9. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-X, Statistics Canada (for 1990-2004).
10. Other Renewables - includes electricity generation by wind, tidal and solar.
11. NAICS category 221119, Other Electric Power Generation.
12. Intensity values have been rounded so as to present the estimated level of accuracy.
13. Adapted from Statistics Canada CANSIM Table 127-0008 (2005-2013) or Cat. No. 57-202-X (1990-2004).
14. Includes transmission line losses, metering differences and other losses.
15. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
16. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
0 Indicates emissions or electricity generation value less than 0.1
x Indicates data not shown due to statistical limitations
unk Indicates unknown as appropriate data were unavailable

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Table A11–6 Electricity Generation and GHG Emission Details for Quebec[1]

	1990	2000	2005	2009	2010	2011	2012	2013[2]
	Greenhouse Gas Emissions[3]							
	kt CO_2 eq							
Combustion	**1 500**	**763**	**1 312**	**1 185**	**430**	**405**	**488**	371
Coal	–	–	–	–	–	–	–	–
Natural Gas	x	x	x	x	x	x	x	x
Other Fuels[4]	x	x	x	x	x	x	x	x
Other Emissions[5]	**–**	**2.5**	**4.6**	**–**	**–**	**–**	**–**	–
Overall Total[6,7]	**1 500**	**765**	**1 317**	**1 185**	**430**	**405**	**488**	371
	Electricity Generation[8,9]							
	GWh							
Combustion	**1 980**	**1 150**	**1 390**	**1 690**	**1 510**	**1 360**	**1 260**	**1 140**
Coal	–	–	–	–	–	–	–	–
Natural Gas	–	191	212	211	200	198	191	14
Other Fuels	1 980	961	1 170	1 480	1 310	1 170	1 070	1 130
Steam from Waste Heat	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Nuclear	**4 070**	**4 890**	**4 480**	**3 600**	**3 550**	**3 530**	**4 210**	0
Hydro	**112 000**	**153 000**	**155 000**	**170 000**	**161 000**	**170 000**	**171 000**	182 000
Other Renewables[10]	**–**	**173**	**416**	**1 320**	**1 550**	**1 000**	**1 011**	1 031
Other Generation[11]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Overall Total[7]	**118 000**	**160 000**	**161 000**	**177 000**	**168 000**	**176 000**	**178 000**	184 000
	Greenhouse Gas Intensity[12]							
	g GHG / kWh electricity generated							
CO_2 intensity (g CO_2 / kWh)	**13**	**3.5**	**3.7**	**3.6**	**2.5**	**2.3**	**2.7**	**2.0**
CH_4 intensity (g CH_4 / kWh)	**0.0004**	**0.0005**	**0.0009**	**0.0007**	**0.0004**	**0.0002**	**0.0004**	**0.0002**
N_2O intensity (g N_2O / kWh)	**0.0003**	**0.0002**	**0.0005**	**0.0004**	**0.0001**	**0.0001**	**0.0001**	**0.0001**
Generation Intensity (g CO_2 eq / kWh)[7]	**13**	**3.6**	**3.9**	**3.7**	**2.6**	**2.3**	**2.7**	2.0
Unallocated Energy (GWh)[13,14]	**7 300**	**13 000**	**9 100**	**11 000**	**13 000**	**11 000**	**12 000**	**8 000**
SF_6 Emissions (kt CO_2 eq)[15]	**37**	**36**	**30**	**34**	**31**	**30**	**53**	**66**
Consumption Intensity (g CO_2 eq / kWh)[16]	**14**	**4.1**	**4.3**	**4.1**	**3.0**	**2.6**	**3.3**	2.5

Notes:
1. Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 - Electric Power Generation.
2. Preliminary data.
3. Emissions based on data taken from the *Report on Energy Supply and Demand in Canada*, Catalogue No. 57-003-X, Statistics Canada.
4. Includes GHG emissions from the combustion of refined petroleum products (light fuel oil, heavy fuel oil, and diesel), petroleum coke, still gas and other fuels not easily categorized.
5. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
6. GHG emissions from the flooding of land for hydro dams are not included.
7. Totals may not add up to overall total due to rounding.
8. Taken from CANSIM Tables 127-0006 and 127-0007 (for 2005-2013).
9. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-X, Statistics Canada (for 1990-2004).
10. Other Renewables - includes electricity generation by wind, tidal and solar.
11. NAICS category 221119, Other Electric Power Generation.
12. Intensity values have been rounded so as to present the estimated level of accuracy.
13. Adapted from Statistics Canada CANSIM Table 127-0008 (2005-2013) or Cat. No. 57-202-X (1990-2004).
14. Includes transmission line losses, metering differences and other losses.
15. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
16. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
0 Indicates emissions or electricity generation value less than 0.1
x Indicates data not shown due to statistical limitations

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Table A11–7 Electricity Generation and GHG Emission Details for Ontario[1]

	1990	2000	2005	2009	2010	2011	2012	2013[2]
	Greenhouse Gas Emissions[3]							
	kt CO_2 eq							
Combustion	**26 000**	**43 800**	**35 200**	**15 700**	**20 100**	**14 500**	**14 400**	11 200
Coal	24 600	38 000	28 100	9 740	12 300	4 200	4 260	3 070
Natural Gas	x	x	x	x	x	x	x	x
Other Fuels[4]	x	x	x	x	x	x	x	x
Other Emissions[5]	**–**	**0.77**	**1.4**	**21**	**0.23**	**0.23**	**–**	–
Overall Total[6,7]	**26 000**	**43 800**	**35 200**	**15 700**	**20 100**	**14 500**	**14 400**	11 200
	Electricity Generation[8,9]							
	GWh							
Combustion	**29 200**	**52 200**	**40 900**	**19 600**	**27 200**	**25 100**	**23 800**	**18 500**
Coal	27 800	40 800	29 400	9 570	12 300	3 900	4 100	2 850
Natural Gas	3.18	10 200	10 000	9 120	14 100	20 400	19 000	14 900
Other Fuels	1 430	1 140	1 440	947	864	782	703	722
Steam from Waste Heat	**–**	**–**	**–**	**2 580**	**3 630**	**3 500**	**4 250**	**3 330**
Nuclear	**59 400**	**59 800**	**78 000**	**81 400**	**82 000**	**84 800**	**84 900**	77 900
Hydro	**38 700**	**36 600**	**34 600**	**38 700**	**31 800**	**34 600**	**33 000**	36 900
Other Renewables[10]	**–**	**1.22**	**26.0**	**2 100**	**3 190**	**3 420**	**4 320**	4 680
Other Generation[11]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Overall Total[7]	**127 000**	**149 000**	**153 000**	**144 000**	**148 000**	**151 000**	**150 000**	141 000
	Greenhouse Gas Intensity[12]							
	g GHG / kWh electricity generated							
CO_2 intensity (g CO_2 / kWh)	**200**	**290**	**220**	**100**	**130**	**93**	**93**	**76**
CH_4 intensity (g CH_4 / kWh)	**0.002**	**0.01**	**0.01**	**0.010**	**0.01**	**0.02**	**0.02**	**0.01**
N_2O intensity (g N_2O / kWh)	**0.003**	**0.005**	**0.004**	**0.002**	**0.003**	**0.002**	**0.002**	**0.002**
Generation Intensity (g CO_2 eq / kWh)[7]	**200**	**290**	**220**	**100**	**130**	**94**	**94**	77
Unallocated Energy (GWh)[13,14]	**10 000**	**12 000**	**12 000**	**21 000**	**15 000**	**16 000**	**15 000**	**9 000**
SF_6 Emissions (kt CO_2 eq)[15]	**76**	**75**	**50**	**60**	**59**	**38**	**56**	**62**
Consumption Intensity (g CO_2 eq / kWh)[16]	**220**	**320**	**240**	**120**	**150**	**110**	**110**	80

Notes:
1. Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 - Electric Power Generation.
2. Preliminary data.
3. Emissions based on data taken from the *Report on Energy Supply and Demand in Canada*, Catalogue No. 57-003-X, Statistics Canada.
4. Includes GHG emissions from the combustion of refined petroleum products (light fuel oil, heavy fuel oil, and diesel), petroleum coke, still gas and other fuels not easily categorized.
5. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
6. GHG emissions from the flooding of land for hydro dams are not included.
7. Totals may not add up to overall total due to rounding.
8. Taken from CANSIM Tables 127-0006 and 127-0007 (for 2005-2013).
9. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-X, Statistics Canada (for 1990-2004).
10. Other Renewables - includes electricity generation by wind, tidal and solar.
11. NAICS category 221119, Other Electric Power Generation.
12. Intensity values have been rounded so as to present the estimated level of accuracy.
13. Adapted from Statistics Canada CANSIM Table 127-0008 (2005-2013) or Cat. No. 57-202-X (1990-2004).
14. Includes transmission line losses, metering differences and other losses.
15. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
16. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
0 Indicates emissions or electricity generation value less than 0.1
x Indicates data not shown due to statistical limitations

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Table A11–8 Electricity Generation and GHG Emission Details for Manitoba[1]

	1990	2000	2005	2009	2010	2011	2012	2013[2]
	Greenhouse Gas Emissions[3]							
	kt CO_2 eq							
Combustion	**523**	**1 004**	**329**	**181**	**75.5**	**107**	**88.2**	99.6
Coal	x	x	x	x	x	x	x	x
Natural Gas	x	x	x	x	x	x	x	x
Other Fuels[4]	51.0	12.2	15.8	11.3	11.5	12.9	12.9	1.7
Other Emissions[5]	**–**	**4.8**	**8.8**	**11**	**12**	**12**	**21**	16
Overall Total[6,7]	**523**	**1 008**	**338**	**192**	**87**	**119**	**109**	115
	Electricity Generation[8,9]							
	GWh							
Combustion	**399**	**881**	**447**	**195**	**84**	**106**	**94**	**91**
Coal	375	869	421	140	44.4	49.7	51.5	65.4
Natural Gas	0.904	–	10.6	39.4	22.9	41.1	27.4	24.0
Other Fuels	22.4	12.4	15.1	14.9	17.0	15.3	15.2	1.5
Steam from Waste Heat	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Hydro	**19 800**	**31 500**	**36 400**	**33 500**	**33 300**	**34 200**	**32 200**	35 300
Other Renewables[10]	**–**	**–**	**53.4**	**365**	**343**	**747**	**877**	868
Other Generation[11]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Overall Total[7]	**20 200**	**32 400**	**36 900**	**34 100**	**33 700**	**35 100**	**33 200**	36 300
	Greenhouse Gas Intensity[12]							
	g GHG / kWh electricity generated							
CO_2 intensity (g CO_2 / kWh)	**26**	**31**	**9.1**	**5.6**	**2.6**	**3.4**	**3.2**	**3.2**
CH_4 intensity (g CH_4 / kWh)	**0.0005**	**0.0004**	**0.0002**	**0.0002**	**0.0001**	**0.0004**	**0.0002**	**0.0002**
N_2O intensity (g N_2O / kWh)	**0.001**	**0.001**	**0.0002**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**
Generation Intensity (g CO_2 eq / kWh)[7]	**26**	**31**	**9.1**	**5.6**	**2.6**	**3.4**	**3.3**	3.2
Unallocated Energy (GWh)[13,14]	**2 100**	**3 750**	**1 900**	**4 700**	**4 600**	**4 600**	**3 600**	**3 800**
SF_6 Emissions (kt CO_2 eq)[15]	**4.3**	**4.2**	**4.0**	**3.0**	**4.3**	**6.0**	**1.3**	**1.2**
Consumption Intensity (g CO_2 eq / kWh)[16]	**29**	**35**	**9.7**	**6.6**	**3.1**	**4.1**	**3.7**	3.6

Notes:
1. Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 - Electric Power Generation.
2. Preliminary data.
3. Emissions based on data taken from the *Report on Energy Supply and Demand in Canada*, Catalogue No. 57-003-X, Statistics Canada.
4. Includes GHG emissions from the combustion of refined petroleum products (light fuel oil, heavy fuel oil, and diesel), petroleum coke, still gas and other fuels not easily categorized.
5. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
6. GHG emissions from the flooding of land for hydro dams are not included.
7. Totals may not add up to overall total due to rounding.
8. Taken from CANSIM Tables 127-0006 and 127-0007 (for 2005-2013).
9. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-X, Statistics Canada (for 1990-2004).
10. Other Renewables - includes electricity generation by wind, tidal and solar.
11. NAICS category 221119, Other Electric Power Generation.
12. Intensity values have been rounded so as to present the estimated level of accuracy.
13. Adapted from Statistics Canada CANSIM Table 127-0008 (2005-2013) or Cat. No. 57-202-X (1990-2004).
14. Includes transmission line losses, metering differences and other losses.
15. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
16. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
0 Indicates emissions or electricity generation value less than 0.1
x Indicates data not shown due to statistical limitations

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Table A11–9 Electricity Generation and GHG Emission Details for Saskatchewan[1]

	1990	2000	2005	2009	2010	2011	2012	2013[2]
	Greenhouse Gas Emissions[3]							
	kt CO_2 eq							
Combustion	**11 200**	**14 600**	**15 300**	**16 500**	**16 200**	**15 700**	**16 200**	16 000
Coal	x	x	x	x	x	x	x	x
Natural Gas	x	x	x	x	x	x	x	x
Other Fuels[4]	6.78	10.9	4.51	0.845	0.280	7.20	6.64	0.28
Other Emissions[5]	**–**	**10**	**18**	**29**	**30**	**30**	**31**	35
Overall Total[6,7]	**11 200**	**14 600**	**15 300**	**16 500**	**16 300**	**15 700**	**16 200**	16 000
	Electricity Generation[8,9]							
	GWh							
Combustion	**9 660**	**14 100**	**14 800**	**16 700**	**15 100**	**14 900**	**15 200**	**16 600**
Coal	9 340	11 400	12 200	13 100	12 100	11 600	11 400	11 800
Natural Gas	308	2 660	2 610	3 570	3 040	3 260	3 800	4 810
Other Fuels	8.78	12.5	12.0	15.3	17.7	10.0	9.30	12.42
Steam from Waste Heat	**–**	**–**	**–**	**360**	**628**	**685**	**815**	**1 227**
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Hydro	**4 210**	**3 050**	**4 570**	**2 960**	**3 870**	**4 640**	**4 240**	4 450
Other Renewables[10]	**–**	**–**	**91.9**	**579**	**507**	**608**	**655**	640
Other Generation[11]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Overall Total[7]	**13 900**	**17 100**	**19 500**	**20 600**	**20 100**	**20 800**	**21 000**	22 900
	Greenhouse Gas Intensity[12]							
	g GHG / kWh electricity generated							
CO_2 intensity (g CO_2 / kWh)	**800**	**850**	**780**	**790**	**800**	**750**	**770**	**690**
CH_4 intensity (g CH_4 / kWh)	**0.02**	**0.03**	**0.03**	**0.03**	**0.04**	**0.03**	**0.04**	**0.04**
N_2O intensity (g N_2O / kWh)	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**
Generation Intensity (g CO_2 eq / kWh)[7]	**810**	**850**	**790**	**800**	**810**	**750**	**770**	700
Unallocated Energy (GWh)[13,14]	**1 300**	**1 700**	**1 400**	**2 700**	**1 300**	**1 100**	**1 200**	**2 100**
SF_6 Emissions (kt CO_2 eq)[15]	**1.8**	**1.7**	**1.3**	**0.59**	**1.3**	**1.2**	**0.75**	**0.91**
Consumption Intensity (g CO_2 eq / kWh)[16]	**890**	**950**	**850**	**920**	**860**	**790**	**820**	770

Notes:
1. Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 - Electric Power Generation.
2. Preliminary data.
3. Emissions based on data taken from the *Report on Energy Supply and Demand in Canada*, Catalogue No. 57-003-X, Statistics Canada.
4. Includes GHG emissions from the combustion of refined petroleum products (light fuel oil, heavy fuel oil, and diesel), petroleum coke, still gas and other fuels not easily categorized.
5. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
6. GHG emissions from the flooding of land for hydro dams are not included.
7. Totals may not add up to overall total due to rounding.
8. Taken from CANSIM Tables 127-0006 and 127-0007 (for 2005-2013).
9. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-X, Statistics Canada (for 1990-2004).
10. Other Renewables - includes electricity generation by wind, tidal and solar.
11. NAICS category 221119, Other Electric Power Generation.
12. Intensity values have been rounded so as to present the estimated level of accuracy.
13. Adapted from Statistics Canada CANSIM Table 127-0008 (2005-2013) or Cat. No. 57-202-X (1990-2004).
14. Includes transmission line losses, metering differences and other losses.
15. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
16. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
0 Indicates emissions or electricity generation value less than 0.1
x Indicates data not shown due to statistical limitations

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Table A11–10 Electricity Generation and GHG Emission Details for Alberta[1]

	1990	2000	2005	2009	2010	2011	2012	2013[2]
	Greenhouse Gas Emissions[3]							
	kt CO_2 eq							
Combustion	**39 800**	**50 300**	**52 400**	**49 200**	**49 300**	**49 200**	**45 000**	46 900
Coal	x	x	x	x	x	x	x	x
Natural Gas	x	x	x	x	x	x	x	x
Other Fuels[4]	11.9	337	408.1	359.5	244.0	373.0	319.8	216.9
Other Emissions[5]	**–**	**5.7**	**10**	**5.1**	**5.6**	**13**	**23**	6
Overall Total[6,7]	**39 800**	**50 300**	**52 400**	**49 300**	**49 300**	**49 200**	**45 000**	46 900
	Electricity Generation[8,9]							
	GWh							
Combustion	**39 900**	**51 300**	**54 200**	**51 500**	**51 700**	**58 800**	**49 100**	**50 800**
Coal	37 300	40 700	42 200	41 000	41 000	46 300	37 300	38 500
Natural Gas	2 510	10 200	11 600	9 970	10 200	12 100	11 300	11 800
Other Fuels	21.6	443	424	548	501	494	595	570
Steam from Waste Heat	**–**	**–**	**32.4**	**1 310**	**1 500**	**1 550**	**1 890**	**1 890**
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Hydro	**2 060**	**1 760**	**2 240**	**1 620**	**1 480**	**1 970**	**2 570**	1 990
Other Renewables[10]	**–**	**88.9**	**837**	**1 340**	**1 630**	**2 220**	**2 290**	2 260
Other Generation[11]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Overall Total[7]	**41 900**	**53 200**	**57 300**	**55 800**	**56 400**	**64 600**	**55 900**	56 900
	Greenhouse Gas Intensity[12]							
	g GHG / kWh electricity generated							
CO_2 intensity (g CO_2 / kWh)	**940**	**940**	**900**	**870**	**860**	**750**	**790**	**820**
CH_4 intensity (g CH_4 / kWh)	**0.02**	**0.04**	**0.03**	**0.03**	**0.03**	**0.03**	**0.04**	**0.04**
N_2O intensity (g N_2O / kWh)	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.01**	**0.02**	**0.02**
Generation Intensity (g CO_2 eq / kWh)[7]	**950**	**950**	**910**	**880**	**870**	**760**	**800**	820
Unallocated Energy (GWh)[13,14]	**3 400**	**4 100**	**4 900**	**10 800**	**9 800**	**16 500**	**8 000**	**0**
SF_6 Emissions (kt CO_2 eq)[15]	**1.6**	**1.6**	**0.43**	**2.1**	**1.01**	**1.16**	**3.1**	**3.6**
Consumption Intensity (g CO_2 eq / kWh)[16]	**1 000**	**1 000**	**990**	**1 100**	**1 100**	**1 000**	**930**	820

Notes:
1. Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 - Electric Power Generation.
2. Preliminary data.
3. Emissions based on data taken from the *Report on Energy Supply and Demand in Canada*, Catalogue No. 57-003-X, Statistics Canada.
4. Includes GHG emissions from the combustion of refined petroleum products (light fuel oil, heavy fuel oil, and diesel), petroleum coke, still gas and other fuels not easily categorized.
5. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
6. GHG emissions from the flooding of land for hydro dams are not included.
7. Totals may not add up to overall total due to rounding.
8. Taken from CANSIM Tables 127-0006 and 127-0007 (for 2005-2013).
9. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-X, Statistics Canada (for 1990-2004).
10. Other Renewables - includes electricity generation by wind, tidal and solar.
11. NAICS category 221119, Other Electric Power Generation.
12. Intensity values have been rounded so as to present the estimated level of accuracy.
13. Adapted from Statistics Canada CANSIM Table 127-0008 (2005-2013) or Cat. No. 57-202-X (1990-2004).
14. Includes transmission line losses, metering differences and other losses.
15. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
16. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
0 Indicates emissions or electricity generation value less than 0.1
x Indicates data not shown due to statistical limitations

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Table A11–11 Electricity Generation and GHG Emission Details for British Columbia[1]

	1990	2000	2005	2009	2010	2011	2012	2013[2]
	Greenhouse Gas Emissions[3]							
	kt CO_2 eq							
Combustion	**807**	**2 200**	**1 980**	**1 720**	**1 830**	**1 337**	**856**	1 209
Coal	–	–	–	–	–	–	–	–
Natural Gas	x	x	x	x	x	x	x	x
Other Fuels[4]	x	x	x	x	x	x	x	x
Other Emissions[5]	**–**	**2.5**	**4.6**	**5.8**	**6.0**	**6.5**	**7.2**	6.7
Overall Total[6,7]	**807**	**2 210**	**1 990**	**1 720**	**1 840**	**1 340**	**863**	1 216
	Electricity Generation[8,9]							
	GWh							
Combustion	**1 390**	**3 930**	**3 820**	**3 020**	**3 050**	**1 860**	**1 540**	**1 880**
Coal	–	–	–	–	–	–	–	–
Natural Gas	1 310	3 350	3 140	2 030	1 850	1 150	1 032	892
Other Fuels	79.4	585	689	993	1 210	700	513	986
Steam from Waste Heat	**–**	**–**	**–**	**648**	**651**	**38.8**	**27.6**	**80.2**
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Hydro	**46 400**	**50 800**	**50 300**	**46 300**	**45 000**	**51 700**	**55 800**	50 500
Other Renewables[10]	**–**	**–**	**–**	**–**	**123**	**187**	**158**	152
Other Generation[11]	**–**	**–**	**–**	**1 920**	**2 980**	**2 510**	**2 720**	2 440
Overall Total[7]	**47 800**	**54 700**	**54 100**	**51 900**	**51 800**	**56 300**	**60 300**	55 000
	Greenhouse Gas Intensity[12]							
	g GHG / kWh electricity generated							
CO_2 intensity (g CO_2 / kWh)	**17**	**35**	**24**	**25**	**23**	**13**	**8.2**	**14.8**
CH_4 intensity (g CH_4 / kWh)	**0.004**	**0.009**	**0.007**	**0.007**	**0.007**	**0.004**	**0.003**	**0.003**
N_2O intensity (g N_2O / kWh)	**0.0006**	**0.001**	**0.0015**	**0.0013**	**0.0015**	**0.0011**	**0.0007**	**0.0009**
Generation Intensity (g CO_2 eq / kWh)[7]	**17**	**35**	**25**	**26**	**24**	**14**	**8.4**	15.1
Unallocated Energy (GWh)[13,14]	**2 200**	**2 300**	**2 100**	**2 200**	**1 900**	**810**	**900**	**2 400**
SF_6 Emissions (kt CO_2 eq)[15]	**57**	**56**	**48**	**58**	**59**	**27**	**45**	**41**
Consumption Intensity (g CO_2 eq / kWh)[16]	**19**	**38**	**27**	**28**	**26**	**15**	**9.3**	16.6

Notes:
1. Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 - Electric Power Generation.
2. Preliminary data.
3. Emissions based on data taken from the *Report on Energy Supply and Demand in Canada*, Catalogue No. 57-003-X, Statistics Canada.
4. Includes GHG emissions from the combustion of refined petroleum products (light fuel oil, heavy fuel oil, and diesel), petroleum coke, still gas and other fuels not easily categorized.
5. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
6. GHG emissions from the flooding of land for hydro dams are not included.
7. Totals may not add up to overall total due to rounding.
8. Taken from CANSIM Tables 127-0006 and 127-0007 (for 2005-2013).
9. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-X, Statistics Canada (for 1990-2004).
10. Other Renewables - includes electricity generation by wind, tidal and solar.
11. NAICS category 221119, Other Electric Power Generation.
12. Intensity values have been rounded so as to present the estimated level of accuracy.
13. Adapted from Statistics Canada CANSIM Table 127-0008 (2005-2013) or Cat. No. 57-202-X (1990-2004).
14. Includes transmission line losses, metering differences and other losses.
15. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
16. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
0 Indicates emissions or electricity generation value less than 0.1
x Indicates data not shown due to statistical limitations

Table A11–12 Electricity Generation and GHG Emission Details for Yukon[1]

	1990	2000	2005	2009	2010	2011	2012	2013[2]
	Greenhouse Gas Emissions[3]							
	kt CO_2 eq							
Combustion	**94.5**	**22.3**	**23.1**	**17.2**	**18.9**	**27.9**	**18.6**	17.7
Coal	–	–	–	–	–	–	–	–
Natural Gas	–	–	–	–	–	–	–	–
Other Fuels[4]	94.5	22.3	23.1	17.2	18.9	27.9	18.6	17.7
Other Emissions[5]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Overall Total[6,7]	**94.5**	**22.3**	**23.1**	**17.2**	**18.9**	**27.9**	**18.6**	17.7
	Electricity Generation[8,9]							
	GWh							
Combustion	**62.1**	**36.7**	**22.4**	**22.6**	**25.0**	**36.9**	**24.4**	**23.3**
Coal	–	–	–	–	–	–	–	–
Natural Gas	–	–	–	–	–	–	–	–
Other Fuels	62.1	36.7	22.4	22.6	25.0	36.9	24.4	23.3
Steam from Waste Heat	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Hydro	**423**	**261**	**320**	**379**	**380**	**388**	**430**	425
Other Renewables[10]	**–**	**0.388**	**0.890**	**0.228**	**0**	**0.402**	**0.445**	0.277
Other Generation[11]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Overall Total[7]	**485**	**298**	**344**	**402**	**405**	**425**	**455**	449
	Greenhouse Gas Intensity[12]							
	g GHG / kWh electricity generated							
CO_2 intensity (g CO_2 / kWh)	**190**	**72**	**64**	**41**	**45**	**63**	**63**	**38**
CH_4 intensity (g CH_4 / kWh)	**0.009**	**0.004**	**0.003**	**0.002**	**0.002**	**0.003**	**0.002**	**0.002**
N_2O intensity (g N_2O / kWh)	**0.03**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
Generation Intensity (g CO_2 eq / kWh)[7]	**190**	**75**	**67**	**43**	**47**	**66**	**41**	39
Unallocated Energy (GWh)[13,14]	**47**	**24**	**45**	**29**	**33**	**51**	**58**	**55**
SF_6 Emissions (kt CO_2 eq)[15]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	–
Consumption Intensity (g CO_2 eq / kWh)[16]	**220**	**81**	**77**	**46**	**51**	**74**	**47**	45

Notes:
1. Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 - Electric Power Generation.
2. Preliminary data.
3. Emissions based on data taken from the *Report on Energy Supply and Demand in Canada*, Catalogue No. 57-003-X, Statistics Canada.
4. Includes GHG emissions from the combustion of refined petroleum products (light fuel oil, heavy fuel oil, and diesel), petroleum coke, still gas and other fuels not easily categorized.
5. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
6. GHG emissions from the flooding of land for hydro dams are not included.
7. Totals may not add up to overall total due to rounding.
8. Taken from CANSIM Tables 127-0006 and 127-0007 (for 2005-2013).
9. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-X, Statistics Canada (for 1990-2004).
10. Other Renewables - includes electricity generation by wind, tidal and solar.
11. NAICS category 221119, Other Electric Power Generation.
12. Intensity values have been rounded so as to present the estimated level of accuracy.
13. Adapted from Statistics Canada CANSIM Table 127-0008 (2005-2013) or Cat. No. 57-202-X (1990-2004).
14. Includes transmission line losses, metering differences and other losses.
15. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
16. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation

0 Indicates emissions or electricity generation value less than 0.1

A11

Table A11–13 Electricity Generation and GHG Emission Details for the Northwest Territories and Nunavut[1]

	1990	2000	2005	2009	2010	2011	2012	2013[2]
	Greenhouse Gas Emissions[3]							
	kt CO_2 eq							
Combustion	**164**	**190**	**219**	**195**	**192**	**142**	**143**	140
Coal	–	–	–	–	–	–	–	–
Natural Gas	–	8.25	27.7	19.7	19.7	17.2	4.48	4.73
Other Fuels[4]	164	182	191	175	173	125	139	135
Other Emissions[5]	**–**	**1.5**	**4.6**	**–**	**1.5**	**–**	**–**	–
Overall Total[6,7]	**164**	**191**	**224**	**195**	**194**	**142**	**143**	140
	Electricity Generation[8,9]							
	GWh							
Combustion	**227**	**195**	**219**	**251**	**247**	**181**	**181**	**183**
Coal	–	–	–	–	–	–	–	–
Natural Gas	–	15.8	23.3	27.5	27.5	23.7	5.63	5.77
Other Fuels	227	179	196	223	220	157	175	177
Steam from Waste Heat	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Hydro	**226**	**247**	**259**	**254**	**254**	**260**	**253**	263
Other Renewables[10]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Other Generation[11]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Overall Total[7]	**453**	**442**	**478**	**504**	**501**	**442**	**434**	446
	Greenhouse Gas Intensity[12]							
	g GHG / kWh electricity generated							
CO_2 intensity (g CO_2 / kWh)	**350**	**350**	**450**	**370**	**370**	**310**	**320**	**300**
CH_4 intensity (g CH_4 / kWh)	**0.02**	**0.02**	**0.03**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**
N_2O intensity (g N_2O / kWh)	**0.05**	**0.06**	**0.06**	**0.05**	**0.05**	**0.04**	**0.05**	**0.04**
Generation Intensity (g CO_2 eq / kWh)[7]	**360**	**430**	**470**	**390**	**380**	**320**	**330**	310
Unallocated Energy (GWh)[13,14]	**21**	**21**	**50**	**28**	**41**	**38**	**21**	**30**
SF_6 Emissions (kt CO_2 eq)[15]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Consumption Intensity (g CO_2 eq / kWh)[16]	**380**	**450**	**520**	**410**	**420**	**350**	**350**	340

Notes:
1. Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 - Electric Power Generation.
2. Preliminary data.
3. Emissions based on data taken from the *Report on Energy Supply and Demand in Canada*, Catalogue No. 57-003-X, Statistics Canada.
4. Includes GHG emissions from the combustion of refined petroleum products (light fuel oil, heavy fuel oil, and diesel), petroleum coke, still gas and other fuels not easily categorized.
5. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
6. GHG emissions from the flooding of land for hydro dams are not included.
7. Totals may not add up to overall total due to rounding.
8. Taken from CANSIM Tables 127-0006 and 127-0007 (for 2005-2013).
9. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-X, Statistics Canada (for 1990-2004).
10. Other Renewables - includes electricity generation by wind, tidal and solar.
11. NAICS category 221119, Other Electric Power Generation.
12. Intensity values have been rounded so as to present the estimated level of accuracy.
13. Adapted from Statistics Canada CANSIM Table 127-0008 (2005-2013) or Cat. No. 57-202-X (1990-2004).
14. Includes transmission line losses, metering differences and other losses.
15. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
16. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation

0 Indicates emissions or electricity generation value less than 0.1

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SIEMENS

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The future needs expertise

Shaping tomorrow's electricity age – with turbines and generators for fossil power generation

Answers for energy.

The future needs …

> Your success is our mission – that's why we provide you with everything you need to stay competitive in the fossil power generation business: with our in-depth expertise, our cutting-edge power plant components, and our comprehensive support right from the start.

Thierry Toupin, CEO Products, Energy Sector, Fossil Power Generation

Thinking globally, acting locally – embodying the pioneering spirit of Siemens

The future needs ...

Efficient products – taking power plants to unprecedented levels of performance

60.75 %, 578 MW:
Ulrich Hartmann reference site conditions, world record test run results, TÜV certified

> We are the absolute trendsetter in efficiency. Equipped with Siemens technology, our power plants achieve world-class operating efficiency. Our goal is to maintain and expand this high standard in the future – with increasingly efficient power plant components.

Dr. Bernhard Fischer,
CEO E.ON Generation

Our strength: efficient power plant components

In simple-cycle mode, our innovative gas turbines achieve remarkable efficiency levels of more than 40 percent, while our generators operate at up to 99 percent efficiency. And our latest steam turbine technology raises plant efficiency levels above 46 percent. As impressive as these numbers are, we continually strive, through our innovative technology, to make them even better.

For example, for the SGT5-4000F gas turbine launched in the mid-90s, we've already increased output by almost three percent – a tremendous leap forward, considering that improvements in this field are measured in tenths of a percent. These technical advances and modernization techniques can be used in upgrading installed units, too.

Securing your competitiveness through unparalleled efficiency

Over the past two decades, our turbines and generators have helped increase efficiency by approximately 10 percent in combined-cycle plants. Today, the efficiency levels achieved in combined-cycle power plants equipped with Siemens technology are unparalleled.

Take the Ulrich Hartmann power plant in Irsching, Germany, for example, where Siemens installed a SGT5-8000H gas turbine, a SST5-5000 steam turbine, and a SGen5-3000W generator. The plant achieved an unprecedented 60.75 percent efficiency rating with a power output of 578 MW on its world-record test run, making it the first plant in the world to surpass the 60 percent efficiency mark.

But that's yesterday's news. As part of Siemens, a technology pioneer for more than 160 years, we continue to develop highly efficient turbines and generators – all designed to keep you competitive over the long term.

Innovative products – shaping tomorrow's power plants today

> "We look forward to modernizing our Riviera Beach and Cape Canaveral Next Generation Clean Energy Centers in Florida using Siemens advanced highly efficient gas turbine because it will extend the benefits of fuel savings and lower emissions to our customers."

Tony Rodriguez,
Executive Vice President,
Power Generation Division
NextEra Energy, Inc.

A pioneering tradition

At Siemens, pioneering new technologies is a company tradition. In the 19th century, Werner von Siemens, our founder, discovered the electro dynamic principle and developed the dynamo – the forerunner of today's generators. Since then, developing and fostering new technologies has been the lifeblood of our company. Our employees' high level of technical expertise and our best-in-class manufacturing technologies are at the core of our future-oriented fossil products. With our advanced proprietary test systems – including the recently expanded test bed facility in Berlin – we can test the power plant components we manufacture extensively before releasing them to the market.

Future-oriented power plant components

Outstanding success requires outstanding products – like the SGT5-8000H gas turbine. Its unique design has won several awards, including the Innovation Prize for Climate and Environment, awarded by the German Ministry for Environmental Protection (BMU). The latest H-class technology has also been adapted for 60 Hz markets. In combined-cycle operation, these turbines reach an output of 570 MW at 50 Hz and 410 MW at 60 Hz, and unsurpassed efficiencies of more than 60 percent.

Upgrades to maintain your competitive edge

Siemens components have an extensive lifecycle. Thus, to ensure that you can take advantage of the new technologies we are developing for next-generation products, we also offer upgrades for installed engines. For example, we can upgrade gas turbines during the scheduled replacement of the blades – after all, the blades' design has a significant impact on overall power plant efficiency. Here's a real-world example: By continuously upgrading a 15-year-old SGT5-4000F gas turbine, we were able to increase its power output by up to 50 MW – enough to supply electricity to a city with a population about 230,000.

Sustainable products – leading the way to cleaner electricity

> “We place special emphasis on maximized efficiency and environmental friendliness. For that reason we opted for a solution provided by Siemens, which features cutting-edge power plant technology.”

Lee Wan-Kyoung,
President and CEO of GS EPS

A well-balanced energy mix

The future of power generation lies in a diverse mix of energy sources. While renewable sources are playing an increasingly important role, fossil fuels will continue to be the mainstay, ensuring grid stability as well as a reliable energy supply – anytime, anywhere. Predictions for 2030 forecast that more than 50 percent of the global energy mix will still be based on fossil fuels. With our continued reliance on fossil fuels, emissions need to be significantly reduced. Consequently, cleaner products and technologies that provide a solid foundation for a sustainable energy supply are required.

Making cleaner power a reality

Siemens turbines and generators deliver unparalleled power plant performance all over the world. In China, for example, where 70 percent of all energy is obtained from coal, clean-coal solutions are desperately needed. Equipped with Siemens steam turbine technology, the Waigaoqiao III power plant in Shanghai has reduced CO_2 emissions by 1.9 million tons annually. Another groundbreaking example, is the Ulrich Hartmann power plant in Irsching, Germany. Compared to other state-of-the-art combined-cycle power plants, the installed Siemens H-class gas turbine helps reduce annual CO_2 emissions by approximately 43,000 metric tons – the equivalent of the annual emissions of more than 10,000 mid-size cars traveling 20,000 km per year.

We walk the talk

For us, sustainability starts long before we commission power plant components at your site. Our facilities reflect the latest protocols for conserving energy and protecting the environment, such as green building standards, which are used to certify new buildings. We even apply energy-saving measures to buildings listed as historic landmarks, such as the Peter Behrens Hall, in which part of our Berlin gas turbine plant is housed. In other words, we’re doing everything we can to reduce our own carbon footprint.

High-quality products – ensuring reliable performance

> “We have to be able to rely one hundred percent on the quality of the products we use as well as on the expertise and skills of our project partners. The success of the entire project depends on it. And that’s precisely why Siemens is the right partner for us.”

Whei Zong Feng,
General Manager of the
Waigaoqiao III Power Plant

Coordinated workflows – right from the start

To us, quality is the priority. Harmonized processes are employed throughout the entire lifecycle of our turbines and generators to ensure highest quality in every project phase. We make sure that your product configuration is tailored to your specifications and site conditions. These processes begin with the development of our world-class components and continue from the first consultation to the final commissioning. And our after-sales service ensures that this high quality is maintained after the engines are up and running, too.

Products and services you can count on

Of course, all our products are designed and manufactured to meet internationally recognized codes, standards, and guidelines, such as ASME, ISO, IEC, and the corresponding European EN norms. Thanks to our high-quality standards, you can always depend on our power plant components. You can even verify them yourself before installing them. And our technical field assistance will assist you after commissioning. With an unrivaled combination of large operating-fleet experience and robust component and system designs, we stand behind the reliability of our products.

A big portion of people excellence

Expertly trained employees with superior business knowledge are the basis for the successful development and manufacturing of our turbines and generators. Our 10,000 employees worldwide – talented, skilled, and dedicated – produce the high-quality products on which Siemens has built its reputation for more than a century. To maintain this kind of excellence, we place great value on shared expertise. That’s why we continue to promote ongoing research and development, as well as employee development through in-house training and partnerships with leading technical universities and institutions.

Flexible products – matching every specification

> When we plan a power plant, we need components that provide us with options instead of setting technical limits. And it goes without saying that we also need a partner with the flexibility to help us overcome limits wherever we might encounter them. That's why we rely on Siemens technology and expertise.

Xiao Jun,
Project Manager Shikalbaha Project,
Sinohydro Corp. Ltd.

Comprehensive portfolio

Our broad product portfolio guarantees flexibility. You can choose from among several turbines and generators, each precisely tailored to different parameters, such as network frequency. Siemens specialists combine those individual products into turbine packages and then supplement them with the options your installation requires, such as noise enclosure, or cooling or anti-icing systems. Regardless of how we support you, all of our components and services are designed for smooth and seamless integration with all aspects of a power plant's operation.

A broad range of fuel options

Fuel flexibility plays an increasingly critical role for the power plant industry – today and in the future. Depending on the availability of natural resources, the access to fuels can vary from country to country. Other important factors that impact the design are rising fuel prices, the scarcity of resources, and requirements for dual fuel options. That's why our portfolio offers special turbine configurations that can accommodate a broad range of fuels, such as natural gas, syngas, fuel oil, or crude oil. The SGT-2000E gas turbine series, our proven and robust product line that offers this kind of fuel flexibility, has been operating successfully around the globe for decades.

Seamless integration

But there is more to flexibility than just fuel choices. To maintain grid stability, power plants must be able to start up fast. To that end, we've designed our turbines and generators to interact seamlessly with all other parts and systems within the power plant. This kind of concept helps to minimize the time it takes to ramp up and ramp down operations. The result – stable and cost-effective power generation, even with frequent grid fluctuations, enabling operators to react quickly to constantly changing energy demands.

Profitable products – ensuring a competitive edge

> “With more than 30 years of experience in the power business, we know that our customer place high value on choosing the right components for their power plant. Siemens fossil products offer both extended life cycles and reduced operating costs with the most competitive performance and state-of-the-art technology – which are key drivers in today’s power plant business.”

T. Y. Chung,
Executive Vice President
Daewoo Engineering & Construction Co., Ltd.

A balanced cost-benefit ratio

Bottom line – we know that your profitability is intricately linked to the performance of our power plant components. And, through our ongoing R&D, we make sure that our products’ performance always meets what the market demands. Engineered to your specifications and site conditions, our turbines and generators provide a balanced cost-benefit ratio, producing a rapid return on investment.

Serviceability is a key factor: Our easy-to-service turbines and generators, with extended service intervals, mean higher availability. And we can improve it even further by implementing service and maintenance concepts specifically designed for a particular plant. This includes scheduling maintenance work during planned outages, having spare parts available immediately, and training personnel for the unexpected, in order to minimize potential interruptions to operations. As a result, the low lifecycle costs of Siemens turbines and generators, combined with their outstanding efficiency levels, ensure you a high return on investment through performance as well as cost savings.

Cooperation – the key to success

One of the most important lessons we have learned in our decades of experience is: Our most cost-effective power plant components are the result of the closest possible cooperation with power plant operators and EPC companies. During this dialog, we learn everything we can about market and customer requirements, and then integrate these into our product development and corresponding test runs. Backed by the expertise of other Siemens businesses, such as Oil & Gas and Energy Services, we can then focus on developing the optimal – and most profitable – product.

From single components to turbine packages and entire power plants:

We offer a wide range of products and turbine packages for a variety of applications. Here's how it works:

1) We offer components, ...

Gas turbines

SGT-2000E series
SGT-4000F series
SGT-5000F series
SGT-8000H series

Steam turbines

SST-3000 series
SST-5000 series
SST-6000 series
SST-9000 series

Generators

SGen-100A series
SGen-1000A series
SGen-2000H series
SGen-3000W series
SGen-4000W series

2) ... supply turbine packages, ...

Gas turbine packages*

SGT6-PAC 2000E CO	
Grid frequency	60 Hz
Power output	70 MW
Efficiency	34 %
Components	SGT6-2000E, SGen6-100A-2P
Plant type	Crude oil applications

SGT5-PAC 2000E	
Grid frequency	50 Hz
Power output	166 MW
Efficiency	34.7 %
Components	SGT5-2000E, SGen5-100A-2P
Plant type	Simple-cycle

SGT6-PAC 5000F	
Grid frequency	60 Hz
Power output	208 MW
Efficiency	38.5 %
Components	SGT6-5000F, SGen6-1000A
Plant type	Simple-cycle

Combined-cycle packages*

SCC6-PAC 8000H 1S	
Grid frequency	60 Hz
Power output	410 MW
Efficiency	> 60 %
Components	SGT6-8000H, SST6-5000, SGen6-2000H
Plant type	Combined-cycle
Configuration	Single-shaft

SCC5-PAC 4000F 1S	
Grid frequency	50 Hz
Power output	426 MW
Efficiency	58.5 %
Components	SGT5-4000F, SST5-3000, SGen5-2000H
Plant type	Combined-cycle
Configuration	Single-shaft

SCC5-PAC 8000H 1S	
Grid frequency	50 Hz
Power output	570 MW
Efficency	> 60 %
Components	SGT5-8000H, SST5-5000, SGen5-3000W
Plant type	Combined-cycle
Configuration:	Single-shaft

SCC5-PAC 4000F 2x1	
Grid frequency	50 Hz
Power output	853 MW
Efficiency	58.6 %
Components	SGT5-4000F, SST5-5000, SGen5-1000A
Plant type	Combined-cycle
Configuration	Multi-shaft 2x1

Steam turbine packages*

SST5-PAC 6000	
Grid frequency	50 Hz
Power output	up to 1,200 MW
Efficiency	46 %
Components	SST5-6000, SGen5-3000W
Plant type	Conventional steam

SST5-PAC 9000	
Grid frequency	50 Hz
Power output	up to 1,900 MW
Efficiency	up to 38 %
Components	SST5-9000, SGen5-4000W
Plant type	Advanced pressurized water reactors

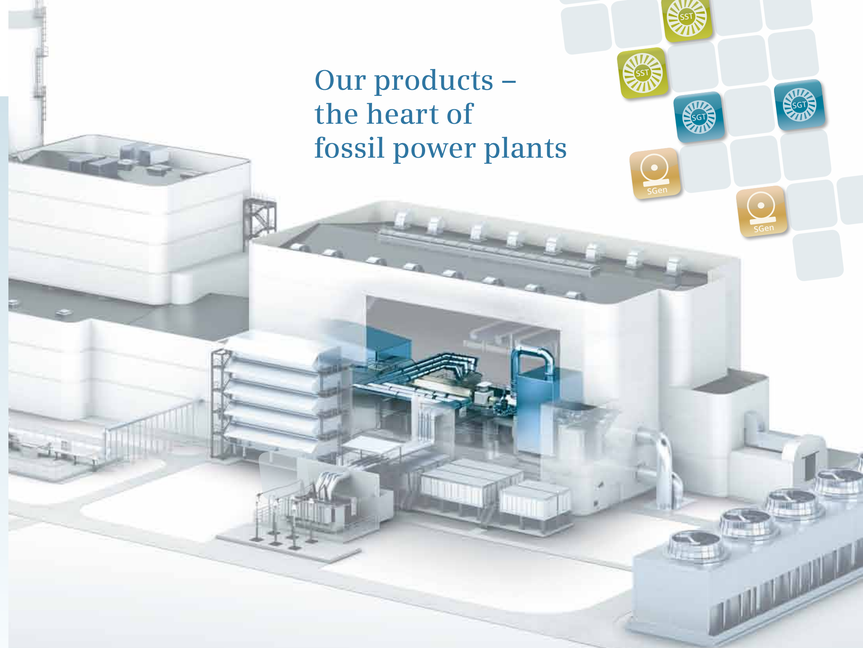
* Naturally, other configurations are also available to meet your specific needs.

3) ... and provide various additional options, e.g. ...

Further options

Power augmentation
Transformers
Bypass stack
Filter systems
Dual fuel systems
Cooling systems
Anti-icing systems
Noise enclosures
Spare parts packages
Plant control system
Full erection & commissioning
Technical Field Assistance (TFA)
and many more ...

Our products – the heart of fossil power plants



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