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# 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 

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Environment Canada

Inquiry Centre

10 Wellington Street, 23rd Floor

Gatineau QC K1A 0H3

Telephone: 819-997-2800

Toll Free: 1-800-668-6767 (in Canada only)

Fax: 819-994-1412

TTY: 819-994-0736

Email: [enviroinfo@ec.gc.ca](mailto:enviroinfo@ec.gc.ca)

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# 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 <sub>2</sub> O <sub>3</sub>	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 <sub>0</sub>	maximum methane production potential
BC	average binder content in paste
BOF	basic oxygen furnace
BOD <sub>5</sub>	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 Processes and Product Use Sector)
CaC <sub>2</sub>	calcium carbide
CaCO <sub>3</sub>	calcium carbonate; limestone
CaMg(CO <sub>3</sub> ) <sub>2</sub>	dolomite (also CaCO <sub>3</sub> •MgCO <sub>3</sub> )
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	<i>Canadian Environmental Protection Act, 1999</i>
CESI	Canadian Environmental Sustainability Indicators
CF <sub>4</sub>	carbon tetrafluoride
C <sub>2</sub> F <sub>6</sub>	carbon hexafluoride
CFC	chlorofluorocarbon
CFS	Canadian Forest Service
CGA	Canadian Gas Association
CH <sub>3</sub> OH	methanol
CH <sub>4</sub>	methane
C <sub>2</sub> H <sub>6</sub>	ethane
C <sub>3</sub> H <sub>8</sub>	propane
C <sub>4</sub> H <sub>10</sub>	butane
C <sub>2</sub> H <sub>4</sub>	ethylene

C <sub>6</sub> H <sub>6</sub>	benzene
CHCl <sub>3</sub>	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 <sub>2</sub>	carbon dioxide
CO <sub>2</sub> 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 <sub>BASE</sub>	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 <sub>TILL</sub>	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 <sub>2</sub>	hydrogen
H <sub>2</sub> O	water
H <sub>2</sub> S	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 <sub>3</sub>	nitric acid
HQ	Hydro-Québec
HRAI	Heating, Refrigeration and Air Conditioning Institute of Canada
HSS	horizontal stud Söderberg
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 Processes and Product Use
IT	intensive tillage
KAR	kilometre accumulation rate
K <sub>2</sub> CO <sub>3</sub>	potassium carbonate
kg	kilogram
kha	kilohectare
kt	kilotonne
kWh	kilowatt-hour
L <sub>0</sub>	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 <sub>3</sub>	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 <sub>2</sub>	nitrogen gas
Na <sub>2</sub> CO <sub>3</sub>	sodium carbonate; soda ash
Na <sub>3</sub> AlF <sub>6</sub>	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 <sub>3</sub>	ammonia
NH <sub>4</sub> <sup>+</sup>	ammonium
NH <sub>4</sub> NO <sub>3</sub>	ammonium nitrate
NIR	National Inventory Report
NMVOC	non-methane volatile organic compound
N <sub>2</sub> O	nitrous oxide
NO	nitric oxide; also used for not occurring
NO <sub>2</sub>	nitrogen dioxide
NO <sub>3</sub> <sup>-</sup>	nitrate
NO <sub>x</sub>	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 <sub>2</sub>	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
RES D	<i>Report on Energy Supply and Demand in Canada</i>
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 <sub>6</sub>	sulphur hexafluoride
SIC	Standard Industrial Classification
SiC	silicon carbide
SLC	Soil Landscapes of Canada
SMR	steam methane reforming
SO <sub>2</sub>	sulphur dioxide
SO <sub>x</sub>	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 Söderberg
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 <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>
TOTAL		3	2	2	2	2	2	1
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 <sub>2</sub> 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 <sub>6</sub> Used in Magnesium Smelters and Casters						3	3
d.	Production and Consumption of Halocarbons, and SF <sub>6</sub> and NF <sub>3</sub>				2	2	2	1
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

# 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	
<b>ENERGY</b>	
<b>a. Stationary Combustion Sources</b>	
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: <ul style="list-style-type: none"> <li>- Metal and non-metal mines, coal mines, stone quarries, and gravel pits</li> <li>- Oil and gas extraction industries</li> <li>- Mineral exploration and contract drilling operations</li> </ul>
Manufacturing Industries	Emissions from fuel consumed by the following industries: <ul style="list-style-type: none"> <li>- Iron and Steel (steel foundries, casting and rolling mills)</li> <li>- Non-ferrous metals (aluminium, magnesium and other production)</li> <li>- Chemical (fertilizer manufacturing, organic and inorganic chemical manufacturing)</li> <li>- Pulp and Paper (primarily pulp, paper, and paper product manufacturers)</li> <li>- Cement and other non-metallic mineral production</li> <li>- Other manufacturing industries not listed (such as automobile manufacturing, textiles, food and beverage industries)</li> </ul>
Construction	Emissions from fuels consumed by the construction industry – buildings, highways etc.
Commercial & Institutional	Emissions from fuel consumed by: <ul style="list-style-type: none"> <li>- Service industries related to mining, communication, wholesale and retail trade, finance and insurance, real estate, education, etc.)</li> <li>- Federal, provincial and municipal establishments</li> <li>- National Defence and Canadian Coast Guard</li> <li>- Train stations, airports and warehouses</li> </ul>
Residential	Emissions from fuel consumed for personal residences (homes, apartment hotels, condominiums and farm houses)
Agriculture & Forestry	Emissions from fuel consumed by: <ul style="list-style-type: none"> <li>- Forestry and logging service industry</li> <li>- Agricultural, hunting and trapping industry (excluding food processing, farm machinery manufacturing, and repair)</li> </ul>
<b>b. Transportation</b>	Emissions resulting from the: <ul style="list-style-type: none"> <li>- Consumption of fossil fuels by aircrafts flying domestically with Canadian purchased fuel</li> <li>- Consumption of fossil fuels (including non-CO<sub>2</sub> emissions from ethanol and biodiesel) by vehicles licensed to operate on roads</li> <li>- Consumption of fossil fuels (including non-CO<sub>2</sub> emissions from biodiesel) by Canadian railways</li> <li>- Consumption of fossil fuels (including non-CO<sub>2</sub> emissions from ethanol and biodiesel) by Canadian registered marine vessels fuelled domestically</li> <li>- Consumption of fossil fuels (including non-CO<sub>2</sub> emissions from ethanol and biodiesel) by combustion devices not licensed to operate on roads</li> <li>- Transportation and distribution of crude oil, natural gas and other products</li> </ul>
Domestic Aviation	
Road Transportation	
Railways	
Domestic Navigation	
Others – Off-road	
Others – Pipeline Transport	
<b>c. Fugitive Sources</b>	Intentional and unintentional releases of greenhouse gases from the following activities: <ul style="list-style-type: none"> <li>- Underground and surface mining, abandoned underground coal mines</li> <li>- Conventional and unconventional oil and gas exploration, production, transportation, and distribution</li> </ul>
Coal Mining	
Oil and Natural Gas	
<b>d. CO<sub>2</sub> Transport and Storage</b>	Intentional and unintentional releases of greenhouse gases from the transport and storage of carbon dioxide
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	
<b>a. Mineral Products</b>	Emissions resulting from the following process activities: <ul style="list-style-type: none"> <li>- Production of cement and lime; use of soda ash, limestone &amp; dolomite, and magnesite</li> </ul>
<b>b. Chemical Industry</b>	<ul style="list-style-type: none"> <li>- Production of ammonia, nitric acid, adipic acid, carbide, carbon black, ethylene dichloride, ethylene, methanol and styrene</li> <li>- Production of aluminum, iron and steel production, magnesium production and casting</li> </ul>
<b>c. Metal Production</b>	
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub></b>	<ul style="list-style-type: none"> <li>- 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<sub>6</sub> in electrical equipment and semiconductor manufacturing; use of NF<sub>3</sub> in semiconductor manufacturing</li> <li>- Non-energy use of fossil fuels mostly in chemical/petrochemical activities, including solvents and lubricants</li> </ul>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	
<b>f. Other Product Manufacture and Use</b>	<ul style="list-style-type: none"> <li>- Emissions resulting from the use of N<sub>2</sub>O as an anaesthetic and propellant; emissions from the use of urea in selective catalytic reduction (SCR) equipped vehicles</li> </ul>
<b>AGRICULTURE</b>	
<b>a. Enteric Fermentation</b>	Emissions resulting from the: <ul style="list-style-type: none"> <li>- Eructation of CH<sub>4</sub> during the digestion of plant material by (mainly) ruminants</li> </ul>
<b>b. Manure Management</b>	<ul style="list-style-type: none"> <li>- Release of CH<sub>4</sub> and N<sub>2</sub>O due to microbial activity during the storage of feces, urine and bedding materials from the cleaning of barns and pens</li> <li>- Indirect N<sub>2</sub>O emissions from volatilization and leaching of nitrogen from animal manure during storage</li> </ul>
<b>c. Agricultural Soils</b>	
Direct sources	<ul style="list-style-type: none"> <li>- Direct N<sub>2</sub>O emissions from Synthetic fertilizer, manure on cropland, pasture range and paddock, crop residue, tillage, summer-fallow, irrigation and cultivation of organic soils</li> </ul>
Indirect Sources	<ul style="list-style-type: none"> <li>- Indirect N<sub>2</sub>O emissions from volatilization and leaching of animal manure nitrogen, synthetic fertilizer nitrogen and crop residue nitrogen</li> </ul>
<b>d. Field Burning of Agricultural Residues</b>	<ul style="list-style-type: none"> <li>- CH<sub>4</sub> and N<sub>2</sub>O emissions from crop residue burning</li> </ul>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<ul style="list-style-type: none"> <li>- Direct emissions of CO<sub>2</sub> from the application of lime, urea and other fertilizers containing carbon</li> </ul>
<b>WASTE</b>	
<b>a. Solid Waste Disposal on Land</b>	Emissions resulting from: <ul style="list-style-type: none"> <li>- Municipal solid waste management sites (landfills) and dedicated wood waste landfills</li> </ul>
<b>b. Wastewater Handling</b>	<ul style="list-style-type: none"> <li>- Wastewater treatment</li> </ul>
<b>c. Waste Incineration</b>	<ul style="list-style-type: none"> <li>- Municipal solid waste, sewage sludge and hazardous waste incineration</li> </ul>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	
<b>a. Forest Land</b>	Emissions and removals resulting from: <ul style="list-style-type: none"> <li>- Managed forests and lands converted to forests; includes growth, natural and anthropogenic disturbances (fire, harvest, insects)</li> </ul>
<b>b. Cropland</b>	<ul style="list-style-type: none"> <li>- Management practices on lands in annual crops, summerfallow and perennial crops (forage, specialty crops, orchards); immediate and residual emissions from lands converted to cropland</li> </ul>
<b>c. Grassland</b>	<ul style="list-style-type: none"> <li>- Managed agricultural grassland</li> </ul>
<b>d. Wetlands</b>	<ul style="list-style-type: none"> <li>- Peatlands disturbed for peat extraction, or land flooded from hydro reservoir development</li> </ul>
<b>e. Settlements</b>	<ul style="list-style-type: none"> <li>- Forest and grassland converted to built-up land (settlements, transport infrastructure, oil &amp; gas infrastructure, mining, etc); urban tree growth</li> </ul>
<b>f. Harvested Wood Products</b>	<ul style="list-style-type: none"> <li>- Use and disposal of harvested wood products manufactured from wood coming from forest harvest and forest conversion activities in Canada</li> </ul>



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

Greenhouse Gas Categories	1990	2000	2005	2009	2010	2011	2012	2013
<i>kt CO<sub>2</sub> eq.</i>								
<b>TOTAL<sup>1</sup></b>	<b>613 000</b>	<b>745 000</b>	<b>749 000</b>	<b>699 000</b>	<b>707 000</b>	<b>709 000</b>	<b>715 000</b>	<b>726 000</b>
<b>ENERGY</b>	<b>485 000</b>	<b>606 000</b>	<b>601 000</b>	<b>563 000</b>	<b>573 000</b>	<b>576 000</b>	<b>577 000</b>	<b>588 000</b>
<b>a. Stationary Combustion Sources</b>	<b>288 000</b>	<b>355 000</b>	<b>344 000</b>	<b>318 000</b>	<b>318 000</b>	<b>321 000</b>	<b>320 000</b>	<b>325 000</b>
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>b. Transport<sup>2</sup></b>	<b>148 000</b>	<b>182 000</b>	<b>195 000</b>	<b>190 000</b>	<b>200 000</b>	<b>199 000</b>	<b>199 000</b>	<b>204 000</b>
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
<b>c. Fugitive Sources</b>	<b>49 000</b>	<b>70 000</b>	<b>61 000</b>	<b>56 000</b>	<b>55 000</b>	<b>56 000</b>	<b>57 000</b>	<b>59 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>0.09</b>	<b>0.09</b>	<b>0.09</b>	<b>0.09</b>	<b>0.09</b>	<b>0.09</b>	<b>0.09</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>55 100</b>	<b>53 400</b>	<b>58 800</b>	<b>49 100</b>	<b>50 700</b>	<b>50 900</b>	<b>55 000</b>	<b>52 200</b>
<b>a. Mineral Products</b>	<b>8 700</b>	<b>10 000</b>	<b>10 000</b>	<b>7 300</b>	<b>8 000</b>	<b>8 200</b>	<b>8 800</b>	<b>8 100</b>
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>b. Chemical Industry</b>	<b>14 000</b>	<b>5 100</b>	<b>6 500</b>	<b>4 200</b>	<b>3 600</b>	<b>4 100</b>	<b>4 200</b>	<b>4 500</b>
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 <sup>3</sup>	130	110	90	68	68	69	71	84
<b>c. Metal Production</b>	<b>23 500</b>	<b>23 100</b>	<b>20 100</b>	<b>15 700</b>	<b>16 100</b>	<b>16 900</b>	<b>16 600</b>	<b>14 500</b>
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 <sub>6</sub> Used in Magnesium Smelters and Casters	2 960	2 660	1 230	184	182	183	248	213
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	<b>1 200</b>	<b>3 800</b>	<b>5 400</b>	<b>5 800</b>	<b>5 900</b>	<b>6 100</b>	<b>6 400</b>	<b>6 600</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>7 400</b>	<b>11 000</b>	<b>16 000</b>	<b>16 000</b>	<b>17 000</b>	<b>15 000</b>	<b>19 000</b>	<b>18 000</b>
<b>f. Other Product Manufacture and Use</b>	<b>170</b>	<b>430</b>	<b>360</b>	<b>250</b>	<b>240</b>	<b>260</b>	<b>330</b>	<b>300</b>
<b>AGRICULTURE</b>	<b>49 000</b>	<b>59 000</b>	<b>62 000</b>	<b>58 000</b>	<b>57 000</b>	<b>56 000</b>	<b>58 000</b>	<b>60 000</b>
<b>a. Enteric Fermentation</b>	<b>23 000</b>	<b>28 000</b>	<b>31 000</b>	<b>27 000</b>	<b>26 000</b>	<b>25 000</b>	<b>25 000</b>	<b>25 000</b>
<b>b. Manure Management</b>	<b>7 600</b>	<b>9 200</b>	<b>9 900</b>	<b>8 700</b>	<b>8 500</b>	<b>8 400</b>	<b>8 400</b>	<b>8 400</b>
<b>c. Agriculture Soils</b>	<b>17 000</b>	<b>19 000</b>	<b>19 000</b>	<b>20 000</b>	<b>21 000</b>	<b>20 000</b>	<b>22 000</b>	<b>24 000</b>
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
<b>d. Field Burning of Agricultural Residues</b>	<b>200</b>	<b>100</b>	<b>50</b>	<b>50</b>	<b>30</b>	<b>30</b>	<b>40</b>	<b>50</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>1 000</b>	<b>2 000</b>	<b>1 000</b>	<b>2 000</b>	<b>2 000</b>	<b>2 000</b>	<b>2 000</b>	<b>3 000</b>
<b>WASTE</b>	<b>24 000</b>	<b>26 000</b>	<b>28 000</b>	<b>28 000</b>	<b>27 000</b>	<b>26 000</b>	<b>26 000</b>	<b>25 000</b>
<b>a. Solid Waste Disposal on Land</b>	<b>22 000</b>	<b>25 000</b>	<b>26 000</b>	<b>27 000</b>	<b>25 000</b>	<b>25 000</b>	<b>24 000</b>	<b>24 000</b>
<b>b. Wastewater Handling</b>	<b>870</b>	<b>950</b>	<b>980</b>	<b>1 000</b>	<b>1 000</b>	<b>1 000</b>	<b>1 000</b>	<b>1 100</b>
<b>c. Waste Incineration</b>	<b>730</b>	<b>740</b>	<b>690</b>	<b>640</b>	<b>660</b>	<b>640</b>	<b>710</b>	<b>550</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>-87 000</b>	<b>-77 000</b>	<b>16 000</b>	<b>-7 900</b>	<b>81 000</b>	<b>82 000</b>	<b>60 000</b>	<b>-15 000</b>
<b>a. Forest Land</b>	<b>-250 000</b>	<b>-250 000</b>	<b>-140 000</b>	<b>-140 000</b>	<b>-65 000</b>	<b>-69 000</b>	<b>-94 000</b>	<b>-160 000</b>
<b>b. Cropland</b>	<b>10 000</b>	<b>-2 100</b>	<b>-8 400</b>	<b>-8 700</b>	<b>-8 400</b>	<b>-8 000</b>	<b>-7 700</b>	<b>-7 400</b>
<b>c. Grassland</b>	<b>600</b>	<b>1 000</b>	<b>900</b>	<b>400</b>	<b>300</b>	<b>600</b>	<b>2 000</b>	<b>700</b>
<b>d. Wetlands</b>	<b>6 000</b>	<b>4 000</b>	<b>4 000</b>	<b>4 000</b>	<b>4 000</b>	<b>4 000</b>	<b>4 000</b>	<b>4 000</b>
<b>e. Settlements</b>	<b>4 000</b>	<b>4 000</b>	<b>4 000</b>	<b>4 000</b>	<b>4 000</b>	<b>4 000</b>	<b>4 000</b>	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>140 000</b>	<b>170 000</b>	<b>160 000</b>	<b>130 000</b>	<b>150 000</b>	<b>150 000</b>	<b>150 000</b>	<b>150 000</b>

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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

- 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 <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>570 000</b>	<b>4 300</b>	<b>110 000</b>	<b>140</b>	<b>41 000</b>	<b>6 400</b>	<b>1 600</b>	<b>430</b>	<b>0.2</b>	<b>726 000</b>
<b>ENERGY</b>	<b>524 000</b>	<b>2 100</b>	<b>54 000</b>	<b>30</b>	<b>10 000</b>	-	-	-	-	<b>588 000</b>
<b>a. Stationary Combustion Sources</b>	<b>315 000</b>	<b>300</b>	<b>7 000</b>	<b>10</b>	<b>3 000</b>	-	-	-	-	<b>325 000</b>
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>b. Transport<sup>2</sup></b>	<b>196 000</b>	<b>30</b>	<b>700</b>	<b>20</b>	<b>7 000</b>	-	-	-	-	<b>204 000</b>
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
<b>c. Fugitive Sources</b>	<b>13 000</b>	<b>1 800</b>	<b>45 000</b>	<b>0.2</b>	<b>50</b>	-	-	-	-	<b>59 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>0.09</b>	-	-	-	-	-	-	-	-	<b>0.09</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>42 400</b>	<b>3</b>	<b>76</b>	<b>4.19</b>	<b>1 250</b>	<b>6 400</b>	<b>1 600</b>	<b>430</b>	-	<b>52 200</b>
<b>a. Mineral Products</b>	<b>8 100</b>	-	-	-	-	-	-	-	-	<b>8 100</b>
Cement Production	6 000	-	-	-	-	-	-	-	-	6 000
Lime Production	1 320	-	-	-	-	-	-	-	-	1 320
Mineral Product Use	780	-	-	-	-	-	-	-	-	780
<b>b. Chemical Industry</b>	<b>3 500</b>	<b>3</b>	<b>76</b>	<b>3.3</b>	<b>990</b>	-	-	-	-	<b>4 500</b>
Ammonia Production	3 480	-	-	-	-	-	-	-	-	3 480
Nitric Acid Production	-	-	-	3.3	990	-	-	-	-	990
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
Petrochemical and Carbon Black Production <sup>3</sup>	-	3	76	0.03	8.4	-	-	-	-	84
<b>c. Metal Production</b>	<b>12 700</b>	-	-	-	-	-	<b>1 590</b>	<b>219</b>	-	<b>14 500</b>
Iron and Steel Production	7 530	-	-	-	-	-	-	-	-	7 530
Aluminum Production	5 120	-	-	-	-	-	1 590	5.39	-	6 720
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	213	-	213
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>6 400</b>	<b>23</b>	<b>210</b>	<b>0.2</b>	<b>6 600</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>18 000</b>	-	-	-	-	-	-	-	-	<b>18 000</b>
<b>f. Other Product Manufacture and Use</b>	<b>50</b>	-	-	<b>0.86</b>	<b>260</b>	-	-	-	-	<b>300</b>
<b>AGRICULTURE</b>	<b>-</b>	<b>1 200</b>	<b>29 000</b>	<b>100</b>	<b>30 000</b>	-	-	-	-	<b>60 000</b>
<b>a. Enteric Fermentation</b>	<b>-</b>	<b>1 000</b>	<b>25 000</b>	-	-	-	-	-	-	<b>25 000</b>
<b>b. Manure Management</b>	<b>-</b>	<b>150</b>	<b>3 700</b>	<b>15.9</b>	<b>4 730</b>	-	-	-	-	<b>8 400</b>
<b>c. Agriculture Soils</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>81</b>	<b>24 000</b>	-	-	-	-	<b>24 000</b>
Direct Sources	-	-	-	66	20 000	-	-	-	-	20 000
Indirect Sources	-	-	-	20	5 000	-	-	-	-	5 000
<b>d. Field Burning of Agricultural Residues</b>	<b>-</b>	<b>2</b>	<b>40</b>	<b>0.04</b>	<b>10</b>	-	-	-	-	<b>50</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>3 000</b>	-	-	-	-	-	-	-	-	<b>3 000</b>
<b>WASTE</b>	<b>400</b>	<b>970</b>	<b>24 000</b>	<b>3</b>	<b>800</b>	-	-	-	-	<b>25 000</b>
<b>a. Solid Waste Disposal on Land</b>	<b>-</b>	<b>950</b>	<b>24 000</b>	-	-	-	-	-	-	<b>24 000</b>
<b>b. Wastewater Handling</b>	<b>-</b>	<b>16</b>	<b>390</b>	<b>2</b>	<b>700</b>	-	-	-	-	<b>1 100</b>
<b>c. Waste Incineration</b>	<b>400</b>	<b>0.1</b>	<b>3</b>	<b>0.5</b>	<b>100</b>	-	-	-	-	<b>550</b>
<b>LAND-USE, LAND-USE CHANGE AND FORESTRY</b>	<b>-24 000</b>	<b>250</b>	<b>6 300</b>	<b>10</b>	<b>3 100</b>	-	-	-	-	<b>-15 000</b>
<b>a. Forest Land</b>	<b>-170 000</b>	<b>220</b>	<b>5 500</b>	<b>9.2</b>	<b>2 800</b>	-	-	-	-	<b>-160 000</b>
<b>b. Cropland</b>	<b>-7 600</b>	<b>5</b>	<b>100</b>	<b>0.2</b>	<b>70</b>	-	-	-	-	<b>-7 400</b>
<b>c. Grassland</b>	<b>-</b>	<b>20</b>	<b>500</b>	<b>0.5</b>	<b>200</b>	-	-	-	-	<b>700</b>
<b>d. Wetlands</b>	<b>4 000</b>	-	-	-	-	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>4 000</b>	<b>6</b>	<b>100</b>	<b>0.2</b>	<b>60</b>	-	-	-	-	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>150 000</b>	-	-	-	-	-	-	-	-	<b>150 000</b>

## 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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>562 000</b>	<b>4 200</b>	<b>110 000</b>	<b>130</b>	<b>39 000</b>	<b>6 200</b>	<b>1 800</b>	<b>440</b>	<b>0.2</b>	<b>715 000</b>
<b>ENERGY</b>	<b>514 000</b>	<b>2 100</b>	<b>52 000</b>	<b>30</b>	<b>10 000</b>	-	-	-	-	<b>577 000</b>
<b>a. Stationary Combustion Sources</b>	<b>310 000</b>	<b>300</b>	<b>7 000</b>	<b>10</b>	<b>3 000</b>	-	-	-	-	<b>320 000</b>
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>b. Transport<sup>2</sup></b>	<b>191 000</b>	<b>30</b>	<b>700</b>	<b>20</b>	<b>7 000</b>	-	-	-	-	<b>199 000</b>
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
<b>c. Fugitive Sources</b>	<b>13 000</b>	<b>1 800</b>	<b>44 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>57 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>0.09</b>	-	-	-	-	-	-	-	-	<b>0.09</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>45 200</b>	<b>2.7</b>	<b>69</b>	<b>4.71</b>	<b>1 400</b>	<b>6 200</b>	<b>1 800</b>	<b>440</b>	-	<b>55 000</b>
<b>a. Mineral Products</b>	<b>8 800</b>	-	-	-	-	-	-	-	-	<b>8 800</b>
Cement Production	6 600	-	-	-	-	-	-	-	-	6 600
Lime Production	1 450	-	-	-	-	-	-	-	-	1 450
Mineral Product Use	770	-	-	-	-	-	-	-	-	770
<b>b. Chemical Industry</b>	<b>3 000</b>	<b>2.7</b>	<b>69</b>	<b>3.7</b>	<b>1 100</b>	-	-	-	-	<b>4 200</b>
Ammonia Production	3 000	-	-	-	-	-	-	-	-	3 000
Nitric Acid Production	-	-	-	3.7	1 100	-	-	-	-	1 100
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
Petrochemical and Carbon Black Production <sup>3</sup>	-	2.7	69	0.01	2.1	-	-	-	-	71
<b>c. Metal Production</b>	<b>14 600</b>	-	-	-	-	-	<b>1 760</b>	<b>253</b>	-	<b>16 600</b>
Iron and Steel Production	9 840	-	-	-	-	-	-	-	-	9 840
Aluminum Production	4 710	-	-	-	-	-	1 760	4.78	-	6 470
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	248	-	248
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>6 200</b>	<b>41</b>	<b>180</b>	<b>0.2</b>	<b>6 400</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>19 000</b>	-	-	-	-	-	-	-	-	<b>19 000</b>
<b>f. Other Product Manufacture and Use</b>	<b>40</b>	-	-	<b>1</b>	<b>300</b>	-	-	-	-	<b>330</b>
<b>AGRICULTURE</b>	-	<b>1 200</b>	<b>29 000</b>	<b>90</b>	<b>30 000</b>	-	-	-	-	<b>58 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 000</b>	<b>25 000</b>	-	-	-	-	-	-	<b>25 000</b>
<b>b. Manure Management</b>	-	<b>150</b>	<b>3 600</b>	<b>15.9</b>	<b>4 750</b>	-	-	-	-	<b>8 400</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>74</b>	<b>22 000</b>	-	-	-	-	<b>22 000</b>
Direct Sources	-	-	-	60	18 000	-	-	-	-	18 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>1</b>	<b>30</b>	<b>0.03</b>	<b>9</b>	-	-	-	-	<b>40</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>2 000</b>	-	-	-	-	-	-	-	-	<b>2 000</b>
<b>WASTE</b>	<b>500</b>	<b>970</b>	<b>24 000</b>	<b>3</b>	<b>900</b>	-	-	-	-	<b>26 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>950</b>	<b>24 000</b>	-	-	-	-	-	-	<b>24 000</b>
<b>b. Wastewater Handling</b>	-	<b>15</b>	<b>390</b>	<b>2</b>	<b>700</b>	-	-	-	-	<b>1 000</b>
<b>c. Waste Incineration</b>	<b>500</b>	<b>0.1</b>	<b>3</b>	<b>0.7</b>	<b>200</b>	-	-	-	-	<b>710</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>42 000</b>	<b>480</b>	<b>12 000</b>	<b>19</b>	<b>5 700</b>	-	-	-	-	<b>60 000</b>
<b>a. Forest Land</b>	<b>-110 000</b>	<b>420</b>	<b>10 000</b>	<b>18</b>	<b>5 200</b>	-	-	-	-	<b>-94 000</b>
<b>b. Cropland</b>	<b>-7 900</b>	<b>5</b>	<b>100</b>	<b>0.2</b>	<b>70</b>	-	-	-	-	<b>-7 700</b>
<b>c. Grassland</b>	-	<b>50</b>	<b>1 000</b>	<b>1</b>	<b>400</b>	-	-	-	-	<b>2 000</b>
<b>d. Wetlands</b>	<b>4 000</b>	-	-	-	-	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>4 000</b>	<b>6</b>	<b>100</b>	<b>0.2</b>	<b>70</b>	-	-	-	-	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>150 000</b>	-	-	-	-	-	-	-	-	<b>150 000</b>

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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 A9–5 2011 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>559 000</b>	<b>4 200</b>	<b>100 000</b>	<b>130</b>	<b>38 000</b>	<b>5 900</b>	<b>1 700</b>	<b>400</b>	<b>0.2</b>	<b>709 000</b>
<b>ENERGY</b>	<b>515 000</b>	<b>2 000</b>	<b>50 000</b>	<b>40</b>	<b>10 000</b>	-	-	-	-	<b>576 000</b>
<b>a. Stationary Combustion Sources</b>	<b>311 000</b>	<b>300</b>	<b>7 000</b>	<b>9</b>	<b>3 000</b>	-	-	-	-	<b>321 000</b>
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>b. Transport<sup>2</sup></b>	<b>191 000</b>	<b>30</b>	<b>700</b>	<b>30</b>	<b>8 000</b>	-	-	-	-	<b>199 000</b>
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
<b>c. Fugitive Sources</b>	<b>13 000</b>	<b>1 700</b>	<b>42 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>56 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>0.09</b>	-	-	-	-	-	-	-	-	<b>0.09</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>41 400</b>	<b>2.7</b>	<b>67</b>	<b>4.56</b>	<b>1 360</b>	<b>5 900</b>	<b>1 700</b>	<b>400</b>	-	<b>50 900</b>
<b>a. Mineral Products</b>	<b>8 200</b>	-	-	-	-	-	-	-	-	<b>8 200</b>
Cement Production	6 100	-	-	-	-	-	-	-	-	6 100
Lime Production	1 430	-	-	-	-	-	-	-	-	1 430
Mineral Product Use	670	-	-	-	-	-	-	-	-	670
<b>b. Chemical Industry</b>	<b>2 900</b>	<b>2.7</b>	<b>67</b>	<b>3.8</b>	<b>1 100</b>	-	-	-	-	<b>4 100</b>
Ammonia Production	2 880	-	-	-	-	-	-	-	-	2 880
Nitric Acid Production	-	-	-	3.8	1 100	-	-	-	-	1 100
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
Petrochemical and Carbon Black Production <sup>3</sup>	-	2.7	67	0.01	2.2	-	-	-	-	69
<b>c. Metal Production</b>	<b>14 900</b>	-	-	-	-	-	<b>1 670</b>	<b>256</b>	-	<b>16 900</b>
Iron and Steel Production	9 860	-	-	-	-	-	-	-	-	9 860
Aluminum Production	5 070	-	-	-	-	-	1 670	73.2	-	6 810
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	183	-	183
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>5 900</b>	<b>20</b>	<b>140</b>	<b>0.2</b>	<b>6 100</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>15 000</b>	-	-	-	-	-	-	-	-	<b>15 000</b>
<b>f. Other Product Manufacture and Use</b>	<b>20</b>	-	-	<b>0.8</b>	<b>240</b>	-	-	-	-	<b>260</b>
<b>AGRICULTURE</b>	-	<b>1 200</b>	<b>29 000</b>	<b>80</b>	<b>30 000</b>	-	-	-	-	<b>56 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 000</b>	<b>25 000</b>	-	-	-	-	-	-	<b>25 000</b>
<b>b. Manure Management</b>	-	<b>150</b>	<b>3 700</b>	<b>15.9</b>	<b>4 720</b>	-	-	-	-	<b>8 400</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>69</b>	<b>20 000</b>	-	-	-	-	<b>20 000</b>
Direct Sources	-	-	-	56	17 000	-	-	-	-	17 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>0.9</b>	<b>20</b>	<b>0.02</b>	<b>7</b>	-	-	-	-	<b>30</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>2 000</b>	-	-	-	-	-	-	-	-	<b>2 000</b>
<b>WASTE</b>	<b>460</b>	<b>1 000</b>	<b>25 000</b>	<b>3</b>	<b>800</b>	-	-	-	-	<b>26 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>990</b>	<b>25 000</b>	-	-	-	-	-	-	<b>25 000</b>
<b>b. Wastewater Handling</b>	-	<b>15</b>	<b>380</b>	<b>2</b>	<b>700</b>	-	-	-	-	<b>1 000</b>
<b>c. Waste Incineration</b>	<b>460</b>	<b>0.1</b>	<b>3</b>	<b>0.6</b>	<b>200</b>	-	-	-	-	<b>640</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>63 000</b>	<b>510</b>	<b>13 000</b>	<b>21</b>	<b>6 400</b>	-	-	-	-	<b>82 000</b>
<b>a. Forest Land</b>	<b>-87 000</b>	<b>480</b>	<b>12 000</b>	<b>20</b>	<b>6 100</b>	-	-	-	-	<b>-69 000</b>
<b>b. Cropland</b>	<b>-8 200</b>	<b>5</b>	<b>100</b>	<b>0.2</b>	<b>70</b>	-	-	-	-	<b>-8 000</b>
<b>c. Grassland</b>	-	<b>20</b>	<b>500</b>	<b>0.5</b>	<b>100</b>	-	-	-	-	<b>600</b>
<b>d. Wetlands</b>	<b>4 000</b>	-	-	-	-	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>4 000</b>	<b>6</b>	<b>200</b>	<b>0.2</b>	<b>70</b>	-	-	-	-	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>150 000</b>	-	-	-	-	-	-	-	-	<b>150 000</b>

## 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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>556 000</b>	<b>4 200</b>	<b>100 000</b>	<b>130</b>	<b>38 000</b>	<b>5 700</b>	<b>1 900</b>	<b>440</b>	<b>0.2</b>	<b>707 000</b>
<b>ENERGY</b>	<b>513 000</b>	<b>2 000</b>	<b>49 000</b>	<b>40</b>	<b>10 000</b>	-	-	-	-	<b>573 000</b>
<b>a. Stationary Combustion Sources</b>	<b>309 000</b>	<b>300</b>	<b>7 000</b>	<b>9</b>	<b>3 000</b>	-	-	-	-	<b>318 000</b>
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>b. Transport<sup>2</sup></b>	<b>191 000</b>	<b>30</b>	<b>700</b>	<b>30</b>	<b>8 000</b>	-	-	-	-	<b>200 000</b>
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
<b>c. Fugitive Sources</b>	<b>13 000</b>	<b>1 700</b>	<b>41 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>55 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>0.09</b>	-	-	-	-	-	-	-	-	<b>0.09</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>41 300</b>	<b>2.7</b>	<b>66</b>	<b>4.34</b>	<b>1 290</b>	<b>5 700</b>	<b>1 900</b>	<b>440</b>	-	<b>50 700</b>
<b>a. Mineral Products</b>	<b>8 000</b>	-	-	-	-	-	-	-	-	<b>8 000</b>
Cement Production	6 000	-	-	-	-	-	-	-	-	6 000
Lime Production	1 370	-	-	-	-	-	-	-	-	1 370
Mineral Product Use	540	-	-	-	-	-	-	-	-	540
<b>b. Chemical Industry</b>	<b>2 500</b>	<b>2.7</b>	<b>66</b>	<b>3.6</b>	<b>1 100</b>	-	-	-	-	<b>3 600</b>
Ammonia Production	2 490	-	-	-	-	-	-	-	-	2 490
Nitric Acid Production	-	-	-	3.6	1 100	-	-	-	-	1 100
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
Petrochemical and Carbon Black Production <sup>3</sup>	-	2.7	66	0.01	2.1	-	-	-	-	68
<b>c. Metal Production</b>	<b>14 000</b>	-	-	-	-	-	<b>1 850</b>	<b>254</b>	-	<b>16 100</b>
Iron and Steel Production	9 030	-	-	-	-	-	-	-	-	9 030
Aluminum Production	4 950	-	-	-	-	-	1 850	72.7	-	6 870
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	182	-	182
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>5 700</b>	<b>12</b>	<b>180</b>	<b>0.2</b>	<b>5 900</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>17 000</b>	-	-	-	-	-	-	-	-	<b>17 000</b>
<b>f. Other Product Manufacture and Use</b>	<b>9</b>	-	-	<b>0.78</b>	<b>230</b>	-	-	-	-	<b>240</b>
<b>AGRICULTURE</b>	-	<b>1 200</b>	<b>30 000</b>	<b>90</b>	<b>30 000</b>	-	-	-	-	<b>57 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 000</b>	<b>26 000</b>	-	-	-	-	-	-	<b>26 000</b>
<b>b. Manure Management</b>	-	<b>150</b>	<b>3 700</b>	<b>16.2</b>	<b>4 820</b>	-	-	-	-	<b>8 500</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>70</b>	<b>21 000</b>	-	-	-	-	<b>21 000</b>
Direct Sources	-	-	-	56	17 000	-	-	-	-	17 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>1</b>	<b>30</b>	<b>0.03</b>	<b>8</b>	-	-	-	-	<b>30</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>2 000</b>	-	-	-	-	-	-	-	-	<b>2 000</b>
<b>WASTE</b>	<b>470</b>	<b>1 000</b>	<b>25 000</b>	<b>3</b>	<b>800</b>	-	-	-	-	<b>27 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>1 000</b>	<b>25 000</b>	-	-	-	-	-	-	<b>25 000</b>
<b>b. Wastewater Handling</b>	-	<b>15</b>	<b>380</b>	<b>2</b>	<b>600</b>	-	-	-	-	<b>1 000</b>
<b>c. Waste Incineration</b>	<b>470</b>	<b>0.1</b>	<b>3</b>	<b>0.6</b>	<b>200</b>	-	-	-	-	<b>660</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>63 000</b>	<b>500</b>	<b>13 000</b>	<b>21</b>	<b>6 300</b>	-	-	-	-	<b>81 000</b>
<b>a. Forest Land</b>	<b>-83 000</b>	<b>480</b>	<b>12 000</b>	<b>20</b>	<b>6 000</b>	-	-	-	-	<b>-65 000</b>
<b>b. Cropland</b>	<b>-8 600</b>	<b>5</b>	<b>100</b>	<b>0.2</b>	<b>70</b>	-	-	-	-	<b>-8 400</b>
<b>c. Grassland</b>	-	<b>10</b>	<b>200</b>	<b>0.3</b>	<b>80</b>	-	-	-	-	<b>300</b>
<b>d. Wetlands</b>	<b>4 000</b>	<b>0.5</b>	<b>10</b>	<b>0.02</b>	<b>6</b>	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>4 000</b>	<b>6</b>	<b>100</b>	<b>0.2</b>	<b>60</b>	-	-	-	-	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>150 000</b>	-	-	-	-	-	-	-	-	<b>150 000</b>

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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>545 000</b>	<b>4 300</b>	<b>110 000</b>	<b>130</b>	<b>38 000</b>	<b>5 700</b>	<b>2 500</b>	<b>370</b>	<b>0.2</b>	<b>699 000</b>
<b>ENERGY</b>	<b>504 000</b>	<b>2 000</b>	<b>49 000</b>	<b>30</b>	<b>10 000</b>	-	-	-	-	<b>563 000</b>
<b>a. Stationary Combustion Sources</b>	<b>308 000</b>	<b>300</b>	<b>7 000</b>	<b>9</b>	<b>3 000</b>	-	-	-	-	<b>318 000</b>
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>b. Transport<sup>2</sup></b>	<b>182 000</b>	<b>30</b>	<b>700</b>	<b>20</b>	<b>7 000</b>	-	-	-	-	<b>190 000</b>
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
<b>c. Fugitive Sources</b>	<b>14 000</b>	<b>1 700</b>	<b>42 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>56 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>0.09</b>	-	-	-	-	-	-	-	-	<b>0.09</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>38 500</b>	<b>2.6</b>	<b>66</b>	<b>6.69</b>	<b>1 990</b>	<b>5 700</b>	<b>2 500</b>	<b>370</b>	-	<b>49 100</b>
<b>a. Mineral Products</b>	<b>7 300</b>	-	-	-	-	-	-	-	-	<b>7 300</b>
Cement Production	5 400	-	-	-	-	-	-	-	-	5 400
Lime Production	1 190	-	-	-	-	-	-	-	-	1 190
Mineral Product Use	720	-	-	-	-	-	-	-	-	720
<b>b. Chemical Industry</b>	<b>2 400</b>	<b>2.6</b>	<b>66</b>	<b>5.9</b>	<b>1 700</b>	-	-	-	-	<b>4 200</b>
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 <sup>3</sup>	-	2.6	66	0.01	1.9	-	-	-	-	68
<b>c. Metal Production</b>	<b>13 100</b>	-	-	-	-	-	<b>2 500</b>	<b>198</b>	-	<b>15 700</b>
Iron and Steel Production	8 030	-	-	-	-	-	-	-	-	8 030
Aluminum Production	5 030	-	-	-	-	-	2 500	13.1	-	7 540
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	184	-	184
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>5 700</b>	<b>11</b>	<b>180</b>	<b>0.2</b>	<b>5 800</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>16 000</b>	-	-	-	-	-	-	-	-	<b>16 000</b>
<b>f. Other Product Manufacture and Use</b>	<b>2</b>	-	-	<b>0.84</b>	<b>250</b>	-	-	-	-	<b>250</b>
<b>AGRICULTURE</b>	-	<b>1 200</b>	<b>31 000</b>	<b>90</b>	<b>30 000</b>	-	-	-	-	<b>58 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 100</b>	<b>27 000</b>	-	-	-	-	-	-	<b>27 000</b>
<b>b. Manure Management</b>	-	<b>150</b>	<b>3 700</b>	<b>16.7</b>	<b>4 970</b>	-	-	-	-	<b>8 700</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>68</b>	<b>20 000</b>	-	-	-	-	<b>20 000</b>
Direct Sources	-	-	-	55	16 000	-	-	-	-	16 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>2</b>	<b>40</b>	<b>0.04</b>	<b>10</b>	-	-	-	-	<b>50</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>2 000</b>	-	-	-	-	-	-	-	-	<b>2 000</b>
<b>WASTE</b>	<b>460</b>	<b>1 100</b>	<b>27 000</b>	<b>3</b>	<b>800</b>	-	-	-	-	<b>28 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>1 100</b>	<b>27 000</b>	-	-	-	-	-	-	<b>27 000</b>
<b>b. Wastewater Handling</b>	-	<b>15</b>	<b>370</b>	<b>2</b>	<b>600</b>	-	-	-	-	<b>1 000</b>
<b>c. Waste Incineration</b>	<b>460</b>	<b>0.1</b>	<b>3</b>	<b>0.6</b>	<b>200</b>	-	-	-	-	<b>640</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>-18 000</b>	<b>280</b>	<b>7 000</b>	<b>12</b>	<b>3 500</b>	-	-	-	-	<b>-7 900</b>
<b>a. Forest Land</b>	<b>-150 000</b>	<b>260</b>	<b>6 400</b>	<b>11</b>	<b>3 200</b>	-	-	-	-	<b>-140 000</b>
<b>b. Cropland</b>	<b>-8 900</b>	<b>5</b>	<b>100</b>	<b>0.2</b>	<b>70</b>	-	-	-	-	<b>-8 700</b>
<b>c. Grassland</b>	-	<b>10</b>	<b>300</b>	<b>0.3</b>	<b>100</b>	-	-	-	-	<b>400</b>
<b>d. Wetlands</b>	<b>4 000</b>	<b>0.6</b>	<b>10</b>	<b>0.02</b>	<b>7</b>	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>4 000</b>	<b>6</b>	<b>100</b>	<b>0.2</b>	<b>70</b>	-	-	-	-	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>130 000</b>	-	-	-	-	-	-	-	-	<b>130 000</b>

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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>579 000</b>	<b>4 400</b>	<b>110 000</b>	<b>140</b>	<b>42 000</b>	<b>5 500</b>	<b>2 600</b>	<b>640</b>	<b>0.2</b>	<b>741 000</b>
<b>ENERGY</b>	<b>533 000</b>	<b>2 100</b>	<b>52 000</b>	<b>40</b>	<b>10 000</b>	-	-	-	-	<b>596 000</b>
<b>a. Stationary Combustion Sources</b>	<b>330 000</b>	<b>300</b>	<b>7 000</b>	<b>10</b>	<b>3 000</b>	-	-	-	-	<b>340 000</b>
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>b. Transport<sup>2</sup></b>	<b>188 000</b>	<b>30</b>	<b>700</b>	<b>30</b>	<b>8 000</b>	-	-	-	-	<b>197 000</b>
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
<b>c. Fugitive Sources</b>	<b>15 000</b>	<b>1 800</b>	<b>44 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>59 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>0.09</b>	-	-	-	-	-	-	-	-	<b>0.09</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>44 300</b>	<b>3.1</b>	<b>77</b>	<b>13</b>	<b>3 880</b>	<b>5 500</b>	<b>2 600</b>	<b>640</b>	-	<b>57 000</b>
<b>a. Mineral Products</b>	<b>9 400</b>	-	-	-	-	-	-	-	-	<b>9 400</b>
Cement Production	7 000	-	-	-	-	-	-	-	-	7 000
Lime Production	1 540	-	-	-	-	-	-	-	-	1 540
Mineral Product Use	890	-	-	-	-	-	-	-	-	890
<b>b. Chemical Industry</b>	<b>2 800</b>	<b>3.1</b>	<b>77</b>	<b>12</b>	<b>3 500</b>	-	-	-	-	<b>6 400</b>
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 <sup>3</sup>	-	3.1	77	0.01	2	-	-	-	-	79
<b>c. Metal Production</b>	<b>15 800</b>	-	-	-	-	-	<b>2 590</b>	<b>438</b>	-	<b>18 900</b>
Iron and Steel Production	10 700	-	-	-	-	-	-	-	-	10 700
Aluminum Production	5 170	-	-	-	-	-	2 590	3.57	-	7 760
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	435	-	435
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>5 500</b>	<b>13</b>	<b>210</b>	<b>0.2</b>	<b>5 700</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>16 000</b>	-	-	-	-	-	-	-	-	<b>16 000</b>
<b>f. Other Product Manufacture and Use</b>	<b>0.0</b>	-	-	<b>1.1</b>	<b>330</b>	-	-	-	-	<b>330</b>
<b>AGRICULTURE</b>	-	<b>1 300</b>	<b>32 000</b>	<b>90</b>	<b>30 000</b>	-	-	-	-	<b>61 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 100</b>	<b>29 000</b>	-	-	-	-	-	-	<b>29 000</b>
<b>b. Manure Management</b>	-	<b>150</b>	<b>3 800</b>	<b>17.5</b>	<b>5 210</b>	-	-	-	-	<b>9 100</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>71</b>	<b>21 000</b>	-	-	-	-	<b>21 000</b>
Direct Sources	-	-	-	57	17 000	-	-	-	-	17 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>2</b>	<b>40</b>	<b>0.04</b>	<b>10</b>	-	-	-	-	<b>50</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>2 000</b>	-	-	-	-	-	-	-	-	<b>2 000</b>
<b>WASTE</b>	<b>480</b>	<b>1 100</b>	<b>27 000</b>	<b>3</b>	<b>800</b>	-	-	-	-	<b>28 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>1 100</b>	<b>26 000</b>	-	-	-	-	-	-	<b>26 000</b>
<b>b. Wastewater Handling</b>	-	<b>15</b>	<b>370</b>	<b>2</b>	<b>600</b>	-	-	-	-	<b>1 000</b>
<b>c. Waste Incineration</b>	<b>480</b>	<b>0.1</b>	<b>3</b>	<b>0.6</b>	<b>200</b>	-	-	-	-	<b>670</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>-24 000</b>	<b>210</b>	<b>5 200</b>	<b>8.5</b>	<b>2 500</b>	-	-	-	-	<b>-16 000</b>
<b>a. Forest Land</b>	<b>-160 000</b>	<b>180</b>	<b>4 500</b>	<b>7.6</b>	<b>2 300</b>	-	-	-	-	<b>-160 000</b>
<b>b. Cropland</b>	<b>-9 300</b>	<b>5</b>	<b>100</b>	<b>0.2</b>	<b>70</b>	-	-	-	-	<b>-9 100</b>
<b>c. Grassland</b>	-	<b>10</b>	<b>400</b>	<b>0.4</b>	<b>100</b>	-	-	-	-	<b>500</b>
<b>d. Wetlands</b>	<b>4 000</b>	<b>0.5</b>	<b>10</b>	<b>0.02</b>	<b>7</b>	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>4 000</b>	<b>6</b>	<b>200</b>	<b>0.2</b>	<b>70</b>	-	-	-	-	<b>5 000</b>
<b>f. Harvested Wood Products</b>	<b>140 000</b>	-	-	-	-	-	-	-	-	<b>140 000</b>

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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 A9–9 2007 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									TOTAL
	CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	
Global Warming Potential Unit	kt	kt	25 kt CO <sub>2</sub> eq.	kt	298 kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	22 800 kt CO <sub>2</sub> eq.	17 200 kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>598 000</b>	<b>4 600</b>	<b>110 000</b>	<b>140</b>	<b>40 000</b>	<b>5 400</b>	<b>2 500</b>	<b>730</b>	<b>0.2</b>	<b>761 000</b>
<b>ENERGY</b>	<b>549 000</b>	<b>2 100</b>	<b>53 000</b>	<b>40</b>	<b>10 000</b>	-	-	-	-	<b>614 000</b>
<b>a. Stationary Combustion Sources</b>	<b>346 000</b>	<b>300</b>	<b>7 000</b>	<b>10</b>	<b>3 000</b>	-	-	-	-	<b>356 000</b>
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>b. Transport<sup>2</sup></b>	<b>189 000</b>	<b>30</b>	<b>800</b>	<b>30</b>	<b>9 000</b>	-	-	-	-	<b>198 000</b>
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
<b>c. Fugitive Sources</b>	<b>15 000</b>	<b>1 800</b>	<b>45 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>60 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>0.09</b>	-	-	-	-	-	-	-	-	<b>0.09</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>46 500</b>	<b>3.4</b>	<b>84</b>	<b>9.53</b>	<b>2 840</b>	<b>5 400</b>	<b>2 500</b>	<b>730</b>	-	<b>58 100</b>
<b>a. Mineral Products</b>	<b>10 000</b>	-	-	-	-	-	-	-	-	<b>10 000</b>
Cement Production	7 800	-	-	-	-	-	-	-	-	7 800
Lime Production	1 590	-	-	-	-	-	-	-	-	1 590
Mineral Product Use	850	-	-	-	-	-	-	-	-	850
<b>b. Chemical Industry</b>	<b>2 600</b>	<b>3.4</b>	<b>84</b>	<b>8.5</b>	<b>2 500</b>	-	-	-	-	<b>5 200</b>
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 <sup>3</sup>	-	3.4	84	0.01	2	-	-	-	-	86
<b>c. Metal Production</b>	<b>16 200</b>	-	-	-	-	-	<b>2 520</b>	<b>501</b>	-	<b>19 200</b>
Iron and Steel Production	11 100	-	-	-	-	-	-	-	-	11 100
Aluminum Production	5 100	-	-	-	-	-	2 520	11.9	-	7 630
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	489	-	489
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>5 400</b>	<b>11</b>	<b>230</b>	<b>0.2</b>	<b>5 700</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>18 000</b>	-	-	-	-	-	-	-	-	<b>18 000</b>
<b>f. Other Product Manufacture and Use</b>	-	-	-	<b>1.1</b>	<b>310</b>	-	-	-	-	<b>310</b>
<b>AGRICULTURE</b>	-	<b>1 300</b>	<b>33 000</b>	<b>80</b>	<b>30 000</b>	-	-	-	-	<b>60 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 200</b>	<b>29 000</b>	-	-	-	-	-	-	<b>29 000</b>
<b>b. Manure Management</b>	-	<b>160</b>	<b>4 000</b>	<b>18</b>	<b>5 360</b>	-	-	-	-	<b>9 400</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>66</b>	<b>20 000</b>	-	-	-	-	<b>20 000</b>
Direct Sources	-	-	-	53	16 000	-	-	-	-	16 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>1</b>	<b>30</b>	<b>0.03</b>	<b>9</b>	-	-	-	-	<b>40</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>2 000</b>	-	-	-	-	-	-	-	-	<b>2 000</b>
<b>WASTE</b>	<b>460</b>	<b>1 100</b>	<b>27 000</b>	<b>3</b>	<b>800</b>	-	-	-	-	<b>28 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>1 100</b>	<b>27 000</b>	-	-	-	-	-	-	<b>27 000</b>
<b>b. Wastewater Handling</b>	-	<b>14</b>	<b>360</b>	<b>2</b>	<b>600</b>	-	-	-	-	<b>1 000</b>
<b>c. Waste Incineration</b>	<b>460</b>	<b>0.1</b>	<b>2</b>	<b>0.6</b>	<b>200</b>	-	-	-	-	<b>640</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>19 000</b>	<b>340</b>	<b>8 500</b>	<b>14</b>	<b>4 200</b>	-	-	-	-	<b>31 000</b>
<b>a. Forest Land</b>	<b>-120 000</b>	<b>310</b>	<b>7 800</b>	<b>13</b>	<b>3 900</b>	-	-	-	-	<b>-110 000</b>
<b>b. Cropland</b>	<b>-9 400</b>	<b>5</b>	<b>100</b>	<b>0.3</b>	<b>80</b>	-	-	-	-	<b>-9 200</b>
<b>c. Grassland</b>	-	<b>10</b>	<b>300</b>	<b>0.3</b>	<b>100</b>	-	-	-	-	<b>400</b>
<b>d. Wetlands</b>	<b>4 000</b>	-	-	-	-	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>4 000</b>	<b>7</b>	<b>200</b>	<b>0.3</b>	<b>80</b>	-	-	-	-	<b>5 000</b>
<b>f. Harvested Wood Products</b>	<b>140 000</b>	-	-	-	-	-	-	-	-	<b>140 000</b>

## 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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>575 000</b>	<b>4 600</b>	<b>120 000</b>	<b>130</b>	<b>39 000</b>	<b>5 400</b>	<b>3 000</b>	<b>1 500</b>	<b>0.2</b>	<b>740 000</b>
<b>ENERGY</b>	<b>526 000</b>	<b>2 200</b>	<b>54 000</b>	<b>40</b>	<b>10 000</b>	-	-	-	-	<b>591 000</b>
<b>a. Stationary Combustion Sources</b>	<b>325 000</b>	<b>300</b>	<b>7 000</b>	<b>10</b>	<b>3 000</b>	-	-	-	-	<b>335 000</b>
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>b. Transport<sup>2</sup></b>	<b>185 000</b>	<b>30</b>	<b>800</b>	<b>30</b>	<b>9 000</b>	-	-	-	-	<b>195 000</b>
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
<b>c. Fugitive Sources</b>	<b>16 000</b>	<b>1 800</b>	<b>46 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>62 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>0.09</b>	-	-	-	-	-	-	-	-	<b>0.09</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>46 900</b>	<b>3.4</b>	<b>84</b>	<b>8.96</b>	<b>2 670</b>	<b>5 400</b>	<b>3 000</b>	<b>1 500</b>	-	<b>59 500</b>
<b>a. Mineral Products</b>	<b>10 000</b>	-	-	-	-	-	-	-	-	<b>10 000</b>
Cement Production	7 700	-	-	-	-	-	-	-	-	7 700
Lime Production	1 630	-	-	-	-	-	-	-	-	1 630
Mineral Product Use	970	-	-	-	-	-	-	-	-	970
<b>b. Chemical Industry</b>	<b>2 800</b>	<b>3.4</b>	<b>84</b>	<b>7.9</b>	<b>2 400</b>	-	-	-	-	<b>5 200</b>
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 <sup>3</sup>	-	3.4	84	0.01	4.1	-	-	-	-	88
<b>c. Metal Production</b>	<b>16 300</b>	-	-	-	-	-	<b>2 980</b>	<b>1 350</b>	-	<b>20 600</b>
Iron and Steel Production	11 200	-	-	-	-	-	-	-	-	11 200
Aluminum Production	5 090	-	-	-	-	-	2 980	12.5	-	8 080
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	1 340	-	1 340
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>5 400</b>	<b>10</b>	<b>180</b>	<b>0.2</b>	<b>5 500</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>17 000</b>	-	-	-	-	-	-	-	-	<b>17 000</b>
<b>f. Other Product Manufacture and Use</b>	-	-	-	<b>1.1</b>	<b>320</b>	-	-	-	-	<b>320</b>
<b>AGRICULTURE</b>	-	<b>1 400</b>	<b>35 000</b>	<b>80</b>	<b>20 000</b>	-	-	-	-	<b>61 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 200</b>	<b>30 000</b>	-	-	-	-	-	-	<b>30 000</b>
<b>b. Manure Management</b>	-	<b>170</b>	<b>4 300</b>	<b>18.5</b>	<b>5 510</b>	-	-	-	-	<b>9 800</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>63</b>	<b>19 000</b>	-	-	-	-	<b>19 000</b>
Direct Sources	-	-	-	51	15 000	-	-	-	-	15 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>2</b>	<b>40</b>	<b>0.04</b>	<b>10</b>	-	-	-	-	<b>50</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>1 000</b>	-	-	-	-	-	-	-	-	<b>1 000</b>
<b>WASTE</b>	<b>480</b>	<b>1 100</b>	<b>27 000</b>	<b>3</b>	<b>800</b>	-	-	-	-	<b>29 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>1 100</b>	<b>27 000</b>	-	-	-	-	-	-	<b>27 000</b>
<b>b. Wastewater Handling</b>	-	<b>14</b>	<b>360</b>	<b>2</b>	<b>600</b>	-	-	-	-	<b>990</b>
<b>c. Waste Incineration</b>	<b>480</b>	<b>0.09</b>	<b>2</b>	<b>0.6</b>	<b>200</b>	-	-	-	-	<b>670</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>27 000</b>	<b>390</b>	<b>9 800</b>	<b>16</b>	<b>4 800</b>	-	-	-	-	<b>42 000</b>
<b>a. Forest Land</b>	<b>-120 000</b>	<b>350</b>	<b>8 600</b>	<b>15</b>	<b>4 300</b>	-	-	-	-	<b>-100 000</b>
<b>b. Cropland</b>	<b>-9 800</b>	<b>5</b>	<b>100</b>	<b>0.3</b>	<b>70</b>	-	-	-	-	<b>-9 600</b>
<b>c. Grassland</b>	-	<b>40</b>	<b>900</b>	<b>0.9</b>	<b>300</b>	-	-	-	-	<b>1 000</b>
<b>d. Wetlands</b>	<b>4 000</b>	<b>0.1</b>	<b>4</b>	<b>0.01</b>	<b>2</b>	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>4 000</b>	<b>7</b>	<b>200</b>	<b>0.3</b>	<b>80</b>	-	-	-	-	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>150 000</b>	-	-	-	-	-	-	-	-	<b>150 000</b>

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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 A9–11 2005 GHG Emission Summary for Canada

Greenhouse Gas Categories		Greenhouse Gases									
		CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential <i>Unit</i>		kt	kt	25 kt CO <sub>2</sub> eq.	kt	298 kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	22 800 kt CO <sub>2</sub> eq.	17 200 kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
TOTAL <sup>1</sup>		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 <sup>2</sup>	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 <sub>2</sub> 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 <sup>3</sup>	-	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 <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	1 230	-	1 230
d.	Production and Consumption of Halocarbons, SF <sub>6</sub> and NF <sub>3</sub> <sup>4</sup>	-	-	-	-	-	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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>587 000</b>	<b>4 700</b>	<b>120 000</b>	<b>140</b>	<b>43 000</b>	<b>5 000</b>	<b>3 500</b>	<b>2 300</b>	<b>0.2</b>	<b>758 000</b>
<b>ENERGY</b>	<b>540 000</b>	<b>2 300</b>	<b>56 000</b>	<b>40</b>	<b>10 000</b>	-	-	-	-	<b>609 000</b>
<b>a. Stationary Combustion Sources</b>	<b>344 000</b>	<b>300</b>	<b>8 000</b>	<b>10</b>	<b>3 000</b>	-	-	-	-	<b>354 000</b>
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>b. Transport<sup>2</sup></b>	<b>181 000</b>	<b>30</b>	<b>800</b>	<b>30</b>	<b>9 000</b>	-	-	-	-	<b>191 000</b>
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
<b>c. Fugitive Sources</b>	<b>16 000</b>	<b>1 900</b>	<b>48 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>63 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>0.09</b>	-	-	-	-	-	-	-	-	<b>0.09</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>44 200</b>	<b>4.2</b>	<b>100</b>	<b>15.3</b>	<b>4 550</b>	<b>5 000</b>	<b>3 500</b>	<b>2 300</b>	-	<b>59 700</b>
<b>a. Mineral Products</b>	<b>10 000</b>	-	-	-	-	-	-	-	-	<b>10 000</b>
Cement Production	7 500	-	-	-	-	-	-	-	-	7 500
Lime Production	1 780	-	-	-	-	-	-	-	-	1 780
Mineral Product Use	970	-	-	-	-	-	-	-	-	970
<b>b. Chemical Industry</b>	<b>2 900</b>	<b>4.2</b>	<b>100</b>	<b>14</b>	<b>4 200</b>	-	-	-	-	<b>7 200</b>
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 <sup>3</sup>	-	4.2	100	0.02	5.7	-	-	-	-	110
<b>c. Metal Production</b>	<b>14 800</b>	-	-	-	-	-	<b>3 510</b>	<b>2 120</b>	-	<b>20 400</b>
Iron and Steel Production	10 500	-	-	-	-	-	-	-	-	10 500
Aluminum Production	4 220	-	-	-	-	-	3 510	30.4	-	7 770
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 090	-	2 090
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>5 000</b>	<b>10</b>	<b>220</b>	<b>0.2</b>	<b>5 200</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>16 000</b>	-	-	-	-	-	-	-	-	<b>16 000</b>
<b>f. Other Product Manufacture and Use</b>	-	-	-	<b>1.3</b>	<b>390</b>	-	-	-	-	<b>390</b>
<b>AGRICULTURE</b>	-	<b>1 400</b>	<b>35 000</b>	<b>80</b>	<b>20 000</b>	-	-	-	-	<b>61 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 200</b>	<b>31 000</b>	-	-	-	-	-	-	<b>31 000</b>
<b>b. Manure Management</b>	-	<b>170</b>	<b>4 300</b>	<b>18.5</b>	<b>5 500</b>	-	-	-	-	<b>9 800</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>65</b>	<b>19 000</b>	-	-	-	-	<b>19 000</b>
Direct Sources	-	-	-	52	16 000	-	-	-	-	16 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>1</b>	<b>30</b>	<b>0.03</b>	<b>8</b>	-	-	-	-	<b>40</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>1 000</b>	-	-	-	-	-	-	-	-	<b>1 000</b>
<b>WASTE</b>	<b>500</b>	<b>1 100</b>	<b>26 000</b>	<b>3</b>	<b>800</b>	-	-	-	-	<b>28 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>1 000</b>	<b>26 000</b>	-	-	-	-	-	-	<b>26 000</b>
<b>b. Wastewater Handling</b>	-	<b>14</b>	<b>350</b>	<b>2</b>	<b>600</b>	-	-	-	-	<b>980</b>
<b>c. Waste Incineration</b>	<b>500</b>	<b>0.09</b>	<b>2</b>	<b>0.7</b>	<b>200</b>	-	-	-	-	<b>700</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>79 000</b>	<b>600</b>	<b>15 000</b>	<b>25</b>	<b>7 300</b>	-	-	-	-	<b>100 000</b>
<b>a. Forest Land</b>	<b>-84 000</b>	<b>560</b>	<b>14 000</b>	<b>23</b>	<b>7 000</b>	-	-	-	-	<b>-63 000</b>
<b>b. Cropland</b>	<b>-7 400</b>	<b>5</b>	<b>100</b>	<b>0.3</b>	<b>80</b>	-	-	-	-	<b>-7 200</b>
<b>c. Grassland</b>	-	<b>30</b>	<b>700</b>	<b>0.7</b>	<b>200</b>	-	-	-	-	<b>900</b>
<b>d. Wetlands</b>	<b>4 000</b>	<b>1</b>	<b>20</b>	<b>0.04</b>	<b>10</b>	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>4 000</b>	<b>6</b>	<b>200</b>	<b>0.2</b>	<b>70</b>	-	-	-	-	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>160 000</b>	-	-	-	-	-	-	-	-	<b>160 000</b>

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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 A9–13 2003 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>588 000</b>	<b>4 700</b>	<b>120 000</b>	<b>130</b>	<b>40 000</b>	<b>4 700</b>	<b>3 500</b>	<b>2 700</b>	<b>0.2</b>	<b>756 000</b>
<b>ENERGY</b>	<b>544 000</b>	<b>2 300</b>	<b>57 000</b>	<b>40</b>	<b>10 000</b>	-	-	-	-	<b>614 000</b>
<b>a. Stationary Combustion Sources</b>	<b>352 000</b>	<b>300</b>	<b>8 000</b>	<b>10</b>	<b>3 000</b>	-	-	-	-	<b>363 000</b>
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>b. Transport<sup>2</sup></b>	<b>176 000</b>	<b>30</b>	<b>800</b>	<b>30</b>	<b>10 000</b>	-	-	-	-	<b>187 000</b>
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
<b>c. Fugitive Sources</b>	<b>16 000</b>	<b>1 900</b>	<b>48 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>64 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>0.09</b>	-	-	-	-	-	-	-	-	<b>0.09</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>42 000</b>	<b>3.7</b>	<b>93</b>	<b>9.04</b>	<b>2 690</b>	<b>4 700</b>	<b>3 500</b>	<b>2 700</b>	-	<b>55 600</b>
<b>a. Mineral Products</b>	<b>9 800</b>	-	-	-	-	-	-	-	-	<b>9 800</b>
Cement Production	7 200	-	-	-	-	-	-	-	-	7 200
Lime Production	1 650	-	-	-	-	-	-	-	-	1 650
Mineral Product Use	910	-	-	-	-	-	-	-	-	910
<b>b. Chemical Industry</b>	<b>2 600</b>	<b>3.7</b>	<b>93</b>	<b>7.6</b>	<b>2 300</b>	-	-	-	-	<b>5 000</b>
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 <sup>3</sup>	-	3.7	93	0.02	5.6	-	-	-	-	98
<b>c. Metal Production</b>	<b>14 900</b>	-	-	-	-	-	<b>3 480</b>	<b>2 440</b>	-	<b>20 900</b>
Iron and Steel Production	10 400	-	-	-	-	-	-	-	-	10 400
Aluminum Production	4 580	-	-	-	-	-	3 480	67.2	-	8 130
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 370	-	2 370
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>4 700</b>	<b>8.2</b>	<b>220</b>	<b>0.2</b>	<b>4 900</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>15 000</b>	-	-	-	-	-	-	-	-	<b>15 000</b>
<b>f. Other Product Manufacture and Use</b>	-	-	-	<b>1.4</b>	<b>430</b>	-	-	-	-	<b>430</b>
<b>AGRICULTURE</b>	-	<b>1 400</b>	<b>34 000</b>	<b>80</b>	<b>20 000</b>	-	-	-	-	<b>60 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 200</b>	<b>30 000</b>	-	-	-	-	-	-	<b>30 000</b>
<b>b. Manure Management</b>	-	<b>170</b>	<b>4 200</b>	<b>18.1</b>	<b>5 390</b>	-	-	-	-	<b>9 600</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>63</b>	<b>19 000</b>	-	-	-	-	<b>19 000</b>
Direct Sources	-	-	-	50	15 000	-	-	-	-	15 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>4</b>	<b>100</b>	<b>0.1</b>	<b>30</b>	-	-	-	-	<b>100</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>2 000</b>	-	-	-	-	-	-	-	-	<b>2 000</b>
<b>WASTE</b>	<b>460</b>	<b>1 000</b>	<b>26 000</b>	<b>3</b>	<b>800</b>	-	-	-	-	<b>27 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>1 000</b>	<b>26 000</b>	-	-	-	-	-	-	<b>26 000</b>
<b>b. Wastewater Handling</b>	-	<b>14</b>	<b>350</b>	<b>2</b>	<b>600</b>	-	-	-	-	<b>970</b>
<b>c. Waste Incineration</b>	<b>460</b>	<b>0.08</b>	<b>2</b>	<b>0.6</b>	<b>200</b>	-	-	-	-	<b>650</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>6 000</b>	<b>470</b>	<b>12 000</b>	<b>19</b>	<b>5 700</b>	-	-	-	-	<b>23 000</b>
<b>a. Forest Land</b>	<b>-140 000</b>	<b>420</b>	<b>11 000</b>	<b>18</b>	<b>5 300</b>	-	-	-	-	<b>-120 000</b>
<b>b. Cropland</b>	<b>-6 200</b>	<b>5</b>	<b>100</b>	<b>0.2</b>	<b>70</b>	-	-	-	-	<b>-6 000</b>
<b>c. Grassland</b>	-	<b>40</b>	<b>900</b>	<b>0.9</b>	<b>300</b>	-	-	-	-	<b>1 000</b>
<b>d. Wetlands</b>	<b>4 000</b>	<b>0.7</b>	<b>20</b>	<b>0.03</b>	<b>8</b>	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>4 000</b>	<b>6</b>	<b>100</b>	<b>0.2</b>	<b>60</b>	-	-	-	-	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>140 000</b>	-	-	-	-	-	-	-	-	<b>140 000</b>

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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>571 000</b>	<b>4 700</b>	<b>120 000</b>	<b>130</b>	<b>38 000</b>	<b>4 400</b>	<b>3 500</b>	<b>3 000</b>	<b>0.2</b>	<b>738 000</b>
<b>ENERGY</b>	<b>529 000</b>	<b>2 400</b>	<b>59 000</b>	<b>40</b>	<b>10 000</b>	-	-	-	-	<b>600 000</b>
<b>a. Stationary Combustion Sources</b>	<b>342 000</b>	<b>400</b>	<b>9 000</b>	<b>10</b>	<b>3 000</b>	-	-	-	-	<b>354 000</b>
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>b. Transport<sup>2</sup></b>	<b>171 000</b>	<b>30</b>	<b>900</b>	<b>30</b>	<b>9 000</b>	-	-	-	-	<b>181 000</b>
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
<b>c. Fugitive Sources</b>	<b>16 000</b>	<b>2 000</b>	<b>49 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>65 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>0.09</b>	-	-	-	-	-	-	-	-	<b>0.09</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>40 100</b>	<b>4</b>	<b>99</b>	<b>9.35</b>	<b>2 790</b>	<b>4 400</b>	<b>3 500</b>	<b>3 000</b>	-	<b>53 900</b>
<b>a. Mineral Products</b>	<b>9 800</b>	-	-	-	-	-	-	-	-	<b>9 800</b>
Cement Production	7 200	-	-	-	-	-	-	-	-	7 200
Lime Production	1 670	-	-	-	-	-	-	-	-	1 670
Mineral Product Use	940	-	-	-	-	-	-	-	-	940
<b>b. Chemical Industry</b>	<b>2 600</b>	<b>4</b>	<b>99</b>	<b>8.1</b>	<b>2 400</b>	-	-	-	-	<b>5 100</b>
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 <sup>3</sup>	-	4	99	0.02	5.5	-	-	-	-	100
<b>c. Metal Production</b>	<b>14 900</b>	-	-	-	-	-	<b>3 440</b>	<b>2 880</b>	-	<b>21 200</b>
Iron and Steel Production	10 400	-	-	-	-	-	-	-	-	10 400
Aluminum Production	4 420	-	-	-	-	-	3 440	76.5	-	7 930
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 800	-	2 800
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>4 400</b>	<b>25</b>	<b>140</b>	<b>0.2</b>	<b>4 500</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>13 000</b>	-	-	-	-	-	-	-	-	<b>13 000</b>
<b>f. Other Product Manufacture and Use</b>	-	-	-	<b>1.2</b>	<b>370</b>	-	-	-	-	<b>370</b>
<b>AGRICULTURE</b>	-	<b>1 300</b>	<b>34 000</b>	<b>80</b>	<b>20 000</b>	-	-	-	-	<b>58 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 200</b>	<b>29 000</b>	-	-	-	-	-	-	<b>29 000</b>
<b>b. Manure Management</b>	-	<b>170</b>	<b>4 200</b>	<b>17.9</b>	<b>5 340</b>	-	-	-	-	<b>9 600</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>57</b>	<b>17 000</b>	-	-	-	-	<b>17 000</b>
Direct Sources	-	-	-	46	14 000	-	-	-	-	14 000
Indirect Sources	-	-	-	10	3 000	-	-	-	-	3 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>3</b>	<b>90</b>	<b>0.09</b>	<b>30</b>	-	-	-	-	<b>100</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>2 000</b>	-	-	-	-	-	-	-	-	<b>2 000</b>
<b>WASTE</b>	<b>530</b>	<b>1 000</b>	<b>26 000</b>	<b>3</b>	<b>800</b>	-	-	-	-	<b>27 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>1 000</b>	<b>25 000</b>	-	-	-	-	-	-	<b>25 000</b>
<b>b. Wastewater Handling</b>	-	<b>14</b>	<b>340</b>	<b>2</b>	<b>600</b>	-	-	-	-	<b>970</b>
<b>c. Waste Incineration</b>	<b>530</b>	<b>0.08</b>	<b>2</b>	<b>0.7</b>	<b>200</b>	-	-	-	-	<b>750</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>81 000</b>	<b>700</b>	<b>17 000</b>	<b>29</b>	<b>8 600</b>	-	-	-	-	<b>110 000</b>
<b>a. Forest Land</b>	<b>-81 000</b>	<b>650</b>	<b>16 000</b>	<b>28</b>	<b>8 200</b>	-	-	-	-	<b>-56 000</b>
<b>b. Cropland</b>	<b>-4 800</b>	<b>5</b>	<b>100</b>	<b>0.3</b>	<b>80</b>	-	-	-	-	<b>-4 600</b>
<b>c. Grassland</b>	-	<b>30</b>	<b>800</b>	<b>0.9</b>	<b>300</b>	-	-	-	-	<b>1 000</b>
<b>d. Wetlands</b>	<b>4 000</b>	<b>0.0</b>	<b>0.03</b>	<b>0.0</b>	<b>0.01</b>	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>4 000</b>	<b>6</b>	<b>100</b>	<b>0.2</b>	<b>60</b>	-	-	-	-	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>160 000</b>	-	-	-	-	-	-	-	-	<b>160 000</b>

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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 A9–15 2001 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									TOTAL
	CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	
Global Warming Potential Unit	kt	kt	25 kt CO <sub>2</sub> eq.	kt	298 kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	22 800 kt CO <sub>2</sub> eq.	17 200 kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>565 000</b>	<b>4 800</b>	<b>120 000</b>	<b>130</b>	<b>39 000</b>	<b>3 900</b>	<b>4 000</b>	<b>2 600</b>	<b>0.2</b>	<b>735 000</b>
<b>ENERGY</b>	<b>525 000</b>	<b>2 500</b>	<b>62 000</b>	<b>40</b>	<b>10 000</b>	-	-	-	-	<b>599 000</b>
<b>a. Stationary Combustion Sources</b>	<b>339 000</b>	<b>300</b>	<b>9 000</b>	<b>10</b>	<b>3 000</b>	-	-	-	-	<b>351 000</b>
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>b. Transport<sup>2</sup></b>	<b>170 000</b>	<b>30</b>	<b>800</b>	<b>30</b>	<b>9 000</b>	-	-	-	-	<b>180 000</b>
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
<b>c. Fugitive Sources</b>	<b>16 000</b>	<b>2 100</b>	<b>52 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>68 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>0.09</b>	-	-	-	-	-	-	-	-	<b>0.09</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>38 500</b>	<b>4.1</b>	<b>100</b>	<b>8.11</b>	<b>2 420</b>	<b>3 900</b>	<b>4 000</b>	<b>2 600</b>	-	<b>51 500</b>
<b>a. Mineral Products</b>	<b>9 600</b>	-	-	-	-	-	-	-	-	<b>9 600</b>
Cement Production	7 000	-	-	-	-	-	-	-	-	7 000
Lime Production	1 640	-	-	-	-	-	-	-	-	1 640
Mineral Product Use	970	-	-	-	-	-	-	-	-	970
<b>b. Chemical Industry</b>	<b>2 600</b>	<b>4.1</b>	<b>100</b>	<b>6.8</b>	<b>2 000</b>	-	-	-	-	<b>4 700</b>
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 <sup>3</sup>	-	4.1	100	0.02	5.4	-	-	-	-	110
<b>c. Metal Production</b>	<b>14 800</b>	-	-	-	-	-	<b>4 010</b>	<b>2 290</b>	-	<b>21 100</b>
Iron and Steel Production	10 600	-	-	-	-	-	-	-	-	10 600
Aluminum Production	4 200	-	-	-	-	-	4 010	41.9	-	8 260
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 250	-	2 250
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>3 900</b>	<b>37</b>	<b>260</b>	<b>0.2</b>	<b>4 200</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>11 000</b>	-	-	-	-	-	-	-	-	<b>11 000</b>
<b>f. Other Product Manufacture and Use</b>	-	-	-	<b>1.4</b>	<b>400</b>	-	-	-	-	<b>400</b>
<b>AGRICULTURE</b>	-	<b>1 300</b>	<b>33 000</b>	<b>80</b>	<b>20 000</b>	-	-	-	-	<b>58 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 200</b>	<b>29 000</b>	-	-	-	-	-	-	<b>29 000</b>
<b>b. Manure Management</b>	-	<b>160</b>	<b>4 100</b>	<b>17.9</b>	<b>5 330</b>	-	-	-	-	<b>9 400</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>60</b>	<b>18 000</b>	-	-	-	-	<b>18 000</b>
Direct Sources	-	-	-	48	14 000	-	-	-	-	14 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>3</b>	<b>90</b>	<b>0.09</b>	<b>30</b>	-	-	-	-	<b>100</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>1 000</b>	-	-	-	-	-	-	-	-	<b>1 000</b>
<b>WASTE</b>	<b>550</b>	<b>1 000</b>	<b>25 000</b>	<b>3</b>	<b>800</b>	-	-	-	-	<b>27 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>990</b>	<b>25 000</b>	-	-	-	-	-	-	<b>25 000</b>
<b>b. Wastewater Handling</b>	-	<b>14</b>	<b>340</b>	<b>2</b>	<b>600</b>	-	-	-	-	<b>960</b>
<b>c. Waste Incineration</b>	<b>550</b>	<b>0.08</b>	<b>2</b>	<b>0.7</b>	<b>200</b>	-	-	-	-	<b>770</b>
<b>LAND-USE, LAND-USE CHANGE AND FORESTRY</b>	<b>-80 000</b>	<b>180</b>	<b>4 500</b>	<b>7.1</b>	<b>2 100</b>	-	-	-	-	<b>-73 000</b>
<b>a. Forest Land</b>	<b>-230 000</b>	<b>140</b>	<b>3 500</b>	<b>5.8</b>	<b>1 700</b>	-	-	-	-	<b>-230 000</b>
<b>b. Cropland</b>	<b>-3 200</b>	<b>6</b>	<b>200</b>	<b>0.3</b>	<b>90</b>	-	-	-	-	<b>-2 900</b>
<b>c. Grassland</b>	-	<b>30</b>	<b>700</b>	<b>0.8</b>	<b>200</b>	-	-	-	-	<b>1 000</b>
<b>d. Wetlands</b>	<b>4 000</b>	<b>0.0</b>	<b>0.03</b>	<b>0.0</b>	<b>0.01</b>	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>3 000</b>	<b>5</b>	<b>100</b>	<b>0.2</b>	<b>60</b>	-	-	-	-	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>150 000</b>	-	-	-	-	-	-	-	-	<b>150 000</b>

## 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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>572 000</b>	<b>4 900</b>	<b>120 000</b>	<b>130</b>	<b>40 000</b>	<b>3 600</b>	<b>5 000</b>	<b>2 900</b>	<b>0.2</b>	<b>745 000</b>
<b>ENERGY</b>	<b>530 000</b>	<b>2 500</b>	<b>64 000</b>	<b>40</b>	<b>10 000</b>	-	-	-	-	<b>606 000</b>
<b>a. Stationary Combustion Sources</b>	<b>343 000</b>	<b>400</b>	<b>9 000</b>	<b>10</b>	<b>3 000</b>	-	-	-	-	<b>355 000</b>
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>b. Transport<sup>2</sup></b>	<b>172 000</b>	<b>40</b>	<b>900</b>	<b>30</b>	<b>9 000</b>	-	-	-	-	<b>182 000</b>
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
<b>c. Fugitive Sources</b>	<b>16 000</b>	<b>2 100</b>	<b>54 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>70 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>0.09</b>	-	-	-	-	-	-	-	-	<b>0.09</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>39 400</b>	<b>4.2</b>	<b>110</b>	<b>8.34</b>	<b>2 490</b>	<b>3 600</b>	<b>5 000</b>	<b>2 900</b>	-	<b>53 400</b>
<b>a. Mineral Products</b>	<b>10 000</b>	-	-	-	-	-	-	-	-	<b>10 000</b>
Cement Production	7 200	-	-	-	-	-	-	-	-	7 200
Lime Production	1 870	-	-	-	-	-	-	-	-	1 870
Mineral Product Use	1 200	-	-	-	-	-	-	-	-	1 200
<b>b. Chemical Industry</b>	<b>3 000</b>	<b>4.2</b>	<b>110</b>	<b>6.9</b>	<b>2 100</b>	-	-	-	-	<b>5 100</b>
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 <sup>3</sup>	-	4.2	110	0.02	6	-	-	-	-	110
<b>c. Metal Production</b>	<b>15 400</b>	-	-	-	-	-	<b>4 950</b>	<b>2 700</b>	-	<b>23 100</b>
Iron and Steel Production	11 500	-	-	-	-	-	-	-	-	11 500
Aluminum Production	3 900	-	-	-	-	-	4 950	45.1	-	8 890
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 660	-	2 660
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>3 600</b>	<b>37</b>	<b>200</b>	<b>0.2</b>	<b>3 800</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>11 000</b>	-	-	-	-	-	-	-	-	<b>11 000</b>
<b>f. Other Product Manufacture and Use</b>	-	-	-	<b>1.5</b>	<b>430</b>	-	-	-	-	<b>430</b>
<b>AGRICULTURE</b>	-	<b>1 300</b>	<b>33 000</b>	<b>80</b>	<b>20 000</b>	-	-	-	-	<b>59 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 100</b>	<b>28 000</b>	-	-	-	-	-	-	<b>28 000</b>
<b>b. Manure Management</b>	-	<b>160</b>	<b>4 000</b>	<b>17.4</b>	<b>5 180</b>	-	-	-	-	<b>9 200</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>65</b>	<b>19 000</b>	-	-	-	-	<b>19 000</b>
Direct Sources	-	-	-	52	16 000	-	-	-	-	16 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>4</b>	<b>100</b>	<b>0.1</b>	<b>30</b>	-	-	-	-	<b>100</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>2 000</b>	-	-	-	-	-	-	-	-	<b>2 000</b>
<b>WASTE</b>	<b>530</b>	<b>1 000</b>	<b>25 000</b>	<b>3</b>	<b>800</b>	-	-	-	-	<b>26 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>990</b>	<b>25 000</b>	-	-	-	-	-	-	<b>25 000</b>
<b>b. Wastewater Handling</b>	-	<b>14</b>	<b>350</b>	<b>2</b>	<b>600</b>	-	-	-	-	<b>950</b>
<b>c. Waste Incineration</b>	<b>530</b>	<b>0.07</b>	<b>2</b>	<b>0.7</b>	<b>200</b>	-	-	-	-	<b>740</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>-80 000</b>	<b>100</b>	<b>2 600</b>	<b>3.9</b>	<b>1 200</b>	-	-	-	-	<b>-77 000</b>
<b>a. Forest Land</b>	<b>-250 000</b>	<b>62</b>	<b>1 600</b>	<b>2.6</b>	<b>780</b>	-	-	-	-	<b>-250 000</b>
<b>b. Cropland</b>	<b>-2 300</b>	<b>5</b>	<b>100</b>	<b>0.3</b>	<b>80</b>	-	-	-	-	<b>-2 100</b>
<b>c. Grassland</b>	-	<b>30</b>	<b>800</b>	<b>0.8</b>	<b>200</b>	-	-	-	-	<b>1 000</b>
<b>d. Wetlands</b>	<b>4 000</b>	-	-	-	-	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>3 000</b>	<b>5</b>	<b>100</b>	<b>0.2</b>	<b>60</b>	-	-	-	-	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>170 000</b>	-	-	-	-	-	-	-	-	<b>170 000</b>

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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 A9–17 1999 GHG Emission Summary for Canada

Greenhouse Gas Categories	Greenhouse Gases									
	CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>549 000</b>	<b>4 800</b>	<b>120 000</b>	<b>140</b>	<b>40 000</b>	<b>3 000</b>	<b>5 400</b>	<b>2 400</b>	<b>0.2</b>	<b>722 000</b>
<b>ENERGY</b>	<b>508 000</b>	<b>2 600</b>	<b>64 000</b>	<b>40</b>	<b>10 000</b>	-	-	-	-	<b>584 000</b>
<b>a. Stationary Combustion Sources</b>	<b>321 000</b>	<b>400</b>	<b>9 000</b>	<b>10</b>	<b>3 000</b>	-	-	-	-	<b>333 000</b>
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>b. Transport<sup>2</sup></b>	<b>171 000</b>	<b>40</b>	<b>900</b>	<b>30</b>	<b>9 000</b>	-	-	-	-	<b>181 000</b>
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
<b>c. Fugitive Sources</b>	<b>16 000</b>	<b>2 200</b>	<b>54 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>70 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	-	-	-	-	-	-	-	-	-	-
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>39 400</b>	<b>4.1</b>	<b>100</b>	<b>10.8</b>	<b>3 200</b>	<b>3 000</b>	<b>5 400</b>	<b>2 400</b>	-	<b>53 500</b>
<b>a. Mineral Products</b>	<b>9 900</b>	-	-	-	-	-	-	-	-	<b>9 900</b>
Cement Production	7 100	-	-	-	-	-	-	-	-	7 100
Lime Production	1 920	-	-	-	-	-	-	-	-	1 920
Mineral Product Use	960	-	-	-	-	-	-	-	-	960
<b>b. Chemical Industry</b>	<b>3 000</b>	<b>4.1</b>	<b>100</b>	<b>9.4</b>	<b>2 800</b>	-	-	-	-	<b>5 900</b>
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 <sup>3</sup>	-	4.1	100	0.02	6.7	-	-	-	-	110
<b>c. Metal Production</b>	<b>15 400</b>	-	-	-	-	-	<b>5 340</b>	<b>2 220</b>	-	<b>23 000</b>
Iron and Steel Production	11 500	-	-	-	-	-	-	-	-	11 500
Aluminum Production	3 950	-	-	-	-	-	5 340	51.1	-	9 340
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 160	-	2 160
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>3 000</b>	<b>28</b>	<b>200</b>	<b>0.2</b>	<b>3 200</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>11 000</b>	-	-	-	-	-	-	-	-	<b>11 000</b>
<b>f. Other Product Manufacture and Use</b>	-	-	-	<b>1.3</b>	<b>390</b>	-	-	-	-	<b>390</b>
<b>AGRICULTURE</b>	-	<b>1 300</b>	<b>32 000</b>	<b>80</b>	<b>20 000</b>	-	-	-	-	<b>58 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 100</b>	<b>28 000</b>	-	-	-	-	-	-	<b>28 000</b>
<b>b. Manure Management</b>	-	<b>160</b>	<b>3 900</b>	<b>16.9</b>	<b>5 050</b>	-	-	-	-	<b>8 900</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>65</b>	<b>19 000</b>	-	-	-	-	<b>19 000</b>
Direct Sources	-	-	-	53	16 000	-	-	-	-	16 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>5</b>	<b>100</b>	<b>0.1</b>	<b>30</b>	-	-	-	-	<b>100</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>2 000</b>	-	-	-	-	-	-	-	-	<b>2 000</b>
<b>WASTE</b>	<b>480</b>	<b>1 000</b>	<b>25 000</b>	<b>3</b>	<b>800</b>	-	-	-	-	<b>26 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>990</b>	<b>25 000</b>	-	-	-	-	-	-	<b>25 000</b>
<b>b. Wastewater Handling</b>	-	<b>15</b>	<b>360</b>	<b>2</b>	<b>600</b>	-	-	-	-	<b>960</b>
<b>c. Waste Incineration</b>	<b>480</b>	<b>0.06</b>	<b>1</b>	<b>0.6</b>	<b>200</b>	-	-	-	-	<b>660</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>-25 000</b>	<b>330</b>	<b>8 300</b>	<b>14</b>	<b>4 100</b>	-	-	-	-	<b>-12 000</b>
<b>a. Forest Land</b>	<b>-190 000</b>	<b>300</b>	<b>7 400</b>	<b>13</b>	<b>3 700</b>	-	-	-	-	<b>-180 000</b>
<b>b. Cropland</b>	<b>-990</b>	<b>6</b>	<b>100</b>	<b>0.3</b>	<b>90</b>	-	-	-	-	<b>-750</b>
<b>c. Grassland</b>	-	<b>20</b>	<b>600</b>	<b>0.6</b>	<b>200</b>	-	-	-	-	<b>800</b>
<b>d. Wetlands</b>	<b>5 000</b>	<b>2</b>	<b>40</b>	<b>0.07</b>	<b>20</b>	-	-	-	-	<b>5 000</b>
<b>e. Settlements</b>	<b>3 000</b>	<b>5</b>	<b>100</b>	<b>0.2</b>	<b>60</b>	-	-	-	-	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>160 000</b>	-	-	-	-	-	-	-	-	<b>160 000</b>

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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>534 000</b>	<b>4 900</b>	<b>120 000</b>	<b>140</b>	<b>43 000</b>	<b>2 400</b>	<b>6 500</b>	<b>2 400</b>	<b>0.3</b>	<b>709 000</b>
<b>ENERGY</b>	<b>493 000</b>	<b>2 600</b>	<b>65 000</b>	<b>40</b>	<b>10 000</b>	-	-	-	-	<b>570 000</b>
<b>a. Stationary Combustion Sources</b>	<b>309 000</b>	<b>400</b>	<b>9 000</b>	<b>10</b>	<b>3 000</b>	-	-	-	-	<b>321 000</b>
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>b. Transport<sup>2</sup></b>	<b>167 000</b>	<b>40</b>	<b>900</b>	<b>30</b>	<b>9 000</b>	-	-	-	-	<b>176 000</b>
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
<b>c. Fugitive Sources</b>	<b>18 000</b>	<b>2 200</b>	<b>55 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>73 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	-	-	-	-	-	-	-	-	-	-
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>38 200</b>	<b>3.6</b>	<b>91</b>	<b>21</b>	<b>6 260</b>	<b>2 400</b>	<b>6 500</b>	<b>2 400</b>	-	<b>55 800</b>
<b>a. Mineral Products</b>	<b>9 700</b>	-	-	-	-	-	-	-	-	<b>9 700</b>
Cement Production	6 800	-	-	-	-	-	-	-	-	6 800
Lime Production	1 850	-	-	-	-	-	-	-	-	1 850
Mineral Product Use	1 100	-	-	-	-	-	-	-	-	1 100
<b>b. Chemical Industry</b>	<b>3 100</b>	<b>3.6</b>	<b>91</b>	<b>20</b>	<b>5 900</b>	-	-	-	-	<b>9 100</b>
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 <sup>3</sup>	-	3.6	91	0.02	7.2	-	-	-	-	98
<b>c. Metal Production</b>	<b>15 200</b>	-	-	-	-	-	<b>6 450</b>	<b>2 160</b>	-	<b>23 800</b>
Iron and Steel Production	11 200	-	-	-	-	-	-	-	-	11 200
Aluminum Production	3 980	-	-	-	-	-	6 450	56.4	-	10 500
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 100	-	2 100
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>2 400</b>	<b>22</b>	<b>200</b>	<b>0.3</b>	<b>2 600</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>10 000</b>	-	-	-	-	-	-	-	-	<b>10 000</b>
<b>f. Other Product Manufacture and Use</b>	-	-	-	<b>1.3</b>	<b>390</b>	-	-	-	-	<b>390</b>
<b>AGRICULTURE</b>	-	<b>1 300</b>	<b>32 000</b>	<b>80</b>	<b>20 000</b>	-	-	-	-	<b>58 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 100</b>	<b>28 000</b>	-	-	-	-	-	-	<b>28 000</b>
<b>b. Manure Management</b>	-	<b>150</b>	<b>3 900</b>	<b>16.7</b>	<b>4 960</b>	-	-	-	-	<b>8 800</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>64</b>	<b>19 000</b>	-	-	-	-	<b>19 000</b>
Direct Sources	-	-	-	52	16 000	-	-	-	-	16 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>6</b>	<b>200</b>	<b>0.2</b>	<b>50</b>	-	-	-	-	<b>200</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>2 000</b>	-	-	-	-	-	-	-	-	<b>2 000</b>
<b>WASTE</b>	<b>530</b>	<b>980</b>	<b>25 000</b>	<b>3</b>	<b>800</b>	-	-	-	-	<b>26 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>970</b>	<b>24 000</b>	-	-	-	-	-	-	<b>24 000</b>
<b>b. Wastewater Handling</b>	-	<b>15</b>	<b>380</b>	<b>2</b>	<b>600</b>	-	-	-	-	<b>960</b>
<b>c. Waste Incineration</b>	<b>530</b>	<b>0.06</b>	<b>2</b>	<b>0.7</b>	<b>200</b>	-	-	-	-	<b>730</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>94 000</b>	<b>800</b>	<b>20 000</b>	<b>33</b>	<b>9 900</b>	-	-	-	-	<b>120 000</b>
<b>a. Forest Land</b>	<b>-69 000</b>	<b>760</b>	<b>19 000</b>	<b>32</b>	<b>9 600</b>	-	-	-	-	<b>-41 000</b>
<b>b. Cropland</b>	<b>300</b>	<b>6</b>	<b>200</b>	<b>0.3</b>	<b>90</b>	-	-	-	-	<b>540</b>
<b>c. Grassland</b>	-	<b>20</b>	<b>500</b>	<b>0.5</b>	<b>200</b>	-	-	-	-	<b>700</b>
<b>d. Wetlands</b>	<b>4 000</b>	<b>0.9</b>	<b>20</b>	<b>0.04</b>	<b>10</b>	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>3 000</b>	<b>5</b>	<b>100</b>	<b>0.2</b>	<b>50</b>	-	-	-	-	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>160 000</b>	-	-	-	-	-	-	-	-	<b>160 000</b>

## Notes:

- National totals exclude all GHGs from the Land Use, Land-use Change and Forestry Sector.
- Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
- The Petrochemical and Carbon Black Production category includes CH<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> emissions are included in Non-Energy Products from Fuels and Solvent Use.
- 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.
- 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 <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential Unit	kt	kt	25 kt CO <sub>2</sub> eq.	kt	298 kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	22 800 kt CO <sub>2</sub> eq.	17 200 kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>524 000</b>	<b>4 800</b>	<b>120 000</b>	<b>160</b>	<b>47 000</b>	<b>1 900</b>	<b>6 400</b>	<b>1 800</b>	<b>0.3</b>	<b>701 000</b>
<b>ENERGY</b>	<b>485 000</b>	<b>2 500</b>	<b>64 000</b>	<b>40</b>	<b>10 000</b>	-	-	-	-	<b>560 000</b>
<b>a. Stationary Combustion Sources</b>	<b>305 000</b>	<b>300</b>	<b>8 000</b>	<b>9</b>	<b>3 000</b>	-	-	-	-	<b>316 000</b>
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>b. Transport<sup>2</sup></b>	<b>163 000</b>	<b>40</b>	<b>900</b>	<b>30</b>	<b>9 000</b>	-	-	-	-	<b>173 000</b>
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
<b>c. Fugitive Sources</b>	<b>16 000</b>	<b>2 200</b>	<b>55 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>71 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	-	-	-	-	-	-	-	-	-	-
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>37 800</b>	<b>3.8</b>	<b>95</b>	<b>36.1</b>	<b>10 700</b>	<b>1 900</b>	<b>6 400</b>	<b>1 800</b>	-	<b>58 700</b>
<b>a. Mineral Products</b>	<b>9 600</b>	-	-	-	-	-	-	-	-	<b>9 600</b>
Cement Production	6 600	-	-	-	-	-	-	-	-	6 600
Lime Production	1 860	-	-	-	-	-	-	-	-	1 860
Mineral Product Use	1 100	-	-	-	-	-	-	-	-	1 100
<b>b. Chemical Industry</b>	<b>2 800</b>	<b>3.8</b>	<b>95</b>	<b>35</b>	<b>11 000</b>	-	-	-	-	<b>13 000</b>
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 <sup>3</sup>	-	3.8	95	0.03	8.1	-	-	-	-	100
<b>c. Metal Production</b>	<b>14 900</b>	-	-	-	-	-	<b>6 350</b>	<b>1 650</b>	-	<b>22 900</b>
Iron and Steel Production	11 000	-	-	-	-	-	-	-	-	11 000
Aluminum Production	3 930	-	-	-	-	-	6 350	56.4	-	10 300
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	1 600	-	1 600
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>1 900</b>	<b>23</b>	<b>180</b>	<b>0.3</b>	<b>2 100</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>11 000</b>	-	-	-	-	-	-	-	-	<b>11 000</b>
<b>f. Other Product Manufacture and Use</b>	-	-	-	<b>0.74</b>	<b>220</b>	-	-	-	-	<b>220</b>
<b>AGRICULTURE</b>	-	<b>1 300</b>	<b>32 000</b>	<b>80</b>	<b>20 000</b>	-	-	-	-	<b>57 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 100</b>	<b>28 000</b>	-	-	-	-	-	-	<b>28 000</b>
<b>b. Manure Management</b>	-	<b>150</b>	<b>3 800</b>	<b>16.4</b>	<b>4 880</b>	-	-	-	-	<b>8 700</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>63</b>	<b>19 000</b>	-	-	-	-	<b>19 000</b>
Direct Sources	-	-	-	51	15 000	-	-	-	-	15 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>6</b>	<b>100</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>200</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>2 000</b>	-	-	-	-	-	-	-	-	<b>2 000</b>
<b>WASTE</b>	<b>500</b>	<b>970</b>	<b>24 000</b>	<b>3</b>	<b>700</b>	-	-	-	-	<b>26 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>960</b>	<b>24 000</b>	-	-	-	-	-	-	<b>24 000</b>
<b>b. Wastewater Handling</b>	-	<b>16</b>	<b>390</b>	<b>2</b>	<b>600</b>	-	-	-	-	<b>960</b>
<b>c. Waste Incineration</b>	<b>500</b>	<b>0.05</b>	<b>1</b>	<b>0.6</b>	<b>200</b>	-	-	-	-	<b>680</b>
<b>LAND-USE, LAND-USE CHANGE AND FORESTRY</b>	<b>-92 000</b>	<b>110</b>	<b>2 800</b>	<b>4.4</b>	<b>1 300</b>	-	-	-	-	<b>-88 000</b>
<b>a. Forest Land</b>	<b>-260 000</b>	<b>84</b>	<b>2 100</b>	<b>3.5</b>	<b>1 000</b>	-	-	-	-	<b>-260 000</b>
<b>b. Cropland</b>	<b>1 600</b>	<b>6</b>	<b>200</b>	<b>0.3</b>	<b>90</b>	-	-	-	-	<b>1 900</b>
<b>c. Grassland</b>	-	<b>20</b>	<b>400</b>	<b>0.4</b>	<b>100</b>	-	-	-	-	<b>600</b>
<b>d. Wetlands</b>	<b>4 000</b>	<b>0.1</b>	<b>4</b>	<b>0.01</b>	<b>2</b>	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>3 000</b>	<b>5</b>	<b>100</b>	<b>0.2</b>	<b>50</b>	-	-	-	-	<b>3 000</b>
<b>f. Harvested Wood Products</b>	<b>160 000</b>	-	-	-	-	-	-	-	-	<b>160 000</b>

## 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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>510 000</b>	<b>4 700</b>	<b>120 000</b>	<b>160</b>	<b>48 000</b>	<b>1 400</b>	<b>6 500</b>	<b>1 800</b>	<b>0.3</b>	<b>685 000</b>
<b>ENERGY</b>	<b>471 000</b>	<b>2 500</b>	<b>62 000</b>	<b>40</b>	<b>10 000</b>	-	-	-	-	<b>544 000</b>
<b>a. Stationary Combustion Sources</b>	<b>298 000</b>	<b>300</b>	<b>8 000</b>	<b>9</b>	<b>3 000</b>	-	-	-	-	<b>309 000</b>
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>b. Transport<sup>2</sup></b>	<b>158 000</b>	<b>40</b>	<b>900</b>	<b>30</b>	<b>8 000</b>	-	-	-	-	<b>167 000</b>
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
<b>c. Fugitive Sources</b>	<b>16 000</b>	<b>2 100</b>	<b>53 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>69 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	-	-	-	-	-	-	-	-	-	-
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>36 800</b>	<b>4</b>	<b>99</b>	<b>41.3</b>	<b>12 300</b>	<b>1 400</b>	<b>6 500</b>	<b>1 800</b>	-	<b>58 900</b>
<b>a. Mineral Products</b>	<b>8 900</b>	-	-	-	-	-	-	-	-	<b>8 900</b>
Cement Production	6 100	-	-	-	-	-	-	-	-	6 100
Lime Production	1 800	-	-	-	-	-	-	-	-	1 800
Mineral Product Use	1 000	-	-	-	-	-	-	-	-	1 000
<b>b. Chemical Industry</b>	<b>2 800</b>	<b>4</b>	<b>99</b>	<b>41</b>	<b>12 000</b>	-	-	-	-	<b>15 000</b>
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 <sup>3</sup>	-	4	99	0.03	7.8	-	-	-	-	110
<b>c. Metal Production</b>	<b>15 000</b>	-	-	-	-	-	<b>6 480</b>	<b>1 620</b>	-	<b>23 100</b>
Iron and Steel Production	11 200	-	-	-	-	-	-	-	-	11 200
Aluminum Production	3 860	-	-	-	-	-	6 480	56.4	-	10 400
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	1 560	-	1 560
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>1 400</b>	<b>27</b>	<b>150</b>	<b>0.3</b>	<b>1 600</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>10 000</b>	-	-	-	-	-	-	-	-	<b>10 000</b>
<b>f. Other Product Manufacture and Use</b>	-	-	-	<b>0.7</b>	<b>210</b>	-	-	-	-	<b>210</b>
<b>AGRICULTURE</b>	-	<b>1 300</b>	<b>32 000</b>	<b>80</b>	<b>20 000</b>	-	-	-	-	<b>57 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 100</b>	<b>28 000</b>	-	-	-	-	-	-	<b>28 000</b>
<b>b. Manure Management</b>	-	<b>150</b>	<b>3 800</b>	<b>16.3</b>	<b>4 850</b>	-	-	-	-	<b>8 700</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>64</b>	<b>19 000</b>	-	-	-	-	<b>19 000</b>
Direct Sources	-	-	-	52	16 000	-	-	-	-	16 000
Indirect Sources	-	-	-	10	4 000	-	-	-	-	4 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>5</b>	<b>100</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>200</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>1 000</b>	-	-	-	-	-	-	-	-	<b>1 000</b>
<b>WASTE</b>	<b>540</b>	<b>960</b>	<b>24 000</b>	<b>3</b>	<b>800</b>	-	-	-	-	<b>25 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>940</b>	<b>24 000</b>	-	-	-	-	-	-	<b>24 000</b>
<b>b. Wastewater Handling</b>	-	<b>16</b>	<b>400</b>	<b>2</b>	<b>600</b>	-	-	-	-	<b>950</b>
<b>c. Waste Incineration</b>	<b>540</b>	<b>0.4</b>	<b>9</b>	<b>0.8</b>	<b>200</b>	-	-	-	-	<b>780</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>-48 000</b>	<b>260</b>	<b>6 400</b>	<b>11</b>	<b>3 100</b>	-	-	-	-	<b>-38 000</b>
<b>a. Forest Land</b>	<b>-220 000</b>	<b>230</b>	<b>5 800</b>	<b>9.7</b>	<b>2 900</b>	-	-	-	-	<b>-210 000</b>
<b>b. Cropland</b>	<b>2 900</b>	<b>6</b>	<b>200</b>	<b>0.3</b>	<b>100</b>	-	-	-	-	<b>3 200</b>
<b>c. Grassland</b>	-	<b>20</b>	<b>400</b>	<b>0.4</b>	<b>100</b>	-	-	-	-	<b>500</b>
<b>d. Wetlands</b>	<b>4 000</b>	-	-	-	-	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>3 000</b>	<b>4</b>	<b>100</b>	<b>0.2</b>	<b>50</b>	-	-	-	-	<b>3 000</b>
<b>f. Harvested Wood Products</b>	<b>160 000</b>	-	-	-	-	-	-	-	-	<b>160 000</b>

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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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									TOTAL
	CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	
Global Warming Potential Unit	kt	kt	25 kt CO <sub>2</sub> eq.	kt	298 kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	22 800 kt CO <sub>2</sub> eq.	17 200 kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>494 000</b>	<b>4 600</b>	<b>110 000</b>	<b>150</b>	<b>46 000</b>	<b>960</b>	<b>6 300</b>	<b>2 300</b>	<b>0.3</b>	<b>664 000</b>
<b>ENERGY</b>	<b>457 000</b>	<b>2 300</b>	<b>59 000</b>	<b>30</b>	<b>10 000</b>	-	-	-	-	<b>526 000</b>
<b>a. Stationary Combustion Sources</b>	<b>289 000</b>	<b>300</b>	<b>9 000</b>	<b>9</b>	<b>3 000</b>	-	-	-	-	<b>300 000</b>
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>b. Transport<sup>2</sup></b>	<b>154 000</b>	<b>40</b>	<b>900</b>	<b>30</b>	<b>8 000</b>	-	-	-	-	<b>162 000</b>
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
<b>c. Fugitive Sources</b>	<b>15 000</b>	<b>2 000</b>	<b>49 000</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>64 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	-	-	-	-	-	-	-	-	-	-
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>35 100</b>	<b>3.9</b>	<b>97</b>	<b>38.6</b>	<b>11 500</b>	<b>960</b>	<b>6 300</b>	<b>2 300</b>	-	<b>56 300</b>
<b>a. Mineral Products</b>	<b>9 200</b>	-	-	-	-	-	-	-	-	<b>9 200</b>
Cement Production	6 500	-	-	-	-	-	-	-	-	6 500
Lime Production	1 860	-	-	-	-	-	-	-	-	1 860
Mineral Product Use	890	-	-	-	-	-	-	-	-	890
<b>b. Chemical Industry</b>	<b>2 900</b>	<b>3.9</b>	<b>97</b>	<b>38</b>	<b>11 000</b>	-	-	-	-	<b>14 000</b>
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 <sup>3</sup>	-	3.9	97	0.03	8.3	-	-	-	-	100
<b>c. Metal Production</b>	<b>15 000</b>	-	-	-	-	-	<b>6 310</b>	<b>2 070</b>	-	<b>23 400</b>
Iron and Steel Production	11 300	-	-	-	-	-	-	-	-	11 300
Aluminum Production	3 640	-	-	-	-	-	6 310	56.4	-	10 000
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 010	-	2 010
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	-	-	-	-	-	<b>960</b>	<b>35</b>	<b>210</b>	<b>0.3</b>	<b>1 200</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>8 000</b>	-	-	-	-	-	-	-	-	<b>8 000</b>
<b>f. Other Product Manufacture and Use</b>	-	-	-	<b>0.69</b>	<b>200</b>	-	-	-	-	<b>200</b>
<b>AGRICULTURE</b>	-	<b>1 200</b>	<b>31 000</b>	<b>80</b>	<b>20 000</b>	-	-	-	-	<b>56 000</b>
<b>a. Enteric Fermentation</b>	-	<b>1 100</b>	<b>27 000</b>	-	-	-	-	-	-	<b>27 000</b>
<b>b. Manure Management</b>	-	<b>150</b>	<b>3 800</b>	<b>16.2</b>	<b>4 830</b>	-	-	-	-	<b>8 600</b>
<b>c. Agriculture Soils</b>	-	-	-	<b>61</b>	<b>18 000</b>	-	-	-	-	<b>18 000</b>
Direct Sources	-	-	-	50	15 000	-	-	-	-	15 000
Indirect Sources	-	-	-	10	3 000	-	-	-	-	3 000
<b>d. Field Burning of Agricultural Residues</b>	-	<b>6</b>	<b>100</b>	<b>0.1</b>	<b>40</b>	-	-	-	-	<b>200</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>1 000</b>	-	-	-	-	-	-	-	-	<b>1 000</b>
<b>WASTE</b>	<b>580</b>	<b>960</b>	<b>24 000</b>	<b>3</b>	<b>800</b>	-	-	-	-	<b>25 000</b>
<b>a. Solid Waste Disposal on Land</b>	-	<b>950</b>	<b>24 000</b>	-	-	-	-	-	-	<b>24 000</b>
<b>b. Wastewater Handling</b>	-	<b>16</b>	<b>390</b>	<b>2</b>	<b>500</b>	-	-	-	-	<b>940</b>
<b>c. Waste Incineration</b>	<b>580</b>	<b>0.4</b>	<b>9</b>	<b>0.9</b>	<b>300</b>	-	-	-	-	<b>840</b>
<b>LAND-USE, LAND-USE CHANGE AND FORESTRY</b>	<b>150 000</b>	<b>960</b>	<b>24 000</b>	<b>40</b>	<b>12 000</b>	-	-	-	-	<b>190 000</b>
<b>a. Forest Land</b>	<b>-26 000</b>	<b>930</b>	<b>23 000</b>	<b>39</b>	<b>12 000</b>	-	-	-	-	<b>9 500</b>
<b>b. Cropland</b>	<b>4 000</b>	<b>7</b>	<b>200</b>	<b>0.4</b>	<b>100</b>	-	-	-	-	<b>4 300</b>
<b>c. Grassland</b>	-	<b>9</b>	<b>200</b>	<b>0.2</b>	<b>70</b>	-	-	-	-	<b>300</b>
<b>d. Wetlands</b>	<b>4 000</b>	<b>0.01</b>	<b>0.3</b>	<b>0.0</b>	<b>0.2</b>	-	-	-	-	<b>4 000</b>
<b>e. Settlements</b>	<b>3 000</b>	<b>4</b>	<b>100</b>	<b>0.2</b>	<b>50</b>	-	-	-	-	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>170 000</b>	-	-	-	-	-	-	-	-	<b>170 000</b>

## 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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>482 000</b>	<b>4 400</b>	<b>110 000</b>	<b>150</b>	<b>45 000</b>	<b>-</b>	<b>6 900</b>	<b>2 400</b>	<b>0.3</b>	<b>646 000</b>
<b>ENERGY</b>	<b>446 000</b>	<b>2 200</b>	<b>56 000</b>	<b>30</b>	<b>10 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>512 000</b>
<b>a. Stationary Combustion Sources</b>	<b>282 000</b>	<b>400</b>	<b>9 000</b>	<b>9</b>	<b>3 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>293 000</b>
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>b. Transport<sup>2</sup></b>	<b>150 000</b>	<b>30</b>	<b>800</b>	<b>20</b>	<b>7 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>158 000</b>
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
<b>c. Fugitive Sources</b>	<b>14 000</b>	<b>1 900</b>	<b>46 000</b>	<b>0.1</b>	<b>40</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>61 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>33 900</b>	<b>4</b>	<b>100</b>	<b>39.1</b>	<b>11 600</b>	<b>-</b>	<b>6 900</b>	<b>2 400</b>	<b>-</b>	<b>55 000</b>
<b>a. Mineral Products</b>	<b>8 500</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>8 500</b>
Cement Production	5 700	-	-	-	-	-	-	-	-	5 700
Lime Production	1 850	-	-	-	-	-	-	-	-	1 850
Mineral Product Use	930	-	-	-	-	-	-	-	-	930
<b>b. Chemical Industry</b>	<b>3 000</b>	<b>4</b>	<b>100</b>	<b>38</b>	<b>11 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>15 000</b>
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 <sup>3</sup>	-	4	100	0.03	9	-	-	-	-	110
<b>c. Metal Production</b>	<b>14 700</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>6 890</b>	<b>2 240</b>	<b>-</b>	<b>23 800</b>
Iron and Steel Production	10 900	-	-	-	-	-	-	-	-	10 900
Aluminum Production	3 770	-	-	-	-	-	6 890	56.3	-	10 700
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 180	-	2 180
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.05</b>	<b>210</b>	<b>0.3</b>	<b>210</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>7 700</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7 700</b>
<b>f. Other Product Manufacture and Use</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.57</b>	<b>170</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>170</b>
<b>AGRICULTURE</b>	<b>-</b>	<b>1 200</b>	<b>30 000</b>	<b>80</b>	<b>20 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>54 000</b>
<b>a. Enteric Fermentation</b>	<b>-</b>	<b>1 000</b>	<b>26 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>26 000</b>
<b>b. Manure Management</b>	<b>-</b>	<b>140</b>	<b>3 600</b>	<b>15.5</b>	<b>4 610</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>8 200</b>
<b>c. Agriculture Soils</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>60</b>	<b>18 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>18 000</b>
Direct Sources	-	-	-	49	15 000	-	-	-	-	15 000
Indirect Sources	-	-	-	10	3 000	-	-	-	-	3 000
<b>d. Field Burning of Agricultural Residues</b>	<b>-</b>	<b>6</b>	<b>100</b>	<b>0.1</b>	<b>40</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>200</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>1 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1 000</b>
<b>WASTE</b>	<b>550</b>	<b>960</b>	<b>24 000</b>	<b>3</b>	<b>800</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>25 000</b>
<b>a. Solid Waste Disposal on Land</b>	<b>-</b>	<b>950</b>	<b>24 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>24 000</b>
<b>b. Wastewater Handling</b>	<b>-</b>	<b>16</b>	<b>390</b>	<b>2</b>	<b>500</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>930</b>
<b>c. Waste Incineration</b>	<b>550</b>	<b>0.3</b>	<b>8</b>	<b>0.8</b>	<b>200</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>780</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>-50 000</b>	<b>320</b>	<b>7 900</b>	<b>13</b>	<b>3 800</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-38 000</b>
<b>a. Forest Land</b>	<b>-220 000</b>	<b>280</b>	<b>6 900</b>	<b>12</b>	<b>3 400</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-210 000</b>
<b>b. Cropland</b>	<b>5 100</b>	<b>8</b>	<b>200</b>	<b>0.4</b>	<b>100</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>5 400</b>
<b>c. Grassland</b>	<b>-</b>	<b>30</b>	<b>700</b>	<b>0.8</b>	<b>200</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1 000</b>
<b>d. Wetlands</b>	<b>4 000</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>4 000</b>
<b>e. Settlements</b>	<b>4 000</b>	<b>4</b>	<b>100</b>	<b>0.2</b>	<b>50</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>160 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>160 000</b>

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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential Unit	kt	kt	25 kt CO <sub>2</sub> eq.	kt	298 kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	22 800 kt CO <sub>2</sub> eq.	17 200 kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>467 000</b>	<b>4 200</b>	<b>110 000</b>	<b>140</b>	<b>42 000</b>	<b>-</b>	<b>7 500</b>	<b>2 400</b>	<b>0.3</b>	<b>625 000</b>
<b>ENERGY</b>	<b>431 000</b>	<b>2 100</b>	<b>54 000</b>	<b>30</b>	<b>10 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>495 000</b>
<b>a. Stationary Combustion Sources</b>	<b>276 000</b>	<b>300</b>	<b>9 000</b>	<b>9</b>	<b>3 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>287 000</b>
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>b. Transport<sup>2</sup></b>	<b>143 000</b>	<b>30</b>	<b>800</b>	<b>20</b>	<b>7 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>151 000</b>
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
<b>c. Fugitive Sources</b>	<b>13 000</b>	<b>1 800</b>	<b>44 000</b>	<b>0.1</b>	<b>30</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>57 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>33 600</b>	<b>3.9</b>	<b>97</b>	<b>33.2</b>	<b>9 900</b>	<b>-</b>	<b>7 500</b>	<b>2 400</b>	<b>-</b>	<b>53 400</b>
<b>a. Mineral Products</b>	<b>7 400</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7 400</b>
Cement Production	4 800	-	-	-	-	-	-	-	-	4 800
Lime Production	1 800	-	-	-	-	-	-	-	-	1 800
Mineral Product Use	790	-	-	-	-	-	-	-	-	790
<b>b. Chemical Industry</b>	<b>2 900</b>	<b>3.9</b>	<b>97</b>	<b>33</b>	<b>9 700</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>13 000</b>
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 <sup>3</sup>	-	3.9	97	0.03	7.7	-	-	-	-	110
<b>c. Metal Production</b>	<b>15 700</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7 460</b>	<b>2 170</b>	<b>-</b>	<b>25 300</b>
Iron and Steel Production	11 800	-	-	-	-	-	-	-	-	11 800
Aluminum Production	3 910	-	-	-	-	-	7 460	56.3	-	11 400
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 110	-	2 110
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.05</b>	<b>210</b>	<b>0.3</b>	<b>210</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>7 600</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7 600</b>
<b>f. Other Product Manufacture and Use</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.51</b>	<b>150</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>150</b>
<b>AGRICULTURE</b>	<b>-</b>	<b>1 100</b>	<b>29 000</b>	<b>70</b>	<b>20 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>52 000</b>
<b>a. Enteric Fermentation</b>	<b>-</b>	<b>1 000</b>	<b>25 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>25 000</b>
<b>b. Manure Management</b>	<b>-</b>	<b>140</b>	<b>3 600</b>	<b>14.9</b>	<b>4 450</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>8 000</b>
<b>c. Agriculture Soils</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>58</b>	<b>17 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>17 000</b>
Direct Sources	-	-	-	48	14 000	-	-	-	-	14 000
Indirect Sources	-	-	-	10	3 000	-	-	-	-	3 000
<b>d. Field Burning of Agricultural Residues</b>	<b>-</b>	<b>5</b>	<b>100</b>	<b>0.1</b>	<b>40</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>200</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>1 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1 000</b>
<b>WASTE</b>	<b>520</b>	<b>960</b>	<b>24 000</b>	<b>2</b>	<b>700</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>25 000</b>
<b>a. Solid Waste Disposal on Land</b>	<b>-</b>	<b>940</b>	<b>24 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>24 000</b>
<b>b. Wastewater Handling</b>	<b>-</b>	<b>15</b>	<b>390</b>	<b>2</b>	<b>500</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>910</b>
<b>c. Waste Incineration</b>	<b>520</b>	<b>0.3</b>	<b>8</b>	<b>0.7</b>	<b>200</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>750</b>
<b>LAND-USE, LAND-USE CHANGE AND FORESTRY</b>	<b>-58 000</b>	<b>280</b>	<b>7 000</b>	<b>11</b>	<b>3 400</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-48 000</b>
<b>a. Forest Land</b>	<b>-230 000</b>	<b>250</b>	<b>6 300</b>	<b>11</b>	<b>3 100</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-220 000</b>
<b>b. Cropland</b>	<b>6 300</b>	<b>9</b>	<b>200</b>	<b>0.4</b>	<b>100</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>6 600</b>
<b>c. Grassland</b>	<b>-</b>	<b>10</b>	<b>300</b>	<b>0.3</b>	<b>100</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>400</b>
<b>d. Wetlands</b>	<b>6 000</b>	<b>0.2</b>	<b>4</b>	<b>0.01</b>	<b>2</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>6 000</b>
<b>e. Settlements</b>	<b>4 000</b>	<b>5</b>	<b>100</b>	<b>0.2</b>	<b>50</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>160 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>160 000</b>

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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>468 000</b>	<b>4 100</b>	<b>100 000</b>	<b>140</b>	<b>41 000</b>	<b>830</b>	<b>7 600</b>	<b>2 600</b>	<b>0.3</b>	<b>623 000</b>
<b>ENERGY</b>	<b>434 000</b>	<b>2 000</b>	<b>51 000</b>	<b>30</b>	<b>9 000</b>	-	-	-	-	<b>493 000</b>
<b>a. Stationary Combustion Sources</b>	<b>282 000</b>	<b>300</b>	<b>8 000</b>	<b>9</b>	<b>3 000</b>	-	-	-	-	<b>293 000</b>
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>b. Transport<sup>2</sup></b>	<b>140 000</b>	<b>30</b>	<b>800</b>	<b>20</b>	<b>6 000</b>	-	-	-	-	<b>147 000</b>
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
<b>c. Fugitive Sources</b>	<b>12 000</b>	<b>1 700</b>	<b>42 000</b>	<b>0.1</b>	<b>30</b>	-	-	-	-	<b>54 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>32 500</b>	<b>4</b>	<b>99</b>	<b>36.1</b>	<b>10 800</b>	<b>830</b>	<b>7 600</b>	<b>2 600</b>	<b>-</b>	<b>54 400</b>
<b>a. Mineral Products</b>	<b>7 500</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7 500</b>
Cement Production	4 800	-	-	-	-	-	-	-	-	4 800
Lime Production	1 800	-	-	-	-	-	-	-	-	1 800
Mineral Product Use	950	-	-	-	-	-	-	-	-	950
<b>b. Chemical Industry</b>	<b>2 500</b>	<b>4</b>	<b>99</b>	<b>36</b>	<b>11 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>13 000</b>
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 <sup>3</sup>	-	4	99	0.02	7	-	-	-	-	110
<b>c. Metal Production</b>	<b>15 500</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7 580</b>	<b>2 350</b>	<b>-</b>	<b>25 400</b>
Iron and Steel Production	12 200	-	-	-	-	-	-	-	-	12 200
Aluminum Production	3 270	-	-	-	-	-	7 580	56.3	-	10 900
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 290	-	2 290
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>830</b>	<b>0.05</b>	<b>210</b>	<b>0.3</b>	<b>1 000</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>7 100</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7 100</b>
<b>f. Other Product Manufacture and Use</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.46</b>	<b>140</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>140</b>
<b>AGRICULTURE</b>	<b>-</b>	<b>1 100</b>	<b>28 000</b>	<b>70</b>	<b>20 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>50 000</b>
<b>a. Enteric Fermentation</b>	<b>-</b>	<b>980</b>	<b>24 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>24 000</b>
<b>b. Manure Management</b>	<b>-</b>	<b>140</b>	<b>3 600</b>	<b>14.7</b>	<b>4 390</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>8 000</b>
<b>c. Agriculture Soils</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>56</b>	<b>17 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>17 000</b>
Direct Sources	-	-	-	46	14 000	-	-	-	-	14 000
Indirect Sources	-	-	-	10	3 000	-	-	-	-	3 000
<b>d. Field Burning of Agricultural Residues</b>	<b>-</b>	<b>5</b>	<b>100</b>	<b>0.1</b>	<b>40</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>200</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>1 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1 000</b>
<b>WASTE</b>	<b>530</b>	<b>940</b>	<b>24 000</b>	<b>3</b>	<b>800</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>25 000</b>
<b>a. Solid Waste Disposal on Land</b>	<b>-</b>	<b>920</b>	<b>23 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>23 000</b>
<b>b. Wastewater Handling</b>	<b>-</b>	<b>15</b>	<b>380</b>	<b>2</b>	<b>500</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>900</b>
<b>c. Waste Incineration</b>	<b>530</b>	<b>0.5</b>	<b>10</b>	<b>0.8</b>	<b>200</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>780</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>-110 000</b>	<b>140</b>	<b>3 400</b>	<b>5.1</b>	<b>1 500</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-100 000</b>
<b>a. Forest Land</b>	<b>-280 000</b>	<b>82</b>	<b>2 000</b>	<b>3.4</b>	<b>1 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-270 000</b>
<b>b. Cropland</b>	<b>7 700</b>	<b>10</b>	<b>300</b>	<b>0.5</b>	<b>100</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>8 100</b>
<b>c. Grassland</b>	<b>-</b>	<b>40</b>	<b>900</b>	<b>1</b>	<b>300</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1 000</b>
<b>d. Wetlands</b>	<b>6 000</b>	<b>0.7</b>	<b>20</b>	<b>0.03</b>	<b>9</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>6 000</b>
<b>e. Settlements</b>	<b>4 000</b>	<b>5</b>	<b>100</b>	<b>0.2</b>	<b>50</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>150 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>150 000</b>

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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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									
Global Warming Potential		CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Unit		kt	kt	25 kt CO <sub>2</sub> eq.	kt	298 kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	22 800 kt CO <sub>2</sub> eq.	17 200 kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
TOTAL <sup>1</sup>		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 <sup>2</sup>		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 <sub>2</sub> 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 <sup>3</sup>		-	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 <sub>6</sub> Used in Magnesium Smelters and Casters		-	-	-	-	-	-	-	3 420	-	3 420
d. Production and Consumption of Halocarbons, SF <sub>6</sub> and NF <sub>3</sub> <sup>4</sup>		-	-	-	-	-	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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>5</sup>	PFCs <sup>5</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Global Warming Potential			25		298			22 800	17 200	
Unit	kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
<b>TOTAL<sup>1</sup></b>	<b>463 000</b>	<b>3 800</b>	<b>96 000</b>	<b>140</b>	<b>42 000</b>	<b>970</b>	<b>7 600</b>	<b>3 200</b>	<b>0.3</b>	<b>613 000</b>
<b>ENERGY</b>	<b>429 000</b>	<b>1 900</b>	<b>47 000</b>	<b>30</b>	<b>9 000</b>	-	-	-	-	<b>485 000</b>
<b>a. Stationary Combustion Sources</b>	<b>277 000</b>	<b>300</b>	<b>9 000</b>	<b>9</b>	<b>3 000</b>	-	-	-	-	<b>288 000</b>
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>b. Transport<sup>2</sup></b>	<b>141 000</b>	<b>30</b>	<b>800</b>	<b>20</b>	<b>6 000</b>	-	-	-	-	<b>148 000</b>
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
<b>c. Fugitive Sources</b>	<b>12 000</b>	<b>1 500</b>	<b>37 000</b>	<b>0.1</b>	<b>30</b>	-	-	-	-	<b>49 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>31 800</b>	<b>4.7</b>	<b>120</b>	<b>38.4</b>	<b>11 500</b>	<b>970</b>	<b>7 600</b>	<b>3 200</b>	<b>-</b>	<b>55 100</b>
<b>a. Mineral Products</b>	<b>8 700</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>8 700</b>
Cement Production	5 800	-	-	-	-	-	-	-	-	5 800
Lime Production	1 760	-	-	-	-	-	-	-	-	1 760
Mineral Product Use	1 200	-	-	-	-	-	-	-	-	1 200
<b>b. Chemical Industry</b>	<b>2 800</b>	<b>4.7</b>	<b>120</b>	<b>38</b>	<b>11 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>14 000</b>
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 <sup>3</sup>	-	4.7	120	0.02	7	-	-	-	-	130
<b>c. Metal Production</b>	<b>12 900</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7 560</b>	<b>3 020</b>	<b>-</b>	<b>23 500</b>
Iron and Steel Production	10 200	-	-	-	-	-	-	-	-	10 200
Aluminum Production	2 710	-	-	-	-	-	7 560	56.3	-	10 300
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	2 960	-	2 960
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>4</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>970</b>	<b>0.06</b>	<b>210</b>	<b>0.3</b>	<b>1 200</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>7 400</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7 400</b>
<b>f. Other Product Manufacture and Use</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.58</b>	<b>170</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>170</b>
<b>AGRICULTURE</b>	<b>-</b>	<b>1 100</b>	<b>27 000</b>	<b>70</b>	<b>20 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>49 000</b>
<b>a. Enteric Fermentation</b>	<b>-</b>	<b>910</b>	<b>23 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>23 000</b>
<b>b. Manure Management</b>	<b>-</b>	<b>140</b>	<b>3 500</b>	<b>13.8</b>	<b>4 120</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7 600</b>
<b>c. Agriculture Soils</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>58</b>	<b>17 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>17 000</b>
Direct Sources	-	-	-	48	14 000	-	-	-	-	14 000
Indirect Sources	-	-	-	10	3 000	-	-	-	-	3 000
<b>d. Field Burning of Agricultural Residues</b>	<b>-</b>	<b>7</b>	<b>200</b>	<b>0.2</b>	<b>50</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>200</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>1 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1 000</b>
<b>WASTE</b>	<b>510</b>	<b>910</b>	<b>23 000</b>	<b>2</b>	<b>700</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>24 000</b>
<b>a. Solid Waste Disposal on Land</b>	<b>-</b>	<b>890</b>	<b>22 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>22 000</b>
<b>b. Wastewater Handling</b>	<b>-</b>	<b>15</b>	<b>380</b>	<b>2</b>	<b>500</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>870</b>
<b>c. Waste Incineration</b>	<b>510</b>	<b>0.5</b>	<b>10</b>	<b>0.7</b>	<b>200</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>730</b>
<b>LAND USE, LAND-USE CHANGE AND FORESTRY</b>	<b>-94 000</b>	<b>180</b>	<b>4 400</b>	<b>7.2</b>	<b>2 100</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-87 000</b>
<b>a. Forest Land</b>	<b>-250 000</b>	<b>140</b>	<b>3 500</b>	<b>5.9</b>	<b>1 700</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-250 000</b>
<b>b. Cropland</b>	<b>9 800</b>	<b>10</b>	<b>300</b>	<b>0.6</b>	<b>200</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>10 000</b>
<b>c. Grassland</b>	<b>-</b>	<b>20</b>	<b>500</b>	<b>0.5</b>	<b>200</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>600</b>
<b>d. Wetlands</b>	<b>6 000</b>	<b>0.3</b>	<b>8</b>	<b>0.01</b>	<b>4</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>6 000</b>
<b>e. Settlements</b>	<b>4 000</b>	<b>5</b>	<b>100</b>	<b>0.2</b>	<b>50</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>4 000</b>
<b>f. Harvested Wood Products</b>	<b>140 000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>140 000</b>

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<sub>4</sub> and N<sub>2</sub>O emissions; CO<sub>2</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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

# 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<sub>6</sub> (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	
<b>ENERGY</b>	
<b>a. Stationary Combustion Sources</b>	
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: <ul style="list-style-type: none"> <li>- Metal and non-metal mines, coal mines, stone quarries, and gravel pits</li> <li>- Oil and gas extraction industries</li> <li>- Mineral exploration and contract drilling operations</li> </ul>
Manufacturing Industries	Emissions from fuel consumed by the following industries: <ul style="list-style-type: none"> <li>- Iron and Steel (steel foundries, casting and rolling mills)</li> <li>- Non-ferrous metals (aluminium, magnesium and other production)</li> <li>- Chemical (fertilizer manufacturing, organic and inorganic chemical manufacturing)</li> <li>- Pulp and Paper (primarily pulp, paper, and paper product manufacturers)</li> <li>- Cement and other non-metallic mineral production</li> <li>- Other manufacturing industries not listed (such as automobile manufacturing, textiles, food and beverage industries)</li> </ul>
Construction	Emissions from fuels consumed by the construction industry – buildings, highways etc.
Commercial & Institutional	Emissions from fuel consumed by: <ul style="list-style-type: none"> <li>- Service industries related to mining, communication, wholesale and retail trade, finance and insurance, real estate, education, etc.)</li> <li>- Federal, provincial and municipal establishments</li> <li>- National Defence and Canadian Coast Guard</li> <li>- Train stations, airports and warehouses</li> </ul>
Residential	Emissions from fuel consumed for personal residences (homes, apartment hotels, condominiums and farm houses)
Agriculture & Forestry	Emissions from fuel consumed by: <ul style="list-style-type: none"> <li>- Forestry and logging service industry</li> <li>- Agricultural, hunting and trapping industry (excluding food processing, farm machinery manufacturing, and repair)</li> </ul>
Residential	Emissions from fuel consumed for personal residences (homes, apartment hotels, condominiums and farm houses)
Agriculture & Forestry	Emissions from fuel consumed by: <ul style="list-style-type: none"> <li>- Forestry and logging service industry</li> <li>- Agricultural, hunting and trapping industry (excluding food processing, farm machinery manufacturing, and repair)</li> </ul>
<b>b. Transportation</b>	Emissions resulting from the: <ul style="list-style-type: none"> <li>- Consumption of fossil fuels by aircrafts flying domestically with Canadian purchased fuel</li> <li>- Consumption of fossil fuels (including non-CO<sub>2</sub> emissions from ethanol and biodiesel) by vehicles licensed to operate on roads</li> <li>- Consumption of fossil fuels (including non-CO<sub>2</sub> emissions from biodiesel) by Canadian railways</li> <li>- Consumption of fossil fuels (including non-CO<sub>2</sub> emissions from ethanol and biodiesel) by Canadian registered marine vessels fuelled domestically</li> <li>- Consumption of fossil fuels (including non-CO<sub>2</sub> emissions from ethanol and biodiesel) by combustion devices not licensed to operate on roads</li> <li>- Transportation and distribution of crude oil, natural gas and other products</li> </ul>
<b>c. Fugitive Sources</b>	Intentional and unintentional releases of greenhouse gases from the following activities: <ul style="list-style-type: none"> <li>- Underground and surface mining, abandoned underground coal mines</li> <li>- Conventional and unconventional oil and gas exploration, production, transportation, and distribution</li> </ul>
<b>d. CO<sub>2</sub> Transport and Storage</b>	Intentional and unintentional releases of greenhouse gases from the transport and storage of carbon dioxide
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	
a. Mineral Products	Emissions resulting from the following process activities: <ul style="list-style-type: none"> <li>- Production of cement and lime; use of soda ash, limestone &amp; dolomite, and magnesite</li> </ul>
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 <sub>6</sub> and NF <sub>3</sub>	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 <sub>6</sub> in electrical equipment and semiconductor manufacturing; use of NF <sub>3</sub> 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 <sub>2</sub> O as an anaesthetic and propellant; emissions from the use of urea in selective catalytic reduction (SCR) equipped vehicles
<b>AGRICULTURE</b>	
a. Enteric Fermentation	Emissions resulting from the: <ul style="list-style-type: none"> <li>- Eructation of CH<sub>4</sub> during the digestion of plant material by (mainly) ruminants</li> </ul>
b. Manure Management	<ul style="list-style-type: none"> <li>- Release of CH<sub>4</sub> and N<sub>2</sub>O due to microbial activity during the storage of feces, urine and bedding materials from the cleaning of barns and pens</li> <li>- Indirect N<sub>2</sub>O emissions from volatilization and leaching of nitrogen from animal manure during storage</li> </ul>
c. Agricultural Soils	
Direct sources	Direct N <sub>2</sub> O 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 <sub>2</sub> O emissions from volatilization and leaching of animal manure nitrogen, synthetic fertilizer nitrogen and crop residue nitrogen
d. Field Burning of Agricultural Residues	CH <sub>4</sub> and N <sub>2</sub> O emissions from crop residue burning
e. Liming, Urea Application and Other Carbon-containing Fertilizers	Direct emissions of CO <sub>2</sub> from the application of lime, urea and other fertilizers containing carbon
<b>WASTE</b>	
a. Solid Waste Disposal on Land	Emissions resulting from: <ul style="list-style-type: none"> <li>- Municipal solid waste management sites (landfills) and dedicated wood waste landfills</li> </ul>
b. Wastewater Handling	Wastewater treatment
c. Waste Incineration	Municipal solid waste, sewage sludge and hazardous waste incineration

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

Greenhouse Gas Categories								
	1990	2000	2005	2009	2010	2011	2012	2013
<i>kt CO<sub>2</sub> equivalent</i>								
<b>TOTAL</b>	<b>9 750</b>	<b>9 290</b>	<b>10 300</b>	<b>10 200</b>	<b>9 800</b>	<b>9 820</b>	<b>9 180</b>	<b>8 640</b>
<b>ENERGY</b>	<b>8 840</b>	<b>8 260</b>	<b>9 290</b>	<b>9 140</b>	<b>8 770</b>	<b>8 740</b>	<b>8 170</b>	<b>7 660</b>
<b>a. Stationary Combustion Sources</b>	<b>5 680</b>	<b>4 610</b>	<b>4 870</b>	<b>4 780</b>	<b>4 250</b>	<b>4 180</b>	<b>3 900</b>	<b>3 830</b>
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>b. Transport<sup>1</sup></b>	<b>3 110</b>	<b>3 350</b>	<b>3 520</b>	<b>3 740</b>	<b>3 940</b>	<b>4 070</b>	<b>3 740</b>	<b>3 270</b>
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
<b>c. Fugitive Sources</b>	<b>41</b>	<b>310</b>	<b>910</b>	<b>610</b>	<b>580</b>	<b>490</b>	<b>520</b>	<b>560</b>
Coal Mining	-	-	-	-	-	-	-	-
Oil and Natural Gas	41	310	910	610	580	490	520	560
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>86.6</b>	<b>132</b>	<b>137</b>	<b>143</b>	<b>158</b>	<b>191</b>	<b>144</b>	<b>157</b>
<b>a. Mineral Products</b>	<b>64</b>	<b>1.7</b>	<b>1.5</b>	<b>1.1</b>	<b>0.8</b>	<b>0.75</b>	<b>1</b>	<b>1.1</b>
Cement Production	60	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-
Mineral Products Use	3.4	1.7	1.5	1.1	0.8	0.75	1	1.1
<b>b. Chemical Industry<sup>2</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Adipic Acid Production	-	-	-	-	-	-	-	-
<b>c. Metal Production</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminum Production	-	-	-	-	-	-	-	-
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>3</sup></b>	<b>0.91</b>	<b>47</b>	<b>65</b>	<b>72</b>	<b>75</b>	<b>79</b>	<b>84</b>	<b>88</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>19</b>	<b>76</b>	<b>64</b>	<b>66</b>	<b>79</b>	<b>110</b>	<b>54</b>	<b>63</b>
<b>f. Other Product Manufacture and Use</b>	<b>3.6</b>	<b>7.4</b>	<b>5.8</b>	<b>3.9</b>	<b>3.7</b>	<b>3.9</b>	<b>5</b>	<b>4.5</b>
<b>AGRICULTURE</b>	<b>57</b>	<b>69</b>	<b>73</b>	<b>81</b>	<b>95</b>	<b>110</b>	<b>140</b>	<b>140</b>
<b>a. Enteric Fermentation</b>	<b>25</b>	<b>27</b>	<b>35</b>	<b>37</b>	<b>36</b>	<b>35</b>	<b>35</b>	<b>36</b>
<b>b. Manure Management</b>	<b>19</b>	<b>20</b>	<b>25</b>	<b>27</b>	<b>26</b>	<b>26</b>	<b>26</b>	<b>26</b>
<b>c. Agriculture Soils</b>	<b>10</b>	<b>10</b>	<b>13</b>	<b>15</b>	<b>15</b>	<b>14</b>	<b>14</b>	<b>13</b>
Direct Sources	8.3	8.5	11	12	12	12	11	11
Indirect Sources	2	2	3	3	3	3	3	3
<b>d. Field Burning of Agricultural Residues</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>3</b>	<b>10</b>	<b>-</b>	<b>2</b>	<b>20</b>	<b>40</b>	<b>60</b>	<b>60</b>
<b>WASTE</b>	<b>770</b>	<b>830</b>	<b>840</b>	<b>850</b>	<b>780</b>	<b>780</b>	<b>730</b>	<b>680</b>
<b>a. Solid Waste Disposal on Land</b>	<b>730</b>	<b>790</b>	<b>800</b>	<b>810</b>	<b>740</b>	<b>740</b>	<b>700</b>	<b>650</b>
<b>b. Wastewater Handling</b>	<b>37</b>	<b>34</b>	<b>33</b>	<b>33</b>	<b>34</b>	<b>34</b>	<b>34</b>	<b>34</b>
<b>c. Waste Incineration</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

## 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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

- 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						
Global Warming Potential		CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>4</sup>	PFCs <sup>4</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Unit		kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> 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 <sup>1</sup>	3 160	0.5	10	0.3	100	-	-	-	-
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 <sub>2</sub> 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 <sup>2</sup>	-	-	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c.	Metal Production	-	-	-	-	-	-	-	-	-	-
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-	-	-
	SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d.	Production and Consumption of Halocarbons, SF <sub>6</sub> and NF <sub>3</sub> <sup>3</sup>	-	-	-	-	-	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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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

Greenhouse Gas Categories								
	1990	2000	2005	2009	2010	2011	2012	2013
<i>kt CO<sub>2</sub> equivalent</i>								
<b>TOTAL</b>	<b>2 000</b>	<b>2 190</b>	<b>2 120</b>	<b>1 980</b>	<b>2 030</b>	<b>2 100</b>	<b>2 110</b>	<b>1 800</b>
<b>ENERGY</b>	<b>1 480</b>	<b>1 590</b>	<b>1 490</b>	<b>1 450</b>	<b>1 530</b>	<b>1 590</b>	<b>1 580</b>	<b>1 310</b>
<b>a. Stationary Combustion Sources</b>	<b>772</b>	<b>756</b>	<b>635</b>	<b>652</b>	<b>678</b>	<b>754</b>	<b>703</b>	<b>567</b>
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>b. Transport<sup>1</sup></b>	<b>703</b>	<b>837</b>	<b>851</b>	<b>802</b>	<b>847</b>	<b>838</b>	<b>873</b>	<b>742</b>
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
<b>c. Fugitive Sources</b>	<b>-</b>	<b>-</b>	<b>0.0</b>	<b>-</b>	<b>-</b>	<b>0.0</b>	<b>-</b>	<b>-</b>
Coal Mining	-	-	-	-	-	-	-	-
Oil and Natural Gas	-	-	0.0	-	-	0.0	-	-
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>4.48</b>	<b>21</b>	<b>28.1</b>	<b>28.8</b>	<b>28.4</b>	<b>29.5</b>	<b>30.3</b>	<b>31.3</b>
<b>a. Mineral Products</b>	<b>0.34</b>	<b>0.69</b>	<b>0.88</b>	<b>1</b>	<b>0.66</b>	<b>0.62</b>	<b>0.6</b>	<b>0.6</b>
Cement Production	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-
Mineral Products Use	0.34	0.69	0.88	1	0.66	0.62	0.6	0.6
<b>b. Chemical Industry<sup>2</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Adipic Acid Production	-	-	-	-	-	-	-	-
<b>c. Metal Production</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminum Production	-	-	-	-	-	-	-	-
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>3</sup></b>	<b>-</b>	<b>16</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>27</b>	<b>29</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>3.3</b>	<b>2.4</b>	<b>1.3</b>	<b>1.4</b>	<b>0.99</b>	<b>1.3</b>	<b>0.85</b>	<b>0.99</b>
<b>f. Other Product Manufacture and Use</b>	<b>0.81</b>	<b>1.9</b>	<b>1.6</b>	<b>1</b>	<b>1</b>	<b>1.1</b>	<b>1.4</b>	<b>1.2</b>
<b>AGRICULTURE</b>	<b>410</b>	<b>450</b>	<b>470</b>	<b>360</b>	<b>340</b>	<b>340</b>	<b>360</b>	<b>320</b>
<b>a. Enteric Fermentation</b>	<b>150</b>	<b>150</b>	<b>140</b>	<b>120</b>	<b>120</b>	<b>120</b>	<b>120</b>	<b>120</b>
<b>b. Manure Management</b>	<b>61</b>	<b>63</b>	<b>63</b>	<b>46</b>	<b>45</b>	<b>45</b>	<b>44</b>	<b>44</b>
<b>c. Agriculture Soils</b>	<b>190</b>	<b>230</b>	<b>260</b>	<b>190</b>	<b>170</b>	<b>170</b>	<b>200</b>	<b>150</b>
Direct Sources	160	190	210	160	140	140	160	130
Indirect Sources	40	40	50	30	30	30	30	30
<b>d. Field Burning of Agricultural Residues</b>	<b>0.09</b>	<b>0.2</b>	<b>0.2</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.2</b>	<b>0.2</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>WASTE</b>	<b>110</b>	<b>130</b>	<b>140</b>	<b>140</b>	<b>140</b>	<b>140</b>	<b>140</b>	<b>140</b>
<b>a. Solid Waste Disposal on Land</b>	<b>96</b>	<b>110</b>	<b>120</b>	<b>110</b>	<b>120</b>	<b>110</b>	<b>110</b>	<b>110</b>
<b>b. Wastewater Handling</b>	<b>6.2</b>	<b>8</b>	<b>8.1</b>	<b>8</b>	<b>8</b>	<b>8.1</b>	<b>8.2</b>	<b>8.4</b>
<b>c. Waste Incineration</b>	<b>11</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>13</b>	<b>13</b>	<b>13</b>	<b>13</b>

## 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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

- 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 Summary for Prince Edward Island

Greenhouse Gas Categories					Greenhouse Gases						
Global Warming Potential		CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>4</sup>	PFCs <sup>4</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Unit		kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> 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 <sup>1</sup>	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 <sub>2</sub> 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 <sup>2</sup>	-	-	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c.	Metal Production	-	-	-	-	-	-	-	-	-	-
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-	-	-
	SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d.	Production and Consumption of Halocarbons, SF <sub>6</sub> and NF <sub>3</sub> <sup>3</sup>	-	-	-	-	-	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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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

Greenhouse Gas Categories								
	1990	2000	2005	2009	2010	2011	2012	2013
<i>kt CO<sub>2</sub> equivalent</i>								
<b>TOTAL</b>	<b>20 200</b>	<b>22 700</b>	<b>24 000</b>	<b>21 000</b>	<b>20 700</b>	<b>21 400</b>	<b>19 600</b>	<b>18 300</b>
<b>ENERGY</b>	<b>18 300</b>	<b>20 800</b>	<b>22 200</b>	<b>19 600</b>	<b>19 200</b>	<b>19 900</b>	<b>18 000</b>	<b>16 700</b>
<b>a. Stationary Combustion Sources</b>	<b>11 700</b>	<b>14 500</b>	<b>15 700</b>	<b>14 100</b>	<b>13 500</b>	<b>13 600</b>	<b>12 300</b>	<b>11 500</b>
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>b. Transport<sup>1</sup></b>	<b>4 910</b>	<b>5 610</b>	<b>6 070</b>	<b>5 040</b>	<b>5 360</b>	<b>5 880</b>	<b>5 340</b>	<b>4 920</b>
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
<b>c. Fugitive Sources</b>	<b>1 700</b>	<b>700</b>	<b>480</b>	<b>420</b>	<b>410</b>	<b>390</b>	<b>390</b>	<b>360</b>
Coal Mining	2 000	600	400	300	300	300	300	300
Oil and Natural Gas	51	140	130	120	120	110	100	86
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>318</b>	<b>426</b>	<b>476</b>	<b>328</b>	<b>420</b>	<b>482</b>	<b>479</b>	<b>538</b>
<b>a. Mineral Products</b>	<b>190</b>	<b>230</b>	<b>250</b>	<b>100</b>	<b>200</b>	<b>200</b>	<b>210</b>	<b>190</b>
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>b. Chemical Industry<sup>2</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Adipic Acid Production	-	-	-	-	-	-	-	-
<b>c. Metal Production</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminum Production	-	-	-	-	-	-	-	-
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>3</sup></b>	<b>23</b>	<b>110</b>	<b>160</b>	<b>160</b>	<b>170</b>	<b>180</b>	<b>170</b>	<b>190</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>100</b>	<b>66</b>	<b>52</b>	<b>59</b>	<b>49</b>	<b>100</b>	<b>89</b>	<b>150</b>
<b>f. Other Product Manufacture and Use</b>	<b>5.6</b>	<b>13</b>	<b>11</b>	<b>7</b>	<b>6.7</b>	<b>7.1</b>	<b>9</b>	<b>7.9</b>
<b>AGRICULTURE</b>	<b>550</b>	<b>570</b>	<b>550</b>	<b>480</b>	<b>460</b>	<b>450</b>	<b>450</b>	<b>450</b>
<b>a. Enteric Fermentation</b>	<b>250</b>	<b>240</b>	<b>230</b>	<b>200</b>	<b>190</b>	<b>190</b>	<b>190</b>	<b>190</b>
<b>b. Manure Management</b>	<b>150</b>	<b>160</b>	<b>180</b>	<b>150</b>	<b>140</b>	<b>130</b>	<b>130</b>	<b>130</b>
<b>c. Agriculture Soils</b>	<b>110</b>	<b>120</b>	<b>130</b>	<b>120</b>	<b>110</b>	<b>110</b>	<b>110</b>	<b>100</b>
Direct Sources	92	99	110	96	94	88	94	85
Indirect Sources	20	20	30	20	20	20	20	20
<b>d. Field Burning of Agricultural Residues</b>	<b>0.03</b>	<b>0.1</b>	<b>0.1</b>	<b>0.05</b>	<b>0.05</b>	<b>0.06</b>	<b>0.04</b>	<b>0.04</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>40</b>	<b>40</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>20</b>
<b>WASTE</b>	<b>980</b>	<b>900</b>	<b>720</b>	<b>620</b>	<b>610</b>	<b>590</b>	<b>600</b>	<b>610</b>
<b>a. Solid Waste Disposal on Land</b>	<b>900</b>	<b>830</b>	<b>660</b>	<b>550</b>	<b>540</b>	<b>530</b>	<b>540</b>	<b>550</b>
<b>b. Wastewater Handling</b>	<b>50</b>	<b>53</b>	<b>53</b>	<b>53</b>	<b>53</b>	<b>53</b>	<b>53</b>	<b>53</b>
<b>c. Waste Incineration</b>	<b>26</b>	<b>15</b>	<b>13</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>11</b>

## 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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

- 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 A10-7 2013 GHG Emission Summary for Nova Scotia

Greenhouse Gas Categories					Greenhouse Gases							
Global Warming Potential		CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>4</sup>	PFCs <sup>4</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL	
Unit		kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> 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 <sup>1</sup>	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 <sub>2</sub> 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 <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-	
c.	Metal Production	-	-	-	-	-	-	-	-	-	-	
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-	
	Aluminum Production	-	-	-	-	-	-	-	-	-	-	
	SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-	
d.	Production and Consumption of Halocarbons, SF <sub>6</sub> and NF <sub>3</sub> <sup>3</sup>	-	-	-	-	-	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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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

Greenhouse Gas Categories								
	1990	2000	2005	2009	2010	2011	2012	2013
<i>kt CO<sub>2</sub> equivalent</i>								
<b>TOTAL</b>	<b>16 500</b>	<b>21 300</b>	<b>20 600</b>	<b>18 700</b>	<b>18 700</b>	<b>18 800</b>	<b>16 900</b>	<b>15 700</b>
<b>ENERGY</b>	<b>15 100</b>	<b>19 500</b>	<b>18 900</b>	<b>16 500</b>	<b>16 100</b>	<b>16 900</b>	<b>14 800</b>	<b>13 100</b>
<b>a. Stationary Combustion Sources</b>	<b>10 900</b>	<b>14 100</b>	<b>13 300</b>	<b>11 900</b>	<b>10 800</b>	<b>10 600</b>	<b>9 480</b>	<b>8 730</b>
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>b. Transport<sup>1</sup></b>	<b>4 090</b>	<b>5 340</b>	<b>5 310</b>	<b>4 450</b>	<b>5 090</b>	<b>6 070</b>	<b>5 110</b>	<b>4 160</b>
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
<b>c. Fugitive Sources</b>	<b>60</b>	<b>130</b>	<b>220</b>	<b>200</b>	<b>210</b>	<b>200</b>	<b>200</b>	<b>190</b>
Coal Mining	1	0.4	0.3	0.3	-	-	-	-
Oil and Natural Gas	60	130	220	200	210	200	200	190
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>166</b>	<b>391</b>	<b>326</b>	<b>981</b>	<b>1 340</b>	<b>873</b>	<b>950</b>	<b>1 580</b>
<b>a. Mineral Products</b>	<b>88</b>	<b>120</b>	<b>94</b>	<b>47</b>	<b>54</b>	<b>57</b>	<b>57</b>	<b>52</b>
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>b. Chemical Industry<sup>2</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Adipic Acid Production	-	-	-	-	-	-	-	-
<b>c. Metal Production</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminum Production	-	-	-	-	-	-	-	-
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>3</sup></b>	<b>0.68</b>	<b>81</b>	<b>110</b>	<b>120</b>	<b>120</b>	<b>120</b>	<b>130</b>	<b>130</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>72</b>	<b>180</b>	<b>110</b>	<b>810</b>	<b>1 200</b>	<b>690</b>	<b>760</b>	<b>1 400</b>
<b>f. Other Product Manufacture and Use</b>	<b>4.6</b>	<b>11</b>	<b>8.4</b>	<b>5.6</b>	<b>5.5</b>	<b>6</b>	<b>7.7</b>	<b>6.8</b>
<b>AGRICULTURE</b>	<b>530</b>	<b>580</b>	<b>580</b>	<b>510</b>	<b>500</b>	<b>470</b>	<b>520</b>	<b>470</b>
<b>a. Enteric Fermentation</b>	<b>210</b>	<b>200</b>	<b>200</b>	<b>180</b>	<b>180</b>	<b>180</b>	<b>170</b>	<b>170</b>
<b>b. Manure Management</b>	<b>92</b>	<b>98</b>	<b>96</b>	<b>83</b>	<b>82</b>	<b>78</b>	<b>78</b>	<b>79</b>
<b>c. Agriculture Soils</b>	<b>170</b>	<b>190</b>	<b>230</b>	<b>180</b>	<b>170</b>	<b>160</b>	<b>190</b>	<b>150</b>
Direct Sources	140	160	190	150	140	140	160	120
Indirect Sources	30	30	40	30	30	30	30	20
<b>d. Field Burning of Agricultural Residues</b>	<b>0.03</b>	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	<b>0.03</b>	<b>0.01</b>	<b>0.02</b>	<b>0.02</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>70</b>	<b>80</b>	<b>50</b>	<b>60</b>	<b>60</b>	<b>60</b>	<b>70</b>	<b>80</b>
<b>WASTE</b>	<b>750</b>	<b>800</b>	<b>800</b>	<b>730</b>	<b>740</b>	<b>630</b>	<b>610</b>	<b>570</b>
<b>a. Solid Waste Disposal on Land</b>	<b>720</b>	<b>760</b>	<b>770</b>	<b>700</b>	<b>710</b>	<b>600</b>	<b>580</b>	<b>540</b>
<b>b. Wastewater Handling</b>	<b>29</b>	<b>31</b>	<b>31</b>	<b>31</b>	<b>31</b>	<b>31</b>	<b>32</b>	<b>31</b>
<b>c. Waste Incineration</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

## 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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

- 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 A10-9 2013 GHG Emission Summary for New Brunswick

Greenhouse Gas Categories					Greenhouse Gases						
Global Warming Potential		CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>4</sup>	PFCs <sup>4</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Unit		kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> 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 <sup>1</sup>	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 <sub>2</sub> 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 <sup>2</sup>	-	-	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c.	Metal Production	-	-	-	-	-	-	-	-	-	-
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-	-	-
	SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d.	Production and Consumption of Halocarbons, SF <sub>6</sub> and NF <sub>3</sub> <sup>3</sup>	-	-	-	-	-	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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 A10–10 1990–2013 GHG Emission Summary for Quebec

Greenhouse Gas Categories								
	1990	2000	2005	2009	2010	2011	2012	2013
<i>kt CO<sub>2</sub> equivalent</i>								
<b>TOTAL</b>	<b>89 800</b>	<b>89 700</b>	<b>90 200</b>	<b>87 600</b>	<b>82 700</b>	<b>84 200</b>	<b>81 600</b>	<b>82 600</b>
<b>ENERGY</b>	<b>60 700</b>	<b>63 000</b>	<b>62 700</b>	<b>62 700</b>	<b>59 000</b>	<b>59 900</b>	<b>58 300</b>	<b>58 800</b>
<b>a. Stationary Combustion Sources</b>	<b>32 300</b>	<b>30 600</b>	<b>28 400</b>	<b>26 400</b>	<b>23 300</b>	<b>23 500</b>	<b>22 600</b>	<b>23 600</b>
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>b. Transport<sup>1</sup></b>	<b>28 000</b>	<b>31 900</b>	<b>33 900</b>	<b>35 900</b>	<b>35 400</b>	<b>36 100</b>	<b>35 300</b>	<b>34 900</b>
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
<b>c. Fugitive Sources</b>	<b>430</b>	<b>500</b>	<b>390</b>	<b>360</b>	<b>340</b>	<b>290</b>	<b>280</b>	<b>260</b>
Coal Mining	-	-	-	-	-	-	-	-
Oil and Natural Gas	430	500	390	360	340	290	280	260
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>14 500</b>	<b>12 100</b>	<b>12 400</b>	<b>10 100</b>	<b>9 860</b>	<b>11 000</b>	<b>10 300</b>	<b>10 800</b>
<b>a. Mineral Products</b>	<b>1 900</b>	<b>2 000</b>	<b>2 100</b>	<b>1 600</b>	<b>1 800</b>	<b>1 800</b>	<b>2 000</b>	<b>1 800</b>
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>b. Chemical Industry<sup>2</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Adipic Acid Production	-	-	-	-	-	-	-	-
<b>c. Metal Production</b>	<b>10 900</b>	<b>8 090</b>	<b>7 560</b>	<b>6 330</b>	<b>6 070</b>	<b>6 010</b>	<b>5 630</b>	<b>6 000</b>
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 <sub>6</sub> Used in Magnesium Smelters and Casters	2 280	1 210	103	19.7	13	12.3	15.5	21.7
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>3</sup></b>	<b>37</b>	<b>760</b>	<b>1 100</b>	<b>1 200</b>	<b>1 200</b>	<b>1 300</b>	<b>1 300</b>	<b>1 400</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>1 500</b>	<b>1 200</b>	<b>1 600</b>	<b>840</b>	<b>710</b>	<b>1 800</b>	<b>1 300</b>	<b>1 500</b>
<b>f. Other Product Manufacture and Use</b>	<b>43</b>	<b>100</b>	<b>85</b>	<b>59</b>	<b>56</b>	<b>60</b>	<b>77</b>	<b>68</b>
<b>AGRICULTURE</b>	<b>7 700</b>	<b>7 700</b>	<b>7 900</b>	<b>7 800</b>	<b>7 800</b>	<b>7 700</b>	<b>8 000</b>	<b>7 800</b>
<b>a. Enteric Fermentation</b>	<b>3 300</b>	<b>3 200</b>	<b>3 300</b>	<b>3 100</b>	<b>3 000</b>	<b>3 000</b>	<b>2 900</b>	<b>2 900</b>
<b>b. Manure Management</b>	<b>1 700</b>	<b>1 800</b>	<b>1 800</b>	<b>1 700</b>	<b>1 700</b>	<b>1 700</b>	<b>1 700</b>	<b>1 700</b>
<b>c. Agriculture Soils</b>	<b>2 500</b>	<b>2 400</b>	<b>2 600</b>	<b>2 800</b>	<b>2 900</b>	<b>2 800</b>	<b>3 100</b>	<b>3 000</b>
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
<b>d. Field Burning of Agricultural Residues</b>	<b>0.4</b>	<b>0.2</b>	<b>0.3</b>	<b>0.2</b>	<b>0.3</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>200</b>	<b>300</b>	<b>200</b>	<b>200</b>	<b>200</b>	<b>200</b>	<b>300</b>	<b>300</b>
<b>WASTE</b>	<b>6 900</b>	<b>6 900</b>	<b>7 200</b>	<b>7 000</b>	<b>6 000</b>	<b>5 600</b>	<b>5 100</b>	<b>5 300</b>
<b>a. Solid Waste Disposal on Land</b>	<b>6 300</b>	<b>6 400</b>	<b>6 700</b>	<b>6 500</b>	<b>5 400</b>	<b>5 100</b>	<b>4 600</b>	<b>4 900</b>
<b>b. Wastewater Handling</b>	<b>270</b>	<b>240</b>	<b>240</b>	<b>250</b>	<b>250</b>	<b>260</b>	<b>260</b>	<b>260</b>
<b>c. Waste Incineration</b>	<b>340</b>	<b>260</b>	<b>270</b>	<b>250</b>	<b>270</b>	<b>260</b>	<b>300</b>	<b>130</b>

## 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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

- 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							
Global Warming Potential		CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>4</sup>	PFCs <sup>4</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL	
Unit		kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> 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 <sup>1</sup>	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 <sub>2</sub> 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 <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	
	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 <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	21.7	-	21.7	
d.	Production and Consumption of Halocarbons, SF <sub>6</sub> and NF <sub>3</sub> <sup>3</sup>	-	-	-	-	-	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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 A10–12 1990–2013 GHG Emission Summary for Ontario

Greenhouse Gas Categories								
	1990	2000	2005	2009	2010	2011	2012	2013
<i>kt CO<sub>2</sub> equivalent</i>								
<b>TOTAL</b>	<b>182 000</b>	<b>211 000</b>	<b>211 000</b>	<b>171 000</b>	<b>178 000</b>	<b>175 000</b>	<b>171 000</b>	<b>171 000</b>
<b>ENERGY</b>	<b>133 000</b>	<b>167 000</b>	<b>163 000</b>	<b>131 000</b>	<b>137 000</b>	<b>135 000</b>	<b>129 000</b>	<b>131 000</b>
<b>a. Stationary Combustion Sources</b>	<b>83 800</b>	<b>106 000</b>	<b>96 600</b>	<b>70 000</b>	<b>73 900</b>	<b>72 200</b>	<b>69 400</b>	<b>68 400</b>
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>b. Transport<sup>1</sup></b>	<b>48 200</b>	<b>60 400</b>	<b>64 800</b>	<b>59 000</b>	<b>61 300</b>	<b>61 000</b>	<b>58 500</b>	<b>61 200</b>
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
<b>c. Fugitive Sources</b>	<b>1 600</b>	<b>1 500</b>	<b>1 500</b>	<b>1 500</b>	<b>1 400</b>	<b>1 400</b>	<b>1 300</b>	<b>1 300</b>
Coal Mining	-	-	-	-	-	-	-	-
Oil and Natural Gas	1 600	1 500	1 500	1 500	1 400	1 400	1 300	1 300
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>30 300</b>	<b>24 800</b>	<b>28 100</b>	<b>20 700</b>	<b>22 000</b>	<b>20 800</b>	<b>22 600</b>	<b>20 500</b>
<b>a. Mineral Products</b>	<b>4 100</b>	<b>5 000</b>	<b>4 900</b>	<b>3 300</b>	<b>3 500</b>	<b>3 600</b>	<b>3 900</b>	<b>3 600</b>
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>b. Chemical Industry<sup>2</sup></b>	<b>10 000</b>	<b>870</b>	<b>2 500</b>	<b>640</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Adipic Acid Production	10 000	870	2 500	640	-	-	-	-
<b>c. Metal Production</b>	<b>10 900</b>	<b>12 900</b>	<b>11 300</b>	<b>8 170</b>	<b>9 160</b>	<b>9 990</b>	<b>10 000</b>	<b>7 710</b>
Iron and Steel Production	10 200	11 500	10 200	8 000	8 990	9 820	9 810	7 520
Aluminum Production	-	-	-	-	-	-	-	-
SF <sub>6</sub> Used in Magnesium Smelters and Casters	687	1 450	1 130	164	168	170	232	191
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>3</sup></b>	<b>1 000</b>	<b>1 500</b>	<b>2 000</b>	<b>2 100</b>	<b>2 100</b>	<b>2 200</b>	<b>2 300</b>	<b>2 300</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>3 900</b>	<b>4 400</b>	<b>7 200</b>	<b>6 400</b>	<b>7 100</b>	<b>4 900</b>	<b>6 200</b>	<b>6 700</b>
<b>f. Other Product Manufacture and Use</b>	<b>64</b>	<b>160</b>	<b>140</b>	<b>97</b>	<b>93</b>	<b>98</b>	<b>130</b>	<b>110</b>
<b>AGRICULTURE</b>	<b>11 000</b>	<b>10 000</b>	<b>10 000</b>	<b>10 000</b>	<b>11 000</b>	<b>10 000</b>	<b>9 900</b>	<b>10 000</b>
<b>a. Enteric Fermentation</b>	<b>4 400</b>	<b>4 300</b>	<b>4 300</b>	<b>3 700</b>	<b>3 700</b>	<b>3 600</b>	<b>3 600</b>	<b>3 600</b>
<b>b. Manure Management</b>	<b>2 100</b>	<b>2 200</b>	<b>2 300</b>	<b>1 900</b>	<b>1 900</b>	<b>1 900</b>	<b>1 900</b>	<b>1 900</b>
<b>c. Agriculture Soils</b>	<b>3 900</b>	<b>3 600</b>	<b>3 600</b>	<b>4 500</b>	<b>4 800</b>	<b>4 300</b>	<b>4 200</b>	<b>4 600</b>
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
<b>d. Field Burning of Agricultural Residues</b>	<b>4</b>	<b>2</b>	<b>0.6</b>	<b>0.5</b>	<b>0.5</b>	<b>0.3</b>	<b>0.4</b>	<b>0.3</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>200</b>	<b>300</b>	<b>200</b>	<b>200</b>	<b>200</b>	<b>200</b>	<b>200</b>	<b>200</b>
<b>WASTE</b>	<b>7 500</b>	<b>8 600</b>	<b>9 600</b>	<b>9 400</b>	<b>9 100</b>	<b>9 300</b>	<b>9 200</b>	<b>9 000</b>
<b>a. Solid Waste Disposal on Land</b>	<b>7 100</b>	<b>8 000</b>	<b>9 000</b>	<b>8 800</b>	<b>8 500</b>	<b>8 700</b>	<b>8 600</b>	<b>8 400</b>
<b>b. Wastewater Handling</b>	<b>230</b>	<b>280</b>	<b>300</b>	<b>310</b>	<b>310</b>	<b>310</b>	<b>310</b>	<b>320</b>
<b>c. Waste Incineration</b>	<b>260</b>	<b>330</b>	<b>290</b>	<b>290</b>	<b>280</b>	<b>270</b>	<b>270</b>	<b>280</b>

## 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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

- 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 A10-13 2013 GHG Emission Summary for Ontario

Greenhouse Gas Categories					Greenhouse Gases							
Global Warming Potential		CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>4</sup>	PFCs <sup>4</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL	
Unit		kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> 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 <sup>1</sup>	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 <sub>2</sub> 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 <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-	
c.	Metal Production	7 520	-	-	-	-	-	-	191	-	7 710	
	Iron and Steel Production	7 520	-	-	-	-	-	-	-	-	7 520	
	Aluminum Production	-	-	-	-	-	-	-	-	-	-	
	SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	191	-	191	
d.	Production and Consumption of Halocarbons, SF <sub>6</sub> and NF <sub>3</sub> <sup>3</sup>	-	-	-	-	-	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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 A10–14 1990–2013 GHG Emission for Manitoba

Greenhouse Gas Categories								
	1990	2000	2005	2009	2010	2011	2012	2013
<i>kt CO<sub>2</sub> equivalent</i>								
<b>TOTAL</b>	<b>18 700</b>	<b>21 100</b>	<b>20 700</b>	<b>19 900</b>	<b>19 600</b>	<b>19 400</b>	<b>20 700</b>	<b>21 400</b>
<b>ENERGY</b>	<b>12 700</b>	<b>13 200</b>	<b>12 500</b>	<b>11 700</b>	<b>11 300</b>	<b>11 600</b>	<b>12 800</b>	<b>13 000</b>
<b>a. Stationary Combustion Sources</b>	<b>5 040</b>	<b>5 530</b>	<b>4 610</b>	<b>4 610</b>	<b>3 970</b>	<b>3 940</b>	<b>3 910</b>	<b>4 290</b>
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>b. Transport<sup>1</sup></b>	<b>7 200</b>	<b>7 290</b>	<b>7 690</b>	<b>6 760</b>	<b>7 060</b>	<b>7 250</b>	<b>8 500</b>	<b>8 220</b>
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
<b>c. Fugitive Sources</b>	<b>450</b>	<b>410</b>	<b>210</b>	<b>300</b>	<b>300</b>	<b>370</b>	<b>430</b>	<b>450</b>
Coal Mining	-	-	-	-	-	-	-	-
Oil and Natural Gas	450	410	210	300	300	370	430	450
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>459</b>	<b>609</b>	<b>659</b>	<b>662</b>	<b>823</b>	<b>840</b>	<b>682</b>	<b>701</b>
<b>a. Mineral Products</b>	<b>220</b>	<b>80</b>	<b>69</b>	<b>56</b>	<b>62</b>	<b>66</b>	<b>69</b>	<b>64</b>
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>b. Chemical Industry<sup>2</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Adipic Acid Production	-	-	-	-	-	-	-	-
<b>c. Metal Production</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminum Production	-	-	-	-	-	-	-	-
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>3</sup></b>	<b>4.3</b>	<b>150</b>	<b>200</b>	<b>200</b>	<b>210</b>	<b>220</b>	<b>220</b>	<b>230</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>230</b>	<b>370</b>	<b>380</b>	<b>390</b>	<b>540</b>	<b>550</b>	<b>380</b>	<b>390</b>
<b>f. Other Product Manufacture and Use</b>	<b>6.9</b>	<b>16</b>	<b>13</b>	<b>9.1</b>	<b>8.8</b>	<b>9.6</b>	<b>12</b>	<b>11</b>
<b>AGRICULTURE</b>	<b>4 800</b>	<b>6 400</b>	<b>6 500</b>	<b>6 400</b>	<b>6 400</b>	<b>5 800</b>	<b>6 000</b>	<b>6 700</b>
<b>a. Enteric Fermentation</b>	<b>1 900</b>	<b>2 700</b>	<b>3 300</b>	<b>2 800</b>	<b>2 700</b>	<b>2 500</b>	<b>2 400</b>	<b>2 500</b>
<b>b. Manure Management</b>	<b>490</b>	<b>720</b>	<b>880</b>	<b>790</b>	<b>790</b>	<b>770</b>	<b>760</b>	<b>780</b>
<b>c. Agriculture Soils</b>	<b>2 100</b>	<b>2 700</b>	<b>2 100</b>	<b>2 600</b>	<b>2 700</b>	<b>2 300</b>	<b>2 600</b>	<b>3 100</b>
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
<b>d. Field Burning of Agricultural Residues</b>	<b>200</b>	<b>80</b>	<b>10</b>	<b>20</b>	<b>20</b>	<b>10</b>	<b>20</b>	<b>20</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>100</b>	<b>200</b>	<b>200</b>	<b>200</b>	<b>200</b>	<b>200</b>	<b>200</b>	<b>300</b>
<b>WASTE</b>	<b>730</b>	<b>940</b>	<b>1 000</b>	<b>1 100</b>	<b>1 100</b>	<b>1 100</b>	<b>1 100</b>	<b>1 000</b>
<b>a. Solid Waste Disposal on Land</b>	<b>700</b>	<b>900</b>	<b>990</b>	<b>1 100</b>	<b>1 100</b>	<b>1 100</b>	<b>1 100</b>	<b>1 000</b>
<b>b. Wastewater Handling</b>	<b>36</b>	<b>40</b>	<b>41</b>	<b>42</b>	<b>42</b>	<b>42</b>	<b>43</b>	<b>43</b>
<b>c. Waste Incineration</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

## 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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

- Indicates no emissions

0.0 Indicates emissions truncated due to rounding

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Table A10-15 2013 GHG Emission Summary for Manitoba

Greenhouse Gas Categories					Greenhouse Gases						
Global Warming Potential		CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>4</sup>	PFCs <sup>4</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
		kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.
Unit		12 900	180	4 400	13	3 800	230	-	1.1	-	21 400
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 <sup>1</sup>	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	-	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 <sub>2</sub> Transport and Storage	-	-	-	-	-	-	-	-	-	-	
INDUSTRIAL PROCESSES AND PRODUCT USE		461	-	-	0.03	9.22	230	-	1.1	-	701
a. Mineral Products	Mineral Products	64	-	-	-	-	-	-	-	-	64
	Cement Production	-	-	-	-	-	-	-	-	-	-
	Lime Production	51.6	-	-	-	-	-	-	-	-	51.6
Mineral Products Use	13	-	-	-	-	-	-	-	-	13	
b. Chemical Industry <sup>2</sup>	Chemical Industry <sup>2</sup>	-	-	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	Metal Production	-	-	-	-	-	-	-	-	-	-
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-	-	-
	SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF <sub>6</sub> and NF <sub>3</sub> <sup>3</sup>	-	-	-	-	-	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	Enteric Fermentation	-	99	2 500	-	-	-	-	-	-	2 500
b. Manure Management	Manure Management	-	17	420	1.21	360	-	-	-	-	780
c. Agriculture Soils	Agriculture Soils	-	-	-	10	3 100	-	-	-	-	3 100
Direct Sources	Direct Sources	-	-	-	8.2	2 500	-	-	-	-	2 500
Indirect Sources	Indirect Sources	-	-	-	2	700	-	-	-	-	700
d. Field Burning of Agricultural Residues	Field Burning of Agricultural Residues	-	0.6	20	0.02	5	-	-	-	-	20
e. Liming, Urea Application and Other Carbon-containing Fertilizers	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	Solid Waste Disposal on Land	-	40	1 000	-	-	-	-	-	-	1 000
b. Wastewater Handling	Wastewater Handling	-	0.78	20	0.08	20	-	-	-	-	43
c. Waste Incineration	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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 A10–16 1990–2013 GHG Emission Summary from Saskatchewan

Greenhouse Gas Categories								
	1990	2000	2005	2009	2010	2011	2012	2013
<i>kt CO<sub>2</sub> equivalent</i>								
<b>TOTAL</b>	<b>45 000</b>	<b>68 100</b>	<b>69 500</b>	<b>70 200</b>	<b>69 800</b>	<b>69 200</b>	<b>71 700</b>	<b>74 800</b>
<b>ENERGY</b>	<b>36 300</b>	<b>55 800</b>	<b>55 100</b>	<b>56 700</b>	<b>57 100</b>	<b>56 000</b>	<b>57 600</b>	<b>59 500</b>
<b>a. Stationary Combustion Sources</b>	<b>20 300</b>	<b>27 000</b>	<b>27 600</b>	<b>29 400</b>	<b>29 600</b>	<b>29 100</b>	<b>29 300</b>	<b>29 700</b>
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>b. Transport<sup>1</sup></b>	<b>9 330</b>	<b>11 200</b>	<b>11 800</b>	<b>14 300</b>	<b>15 000</b>	<b>14 400</b>	<b>15 200</b>	<b>16 600</b>
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
<b>c. Fugitive Sources</b>	<b>6 700</b>	<b>18 000</b>	<b>16 000</b>	<b>13 000</b>	<b>12 000</b>	<b>12 000</b>	<b>13 000</b>	<b>13 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>0.09</b>	<b>0.09</b>	<b>0.09</b>	<b>0.09</b>	<b>0.09</b>	<b>0.09</b>	<b>0.09</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>318</b>	<b>640</b>	<b>789</b>	<b>712</b>	<b>725</b>	<b>891</b>	<b>829</b>	<b>877</b>
<b>a. Mineral Products</b>	<b>98</b>	<b>16</b>	<b>12</b>	<b>12</b>	<b>8.5</b>	<b>12</b>	<b>18</b>	<b>18</b>
Cement Production	88	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-
Mineral Products Use	10	16	12	12	8.5	12	18	18
<b>b. Chemical Industry<sup>2</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Adipic Acid Production	-	-	-	-	-	-	-	-
<b>c. Metal Production</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminum Production	-	-	-	-	-	-	-	-
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>3</sup></b>	<b>1.8</b>	<b>140</b>	<b>180</b>	<b>200</b>	<b>200</b>	<b>210</b>	<b>220</b>	<b>230</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>210</b>	<b>470</b>	<b>580</b>	<b>490</b>	<b>510</b>	<b>660</b>	<b>580</b>	<b>620</b>
<b>f. Other Product Manufacture and Use</b>	<b>6.2</b>	<b>14</b>	<b>11</b>	<b>7.8</b>	<b>7.9</b>	<b>9.1</b>	<b>12</b>	<b>12</b>
<b>AGRICULTURE</b>	<b>7 900</b>	<b>11 000</b>	<b>13 000</b>	<b>12 000</b>	<b>11 000</b>	<b>11 000</b>	<b>12 000</b>	<b>13 000</b>
<b>a. Enteric Fermentation</b>	<b>3 300</b>	<b>4 700</b>	<b>6 100</b>	<b>5 200</b>	<b>4 900</b>	<b>4 800</b>	<b>4 900</b>	<b>4 800</b>
<b>b. Manure Management</b>	<b>790</b>	<b>1 100</b>	<b>1 400</b>	<b>1 200</b>	<b>1 200</b>	<b>1 100</b>	<b>1 200</b>	<b>1 200</b>
<b>c. Agriculture Soils</b>	<b>3 500</b>	<b>4 700</b>	<b>4 700</b>	<b>4 900</b>	<b>4 500</b>	<b>4 900</b>	<b>5 600</b>	<b>6 600</b>
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
<b>d. Field Burning of Agricultural Residues</b>	<b>70</b>	<b>50</b>	<b>30</b>	<b>30</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>30</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>200</b>	<b>400</b>	<b>400</b>	<b>600</b>	<b>600</b>	<b>600</b>	<b>700</b>	<b>900</b>
<b>WASTE</b>	<b>590</b>	<b>750</b>	<b>820</b>	<b>860</b>	<b>890</b>	<b>900</b>	<b>920</b>	<b>850</b>
<b>a. Solid Waste Disposal on Land</b>	<b>550</b>	<b>710</b>	<b>780</b>	<b>820</b>	<b>840</b>	<b>860</b>	<b>870</b>	<b>810</b>
<b>b. Wastewater Handling</b>	<b>40</b>	<b>42</b>	<b>41</b>	<b>42</b>	<b>43</b>	<b>43</b>	<b>44</b>	<b>45</b>
<b>c. Waste Incineration</b>	<b>0.51</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

## 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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

- 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						
Global Warming Potential		CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>4</sup>	PFCs <sup>4</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Unit		kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> 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 <sup>1</sup>	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 <sub>2</sub> 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 <sup>2</sup>	-	-	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c.	Metal Production	-	-	-	-	-	-	-	-	-	-
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-	-	-
	SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d.	Production and Consumption of Halocarbons, SF <sub>6</sub> and NF <sub>3</sub> <sup>3</sup>	-	-	-	-	-	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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 A10–18 1990–2013 GHG Emission Summary for Alberta

Greenhouse Gas Categories								
	1990	2000	2005	2009	2010	2011	2012	2013
<i>kt CO<sub>2</sub> equivalent</i>								
<b>TOTAL</b>	<b>175 000</b>	<b>232 000</b>	<b>234 000</b>	<b>235 000</b>	<b>243 000</b>	<b>247 000</b>	<b>258 000</b>	<b>267 000</b>
<b>ENERGY</b>	<b>153 000</b>	<b>202 000</b>	<b>201 000</b>	<b>204 000</b>	<b>212 000</b>	<b>215 000</b>	<b>223 000</b>	<b>233 000</b>
<b>a. Stationary Combustion Sources</b>	<b>96 900</b>	<b>128 000</b>	<b>130 000</b>	<b>134 000</b>	<b>137 000</b>	<b>141 000</b>	<b>146 000</b>	<b>152 000</b>
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>b. Transport<sup>1</sup></b>	<b>22 600</b>	<b>30 700</b>	<b>34 800</b>	<b>35 500</b>	<b>40 500</b>	<b>40 000</b>	<b>41 300</b>	<b>44 200</b>
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
<b>c. Fugitive Sources</b>	<b>34 000</b>	<b>43 000</b>	<b>36 000</b>	<b>34 000</b>	<b>34 000</b>	<b>35 000</b>	<b>36 000</b>	<b>37 000</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>6 080</b>	<b>9 560</b>	<b>11 500</b>	<b>11 500</b>	<b>11 700</b>	<b>12 300</b>	<b>15 300</b>	<b>13 500</b>
<b>a. Mineral Products</b>	<b>1 100</b>	<b>1 400</b>	<b>1 500</b>	<b>1 100</b>	<b>1 200</b>	<b>1 200</b>	<b>1 300</b>	<b>1 200</b>
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>b. Chemical Industry<sup>2</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Adipic Acid Production	-	-	-	-	-	-	-	-
<b>c. Metal Production</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminum Production	-	-	-	-	-	-	-	-
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>3</sup></b>	<b>1.6</b>	<b>460</b>	<b>700</b>	<b>820</b>	<b>820</b>	<b>850</b>	<b>880</b>	<b>920</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>5 000</b>	<b>7 700</b>	<b>9 300</b>	<b>9 600</b>	<b>9 700</b>	<b>10 000</b>	<b>13 000</b>	<b>11 000</b>
<b>f. Other Product Manufacture and Use</b>	<b>16</b>	<b>42</b>	<b>37</b>	<b>28</b>	<b>27</b>	<b>31</b>	<b>41</b>	<b>40</b>
<b>AGRICULTURE</b>	<b>14 000</b>	<b>19 000</b>	<b>20 000</b>	<b>18 000</b>	<b>17 000</b>	<b>17 000</b>	<b>18 000</b>	<b>19 000</b>
<b>a. Enteric Fermentation</b>	<b>7 800</b>	<b>11 000</b>	<b>12 000</b>	<b>10 000</b>	<b>9 600</b>	<b>9 400</b>	<b>9 500</b>	<b>9 600</b>
<b>b. Manure Management</b>	<b>1 800</b>	<b>2 500</b>	<b>2 600</b>	<b>2 300</b>	<b>2 200</b>	<b>2 100</b>	<b>2 100</b>	<b>2 200</b>
<b>c. Agriculture Soils</b>	<b>4 200</b>	<b>4 800</b>	<b>4 600</b>	<b>4 600</b>	<b>5 000</b>	<b>5 400</b>	<b>5 700</b>	<b>6 100</b>
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
<b>d. Field Burning of Agricultural Residues</b>	<b>4</b>	<b>0.2</b>	<b>0.7</b>	<b>0.4</b>	<b>0.4</b>	<b>0.7</b>	<b>0.6</b>	<b>1</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>300</b>	<b>400</b>	<b>400</b>	<b>600</b>	<b>600</b>	<b>600</b>	<b>700</b>	<b>800</b>
<b>WASTE</b>	<b>1 300</b>	<b>1 500</b>	<b>1 900</b>	<b>2 100</b>	<b>2 000</b>	<b>2 000</b>	<b>2 100</b>	<b>2 300</b>
<b>a. Solid Waste Disposal on Land</b>	<b>1 200</b>	<b>1 400</b>	<b>1 800</b>	<b>2 000</b>	<b>1 900</b>	<b>1 900</b>	<b>2 000</b>	<b>2 100</b>
<b>b. Wastewater Handling</b>	<b>68</b>	<b>86</b>	<b>95</b>	<b>110</b>	<b>110</b>	<b>110</b>	<b>110</b>	<b>120</b>
<b>c. Waste Incineration</b>	<b>11</b>	<b>33</b>	<b>33</b>	<b>7.4</b>	<b>17</b>	<b>22</b>	<b>43</b>	<b>46</b>

## 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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

- 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						
Global Warming Potential		CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>4</sup>	PFCs <sup>4</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Unit		kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> 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 <sup>1</sup>	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 <sub>2</sub> 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 <sup>2</sup>	-	-	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c.	Metal Production	-	-	-	-	-	-	-	-	-	-
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-	-	-
	SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d.	Production and Consumption of Halocarbons, SF <sub>6</sub> and NF <sub>3</sub> <sup>3</sup>	-	-	-	-	-	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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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

Greenhouse Gas Categories								
	1990	2000	2005	2009	2010	2011	2012	2013
<i>kt CO<sub>2</sub> equivalent</i>								
<b>TOTAL</b>	<b>51 900</b>	<b>64 900</b>	<b>64 400</b>	<b>60 700</b>	<b>60 200</b>	<b>60 500</b>	<b>61 900</b>	<b>62 800</b>
<b>ENERGY</b>	<b>42 400</b>	<b>52 400</b>	<b>52 100</b>	<b>49 000</b>	<b>49 000</b>	<b>49 500</b>	<b>51 100</b>	<b>52 200</b>
<b>a. Stationary Combustion Sources</b>	<b>19 500</b>	<b>22 600</b>	<b>21 700</b>	<b>20 700</b>	<b>20 200</b>	<b>21 600</b>	<b>21 900</b>	<b>22 100</b>
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>b. Transport<sup>1</sup></b>	<b>18 800</b>	<b>24 200</b>	<b>25 100</b>	<b>23 400</b>	<b>24 000</b>	<b>22 500</b>	<b>23 900</b>	<b>24 800</b>
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
<b>c. Fugitive Sources</b>	<b>4 100</b>	<b>5 700</b>	<b>5 300</b>	<b>4 900</b>	<b>4 900</b>	<b>5 400</b>	<b>5 200</b>	<b>5 400</b>
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
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>2 870</b>	<b>4 670</b>	<b>4 350</b>	<b>3 980</b>	<b>3 700</b>	<b>3 450</b>	<b>3 630</b>	<b>3 440</b>
<b>a. Mineral Products</b>	<b>870</b>	<b>1 400</b>	<b>1 500</b>	<b>1 100</b>	<b>1 200</b>	<b>1 200</b>	<b>1 300</b>	<b>1 200</b>
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>b. Chemical Industry<sup>2</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Adipic Acid Production	-	-	-	-	-	-	-	-
<b>c. Metal Production</b>	<b>1 670</b>	<b>2 030</b>	<b>1 220</b>	<b>1 250</b>	<b>848</b>	<b>848</b>	<b>886</b>	<b>759</b>
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminum Production	1 670	2 030	1 220	1 250	847	847	885	758
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	0.68	1.46	0.57	0.53	0.52	0.55	0.56
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>3</sup></b>	<b>57</b>	<b>560</b>	<b>820</b>	<b>910</b>	<b>930</b>	<b>930</b>	<b>990</b>	<b>1 000</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>260</b>	<b>630</b>	<b>780</b>	<b>710</b>	<b>710</b>	<b>450</b>	<b>450</b>	<b>460</b>
<b>f. Other Product Manufacture and Use</b>	<b>20</b>	<b>57</b>	<b>47</b>	<b>33</b>	<b>32</b>	<b>34</b>	<b>43</b>	<b>39</b>
<b>AGRICULTURE</b>	<b>2 400</b>	<b>2 700</b>	<b>2 900</b>	<b>2 300</b>	<b>2 300</b>	<b>2 300</b>	<b>2 200</b>	<b>2 300</b>
<b>a. Enteric Fermentation</b>	<b>1 400</b>	<b>1 700</b>	<b>1 800</b>	<b>1 400</b>	<b>1 400</b>	<b>1 300</b>	<b>1 300</b>	<b>1 400</b>
<b>b. Manure Management</b>	<b>430</b>	<b>510</b>	<b>530</b>	<b>470</b>	<b>460</b>	<b>460</b>	<b>450</b>	<b>460</b>
<b>c. Agriculture Soils</b>	<b>500</b>	<b>450</b>	<b>480</b>	<b>430</b>	<b>450</b>	<b>440</b>	<b>410</b>	<b>470</b>
Direct Sources	400	340	360	330	350	340	320	370
Indirect Sources	100	100	100	100	100	100	90	100
<b>d. Field Burning of Agricultural Residues</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>30</b>	<b>40</b>	<b>20</b>	<b>10</b>	<b>10</b>	<b>30</b>	<b>20</b>	<b>20</b>
<b>WASTE</b>	<b>4 300</b>	<b>5 100</b>	<b>5 100</b>	<b>5 400</b>	<b>5 300</b>	<b>5 300</b>	<b>5 000</b>	<b>4 800</b>
<b>a. Solid Waste Disposal on Land</b>	<b>4 100</b>	<b>4 800</b>	<b>4 900</b>	<b>5 200</b>	<b>5 100</b>	<b>5 100</b>	<b>4 800</b>	<b>4 600</b>
<b>b. Wastewater Handling</b>	<b>96</b>	<b>130</b>	<b>130</b>	<b>130</b>	<b>140</b>	<b>140</b>	<b>140</b>	<b>140</b>
<b>c. Waste Incineration</b>	<b>81</b>	<b>87</b>	<b>79</b>	<b>70</b>	<b>67</b>	<b>66</b>	<b>64</b>	<b>62</b>

## 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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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Table A10-21 2013 GHG Emission Summary for British Columbia

Greenhouse Gas Categories					Greenhouse Gases						
Global Warming Potential		CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>4</sup>	PFCs <sup>4</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Unit		kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> 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 <sup>1</sup>	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 <sub>2</sub> 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 <sup>2</sup>	-	-	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c.	Metal Production	351	-	-	-	-	-	407	0.56	-	759
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
	Aluminum Production	351	-	-	-	-	-	407	0.01	-	758
	SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	0.56	-	0.56
d.	Production and Consumption of Halocarbons, SF <sub>6</sub> and NF <sub>3</sub> <sup>3</sup>	-	-	-	-	-	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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 A10–22 1990–2013 GHG Emission Summary for Yukon

Greenhouse Gas Categories								
	1990	2000	2005	2009	2010	2011	2012	2013
<i>kt CO<sub>2</sub> equivalent</i>								
<b>TOTAL</b>	<b>539</b>	<b>507</b>	<b>467</b>	<b>353</b>	<b>350</b>	<b>390</b>	<b>400</b>	<b>358</b>
<b>ENERGY</b>	<b>536</b>	<b>497</b>	<b>453</b>	<b>339</b>	<b>334</b>	<b>374</b>	<b>383</b>	<b>341</b>
<b>a. Stationary Combustion Sources</b>	<b>220</b>	<b>249</b>	<b>203</b>	<b>133</b>	<b>135</b>	<b>153</b>	<b>145</b>	<b>117</b>
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>b. Transport<sup>1</sup></b>	<b>315</b>	<b>240</b>	<b>241</b>	<b>196</b>	<b>189</b>	<b>209</b>	<b>228</b>	<b>224</b>
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
<b>c. Fugitive Sources</b>	<b>-</b>	<b>7.8</b>	<b>10</b>	<b>9.8</b>	<b>11</b>	<b>11</b>	<b>10</b>	<b>0.09</b>
Coal Mining	-	-	-	-	-	-	-	-
Oil and Natural Gas	-	7.8	10	9.8	11	11	10	0.09
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>1.68</b>	<b>6.96</b>	<b>9.82</b>	<b>11.2</b>	<b>11.7</b>	<b>12.6</b>	<b>13.2</b>	<b>13.1</b>
<b>a. Mineral Products</b>	<b>0.13</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.0</b>	<b>0.0</b>
Cement Production	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-
Mineral Products Use	0.13	-	-	-	-	-	0.0	0.0
<b>b. Chemical Industry<sup>2</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Adipic Acid Production	-	-	-	-	-	-	-	-
<b>c. Metal Production</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminum Production	-	-	-	-	-	-	-	-
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>3</sup></b>	<b>-</b>	<b>6.2</b>	<b>9.2</b>	<b>10</b>	<b>11</b>	<b>11</b>	<b>12</b>	<b>12</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>1.4</b>	<b>0.35</b>	<b>0.28</b>	<b>0.56</b>	<b>0.85</b>	<b>1.1</b>	<b>1.1</b>	<b>0.42</b>
<b>f. Other Product Manufacture and Use</b>	<b>0.17</b>	<b>0.43</b>	<b>0.36</b>	<b>0.25</b>	<b>0.25</b>	<b>0.28</b>	<b>0.37</b>	<b>0.34</b>
<b>AGRICULTURE</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>a. Enteric Fermentation</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>b. Manure Management</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>c. Agriculture Soils</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Direct Sources	-	-	-	-	-	-	-	-
Indirect Sources	-	-	-	-	-	-	-	-
<b>d. Field Burning of Agricultural Residues</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>WASTE</b>	<b>2</b>	<b>2.8</b>	<b>3.2</b>	<b>3.5</b>	<b>3.6</b>	<b>3.7</b>	<b>3.8</b>	<b>3.9</b>
<b>a. Solid Waste Disposal on Land</b>	<b>0.74</b>	<b>1.4</b>	<b>1.7</b>	<b>1.9</b>	<b>2</b>	<b>2.1</b>	<b>2.1</b>	<b>2.2</b>
<b>b. Wastewater Handling</b>	<b>1.3</b>	<b>1.5</b>	<b>1.5</b>	<b>1.6</b>	<b>1.6</b>	<b>1.7</b>	<b>1.7</b>	<b>1.7</b>
<b>c. Waste Incineration</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

## 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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

- 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 A10-23 2013 GHG Emission Summary for Yukon

Greenhouse Gas Categories		Greenhouse Gases									
Global Warming Potential		CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>4</sup>	PFCs <sup>4</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Unit		kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> 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 <sup>1</sup>	216	0.01	0.4	0.03	8	-	-	-	-
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 <sub>2</sub> 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 <sup>2</sup>	-	-	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c.	Metal Production	-	-	-	-	-	-	-	-	-	-
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-	-	-
	SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d.	Production and Consumption of Halocarbons, SF <sub>6</sub> and NF <sub>3</sub> <sup>3</sup>	-	-	-	-	-	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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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

Greenhouse Gas Categories								
	1990	2000	2005	2009	2010	2011	2012	2013
<i>kt CO<sub>2</sub> equivalent</i>								
<b>TOTAL</b>	<b>1 230</b>	<b>1 500</b>	<b>1 660</b>	<b>1 240</b>	<b>1 360</b>	<b>1 430</b>	<b>1 560</b>	<b>1 460</b>
<b>ENERGY</b>	<b>1 220</b>	<b>1 480</b>	<b>1 640</b>	<b>1 220</b>	<b>1 340</b>	<b>1 420</b>	<b>1 550</b>	<b>1 440</b>
<b>a. Stationary Combustion Sources</b>	<b>603</b>	<b>863</b>	<b>724</b>	<b>657</b>	<b>657</b>	<b>634</b>	<b>769</b>	<b>710</b>
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>b. Transport<sup>1</sup></b>	<b>605</b>	<b>598</b>	<b>898</b>	<b>552</b>	<b>672</b>	<b>769</b>	<b>755</b>	<b>710</b>
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
<b>c. Fugitive Sources</b>	<b>14</b>	<b>21</b>	<b>18</b>	<b>14</b>	<b>15</b>	<b>14</b>	<b>24</b>	<b>20</b>
Coal Mining	-	-	-	-	-	-	-	-
Oil and Natural Gas	14	21	18	14	15	14	24	20
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>6.15</b>	<b>8.6</b>	<b>10.1</b>	<b>9.37</b>	<b>8.97</b>	<b>9.43</b>	<b>9.57</b>	<b>10.3</b>
<b>a. Mineral Products</b>	<b>0.01</b>	<b>0.04</b>	<b>0.16</b>	<b>0.07</b>	<b>0.03</b>	<b>0.04</b>	<b>0.02</b>	<b>0.02</b>
Cement Production	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-
Mineral Products Use	0.01	0.04	0.16	0.07	0.03	0.04	0.02	0.02
<b>b. Chemical Industry<sup>2</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Adipic Acid Production	-	-	-	-	-	-	-	-
<b>c. Metal Production</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminum Production	-	-	-	-	-	-	-	-
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>3</sup></b>	<b>3.2</b>	<b>3.9</b>	<b>5.8</b>	<b>6.7</b>	<b>6.5</b>	<b>6.6</b>	<b>6.8</b>	<b>7</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>2.4</b>	<b>4.1</b>	<b>3.6</b>	<b>2.3</b>	<b>2.1</b>	<b>2.4</b>	<b>2.3</b>	<b>2.8</b>
<b>f. Other Product Manufacture and Use</b>	<b>0.53</b>	<b>0.57</b>	<b>0.49</b>	<b>0.33</b>	<b>0.32</b>	<b>0.38</b>	<b>0.49</b>	<b>0.44</b>
<b>AGRICULTURE</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>a. Enteric Fermentation</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>b. Manure Management</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>c. Agriculture Soils</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Direct Sources	-	-	-	-	-	-	-	-
Indirect Sources	-	-	-	-	-	-	-	-
<b>d. Field Burning of Agricultural Residues</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>WASTE</b>	<b>5.1</b>	<b>5.2</b>	<b>6</b>	<b>6.3</b>	<b>6.4</b>	<b>6.5</b>	<b>6.6</b>	<b>6.7</b>
<b>a. Solid Waste Disposal on Land</b>	<b>2.4</b>	<b>2.5</b>	<b>3.1</b>	<b>3.4</b>	<b>3.5</b>	<b>3.5</b>	<b>3.6</b>	<b>3.7</b>
<b>b. Wastewater Handling</b>	<b>2.8</b>	<b>2.8</b>	<b>3</b>	<b>2.9</b>	<b>2.9</b>	<b>2.9</b>	<b>2.9</b>	<b>3</b>
<b>c. Waste Incineration</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

## 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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

- 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									
Global Warming Potential		CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>4</sup>	PFCs <sup>4</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Unit		kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> 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 <sup>1</sup>	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 <sub>2</sub> 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 <sup>2</sup>	-	-	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c.	Metal Production	-	-	-	-	-	-	-	-	-	-
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-	-	-
	SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d.	Production and Consumption of Halocarbons, SF <sub>6</sub> and NF <sub>3</sub> <sup>3</sup>	-	-	-	-	-	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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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 A10–26 1999–2013 GHG Emission Summary for Nunavut

Greenhouse Gas Categories								
	1990	2000	2005	2009	2010	2011	2012	2013
<i>kt CO<sub>2</sub> equivalent</i>								
<b>TOTAL</b>	<b>261</b>	<b>382</b>	<b>345</b>	<b>433</b>	<b>421</b>	<b>227</b>	<b>229</b>	<b>221</b>
<b>ENERGY</b>	<b>256</b>	<b>377</b>	<b>338</b>	<b>425</b>	<b>414</b>	<b>219</b>	<b>221</b>	<b>212</b>
<b>a. Stationary Combustion Sources</b>	<b>109</b>	<b>92.9</b>	<b>133</b>	<b>125</b>	<b>125</b>	<b>76.2</b>	<b>76.5</b>	<b>71.7</b>
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>b. Transport<sup>1</sup></b>	<b>147</b>	<b>284</b>	<b>205</b>	<b>300</b>	<b>288</b>	<b>143</b>	<b>144</b>	<b>140</b>
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
<b>c. Fugitive Sources</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Coal Mining	-	-	-	-	-	-	-	-
Oil and Natural Gas	-	-	-	-	-	-	-	-
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>1.41</b>	<b>1.67</b>	<b>2.38</b>	<b>2.78</b>	<b>2.79</b>	<b>3</b>	<b>3.33</b>	<b>3.59</b>
<b>a. Mineral Products</b>	<b>0.01</b>	<b>0.04</b>	<b>0.16</b>	<b>0.07</b>	<b>0.03</b>	<b>0.04</b>	<b>0.02</b>	<b>0.02</b>
Cement Production	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-
Mineral Products Use	0.01	0.04	0.16	0.07	0.03	0.04	0.02	0.02
<b>b. Chemical Industry<sup>2</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Adipic Acid Production	-	-	-	-	-	-	-	-
<b>c. Metal Production</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminum Production	-	-	-	-	-	-	-	-
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>3</sup></b>	<b>1</b>	<b>1.2</b>	<b>1.9</b>	<b>2.5</b>	<b>2.5</b>	<b>2.7</b>	<b>3</b>	<b>3.3</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>f. Other Product Manufacture and Use</b>	<b>0.35</b>	<b>0.39</b>	<b>0.34</b>	<b>0.24</b>	<b>0.23</b>	<b>0.24</b>	<b>0.3</b>	<b>0.26</b>
<b>AGRICULTURE</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>a. Enteric Fermentation</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>b. Manure Management</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>c. Agriculture Soils</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Direct Sources	-	-	-	-	-	-	-	-
Indirect Sources	-	-	-	-	-	-	-	-
<b>d. Field Burning of Agricultural Residues</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>WASTE</b>	<b>3.4</b>	<b>3.6</b>	<b>4.2</b>	<b>4.8</b>	<b>4.9</b>	<b>5.1</b>	<b>5.2</b>	<b>5.4</b>
<b>a. Solid Waste Disposal on Land</b>	<b>1.6</b>	<b>1.7</b>	<b>2.2</b>	<b>2.6</b>	<b>2.7</b>	<b>2.8</b>	<b>2.9</b>	<b>3</b>
<b>b. Wastewater Handling</b>	<b>1.8</b>	<b>1.9</b>	<b>2.1</b>	<b>2.2</b>	<b>2.3</b>	<b>2.3</b>	<b>2.3</b>	<b>2.4</b>
<b>c. Waste Incineration</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

## 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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

- 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									
Global Warming Potential		CO <sub>2</sub>	CH <sub>4</sub>	CH <sub>4</sub>	N <sub>2</sub> O	N <sub>2</sub> O	HFCs <sup>4</sup>	PFCs <sup>4</sup>	SF <sub>6</sub>	NF <sub>3</sub>	TOTAL
Unit		kt	kt	kt CO <sub>2</sub> eq.	kt	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> eq.	kt CO <sub>2</sub> 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 <sup>1</sup>	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 <sub>2</sub> 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 <sup>2</sup>	-	-	-	-	-	-	-	-	-	-
	Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c.	Metal Production	-	-	-	-	-	-	-	-	-	-
	Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
	Aluminum Production	-	-	-	-	-	-	-	-	-	-
	SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d.	Production and Consumption of Halocarbons, SF <sub>6</sub> and NF <sub>3</sub> <sup>3</sup>	-	-	-	-	-	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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

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
<i>kt CO<sub>2</sub> equivalent</i>									
<b>TOTAL</b>	<b>1 640</b>	<b>1 600</b>	<b>1 400</b>	<b>1 680</b>	<b>1 840</b>	<b>1 970</b>	<b>1 920</b>	<b>1 740</b>	<b>1 580</b>
<b>ENERGY</b>	<b>1 630</b>	<b>1 580</b>	<b>1 390</b>	<b>1 650</b>	<b>1 730</b>	<b>1 880</b>	<b>1 910</b>	<b>1 720</b>	<b>1 560</b>
<b>a. Stationary Combustion Sources</b>	<b>921</b>	<b>991</b>	<b>853</b>	<b>950</b>	<b>1 010</b>	<b>1 160</b>	<b>1 030</b>	<b>981</b>	<b>740</b>
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>b. Transport<sup>1</sup></b>	<b>616</b>	<b>486</b>	<b>448</b>	<b>604</b>	<b>659</b>	<b>654</b>	<b>819</b>	<b>732</b>	<b>814</b>
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	-
<b>c. Fugitive Sources</b>	<b>97</b>	<b>100</b>	<b>89</b>	<b>94</b>	<b>65</b>	<b>65</b>	<b>60</b>	<b>12</b>	<b>10</b>
Coal Mining	-	-	-	-	-	-	-	-	-
Oil and Natural Gas	97	100	89	94	65	65	60	12	10
<b>d. CO<sub>2</sub> Transport and Storage</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>INDUSTRIAL PROCESSES AND PRODUCT USE</b>	<b>3.4</b>	<b>11.7</b>	<b>2.53</b>	<b>24.7</b>	<b>104</b>	<b>85.7</b>	<b>1.98</b>	<b>2.73</b>	<b>2.99</b>
<b>a. Mineral Products</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.02</b>	<b>0.02</b>	<b>0.04</b>	<b>-</b>	<b>-</b>
Cement Production	-	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-	-
Mineral Products Use	-	-	-	-	0.02	0.02	0.04	-	-
<b>b. Chemical Industry<sup>2</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Adipic Acid Production	-	-	-	-	-	-	-	-	-
<b>c. Metal Production</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Iron and Steel Production	-	-	-	-	-	-	-	-	-
Aluminum Production	-	-	-	-	-	-	-	-	-
SF <sub>6</sub> Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-
<b>d. Production and Consumption of Halocarbons, SF<sub>6</sub> and NF<sub>3</sub><sup>3</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.7</b>	<b>1.3</b>	<b>1.9</b>	<b>2.1</b>
<b>e. Non-Energy Products from Fuels and Solvent Use</b>	<b>3</b>	<b>11</b>	<b>2.2</b>	<b>24</b>	<b>100</b>	<b>85</b>	<b>0.2</b>	<b>0.37</b>	<b>0.03</b>
<b>f. Other Product Manufacture and Use</b>	<b>0.37</b>	<b>0.36</b>	<b>0.3</b>	<b>0.34</b>	<b>0.38</b>	<b>0.46</b>	<b>0.47</b>	<b>0.5</b>	<b>0.86</b>
<b>AGRICULTURE</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>a. Enteric Fermentation</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>b. Manure Management</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>c. Agriculture Soils</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Direct Sources	-	-	-	-	-	-	-	-	-
Indirect Sources	-	-	-	-	-	-	-	-	-
<b>d. Field Burning of Agricultural Residues</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>e. Liming, Urea Application and Other Carbon-containing Fertilizers</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>WASTE</b>	<b>5.9</b>	<b>6.2</b>	<b>6.5</b>	<b>6.8</b>	<b>7.1</b>	<b>7.4</b>	<b>7.7</b>	<b>8</b>	<b>8.2</b>
<b>a. Solid Waste Disposal on Land</b>	<b>2</b>	<b>2.2</b>	<b>2.3</b>	<b>2.5</b>	<b>2.7</b>	<b>2.9</b>	<b>3.2</b>	<b>3.4</b>	<b>3.7</b>
<b>b. Wastewater Handling</b>	<b>3.9</b>	<b>4.1</b>	<b>4.2</b>	<b>4.2</b>	<b>4.4</b>	<b>4.5</b>	<b>4.5</b>	<b>4.6</b>	<b>4.6</b>
<b>c. Waste Incineration</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

## 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<sub>2</sub> eq values.3. Emission estimates from consumption of PFCs and NF<sub>3</sub>, as well as emissions of SF<sub>6</sub> 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<sub>4</sub> emissions from the use of NF<sub>3</sub>.

- 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 (SF<sub>6</sub>) 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* (RES<sub>D</sub>) (Statistics Canada 57-003-X), in the publication *Electric Power Generation, Transmission and Distribution* (EPG<sub>TD</sub>) (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 RES<sub>D</sub>,<sup>1</sup> while generation data are from CANSIM (2005–2013) and the EPG<sub>TD</sub> 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<sub>6</sub> 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<sub>6</sub> emission values are based on the electric utility sector’s share of total SF<sub>6</sub> 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.

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<sup>1</sup> 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<sup>1</sup>

	1990	2000	2005	2009	2010	2011	2012	2013 <sup>2</sup>
<b>Greenhouse Gas Emissions<sup>3</sup></b>								
<i>kt CO<sub>2</sub> eq</i>								
<b>Combustion</b>	<b>94 700</b>	<b>132 000</b>	<b>127 000</b>	<b>102 300</b>	<b>103 000</b>	<b>95 600</b>	<b>89 700</b>	<b>88 300</b>
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 <sup>4</sup>	11 500	10 490	14 100	9 630	5 870	5 310	4 930	5 070
<b>Other Emissions<sup>5</sup></b>	<b>–</b>	<b>27.3</b>	<b>52</b>	<b>73</b>	<b>54</b>	<b>61</b>	<b>82</b>	<b>63</b>
<b>Overall Total<sup>6,7</sup></b>	<b>94 700</b>	<b>132 000</b>	<b>127 000</b>	<b>102 000</b>	<b>103 000</b>	<b>95 700</b>	<b>89 800</b>	<b>88 300</b>
<b>Electricity Generation<sup>8,9</sup></b>								
<i>GWh</i>								
<b>Combustion</b>	<b>101 000</b>	<b>146 000</b>	<b>140 000</b>	<b>113 000</b>	<b>117 000</b>	<b>119 000</b>	<b>107 000</b>	<b>104 000</b>
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
<b>Steam from Waste Heat</b>	<b>–</b>	<b>–</b>	<b>32.4</b>	<b>5 520</b>	<b>7 090</b>	<b>6 440</b>	<b>7 530</b>	<b>7 110</b>
<b>Nuclear</b>	<b>68 800</b>	<b>68 700</b>	<b>86 800</b>	<b>85 000</b>	<b>85 500</b>	<b>88 300</b>	<b>89 500</b>	<b>82 400</b>
<b>Hydro</b>	<b>263 000</b>	<b>323 000</b>	<b>327 000</b>	<b>334 000</b>	<b>321 000</b>	<b>342 000</b>	<b>345 000</b>	<b>357 000</b>
<b>Other Renewables<sup>10</sup></b>	<b>26.2</b>	<b>264</b>	<b>1 580</b>	<b>6 610</b>	<b>8 780</b>	<b>10 370</b>	<b>11 500</b>	<b>11 800</b>
<b>Other Generation<sup>11</sup></b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>1 920</b>	<b>2 980</b>	<b>2 510</b>	<b>2 720</b>	<b>2 440</b>
<b>Overall Total<sup>7</sup></b>	<b>433 000</b>	<b>539 000</b>	<b>556 000</b>	<b>546 000</b>	<b>542 000</b>	<b>568 000</b>	<b>563 000</b>	<b>565 000</b>
<b>Greenhouse Gas Intensity<sup>12</sup></b>								
<i>g GHG / kWh electricity generated</i>								
<b>CO<sub>2</sub> intensity (g CO<sub>2</sub> / kWh)</b>	<b>220</b>	<b>240</b>	<b>220</b>	<b>180</b>	<b>190</b>	<b>170</b>	<b>160</b>	<b>150</b>
<b>CH<sub>4</sub> intensity (g CH<sub>4</sub> / kWh)</b>	<b>0.004</b>	<b>0.009</b>	<b>0.01</b>	<b>0.009</b>	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>
<b>N<sub>2</sub>O intensity (g N<sub>2</sub>O / kWh)</b>	<b>0.004</b>	<b>0.005</b>	<b>0.005</b>	<b>0.004</b>	<b>0.004</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>
<b>Generation Intensity (g CO<sub>2</sub> eq / kWh)<sup>7</sup></b>	<b>220</b>	<b>240</b>	<b>220</b>	<b>180</b>	<b>190</b>	<b>170</b>	<b>160</b>	<b>150</b>
<b>Unallocated Energy (GWh)<sup>13,14</sup></b>	<b>31 000</b>	<b>42 000</b>	<b>37 000</b>	<b>57 000</b>	<b>52 000</b>	<b>57 000</b>	<b>46 000</b>	<b>29 000</b>
<b>SF<sub>6</sub> Emissions (kt CO<sub>2</sub> eq)<sup>15</sup></b>	<b>200</b>	<b>200</b>	<b>160</b>	<b>180</b>	<b>180</b>	<b>140</b>	<b>180</b>	<b>210</b>
<b>Consumption Intensity (g CO<sub>2</sub> eq / kWh)<sup>16</sup></b>	<b>240</b>	<b>260</b>	<b>240</b>	<b>210</b>	<b>210</b>	<b>190</b>	<b>170</b>	<b>160</b>

## 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<sub>6</sub>).
16. Consumption intensity values are impacted by unallocated energy and SF<sub>6</sub> 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<sup>1</sup>

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

## 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<sub>6</sub>).
  16. Consumption intensity values are impacted by unallocated energy and SF<sub>6</sub> transmission emissions.
- Indicates no emissions or no electricity generation  
0 Indicates emissions or electricity generation value less than 0.1

Table A11–3 Electricity Generation and GHG Emission Details for Prince Edward Island<sup>1</sup>

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

## 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<sub>6</sub>).
16. Consumption intensity values are impacted by unallocated energy and SF<sub>6</sub> 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<sup>1</sup>

	1990	2000	2005	2009	2010	2011	2012	2013 <sup>2</sup>
<b>Greenhouse Gas Emissions<sup>3</sup></b>								
<i>kt CO<sub>2</sub> eq</i>								
<b>Combustion</b>	<b>6 940</b>	<b>9 670</b>	<b>11 000</b>	<b>9 770</b>	<b>8 860</b>	<b>8 520</b>	<b>7 680</b>	<b>7 310</b>
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 <sup>4</sup>	x	1 420	x	x	x	x	x	x
<b>Other Emissions<sup>5</sup></b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>
<b>Overall Total<sup>6,7</sup></b>	<b>6 940</b>	<b>9 670</b>	<b>11 000</b>	<b>9 770</b>	<b>8 860</b>	<b>8 520</b>	<b>7 680</b>	<b>7 310</b>
<b>Electricity Generation<sup>8,9</sup></b>								
<i>GWh</i>								
<b>Combustion</b>	<b>8 440</b>	<b>10 500</b>	<b>11 100</b>	<b>10 200</b>	<b>10 300</b>	<b>9 500</b>	<b>9 210</b>	<b>8 770</b>
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
<b>Steam from Waste Heat</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>
<b>Nuclear</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>
<b>Hydro</b>	<b>1 120</b>	<b>887</b>	<b>1 040</b>	<b>1 040</b>	<b>969</b>	<b>1 070</b>	<b>806</b>	<b>964</b>
<b>Other Renewables<sup>10</sup></b>	<b>26.1</b>	<b>0</b>	<b>113</b>	<b>184</b>	<b>414</b>	<b>809</b>	<b>827</b>	<b>780</b>
<b>Other Generation<sup>11</sup></b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>
<b>Overall Total<sup>7</sup></b>	<b>9 590</b>	<b>11 300</b>	<b>12 200</b>	<b>11 500</b>	<b>11 700</b>	<b>11 400</b>	<b>10 800</b>	<b>10 500</b>
<b>Greenhouse Gas Intensity<sup>12</sup></b>								
<i>g GHG / kWh electricity generated</i>								
<b>CO<sub>2</sub> intensity (g CO<sub>2</sub> / kWh)</b>	<b>720</b>	<b>840</b>	<b>880</b>	<b>820</b>	<b>750</b>	<b>740</b>	<b>700</b>	<b>690</b>
<b>CH<sub>4</sub> intensity (g CH<sub>4</sub> / kWh)</b>	<b>0.007</b>	<b>0.009</b>	<b>0.02</b>	<b>0.03</b>	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	<b>0.03</b>
<b>N<sub>2</sub>O intensity (g N<sub>2</sub>O / kWh)</b>	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>
<b>Generation Intensity (g CO<sub>2</sub> eq / kWh)<sup>7</sup></b>	<b>720</b>	<b>840</b>	<b>880</b>	<b>820</b>	<b>760</b>	<b>750</b>	<b>710</b>	<b>690</b>
<b>Unallocated Energy (GWh)<sup>13,14</sup></b>	<b>580</b>	<b>830</b>	<b>770</b>	<b>710</b>	<b>670</b>	<b>640</b>	<b>1 200</b>	<b>600</b>
<b>SF<sub>6</sub> Emissions (kt CO<sub>2</sub> eq)<sup>15</sup></b>	<b>23</b>	<b>23</b>	<b>29</b>	<b>17</b>	<b>27</b>	<b>33</b>	<b>22</b>	<b>36</b>
<b>Consumption Intensity (g CO<sub>2</sub> eq / kWh)<sup>16</sup></b>	<b>770</b>	<b>910</b>	<b>940</b>	<b>880</b>	<b>800</b>	<b>800</b>	<b>800</b>	<b>740</b>

## 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<sub>6</sub>).
16. Consumption intensity values are impacted by unallocated energy and SF<sub>6</sub> transmission emissions.
  - Indicates no emissions or no electricity generation
  - 0 Indicates emissions or electricity generation value less than 0.1

Table A11–5 Electricity Generation and GHG Emission Details for New Brunswick<sup>1</sup>

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

## 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<sub>6</sub>).
16. Consumption intensity values are impacted by unallocated energy and SF<sub>6</sub> 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



Table A11-6 Electricity Generation and GHG Emission Details for Quebec<sup>1</sup>

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

## 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<sub>6</sub>).
16. Consumption intensity values are impacted by unallocated energy and SF<sub>6</sub> 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 A11–7 Electricity Generation and GHG Emission Details for Ontario<sup>1</sup>

	1990	2000	2005	2009	2010	2011	2012	2013 <sup>2</sup>
<b>Greenhouse Gas Emissions<sup>3</sup></b>								
<i>kt CO<sub>2</sub> eq</i>								
<b>Combustion</b>	<b>26 000</b>	<b>43 800</b>	<b>35 200</b>	<b>15 700</b>	<b>20 100</b>	<b>14 500</b>	<b>14 400</b>	<b>11 200</b>
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 <sup>4</sup>	x	x	x	x	x	x	x	x
<b>Other Emissions<sup>5</sup></b>	<b>–</b>	<b>0.77</b>	<b>1.4</b>	<b>21</b>	<b>0.23</b>	<b>0.23</b>	<b>–</b>	<b>–</b>
<b>Overall Total<sup>6,7</sup></b>	<b>26 000</b>	<b>43 800</b>	<b>35 200</b>	<b>15 700</b>	<b>20 100</b>	<b>14 500</b>	<b>14 400</b>	<b>11 200</b>
<b>Electricity Generation<sup>8,9</sup></b>								
<i>GWh</i>								
<b>Combustion</b>	<b>29 200</b>	<b>52 200</b>	<b>40 900</b>	<b>19 600</b>	<b>27 200</b>	<b>25 100</b>	<b>23 800</b>	<b>18 500</b>
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
<b>Steam from Waste Heat</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>2 580</b>	<b>3 630</b>	<b>3 500</b>	<b>4 250</b>	<b>3 330</b>
<b>Nuclear</b>	<b>59 400</b>	<b>59 800</b>	<b>78 000</b>	<b>81 400</b>	<b>82 000</b>	<b>84 800</b>	<b>84 900</b>	<b>77 900</b>
<b>Hydro</b>	<b>38 700</b>	<b>36 600</b>	<b>34 600</b>	<b>38 700</b>	<b>31 800</b>	<b>34 600</b>	<b>33 000</b>	<b>36 900</b>
<b>Other Renewables<sup>10</sup></b>	<b>–</b>	<b>1.22</b>	<b>26.0</b>	<b>2 100</b>	<b>3 190</b>	<b>3 420</b>	<b>4 320</b>	<b>4 680</b>
<b>Other Generation<sup>11</sup></b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>
<b>Overall Total<sup>7</sup></b>	<b>127 000</b>	<b>149 000</b>	<b>153 000</b>	<b>144 000</b>	<b>148 000</b>	<b>151 000</b>	<b>150 000</b>	<b>141 000</b>
<b>Greenhouse Gas Intensity<sup>12</sup></b>								
<i>g GHG / kWh electricity generated</i>								
<b>CO<sub>2</sub> intensity (g CO<sub>2</sub> / kWh)</b>	<b>200</b>	<b>290</b>	<b>220</b>	<b>100</b>	<b>130</b>	<b>93</b>	<b>93</b>	<b>76</b>
<b>CH<sub>4</sub> intensity (g CH<sub>4</sub> / kWh)</b>	<b>0.002</b>	<b>0.01</b>	<b>0.01</b>	<b>0.010</b>	<b>0.01</b>	<b>0.02</b>	<b>0.02</b>	<b>0.01</b>
<b>N<sub>2</sub>O intensity (g N<sub>2</sub>O / kWh)</b>	<b>0.003</b>	<b>0.005</b>	<b>0.004</b>	<b>0.002</b>	<b>0.003</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>
<b>Generation Intensity (g CO<sub>2</sub> eq / kWh)<sup>7</sup></b>	<b>200</b>	<b>290</b>	<b>220</b>	<b>100</b>	<b>130</b>	<b>94</b>	<b>94</b>	<b>77</b>
<b>Unallocated Energy (GWh)<sup>13,14</sup></b>	<b>10 000</b>	<b>12 000</b>	<b>12 000</b>	<b>21 000</b>	<b>15 000</b>	<b>16 000</b>	<b>15 000</b>	<b>9 000</b>
<b>SF<sub>6</sub> Emissions (kt CO<sub>2</sub> eq)<sup>15</sup></b>	<b>76</b>	<b>75</b>	<b>50</b>	<b>60</b>	<b>59</b>	<b>38</b>	<b>56</b>	<b>62</b>
<b>Consumption Intensity (g CO<sub>2</sub> eq / kWh)<sup>16</sup></b>	<b>220</b>	<b>320</b>	<b>240</b>	<b>120</b>	<b>150</b>	<b>110</b>	<b>110</b>	<b>80</b>

## 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<sub>6</sub>).
16. Consumption intensity values are impacted by unallocated energy and SF<sub>6</sub> 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 A11-8 Electricity Generation and GHG Emission Details for Manitoba<sup>1</sup>

	1990	2000	2005	2009	2010	2011	2012	2013 <sup>2</sup>
<b>Greenhouse Gas Emissions<sup>3</sup></b>								
<i>kt CO<sub>2</sub> eq</i>								
<b>Combustion</b>	<b>523</b>	<b>1 004</b>	<b>329</b>	<b>181</b>	<b>75.5</b>	<b>107</b>	<b>88.2</b>	<b>99.6</b>
Coal	x	x	x	x	x	x	x	x
Natural Gas	x	x	x	x	x	x	x	x
Other Fuels <sup>4</sup>	51.0	12.2	15.8	11.3	11.5	12.9	12.9	1.7
<b>Other Emissions<sup>5</sup></b>	<b>–</b>	<b>4.8</b>	<b>8.8</b>	<b>11</b>	<b>12</b>	<b>12</b>	<b>21</b>	<b>16</b>
<b>Overall Total<sup>6,7</sup></b>	<b>523</b>	<b>1 008</b>	<b>338</b>	<b>192</b>	<b>87</b>	<b>119</b>	<b>109</b>	<b>115</b>
<b>Electricity Generation<sup>8,9</sup></b>								
<i>GWh</i>								
<b>Combustion</b>	<b>399</b>	<b>881</b>	<b>447</b>	<b>195</b>	<b>84</b>	<b>106</b>	<b>94</b>	<b>91</b>
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
<b>Steam from Waste Heat</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>
<b>Nuclear</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>
<b>Hydro</b>	<b>19 800</b>	<b>31 500</b>	<b>36 400</b>	<b>33 500</b>	<b>33 300</b>	<b>34 200</b>	<b>32 200</b>	<b>35 300</b>
<b>Other Renewables<sup>10</sup></b>	<b>–</b>	<b>–</b>	<b>53.4</b>	<b>365</b>	<b>343</b>	<b>747</b>	<b>877</b>	<b>868</b>
<b>Other Generation<sup>11</sup></b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>
<b>Overall Total<sup>7</sup></b>	<b>20 200</b>	<b>32 400</b>	<b>36 900</b>	<b>34 100</b>	<b>33 700</b>	<b>35 100</b>	<b>33 200</b>	<b>36 300</b>
<b>Greenhouse Gas Intensity<sup>12</sup></b>								
<i>g GHG / kWh electricity generated</i>								
<b>CO<sub>2</sub> intensity (g CO<sub>2</sub> / kWh)</b>	<b>26</b>	<b>31</b>	<b>9.1</b>	<b>5.6</b>	<b>2.6</b>	<b>3.4</b>	<b>3.2</b>	<b>3.2</b>
<b>CH<sub>4</sub> intensity (g CH<sub>4</sub> / kWh)</b>	<b>0.0005</b>	<b>0.0004</b>	<b>0.0002</b>	<b>0.0002</b>	<b>0.0001</b>	<b>0.0004</b>	<b>0.0002</b>	<b>0.0002</b>
<b>N<sub>2</sub>O intensity (g N<sub>2</sub>O / kWh)</b>	<b>0.001</b>	<b>0.001</b>	<b>0.0002</b>	<b>0.0001</b>	<b>0.0001</b>	<b>0.0001</b>	<b>0.0001</b>	<b>0.0001</b>
<b>Generation Intensity (g CO<sub>2</sub> eq / kWh)<sup>7</sup></b>	<b>26</b>	<b>31</b>	<b>9.1</b>	<b>5.6</b>	<b>2.6</b>	<b>3.4</b>	<b>3.3</b>	<b>3.2</b>
<b>Unallocated Energy (GWh)<sup>13,14</sup></b>	<b>2 100</b>	<b>3 750</b>	<b>1 900</b>	<b>4 700</b>	<b>4 600</b>	<b>4 600</b>	<b>3 600</b>	<b>3 800</b>
<b>SF<sub>6</sub> Emissions (kt CO<sub>2</sub> eq)<sup>15</sup></b>	<b>4.3</b>	<b>4.2</b>	<b>4.0</b>	<b>3.0</b>	<b>4.3</b>	<b>6.0</b>	<b>1.3</b>	<b>1.2</b>
<b>Consumption Intensity (g CO<sub>2</sub> eq / kWh)<sup>16</sup></b>	<b>29</b>	<b>35</b>	<b>9.7</b>	<b>6.6</b>	<b>3.1</b>	<b>4.1</b>	<b>3.7</b>	<b>3.6</b>

## 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<sub>6</sub>).
16. Consumption intensity values are impacted by unallocated energy and SF<sub>6</sub> 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 A11–9 Electricity Generation and GHG Emission Details for Saskatchewan<sup>1</sup>

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

## 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<sub>6</sub>).
16. Consumption intensity values are impacted by unallocated energy and SF<sub>6</sub> 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 A11-10 Electricity Generation and GHG Emission Details for Alberta<sup>1</sup>

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

## 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<sub>6</sub>).
16. Consumption intensity values are impacted by unallocated energy and SF<sub>6</sub> 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 A11–11 Electricity Generation and GHG Emission Details for British Columbia<sup>1</sup>

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

## 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<sub>6</sub>).
16. Consumption intensity values are impacted by unallocated energy and SF<sub>6</sub> 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<sup>1</sup>

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

## 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<sub>6</sub>).
  16. Consumption intensity values are impacted by unallocated energy and SF<sub>6</sub> transmission emissions.
- Indicates no emissions or no electricity generation  
0 Indicates emissions or electricity generation value less than 0.1



Table A11–13 Electricity Generation and GHG Emission Details for the Northwest Territories and Nunavut<sup>1</sup>

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

## 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 22119, 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<sub>6</sub>).
16. Consumption intensity values are impacted by unallocated energy and SF<sub>6</sub> transmission emissions.
  - Indicates no emissions or no electricity generation
  - 0 Indicates emissions or electricity generation value less than 0.1

# References

## Annex 11, Electricity in Canada: Summary and Intensity Tables

Statistics Canada. *Electric Power Generation, Transmission and Distribution (annual)*. Catalogue No. 57-202-X.

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Statistics Canada. No date. *Table 127-0006: Electricity generated from fuels, by electric utility thermal plants (annual)*. CANSIM 2005-2013 [accessed 2015 January].

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Statistics Canada. No date. *Table 127-0008: Supply and disposition of electric power, electric utilities and industry (annual)*. CANSIM 2005-2013 [accessed 2015 January].