NATIONAL INVENTORY REPORT 1990–2022: GREENHOUSE GAS SOURCES AND SINKS IN CANADA

CANADA'S SUBMISSION TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

PART 3

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Environment and Climate Change Canada
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LIST OF COMMON ABBREVIATIONS AND UNITS

Abbreviations

AR4 ..... Fourth Assessment Report of the Intergovernmental Panel on Climate Change
AR5 ..... Fifth Assessment Report of the Intergovernmental Panel on Climate Change
BCER ..... British Columbia Energy Regulator
BCOGC ..... British Columbia Oil and Gas Commission
CAC ..... criteria air contaminant
CANSIM ..... Statistics Canada's key socioeconomic database
CAPP ..... Canadian Association of Petroleum Producers
CEEDC ..... Canadian Energy and Emissions Data Centre
CEPA 1999 ..... *Canadian Environmental Protection Act, 1999*
CEPEI ..... Canadian Energy Partnership for Environmental Innovation
CFC ..... chlorofluorocarbon
CFS ..... Canadian Forest Service
CRF ..... Common Reporting Format
DOC ..... dissolved organic carbon
ECCC ..... Environment and Climate Change Canada
EF ..... emission factor
EOR ..... enhanced oil recovery
FRD ..... facility-reported data
GDP ..... gross domestic product
GHG ..... greenhouse gas
GHGRP ..... Greenhouse Gas Reporting Program
GWP ..... global warming potential
HCFC ..... hydrochlorofluorocarbon
HFC ..... hydrofluorocarbon
HWP ..... harvested wood products
IEA ..... International Energy Agency
IPCC ..... Intergovernmental Panel on Climate Change
IPPU ..... Industrial Processes and Product Use
LDAR ..... light detection and repair
LTO ..... landing and takeoff
LULUCF ..... Land Use, Land-Use Change and Forestry
MMV ..... Measurement, Monitoring and Verification

MPGs ..... modalities, procedures and guidelines for the transparency framework for action and supportreferred to in Article 13 of the Paris Agreement

MSW ..... municipal solid waste

N/A ..... not available

NIR ..... National Inventory Report

NMVOC ..... non-methane volatile organic compound

NRCan ..... Natural Resources Canada

ODS ..... ozone-depleting substance

OECD ..... Organisation for Economic Co-operation and Development

PFC ..... perfluorocarbon

QA ..... quality assurance

QC ..... quality control

RESD ..... *Report on Energy Supply and Demand in Canada*

StatCan ..... Statistics Canada

UOG ..... upstream oil and gas

VKT ..... vehicle kilometres travelled

UNFCCC ..... United Nations Framework Convention on Climate Change

Chemical Formulas

Al ..... aluminium

$CaCO_3$ ..... calcium carbonate; limestone

$CaMg(CO_3)_2$ ..... dolomite

CaO ..... lime; quicklime; calcined limestone

CF_4 ..... carbon tetrafluoride

C_2F_6 ..... carbon hexafluoride

CH_3OH ..... methanol

CH_4 ..... methane

C_2H_6 ..... ethane

C_3H_8 ..... propane

C_4H_{10} ..... butane

C_2H_4 ..... ethylene

CO_2 ..... carbon dioxide

CO_2 eq ..... carbon dioxide equivalent

H_2O ..... water

H_2S ..... hydrogen sulphide

HNO_3 ..... nitric acid

Mg ..... magnesium

$MgCO_3$ ..... magnesite; magnesium carbonate

MgO ..... magnesia; dolomitic lime

N ..... nitrogen

Na_2CO_3 ..... sodium carbonate; soda ash

NF_3 ..... nitrogen trifluoride

NH_3 ..... ammonia

NH_4+ ..... ammonium

NH_4NO_3 ..... ammonium nitrate

N_2O ..... nitrous oxide

N_2O-N ..... nitrous oxide emissions represented in terms of nitrogen

NO ..... nitric oxide

NO_2 ..... nitrogen dioxide

NO_3- ..... nitrate

NO_x ..... nitrogen oxides

O_2 ..... oxygen

SF_6 ..... sulphur hexafluoride

SiC ..... silicon carbide

Notation Keys

IE ..... included elsewhere

NA ..... not applicable

NE ..... not estimated

NO ..... not occurring

Units

g ..... gram

Gg ..... gigagram

Gt ..... gigatonne

GWh ..... gigawatt-hour

ha ..... hectare

kg ..... kilogram

kha ..... kilohectare

km ..... kilometre

kt ..... kilotonne

kWh ..... kilowatt-hour

m ..... metre

Mg ..... megagram

Mha ..... million hectares

ML ..... megalitre

Mt ..... megatonne

PJ ..... petajoule

TJ ..... terajoule

t ..... tonne

TWh ..... terawatt-hour

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE SECTOR ROUNDING PROTOCOL

A rounding protocol has been developed for the emission and removal estimates presented by activity sectors defined by the Intergovernmental Panel on Climate Change (IPCC) (Annex 9 and Annex 11) 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 in this protocol, can be found in Table A8–1.

Many 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 National Inventory Report (NIR) 2003. Default uncertainty values published by the IPCC (IPCC/OECD/IEA, 1997; IPCC, 2001; IPCC, 2006) and those resulting from expert elicitation were also utilized for some ranges. Since 2004–2005, there have been many methodological changes, refinements and updates, including updates to the uncertainty parameters. 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 (up to a maximum of two decimal places) to which the estimates have been rounded:

- uncertainty greater than 50%: one significant figure
- uncertainty between 10% and 50%: two significant figures
- uncertainty less than 10%: three significant figures

Note that for Land Use, Land-Use Change and Forestry, the rounding rules mentioned above are generally followed, except in some cases where there is a requirement to explain specific details of estimates or trends that may be masked by rounding. In those cases, two significant figures are used despite some high uncertainty ranges that suggest using only one significant figure (refer to Chapter 6 for more details).

This rounding protocol does not apply to estimates presented by Canadian Economic Sectors (Annex 10 and Annex 12) which have been rounded to the nearest 1 Mt and 0.1 Mt for National-level estimates (Annex 10) and provincial/territorial-level estimates (Annex 12), respectively.

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. It should be noted that formatting this report 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 IPCC Sector GHG Summary Tables**

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

ANNEX 9

CANADA'S GREENHOUSE GAS EMISSION TABLES BY IPCC SECTOR, 1990–2022

In this National Inventory Report, emission estimates are primarily presented for each of the activity sectors defined by the Intergovernmental Panel on Climate Change (IPCC): Energy, Industrial Processes and Product Use (IPPU), Agriculture, Land Use, Land-Use Change and Forestry (LULUCF), and Waste. This is consistent with the categorization outlined in the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*,[1] as per the Modalities, procedures, and guidelines (MPGs).

This annex contains category descriptions and summary tables (Table A9–1 to Table A9–3) illustrating national greenhouse gas (GHG) emissions by year, by gas and by IPCC sector. National GHG emissions allocated to Canadian economic sectors are provided in Annex 10 of this report.

Canada's GHG emission tables are also available in electronic file format online at https://open.canada.ca.

1 Available online at http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html.

Table A9–1 GHG Source and Sink Category Descriptions

GHG Source and Sink Categories	
ENERGY	
a. Stationary Combustion Sources	
Public Electricity and Heat Production	Emissions from fuel consumed by utility electricity generation and steam production (for sale).
Petroleum Refining Industries	Emissions from fuel consumed by petroleum refining industries.
Oil and Gas Extraction	Emissions from fuel consumed by oil and gas extraction industries.
Mining	Emissions from fuel consumed by: – metal and non-metal mines, coal mines, stone quarries, and gravel pits – mineral exploration and contract drilling operations
Manufacturing Industries	Emissions from fuel consumed by the following industries: – iron and steel (steel foundries, casting and rolling mills) – non-ferrous metals (aluminium, magnesium and other production) – chemical (fertilizer manufacturing, organic and inorganic chemical manufacturing) – pulp and paper (primarily pulp, paper, and paper product manufacturers) – cement and other non-metallic mineral production – other manufacturing industries not listed (such as automobile manufacturing, textiles, food and beverage industries)
Construction	Emissions from fuels consumed by the construction industry (buildings, highways etc.)
Commercial and Institutional	Emissions from fuel consumed by: – service industries related to mining, communication, wholesale and retail trade, finance and insurance, real estate, education, etc.) – federal, provincial and municipal establishments – national Defence and Canadian Coast Guard – train stations, airports and warehouses
Residential	Emissions from fuel consumed for personal residences (homes, apartment hotels, condominiums and farm houses).
Agriculture and Forestry	Emissions from fuel consumed by: – forestry and logging service industry – agricultural, hunting and trapping industry (excluding food processing, farm machinery manufacturing and repair)
b. Transport	Emissions resulting from the:
Aviation	– consumption of fossil fuels by civilian aircraft flying domestically and all military aircraft operations with Canadian purchased fuel
Domestic Aviation (Civil)	– consumption of fossil fuels by civilian aircraft flying domestically with Canadian purchased fuel
Military	– consumption of fossil fuels by military aircraft operations with Canadian purchased fuel
Road Transportation	– consumption of fuels (excluding the biogenic CO_2 emissions from ethanol and biodiesel) by vehicles licensed to operate on roads
Light-Duty Gasoline Vehicles	– consumption of motor gasoline (excluding the biogenic CO_2 emissions from ethanol) by passenger cars
Light-Duty Gasoline Trucks	– consumption of motor gasoline (excluding the biogenic CO_2 emissions from ethanol) by trucks, vans and SUVs with a Gross Vehicle Weight Rating (GVWR) less than 3856 kg
Heavy-Duty Gasoline Vehicles	– consumption of motor gasoline (excluding the biogenic CO_2 emissions from ethanol) by trucks, vans and SUVs with a GVWR greater than or equal to 3856 kg
Motorcycles	– consumption of motor gasoline (excluding the biogenic CO_2 emissions from ethanol) by motorcycles that are licensed to operate on roads
Light-Duty Diesel Vehicles	– consumption of diesel fuel oil (excluding the biogenic CO_2 emissions from biodiesel) by passenger cars licensed to operate on roads
Light-Duty Diesel Trucks	– consumption of diesel fuel oil (excluding the biogenic CO_2 emissions from biodiesel) by trucks, vans and SUVs with a GVWR less than 3856 kg
Heavy-Duty Diesel Vehicles	– consumption of diesel fuel oil (excluding the biogenic CO_2 emissions from biodiesel) by trucks, vans and SUVs with a GVWR greater than or equal to 3856 kg
Propane and Natural Gas Vehicles	– consumption of propane and natural gas by vehicles that are licensed to operate on roads
Railways	– consumption of fuels (excluding the biogenic CO_2 emissions from ethanol and biodiesel) by Canadian railways
Marine	– consumption of fuels (excluding the biogenic CO_2 emissions from ethanol and biodiesel) by marine vessels navigating between Canadian ports (inclusive of all fishing and military operations)
Domestic Navigation	– consumption of fuels (excluding the biogenic CO_2 emissions from ethanol and biodiesel) by marine vessels navigating between Canadian ports
Fishing	– consumption of fuels (excluding the biogenic CO_2 emissions from ethanol and biodiesel) by fishing vessels operating in Canadian waters
Military Water-Borne Navigation	– consumption of fuels (excluding the biogenic CO_2 emissions from ethanol and biodiesel) by military vessels operating in Canadian waters
Others – Off-Road	– consumption of fuels (excluding the biogenic CO_2 emissions from ethanol and biodiesel) by mobile combustion devices not licensed to operate on roads
Others – Pipeline Transport	– transportation and distribution of crude oil, natural gas and other products
c. Fugitive Sources	Intentional and unintentional releases of greenhouse gases from the following activities:
Coal Mining	– underground and surface mining, abandoned underground coal mines
Oil and Natural Gas	– conventional and unconventional oil and gas exploration, production, transportation and distribution
Oil	– unintentional releases of greenhouse gases from the production, processing, transmission, storage and delivery of crude oil
Natural Gas	– unintentional releases of greenhouse gases from the production, processing, transmission, storage and delivery of natural gas (includes post-meter fugitive emissions from residential and commercial natural gas appliances, natural gas vehicles and industrial facilities)
Venting	– intentional releases of greenhouse gases at oil and natural gas facilities
Flaring	– routine or emergency disposal of waste gas through combustion in an open flame or incinerator at oil and natural gas facilities
d. CO_2 Transport and Storage	Intentional and unintentional releases of greenhouse gases from the transport and storage of carbon dioxide
INDUSTRIAL PROCESSES AND PRODUCT USE	Emissions resulting from the following process activities:
a. Mineral Products	– cement production, lime production, and mineral product use (which includes glass production, other uses of soda ash, magnesite use, and other limestone and dolomite use)
b. Chemical Industry	– production of ammonia, nitric acid, adipic acid, carbide and petrochemicals (petrochemical production includes production of carbon black, ethylene, ethylene dichloride, ethylene oxide, methanol, styrene and other uses of urea)
c. Metal Production	– aluminum production, iron and steel production, and magnesium production and casting
d. Production and Consumption of Halocarbons, SF_6 and NF_3	– by-product production of HFC-23; use of HFCs and/or PFCs in air conditioning units, refrigeration units, fire extinguishers, aerosol cans, solvents, foam blowing, semiconductor manufacturing and electronics industry, and use of SF_6 and NF_3 in semiconductor manufacturing
e. Non-Energy Products from Fuels and Solvent Use	– non-energy use of fossil fuels (including solvents and lubricants) that are not accounted for elsewhere under the Industrial Processes and Product Use Sector and the use of urea in selective catalytic reduction (SCR) equipped vehicles
f. Other Product Manufacture and Use	– use of N_2O as an anaesthetic and propellant; use of SF_6 in electrical equipment; and PFCs in other contained product uses as a dielectric coolant or as an electric insulator

Table A9–1 **GHG Source and Sink Category Descriptions** (cont'd)

GHG Source and Sink Categories	
AGRICULTURE	Emissions resulting from:
a. Enteric Fermentation	– eructation of CH_4 during the digestion of plant material by (mainly) ruminants
b. Manure Management	– release of CH_4 and N_2O due to microbial activity during the storage of feces, urine and bedding materials from the cleaning of barns and pens
	– indirect N_2O emissions from volatilization and leaching of nitrogen from animal manure during storage
c. Agricultural Soils	
Direct sources	– direct N_2O emissions from inorganic nitrogen fertilizers, manure and biosolids applied on cropland, pasture range and paddock, crop residue, loss of soil organic carbon, tillage, irrigation and cultivation of organic soils
Indirect Sources	– indirect N_2O emissions from volatilization and leaching of animal manure and biosolid nitrogen, inorganic nitrogen fertilizer and crop residue nitrogen
d. Field Burning of Agricultural Residues	– CH_4 and N_2O emissions from crop residue burning
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	– direct emissions of CO_2 from the application of lime, urea and other fertilizers containing carbon
WASTE	Emissions resulting from:
a. Solid Waste Disposal (Landfills)	– municipal solid waste management sites (landfills)
b. Biological Treatment of Solid Waste	– composting and anaerobic digestion of municipal solid waste
c. Wastewater Treatment and Discharge	– municipal and industrial wastewater treatment
d. Incineration and Open Burning of Waste	– municipal solid, hazardous and clinical waste, and sewage sludge incineration
e. Industrial Wood Waste Landfills	– private, dedicated wood waste landfills
LAND USE, LAND-USE CHANGE AND FORESTRY	Emissions and removals resulting from:
a. Forest Land	– managed forests and lands converted to forests; reports emissions and removals from forest growth and anthropogenic disturbances related to forest management but tracks separately emissions and removals from fire and most insect disturbances
b. Cropland	– management practices on lands in annual and perennial crops (forage, specialty crops, orchards); soil organic carbon (SOC) impacted by crop productivity changes and manure application; immediate and residual emissions from lands converted to cropland
c. Grassland	– managed agricultural grassland
d. Wetlands	– peatlands disturbed for peat extraction, or land flooded from hydro reservoir development
e. Settlements	– forest and grassland converted to built-up land (settlements, transport infrastructure, oil & gas infrastructure, mining, etc); urban tree growth
f. Harvested Wood Products	– use and disposal of harvested wood products manufactured from wood coming from forest harvest, forest conversion and firewood collection activities in Canada

Table A9–2 Canada's 1990–2022 GHG Emissions by IPCC Sector

Greenhouse Gas Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	kt CO_2 eq																																
TOTAL[a]	**608 000**	**603 000**	**622 000**	**627 000**	**649 000**	**668 000**	**689 000**	**706 000**	**712 000**	**723 000**	**748 000**	**739 000**	**745 000**	**763 000**	**767 000**	**761 000**	**757 000**	**777 000**	**760 000**	**716 000**	**729 000**	**738 000**	**744 000**	**751 000**	**750 000**	**746 000**	**731 000**	**742 000**	**753 000**	**752 000**	**686 000**	**698 000**	**708 000**
ENERGY	**489 000**	**483 000**	**501 000**	**505 000**	**523 000**	**539 000**	**558 000**	**574 000**	**582 000**	**594 000**	**618 000**	**611 000**	**614 000**	**629 000**	**628 000**	**626 000**	**621 000**	**644 000**	**628 000**	**595 000**	**605 000**	**612 000**	**612 000**	**619 000**	**621 000**	**617 000**	**600 000**	**613 000**	**622 000**	**622 000**	**558 000**	**569 000**	**577 000**
a. Stationary Combustion Sources	**278 000**	**273 000**	**283 000**	**278 000**	**284 000**	**291 000**	**301 000**	**308 000**	**311 000**	**323 000**	**345 000**	**341 000**	**343 000**	**354 000**	**346 000**	**338 000**	**331 000**	**353 000**	**340 000**	**317 000**	**319 000**	**323 000**	**319 000**	**321 000**	**323 000**	**322 000**	**317 000**	**321 000**	**324 000**	**326 000**	**302 000**	**304 000**	**306 000**
Public Electricity and Heat Production	94 100	95 500	102 000	92 900	95 100	98 600	98 300	110 000	123 000	120 000	132 000	133 000	128 000	132 000	126 000	124 000	119 000	125 000	116 000	100 000	102 000	93 100	90 400	87 400	84 900	83 100	81 500	79 200	70 700	69 400	61 800	60 700	56 400
Petroleum Refining Industries	17 400	16 300	16 500	17 200	16 100	16 300	18 700	18 600	18 200	17 300	17 300	18 000	19 100	20 100	21 600	20 000	20 100	20 500	19 300	18 700	19 000	18 200	17 500	16 600	16 100	16 000	16 400	14 600	14 800	15 600	13 600	13 800	14 200
Oil and Gas Extraction	31 000	29 500	31 400	34 600	35 300	36 600	37 000	35 400	38 000	49 300	53 400	56 200	59 200	63 400	61 700	63 300	66 700	75 100	74 400	76 100	77 300	83 900	88 400	90 900	95 000	98 700	95 500	101 000	107 000	108 000	104 000	108 000	109 000
Mining	4 650	4 320	3 720	4 020	4 580	4 970	5 070	5 230	4 700	4 490	4 940	4 930	4 550	4 930	4 810	4 350	5 150	5 310	5 580	5 240	5 280	5 270	5 680	4 920	4 580	4 160	3 850	4 500	5 980	5 970	5 270	6 140	6 150
Manufacturing Industries	56 300	54 000	53 100	50 900	54 300	56 100	57 700	57 900	54 900	55 900	55 900	51 600	51 200	49 100	50 700	47 800	45 900	47 000	44 600	39 700	41 100	44 000	43 800	45 000	45 100	44 000	42 500	42 800	42 800	43 200	39 500	40 300	41 100
Iron and Steel	4 940	4 960	5 290	5 390	6 020	5 780	6 150	6 160	6 230	6 320	6 200	4 990	5 840	5 510	5 790	5 510	5 490	5 940	5 740	4 260	4 950	5 260	5 500	5 580	6 030	5 750	5 610	6 000	6 380	6 060	4 560	5 140	4 890
Non-Ferrous Metals	3 530	2 840	3 120	2 980	3 600	3 410	4 230	4 100	4 110	3 900	3 780	3 990	3 700	3 710	3 720	3 830	3 670	4 050	4 050	3 040	3 220	3 570	3 210	3 320	3 010	3 360	3 440	3 420	2 950	3 430	3 240	3 010	3 230
Chemical	8 260	8 650	8 600	8 520	10 000	10 300	9 920	10 200	10 800	11 100	10 600	9 420	8 970	8 100	8 890	8 250	8 780	8 620	8 720	8 820	9 870	11 100	11 000	11 600	12 400	12 100	10 700	9 840	9 450	9 640	9 570	9 430	9 200
Pulp and Paper	14 500	14 000	13 000	12 900	12 900	12 800	13 400	13 200	12 100	12 500	12 500	11 500	10 800	10 300	10 100	8 580	7 400	7 660	6 210	6 320	5 900	6 160	5 950	6 200	6 070	5 980	5 920	6 370	7 070	7 100	6 510	6 830	6 860
Cement	3 940	3 410	3 380	3 440	4 040	4 130	4 110	4 010	4 160	4 430	4 610	4 560	4 940	4 960	5 440	5 380	5 690	5 060	4 930	4 470	4 060	4 290	4 010	3 830	4 000	3 930	4 010	4 240	4 310	4 200	3 670	3 690	3 790
Other Manufacturing	21 200	20 100	19 700	17 600	17 800	19 700	20 000	20 200	17 500	17 600	18 200	17 100	16 900	16 500	16 800	16 200	14 900	15 700	14 900	12 800	13 100	13 700	14 100	14 400	13 600	12 900	12 800	13 000	12 600	12 800	11 900	12 200	13 100
Construction	1 880	1 630	1 760	1 390	1 400	1 180	1 270	1 250	1 120	1 170	1 080	1 020	1 260	1 340	1 410	1 440	1 390	1 400	1 380	1 220	1 510	1 360	1 390	1 290	1 300	1 310	1 290	1 300	1 380	1 440	1 430	1 460	1 590
Commercial and Institutional	26 200	26 800	27 500	28 500	27 800	29 300	30 000	30 400	27 800	29 300	33 300	32 600	34 100	35 200	33 900	32 400	29 400	30 500	30 100	29 900	28 500	30 500	28 700	29 700	31 400	30 400	34 000	36 000	37 100	38 100	35 200	33 000	35 000
Residential	44 000	42 500	43 800	45 700	46 400	45 100	49 900	46 500	40 800	42 500	44 800	41 700	43 700	45 800	44 200	43 500	41 300	45 900	45 300	43 400	41 500	43 700	40 300	42 000	41 700	41 100	38 400	38 900	40 500	41 100	38 700	37 400	39 100
Agriculture and Forestry	2 410	2 740	3 250	3 040	2 540	2 760	2 920	2 910	2 600	2 680	2 570	2 240	2 160	2 300	2 210	2 180	2 100	2 490	2 470	2 450	2 660	3 160	3 260	3 150	2 990	2 960	3 180	3 080	3 180	3 340	3 030	3 100	3 320
b. Transport[b]	**145 000**	**140 000**	**144 000**	**148 000**	**155 000**	**159 000**	**164 000**	**169 000**	**172 000**	**177 000**	**178 000**	**176 000**	**177 000**	**181 000**	**186 000**	**190 000**	**190 000**	**192 000**	**192 000**	**187 000**	**192 000**	**193 000**	**193 000**	**197 000**	**195 000**	**197 000**	**196 000**	**202 000**	**209 000**	**210 000**	**179 000**	**188 000**	**196 000**
Aviation	7 510	6 490	6 380	6 010	6 370	6 690	7 080	7 240	7 490	7 880	7 790	7 150	7 010	7 140	7 620	7 710	7 740	7 810	7 450	6 640	6 680	6 580	7 590	7 870	7 580	7 580	7 510	7 930	8 660	8 580	4 750	5 600	7 680
Domestic Aviation (Civil)	7 270	6 270	6 150	5 810	6 160	6 460	6 830	6 990	7 260	7 670	7 530	6 940	6 750	6 830	7 320	7 450	7 500	7 510	7 160	6 370	6 420	6 360	7 350	7 660	7 380	7 340	7 260	7 700	8 410	8 340	4 560	5 400	7 490
Military	233	220	228	205	212	231	248	247	235	211	265	205	263	306	301	259	237	304	297	266	257	228	243	213	205	235	255	231	247	242	184	201	196
Road Transportation	91 600	88 900	90 700	94 000	98 900	99 900	102 000	105 000	107 000	109 000	109 000	109 000	111 000	116 000	120 000	122 000	123 000	128 000	129 000	130 000	133 000	131 000	130 000	132 000	131 000	129 000	128 000	129 000	132 000	132 000	111 000	116 000	120 000
Light-Duty Gasoline Vehicles	44 200	42 900	43 600	44 600	45 400	43 900	43 700	43 100	42 800	42 100	41 600	41 400	41 600	41 600	41 700	40 600	39 900	39 900	38 900	38 500	37 900	36 200	35 200	35 300	34 000	34 400	34 300	33 600	33 000	32 300	25 000	24 100	23 400
Light-Duty Gasoline Trucks	24 700	24 300	25 200	26 500	28 000	28 400	29 600	31 200	33 000	34 600	35 000	35 900	37 100	38 600	40 300	40 900	41 700	42 900	42 800	44 000	45 100	43 100	43 900	45 800	46 100	47 700	50 300	51 600	53 300	55 000	47 200	50 500	53 400
Heavy-Duty Gasoline Vehicles	4 790	4 470	4 470	4 370	4 390	4 170	4 150	4 100	4 140	4 350	4 270	4 350	4 310	4 450	4 630	4 620	4 640	4 660	4 610	4 650	4 580	4 350	4 520	4 470	4 300	4 300	4 360	4 420	4 460	4 520	4 190	4 300	4 060
Motorcycles	204	200	207	218	228	226	230	242	256	279	320	332	361	390	431	459	489	527	555	579	595	726	771	785	790	838	875	898	922	952	773	765	721
Light-Duty Diesel Vehicles	367	362	375	382	408	434	438	456	450	433	462	463	480	577	627	665	739	816	809	816	739	768	738	764	761	700	642	613	587	504	310	325	339
Light-Duty Diesel Trucks	887	925	991	1 000	1 080	1 230	1 330	1 360	1 300	1 210	1 100	902	821	872	810	748	684	659	645	621	515	494	488	513	593	587	575	641	719	742	598	720	919
Heavy-Duty Diesel Vehicles	15 700	15 100	15 300	16 700	19 100	21 300	22 100	24 100	24 500	25 600	26 300	25 900	26 600	29 900	31 900	34 300	35 100	38 900	41 000	41 300	43 600	44 800	43 900	44 300	44 000	40 000	36 900	37 000	38 400	37 500	32 600	35 300	37 100
Propane and Natural Gas Vehicles	761	620	533	304	290	218	167	116	93	63	42	37	28	26	25	23	21	24	25	27	33	34	34	36	52	67	78	114	132	171	178	190	206
Railways	6 840	6 340	6 630	6 600	6 830	6 190	6 050	6 140	5 910	6 260	6 460	6 400	5 890	5 940	6 110	6 510	6 810	7 300	7 700	6 570	6 390	7 120	7 290	7 020	7 190	6 850	6 280	7 170	7 320	7 380	6 850	6 760	6 760
Marine	3 100	3 150	3 200	3 250	3 300	3 350	3 410	3 460	3 520	3 570	3 630	3 710	3 780	3 860	3 940	4 020	3 960	3 900	3 840	3 770	3 700	3 570	3 450	3 330	3 220	3 100	3 270	3 460	3 470	4 310	3 840	4 420	4 960
Domestic Navigation	2 200	2 250	2 300	2 350	2 400	2 450	2 510	2 560	2 620	2 670	2 730	2 810	2 890	2 960	3 040	3 120	3 070	3 020	2 960	2 910	2 850	2 830	2 830	2 820	2 820	2 810	2 990	3 200	3 220	4 050	3 610	4 150	4 670
Fishing	874	874	873	873	873	872	872	872	872	872	871	871	871	871	871	871	862	853	845	836	824	688	552	416	281	146	157	152	159	164	153	181	169
Military Water-Borne Navigation	28	28	28	28	28	28	28	28	28	28	28	28	28	27	27	27	27	27	27	27	26	49	72	95	118	141	131	103	86	99	82	81	114
Other Transportation	36 100	35 100	37 100	38 100	39 900	43 300	45 300	47 900	48 900	50 400	50 800	49 100	49 300	48 000	47 700	49 700	48 000	44 900	43 400	39 200	42 600	45 100	44 800	47 100	46 900	50 600	50 800	54 900	57 500	57 900	52 300	55 100	56 400
Off-Road Agriculture and Forestry	8 710	7 830	7 280	7 450	7 710	7 770	8 130	8 830	8 600	8 680	9 150	8 640	8 360	8 910	9 370	9 850	9 460	9 450	9 200	7 960	9 140	9 820	9 920	10 300	10 800	11 700	11 800	13 500	14 200	14 100	13 200	13 300	13 200
Off-Road Commercial and Institutional	4 240	3 900	3 740	3 590	3 510	3 980	3 950	4 200	4 440	4 670	4 580	4 530	4 720	4 510	4 480	4 510	4 370	3 720	3 560	3 660	4 670	5 370	5 230	5 340	4 810	4 970	5 260	5 690	5 930	6 040	5 450	5 950	6 030
Off-Road Manufacturing, Mining and Construction	12 400	12 000	12 300	12 600	13 100	13 900	14 500	15 700	16 100	16 500	17 500	17 000	16 200	16 300	16 200	16 200	15 800	15 000	15 000	13 500	15 300	16 500	16 000	16 400	15 200	17 200	17 000	19 000	19 900	20 200	17 400	18 400	18 600
Off-Road Residential	368	406	467	542	638	690	753	807	865	951	1 000	1 060	1 090	1 150	1 210	1 230	1 230	1 250	1 230	1 220	1 190	1 110	1 110	1 100	1 060	1 070	1 070	1 050	1 040	1 040	1 010	976	872
Off-Road Other Transportation	3 460	3 330	3 350	3 550	4 020	4 910	5 330	5 830	6 320	6 960	7 300	7 610	7 990	7 950	7 910	7 750	7 470	7 100	6 880	6 460	6 580	6 600	6 790	7 170	7 010	7 400	8 030	8 110	8 070	8 020	7 520	7 700	7 500
Pipeline Transport	6 920	7 670	9 910	10 400	10 800	12 100	12 600	12 600	12 600	12 600	11 300	10 300	10 900	9 100	8 520	10 100	9 630	8 420	7 530	6 380	5 740	5 680	5 780	6 780	7 970	8 290	7 730	7 570	8 400	8 500	7 760	8 740	10 100
c. Fugitive Sources	**66 000**	**70 000**	**74 000**	**79 000**	**84 000**	**89 000**	**93 000**	**96 000**	**98 000**	**95 000**	**95 000**	**94 000**	**94 000**	**93 000**	**96 000**	**97 000**	**100 000**	**98 000**	**97 000**	**91 000**	**94 000**	**96 000**	**100 000**	**100 000**	**100 000**	**98 000**	**88 000**	**89 000**	**89 000**	**86 000**	**77 000**	**77 000**	**75 000**
Coal Mining	3 000	3 000	3 000	3 000	3 000	3 000	2 000	3 000	2 000	2 000	2 000	2 000	2 000	2 000	2 000	2 000	1 000	1 000	1 000	1 000	2 000	2 000	2 000	2 000	1 000	1 000	1 000	1 000	1 000	2 000	1 000	1 000	2 000
Oil and Natural Gas	63 000	66 300	71 700	75 800	81 600	86 300	90 800	93 800	96 200	92 700	93 500	92 500	92 000	91 500	94 400	95 300	98 800	96 500	95 100	89 600	92 500	94 200	98 300	99 200	102 000	97 100	86 300	88 000	87 600	84 500	75 300	75 800	73 700
Oil	4 740	4 780	4 960	5 210	5 300	5 660	5 800	6 030	5 970	6 040	6 120	6 710	6 790	6 970	7 160	7 190	7 730	7 800	7 730	7 580	8 060	8 000	8 770	8 870	8 590	8 190	7 870	7 990	8 080	8 160	7 760	7 840	8 030
Natural Gas	11 300	11 500	12 000	12 300	12 900	13 300	15 000	14 200	15 600	14 800	13 200	11 600	10 500	11 000	11 800	12 900	13 500	12 500	12 100	11 500	12 400	12 200	11 800	12 100	11 300	11 000	10 600	10 200	10 200	10 100	9 700	9 710	9 630
Venting	41 600	44 200	48 800	52 600	57 300	61 200	63 500	66 900	66 000	65 400	67 500	68 400	68 400	68 300	70 200	70 000	71 900	70 700	70 400	66 200	67 300	69 100	71 800	71 400	74 500	71 400	62 400	64 000	63 400	60 500	51 500	51 300	49 100
Flaring	5 360	5 830	5 950	5 740	6 190	6 190	6 560	6 640	8 670	6 510	6 560	5 800	6 290	5 240	5 290	5 270	5 620	5 460	4 940	4 260	4 740	4 930	5 830	6 810	7 100	6 550	5 430	5 770	5 980	5 770	6 330	6 920	6 850
d. CO_2 Transport and Storage	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**	**0.10**	**0.20**	**0.30**	**0.30**	**0.30**	**0.30**	**0.50**	**0.60**	**0.60**
INDUSTRIAL PROCESSES AND PRODUCT USE	**54 900**	**56 300**	**54 100**	**54 100**	**55 900**	**56 500**	**58 600**	**58 300**	**55 600**	**53 500**	**53 200**	**51 100**	**53 100**	**55 200**	**59 100**	**55 400**	**56 000**	**54 500**	**53 700**	**46 700**	**49 900**	**53 500**	**57 600**	**55 500**	**53 200**	**52 800**	**53 600**	**52 300**	**53 500**	**52 300**	**49 700**	**51 500**	**51 300**
a. Mineral Products	**8 490**	**7 590**	**7 320**	**7 390**	**8 480**	**9 180**	**8 910**	**9 550**	**9 660**	**9 880**	**10 100**	**9 430**	**9 690**	**9 730**	**10 200**	**10 300**	**10 300**	**10 200**	**9 300**	**7 200**	**7 830**	**7 950**	**8 470**	**7 760**	**7 810**	**8 000**	**7 880**	**8 610**	**8 710**	**8 850**	**8 220**	**9 000**	**8 400**
Cement Production	5 820	4 770	4 800	4 890	5 770	6 530	6 190	6 660	6 830	7 120	7 230	6 980	7 150	7 250	7 520	7 610	7 730	7 730	6 990	5 360	6 010	6 020	6 530	5 970	5 910	6 180	6 110	6 860	6 990	7 200	6 710	7 380	6 750
Lime Production	1 800	1 830	1 840	1 840	1 890	1 900	1 840	1 900	1 890	1 970	1 920	1 680	1 710	1 690	1 830	1 750	1 670	1 620	1 560	1 220	1 410	1 470	1 490	1 410	1 520	1 410	1 380	1 420	1 390	1 340	1 190	1 310	1 340
Mineral Product Use	860	980	670	660	820	750	890	990	940	790	910	770	820	790	880	910	880	810	750	610	410	450	440	380	380	410	390	330	330	320	310	310	310
b. Chemical Industry	**16 300**	**15 700**	**15 500**	**15 700**	**17 700**	**17 200**	**18 100**	**16 400**	**12 800**	**9 630**	**8 510**	**8 440**	**8 660**	**8 970**	**11 000**	**9 970**	**8 680**	**7 920**	**8 680**	**5 760**	**5 720**	**6 380**	**6 670**	**6 630**	**6 370**	**6 720**	**6 820**	**6 320**	**6 400**	**6 220**	**5 940**	**5 730**	**5 780**
Ammonia Production	2 740	2 720	2 490	2 910	3 030	2 920	2 790	2 780	3 090	2 990	2 950	2 600	2 630	2 620	2 920	2 700	2 770	2 570	2 800	2 380	2 470	2 860	2 990	2 990	2 580	2 920	2 850	2 620	2 420	2 500	2 290	2 540	2 590
Nitric Acid Production	865	904	903	901	818	858	946	904	885	998	1 050	1 100	1 070	1 080	1 050	1 070	1 050	967	694	405	426	423	318	275	190	200	232	218	242	225	168	192	128
Adipic Acid Production	9 160	8 550	8 510	7 760	9 380	9 170	9 810	8 450	4 330	1 500	769	688	1 070	928	2 650	2 260	1 030	1 270	2 060	566	–	–	–	–	–	–	–	–	–	–	–	–	–
Petrochemical and Carbon Black Production	3 520	3 580	3 600	4 170	4 530	4 300	4 550	4 230	4 450	4 150	3 740	4 050	3 890	4 340	4 360	3 930	3 820	3 110	3 130	2 400	2 830	3 090	3 360	3 370	3 600	3 600	3 740	3 480	3 740	3 490	3 480	3 000	3 070

Table A9–2 **Canada's 1990–2022 GHG Emissions by IPCC Sector** (cont'd)

Greenhouse Gas Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	kt CO_2 eq																																
INDUSTRIAL PROCESSES AND PRODUCT USE (cont'd)	**54 900**	**56 300**	**54 100**	**54 100**	**55 900**	**56 500**	**58 600**	**58 300**	**55 600**	**53 500**	**53 200**	**51 100**	**53 100**	**55 200**	**59 100**	**55 400**	**56 000**	**54 500**	**53 700**	**46 700**	**49 900**	**53 500**	**57 600**	**55 500**	**53 200**	**52 800**	**53 600**	**52 300**	**53 500**	**52 300**	**49 700**	**51 500**	**51 300**
c. Metal Production	**23 100**	**26 100**	**24 900**	**24 700**	**23 200**	**22 900**	**22 600**	**22 500**	**23 400**	**22 700**	**23 000**	**21 000**	**21 000**	**20 700**	**20 200**	**19 900**	**20 500**	**19 000**	**18 800**	**15 600**	**15 900**	**16 700**	**16 500**	**14 800**	**15 100**	**14 500**	**15 500**	**15 100**	**14 900**	**14 100**	**13 200**	**14 100**	**13 600**
Iron and Steel Production	10 500	12 100	12 400	11 900	11 000	11 500	11 300	11 100	11 400	11 600	11 800	10 900	10 600	10 500	10 600	10 300	11 300	11 100	10 800	8 140	8 980	9 880	9 980	8 230	9 100	8 670	9 410	9 070	9 300	8 550	7 270	8 220	7 810
Aluminium Production	9 560	10 400	10 100	10 700	10 000	9 370	9 740	9 690	9 840	8 800	8 390	7 850	7 590	7 780	7 410	8 300	7 780	7 380	7 500	7 290	6 680	6 580	6 290	6 370	5 720	5 620	5 920	5 940	5 450	5 250	5 840	5 770	5 660
SF_6 Used in Magnesium Smelters and Casters	3 050	3 530	2 360	2 180	2 250	2 070	1 610	1 640	2 170	2 230	2 740	2 320	2 890	2 440	2 150	1 270	1 380	504	448	190	192	191	256	220	253	240	142	136	148	304	105	144	167
d. Production and Consumption of Halocarbons, SF_6 and NF_3[c]	**820**	**890**	**700**	**5**	**5**	**460**	**780**	**1 100**	**1 500**	**2 100**	**2 600**	**3 000**	**3 400**	**3 800**	**4 300**	**4 800**	**5 100**	**5 700**	**5 800**	**6 500**	**7 300**	**8 100**	**8 600**	**9 500**	**10 000**	**10 000**	**11 000**	**11 000**	**12 000**	**11 000**	**11 000**	**11 000**	**11 000**
e. Non-Energy Products from Fuels and Solvent Use	**5 800**	**5 600**	**5 300**	**5 900**	**6 000**	**6 300**	**7 900**	**8 500**	**7 800**	**8 700**	**8 400**	**8 600**	**9 800**	**11 000**	**13 000**	**9 900**	**11 000**	**11 000**	**11 000**	**11 000**	**13 000**	**14 000**	**17 000**	**16 000**	**13 000**	**13 000**	**12 000**	**11 000**	**11 000**	**11 000**	**10 000**	**11 000**	**12 000**
f. Other Product Manufacture and Use	**360**	**360**	**340**	**340**	**350**	**370**	**330**	**370**	**470**	**550**	**570**	**640**	**480**	**570**	**590**	**510**	**480**	**520**	**500**	**440**	**410**	**360**	**460**	**510**	**420**	**510**	**560**	**580**	**650**	**620**	**660**	**660**	**650**
AGRICULTURE	**42 000**	**43 000**	**45 000**	**46 000**	**48 000**	**50 000**	**51 000**	**51 000**	**52 000**	**52 000**	**53 000**	**53 000**	**53 000**	**55 000**	**56 000**	**56 000**	**55 000**	**55 000**	**54 000**	**52 000**	**51 000**	**50 000**	**52 000**	**54 000**	**52 000**	**53 000**	**54 000**	**53 000**	**54 000**	**54 000**	**56 000**	**55 000**	**56 000**
a. Enteric Fermentation	**25 000**	**26 000**	**27 000**	**27 000**	**29 000**	**30 000**	**30 000**	**30 000**	**30 000**	**31 000**	**31 000**	**32 000**	**32 000**	**32 000**	**34 000**	**35 000**	**33 000**	**32 000**	**31 000**	**30 000**	**28 000**	**28 000**	**28 000**	**28 000**	**27 000**	**27 000**	**27 000**	**27 000**	**27 000**	**27 000**	**27 000**	**27 000**	**27 000**
b. Manure Management	**6 000**	**6 100**	**6 400**	**6 400**	**6 700**	**7 000**	**7 200**	**7 200**	**7 400**	**7 600**	**7 800**	**8 100**	**8 300**	**8 300**	**8 500**	**8 700**	**8 500**	**8 200**	**8 100**	**7 800**	**7 600**	**7 600**	**7 600**	**7 700**	**7 600**	**7 700**	**7 800**	**7 900**	**7 900**	**7 900**	**7 800**	**7 900**	**7 800**
c. Agricultural Soils	**10 000**	**9 700**	**10 000**	**11 000**	**11 000**	**11 000**	**12 000**	**12 000**	**12 000**	**12 000**	**12 000**	**11 000**	**11 000**	**12 000**	**12 000**	**12 000**	**12 000**	**12 000**	**13 000**	**13 000**	**13 000**	**13 000**	**14 000**	**16 000**	**15 000**	**16 000**	**16 000**	**15 000**	**16 000**	**16 000**	**18 000**	**17 000**	**18 000**
Direct Sources	7 800	7 500	7 700	8 300	8 300	8 500	8 900	9 000	9 300	9 200	9 100	8 700	8 900	9 600	9 200	8 900	9 100	9 500	10 000	9 800	10 000	10 000	11 000	12 000	12 000	13 000	13 000	12 000	13 000	13 000	14 000	13 000	15 000
Indirect Sources	2 000	2 000	2 000	2 000	2 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	4 000	4 000	4 000	4 000
d. Field Burning of Agricultural Residues	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**100**	**100**	**100**	**100**	**40**	**50**	**50**	**40**	**50**	**60**	**40**	**30**	**40**	**60**	**50**	**60**	**50**	**50**	**50**	**50**	**60**	**40**	**50**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**1 200**	**1 100**	**1 200**	**1 200**	**1 400**	**1 500**	**1 500**	**1 600**	**1 700**	**1 500**	**1 600**	**1 400**	**1 500**	**1 600**	**1 500**	**1 400**	**1 500**	**1 700**	**1 700**	**1 800**	**1 800**	**2 000**	**2 300**	**2 700**	**2 500**	**2 600**	**2 500**	**2 400**	**2 600**	**2 700**	**3 000**	**3 100**	**2 900**
WASTE	**21 000**	**21 000**	**22 000**	**22 000**	**22 000**	**22 000**	**22 000**	**22 000**	**23 000**	**23 000**	**24 000**	**24 000**	**24 000**	**24 000**	**24 000**	**24 000**	**24 000**	**24 000**	**24 000**	**23 000**	**22 000**	**22 000**	**22 000**	**23 000**	**23 000**	**23 000**	**24 000**	**24 000**	**23 000**	**24 000**	**23 000**	**23 000**	**23 000**
a. Solid Waste Disposal (Landfills)	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**	**20 000**
b. Biological Treatment of Solid Waste	**80**	**100**	**100**	**100**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**400**	**400**	**400**	**500**	**500**
c. Wastewater Treatment and Discharge	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**3 000**	**3 000**	**3 000**	**3 000**	**3 000**	**3 000**	**2 000**
d. Incineration and Open Burning of Waste	**260**	**270**	**280**	**290**	**320**	**350**	**330**	**310**	**330**	**310**	**350**	**370**	**380**	**330**	**350**	**340**	**320**	**310**	**320**	**290**	**300**	**290**	**170**	**180**	**160**	**190**	**190**	**180**	**170**	**170**	**150**	**140**	**160**
e. Industrial Wood Waste Landfills	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**900**	**900**	**900**	**900**	**900**	**800**	**800**	**800**	**800**	**800**
LAND USE, LAND-USE CHANGE AND FORESTRY	**49 000**	**43 000**	**54 000**	**67 000**	**55 000**	**65 000**	**55 000**	**54 000**	**47 000**	**51 000**	**57 000**	**40 000**	**70 000**	**66 000**	**63 000**	**66 000**	**47 000**	**46 000**	**39 000**	**11 000**	**39 000**	**42 000**	**27 000**	**29 000**	**5 700**	**43 000**	**27 000**	**19 000**	**23 000**	**14 000**	**26 000**	**14 000**	**51 000**
a. Forest Land	**-89 000**	**-90 000**	**-91 000**	**-90 000**	**-90 000**	**-84 000**	**-90 000**	**-89 000**	**-87 000**	**-84 000**	**-82 000**	**-87 000**	**-81 000**	**-75 000**	**-69 000**	**-64 000**	**-68 000**	**-71 000**	**-76 000**	**-85 000**	**-79 000**	**-87 000**	**-91 000**	**-92 000**	**-95 000**	**-91 000**	**-98 000**	**-99 000**	**-99 000**	**-100 000**	**-100 000**	**-100 000**	**-110 000**
b. Cropland	**310**	**-6 300**	**-4 200**	**4 300**	**-9 000**	**-9 800**	**-8 500**	**-12 000**	**-7 900**	**-16 000**	**-19 000**	**-13 000**	**4 600**	**8 300**	**-23 000**	**-23 000**	**-26 000**	**-19 000**	**-20 000**	**-36 000**	**-22 000**	**-15 000**	**-24 000**	**-24 000**	**-45 000**	**-11 000**	**-18 000**	**-24 000**	**-23 000**	**-19 000**	**-16 000**	**-19 000**	**22 000**
c. Grassland	**0.70**	**0.90**	**1**	**0.40**	**1**	**0.30**	**0.60**	**0.60**	**0.70**	**0.80**	**1**	**1**	**1**	**1**	**1**	**0.90**	**1**	**0.50**	**0.50**	**0.40**	**0.30**	**0.70**	**2**	**2**	**0.90**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
d. Wetlands	**5 400**	**5 300**	**5 200**	**5 500**	**3 300**	**3 200**	**3 100**	**3 200**	**3 500**	**3 800**	**3 200**	**3 200**	**3 200**	**3 100**	**3 200**	**3 100**	**3 200**	**3 300**	**3 300**	**3 100**	**3 100**	**3 000**	**3 100**	**3 200**	**3 200**	**3 000**	**3 100**	**3 100**	**2 800**	**3 100**	**3 500**	**3 200**	**3 300**
e. Settlements	**1 800**	**1 900**	**1 700**	**1 600**	**1 400**	**1 300**	**1 300**	**1 300**	**1 300**	**1 400**	**1 400**	**1 400**	**1 600**	**1 600**	**1 800**	**1 800**	**2 000**	**2 000**	**2 000**	**1 900**	**1 800**	**1 900**	**1 900**	**2 100**	**2 500**	**2 500**	**2 600**	**2 400**	**2 300**	**2 200**	**2 300**	**2 200**	**2 200**
f. Harvested Wood Products	**130 000**	**130 000**	**140 000**	**150 000**	**150 000**	**150 000**	**150 000**	**150 000**	**140 000**	**150 000**	**150 000**	**130 000**	**140 000**	**130 000**	**150 000**	**150 000**	**140 000**	**130 000**	**130 000**	**130 000**	**140 000**	**140 000**	**140 000**	**140 000**	**140 000**	**140 000**	**140 000**	**140 000**	**140 000**	**130 000**	**140 000**	**130 000**	**130 000**

Notes: Totals may not add up due to rounding.

Estimates for the latest year (2022) 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.

National GHG emissions by Canadian economic sector are provided in Annex 10 of this report.

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

b. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

c. HHFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990−1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

0.00 Indicates emissions were truncated due to rounding.

- Indicates no emissions.

Table A9–3 **2022 GHG Emission Summary for Canada**

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[a]	PFCs[a]	SF_6	NF_3	TOTAL
Global Warming Potential			28		265			23 500	16 100	
Unit	kt	kt	kt CO_2 eq	kt	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq
TOTAL[b]	**551 000**	**4 200**	**120 000**	**110**	**28 000**	**11 000**	**748**	**340**	**0.60**	**708 000**
ENERGY	**509 000**	**2 300**	**64 000**	**20**	**4 000**	**–**	**–**	**–**	**–**	**577 000**
a. Stationary Combustion Sources	**299 000**	**200**	**5 000**	**7**	**2 000**	**–**	**–**	**–**	**–**	**306 000**
Public Electricity and Heat Production	55 800	9	250	1	300	–	–	–	–	56 400
Petroleum Refining Industries	14 100	0.30	9	0.10	30	–	–	–	–	14 200
Oil and Gas Extraction	106 000	100	3 000	2	500	–	–	–	–	109 000
Mining	6 120	0.10	4	0.10	30	–	–	–	–	6 150
Manufacturing Industries	40 600	3	70	2	420	–	–	–	–	41 100
Iron and Steel	4 860	0.10	3	0.10	30	–	–	–	–	4 890
Non-Ferrous Metals	3 210	0.06	2	0.05	10	–	–	–	–	3 230
Chemical	9 160	0.17	5	0.20	40	–	–	–	–	9 200
Pulp and Paper	6 670	1	30	0.60	200	–	–	–	–	6 860
Cement	3 770	0.20	6	0.06	20	–	–	–	–	3 790
Other Manufacturing	13 000	0.80	20	0.60	200	–	–	–	–	13 100
Construction	1 580	0.03	0.79	0.05	12	–	–	–	–	1 590
Commercial and Institutional	34 800	0.85	24	0.80	200	–	–	–	–	35 000
Residential	37 300	50	1 000	1	400	–	–	–	–	39 100
Agriculture and Forestry	3 290	0.06	2	0.09	20	–	–	–	–	3 320
b. Transport[c]	**192 000**	**48**	**1 400**	**9**	**2 500**	**–**	**–**	**–**	**–**	**196 000**
Aviation	7 620	0.20	5	0.20	60	–	–	–	–	7 680
Domestic Aviation (Civil)	7 420	0.20	5	0.20	60	–	–	–	–	7 490
Military	194	0.00	0.07	0.01	1	–	–	–	–	196
Road Transportation	119 000	7	200	4	1 100	–	–	–	–	120 000
Light-Duty Gasoline Vehicles	23 300	1	40	0.48	130	–	–	–	–	23 400
Light-Duty Gasoline Trucks	53 000	3	90	1	270	–	–	–	–	53 400
Heavy-Duty Gasoline Vehicles	3 960	0.10	4	0.35	94	–	–	–	–	4 060
Motorcycles	710	0.30	7	0.01	4	–	–	–	–	721
Light-Duty Diesel Vehicles	331	0.01	0.20	0.03	8	–	–	–	–	339
Light-Duty Diesel Trucks	898	0.02	0.70	0.08	20	–	–	–	–	919
Heavy-Duty Diesel Vehicles	36 500	2	40	2	560	–	–	–	–	37 100
Propane and Natural Gas Vehicles	191	0.50	10	0.00	1	–	–	–	–	206
Railways	6 110	0.30	10	2	600	–	–	–	–	6 760
Marine	4 910	0.46	13	0.10	40	–	–	–	–	4 960
Domestic Navigation	4 630	0.44	12	0.10	30	–	–	–	–	4 670
Fishing	168	0.02	0.40	0.01	1	–	–	–	–	169
Military Water-Borne Navigation	113	0.01	0.30	0.00	0.80	–	–	–	–	114
Other Transportation	54 600	40	1 100	2	600	–	–	–	–	56 400
Off-Road Agriculture and Forestry	13 000	0.94	26	0.70	200	–	–	–	–	13 200
Off-Road Commercial and Institutional	5 760	8	217	0.20	60	–	–	–	–	6 030
Off-Road Manufacturing, Mining and Construction	18 300	3	89	1	300	–	–	–	–	18 600
Off-Road Residential	805	2	62	0.02	5	–	–	–	–	872
Off-Road Other Transportation	6 990	17	462	0.20	50	–	–	–	–	7 500
Pipeline Transport	9 810	10	270	0.30	70	–	–	–	–	10 100
c. Fugitive Sources	**17 000**	**2 060**	**57 600**	**0.35**	**94**	**–**	**–**	**–**	**–**	**75 000**
Coal Mining	–	50	2 000	-	-	–	–	–	–	2 000
Oil and Natural Gas	17 000	2 000	56 100	0.40	90	–	–	–	–	73 700
Oil	590	263	7 350	0.30	90	–	–	–	–	8 030
Natural Gas	48	342	9 580	-	-	–	–	–	–	9 630
Venting	11 000	1 370	38 400	-	-	–	–	–	–	49 100
Flaring	6 120	26	723	0.03	7	–	–	–	–	6 850
d. CO_2 Transport and Storage	**0.60**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**0.60**
INDUSTRIAL PROCESSES AND PRODUCT USE	**38 900**	**5**	**140**	**2**	**630**	**11 000**	**748**	**340**	**0.60**	**51 300**
a. Mineral Products	**8 400**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**8 400**
Cement Production	6 750	–	–	–	–	–	–	–	–	6 750
Lime Production	1 340	–	–	–	–	–	–	–	–	1 340
Mineral Product Use	310	–	–	–	–	–	–	–	–	310
b. Chemical Industry	**5 510**	**5**	**140**	**0.52**	**138**	**–**	**–**	**–**	**–**	**5 780**
Ammonia Production	2 590	–	–	–	–	–	–	–	–	2 590
Nitric Acid Production	–	–	–	0.48	128	–	–	–	–	128
Adipic Acid Production	–	–	–	–	–	–	–	–	–	-
Petrochemical and Carbon Black Production	2 920	5	140	0.04	10	–	–	–	–	3 070
c. Metal Production	**12 800**	**0.07**	**2**	**–**	**–**	**–**	**711**	**168**	**–**	**13 600**
Iron and Steel Production	7 810	0.07	2	–	–	–	–	–	–	7 810
Aluminium Production	4 940	–	–	–	–	–	711	0.50	–	5 660
SF_6 Used in Magnesium Smelters and Casters	–	–	–	–	–	–	–	167	–	167
d. Production and Consumption of Halocarbons, SF_6 and NF_3[d]	**–**	**–**	**–**	**–**	**–**	**11 000**	**18**	**38**	**0.60**	**11 000**
e. Non-Energy Products from Fuels and Solvent Use	**12 000**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**12 000**
f. Other Product Manufacture and Use	**–**	**–**	**–**	**2**	**490**	**–**	**20**	**140**	**–**	**650**
AGRICULTURE	**2 900**	**1 100**	**31 000**	**82**	**22 000**	**–**	**–**	**–**	**–**	**56 000**
a. Enteric Fermentation	**–**	**970**	**27 000**	**–**	**–**	**–**	**–**	**–**	**–**	**27 000**
b. Manure Management	**–**	**160**	**4 300**	**10**	**3 000**	**–**	**–**	**–**	**–**	**7 800**
c. Agricultural Soils	**–**	**–**	**–**	**68**	**18 000**	**–**	**–**	**–**	**–**	**18 000**
Direct Sources	–	–	–	55	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	**2 900**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**2 900**
WASTE	**100**	**770**	**22 000**	**6**	**2 000**	**–**	**–**	**–**	**–**	**23 000**
a. Solid Waste Disposal (Landfills)	**–**	**700**	**20 000**	**–**	**–**	**–**	**–**	**–**	**–**	**20 000**
b. Biological Treatment of Solid Waste	**–**	**9**	**200**	**0.90**	**200**	**–**	**–**	**–**	**–**	**500**
c. Wastewater Treatment and Discharge	**–**	**40**	**1 000**	**5**	**1 300**	**–**	**–**	**–**	**–**	**2 000**
d. Incineration and Open Burning of Waste	**95**	**0.03**	**0.90**	**0.20**	**60**	**–**	**–**	**–**	**–**	**160**
e. Industrial Wood Waste Landfills	**–**	**30**	**800**	**–**	**–**	**–**	**–**	**–**	**–**	**800**
LAND USE, LAND-USE CHANGE AND FORESTRY	**51 000**	**22**	**610**	**1**	**280**	**–**	**–**	**–**	**–**	**51 000**
a. Forest Land	**-110 000**	**10**	**300**	**0.60**	**200**	**–**	**–**	**–**	**–**	**-110 000**
b. Cropland	**22 000**	**5**	**150**	**0.25**	**66**	**–**	**–**	**–**	**–**	**22 000**
c. Grassland	**–**	**0.04**	**1**	**0.00**	**0.30**	**–**	**–**	**–**	**–**	**1**
d. Wetlands	**3 300**	**0.64**	**18**	**0.02**	**4**	**–**	**–**	**–**	**–**	**3 300**
e. Settlements	**2 100**	**5**	**140**	**0.20**	**52**	**–**	**–**	**–**	**–**	**2 200**
f. Harvested Wood Products	**130 000**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**130 000**

Notes: Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
National GHG emissions by Canadian economic sector are provided in Annex 10 of this report.

a. Chapter 1, Table 1-1 of this report provides a list of global warming potentials (GWPs) used.
b. National totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.
c. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.
d. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.

ANNEX 10

CANADA'S GREENHOUSE GAS EMISSION TABLES BY CANADIAN ECONOMIC SECTOR, 1990–2022

This annex contains summary tables illustrating national Greenhouse Gas (GHG) emissions for the period 1990–2022 by Canadian economic sector (Table A10–2), as well as the relationship (crosswalk) between the economic sectors and the Intergovernmental Panel on Climate Change (IPCC) sectors presented in Annex 9 of this report (Table A10–3). In addition, Table A10–1 provides a brief description of each economic sector.

Although not a mandatory reporting requirement, reallocating emissions from IPCC sectors to Canadian economic sectors is useful for the purpose of analyzing trends and policies, as most people associate GHG emissions with a particular economic activity (e.g. producing electricity, farming or driving a car). This re-allocation simply re-categorizes emissions under different headings, but does not change the overall magnitude of Canadian emission estimates. Estimates for each economic sector includes emissions from energy-related and non-energy-related processes.

Reallocation of Emissions from IPCC Sector to Canadian Economic Sector

In general, the reallocation of emissions from IPCC sector to economic sector involves aggregating emissions from stationary combustion, fugitive sources, transportation, industrial processes, agriculture and waste into the appropriate economic sector. In many cases, the stationary combustion emissions for a specific IPCC sector are the same as that for the corresponding economic sector with some notable exceptions.

First, unlike allocation for the IPCC sectors, all utility-owned cogeneration facilities that produce steam or electricity for on-site use are reallocated from Electricity to the relevant economic sector. The relevant economic sectors include Natural Gas Production and Processing, Oil Sands, Mining, Pulp and Paper, Chemicals and Fertilizers, Service Industry, and Light Manufacturing. This is generally accomplished by analyzing and reallocating data by sector from the *Electric Power Thermal Generating Station Fuel Consumption Survey* (StatCan, n.d. [a]).

Second, Lime and Gypsum is split out from the IPCC category Other Manufacturing and reported as an economic sector on its own, while all other industries included in the IPCC category are allocated to the economic sector Light Manufacturing. Constituent sectors include all other manufacturing industries not already accounted for in identified IPCC manufacturing categories (e.g. Iron and Steel, Chemicals, etc.). Examples include automobile manufacturing, textiles, food and beverage industries, etc.

Third, emissions resulting from the combustion of fuel used to transport oil and natural gas in pipelines accounted for in the IPCC category Pipeline Transport, is divided into the Oil and Natural Gas Transmission and Natural Gas Distribution economic sectors. This division is based on sector-specific fuel combustion data from an upstream oil and gas (UOG) study (ECCC, 2014).

Fourth, combustion emissions from the Mining and Upstream Oil and Gas Production IPCC category are reallocated to many economic sectors including: Coal Production, Mining, Natural Gas Production and Processing, Conventional Light Oil Production, Conventional Heavy Oil Production, Frontier Oil Production and Oil Sands (Mining, In-situ, Upgrading). A variety of external data sources are used to estimate emissions for the appropriate sectors which are then re-proportioned to align with Canada's energy balance. These external data sources include:

- **Mining**: Metal and non-metal mining fuel consumption data from the Canadian Industrial Energy End-Use Data and Analysis Centre (CEEDC) database on Energy, Production and Intensity Indicators for Canadian Industry (CEEDC, n.d.).

- **Coal Production**: Fuel consumption estimates for the coal mining industry are based on the *Compilation of a National Inventory of Greenhouse Gas and Fugitive VOC Emissions by the Canadian Coal Mining Industry* (Cheminfo/Clearstone, 2014) and annual coal production data provided by Statistics Canada (see Annex 3.2 for further discussion on this activity data).
- **UOG sectors**: Fuel consumption data for the various UOG sectors, except Oil Sands, is estimated from the UOG study (Environment Canada, 2014).
- **Oil Sands**: Fuel consumption data for the Oil Sands industry (including mining and extraction, in-situ and upgrading) is modelled by ECCC and adjusted so that the resultant emissions align with the facility level emissions data that is reported to ECCC through the Greenhouse Gas Emissions Reporting Program (GHGRP) (see Chapter 1 for more information on the GHGRP) (ECCC, 2021).

Fifth, emissions from road, rail, marine and air transport are separated into passenger and freight components. Emissions for Other Transportation (Off-Road) are reallocated to their relevant economic sectors and to the Transportation category Other: Recreational, Commercial, and Residential.

Sixth, CO_2 captured from waste streams at large industrial facilities (e.g. electric utilities, oil sands upgraders) is presented separately in the economic sectors. It is displayed as a negative number to represent the removal of CO_2 from the specific sector while the source of the CO_2 emissions (e.g. stationary combustion) for the sector is displayed as a gross amount.

In terms of process and product use-related emissions, emissions from mineral products, chemical industry and metal production are reallocated to Heavy Industry and Light Manufacturing. Emissions from consumption of halocarbons, SF_6 and NF_3, which mainly consist of HFC emissions from refrigeration and air conditioning, are mostly allocated to Transport and Buildings, where the majority of HFCs are used and emitted. Emissions from non-energy products from fuels and solvent use are reallocated to multiple relevant economic categories. Finally, emissions from other product manufacture and use are mainly distributed to Electricity and Service Industry.

Once all these sector specific fuel consumption estimates are compiled the data are reconciled by province and by fuel with the fuel consumption data from the *Report on Energy Supply and Demand* (StatCan, n.d. [b]). This ensures that the economic sector estimates match the IPCC sector estimates.

Canada's GHG emission tables are also available in electronic file format online at http://open.canada.ca.

Table A10–1 **Canadian Economic Sector Descriptions**

Economic Sector	Description
OIL AND GAS	
Upstream Oil and Gas	Stationary combustion, onsite transportation, electricity and steam production, fugitive and process emissions from:
Natural Gas Production and Processing	– natural gas production and processing
Conventional Oil Production	Emissions resulting from:
Conventional Light Oil Production	– conventional light crude oil production
Conventional Heavy Oil Production	– conventional heavy crude oil production
Frontier Oil Production	– offshore and arctic production of crude oil
Oil Sands (Mining, In-Situ, Upgrading)	Stationary combustion, onsite transportation, electricity and steam production, fugitive and process emissions from:
Mining and Extraction	– crude bitumen mining and extraction
In-Situ	– in-situ extraction of crude bitumen in designated oil sands areas including primary extraction, cyclic steam stimulation (CSS), steam-assisted gravity drainage (SAGD) and other experimental techniques
Upgrading	– crude bitumen and heavy oil upgrading to synthetic crude oil
Oil, Natural Gas and CO_2 Transmission	Combustion and fugitive emissions from the transport and storage of crude oil and natural gas.
Downstream Oil and Gas	Emissions resulting from:
Petroleum Refining	– stationary combustion, onsite transportation, electricity and steam production, fugitive and process emissions from petroleum refining industries
Natural Gas Distribution	– combustion and fugitive emissions from local distribution of natural gas up to and including the natural gas meter
ELECTRICITY	Combustion and process emissions from utility electricity generation, steam production (for sale) and transmission. Excludes utility owned cogeneration at industrial sites. Includes post-meter, unintentional leaks from natural gas consumption.
TRANSPORT	Mobile related emissions including all fossil fuels and non-CO_2 emission from biofuels. Includes post-meter, unintentional leaks from natural gas powered vehicles.
Passenger Transport	Mobile related combustion, process and refrigerant emissions from the vehicles that primarily move people around.
Cars, Light Trucks and Motorcycles	– light duty cars and trucks and motorcycles with a Gross Vehicle Weight Rating (GVWR) less than 3856 kg
Bus, Rail and Aviation	– all buses and the passenger component of rail and aviation
Freight Transport	Mobile related combustion, process and refrigerant emissions from the vehicles that primarily move cargo or freight around.
Heavy Duty Trucks, Rail	– vehicles with a Gross Vehicle Weight Rating (GVWR) greater than or equal to 3856 kg. Also includes the freight component of rail
Aviation and Marine	– cargo component of aviation and all domestic navigation (inclusive of all fishing and military operations)
Other: Recreational, Commercial and Residential	Combustion emissions from the non-industrial use of off-road engines (e.g., ATVs, snowmobiles, personal watercraft), including portable engines (e.g., generators, lawn mowers, chain saws). Includes post-meter, unintentional leaks from natural gas powered engines.
HEAVY INDUSTRY	Stationary combustion, onsite transportation, electricity and steam production, and process emissions. Includes post-meter, unintentional leaks from natural gas consumption.
Mining	– metal and non-metal mines, stone quarries, and gravel pits
Smelting and Refining (Non-Ferrous Metals)	– non-ferrous metals (aluminium, magnesium and other production)
Pulp and Paper	– pulp and paper (primarily pulp, paper, and paper product manufacturers)
Iron and Steel	– Iron and steel (steel foundries, casting, rolling mills and iron making)
Cement	– cement and other non-metallic mineral production
Lime and Gypsum	– lime and gypsum product manufacturing
Chemicals and Fertilizers	– chemical (fertilizer manufacturing, organic and inorganic chemical manufacturing)
BUILDINGS	Stationary combustion and process (i.e. air conditioning) emissions, including post-meter, unintentional leaks from natural gas appliances from:
Service Industry	– service industries related to mining, communication, wholesale and retail trade, finance and insurance, real estate, education, etc.; offices, health, arts, accommodation, food, information & cultural; Federal, provincial and municipal establishments; National Defence and Canadian Coast Guard; Train stations, airports and warehouses
Residential	– personal residences (homes, apartment hotels, condominiums and farm houses)
AGRICULTURE	Emissions resulting from:
On Farm Fuel Use	– stationary combustion, onsite transportation and process emissions from the agricultural, hunting and trapping industry (excluding food processing, farm machinery manufacturing, and repair); includes post-meter, unintentional leaks from natural gas consumption
Crop Production	– Application of biosolids and inorganic nitrogen fertilizers, decomposition of crop residues, loss of soil organic carbon, cultivation of organic soils, indirect emissions from leaching and volatilization, field burning of agricultural residues, liming, and urea application
Animal Production	– Animal housing, manure storage, manure deposited by grazing animals, and application of manure to managed soils
WASTE	Non-CO_2 Emissions from biomass resulting from:
Solid Waste	– municipal solid waste management sites (landfills), dedicated wood waste landfills, and other treatment of municipal solid waste
Wastewater	– municipal and industrial wastewater treatment
Waste Incineration	– municipal solid, hazardous and clinical waste, and sewage sludge incineration
COAL PRODUCTION	Stationary combustion, onsite transportation and fugitive emissions from underground and surface coal mines. Includes post-meter, unintentional leaks from natural gas consumption.
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	Stationary combustion, onsite transportation, electricity and steam production, and process emissions, including post-meter, unintentional leaks from natural gas consumption from (excluding LULUCF):
Light Manufacturing	– all other manufacturing industries not included in the Heavy Industry category above
Construction	– construction of buildings, highways etc.
Forest Resources	– forestry and logging service industry

Table A10–2 Canada's GHG Emissions by Canadian Economic Sector, 1990–2022

Greenhouse Gas Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	Mt CO_2 eq																																
NATIONAL GHG TOTAL	**608**	**603**	**622**	**627**	**649**	**668**	**689**	**706**	**712**	**723**	**748**	**739**	**745**	**763**	**767**	**761**	**757**	**777**	**760**	**716**	**729**	**738**	**744**	**751**	**750**	**746**	**731**	**742**	**753**	**752**	**686**	**698**	**708**
OIL AND GAS	**118**	**120**	**129**	**138**	**144**	**152**	**160**	**162**	**166**	**174**	**179**	**181**	**185**	**189**	**192**	**195**	**202**	**207**	**203**	**198**	**204**	**210**	**219**	**224**	**230**	**229**	**214**	**221**	**228**	**226**	**209**	**216**	**217**
Upstream Oil and Gas	**98**	**101**	**110**	**119**	**126**	**133**	**138**	**140**	**145**	**153**	**159**	**160**	**163**	**166**	**168**	**172**	**179**	**183**	**180**	**176**	**180**	**189**	**197**	**201**	**209**	**208**	**193**	**201**	**209**	**206**	**192**	**198**	**198**
Natural Gas Production and Processing	38	38	40	43	45	48	51	48	51	59	65	67	69	72	71	75	77	79	77	73	72	75	73	72	71	70	65	63	64	62	60	61	60
Conventional Oil Production	32	34	37	40	43	46	47	50	49	49	51	50	50	49	49	48	49	49	48	44	45	48	52	54	56	55	48	51	51	49	40	39	39
Conventional Light Oil Production	19	19	19	20	21	22	22	22	21	21	21	21	21	21	21	22	22	23	23	22	23	26	29	30	33	32	28	30	31	30	24	22	21
Conventional Heavy Oil Production	13	15	18	20	21	24	25	27	25	26	29	28	27	26	26	25	25	24	23	21	20	21	22	22	22	22	18	19	19	17	14	16	17
Frontier Oil Production	0	0	0	0	0	0	0	0	3	2	1	1	3	2	2	2	2	2	2	2	2	1	1	1	2	1	1	2	2	2	2	1	1
Oil Sands (Mining, In-Situ, Upgrading)	15	16	18	19	20	20	21	23	25	25	26	29	30	33	37	36	41	45	46	51	56	57	64	66	71	73	70	77	82	84	81	86	87
Mining and Extraction	2	2	3	3	3	3	3	3	3	3	3	4	5	6	6	6	6	7	7	8	9	9	9	10	10	11	11	13	15	16	15	16	16
In-Situ	5	4	4	4	5	5	5	7	9	9	9	9	9	11	12	13	15	16	19	21	24	26	31	32	37	39	38	42	44	44	42	45	45
Upgrading	8	9	11	12	13	12	13	12	13	13	14	15	16	17	19	17	20	22	20	22	23	23	24	24	24	23	21	22	24	25	25	25	25
Oil, Natural Gas and CO_2 Transmission	13	14	16	17	18	19	20	20	20	20	16	14	14	12	11	12	12	10	9	8	7	8	8	9	10	10	10	10	11	11	10	11	13
Downstream Oil and Gas	**20**	**19**	**19**	**20**	**19**	**19**	**22**	**22**	**21**	**21**	**20**	**21**	**22**	**23**	**25**	**23**	**23**	**24**	**22**	**22**	**23**	**22**	**22**	**22**	**21**	**21**	**21**	**19**	**19**	**20**	**18**	**18**	**19**
Petroleum Refining	18	17	17	18	17	17	20	20	19	18	18	19	20	22	23	22	22	22	21	21	22	20	21	21	20	20	20	18	18	19	16	17	17
Natural Gas Distribution	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ELECTRICITY	**94**	**96**	**102**	**93**	**95**	**98**	**98**	**109**	**122**	**119**	**128**	**129**	**123**	**127**	**119**	**117**	**112**	**119**	**109**	**94**	**95**	**86**	**82**	**80**	**75**	**75**	**75**	**72**	**62**	**61**	**53**	**51**	**47**
TRANSPORT	**118**	**113**	**115**	**118**	**124**	**126**	**129**	**133**	**136**	**140**	**142**	**142**	**144**	**149**	**154**	**156**	**157**	**162**	**163**	**161**	**165**	**164**	**164**	**167**	**164**	**162**	**162**	**165**	**169**	**170**	**143**	**150**	**156**
Passenger Transport	**80**	**77**	**79**	**81**	**84**	**83**	**85**	**86**	**88**	**89**	**89**	**89**	**91**	**93**	**95**	**95**	**95**	**97**	**96**	**96**	**96**	**93**	**94**	**96**	**95**	**97**	**99**	**100**	**102**	**103**	**83**	**86**	**90**
Cars, Light Trucks and Motorcycles	71	69	71	73	76	75	76	77	79	79	79	80	82	83	85	85	85	86	85	86	86	83	83	85	84	85	88	89	90	91	75	78	80
Bus, Rail and Aviation	9	8	8	8	8	8	9	9	9	10	10	9	9	10	10	10	10	11	11	10	10	10	11	12	11	11	11	12	12	12	8	8	10
Freight Transport	**30**	**29**	**29**	**30**	**33**	**34**	**34**	**36**	**37**	**38**	**39**	**39**	**39**	**42**	**45**	**48**	**49**	**53**	**55**	**54**	**56**	**58**	**57**	**57**	**57**	**52**	**49**	**50**	**52**	**52**	**46**	**50**	**52**
Heavy Duty Trucks, Rail	25	24	24	25	28	29	30	31	32	33	34	34	34	37	39	42	44	48	50	49	51	53	53	52	52	48	44	45	47	46	41	43	44
Aviation and Marine	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	5	5	6	5	7	7
Other: Recreational, Commercial and Residential	**8**	**8**	**8**	**8**	**8**	**10**	**10**	**11**	**12**	**13**	**13**	**13**	**14**	**14**	**14**	**14**	**13**	**12**	**12**	**11**	**12**	**13**	**13**	**14**	**13**	**13**	**14**	**15**	**15**	**15**	**14**	**15**	**14**
HEAVY INDUSTRY	**97**	**97**	**94**	**93**	**99**	**100**	**103**	**103**	**99**	**97**	**96**	**91**	**91**	**90**	**93**	**88**	**88**	**86**	**85**	**72**	**75**	**81**	**81**	**80**	**82**	**80**	**77**	**77**	**80**	**79**	**74**	**78**	**78**
Mining	**7**	**7**	**6**	**7**	**8**	**8**	**9**	**9**	**9**	**9**	**9**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**9**	**8**	**8**	**9**	**9**	**9**	**9**	**9**	**8**	**9**	**11**	**11**	**10**	**11**	**11**
Smelting and Refining (Non-Ferrous Metals)	**17**	**18**	**17**	**17**	**17**	**16**	**17**	**16**	**17**	**16**	**16**	**15**	**15**	**15**	**14**	**14**	**14**	**13**	**13**	**12**	**11**	**12**	**10**	**11**	**10**	**10**	**10**	**11**	**11**	**10**	**10**	**10**	**10**
Pulp and Paper	**15**	**15**	**14**	**14**	**14**	**13**	**14**	**14**	**13**	**13**	**13**	**12**	**11**	**11**	**11**	**9**	**8**	**8**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**6**	**7**	**7**	**8**	**8**	**7**	**8**	**8**
Iron and Steel	**17**	**18**	**19**	**18**	**18**	**18**	**18**	**18**	**19**	**19**	**19**	**17**	**17**	**17**	**17**	**16**	**17**	**18**	**17**	**13**	**14**	**17**	**16**	**15**	**16**	**15**	**15**	**15**	**16**	**15**	**12**	**14**	**13**
Cement	**10**	**9**	**9**	**9**	**10**	**11**	**11**	**11**	**11**	**12**	**12**	**12**	**12**	**12**	**13**	**13**	**13**	**13**	**12**	**10**	**10**	**10**	**11**	**10**	**10**	**10**	**10**	**11**	**11**	**11**	**10**	**11**	**11**
Lime and Gypsum	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**2**	**2**	**3**	**2**	**2**	**2**	**2**	**3**
Chemicals and Fertilizers	**28**	**28**	**27**	**27**	**30**	**30**	**32**	**31**	**27**	**25**	**23**	**23**	**24**	**23**	**26**	**24**	**24**	**23**	**24**	**20**	**22**	**24**	**25**	**25**	**28**	**26**	**23**	**21**	**21**	**22**	**22**	**22**	**23**
BUILDINGS	**72**	**72**	**74**	**77**	**78**	**78**	**85**	**82**	**74**	**78**	**84**	**81**	**85**	**90**	**89**	**85**	**80**	**86**	**86**	**84**	**82**	**86**	**85**	**86**	**86**	**85**	**86**	**88**	**92**	**94**	**89**	**85**	**89**
Service Industry	**28**	**28**	**29**	**31**	**30**	**32**	**34**	**34**	**32**	**34**	**38**	**38**	**40**	**43**	**43**	**40**	**37**	**38**	**39**	**39**	**38**	**40**	**42**	**42**	**42**	**42**	**45**	**47**	**49**	**50**	**47**	**45**	**46**
Residential	**45**	**43**	**45**	**47**	**47**	**46**	**51**	**48**	**42**	**44**	**46**	**43**	**45**	**47**	**46**	**45**	**43**	**47**	**47**	**45**	**43**	**46**	**42**	**44**	**44**	**44**	**41**	**42**	**44**	**44**	**42**	**41**	**42**
AGRICULTURE	**51**	**51**	**53**	**54**	**56**	**58**	**60**	**61**	**61**	**61**	**62**	**62**	**62**	**64**	**65**	**66**	**64**	**64**	**64**	**61**	**61**	**61**	**63**	**65**	**64**	**66**	**67**	**67**	**69**	**69**	**70**	**69**	**70**
On Farm Fuel Use	**8**	**8**	**8**	**8**	**8**	**9**	**9**	**10**	**9**	**9**	**10**	**9**	**8**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**10**	**11**	**11**	**12**	**12**	**13**	**13**	**14**	**15**	**15**	**14**	**14**	**14**
Crop Production	**9**	**9**	**9**	**10**	**10**	**10**	**11**	**11**	**11**	**11**	**11**	**10**	**11**	**11**	**11**	**10**	**11**	**12**	**12**	**12**	**13**	**13**	**15**	**16**	**15**	**16**	**16**	**16**	**16**	**17**	**18**	**17**	**19**
Animal Production	**33**	**34**	**35**	**36**	**37**	**39**	**40**	**40**	**40**	**41**	**42**	**43**	**43**	**43**	**45**	**46**	**45**	**43**	**42**	**40**	**38**	**37**	**38**	**38**	**37**	**37**	**37**	**37**	**38**	**38**	**38**	**38**	**37**
WASTE	**21**	**21**	**22**	**22**	**22**	**22**	**22**	**22**	**23**	**23**	**24**	**24**	**24**	**24**	**24**	**24**	**24**	**24**	**24**	**23**	**22**	**22**	**22**	**23**	**23**	**23**	**24**	**24**	**23**	**24**	**23**	**23**	**23**
Solid Waste[a]	**19**	**19**	**19**	**20**	**20**	**20**	**20**	**20**	**21**	**21**	**21**	**21**	**21**	**22**	**22**	**22**	**22**	**21**	**21**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**21**	**21**	**21**	**21**	**20**	**20**	**21**
Wastewater	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**2**
Waste Incineration	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
COAL PRODUCTION	**5**	**5**	**4**	**5**	**5**	**4**	**5**	**5**	**4**	**4**	**4**	**4**	**4**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**4**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	**32**	**29**	**28**	**26**	**26**	**28**	**28**	**29**	**27**	**27**	**28**	**27**	**27**	**27**	**28**	**28**	**26**	**26**	**25**	**21**	**23**	**24**	**24**	**24**	**23**	**23**	**24**	**25**	**25**	**25**	**22**	**23**	**24**
Light Manufacturing	**21**	**21**	**20**	**18**	**18**	**20**	**20**	**21**	**18**	**18**	**19**	**17**	**17**	**17**	**18**	**17**	**16**	**17**	**16**	**14**	**14**	**15**	**16**	**16**	**15**	**15**	**14**	**14**	**14**	**14**	**13**	**14**	**15**
Construction	**7**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**7**	**7**	**7**	**8**	**8**	**8**	**8**	**8**	**7**	**7**	**5**	**6**	**7**	**6**	**6**	**6**	**7**	**7**	**8**	**8**	**8**	**7**	**7**	**7**
Forest Resources	**3**	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**3**	**3**

Notes:
Totals may not add up due to rounding.
Estimates presented here are under continual improvement. Historical emissions may be updated in future publications as new data become available and methods and models are refined and improved.
National GHG emissions allocated to IPCC sectors are provided in Annex 9 of this report.
Provincial and territorial GHG emissions allocated to IPCC sectors are provided in Annex 11 of this report.
a. Emission estimates for Solid Waste include emissions from municipal solid waste landfills, wood waste landfills and municipal solid waste composting.
0 Indicates emissions of less than 0.5 Mt CO_2 eq were truncated due to rounding.
- Indicates no emissions

Table A10–3 Relationship between Canadian Economic Sectors and IPCC Sectors, 2022

ECONOMIC CATEGORY	Economic Category Total	National Inventory Category[a]																										
		Energy								Industrial Processes and Product Use							Agriculture				Waste						CO_2 Captured[j,k]	LULUCF[l]
		Energy: Fuel Combustion				Energy: Fugitive			Total	Mineral Products[d]	Chemical Industry[e]	Metal Production[f]	Consumption of Halocarbons, SF_6 and NF_3	Non-Energy Products from Fuels and Solvent Use	Other Product Manufacture and Use	Total	Manure Management	Enteric Fermentation	Agriculture Soils	Total	Solid Waste Disposal	Biological Treatment of Solid Waste	Wastewater Treatment and Discharge	Incineration and Open Burning of Waste	Industrial Wood Waste Landfills	Total		
		Stationary Combustion			Transport	Fugitive (Unintentional)	Flaring	Venting																				
		Stationary	Industrial Cogeneration																									
			Electricity[c]	Steam for Sale																								
	Mt CO_2 equivalent																											
	NATIONAL INVENTORY TOTAL[a,b]	**708**	**281**	**24.7**	**0.9**	**196**	**19.2**	**6.9**	**51.0**	**580**	**8.4**	**5.8**	**13.6**	**10.6**	**12.2**	**0.6**	**51.3**	**7.8**	**27.1**	**21.0**	**55.9**	**19.5**	**0.5**	**2.5**	**0.2**	**0.8**	**23.4**	**-2.6**	
	OIL AND GAS	**217**	**112.0**	**16.2**	**0.0**	**15.7**	**15.6**	**6.9**	**51.0**	**217.4**					**1.2**		**1.2**											**-1.9**	
	Upstream Oil and Gas	**198**	**98.5**	**15.0**		**15.6**	**14.4**	**6.6**	**48.9**	**199.1**					**0.1**		**0.1**											**-1.0**	
	Natural Gas Production and Processing	60	29.6	1.0		0.4	5.0	2.1	21.8	59.9					0.0		0.0												
	Conventional Oil Production	39	11.4	0.2		0.7	5.3	2.7	18.9	39.2					0.0		0.0												
	Conventional Light Oil Production	21	3.3			0.3	4.4	2.2	11.1	21.3					0.0		0.0												
	Conventional Heavy Oil Production	17	7.2			0.4	0.9	0.3	7.7	16.6																			
	Frontier Oil Production	1	0.8	0.2		0.0	0.0	0.2	0.0	1.3					0.0		0.0												
	Oil Sands (Mining, In-Situ, Upgrading)[c]	87	57.5	13.9		4.4	2.6	1.8	7.3	87.4					0.1		0.1											-1.0	
	Mining and Extraction	16	6.4	3.2		4.3	2.3	0.2	0.0	16.4					0.1		0.1												
	In-Situ	45	36.3	6.6		0.1	0.2	0.5	1.4	45.1																			
	Upgrading	25	14.7	4.1		0.0	0.1	1.1	5.9	25.9																		-1.0	
	Oil, Natural Gas and CO_2 Transmission	13				10.0	1.5	0.0	1.0	12.5																			
	Downstream Oil and Gas	**19**	**13.6**	**1.1**	**0.0**	**0.1**	**1.2**	**0.2**	**2.1**	**18.4**					**1.1**		**1.1**											**-0.9**	
	Petroleum Refining	17	13.6	1.1	0.0		0.1	0.2	2.0	17.1					1.1		1.1											-0.9	
	Natural Gas Distribution	1				0.1	1.1	0.0	0.1	1.3																			
	ELECTRICITY	**47**	**47.3**		**0.5**		**0.1**			**47.9**						**0.1**	**0.1**											**-0.7**	
	TRANSPORT[g]	**156**				**154.1**	**0.0**			**154.1**				**2.0**	**0.2**		**2.2**												
	Passenger Transport	**90**				**88.9**	**0.0**			**88.9**				**1.1**	**0.1**		**1.3**												
	Cars, Light Trucks and Motorcycles	80				78.8	0.0			78.8				1.0	0.1		1.1												
	Bus, Rail and Aviation	10				10.1	0.0			10.1				0.1	0.0		0.1												
	Freight Transport	**52**				**50.8**	**0.0**			**50.8**				**0.9**	**0.1**		**1.0**												
	Heavy Duty Trucks, Rail	44				43.7	0.0			43.7				0.7	0.1		0.8												
	Aviation and Marine	7				7.1				7.1				0.2	0.0		0.2												
	Other: Recreational, Commercial and Residential	**14**				**14.4**				**14.4**																			
	HEAVY INDUSTRY	**78**	**31.3**	**7.8**	**0.3**	**5.0**	**0.2**			**44.5**	**8.2**	**5.8**	**13.6**	**0.1**	**5.7**		**33.5**												
	Mining	**11**	**5.1**	**1.1**		**4.4**	**0.0**			**10.7**				**0.0**	**0.4**		**0.4**												
	Smelting and Refining (Non-Ferrous Metals)	**10**	**3.2**		**0.0**	**0.1**	**0.0**			**3.3**	**0.0**		**5.8**		**0.9**		**6.8**												
	Pulp and Paper	**8**	**5.4**	**1.9**	**0.1**	**0.1**	**0.0**			**7.6**	**0.0**				**0.0**		**0.1**												
	Iron and Steel	**13**	**4.7**	**0.2**		**0.2**	**0.0**			**5.1**			**7.8**		**0.2**		**8.0**												
	Cement	**11**	**3.8**			**0.1**	**0.0**			**3.9**	**6.8**				**0.0**		**6.8**												
	Lime and Gypsum	**3**	**1.2**			**0.0**	**0.0**			**1.2**	**1.3**				**0.0**		**1.4**												
	Chemicals and Fertilizers	**23**	**7.8**	**4.5**	**0.2**	**0.1**	**0.1**			**12.7**	**0.1**	**5.8**		**0.1**	**4.1**		**10.1**												
	BUILDINGS	**89**	**73.7**	**0.4**	**0.1**		**1.7**			**75.8**				**8.0**	**4.4**	**0.5**	**12.9**												
	Service Industry	**46**	**34.5**	**0.4**	**0.1**		**0.2**			**35.2**				**6.3**	**4.4**	**0.5**	**11.2**												
	Residential	**42**	**39.1**				**1.5**			**40.7**				**1.7**			**1.7**												
	AGRICULTURE	**70**	**3.3**	**0.0**		**10.9**	**0.0**			**14.2**					**0.1**		**0.1**	**7.8**	**27.1**	**21.0**	**55.9**								
	On Farm Fuel Use[h]	**14**	**3.3**	**0.0**		**10.9**	**0.0**			**14.2**					**0.1**		**0.1**												
	Crop Production	**19**																		**18.7**	**18.7**								
	Animal Production	**37**																**7.8**	**27.1**	**2.4**	**37.3**							
	WASTE	**23**												**0.0**			**0.0**					**19.5**	**0.5**	**2.5**	**0.2**	**0.8**	**23.4**		
	Solid Waste[i]	**21**												**0.0**			**0.0**					**19.5**	**0.5**			**0.8**	**20.7**		
	Wastewater	**2**																		**2.5**							**2.5**		
	Waste Incineration	**0**																							**0.2**		**0.2**		
	COAL PRODUCTION	**3**	**0.5**			**1.3**	**1.5**			**3.3**																			
	LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	**24**	**13.2**	**0.3**	**0.0**	**9.0**	**0.1**			**22.6**	**0.2**			**0.5**	**0.6**	**0.0**	**1.3**												
	Light Manufacturing	**15**	**11.6**	**0.3**	**0.0**	**1.6**	**0.1**			**13.6**	**0.2**			**0.5**	**0.4**	**0.0**	**1.1**												
	Construction	**7**	**1.6**	**0.0**		**5.1**	**0.0**			**6.7**					**0.0**		**0.0**												
	Forest Resources	**3**	**0.0**			**2.3**				**2.3**					**0.2**		**0.2**												
																												51.5

Notes:

Totals may not add up due to rounding to nearest megatonne (Mt). The estimates for the economic categories may not add up to the national inventory totals by IPCC Sectors due to rounding and statistical differences in the RESD for the IP category of Other & Undifferentiated Production.

Estimates presented here are under continual improvement. Historical emissions may be updated in future publications as new data become available and methods and models are refined and improved.

a. Categorization of emissions is consistent with the IPCC's sectors.
b. National totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.
c. Industrial cogeneration includes emissions associated with the simultaneous production of heat and power. At some facilities, a portion of this power is generated by onsite utility-owned generators. As such, the cogeneration emissions for these specific facilities are included under the Public Electricity and Heat Generation category in the National Inventory (UNFCCC) format.
d. Mineral products includes cement production, lime production and mineral product use.
e. Chemical industry includes the production of ammonia, nitric acid, adipic acid, carbide and petrochemicals.
f. Metal production includes iron and steel production, aluminum production, and SF_6 used in magnesium smelters and casters.
g. Emissions from the consumption of propane and natural gas in Transportation are allocated to Cars, Light Trucks and Buses
h. On Farm Fuel Use includes emissions associated with the use of lube oils and greases.
i. Emission estimates for Solid Waste include emissions from municipal solid waste landfills, wood waste landfills and municipal solid waste composting.
j. Some facilities capture CO_2 emissions. This is displayed as a negative quantity, as it is computed as an emission reduction at the source. Though the CO_2 has been captured, this does not imply permanent storage; some portion may be subsequently re-emitted (for instance, as fugitive releases) in another activity – in such cases, the re-emissions are reported in the economic sectors where they occur.
k. Some ammonia production facilities engage in the capture of CO_2 emissions. These emissions have been subtracted directly in the Ammonia Production category, as per the 2006 IPCC Guidelines. Therefore, the CO_2 Captured column does not include recovered and/or captured CO_2 emissions in the Ammonia Production category.
l. Indicates emissions of less than 0.05 Mt CO_2 eq were truncated due to rounding.

PROVINCIAL AND TERRITORIAL GREENHOUSE GAS EMISSION TABLES BY IPCC SECTOR, 1990–2022

This annex contains summary tables (Table A11–2 to Table A11–28) illustrating greenhouse gas (GHG) emissions by province and territory and year for each IPCC sector.

To account for the creation of Nunavut in 1999, separate time-series are provided from 1999 onwards for both the Northwest Territories and Nunavut (Table A11–24 and Table A11–26); emissions for the years 1990–1998 are presented as a combined region in Table A11–28.

Provincial and territorial GHG emissions allocated to Canadian economic sectors are provided in Annex 12 of this report.

Although the Modalities, procedures, and guidelines (MPGs) only require reporting national-level information, provincial and territorial information is important, owing to differences in regional emission levels and trends. Note that provincial and territorial emission estimates may not necessarily sum to the national totals due to rounding.

Several Canadian 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 emission inventory consistent with IPCC guidelines and international obligations, provincial governments may elect to develop an inventory structure in accordance with specific provincial needs. Environment and Climate Change Canada encourages collaboration with provinces and territories for quality assurance and continuous improvement of this annual National Inventory Report.

Provincial and territorial GHG emission tables are also available in electronic file format online at https://open.canada.ca.

Table A11–1 **GHG Source and Sink Category Description**

GHG Source and Sink Categories	
ENERGY	
a. Stationary Combustion Sources	
Public Electricity and Heat Production	Emissions from fuel consumed by utility electricity generation and steam production (for sale).
Petroleum Refining Industries	Emissions from fuel consumed by petroleum refining industries.
Oil and Gas Extraction	Emissions from fuel consumed by oil and gas extraction industries.
Mining	Emissions from fuel consumed by: – metal and non-metal mines, coal mines, stone quarries, and gravel pits – mineral exploration and contract drilling operations
Manufacturing Industries	Emissions from fuel consumed by the following industries: – iron and steel (steel foundries, casting and rolling mills) – non-ferrous metals (aluminium, magnesium and other production) – chemical (fertilizer manufacturing, organic and inorganic chemical manufacturing) – pulp and paper (primarily pulp, paper, and paper product manufacturers) – cement and other non-metallic mineral production – other manufacturing industries not listed (such as automobile manufacturing, textiles, food and beverage industries)
Construction	Emissions from fuels consumed by the construction industry (buildings, highways etc.)
Commercial and Institutional	Emissions from fuel consumed by: – service industries related to mining, communication, wholesale and retail trade, finance and insurance, real estate, education, etc.) – federal, provincial and municipal establishments – national Defence and Canadian Coast Guard – train stations, airports and warehouses
Residential	Emissions from fuel consumed for personal residences (homes, apartment hotels, condominiums and farm houses).
Agriculture and Forestry	Emissions from fuel consumed by: – forestry and logging service industry – agricultural, hunting and trapping industry (excluding food processing, farm machinery manufacturing and repair)
b. Transport	Emissions resulting from the:
Aviation	– consumption of fossil fuels by civilian aircraft flying domestically and all military aircraft operations with Canadian purchased fuel
Domestic Aviation (Civil)	– consumption of fossil fuels by civilian aircraft flying domestically with Canadian purchased fuel
Military	– consumption of fossil fuels by military aircraft operations with Canadian purchased fuel
Road Transportation	– consumption of fuels (excluding the biogenic CO_2 emissions from ethanol and biodiesel) by vehicles licensed to operate on roads
Light-Duty Gasoline Vehicles	– consumption of motor gasoline (excluding the biogenic CO_2 emissions from ethanol) by passenger cars
Light-Duty Gasoline Trucks	– consumption of motor gasoline (excluding the biogenic CO_2 emissions from ethanol) by trucks, vans and SUVs with a Gross Vehicle Weight Rating (GVWR) less than 3856 kg
Heavy-Duty Gasoline Vehicles	– consumption of motor gasoline (excluding the biogenic CO_2 emissions from ethanol) by trucks, vans and SUVs with a GVWR greater than or equal to 3856 kg
Motorcycles	– consumption of motor gasoline (excluding the biogenic CO_2 emissions from ethanol) by motorcycles that are licensed to operate on roads
Light-Duty Diesel Vehicles	– consumption of diesel fuel oil (excluding the biogenic CO_2 emissions from biodiesel) by passenger cars licensed to operate on roads
Light-Duty Diesel Trucks	– consumption of diesel fuel oil (excluding the biogenic CO_2 emissions from biodiesel) by trucks, vans and SUVs with a GVWR less than 3856 kg
Heavy-Duty Diesel Vehicles	– consumption of diesel fuel oil (excluding the biogenic CO_2 emissions from biodiesel) by trucks, vans and SUVs with a GVWR greater than or equal to 3856 kg
Propane and Natural Gas Vehicles	– consumption of propane and natural gas by vehicles that are licensed to operate on roads

Table A11–1 **GHG Source and Sink Category Description** (cont'd)

GHG Source and Sink Categories	
ENERGY (cont'd)	
Railways	– consumption of fuels (excluding the biogenic CO_2 emissions from ethanol and biodiesel) by Canadian railways
Marine	– consumption of fuels (excluding the biogenic CO_2 emissions from ethanol and biodiesel) by marine vessels navigating between Canadian ports (inclusive of all fishing and military operations)
Domestic Navigation	– consumption of fuels (excluding the biogenic CO_2 emissions from ethanol and biodiesel) by marine vessels navigating between Canadian ports
Fishing	– consumption of fuels (excluding the biogenic CO_2 emissions from ethanol and biodiesel) by fishing vessels operating in Canadian waters
Military Water-Borne Navigation	– consumption of fuels (excluding the biogenic CO_2 emissions from ethanol and biodiesel) by military vessels operating in Canadian waters
Others – Off-Road	– consumption of fuels (excluding the biogenic CO_2 emissions from ethanol and biodiesel) by mobile combustion devices not licensed to operate on roads
Others – Pipeline Transport	– transportation and distribution of crude oil, natural gas and other products
c. Fugitive Sources	Intentional and unintentional releases of greenhouse gases from the following activities:
Coal Mining	– underground and surface mining, abandoned underground coal mines
Oil and Natural Gas	– conventional and unconventional oil and gas exploration, production, transportation and distribution
Oil	– unintentional releases of greenhouse gases from the production, processing, transmission, storage and delivery of crude oil
Natural Gas	– unintentional releases of greenhouse gases from the production, processing, transmission, storage and delivery of natural gas (includes post-meter fugitive emissions from residential and commercial natural gas appliances, natural gas vehicles and industrial facilities)
Venting	– intentional releases of greenhouse gases at oil and natural gas facilities
Flaring	– routine or emergency disposal of waste gas through combustion in an open flame or incinerator at oil and natural gas facilities
d. CO_2 Transport and Storage	Intentional and unintentional releases of greenhouse gases from the transport and storage of carbon dioxide
INDUSTRIAL PROCESSES AND PRODUCT USE	**Emissions resulting from the following process activities:**
a. Mineral Products	– cement production, lime production, and mineral product use (which includes glass production, other uses of soda ash, magnesite use, and other limestone and dolomite use)
b. Chemical Industry	– production of ammonia, nitric acid, adipic acid, carbide and petrochemicals (petrochemical production includes production of carbon black, ethylene, ethylene dichloride, ethylene oxide, methanol, styrene and other uses of urea)
c. Metal Production	– aluminum production, iron and steel production, and magnesium production and casting
d. Production and Consumption of Halocarbons, SF_6 and NF_3	– by-product production of HFC-23; use of HFCs and/or PFCs in air conditioning units, refrigeration units, fire extinguishers, aerosol cans, solvents, foam blowing, semiconductor manufacturing and electronics industry, and use of SF_6 and NF_3 in semiconductor manufacturing
e. Non-Energy Products from Fuels and Solvent Use	– non-energy use of fossil fuels (including solvents and lubricants) that are not accounted for elsewhere under the Industrial Processes and Product Use Sector and the use of urea in selective catalytic reduction (SCR) equipped vehicles
f. Other Product Manufacture and Use	– use of N_2O as an anaesthetic and propellant; use of SF_6 in electrical equipment; and PFCs in other contained product uses as a dielectric coolant or as an electric insulator
AGRICULTURE	**Emissions resulting from:**
a. Enteric Fermentation	– eructation of CH_4 during the digestion of plant material by (mainly) ruminants
b. Manure Management	– release of CH_4 and N_2O due to microbial activity during the storage of feces, urine and bedding materials from the cleaning of barns and pens
	– indirect N_2O emissions from volatilization and leaching of nitrogen from animal manure during storage
c. Agricultural Soils	
Direct sources	– direct N_2O emissions from inorganic nitrogen fertilizers, manure and biosolids applied on cropland, pasture range and paddock, crop residue, loss of soil organic carbon, tillage, irrigation and cultivation of organic soils
Indirect Sources	– indirect N_2O emissions from volatilization and leaching of animal manure and biosolid nitrogen, inorganic nitrogen fertilizer and crop residue nitrogen
d. Field Burning of Agricultural Residues	– CH_4 and N_2O emissions from crop residue burning
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	– direct emissions of CO_2 from the application of lime, urea and other fertilizers containing carbon
WASTE	**Emissions resulting from:**
a. Solid Waste Disposal (Landfills)	– municipal solid waste management sites (landfills)
b. Biological Treatment of Solid Waste	– composting and anaerobic digestion of municipal solid waste
c. Wastewater Treatment and Discharge	– municipal and industrial wastewater treatment
d. Incineration and Open Burning of Waste	– municipal solid, hazardous and clinical waste, and sewage sludge incineration
e. Industrial Wood Waste Landfills	– private, dedicated wood waste landfills
LAND USE, LAND-USE CHANGE AND FORESTRY	**Emissions and removals resulting from:**
a. Forest Land	– managed forests and lands converted to forests; reports emissions and removals from forest growth and anthropogenic disturbances related to forest management but tracks separately emissions and removals from fire and most insect disturbances
b. Cropland	– management practices on lands in annual and perennial crops (forage, specialty crops, orchards); soil organic carbon (SOC) impacted by crop productivity changes and manure application; immediate and residual emissions from lands converted to cropland
c. Grassland	– managed agricultural grassland
d. Wetlands	– peatlands disturbed for peat extraction, or land flooded from hydro reservoir development
e. Settlements	– forest and grassland converted to built-up land (settlements, transport infrastructure, oil & gas infrastructure, mining, etc); urban tree growth
f. Harvested Wood Products	– use and disposal of harvested wood products manufactured from wood coming from forest harvest, forest conversion and firewood collection activities in Canada

Table A11–2 **GHG Emission Summary for Newfoundland and Labrador, Selected Years**

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	kt CO_2 eq							
TOTAL[a]	**9 470**	**10 300**	**10 900**	**10 600**	**11 100**	**8 880**	**8 430**	**8 610**
ENERGY	**8 720**	**9 430**	**9 940**	**9 680**	**10 200**	**7 940**	**7 520**	**7 700**
a. Stationary Combustion Sources	**5 450**	**4 600**	**4 850**	**4 560**	**4 880**	**3 690**	**3 200**	**3 260**
Public Electricity and Heat Production	1 640	822	1 530	1 130	1 140	951	646	685
Petroleum Refining Industries	1 030	900	889	848	931	162	37	27
Oil and Gas Extraction	-	713	941	1 030	1 120	1 060	984	998
Mining	1 160	1 130	458	698	849	722	864	822
Manufacturing Industries	506	276	82	82	50	81	73	92
Construction	33	24	6	7	6	6	5	9
Commercial and Institutional	320	358	487	316	352	312	282	340
Residential	736	363	450	445	427	388	306	278
Agriculture and Forestry	25	8	9	7	9	9	6	11
b. Transport[b]	**3 230**	**3 950**	**4 450**	**4 330**	**4 600**	**3 770**	**3 980**	**4 180**
Aviation	238	339	280	289	281	153	175	247
Road Transportation	1 500	1 760	2 550	2 390	2 330	2 050	2 050	2 080
Light-Duty Gasoline Vehicles	620	577	647	559	508	451	437	414
Light-Duty Gasoline Trucks	546	638	1 280	1 160	1 110	1 060	1 130	1 190
Heavy-Duty Gasoline Vehicles	167	69	100	89	84	83	76	78
Motorcycles	3	6	25	22	21	17	15	15
Light-Duty Diesel Vehicles	1	3	4	4	3	2	2	1
Light-Duty Diesel Trucks	3	7	8	10	12	9	11	11
Heavy-Duty Diesel Vehicles	155	459	484	553	587	429	379	371
Propane and Natural Gas Vehicles	0.83	-	0.01	0.01	0.01	0.00	0.00	0.00
Railways	53	41	45	43	57	52	53	53
Marine	758	929	580	563	888	811	939	1 040
Other Transportation	681	882	1 000	1 040	1 050	701	761	760
Off-Road Agriculture and Forestry	96	68	72	81	83	52	58	59
Off-Road Commercial and Institutional	50	45	66	68	70	47	57	56
Off-Road Manufacturing, Mining and Construction	451	593	662	711	718	449	498	500
Off-Road Residential	6	25	27	25	24	23	19	20
Off-Road Other Transportation	77	151	173	158	152	130	129	126
Pipeline Transport	-	-	-	-	-	-	-	-
c. Fugitive Sources	**42**	**880**	**640**	**780**	**700**	**470**	**340**	**260**
Coal Mining	-	-	-	-	-	-	-	-
Oil and Natural Gas	42	881	644	785	702	474	340	259
Oil	6	14	12	13	13	8	6	6
Natural Gas	0.00	0.04	0.07	0.15	0.16	0.05	0.05	0.04
Venting	25	95	90	87	99	53	36	32
Flaring	11	772	542	685	590	413	298	221
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**98**	**154**	**233**	**243**	**220**	**237**	**228**	**208**
a. Mineral Products	**65**	**2**	**0.97**	**0.92**	**0.83**	**0.93**	**1**	**1**
Cement Production	61	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-
Mineral Products Use	4	2	0.97	0.92	0.83	0.93	1	1
b. Chemical Industry[c]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[d]	**-**	**80**	**170**	**180**	**180**	**180**	**170**	**170**
e. Non-Energy Products from Fuels and Solvent Use[c]	**29**	**67**	**57**	**56**	**28**	**42**	**44**	**28**
f. Other Product Manufacture and Use	**4**	**6**	**8**	**9**	**8**	**10**	**10**	**10**
AGRICULTURE	**50**	**63**	**81**	**81**	**81**	**81**	**79**	**78**
a. Enteric Fermentation	**26**	**35**	**35**	**35**	**36**	**36**	**35**	**34**
b. Manure Management	**17**	**20**	**26**	**26**	**26**	**26**	**25**	**25**
c. Agricultural Soils	**6**	**8**	**8**	**8**	**8**	**8**	**7**	**7**
Direct Sources	3	5	5	5	5	5	4	4
Indirect Sources	2	3	3	3	3	3	3	3
d. Field Burning of Agricultural Residues	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**3**	**-**	**12**	**11**	**11**	**11**	**11**	**11**
WASTE	**600**	**630**	**610**	**610**	**610**	**620**	**610**	**620**
a. Solid Waste Disposal (Landfills)	**500**	**600**	**600**	**600**	**600**	**600**	**600**	**600**
b. Biological Treatment of Solid Waste	**-**	**0.01**	**0.02**	**0.10**	**0.10**	**0.10**	**0.30**	**0.30**
c. Wastewater Treatment and Discharge	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**
d. Incineration and Open Burning of Waste	**26**	**13**	**0.15**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**
e. Industrial Wood Waste Landfills	**20**	**20**	**10**	**10**	**10**	**10**	**10**	**10**
LAND USE, LAND-USE CHANGE AND FORESTRY	**4 200**	**22**	**-380**	**300**	**180**	**210**	**94**	**-13**
a. Forest Land	**2 600**	**-1 500**	**-1 900**	**-1 300**	**-1 400**	**-1 300**	**-1 400**	**-1 400**
b. Cropland	**17**	**28**	**27**	**27**	**28**	**27**	**26**	**26**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**32**	**20**	**30**	**28**	**96**	**81**	**74**	**68**
e. Settlements	**85**	**65**	**260**	**240**	**230**	**220**	**210**	**200**
f. Harvested Wood Products[e]	**1 500**	**1 400**	**1 200**	**1 300**	**1 200**	**1 200**	**1 100**	**1 100**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

c. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

d. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990−1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

e. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–3 **2022 GHG Emission Summary for Newfoundland and Labrador**

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[a]	PFCs[a]	SF_6	NF_3	TOTAL
Global Warming Potential			28		265			23 500	16 100	
Unit	kt	kt	kt CO_2 eq	kt	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq
TOTAL[b]	**7 550**	**28**	**790**	**0.36**	**94**	**170**	**0.08**	**3**	**-**	**8 610**
ENERGY	**7 510**	**5**	**140**	**0.20**	**60**	**-**	**-**	**-**	**-**	**7 700**
a. Stationary Combustion Sources	**3 180**	**2**	**60**	**0.08**	**20**	**-**	**-**	**-**	**-**	**3 260**
Public Electricity and Heat Production	681	0.01	0.27	0.01	4	-	-	-	-	685
Petroleum Refining Industries	26	0.00	0.01	0.00	0.50	-	-	-	-	27
Oil and Gas Extraction	985	0.20	6	0.03	7	-	-	-	-	998
Mining	819	0.02	0.50	0.01	3	-	-	-	-	822
Manufacturing Industries	91	0.00	0.02	0.00	0.38	-	-	-	-	92
Construction	9	0.00	0.00	0.00	0.03	-	-	-	-	9
Commercial and Institutional	338	0.00	0.10	0.01	1	-	-	-	-	340
Residential	223	2	50	0.02	6	-	-	-	-	278
Agriculture and Forestry	11	0.00	0.00	0.00	0.03	-	-	-	-	11
b. Transport[c]	**4 130**	**0.57**	**16**	**0.14**	**38**	**-**	**-**	**-**	**-**	**4 180**
Aviation	245	0.00	0.09	0.01	2	-	-	-	-	247
Road Transportation	2 070	0.10	3	0.05	13	-	-	-	-	2 080
Light-Duty Gasoline Vehicles	412	0.02	0.70	0.01	1	-	-	-	-	414
Light-Duty Gasoline Trucks	1 180	0.07	2	0.01	4	-	-	-	-	1 190
Heavy-Duty Gasoline Vehicles	76	0.00	0.07	0.01	2	-	-	-	-	78
Motorcycles	15	0.01	0.10	0.00	0.07	-	-	-	-	15
Light-Duty Diesel Vehicles	1	0.00	0.00	0.00	0.03	-	-	-	-	1
Light-Duty Diesel Trucks	11	0.00	0.01	0.00	0.24	-	-	-	-	11
Heavy-Duty Diesel Vehicles	365	0.02	0.40	0.02	5	-	-	-	-	371
Propane and Natural Gas Vehicles	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00
Railways	48	0.00	0.07	0.02	5	-	-	-	-	53
Marine	1 030	0.10	3	0.03	7	-	-	-	-	1 040
Other Transportation	739	0.36	10	0.04	10	-	-	-	-	760
Off-Road Agriculture and Forestry	58	0.00	0.06	0.01	1	-	-	-	-	59
Off-Road Commercial and Institutional	54	0.03	0.81	0.00	0.60	-	-	-	-	56
Off-Road Manufacturing, Mining and Construction	491	0.03	0.77	0.03	8	-	-	-	-	500
Off-Road Residential	18	0.05	1	0.00	0.10	-	-	-	-	20
Off-Road Other Transportation	118	0.25	7	0.00	0.80	-	-	-	-	126
Pipeline Transport	-	-	-	-	-	-	-	-	-	-
c. Fugitive Sources	**190**	**2**	**65**	**0.00**	**0.10**	**-**	**-**	**-**	**-**	**260**
Coal Mining	-	-	-	-	-	-	-	-	-	-
Oil and Natural Gas	190	2	65	0.00	0.10	-	-	-	-	259
Oil	0.03	0.20	6	-	-	-	-	-	-	6
Natural Gas	0.00	0.00	0.04	-	-	-	-	-	-	0.04
Venting	0.11	1	32	-	-	-	-	-	-	32
Flaring	194	0.96	27	0.00	0.10	-	-	-	-	221
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**29**	**-**	**-**	**0.03**	**7**	**170**	**0.08**	**3**	**-**	**208**
a. Mineral Products	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**
Cement Production	-	-	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-	-	-
Mineral Products Use	1	-	-	-	-	-	-	-	-	1
b. Chemical Industry[d]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[e]	**-**	**-**	**-**	**-**	**-**	**170**	**0.07**	**-**	**-**	**170**
e. Non-Energy Products from Fuels and Solvent Use[d]	**28**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**28**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.03**	**7**	**-**	**0.01**	**3**	**-**	**10**
AGRICULTURE	**11**	**2**	**47**	**0.08**	**20**	**-**	**-**	**-**	**-**	**78**
a. Enteric Fermentation	**-**	**1**	**34**	**-**	**-**	**-**	**-**	**-**	**-**	**34**
b. Manure Management	**-**	**0.46**	**13**	**0.05**	**10**	**-**	**-**	**-**	**-**	**25**
c. Agricultural Soils	**-**	**-**	**-**	**0.03**	**7**	**-**	**-**	**-**	**-**	**7**
Direct Sources	-	-	-	0.02	4	-	-	-	-	4
Indirect Sources	-	-	-	0.01	3	-	-	-	-	3
d. Field Burning of Agricultural Residues	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**11**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**11**
WASTE	**0.10**	**22**	**610**	**0.03**	**9**	**-**	**-**	**-**	**-**	**620**
a. Solid Waste Disposal (Landfills)	**-**	**20**	**600**	**-**	**-**	**-**	**-**	**-**	**-**	**600**
b. Biological Treatment of Solid Waste	**-**	**0.01**	**0.10**	**0.00**	**0.20**	**-**	**-**	**-**	**-**	**0.30**
c. Wastewater Treatment and Discharge	**-**	**0.70**	**20**	**0.03**	**8**	**-**	**-**	**-**	**-**	**30**
d. Incineration and Open Burning of Waste	**0.03**	**0.00**	**0.00**	**0.00**	**0.00**	**-**	**-**	**-**	**-**	**0.03**
e. Industrial Wood Waste Landfills	**-**	**0.40**	**10**	**-**	**-**	**-**	**-**	**-**	**-**	**10**
LAND USE, LAND-USE CHANGE AND FORESTRY	**-19**	**0.20**	**6**	**0.00**	**1**	**-**	**-**	**-**	**-**	**-13**
a. Forest Land	**-1400**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-1400**
b. Cropland	**26**	**0.01**	**0.25**	**0.00**	**0.05**	**-**	**-**	**-**	**-**	**26**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**67**	**0.00**	**0.08**	**0.00**	**0.01**	**-**	**-**	**-**	**-**	**68**
e. Settlements	**200**	**0.19**	**5**	**0.00**	**1**	**-**	**-**	**-**	**-**	**200**
f. Harvested Wood Products[f]	**1 100**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1 100**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Chapter 1, Table 1-1 of this report provides a list of global warming potentials (GWPs) used.

c. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

d. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

e. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

f. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.

Table A11–4 GHG Emission Summary for Prince Edward Island, Selected Years

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	kt CO_2 eq							
TOTAL[a]	**1 780**	**1 890**	**1 610**	**1 580**	**1 620**	**1 580**	**1 630**	**1 600**
ENERGY	**1 400**	**1 440**	**1 210**	**1 170**	**1 190**	**1 150**	**1 170**	**1 170**
a. Stationary Combustion Sources	**757**	**644**	**374**	**347**	**374**	**429**	**410**	**404**
Public Electricity and Heat Production	104	6	9	3	1	0.28	2	1
Petroleum Refining Industries	-	-	-	-	-	-	-	-
Oil and Gas Extraction	-	-	-	-	-	-	-	-
Mining	0.89	x	x	x	x	x	x	x
Manufacturing Industries	55	145	75	60	82	144	138	122
Construction	11	x	x	x	x	x	x	x
Commercial and Institutional	202	152	57	61	55	65	65	72
Residential	366	308	221	210	220	204	186	193
Agriculture and Forestry	19	24	11	12	13	12	16	14
b. Transport[b]	**645**	**796**	**835**	**820**	**815**	**716**	**756**	**763**
Aviation	17	13	22	24	25	9	11	26
Road Transportation	416	571	600	586	580	526	561	546
Light-Duty Gasoline Vehicles	217	235	201	186	182	159	163	151
Light-Duty Gasoline Trucks	132	236	270	265	274	257	288	295
Heavy-Duty Gasoline Vehicles	43	27	23	21	21	21	19	19
Motorcycles	0.78	2	7	6	6	4	4	4
Light-Duty Diesel Vehicles	0.29	0.91	1	1	1	0.70	0.79	0.58
Light-Duty Diesel Trucks	0.43	1	0.91	1	1	1	2	1
Heavy-Duty Diesel Vehicles	22	69	97	107	96	84	84	75
Propane and Natural Gas Vehicles	0.71	-	-	-	-	-	-	-
Railways	-	-	-	-	-	-	-	-
Marine	33	47	53	58	55	22	30	44
Other Transportation	180	164	161	152	154	159	154	148
Off-Road Agriculture and Forestry	53	45	52	55	56	60	59	56
Off-Road Commercial and Institutional	35	15	14	14	15	16	17	16
Off-Road Manufacturing, Mining and Construction	63	53	44	46	47	49	48	44
Off-Road Residential	2	9	9	6	6	6	5	5
Off-Road Other Transportation	27	42	41	30	30	29	26	27
Pipeline Transport	-	-	-	-	-	-	-	-
c. Fugitive Sources	**0.00**	**0.00**	**0.35**	**0.22**	**0.32**	**0.61**	**0.65**	**0.52**
Coal Mining	-	-	-	-	-	-	-	-
Oil and Natural Gas	0.00	0.00	0.35	0.22	0.32	0.61	0.65	0.52
Oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Natural Gas	-	-	0.35	0.22	0.32	0.61	0.65	0.52
Venting	-	-	-	-	-	-	-	-
Flaring	-	-	-	-	-	-	-	-
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**6**	**26**	**51**	**55**	**55**	**54**	**52**	**52**
a. Mineral Products	**0.34**	**0.65**	**0.37**	**0.41**	**0.42**	**0.51**	**0.50**	**0.59**
Cement Production	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-
Mineral Products Use	0.34	0.65	0.37	0.41	0.42	0.51	0.50	0.59
b. Chemical Industry[c]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[d]	**-**	**23**	**48**	**52**	**52**	**51**	**49**	**48**
e. Non-Energy Products from Fuels and Solvent Use[c]	**5**	**2**	**0.66**	**0.60**	**0.50**	**1**	**1**	**2**
f. Other Product Manufacture and Use	**0.74**	**1**	**2**	**2**	**2**	**2**	**2**	**2**
AGRICULTURE	**300**	**330**	**270**	**290**	**290**	**300**	**310**	**320**
a. Enteric Fermentation	**160**	**150**	**120**	**120**	**130**	**120**	**120**	**120**
b. Manure Management	**47**	**51**	**39**	**38**	**39**	**38**	**38**	**37**
c. Agricultural Soils	**86**	**130**	**110**	**120**	**120**	**130**	**150**	**150**
Direct Sources	56	84	77	85	83	91	100	110
Indirect Sources	30	40	30	40	40	40	40	50
d. Field Burning of Agricultural Residues	**0.10**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**5**	**5**	**2**	**2**	**4**	**7**	**7**	**7**
WASTE	**73**	**88**	**73**	**71**	**89**	**86**	**100**	**67**
a. Solid Waste Disposal (Landfills)	**60**	**70**	**50**	**50**	**50**	**50**	**50**	**50**
b. Biological Treatment of Solid Waste	**-**	**3**	**7**	**6**	**6**	**6**	**6**	**6**
c. Wastewater Treatment and Discharge	**10**	**10**	**10**	**10**	**30**	**30**	**50**	**10**
d. Incineration and Open Burning of Waste	**0.02**	**0.09**	**0.10**	**0.10**	**0.10**	**0.11**	**0.11**	**0.11**
e. Industrial Wood Waste Landfills	**0.08**	**0.08**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**
LAND USE, LAND-USE CHANGE AND FORESTRY	**-570**	**-130**	**-540**	**-540**	**-510**	**-480**	**-490**	**-460**
a. Forest Land	**-900**	**-660**	**-870**	**-870**	**-850**	**-830**	**-820**	**-810**
b. Cropland	**45**	**56**	**53**	**44**	**38**	**53**	**40**	**56**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**3**	**29**	**31**	**29**	**27**	**28**	**30**	**34**
e. Settlements	**3**	**-4**	**-10**	**-10**	**-10**	**-10**	**-11**	**-11**
f. Harvested Wood Products[e]	**280**	**460**	**260**	**270**	**280**	**280**	**270**	**270**

Notes:
Totals may not add up due to rounding.
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Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

c. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

d. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990−1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

e. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–5 **2022 GHG Emission Summary for Prince Edward Island**

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[a]	PFCs[a]	SF_6	NF_3	TOTAL
Global Warming Potential			28		265			23 500	16 100	
Unit	kt	kt	kt CO_2 eq	kt	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq
TOTAL[b]	**1 150**	**8**	**210**	**0.72**	**190**	**48**	**0.05**	**0.05**	**-**	**1 600**
ENERGY	**1 140**	**0.63**	**18**	**0.04**	**9**	**-**	**-**	**-**	**-**	**1 170**
a. Stationary Combustion Sources	**387**	**0.50**	**10**	**0.01**	**3**	**-**	**-**	**-**	**-**	**404**
Public Electricity and Heat Production	1	0.00	0.00	0.00	0.00	-	-	-	-	1
Petroleum Refining Industries	-	-	-	-	-	-	-	-	-	-
Oil and Gas Extraction	-	-	-	-	-	-	-	-	-	-
Mining	x	x	x	x	x	x	x	x	x	x
Manufacturing Industries	121	0.00	0.06	0.00	0.61	-	-	-	-	122
Construction	x	x	x	x	x	x	x	x	x	x
Commercial and Institutional	71	0.01	0.29	0.00	0.70	-	-	-	-	72
Residential	178	0.50	10	0.01	2	-	-	-	-	193
Agriculture and Forestry	13	0.00	0.00	0.00	0.05	-	-	-	-	14
b. Transport[c]	**754**	**0.13**	**4**	**0.02**	**6**	**-**	**-**	**-**	**-**	**763**
Aviation	25	0.00	0.02	0.00	0.20	-	-	-	-	26
Road Transportation	541	0.03	0.90	0.01	4	-	-	-	-	546
Light-Duty Gasoline Vehicles	150	0.01	0.30	0.00	0.73	-	-	-	-	151
Light-Duty Gasoline Trucks	293	0.02	0.50	0.01	1	-	-	-	-	295
Heavy-Duty Gasoline Vehicles	19	0.00	0.02	0.00	0.42	-	-	-	-	19
Motorcycles	4	0.00	0.04	0.00	0.02	-	-	-	-	4
Light-Duty Diesel Vehicles	0.57	0.00	0.00	0.00	0.01	-	-	-	-	0.58
Light-Duty Diesel Trucks	1	0.00	0.00	0.00	0.03	-	-	-	-	1
Heavy-Duty Diesel Vehicles	74	0.00	0.09	0.00	1	-	-	-	-	75
Propane and Natural Gas Vehicles	-	-	-	-	-	-	-	-	-	-
Railways	-	-	-	-	-	-	-	-	-	-
Marine	43	0.00	0.11	0.00	0.30	-	-	-	-	44
Other Transportation	144	0.09	3	0.01	2	-	-	-	-	148
Off-Road Agriculture and Forestry	55	0.00	0.05	0.00	0.80	-	-	-	-	56
Off-Road Commercial and Institutional	16	0.01	0.32	0.00	0.20	-	-	-	-	16
Off-Road Manufacturing, Mining and Construction	44	0.00	0.12	0.00	0.70	-	-	-	-	44
Off-Road Residential	5	0.01	0.35	0.00	0.03	-	-	-	-	5
Off-Road Other Transportation	25	0.06	2	0.00	0.20	-	-	-	-	27
Pipeline Transport	-	-	-	-	-	-	-	-	-	-
c. Fugitive Sources	**-**	**0.02**	**0.52**	**-**	**-**	**-**	**-**	**-**	**-**	**0.52**
Coal Mining	-	-	-	-	-	-	-	-	-	-
Oil and Natural Gas	-	0.02	0.52	-	-	-	-	-	-	0.52
Oil	-	0.00	0.00	-	-	-	-	-	-	0.00
Natural Gas	-	0.02	0.52	-	-	-	-	-	-	0.52
Venting	-	-	-	-	-	-	-	-	-	-
Flaring	-	-	-	-	-	-	-	-	-	-
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**2**	**-**	**-**	**0.01**	**2**	**48**	**0.05**	**0.05**	**-**	**52**
a. Mineral Products	**0.59**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.59**
Cement Production	-	-	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-	-	-
Mineral Products Use	0.59	-	-	-	-	-	-	-	-	0.59
b. Chemical Industry[d]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[e]	**-**	**-**	**-**	**-**	**-**	**48**	**0.02**	**-**	**-**	**48**
e. Non-Energy Products from Fuels and Solvent Use[d]	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.01**	**2**	**-**	**0.03**	**0.05**	**-**	**2**
AGRICULTURE	**7**	**5**	**140**	**0.65**	**170**	**-**	**-**	**-**	**-**	**320**
a. Enteric Fermentation	**-**	**4**	**120**	**-**	**-**	**-**	**-**	**-**	**-**	**120**
b. Manure Management	**-**	**0.71**	**20**	**0.06**	**20**	**-**	**-**	**-**	**-**	**37**
c. Agricultural Soils	**-**	**-**	**-**	**0.58**	**150**	**-**	**-**	**-**	**-**	**150**
Direct Sources	-	-	-	0.41	110	-	-	-	-	110
Indirect Sources	-	-	-	0.20	50	-	-	-	-	50
d. Field Burning of Agricultural Residues	**-**	**0.01**	**0.10**	**0.00**	**0.04**	**-**	**-**	**-**	**-**	**0.20**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**7**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7**
WASTE	**0.10**	**2**	**59**	**0.03**	**7**	**-**	**-**	**-**	**-**	**67**
a. Solid Waste Disposal (Landfills)	**-**	**2**	**50**	**-**	**-**	**-**	**-**	**-**	**-**	**50**
b. Biological Treatment of Solid Waste	**-**	**0.20**	**5**	**0.00**	**0.90**	**-**	**-**	**-**	**-**	**6**
c. Wastewater Treatment and Discharge	**-**	**0.20**	**7**	**0.02**	**6**	**-**	**-**	**-**	**-**	**10**
d. Incineration and Open Burning of Waste	**0.11**	**0.00**	**0.00**	**0.00**	**0.00**	**-**	**-**	**-**	**-**	**0.11**
e. Industrial Wood Waste Landfills	**-**	**0.00**	**0.05**	**-**	**-**	**-**	**-**	**-**	**-**	**0.05**
LAND USE, LAND-USE CHANGE AND FORESTRY	**-460**	**0.03**	**0.72**	**0.00**	**0.36**	**-**	**-**	**-**	**-**	**-460**
a. Forest Land	**-810**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-810**
b. Cropland	**55**	**0.02**	**0.46**	**0.00**	**0.28**	**-**	**-**	**-**	**-**	**56**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**34**	**0.01**	**0.23**	**0.00**	**0.07**	**-**	**-**	**-**	**-**	**34**
e. Settlements	**-11**	**0.00**	**0.03**	**0.00**	**0.01**	**-**	**-**	**-**	**-**	**-11**
f. Harvested Wood Products[f]	**270**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**270**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Chapter 1, Table 1-1 of this report provides a list of global warming potentials (GWPs) used.

c. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

d. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

e. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

f. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–6 **GHG Emission Summary for Nova Scotia, Selected Years**

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	kt CO_2 eq							
TOTAL[a]	**19 600**	**22 800**	**16 000**	**16 500**	**16 200**	**14 800**	**14 700**	**14 800**
ENERGY	**18 000**	**21 300**	**14 600**	**15 100**	**14 900**	**13 400**	**13 300**	**13 400**
a. Stationary Combustion Sources	**11 400**	**15 400**	**9 090**	**9 400**	**8 870**	**8 310**	**8 010**	**7 830**
Public Electricity and Heat Production	6 870	10 700	6 650	6 970	6 670	6 280	6 040	5 790
Petroleum Refining Industries	617	1 050	x	x	x	x	x	x
Oil and Gas Extraction	46	303	286	185	-	-	-	-
Mining	39	38	4	4	4	4	4	4
Manufacturing Industries	774	553	357	338	294	214	251	233
Construction	50	x	x	x	x	x	x	x
Commercial and Institutional	808	x	572	566	571	553	565	612
Residential	2 140	1 330	1 180	1 300	1 300	1 220	1 120	1 170
Agriculture and Forestry	104	96	32	33	27	25	23	26
b. Transport[b]	**4 750**	**5 660**	**5 390**	**5 580**	**5 810**	**4 920**	**5 260**	**5 490**
Aviation	299	277	278	302	295	127	137	253
Road Transportation	3 000	3 600	3 860	3 970	3 880	3 420	3 640	3 690
Light-Duty Gasoline Vehicles	1 390	1 330	1 190	1 180	1 110	954	963	936
Light-Duty Gasoline Trucks	856	1 230	1 600	1 670	1 680	1 490	1 660	1 750
Heavy-Duty Gasoline Vehicles	311	132	127	131	131	117	108	114
Motorcycles	8	12	28	29	33	25	20	22
Light-Duty Diesel Vehicles	11	36	30	21	20	18	23	18
Light-Duty Diesel Trucks	22	18	15	17	17	14	21	20
Heavy-Duty Diesel Vehicles	403	844	879	933	887	790	847	833
Propane and Natural Gas Vehicles	3	-	2	3	3	4	4	4
Railways	63	55	42	39	32	26	28	28
Marine	478	580	388	403	790	645	734	808
Other Transportation	902	1 150	821	860	807	710	719	708
Off-Road Agriculture and Forestry	187	153	98	106	96	85	91	88
Off-Road Commercial and Institutional	122	104	110	118	113	98	109	108
Off-Road Manufacturing, Mining and Construction	466	592	367	387	350	306	330	314
Off-Road Residential	14	43	x	x	41	37	28	30
Off-Road Other Transportation	113	223	205	208	206	182	159	167
Pipeline Transport	-	34	x	x	1	1	1	0.99
c. Fugitive Sources	**1 800**	**250**	**160**	**150**	**200**	**150**	**63**	**54**
Coal Mining	2 000	100	100	100	200	100	40	30
Oil and Natural Gas	51	138	49	38	22	23	23	23
Oil	8	5	0.00	0.00	0.00	0.00	0.00	0.00
Natural Gas	-	16	23	23	22	23	23	23
Venting	31	84	14	8	0.09	0.09	0.09	0.09
Flaring	13	32	12	7	-	-	-	-
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**332**	**487**	**453**	**477**	**447**	**478**	**466**	**468**
a. Mineral Products	**187**	**250**	**107**	**118**	**99**	**104**	**112**	**106**
Cement Production	183	246	x	x	x	x	x	x
Lime Production	-	-	-	-	-	-	-	-
Mineral Products Use	4	3	x	x	x	x	x	x
b. Chemical Industry[c]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[d]	**-**	**130**	**270**	**300**	**310**	**300**	**290**	**280**
e. Non-Energy Products from Fuels and Solvent Use[c]	**120**	**67**	**18**	**19**	**24**	**56**	**46**	**58**
f. Other Product Manufacture and Use	**29**	**40**	**52**	**38**	**19**	**17**	**19**	**19**
AGRICULTURE	**430**	**410**	**350**	**350**	**340**	**340**	**340**	**340**
a. Enteric Fermentation	**260**	**240**	**180**	**190**	**180**	**180**	**180**	**180**
b. Manure Management	**82**	**100**	**94**	**90**	**84**	**86**	**82**	**81**
c. Agricultural Soils	**54**	**54**	**56**	**57**	**57**	**60**	**61**	**63**
Direct Sources	30	31	36	37	37	40	41	43
Indirect Sources	20	20	20	20	20	20	20	20
d. Field Burning of Agricultural Residues	**0.06**	**0.20**	**0.06**	**0.06**	**0.06**	**0.10**	**-**	**-**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**38**	**13**	**12**	**12**	**14**	**16**	**16**	**17**
WASTE	**800**	**630**	**520**	**530**	**550**	**570**	**580**	**590**
a. Solid Waste Disposal (Landfills)	**700**	**500**	**400**	**400**	**400**	**500**	**500**	**500**
b. Biological Treatment of Solid Waste	**0.70**	**20**	**30**	**30**	**30**	**30**	**30**	**30**
c. Wastewater Treatment and Discharge	**50**	**60**	**60**	**70**	**70**	**70**	**70**	**70**
d. Incineration and Open Burning of Waste	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Industrial Wood Waste Landfills	**9**	**10**	**8**	**8**	**8**	**8**	**7**	**7**
LAND USE, LAND-USE CHANGE AND FORESTRY	**-3000**	**750**	**-460**	**-73**	**-620**	**-950**	**-1300**	**-1300**
a. Forest Land	**-5700**	**-3600**	**-4100**	**-3600**	**-3800**	**-4000**	**-4200**	**-4200**
b. Cropland	**120**	**71**	**99**	**89**	**100**	**110**	**110**	**120**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**5**	**22**	**7**	**6**	**6**	**6**	**8**	**7**
e. Settlements	**-33**	**-59**	**-62**	**-64**	**-63**	**-60**	**-60**	**-63**
f. Harvested Wood Products[e]	**2 600**	**4 300**	**3 600**	**3 500**	**3 200**	**3 000**	**2 800**	**2 800**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

c. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

d. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990−1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

e. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–7 **2022 GHG Emission Summary for Nova Scotia**

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[a]	PFCs[a]	SF_6	NF_3	TOTAL
Global Warming Potential			28		265			23 500	16 100	
Unit	kt	kt	kt CO_2 eq	kt	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq
TOTAL[b]	**13 300**	**34**	**950**	**0.89**	**240**	**280**	**0.65**	**6**	**-**	**14 800**
ENERGY	**13 100**	**6**	**170**	**0.30**	**90**	**-**	**-**	**-**	**-**	**13 400**
a. Stationary Combustion Sources	**7 700**	**3**	**90**	**0.20**	**40**	**-**	**-**	**-**	**-**	**7 830**
Public Electricity and Heat Production	5 760	0.29	8	0.08	20	-	-	-	-	5 790
Petroleum Refining Industries	x	x	x	x	x	x	x	x	x	x
Oil and Gas Extraction	-	-	-	-	-	-	-	-	-	-
Mining	4	0.00	0.00	0.00	0.04	-	-	-	-	4
Manufacturing Industries	229	0.02	0.42	0.01	4	-	-	-	-	233
Construction	x	x	x	x	x	x	x	x	x	x
Commercial and Institutional	607	0.01	0.28	0.02	4	-	-	-	-	612
Residential	1 070	3	80	0.04	10	-	-	-	-	1 170
Agriculture and Forestry	26	0.00	0.01	0.00	0.10	-	-	-	-	26
b. Transport[c]	**5 420**	**0.91**	**26**	**0.17**	**45**	**-**	**-**	**-**	**-**	**5 490**
Aviation	251	0.00	0.07	0.01	2	-	-	-	-	253
Road Transportation	3 660	0.20	6	0.10	26	-	-	-	-	3 690
Light-Duty Gasoline Vehicles	930	0.06	2	0.01	4	-	-	-	-	936
Light-Duty Gasoline Trucks	1 740	0.10	3	0.03	7	-	-	-	-	1 750
Heavy-Duty Gasoline Vehicles	112	0.00	0.10	0.01	3	-	-	-	-	114
Motorcycles	21	0.01	0.20	0.00	0.10	-	-	-	-	22
Light-Duty Diesel Vehicles	18	0.00	0.01	0.00	0.39	-	-	-	-	18
Light-Duty Diesel Trucks	20	0.00	0.01	0.00	0.43	-	-	-	-	20
Heavy-Duty Diesel Vehicles	819	0.03	0.90	0.05	12	-	-	-	-	833
Propane and Natural Gas Vehicles	4	0.02	0.50	0.00	0.03	-	-	-	-	4
Railways	25	0.00	0.04	0.01	3	-	-	-	-	28
Marine	800	0.08	2	0.02	6	-	-	-	-	808
Other Transportation	682	0.62	17	0.03	9	-	-	-	-	708
Off-Road Agriculture and Forestry	86	0.00	0.09	0.01	2	-	-	-	-	88
Off-Road Commercial and Institutional	104	0.12	3	0.00	1	-	-	-	-	108
Off-Road Manufacturing, Mining and Construction	308	0.03	0.86	0.02	5	-	-	-	-	314
Off-Road Residential	28	0.07	2	0.00	0.20	-	-	-	-	30
Off-Road Other Transportation	155	0.39	11	0.00	1	-	-	-	-	167
Pipeline Transport	0.96	0.00	0.03	0.00	0.01	-	-	-	-	0.99
c. Fugitive Sources	**0.00**	**2**	**54**	**-**	**-**	**-**	**-**	**-**	**-**	**54**
Coal Mining	-	1	30	-	-	-	-	-	-	30
Oil and Natural Gas	0.00	0.82	23	-	-	-	-	-	-	23
Oil	-	0.00	0.00	-	-	-	-	-	-	0.00
Natural Gas	0.00	0.81	23	-	-	-	-	-	-	23
Venting	0.00	0.00	0.09	-	-	-	-	-	-	0.09
Flaring	-	-	-	-	-	-	-	-	-	-
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**164**	**-**	**-**	**0.05**	**13**	**280**	**0.65**	**6**	**-**	**468**
a. Mineral Products	**106**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**106**
Cement Production	x	-	-	-	-	-	-	-	-	x
Lime Production	-	-	-	-	-	-	-	-	-	-
Mineral Products Use	x	-	-	-	-	-	-	-	-	x
b. Chemical Industry[d]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[e]	**-**	**-**	**-**	**-**	**-**	**280**	**0.13**	**-**	**-**	**280**
e. Non-Energy Products from Fuels and Solvent Use[d]	**58**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**58**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.05**	**13**	**-**	**0.50**	**6**	**-**	**19**
AGRICULTURE	**17**	**8**	**230**	**0.37**	**99**	**-**	**-**	**-**	**-**	**340**
a. Enteric Fermentation	**-**	**6**	**180**	**-**	**-**	**-**	**-**	**-**	**-**	**180**
b. Manure Management	**-**	**2**	**45**	**0.10**	**40**	**-**	**-**	**-**	**-**	**81**
c. Agricultural Soils	**-**	**-**	**-**	**0.24**	**63**	**-**	**-**	**-**	**-**	**63**
Direct Sources	-	-	-	0.16	43	-	-	-	-	43
Indirect Sources	-	-	-	0.08	20	-	-	-	-	20
d. Field Burning of Agricultural Residues	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**17**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**17**
WASTE	**-**	**20**	**550**	**0.10**	**40**	**-**	**-**	**-**	**-**	**590**
a. Solid Waste Disposal (Landfills)	**-**	**20**	**500**	**-**	**-**	**-**	**-**	**-**	**-**	**500**
b. Biological Treatment of Solid Waste	**-**	**0.60**	**20**	**0.06**	**20**	**-**	**-**	**-**	**-**	**30**
c. Wastewater Treatment and Discharge	**-**	**2**	**50**	**0.08**	**21**	**-**	**-**	**-**	**-**	**70**
d. Incineration and Open Burning of Waste	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Industrial Wood Waste Landfills	**-**	**0.30**	**7**	**-**	**-**	**-**	**-**	**-**	**-**	**7**
LAND USE, LAND-USE CHANGE AND FORESTRY	**-1300**	**0.09**	**2**	**0.00**	**1**	**-**	**-**	**-**	**-**	**-1300**
a. Forest Land	**-4200**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-4200**
b. Cropland	**120**	**0.03**	**0.74**	**0.00**	**0.40**	**-**	**-**	**-**	**-**	**120**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**7**	**0.01**	**0.16**	**0.00**	**0.05**	**-**	**-**	**-**	**-**	**7**
e. Settlements	**-65**	**0.05**	**2**	**0.00**	**0.59**	**-**	**-**	**-**	**-**	**-63**
f. Harvested Wood Products[f]	**2 800**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2 800**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Chapter 1, Table 1-1 of this report provides a list of global warming potentials (GWPs) used.

c. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

d. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

e. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

f. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–8 **GHG Emission Summary for New Brunswick, Selected Years**

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	kt CO_2 eq							
TOTAL[a]	**16 200**	**20 100**	**13 600**	**13 400**	**13 000**	**11 300**	**12 000**	**12 500**
ENERGY	**14 800**	**18 600**	**12 200**	**11 900**	**11 600**	**10 000**	**10 700**	**11 100**
a. Stationary Combustion Sources	**10 700**	**13 400**	**8 050**	**7 930**	**7 720**	**6 460**	**7 090**	**7 620**
Public Electricity and Heat Production	6 010	8 440	3 750	4 160	3 730	2 700	3 380	3 990
Petroleum Refining Industries	1 160	2 250	x	x	x	x	x	x
Oil and Gas Extraction	-	-	26	34	24	39	49	61
Mining	126	161	x	x	x	x	x	x
Manufacturing Industries	1 630	1 170	642	679	689	582	656	730
Construction	69	6	10	10	7	9	9	8
Commercial and Institutional	579	600	271	306	332	326	311	341
Residential	1 070	757	635	614	528	449	376	408
Agriculture and Forestry	53	33	36	34	32	28	36	40
b. Transport[b]	**4 010**	**4 910**	**3 920**	**3 840**	**3 710**	**3 350**	**3 360**	**3 280**
Aviation	137	127	108	116	118	61	64	95
Road Transportation	2 810	3 410	2 900	2 850	2 760	2 510	2 450	2 390
Light-Duty Gasoline Vehicles	1 220	1 030	833	796	750	628	593	557
Light-Duty Gasoline Trucks	807	1 040	1 250	1 260	1 260	1 140	1 170	1 220
Heavy-Duty Gasoline Vehicles	134	114	100	97	98	93	81	89
Motorcycles	5	15	27	27	27	21	17	18
Light-Duty Diesel Vehicles	9	31	8	6	5	5	5	3
Light-Duty Diesel Trucks	35	25	6	6	6	6	8	7
Heavy-Duty Diesel Vehicles	599	1 160	679	660	614	616	570	500
Propane and Natural Gas Vehicles	-	-	0.01	0.01	0.14	0.10	0.10	0.13
Railways	146	117	131	119	117	100	131	131
Marine	188	224	148	120	128	105	129	160
Other Transportation	724	1 030	630	632	593	574	593	501
Off-Road Agriculture and Forestry	273	241	127	133	121	113	128	104
Off-Road Commercial and Institutional	103	97	67	68	65	68	83	66
Off-Road Manufacturing, Mining and Construction	242	334	184	189	172	160	183	147
Off-Road Residential	10	x	28	x	26	25	19	20
Off-Road Other Transportation	97	326	214	204	194	189	166	157
Pipeline Transport	-	x	11	x	15	20	15	8
c. Fugitive Sources	**61**	**230**	**230**	**170**	**210**	**190**	**200**	**210**
Coal Mining	1	0.30	-	-	-	-	-	-
Oil and Natural Gas	60	226	225	173	210	188	202	211
Oil	9	19	17	14	15	16	16	15
Natural Gas	0.22	29	25	24	24	25	26	24
Venting	36	147	152	112	141	122	133	142
Flaring	15	31	32	23	30	25	27	30
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**186**	**251**	**502**	**515**	**344**	**353**	**344**	**352**
a. Mineral Products	**91**	**98**	**61**	**51**	**48**	**45**	**50**	**52**
Cement Production	-	-	-	-	-	-	-	-
Lime Production	80	89	x	x	x	x	x	x
Mineral Products Use	10	8	x	x	x	x	x	x
b. Chemical Industry[c]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[d]	**-**	**110**	**230**	**250**	**240**	**240**	**230**	**220**
e. Non-Energy Products from Fuels and Solvent Use[c]	**91**	**31**	**200**	**210**	**43**	**57**	**54**	**64**
f. Other Product Manufacture and Use	**5**	**8**	**10**	**11**	**10**	**11**	**11**	**13**
AGRICULTURE	**440**	**470**	**400**	**410**	**410**	**400**	**420**	**410**
a. Enteric Fermentation	**220**	**210**	**170**	**170**	**160**	**160**	**150**	**140**
b. Manure Management	**60**	**77**	**60**	**61**	**59**	**58**	**55**	**54**
c. Agricultural Soils	**91**	**140**	**120**	**130**	**130**	**130**	**160**	**160**
Direct Sources	64	100	92	99	100	100	130	130
Indirect Sources	30	40	30	30	30	30	30	40
d. Field Burning of Agricultural Residues	**0.02**	**0.03**	**0.03**	**0.02**	**0.02**	**0.01**	**0.04**	**0.04**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**68**	**55**	**52**	**49**	**51**	**54**	**54**	**54**
WASTE	**780**	**810**	**530**	**530**	**560**	**590**	**620**	**610**
a. Solid Waste Disposal (Landfills)	**700**	**700**	**400**	**400**	**400**	**400**	**400**	**400**
b. Biological Treatment of Solid Waste	**3**	**40**	**30**	**20**	**20**	**20**	**40**	**40**
c. Wastewater Treatment and Discharge	**70**	**70**	**80**	**80**	**100**	**100**	**100**	**100**
d. Incineration and Open Burning of Waste	**-**	**0.04**	**-**	**-**	**-**	**-**	**-**	**-**
e. Industrial Wood Waste Landfills	**40**	**50**	**40**	**40**	**40**	**40**	**40**	**30**
LAND USE, LAND-USE CHANGE AND FORESTRY	**9 500**	**7 500**	**2 300**	**1 500**	**620**	**1 400**	**790**	**470**
a. Forest Land	**4 800**	**-370**	**-6100**	**-6800**	**-7300**	**-7000**	**-7300**	**-7700**
b. Cropland	**43**	**86**	**130**	**110**	**160**	**150**	**190**	**120**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**310**	**610**	**760**	**560**	**570**	**630**	**580**	**690**
e. Settlements	**-39**	**21**	**-49**	**-53**	**-58**	**-63**	**-67**	**-68**
f. Harvested Wood Products[e]	**4 400**	**7 200**	**7 600**	**7 600**	**7 200**	**7 700**	**7 400**	**7 400**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

c. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

d. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990−1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

e. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–9 **2022 GHG Emission Summary for New Brunswick**

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[a]	PFCs[a]	SF_6	NF_3	TOTAL
Global Warming Potential			28		265			23 500	16 100	
Unit	kt	kt	kt CO_2 eq	kt	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq
TOTAL[b]	**11 100**	**31**	**860**	**1**	**340**	**220**	**0.13**	**2**	**-**	**12 500**
ENERGY	**10 900**	**4**	**120**	**0.40**	**100**	**-**	**-**	**-**	**-**	**11 100**
a. Stationary Combustion Sources	**7 490**	**2**	**70**	**0.20**	**60**	**-**	**-**	**-**	**-**	**7 620**
Public Electricity and Heat Production	3 970	0.20	6	0.06	20	-	-	-	-	3 990
Petroleum Refining Industries	x	x	x	x	x	x	x	x	x	x
Oil and Gas Extraction	60	0.00	0.03	0.00	1	-	-	-	-	61
Mining	x	x	x	x	x	x	x	x	x	x
Manufacturing Industries	696	0.18	5	0.11	28	-	-	-	-	730
Construction	8	0.00	0.00	0.00	0.02	-	-	-	-	8
Commercial and Institutional	339	0.01	0.15	0.01	2	-	-	-	-	341
Residential	344	2	60	0.03	7	-	-	-	-	408
Agriculture and Forestry	40	0.00	0.01	0.00	0.10	-	-	-	-	40
b. Transport[c]	**3 220**	**0.69**	**19**	**0.14**	**37**	**-**	**-**	**-**	**-**	**3 280**
Aviation	94	0.00	0.10	0.00	0.80	-	-	-	-	95
Road Transportation	2 370	0.10	4	0.06	17	-	-	-	-	2 390
Light-Duty Gasoline Vehicles	554	0.03	1	0.01	2	-	-	-	-	557
Light-Duty Gasoline Trucks	1 210	0.07	2	0.02	5	-	-	-	-	1 220
Heavy-Duty Gasoline Vehicles	87	0.00	0.08	0.01	2	-	-	-	-	89
Motorcycles	18	0.01	0.20	0.00	0.09	-	-	-	-	18
Light-Duty Diesel Vehicles	3	0.00	0.00	0.00	0.07	-	-	-	-	3
Light-Duty Diesel Trucks	7	0.00	0.01	0.00	0.15	-	-	-	-	7
Heavy-Duty Diesel Vehicles	492	0.02	0.60	0.03	7	-	-	-	-	500
Propane and Natural Gas Vehicles	0.13	0.00	0.00	0.00	0.00	-	-	-	-	0.13
Railways	119	0.01	0.20	0.05	10	-	-	-	-	131
Marine	159	0.02	0.42	0.00	1	-	-	-	-	160
Other Transportation	480	0.53	15	0.02	6	-	-	-	-	501
Off-Road Agriculture and Forestry	101	0.01	0.16	0.01	2	-	-	-	-	104
Off-Road Commercial and Institutional	64	0.07	2	0.00	0.60	-	-	-	-	66
Off-Road Manufacturing, Mining and Construction	144	0.02	0.64	0.01	2	-	-	-	-	147
Off-Road Residential	18	0.05	1	0.00	0.10	-	-	-	-	20
Off-Road Other Transportation	145	0.38	11	0.00	1	-	-	-	-	157
Pipeline Transport	7	0.01	0.20	0.00	0.05	-	-	-	-	8
c. Fugitive Sources	**170**	**1**	**35**	**0.01**	**4**	**-**	**-**	**-**	**-**	**210**
Coal Mining	-	-	-	-	-	-	-	-	-	-
Oil and Natural Gas	170	1	35	0.01	4	-	-	-	-	211
Oil	0.09	0.40	11	0.01	3	-	-	-	-	15
Natural Gas	0.01	0.86	24	-	-	-	-	-	-	24
Venting	140	0.01	0.18	-	-	-	-	-	-	142
Flaring	30	0.00	0.04	0.00	0.01	-	-	-	-	30
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**115**	**-**	**-**	**0.04**	**10**	**220**	**0.13**	**2**	**-**	**352**
a. Mineral Products	**52**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**52**
Cement Production	-	-	-	-	-	-	-	-	-	-
Lime Production	x	-	-	-	-	-	-	-	-	x
Mineral Products Use	x	-	-	-	-	-	-	-	-	x
b. Chemical Industry[d]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[e]	**-**	**-**	**-**	**-**	**-**	**220**	**0.11**	**-**	**-**	**220**
e. Non-Energy Products from Fuels and Solvent Use[d]	**64**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**64**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.04**	**10**	**-**	**0.02**	**2**	**-**	**13**
AGRICULTURE	**54**	**6**	**170**	**0.71**	**190**	**-**	**-**	**-**	**-**	**410**
a. Enteric Fermentation	**-**	**5**	**140**	**-**	**-**	**-**	**-**	**-**	**-**	**140**
b. Manure Management	**-**	**1**	**29**	**0.09**	**20**	**-**	**-**	**-**	**-**	**54**
c. Agricultural Soils	**-**	**-**	**-**	**0.62**	**160**	**-**	**-**	**-**	**-**	**160**
Direct Sources	-	-	-	0.49	130	-	-	-	-	130
Indirect Sources	-	-	-	0.10	40	-	-	-	-	40
d. Field Burning of Agricultural Residues	**-**	**0.00**	**0.03**	**0.00**	**0.01**	**-**	**-**	**-**	**-**	**0.04**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**54**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**54**
WASTE	**0.01**	**20**	**570**	**0.20**	**40**	**-**	**-**	**-**	**-**	**610**
a. Solid Waste Disposal (Landfills)	**-**	**20**	**400**	**-**	**-**	**-**	**-**	**-**	**-**	**400**
b. Biological Treatment of Solid Waste	**-**	**0.70**	**20**	**0.07**	**20**	**-**	**-**	**-**	**-**	**40**
c. Wastewater Treatment and Discharge	**0.01**	**3**	**90**	**0.08**	**21**	**-**	**-**	**-**	**-**	**100**
d. Incineration and Open Burning of Waste	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Industrial Wood Waste Landfills	**-**	**1**	**30**	**-**	**-**	**-**	**-**	**-**	**-**	**30**
LAND USE, LAND-USE CHANGE AND FORESTRY	**460**	**0.33**	**9**	**0.01**	**4**	**-**	**-**	**-**	**-**	**470**
a. Forest Land	**-7700**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-7700**
b. Cropland	**120**	**0.05**	**1**	**0.00**	**1**	**-**	**-**	**-**	**-**	**120**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**690**	**0.18**	**5**	**0.01**	**1**	**-**	**-**	**-**	**-**	**690**
e. Settlements	**-72**	**0.10**	**3**	**0.00**	**1**	**-**	**-**	**-**	**-**	**-68**
f. Harvested Wood Products[f]	**7 400**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7 400**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Chapter 1, Table 1-1 of this report provides a list of global warming potentials (GWPs) used.

c. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

d. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

e. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

f. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–10 GHG Emission Summary for Quebec, Selected Years

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	kt CO_2 eq							
TOTAL[a]	**84 400**	**85 600**	**79 500**	**80 700**	**82 100**	**74 300**	**77 400**	**79 100**
ENERGY	**58 400**	**60 400**	**56 600**	**57 700**	**59 100**	**50 900**	**53 900**	**55 600**
a. Stationary Combustion Sources	**30 600**	**26 700**	**20 900**	**22 000**	**22 800**	**20 100**	**20 600**	**20 800**
Public Electricity and Heat Production	1 490	616	239	242	238	291	251	233
Petroleum Refining Industries	3 460	3 640	1 530	2 040	1 890	1 890	1 880	1 900
Oil and Gas Extraction	-	-	-	-	-	-	-	-
Mining	824	318	825	1 480	1 560	1 370	1 520	1 400
Manufacturing Industries	12 500	10 100	9 000	9 050	9 740	8 350	8 580	8 750
Construction	458	311	367	401	412	400	409	421
Commercial and Institutional	4 400	5 410	5 160	4 850	4 950	4 300	4 580	4 700
Residential	7 150	5 860	3 300	3 440	3 540	3 060	2 980	3 090
Agriculture and Forestry	290	367	452	462	475	384	339	348
b. Transport[b]	**27 300**	**33 300**	**35 300**	**35 300**	**35 800**	**30 500**	**33 000**	**34 300**
Aviation	951	763	805	903	900	551	664	831
Road Transportation	20 800	24 800	26 800	26 400	26 500	22 200	24 200	25 600
Light-Duty Gasoline Vehicles	12 000	10 700	9 400	9 130	9 000	7 030	7 120	6 820
Light-Duty Gasoline Trucks	4 020	7 040	8 920	9 130	9 620	8 510	9 930	10 700
Heavy-Duty Gasoline Vehicles	569	765	732	723	744	747	740	791
Motorcycles	77	164	261	272	281	249	226	240
Light-Duty Diesel Vehicles	193	219	155	141	114	56	65	60
Light-Duty Diesel Trucks	322	190	106	110	111	79	113	131
Heavy-Duty Diesel Vehicles	3 610	5 770	7 190	6 870	6 570	5 550	5 970	6 770
Propane and Natural Gas Vehicles	6	0.26	11	11	19	20	24	25
Railways	631	587	395	509	516	502	435	435
Marine	700	943	840	836	802	661	727	763
Other Transportation	4 250	6 140	6 490	6 680	7 170	6 510	6 980	6 680
Off-Road Agriculture and Forestry	811	766	982	1 020	1 130	997	1 110	1 050
Off-Road Commercial and Institutional	820	1 010	1 260	1 310	1 430	1 290	1 430	1 370
Off-Road Manufacturing, Mining and Construction	1 980	2 490	2 810	2 890	3 140	2 750	3 030	2 850
Off-Road Residential	83	240	203	199	199	213	186	192
Off-Road Other Transportation	525	1 300	1 160	1 160	1 180	1 160	1 120	1 120
Pipeline Transport	26	335	82	98	103	100	105	89
c. Fugitive Sources	**540**	**470**	**430**	**410**	**450**	**380**	**390**	**440**
Coal Mining	-	-	-	-	-	-	-	-
Oil and Natural Gas	544	469	429	405	446	377	389	442
Oil	23	29	21	21	22	19	19	21
Natural Gas	380	156	148	149	152	146	147	149
Venting	100	236	220	200	230	181	191	231
Flaring	40	47	39	35	42	30	33	42
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**14 300**	**12 300**	**10 400**	**10 100**	**10 400**	**10 800**	**11 000**	**11 000**
a. Mineral Products	**1 940**	**2 080**	**2 150**	**2 090**	**2 540**	**2 290**	**2 490**	**2 290**
Cement Production	1 450	1 330	1 660	1 620	2 080	1 870	2 040	1 840
Lime Production	286	484	x	x	x	x	x	x
Mineral Products Use	200	270	x	x	x	x	x	x
b. Chemical Industry[c]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-
c. Metal Production	**10 400**	**7 250**	**5 180**	**4 700**	**4 510**	**5 130**	**5 280**	**5 310**
Iron and Steel Production	-	-	19	8	7	10	7	7
Aluminium Production	8 020	7 150	5 150	4 680	4 490	5 110	5 260	5 290
SF_6 Used in Magnesium Smelters and Casters	2 350	106	11	11	11	9	14	19
d. Production and Consumption of Halocarbons, SF_6 and NF_3[d]	**2**	**970**	**2 200**	**2 300**	**2 300**	**2 300**	**2 200**	**2 200**
e. Non-Energy Products from Fuels and Solvent Use[c]	**1 900**	**1 900**	**750**	**790**	**830**	**850**	**860**	**1 000**
f. Other Product Manufacture and Use	**76**	**110**	**120**	**170**	**150**	**180**	**190**	**190**
AGRICULTURE	**6 700**	**7 500**	**7 400**	**7 900**	**7 700**	**7 900**	**7 700**	**7 900**
a. Enteric Fermentation	**3 500**	**3 500**	**2 900**	**2 900**	**2 900**	**2 900**	**2 900**	**2 800**
b. Manure Management	**1 200**	**1 700**	**1 800**	**1 800**	**1 800**	**1 700**	**1 800**	**1 700**
c. Agricultural Soils	**1 800**	**2 100**	**2 500**	**3 000**	**2 800**	**3 000**	**2 900**	**3 100**
Direct Sources	1 400	1 700	2 100	2 500	2 300	2 500	2 400	2 600
Indirect Sources	400	400	400	500	500	500	500	500
d. Field Burning of Agricultural Residues	**0.30**	**0.30**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**220**	**160**	**190**	**240**	**220**	**230**	**210**	**230**
WASTE	**5 000**	**5 400**	**5 100**	**5 000**	**4 900**	**4 700**	**4 700**	**4 600**
a. Solid Waste Disposal (Landfills)	**4 000**	**5 000**	**4 000**	**4 000**	**4 000**	**4 000**	**4 000**	**4 000**
b. Biological Treatment of Solid Waste	**40**	**30**	**30**	**70**	**70**	**70**	**80**	**80**
c. Wastewater Treatment and Discharge	**300**	**300**	**400**	**400**	**400**	**400**	**400**	**400**
d. Incineration and Open Burning of Waste	**160**	**190**	**35**	**35**	**34**	**34**	**35**	**35**
e. Industrial Wood Waste Landfills	**200**	**300**	**200**	**200**	**200**	**200**	**200**	**200**
LAND USE, LAND-USE CHANGE AND FORESTRY	**17 000**	**15 000**	**10 000**	**11 000**	**11 000**	**15 000**	**12 000**	**12 000**
a. Forest Land	**-5900**	**-19000**	**-20000**	**-20000**	**-20000**	**-16000**	**-17000**	**-18000**
b. Cropland	**670**	**1 100**	**1 100**	**1 000**	**1 200**	**1 300**	**1 400**	**1 600**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**4 600**	**1 900**	**1 600**	**1 500**	**1 700**	**1 800**	**1 500**	**1 400**
e. Settlements	**280**	**120**	**-98**	**-110**	**-120**	**-140**	**-150**	**-160**
f. Harvested Wood Products[e]	**17 000**	**31 000**	**28 000**	**28 000**	**27 000**	**28 000**	**27 000**	**27 000**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

c. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

d. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990−1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

e. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–11 **2022 GHG Emission Summary for Quebec**

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[a]	PFCs[a]	SF_6	NF_3	TOTAL
Global Warming Potential			28		265			23 500	16 100	
Unit	kt	kt	kt CO_2 eq	kt	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq
TOTAL[b]	**62 100**	**350**	**9 700**	**17**	**4 500**	**2 200**	**584**	**110**	**0.60**	**79 100**
ENERGY	**53 800**	**42**	**1 200**	**2**	**600**	**-**	**-**	**-**	**-**	**55 600**
a. Stationary Combustion Sources	**19 800**	**30**	**800**	**0.90**	**200**	**-**	**-**	**-**	**-**	**20 800**
Public Electricity and Heat Production	232	0.01	0.14	0.00	0.90	-	-	-	-	233
Petroleum Refining Industries	1 890	0.04	1	0.02	5	-	-	-	-	1 900
Oil and Gas Extraction	-	-	-	-	-	-	-	-	-	-
Mining	1 400	0.03	0.90	0.02	5	-	-	-	-	1 400
Manufacturing Industries	8 630	0.63	18	0.36	96	-	-	-	-	8 750
Construction	419	0.01	0.22	0.01	2	-	-	-	-	421
Commercial and Institutional	4 670	0.18	5	0.10	30	-	-	-	-	4 700
Residential	2 220	30	800	0.40	100	-	-	-	-	3 090
Agriculture and Forestry	343	0.01	0.20	0.02	5	-	-	-	-	348
b. Transport[c]	**33 800**	**6**	**170**	**1**	**330**	**-**	**-**	**-**	**-**	**34 300**
Aviation	824	0.02	0.70	0.02	6	-	-	-	-	831
Road Transportation	25 400	1	40	0.72	190	-	-	-	-	25 600
Light-Duty Gasoline Vehicles	6 780	0.40	10	0.11	28	-	-	-	-	6 820
Light-Duty Gasoline Trucks	10 700	0.60	20	0.15	39	-	-	-	-	10 700
Heavy-Duty Gasoline Vehicles	772	0.02	0.70	0.07	18	-	-	-	-	791
Motorcycles	236	0.08	2	0.00	1	-	-	-	-	240
Light-Duty Diesel Vehicles	58	0.00	0.03	0.00	1	-	-	-	-	60
Light-Duty Diesel Trucks	128	0.00	0.09	0.01	3	-	-	-	-	131
Heavy-Duty Diesel Vehicles	6 660	0.30	8	0.38	100	-	-	-	-	6 770
Propane and Natural Gas Vehicles	23	0.06	2	0.00	0.16	-	-	-	-	25
Railways	393	0.02	0.60	0.20	40	-	-	-	-	435
Marine	755	0.07	2	0.02	5	-	-	-	-	763
Other Transportation	6 460	5	130	0.30	90	-	-	-	-	6 680
Off-Road Agriculture and Forestry	1 030	0.04	1	0.06	20	-	-	-	-	1 050
Off-Road Commercial and Institutional	1 320	1	34	0.05	10	-	-	-	-	1 370
Off-Road Manufacturing, Mining and Construction	2 790	0.34	9	0.20	50	-	-	-	-	2 850
Off-Road Residential	177	0.48	13	0.00	1	-	-	-	-	192
Off-Road Other Transportation	1 050	2	66	0.03	7	-	-	-	-	1 120
Pipeline Transport	86	0.09	2	0.00	0.60	-	-	-	-	89
c. Fugitive Sources	**240**	**7**	**195**	**0.02**	**5**	**-**	**-**	**-**	**-**	**440**
Coal Mining	-	-	-	-	-	-	-	-	-	-
Oil and Natural Gas	240	7	195	0.02	5	-	-	-	-	442
Oil	0.13	0.56	16	0.02	5	-	-	-	-	21
Natural Gas	0.04	5	149	-	-	-	-	-	-	149
Venting	200	1	30	-	-	-	-	-	-	231
Flaring	42	0.00	0.02	0.00	0.01	-	-	-	-	42
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**8 010**	**0.00**	**0.00**	**0.42**	**110**	**2 200**	**584**	**110**	**0.60**	**11 000**
a. Mineral Products	**2 290**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2 290**
Cement Production	1 840	-	-	-	-	-	-	-	-	1 840
Lime Production	x	-	-	-	-	-	-	-	-	x
Mineral Products Use	x	-	-	-	-	-	-	-	-	x
b. Chemical Industry[d]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**4 720**	**0.00**	**0.00**	**-**	**-**	**-**	**572**	**19**	**-**	**5 310**
Iron and Steel Production	7	0.00	0.00	-	-	-	-	-	-	7
Aluminium Production	4 710	-	-	-	-	-	572	0.41	-	5 290
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	19	-	19
d. Production and Consumption of Halocarbons, SF_6 and NF_3[e]	**-**	**-**	**-**	**-**	**-**	**2 200**	**6**	**15**	**0.60**	**2 200**
e. Non-Energy Products from Fuels and Solvent Use[d]	**1 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1 000**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.42**	**110**	**-**	**5**	**71**	**-**	**190**
AGRICULTURE	**230**	**150**	**4 100**	**13**	**3 500**	**-**	**-**	**-**	**-**	**7 900**
a. Enteric Fermentation	**-**	**100**	**2 800**	**-**	**-**	**-**	**-**	**-**	**-**	**2 800**
b. Manure Management	**-**	**48**	**1 300**	**2**	**400**	**-**	**-**	**-**	**-**	**1 700**
c. Agricultural Soils	**-**	**-**	**-**	**12**	**3 100**	**-**	**-**	**-**	**-**	**3 100**
Direct Sources	-	-	-	10	2 600	-	-	-	-	2 600
Indirect Sources	-	-	-	2	500	-	-	-	-	500
d. Field Burning of Agricultural Residues	**-**	**0.01**	**0.20**	**0.00**	**0.04**	**-**	**-**	**-**	**-**	**0.20**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**230**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**230**
WASTE	**10**	**160**	**4 400**	**0.90**	**200**	**-**	**-**	**-**	**-**	**4 600**
a. Solid Waste Disposal (Landfills)	**-**	**100**	**4 000**	**-**	**-**	**-**	**-**	**-**	**-**	**4 000**
b. Biological Treatment of Solid Waste	**-**	**2**	**40**	**0.10**	**40**	**-**	**-**	**-**	**-**	**80**
c. Wastewater Treatment and Discharge	**-**	**8**	**200**	**0.68**	**180**	**-**	**-**	**-**	**-**	**400**
d. Incineration and Open Burning of Waste	**8**	**0.00**	**0.03**	**0.10**	**30**	**-**	**-**	**-**	**-**	**35**
e. Industrial Wood Waste Landfills	**-**	**7**	**200**	**-**	**-**	**-**	**-**	**-**	**-**	**200**
LAND USE, LAND-USE CHANGE AND FORESTRY	**12 000**	**2**	**57**	**0.22**	**59**	**-**	**-**	**-**	**-**	**12 000**
a. Forest Land	**-18000**	**1**	**30**	**0.20**	**50**	**-**	**-**	**-**	**-**	**-18000**
b. Cropland	**1 600**	**0.19**	**5**	**0.02**	**5**	**-**	**-**	**-**	**-**	**1 600**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**1 400**	**0.19**	**5**	**0.00**	**1**	**-**	**-**	**-**	**-**	**1 400**
e. Settlements	**-180**	**0.55**	**15**	**0.01**	**4**	**-**	**-**	**-**	**-**	**-160**
f. Harvested Wood Products[f]	**27 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**27 000**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Chapter 1, Table 1-1 of this report provides a list of global warming potentials (GWPs) used.

c. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

d. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

e. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

f. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–12 GHG Emission Summary for Ontario, Selected Years

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	kt CO_2 eq							
TOTAL[a]	**178 000**	**203 000**	**158 000**	**164 000**	**165 000**	**149 000**	**151 000**	**157 000**
ENERGY	**132 000**	**161 000**	**119 000**	**125 000**	**126 000**	**111 000**	**112 000**	**118 000**
a. Stationary Combustion Sources	**82 200**	**94 400**	**57 800**	**61 300**	**62 500**	**58 300**	**57 500**	**59 900**
Public Electricity and Heat Production	25 600	33 900	2 600	4 160	3 970	4 320	4 620	5 140
Petroleum Refining Industries	6 230	6 890	3 440	3 860	4 310	4 230	4 560	4 700
Oil and Gas Extraction	100	167	36	58	84	34	83	99
Mining	493	417	549	491	510	529	539	579
Manufacturing Industries	21 900	18 600	16 500	16 300	16 100	14 800	15 700	16 000
Construction	571	632	307	291	305	306	366	399
Commercial and Institutional	9 170	12 700	15 800	16 600	17 000	15 400	13 200	13 700
Residential	17 400	20 100	17 200	18 100	18 600	17 200	16 800	17 400
Agriculture and Forestry	774	1 030	1 370	1 410	1 610	1 440	1 590	1 760
b. Transport[b]	**47 800**	**64 000**	**59 000**	**60 900**	**61 200**	**50 000**	**52 200**	**55 600**
Aviation	2 370	2 220	2 410	2 590	2 590	1 350	1 570	2 290
Road Transportation	34 000	47 100	44 000	45 300	45 800	37 300	38 800	40 900
Light-Duty Gasoline Vehicles	18 000	16 400	12 400	12 400	12 300	9 010	8 310	8 370
Light-Duty Gasoline Trucks	8 920	16 200	18 600	19 400	20 300	16 600	17 300	18 800
Heavy-Duty Gasoline Vehicles	1 330	1 650	1 430	1 460	1 500	1 340	1 480	1 370
Motorcycles	68	140	275	282	288	224	252	221
Light-Duty Diesel Vehicles	76	227	234	228	189	114	107	119
Light-Duty Diesel Trucks	142	162	164	185	194	156	173	231
Heavy-Duty Diesel Vehicles	5 310	12 300	10 800	11 300	11 100	9 810	11 100	11 700
Propane and Natural Gas Vehicles	101	7	23	25	29	34	37	41
Railways	2 180	2 140	1 940	1 770	1 720	1 540	1 530	1 530
Marine	207	269	265	249	263	273	300	303
Other Transportation	9 030	12 300	10 400	11 000	10 800	9 540	10 100	10 500
Off-Road Agriculture and Forestry	762	784	1 140	1 250	1 220	1 050	1 080	1 170
Off-Road Commercial and Institutional	1 290	1 500	1 540	1 690	1 700	1 540	1 660	1 750
Off-Road Manufacturing, Mining and Construction	3 620	3 900	4 420	4 610	4 460	3 860	3 980	4 230
Off-Road Residential	152	500	405	409	410	385	414	349
Off-Road Other Transportation	930	2 540	2 010	2 050	2 050	1 920	2 070	1 920
Pipeline Transport	2 280	3 040	929	1 020	948	783	848	1 110
c. Fugitive Sources	**2 300**	**2 600**	**2 600**	**2 600**	**2 700**	**2 600**	**2 700**	**2 800**
Coal Mining	-	-	-	-	-	-	-	-
Oil and Natural Gas	2 300	2 550	2 560	2 610	2 690	2 610	2 680	2 790
Oil	68	45	29	31	31	30	32	33
Natural Gas	1 710	1 920	1 990	2 040	2 070	2 050	2 090	2 130
Venting	364	489	477	483	521	470	502	553
Flaring	157	101	61	62	69	56	62	71
d. CO_2 Transport and Storage	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE	**29 300**	**24 700**	**23 000**	**23 600**	**22 900**	**20 700**	**21 700**	**21 600**
a. Mineral Products	**3 920**	**4 810**	**3 810**	**3 740**	**3 590**	**3 500**	**3 690**	**3 460**
Cement Production	2 440	3 700	3 020	2 950	2 830	2 870	2 970	2 720
Lime Production	1 100	804	x	x	x	x	x	x
Mineral Products Use	380	310	x	x	x	x	x	x
b. Chemical Industry[c]	**9 160**	**2 260**	-	-	-	-	-	-
Adipic Acid Production	9 160	2 260	-	-	-	-	-	-
c. Metal Production	**11 200**	**11 500**	**9 170**	**9 430**	**8 840**	**7 350**	**8 340**	**7 950**
Iron and Steel Production	10 500	10 300	9 050	9 290	8 550	7 260	8 210	7 800
Aluminium Production	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	708	1 160	125	137	293	96	130	148
d. Production and Consumption of Halocarbons, SF_6 and NF_3[d]	**820**	**1 900**	**4 000**	**4 400**	**4 400**	**4 300**	**4 100**	**4 000**
e. Non-Energy Products from Fuels and Solvent Use[c]	**4 100**	**4 100**	**5 800**	**5 800**	**5 900**	**5 300**	**5 400**	**6 000**
f. Other Product Manufacture and Use	**140**	**180**	**220**	**240**	**240**	**260**	**250**	**240**
AGRICULTURE	**9 600**	**9 400**	**9 000**	**8 900**	**9 000**	**9 700**	**9 500**	**9 600**
a. Enteric Fermentation	**4 800**	**4 600**	**3 700**	**3 700**	**3 700**	**3 700**	**3 700**	**3 700**
b. Manure Management	**1 800**	**2 100**	**1 900**	**1 900**	**1 900**	**1 900**	**1 900**	**1 900**
c. Agricultural Soils	**2 600**	**2 500**	**3 200**	**3 000**	**3 100**	**3 800**	**3 600**	**3 700**
Direct Sources	2 000	1 900	2 500	2 400	2 500	3 100	2 900	3 000
Indirect Sources	600	600	600	600	600	700	700	700
d. Field Burning of Agricultural Residues	**3**	**0.60**	**0.20**	**0.30**	**0.30**	**0.30**	**0.20**	**0.20**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**250**	**160**	**200**	**200**	**210**	**260**	**240**	**250**
WASTE	**7 300**	**7 900**	**7 000**	**7 000**	**7 100**	**7 200**	**7 400**	**7 500**
a. Solid Waste Disposal (Landfills)	**6 000**	**7 000**	**6 000**	**6 000**	**6 000**	**6 000**	**6 000**	**6 000**
b. Biological Treatment of Solid Waste	**30**	**70**	**100**	**100**	**100**	**100**	**100**	**100**
c. Wastewater Treatment and Discharge	**600**	**800**	**900**	**900**	**900**	**900**	**1 000**	**1 000**
d. Incineration and Open Burning of Waste	**67**	**110**	**110**	**110**	**98**	**83**	**83**	**100**
e. Industrial Wood Waste Landfills	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
LAND USE, LAND-USE CHANGE AND FORESTRY	**-12000**	**-8000**	**-22000**	**-24000**	**-24000**	**-22000**	**-23000**	**-22000**
a. Forest Land	**-24000**	**-25000**	**-36000**	**-37000**	**-37000**	**-37000**	**-37000**	**-37000**
b. Cropland	**600**	**380**	**1 000**	**250**	**840**	**1 500**	**950**	**2 200**
c. Grassland	-	-	-	-	-	-	-	-
d. Wetlands	**6**	**8**	**13**	**13**	**12**	**12**	**12**	**12**
e. Settlements	**-760**	**-820**	**-840**	**-840**	**-830**	**-830**	**-840**	**-830**
f. Harvested Wood Products[e]	**12 000**	**18 000**	**15 000**	**14 000**	**14 000**	**14 000**	**13 000**	**14 000**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

c. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

d. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990−1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

e. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–13 **2022 GHG Emission Summary for Ontario**

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[a]	PFCs[a]	SF_6	NF_3	TOTAL
Global Warming Potential			28		265			23 500	16 100	
Unit	kt	kt	kt CO_2 eq	kt	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq
TOTAL[b]	**132 000**	**530**	**15 000**	**24**	**6 400**	**4 000**	**15**	**200**	**-**	**157 000**
ENERGY	**114 000**	**110**	**3 100**	**4**	**1 000**	**-**	**-**	**-**	**-**	**118 000**
a. Stationary Combustion Sources	**59 100**	**10**	**400**	**1**	**400**	**-**	**-**	**-**	**-**	**59 900**
Public Electricity and Heat Production	5 070	1	36	0.10	40	-	-	-	-	5 140
Petroleum Refining Industries	4 690	0.10	3	0.02	7	-	-	-	-	4 700
Oil and Gas Extraction	98	0.00	0.05	0.00	0.60	-	-	-	-	99
Mining	571	0.01	0.30	0.03	7	-	-	-	-	579
Manufacturing Industries	15 900	0.47	13	0.35	93	-	-	-	-	16 000
Construction	396	0.01	0.19	0.01	3	-	-	-	-	399
Commercial and Institutional	13 700	0.36	10	0.30	80	-	-	-	-	13 700
Residential	17 000	10	300	0.50	100	-	-	-	-	17 400
Agriculture and Forestry	1 750	0.03	0.90	0.04	10	-	-	-	-	1 760
b. Transport[c]	**54 600**	**11**	**320**	**2**	**630**	**-**	**-**	**-**	**-**	**55 600**
Aviation	2 270	0.04	1	0.07	20	-	-	-	-	2 290
Road Transportation	40 500	2	70	1	330	-	-	-	-	40 900
Light-Duty Gasoline Vehicles	8 320	0.50	20	0.15	40	-	-	-	-	8 370
Light-Duty Gasoline Trucks	18 700	1	30	0.26	69	-	-	-	-	18 800
Heavy-Duty Gasoline Vehicles	1 330	0.04	1	0.12	33	-	-	-	-	1 370
Motorcycles	218	0.08	2	0.00	1	-	-	-	-	221
Light-Duty Diesel Vehicles	116	0.00	0.07	0.01	3	-	-	-	-	119
Light-Duty Diesel Trucks	226	0.01	0.20	0.02	5	-	-	-	-	231
Heavy-Duty Diesel Vehicles	11 500	0.50	10	0.69	180	-	-	-	-	11 700
Propane and Natural Gas Vehicles	39	0.06	2	0.00	0.23	-	-	-	-	41
Railways	1 380	0.08	2	0.50	100	-	-	-	-	1 530
Marine	300	0.03	0.77	0.01	2	-	-	-	-	303
Other Transportation	10 200	9	250	0.50	100	-	-	-	-	10 500
Off-Road Agriculture and Forestry	1 150	0.04	1	0.06	20	-	-	-	-	1 170
Off-Road Commercial and Institutional	1 680	2	47	0.07	20	-	-	-	-	1 750
Off-Road Manufacturing, Mining and Construction	4 140	0.67	19	0.30	70	-	-	-	-	4 230
Off-Road Residential	321	0.91	25	0.01	2	-	-	-	-	349
Off-Road Other Transportation	1 780	4	124	0.05	10	-	-	-	-	1 920
Pipeline Transport	1 070	1	29	0.03	7	-	-	-	-	1 110
c. Fugitive Sources	**330**	**88**	**2 450**	**0.02**	**6**	**-**	**-**	**-**	**-**	**2 800**
Coal Mining	-	-	-	-	-	-	-	-	-	-
Oil and Natural Gas	330	88	2 450	0.02	6	-	-	-	-	2 790
Oil	0.18	0.93	26	0.02	6	-	-	-	-	33
Natural Gas	2	76	2 130	-	-	-	-	-	-	2 130
Venting	260	11	295	-	-	-	-	-	-	553
Flaring	68	0.09	2	0.00	0.03	-	-	-	-	71
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**17 200**	**1**	**33**	**0.80**	**210**	**4 000**	**15**	**200**	**-**	**21 600**
a. Mineral Products	**3 460**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3 460**
Cement Production	2 720	-	-	-	-	-	-	-	-	2 720
Lime Production	x	-	-	-	-	-	-	-	-	x
Mineral Products Use	x	-	-	-	-	-	-	-	-	x
b. Chemical Industry[d]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**7 800**	**0.07**	**2**	**-**	**-**	**-**	**-**	**148**	**-**	**7 950**
Iron and Steel Production	7 800	0.07	2	-	-	-	-	-	-	7 800
Aluminium Production	-	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	148	-	148
d. Production and Consumption of Halocarbons, SF_6 and NF_3[e]	**-**	**-**	**-**	**-**	**-**	**4 000**	**7**	**14**	**-**	**4 000**
e. Non-Energy Products from Fuels and Solvent Use[d]	**5 900**	**-**	**-**	**0.10**	**-**	**-**	**-**	**-**	**-**	**6 000**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.72**	**190**	**-**	**8**	**38**	**-**	**240**
AGRICULTURE	**250**	**170**	**4 900**	**17**	**4 500**	**-**	**-**	**-**	**-**	**9 600**
a. Enteric Fermentation	**-**	**130**	**3 700**	**-**	**-**	**-**	**-**	**-**	**-**	**3 700**
b. Manure Management	**-**	**40**	**1 100**	**3**	**800**	**-**	**-**	**-**	**-**	**1 900**
c. Agricultural Soils	**-**	**-**	**-**	**14**	**3 700**	**-**	**-**	**-**	**-**	**3 700**
Direct Sources	-	-	-	11	3 000	-	-	-	-	3 000
Indirect Sources	-	-	-	3	700	-	-	-	-	700
d. Field Burning of Agricultural Residues	**-**	**0.01**	**0.20**	**0.00**	**0.04**	**-**	**-**	**-**	**-**	**0.20**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**250**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**250**
WASTE	**80**	**240**	**6 700**	**3**	**800**	**-**	**-**	**-**	**-**	**7 500**
a. Solid Waste Disposal (Landfills)	**-**	**200**	**6 000**	**-**	**-**	**-**	**-**	**-**	**-**	**6 000**
b. Biological Treatment of Solid Waste	**-**	**2**	**70**	**0.30**	**70**	**-**	**-**	**-**	**-**	**100**
c. Wastewater Treatment and Discharge	**10**	**10**	**300**	**3**	**660**	**-**	**-**	**-**	**-**	**1 000**
d. Incineration and Open Burning of Waste	**70**	**0.03**	**0.90**	**0.10**	**30**	**-**	**-**	**-**	**-**	**100**
e. Industrial Wood Waste Landfills	**-**	**4**	**100**	**-**	**-**	**-**	**-**	**-**	**-**	**100**
LAND USE, LAND-USE CHANGE AND FORESTRY	**-22000**	**0.56**	**16**	**0.03**	**7**	**-**	**-**	**-**	**-**	**-22000**
a. Forest Land	**-37000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-37000**
b. Cropland	**2 200**	**0.24**	**7**	**0.02**	**5**	**-**	**-**	**-**	**-**	**2 200**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**12**	**0.01**	**0.30**	**0.00**	**0.06**	**-**	**-**	**-**	**-**	**12**
e. Settlements	**-850**	**0.30**	**9**	**0.01**	**2**	**-**	**-**	**-**	**-**	**-830**
f. Harvested Wood Products[f]	**14 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**14 000**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Chapter 1, Table 1-1 of this report provides a list of global warming potentials (GWPs) used.

c. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

d. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

e. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

f. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–14 GHG Emission Summary for Manitoba, Selected Years

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	kt CO_2 eq							
TOTAL[a]	**18 200**	**20 600**	**21 600**	**22 400**	**22 100**	**21 100**	**20 600**	**21 600**
ENERGY	**12 700**	**12 700**	**13 500**	**14 100**	**13 800**	**12 700**	**12 700**	**13 400**
a. Stationary Combustion Sources	**4 910**	**4 500**	**4 310**	**4 280**	**4 260**	**4 130**	**3 920**	**4 420**
Public Electricity and Heat Production	519	361	70	41	40	41	56	48
Petroleum Refining Industries	-	-	-	-	-	-	-	-
Oil and Gas Extraction	1	0.46	0.00	0.00	-	0.00	-	-
Mining	78	96	97	120	119	119	118	107
Manufacturing Industries	1 180	1 450	1 500	1 190	1 200	1 200	1 120	1 270
Construction	63	85	114	126	123	114	112	120
Commercial and Institutional	1 400	1 400	1 370	1 530	1 510	1 430	1 370	1 580
Residential	1 620	1 060	1 110	1 220	1 230	1 160	1 090	1 240
Agriculture and Forestry	43	43	40	49	50	51	50	45
b. Transport[b]	**7 110**	**7 750**	**8 410**	**9 040**	**8 790**	**7 870**	**8 020**	**8 260**
Aviation	471	533	475	515	511	311	358	445
Road Transportation	3 450	3 880	4 270	4 570	4 540	4 020	4 180	4 310
Light-Duty Gasoline Vehicles	1 560	1 150	885	935	904	744	745	712
Light-Duty Gasoline Trucks	1 030	1 410	1 920	2 150	2 180	2 000	2 120	2 200
Heavy-Duty Gasoline Vehicles	195	162	154	169	172	171	166	170
Motorcycles	3	9	25	28	30	26	23	24
Light-Duty Diesel Vehicles	9	10	7	6	6	4	4	4
Light-Duty Diesel Trucks	16	15	11	11	11	8	11	12
Heavy-Duty Diesel Vehicles	620	1 120	1 260	1 270	1 230	1 070	1 110	1 180
Propane and Natural Gas Vehicles	15	0.12	0.61	1	2	2	2	2
Railways	596	513	600	615	592	533	537	537
Marine	2	3	1	4	1	0.77	0.79	0.74
Other Transportation	2 590	2 820	3 070	3 340	3 150	3 000	2 940	2 970
Off-Road Agriculture and Forestry	807	1 020	1 370	1 440	1 380	1 400	1 290	1 290
Off-Road Commercial and Institutional	273	304	462	474	450	404	412	444
Off-Road Manufacturing, Mining and Construction	467	511	518	535	507	492	456	457
Off-Road Residential	11	46	38	41	41	42	36	37
Off-Road Other Transportation	178	349	528	539	506	466	454	499
Pipeline Transport	850	595	157	309	266	192	294	245
c. Fugitive Sources	**680**	**400**	**760**	**770**	**780**	**720**	**720**	**740**
Coal Mining	-	-	-	-	-	-	-	-
Oil and Natural Gas	677	405	757	770	781	719	718	741
Oil	145	166	345	343	345	318	323	334
Natural Gas	436	102	110	110	111	111	112	114
Venting	67	105	201	207	209	190	188	194
Flaring	29	32	101	110	115	99	95	99
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**486**	**684**	**870**	**974**	**937**	**940**	**878**	**943**
a. Mineral Products	**222**	**71**	**87**	**81**	**75**	**73**	**71**	**72**
Cement Production	155	-	-	-	-	-	-	-
Lime Production	61	60	x	x	x	x	x	x
Mineral Products Use	7	12	x	x	x	x	x	x
b. Chemical Industry[c]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[d]	**-**	**180**	**380**	**420**	**420**	**410**	**390**	**380**
e. Non-Energy Products from Fuels and Solvent Use[c]	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**
f. Other Product Manufacture and Use	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**
AGRICULTURE	**4 200**	**6 000**	**5 900**	**6 000**	**6 000**	**6 200**	**5 900**	**5 900**
a. Enteric Fermentation	**2 100**	**3 600**	**2 600**	**2 700**	**2 600**	**2 600**	**2 600**	**2 500**
b. Manure Management	**390**	**760**	**720**	**730**	**720**	**710**	**700**	**690**
c. Agricultural Soils	**1 400**	**1 400**	**2 200**	**2 200**	**2 200**	**2 400**	**2 200**	**2 400**
Direct Sources	1 100	1 100	1 700	1 800	1 800	1 900	1 700	1 900
Indirect Sources	300	300	500	500	500	500	500	500
d. Field Burning of Agricultural Residues	**200**	**10**	**20**	**20**	**20**	**20**	**20**	**20**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**130**	**190**	**310**	**310**	**330**	**460**	**390**	**350**
WASTE	**880**	**1 300**	**1 400**	**1 400**	**1 400**	**1 200**	**1 200**	**1 400**
a. Solid Waste Disposal (Landfills)	**800**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**
b. Biological Treatment of Solid Waste	**0.30**	**5**	**9**	**10**	**10**	**10**	**20**	**20**
c. Wastewater Treatment and Discharge	**70**	**70**	**90**	**100**	**90**	**90**	**100**	**90**
d. Incineration and Open Burning of Waste	**0.41**	**0.44**	**0.08**	**0.03**	**0.03**	**0.01**	**0.01**	**-**
e. Industrial Wood Waste Landfills	**3**	**4**	**3**	**3**	**3**	**3**	**3**	**3**
LAND USE, LAND-USE CHANGE AND FORESTRY	**-1800**	**-1700**	**-3300**	**-5200**	**-4000**	**-2700**	**-4000**	**370**
a. Forest Land	**-1600**	**-630**	**-1900**	**-1900**	**-2000**	**-1900**	**-2000**	**-2000**
b. Cropland	**-1500**	**-2900**	**-3200**	**-5100**	**-3900**	**-2900**	**-3900**	**350**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**91**	**160**	**300**	**290**	**310**	**560**	**380**	**500**
e. Settlements	**9**	**-6**	**100**	**99**	**98**	**95**	**96**	**93**
f. Harvested Wood Products[e]	**1 100**	**1 700**	**1 400**	**1 500**	**1 500**	**1 500**	**1 400**	**1 500**

Notes:
Totals may not add up due to rounding.
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Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

c. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

d. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990−1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

e. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–15 **2022 GHG Emission Summary for Manitoba**

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[a]	PFCs[a]	SF_6	NF_3	TOTAL
Global Warming Potential			28		265			23 500	16 100	
Unit	kt	kt	kt CO_2 eq	kt	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq
TOTAL[b]	**13 300**	**180**	**5 000**	**11**	**2 900**	**380**	**0.75**	**2**	**-**	**21 600**
ENERGY	**12 500**	**28**	**780**	**0.60**	**200**	**-**	**-**	**-**	**-**	**13 400**
a. Stationary Combustion Sources	**4 340**	**2**	**50**	**0.10**	**30**	**-**	**-**	**-**	**-**	**4 420**
Public Electricity and Heat Production	47	0.01	0.16	0.00	0.20	-	-	-	-	48
Petroleum Refining Industries	-	-	-	-	-	-	-	-	-	-
Oil and Gas Extraction	-	-	-	-	-	-	-	-	-	-
Mining	105	0.00	0.05	0.01	2	-	-	-	-	107
Manufacturing Industries	1 260	0.05	2	0.04	10	-	-	-	-	1 270
Construction	119	0.00	0.06	0.00	0.61	-	-	-	-	120
Commercial and Institutional	1 570	0.03	0.84	0.03	9	-	-	-	-	1 580
Residential	1 190	2	40	0.04	10	-	-	-	-	1 240
Agriculture and Forestry	44	0.00	0.02	0.00	0.80	-	-	-	-	45
b. Transport[c]	**8 060**	**3**	**82**	**0.47**	**130**	**-**	**-**	**-**	**-**	**8 260**
Aviation	441	0.02	0.40	0.01	3	-	-	-	-	445
Road Transportation	4 260	0.30	7	0.15	39	-	-	-	-	4 310
Light-Duty Gasoline Vehicles	706	0.05	1	0.02	4	-	-	-	-	712
Light-Duty Gasoline Trucks	2 190	0.10	4	0.05	13	-	-	-	-	2 200
Heavy-Duty Gasoline Vehicles	166	0.01	0.20	0.02	4	-	-	-	-	170
Motorcycles	24	0.01	0.20	0.00	0.12	-	-	-	-	24
Light-Duty Diesel Vehicles	4	0.00	0.00	0.00	0.08	-	-	-	-	4
Light-Duty Diesel Trucks	11	0.00	0.01	0.00	0.25	-	-	-	-	12
Heavy-Duty Diesel Vehicles	1 160	0.05	1	0.07	17	-	-	-	-	1 180
Propane and Natural Gas Vehicles	2	0.00	0.03	0.00	0.01	-	-	-	-	2
Railways	486	0.03	0.80	0.20	50	-	-	-	-	537
Marine	0.73	0.00	0.00	0.00	0.01	-	-	-	-	0.74
Other Transportation	2 870	3	74	0.10	30	-	-	-	-	2 970
Off-Road Agriculture and Forestry	1 270	0.08	2	0.07	20	-	-	-	-	1 290
Off-Road Commercial and Institutional	417	0.85	24	0.01	4	-	-	-	-	444
Off-Road Manufacturing, Mining and Construction	443	0.25	7	0.03	7	-	-	-	-	457
Off-Road Residential	34	0.10	3	0.00	0.20	-	-	-	-	37
Off-Road Other Transportation	464	1	32	0.01	4	-	-	-	-	499
Pipeline Transport	236	0.23	7	0.01	2	-	-	-	-	245
c. Fugitive Sources	**91**	**23**	**650**	**0.00**	**0.08**	**-**	**-**	**-**	**-**	**740**
Coal Mining	-	-	-	-	-	-	-	-	-	-
Oil and Natural Gas	91	23	650	0.00	0.08	-	-	-	-	741
Oil	0.73	12	333	-	-	-	-	-	-	334
Natural Gas	5	4	108	-	-	-	-	-	-	114
Venting	0.57	7	194	-	-	-	-	-	-	194
Flaring	84	0.53	15	0.00	0.08	-	-	-	-	99
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**491**	**-**	**-**	**0.25**	**66**	**380**	**0.75**	**2**	**-**	**943**
a. Mineral Products	**72**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**72**
Cement Production	-	-	-	-	-	-	-	-	-	-
Lime Production	x	-	-	-	-	-	-	-	-	x
Mineral Products Use	x	-	-	-	-	-	-	-	-	x
b. Chemical Industry[d]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[e]	**-**	**-**	**-**	**-**	**-**	**380**	**0.19**	**-**	**-**	**380**
e. Non-Energy Products from Fuels and Solvent Use[d]	**420**	**-**	**-**	**x**	**x**	**-**	**-**	**-**	**-**	**x**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**x**	**x**	**-**	**0.60**	**2**	**-**	**x**
AGRICULTURE	**350**	**110**	**3 000**	**10**	**2 600**	**-**	**-**	**-**	**-**	**5 900**
a. Enteric Fermentation	**-**	**88**	**2 500**	**-**	**-**	**-**	**-**	**-**	**-**	**2 500**
b. Manure Management	**-**	**17**	**490**	**0.80**	**200**	**-**	**-**	**-**	**-**	**690**
c. Agricultural Soils	**-**	**-**	**-**	**9**	**2 400**	**-**	**-**	**-**	**-**	**2 400**
Direct Sources	-	-	-	7	1 900	-	-	-	-	1 900
Indirect Sources	-	-	-	2	500	-	-	-	-	500
d. Field Burning of Agricultural Residues	**-**	**0.60**	**20**	**0.02**	**4**	**-**	**-**	**-**	**-**	**20**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**350**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**350**
WASTE	**-**	**46**	**1 300**	**0.20**	**60**	**-**	**-**	**-**	**-**	**1 400**
a. Solid Waste Disposal (Landfills)	**-**	**40**	**1 000**	**-**	**-**	**-**	**-**	**-**	**-**	**1 000**
b. Biological Treatment of Solid Waste	**-**	**0.30**	**10**	**0.04**	**10**	**-**	**-**	**-**	**-**	**20**
c. Wastewater Treatment and Discharge	**-**	**1**	**40**	**0.20**	**53**	**-**	**-**	**-**	**-**	**90**
d. Incineration and Open Burning of Waste	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Industrial Wood Waste Landfills	**-**	**0.09**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**3**
LAND USE, LAND-USE CHANGE AND FORESTRY	**340**	**0.74**	**21**	**0.03**	**8**	**-**	**-**	**-**	**-**	**370**
a. Forest Land	**-2000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-2000**
b. Cropland	**320**	**0.60**	**17**	**0.03**	**7**	**-**	**-**	**-**	**-**	**350**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**500**	**0.08**	**2**	**0.00**	**0.61**	**-**	**-**	**-**	**-**	**500**
e. Settlements	**91**	**0.06**	**2**	**0.00**	**0.72**	**-**	**-**	**-**	**-**	**93**
f. Harvested Wood Products[f]	**1 500**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1 500**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Chapter 1, Table 1-1 of this report provides a list of global warming potentials (GWPs) used.

c. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

d. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

e. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

f. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–16 GHG Emission Summary for Saskatchewan, Selected Years

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	kt CO_2 eq							
TOTAL[a]	**49 000**	**80 500**	**87 600**	**89 000**	**86 600**	**74 800**	**76 800**	**75 900**
ENERGY	**41 500**	**67 300**	**74 400**	**75 800**	**73 300**	**61 300**	**63 500**	**62 400**
a. Stationary Combustion Sources	**18 300**	**25 900**	**30 000**	**31 200**	**30 800**	**27 500**	**30 600**	**30 200**
Public Electricity and Heat Production	11 100	15 300	16 700	16 400	16 000	13 900	16 100	14 800
Petroleum Refining Industries	627	782	1 270	1 160	1 170	1 030	1 120	1 120
Oil and Gas Extraction	1 400	4 490	5 830	6 220	6 280	5 960	6 420	6 790
Mining	974	1 300	1 730	2 270	2 010	1 710	2 250	2 350
Manufacturing Industries	789	541	896	1 300	1 260	1 250	1 080	1 150
Construction	70	43	46	45	36	34	34	33
Commercial and Institutional	984	1 540	1 510	1 670	1 750	1 580	1 550	1 720
Residential	2 080	1 620	1 850	2 040	2 130	1 920	1 890	2 040
Agriculture and Forestry	296	261	169	170	130	133	137	135
b. Transport[b]	**9 390**	**11 900**	**16 600**	**17 300**	**16 900**	**15 600**	**16 000**	**15 700**
Aviation	259	192	224	235	218	117	147	181
Road Transportation	3 100	4 980	7 050	7 070	6 910	6 260	6 510	6 230
Light-Duty Gasoline Vehicles	1 120	1 170	1 080	1 020	973	751	744	643
Light-Duty Gasoline Trucks	1 080	1 600	2 980	2 960	2 970	2 690	2 830	2 710
Heavy-Duty Gasoline Vehicles	332	237	297	285	281	275	262	239
Motorcycles	2	6	15	14	13	11	10	10
Light-Duty Diesel Vehicles	4	11	14	14	13	9	10	9
Light-Duty Diesel Trucks	16	36	40	44	43	38	47	51
Heavy-Duty Diesel Vehicles	517	1 930	2 610	2 730	2 610	2 480	2 600	2 570
Propane and Natural Gas Vehicles	39	0.40	3	3	4	3	2	2
Railways	769	690	979	1 050	1 050	912	885	884
Marine	0.00	-	-	-	-	-	-	-
Other Transportation	5 260	6 030	8 360	8 910	8 690	8 340	8 420	8 440
Off-Road Agriculture and Forestry	2 500	2 630	5 000	5 410	5 290	5 370	5 130	4 920
Off-Road Commercial and Institutional	361	335	473	470	466	409	431	410
Off-Road Manufacturing, Mining and Construction	422	433	539	552	532	507	488	459
Off-Road Residential	9	47	54	53	52	53	47	45
Off-Road Other Transportation	380	648	1 030	1 010	987	905	907	877
Pipeline Transport	1 600	1 940	1 260	1 420	1 370	1 100	1 420	1 730
c. Fugitive Sources	**14 000**	**30 000**	**28 000**	**27 000**	**26 000**	**18 000**	**17 000**	**16 000**
Coal Mining	20	20	20	20	20	10	20	20
Oil and Natural Gas	13 800	29 500	27 800	27 300	25 600	18 100	16 900	16 500
Oil	229	494	703	711	720	695	717	786
Natural Gas	1 370	560	704	732	728	667	683	680
Venting	11 500	26 800	24 300	23 900	22 300	14 900	13 500	13 200
Flaring	673	1 640	2 110	1 990	1 830	1 860	2 000	1 770
d. CO_2 Transport and Storage	**-**	**0.09**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**
INDUSTRIAL PROCESSES AND PRODUCT USE	**352**	**853**	**783**	**723**	**735**	**891**	**844**	**844**
a. Mineral Products	**96**	**10**	**6**	**5**	**4**	**4**	**4**	**5**
Cement Production	89	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-
Mineral Products Use	8	10	6	5	4	4	5	5
b. Chemical Industry[c]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[d]	**-**	**160**	**380**	**410**	**410**	**410**	**380**	**370**
e. Non-Energy Products from Fuels and Solvent Use[c]	**250**	**x**	**x**	**x**	**x**	**x**	**x**	**x**
f. Other Product Manufacture and Use	**7**	**x**	**x**	**x**	**x**	**x**	**x**	**x**
AGRICULTURE	**6 100**	**11 000**	**11 000**	**11 000**	**11 000**	**11 000**	**11 000**	**11 000**
a. Enteric Fermentation	**3 700**	**6 800**	**5 200**	**5 100**	**5 100**	**5 100**	**5 200**	**5 000**
b. Manure Management	**640**	**1 200**	**970**	**960**	**940**	**950**	**960**	**920**
c. Agricultural Soils	**1 600**	**2 400**	**3 800**	**4 000**	**4 000**	**4 000**	**3 700**	**4 300**
Direct Sources	1 200	1 800	2 900	3 000	3 000	3 100	2 800	3 400
Indirect Sources	400	600	900	1 000	1 000	1 000	900	900
d. Field Burning of Agricultural Residues	**80**	**30**	**30**	**30**	**30**	**30**	**20**	**30**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**190**	**450**	**1 000**	**1 000**	**1 000**	**1 100**	**1 200**	**1 000**
WASTE	**1 000**	**1 400**	**1 400**	**1 400**	**1 400**	**1 400**	**1 400**	**1 400**
a. Solid Waste Disposal (Landfills)	**900**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**	**1 000**
b. Biological Treatment of Solid Waste	**0.01**	**2**	**4**	**4**	**4**	**4**	**3**	**3**
c. Wastewater Treatment and Discharge	**80**	**80**	**100**	**90**	**100**	**100**	**100**	**100**
d. Incineration and Open Burning of Waste	**-**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.03**
e. Industrial Wood Waste Landfills	**40**	**40**	**30**	**30**	**30**	**30**	**30**	**30**
LAND USE, LAND-USE CHANGE AND FORESTRY	**-8200**	**-14000**	**-18000**	**-15000**	**-16000**	**-16000**	**-17000**	**7 900**
a. Forest Land	**-5000**	**-1200**	**-3900**	**-3900**	**-4200**	**-4300**	**-4300**	**-4300**
b. Cropland	**-4800**	**-16000**	**-17000**	**-15000**	**-15000**	**-15000**	**-16000**	**8 800**
c. Grassland	**0.05**	**0.03**	**0.30**	**0.30**	**0.30**	**0.30**	**0.30**	**0.30**
d. Wetlands	**38**	**68**	**42**	**44**	**47**	**52**	**190**	**250**
e. Settlements	**22**	**-5**	**0.13**	**-2**	**0.58**	**0.76**	**0.63**	**2**
f. Harvested Wood Products[e]	**1 500**	**3 200**	**2 900**	**3 000**	**3 100**	**3 200**	**3 100**	**3 200**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

c. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

d. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990−1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

e. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–17 **2022 GHG Emission Summary for Saskatchewan**

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[a]	PFCs[a]	SF_6	NF_3	TOTAL
Global Warming Potential			28		265			23 500	16 100	
Unit	kt	kt	kt CO_2 eq	kt	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq
TOTAL[b]	**48 800**	**760**	**21 000**	**20**	**5 400**	**370**	**0.36**	**0.60**	**-**	**75 900**
ENERGY	**47 300**	**520**	**15 000**	**2**	**500**	**-**	**-**	**-**	**-**	**62 400**
a. Stationary Combustion Sources	**29 800**	**6**	**200**	**0.70**	**200**	**-**	**-**	**-**	**-**	**30 200**
Public Electricity and Heat Production	14 700	1	39	0.40	90	-	-	-	-	14 800
Petroleum Refining Industries	1 110	0.03	0.70	0.01	3	-	-	-	-	1 120
Oil and Gas Extraction	6 650	4	100	0.10	40	-	-	-	-	6 790
Mining	2 330	0.04	1	0.04	10	-	-	-	-	2 350
Manufacturing Industries	1 140	0.04	0.99	0.03	8	-	-	-	-	1 150
Construction	33	0.00	0.02	0.00	0.19	-	-	-	-	33
Commercial and Institutional	1 710	0.03	0.92	0.03	9	-	-	-	-	1 720
Residential	2 020	0.50	10	0.04	10	-	-	-	-	2 040
Agriculture and Forestry	134	0.00	0.07	0.00	0.70	-	-	-	-	135
b. Transport[c]	**15 300**	**6**	**160**	**0.94**	**250**	**-**	**-**	**-**	**-**	**15 700**
Aviation	179	0.01	0.20	0.01	1	-	-	-	-	181
Road Transportation	6 150	0.30	10	0.28	73	-	-	-	-	6 230
Light-Duty Gasoline Vehicles	635	0.04	1	0.02	6	-	-	-	-	643
Light-Duty Gasoline Trucks	2 680	0.20	5	0.09	23	-	-	-	-	2 710
Heavy-Duty Gasoline Vehicles	234	0.01	0.30	0.02	5	-	-	-	-	239
Motorcycles	10	0.00	0.10	0.00	0.05	-	-	-	-	10
Light-Duty Diesel Vehicles	9	0.00	0.01	0.00	0.19	-	-	-	-	9
Light-Duty Diesel Trucks	50	0.00	0.04	0.00	1	-	-	-	-	51
Heavy-Duty Diesel Vehicles	2 530	0.10	3	0.14	38	-	-	-	-	2 570
Propane and Natural Gas Vehicles	2	0.00	0.04	0.00	0.01	-	-	-	-	2
Railways	800	0.05	1	0.30	80	-	-	-	-	884
Marine	-	-	-	-	-	-	-	-	-	-
Other Transportation	8 200	5	150	0.40	90	-	-	-	-	8 440
Off-Road Agriculture and Forestry	4 850	0.41	11	0.20	70	-	-	-	-	4 920
Off-Road Commercial and Institutional	382	0.89	25	0.01	3	-	-	-	-	410
Off-Road Manufacturing, Mining and Construction	443	0.33	9	0.02	6	-	-	-	-	459
Off-Road Residential	41	0.12	3	0.00	0.30	-	-	-	-	45
Off-Road Other Transportation	814	2	57	0.02	6	-	-	-	-	877
Pipeline Transport	1 670	2	46	0.04	10	-	-	-	-	1 730
c. Fugitive Sources	**2 100**	**510**	**14 300**	**0.24**	**63**	**-**	**-**	**-**	**-**	**16 000**
Coal Mining	-	0.50	20	-	-	-	-	-	-	20
Oil and Natural Gas	2 100	509	14 300	0.20	60	-	-	-	-	16 500
Oil	15	25	710	0.20	60	-	-	-	-	786
Natural Gas	34	23	647	-	-	-	-	-	-	680
Venting	460	456	12 800	-	-	-	-	-	-	13 200
Flaring	1 620	5	146	0.01	2	-	-	-	-	1 770
d. CO_2 Transport and Storage	**0.20**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.20**
INDUSTRIAL PROCESSES AND PRODUCT USE	**444**	**-**	**-**	**0.09**	**25**	**370**	**0.36**	**0.60**	**-**	**844**
a. Mineral Products	**5**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**5**
Cement Production	-	-	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-	-	-
Mineral Products Use	5	-	-	-	-	-	-	-	-	5
b. Chemical Industry[d]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[e]	**-**	**-**	**-**	**-**	**-**	**370**	**0.17**	**-**	**-**	**370**
e. Non-Energy Products from Fuels and Solvent Use[d]	**440**	**-**	**-**	**x**	**x**	**-**	**-**	**-**	**-**	**x**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**x**	**x**	**-**	**0.20**	**0.60**	**-**	**x**
AGRICULTURE	**1 000**	**190**	**5 300**	**18**	**4 900**	**-**	**-**	**-**	**-**	**11 000**
a. Enteric Fermentation	**-**	**180**	**5 000**	**-**	**-**	**-**	**-**	**-**	**-**	**5 000**
b. Manure Management	**-**	**12**	**330**	**2**	**600**	**-**	**-**	**-**	**-**	**920**
c. Agricultural Soils	**-**	**-**	**-**	**16**	**4 300**	**-**	**-**	**-**	**-**	**4 300**
Direct Sources	-	-	-	13	3 400	-	-	-	-	3 400
Indirect Sources	-	-	-	3	900	-	-	-	-	900
d. Field Burning of Agricultural Residues	**-**	**0.80**	**20**	**0.02**	**5**	**-**	**-**	**-**	**-**	**30**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**1 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1 000**
WASTE	**10**	**48**	**1 400**	**0.10**	**30**	**-**	**-**	**-**	**-**	**1 400**
a. Solid Waste Disposal (Landfills)	**-**	**40**	**1 000**	**-**	**-**	**-**	**-**	**-**	**-**	**1 000**
b. Biological Treatment of Solid Waste	**-**	**0.06**	**2**	**0.01**	**2**	**-**	**-**	**-**	**-**	**3**
c. Wastewater Treatment and Discharge	**-**	**3**	**80**	**0.11**	**30**	**-**	**-**	**-**	**-**	**100**
d. Incineration and Open Burning of Waste	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**-**	**-**	**-**	**-**	**0.03**
e. Industrial Wood Waste Landfills	**-**	**0.90**	**30**	**-**	**-**	**-**	**-**	**-**	**-**	**30**
LAND USE, LAND-USE CHANGE AND FORESTRY	**7 900**	**0.66**	**19**	**0.03**	**8**	**-**	**-**	**-**	**-**	**7 900**
a. Forest Land	**-4300**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-4300**
b. Cropland	**8 800**	**0.58**	**16**	**0.03**	**7**	**-**	**-**	**-**	**-**	**8 800**
c. Grassland	**-**	**0.01**	**0.30**	**0.00**	**0.06**	**-**	**-**	**-**	**-**	**0.30**
d. Wetlands	**250**	**0.02**	**0.65**	**0.00**	**0.15**	**-**	**-**	**-**	**-**	**250**
e. Settlements	**0**	**0.05**	**1**	**0.00**	**0.54**	**-**	**-**	**-**	**-**	**2**
f. Harvested Wood Products[f]	**3 200**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3 200**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Chapter 1, Table 1-1 of this report provides a list of global warming potentials (GWPs) used.

c. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

d. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

e. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

f. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–18 GHG Emission Summary for Alberta, Selected Years

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	kt CO_2 eq							
TOTAL[a]	**177 000**	**251 000**	**287 000**	**286 000**	**287 000**	**269 000**	**271 000**	**270 000**
ENERGY	**156 000**	**218 000**	**254 000**	**252 000**	**253 000**	**235 000**	**237 000**	**235 000**
a. Stationary Combustion Sources	**92 900**	**131 000**	**164 000**	**160 000**	**162 000**	**152 000**	**151 000**	**149 000**
Public Electricity and Heat Production	39 700	52 000	46 800	36 600	36 300	32 300	28 400	24 600
Petroleum Refining Industries	2 990	4 000	4 280	4 390	4 470	3 590	3 500	3 960
Oil and Gas Extraction	26 900	52 000	86 400	92 300	93 200	89 600	93 200	93 800
Mining	297	325	148	170	176	131	65	126
Manufacturing Industries	10 400	8 770	8 840	8 790	9 290	8 770	8 690	8 760
Construction	238	170	346	385	439	450	421	488
Commercial and Institutional	5 040	5 610	7 810	8 400	8 630	8 120	7 810	8 480
Residential	6 750	7 480	8 590	8 970	8 890	8 680	8 190	8 660
Agriculture and Forestry	477	238	393	389	403	370	373	394
b. Transport[b]	**21 100**	**32 200**	**39 700**	**41 300**	**42 300**	**35 100**	**36 500**	**37 800**
Aviation	1 140	1 350	1 530	1 700	1 670	901	1 040	1 450
Road Transportation	11 900	17 400	20 700	21 900	22 100	17 900	18 100	18 100
Light-Duty Gasoline Vehicles	3 700	3 740	3 070	3 060	3 070	2 350	2 180	2 060
Light-Duty Gasoline Trucks	4 050	6 180	8 280	8 600	8 980	7 350	7 480	7 650
Heavy-Duty Gasoline Vehicles	1 120	842	818	839	866	708	734	621
Motorcycles	23	66	151	153	165	115	122	103
Light-Duty Diesel Vehicles	13	42	58	62	59	39	37	40
Light-Duty Diesel Trucks	116	112	160	186	190	153	160	211
Heavy-Duty Diesel Vehicles	2 530	6 420	8 100	8 990	8 740	7 120	7 340	7 320
Propane and Natural Gas Vehicles	304	6	46	50	67	71	72	77
Railways	521	885	1 210	1 190	1 170	1 110	1 050	1 050
Marine	0.01	0.05	0.30	-	0.01	0.01	0.01	0.00
Other Transportation	7 600	12 600	16 200	16 400	17 300	15 200	16 200	17 200
Off-Road Agriculture and Forestry	1 990	2 790	3 260	3 080	3 220	2 720	2 840	2 880
Off-Road Commercial and Institutional	812	658	956	900	907	783	866	889
Off-Road Manufacturing, Mining and Construction	2 670	4 480	6 530	6 540	7 000	5 940	6 180	6 320
Off-Road Residential	45	153	127	128	130	110	111	89
Off-Road Other Transportation	771	1 320	1 670	1 590	1 600	1 390	1 490	1 460
Pipeline Transport	1 300	3 190	3 700	4 200	4 410	4 250	4 760	5 540
c. Fugitive Sources	**42 000**	**55 000**	**51 000**	**51 000**	**49 000**	**48 000**	**50 000**	**48 000**
Coal Mining	400	400	300	200	200	200	80	400
Oil and Natural Gas	41 300	54 900	50 600	50 400	48 800	47 400	49 400	47 400
Oil	4 150	6 260	6 760	6 850	6 930	6 620	6 670	6 790
Natural Gas	6 250	8 740	6 370	6 280	6 090	5 870	5 830	5 710
Venting	26 900	38 000	35 200	34 700	33 200	31 600	33 200	30 900
Flaring	3 970	1 930	2 330	2 530	2 580	3 320	3 730	3 960
d. CO_2 Transport and Storage	**-**	**-**	**0.10**	**0.10**	**0.10**	**0.30**	**0.50**	**0.50**
INDUSTRIAL PROCESSES AND PRODUCT USE	**6 660**	**11 300**	**12 300**	**12 800**	**12 400**	**11 600**	**12 400**	**12 500**
a. Mineral Products	**1 100**	**1 460**	**1 420**	**1 550**	**1 500**	**1 290**	**1 570**	**1 520**
Cement Production	795	1 090	x	x	x	x	x	x
Lime Production	108	125	x	x	x	x	x	x
Mineral Products Use	190	250	150	160	150	150	150	150
b. Chemical Industry[c]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**0.33**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	0.33	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[d]	**0.28**	**640**	**1 500**	**1 600**	**1 600**	**1 500**	**1 500**	**1 400**
e. Non-Energy Products from Fuels and Solvent Use[c]	**5 500**	**9 200**	**9 400**	**9 600**	**9 200**	**8 700**	**9 300**	**9 500**
f. Other Product Manufacture and Use	**16**	**35**	**51**	**58**	**60**	**60**	**61**	**61**
AGRICULTURE	**13 000**	**18 000**	**16 000**	**17 000**	**17 000**	**18 000**	**17 000**	**18 000**
a. Enteric Fermentation	**8 700**	**13 000**	**11 000**	**11 000**	**11 000**	**11 000**	**11 000**	**11 000**
b. Manure Management	**1 400**	**2 200**	**1 900**	**1 900**	**1 900**	**1 900**	**1 900**	**1 900**
c. Agricultural Soils	**2 200**	**2 600**	**3 200**	**3 400**	**3 600**	**3 900**	**3 600**	**4 100**
Direct Sources	1 700	2 000	2 500	2 700	2 800	3 100	2 800	3 300
Indirect Sources	500	700	700	800	800	900	800	800
d. Field Burning of Agricultural Residues	**4**	**0.80**	**0.90**	**0.90**	**1**	**1**	**0.90**	**1**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**260**	**370**	**610**	**720**	**760**	**880**	**920**	**860**
WASTE	**2 200**	**3 300**	**4 500**	**4 600**	**4 500**	**4 600**	**4 600**	**4 600**
a. Solid Waste Disposal (Landfills)	**2 000**	**3 000**	**4 000**	**4 000**	**4 000**	**4 000**	**4 000**	**4 000**
b. Biological Treatment of Solid Waste	**4**	**20**	**40**	**30**	**20**	**30**	**60**	**60**
c. Wastewater Treatment and Discharge	**500**	**500**	**500**	**600**	**500**	**400**	**400**	**400**
d. Incineration and Open Burning of Waste	**6**	**18**	**36**	**31**	**37**	**37**	**26**	**22**
e. Industrial Wood Waste Landfills	**100**	**100**	**90**	**90**	**90**	**90**	**90**	**80**
LAND USE, LAND-USE CHANGE AND FORESTRY	**5 100**	**16 000**	**14 000**	**15 000**	**16 000**	**22 000**	**19 000**	**30 000**
a. Forest Land	**-6700**	**3 300**	**-2100**	**-2700**	**-3300**	**-1700**	**-2200**	**-2800**
b. Cropland	**3 700**	**-6200**	**-6200**	**-5100**	**-2200**	**-1600**	**-2600**	**8 000**
c. Grassland	**0.60**	**0.70**	**0.90**	**0.90**	**0.90**	**0.90**	**0.90**	**0.90**
d. Wetlands	**88**	**200**	**250**	**270**	**310**	**320**	**350**	**350**
e. Settlements	**1 600**	**2 600**	**3 200**	**3 100**	**3 000**	**3 200**	**3 100**	**3 200**
f. Harvested Wood Products[e]	**6 300**	**16 000**	**19 000**	**20 000**	**18 000**	**21 000**	**21 000**	**21 000**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

c. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

d. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990−1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

e. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–19 **2022 GHG Emission Summary for Alberta**

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[a]	PFCs[a]	SF_6	NF_3	TOTAL
Global Warming Potential			28		265			23 500	16 100	
Unit	kt	kt	kt CO_2 eq	kt	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq
TOTAL[b]	**207 000**	**2 000**	**55 000**	**26**	**6 900**	**1 400**	**4**	**7**	**-**	**270 000**
ENERGY	**195 000**	**1 400**	**39 000**	**5**	**1 000**	**-**	**-**	**-**	**-**	**235 000**
a. Stationary Combustion Sources	**146 000**	**90**	**3 000**	**3**	**800**	**-**	**-**	**-**	**-**	**149 000**
Public Electricity and Heat Production	24 300	4	110	0.50	100	-	-	-	-	24 600
Petroleum Refining Industries	3 950	0.08	2	0.03	8	-	-	-	-	3 960
Oil and Gas Extraction	90 900	90	2 000	2	500	-	-	-	-	93 800
Mining	125	0.00	0.06	0.00	0.60	-	-	-	-	126
Manufacturing Industries	8 660	0.47	13	0.32	86	-	-	-	-	8 760
Construction	482	0.01	0.24	0.02	5	-	-	-	-	488
Commercial and Institutional	8 420	0.16	4	0.20	50	-	-	-	-	8 480
Residential	8 580	1	40	0.20	50	-	-	-	-	8 660
Agriculture and Forestry	391	0.01	0.20	0.01	2	-	-	-	-	394
b. Transport[c]	**36 900**	**13**	**360**	**2**	**470**	**-**	**-**	**-**	**-**	**37 800**
Aviation	1 440	0.03	0.70	0.04	10	-	-	-	-	1 450
Road Transportation	17 900	1	30	0.73	190	-	-	-	-	18 100
Light-Duty Gasoline Vehicles	2 040	0.10	4	0.06	16	-	-	-	-	2 060
Light-Duty Gasoline Trucks	7 590	0.50	10	0.19	49	-	-	-	-	7 650
Heavy-Duty Gasoline Vehicles	606	0.02	0.60	0.05	14	-	-	-	-	621
Motorcycles	101	0.04	1	0.00	0.50	-	-	-	-	103
Light-Duty Diesel Vehicles	39	0.00	0.02	0.00	0.86	-	-	-	-	40
Light-Duty Diesel Trucks	207	0.01	0.10	0.02	5	-	-	-	-	211
Heavy-Duty Diesel Vehicles	7 210	0.30	9	0.41	110	-	-	-	-	7 320
Propane and Natural Gas Vehicles	71	0.20	6	0.00	0.49	-	-	-	-	77
Railways	954	0.05	2	0.40	100	-	-	-	-	1 050
Marine	0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00
Other Transportation	16 700	12	330	0.60	200	-	-	-	-	17 200
Off-Road Agriculture and Forestry	2 830	0.25	7	0.10	40	-	-	-	-	2 880
Off-Road Commercial and Institutional	833	2	49	0.03	7	-	-	-	-	889
Off-Road Manufacturing, Mining and Construction	6 220	0.96	27	0.30	70	-	-	-	-	6 320
Off-Road Residential	82	0.23	6	0.00	0.60	-	-	-	-	89
Off-Road Other Transportation	1 350	3	92	0.04	10	-	-	-	-	1 460
Pipeline Transport	5 360	5	140	0.10	40	-	-	-	-	5 540
c. Fugitive Sources	**12 000**	**1 270**	**35 700**	**0.06**	**15**	**-**	**-**	**-**	**-**	**48 000**
Coal Mining	-	10	400	-	-	-	-	-	-	400
Oil and Natural Gas	12 000	1 260	35 300	0.06	20	-	-	-	-	47 400
Oil	580	221	6 200	0.04	10	-	-	-	-	6 790
Natural Gas	7	204	5 700	-	-	-	-	-	-	5 710
Venting	8 000	820	23 000	-	-	-	-	-	-	30 900
Flaring	3 510	16	441	0.02	5	-	-	-	-	3 960
d. CO_2 Transport and Storage	**0.50**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.50**
INDUSTRIAL PROCESSES AND PRODUCT USE	**10 900**	**4**	**110**	**0.44**	**120**	**1 400**	**4**	**7**	**-**	**12 500**
a. Mineral Products	**1 520**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1 520**
Cement Production	x	-	-	-	-	-	-	-	-	x
Lime Production	x	-	-	-	-	-	-	-	-	x
Mineral Products Use	150	-	-	-	-	-	-	-	-	150
b. Chemical Industry[d]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[e]	**-**	**-**	**-**	**-**	**-**	**1 400**	**3**	**5**	**-**	**1 400**
e. Non-Energy Products from Fuels and Solvent Use[d]	**9 400**	**-**	**-**	**-**	**100**	**-**	**-**	**-**	**-**	**9 500**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.22**	**57**	**-**	**1**	**2**	**-**	**61**
AGRICULTURE	**860**	**420**	**12 000**	**20**	**5 300**	**-**	**-**	**-**	**-**	**18 000**
a. Enteric Fermentation	**-**	**400**	**11 000**	**-**	**-**	**-**	**-**	**-**	**-**	**11 000**
b. Manure Management	**-**	**27**	**760**	**4**	**1 000**	**-**	**-**	**-**	**-**	**1 900**
c. Agricultural Soils	**-**	**-**	**-**	**15**	**4 100**	**-**	**-**	**-**	**-**	**4 100**
Direct Sources	-	-	-	12	3 300	-	-	-	-	3 300
Indirect Sources	-	-	-	3	800	-	-	-	-	800
d. Field Burning of Agricultural Residues	**-**	**0.03**	**1**	**0.00**	**0.24**	**-**	**-**	**-**	**-**	**1**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**860**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**860**
WASTE	**30**	**160**	**4 400**	**0.80**	**200**	**-**	**-**	**-**	**-**	**4 600**
a. Solid Waste Disposal (Landfills)	**-**	**100**	**4 000**	**-**	**-**	**-**	**-**	**-**	**-**	**4 000**
b. Biological Treatment of Solid Waste	**-**	**1**	**30**	**0.09**	**20**	**-**	**-**	**-**	**-**	**60**
c. Wastewater Treatment and Discharge	**-**	**6**	**200**	**0.71**	**190**	**-**	**-**	**-**	**-**	**400**
d. Incineration and Open Burning of Waste	**16**	**0.00**	**0.00**	**0.02**	**6**	**-**	**-**	**-**	**-**	**22**
e. Industrial Wood Waste Landfills	**-**	**3**	**80**	**-**	**-**	**-**	**-**	**-**	**-**	**80**
LAND USE, LAND-USE CHANGE AND FORESTRY	**30 000**	**6**	**170**	**0.26**	**69**	**-**	**-**	**-**	**-**	**30 000**
a. Forest Land	**-2800**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-2800**
b. Cropland	**7 900**	**3**	**84**	**0.13**	**35**	**-**	**-**	**-**	**-**	**8 000**
c. Grassland	**-**	**0.03**	**0.70**	**0.00**	**0.20**	**-**	**-**	**-**	**-**	**0.90**
d. Wetlands	**350**	**0.12**	**3**	**0.00**	**0.34**	**-**	**-**	**-**	**-**	**350**
e. Settlements	**3 100**	**3**	**83**	**0.13**	**33**	**-**	**-**	**-**	**-**	**3 200**
f. Harvested Wood Products[f]	**21 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**21 000**

Notes:
Totals may not add up due to rounding.
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Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Chapter 1, Table 1-1 of this report provides a list of global warming potentials (GWPs) used.

c. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

d. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

e. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

f. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

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- Indicates no emissions.
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Table A11–20 GHG Emission Summary for British Columbia, Selected Years

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	kt CO_2 eq							
TOTAL[a]	**51 100**	**62 700**	**62 800**	**65 000**	**64 000**	**60 200**	**62 200**	**64 300**
ENERGY	**43 200**	**52 800**	**54 500**	**56 400**	**55 600**	**52 400**	**54 700**	**57 000**
a. Stationary Combustion Sources	**19 400**	**21 400**	**21 900**	**21 900**	**21 300**	**20 800**	**21 100**	**21 800**
Public Electricity and Heat Production	804	1 330	637	817	1 050	735	961	894
Petroleum Refining Industries	1 240	493	504	378	471	382	424	448
Oil and Gas Extraction	2 220	5 290	7 570	7 620	6 960	7 200	6 960	7 420
Mining	615	384	479	534	528	513	574	535
Manufacturing Industries	6 480	6 110	4 910	4 990	4 450	4 010	4 040	3 970
Construction	307	112	96	106	101	100	90	102
Commercial and Institutional	2 950	3 130	2 860	2 780	2 930	3 000	3 120	3 330
Residential	4 500	4 470	4 290	4 050	4 220	4 290	4 390	4 540
Agriculture and Forestry	323	75	568	614	586	578	520	543
b. Transport[b]	**18 700**	**24 100**	**26 700**	**28 200**	**28 000**	**25 200**	**27 300**	**28 800**
Aviation	1 340	1 550	1 460	1 600	1 600	905	1 120	1 540
Road Transportation	10 400	14 000	15 200	15 600	15 400	13 900	15 000	15 500
Light-Duty Gasoline Vehicles	4 300	4 270	3 780	3 720	3 500	2 880	2 850	2 720
Light-Duty Gasoline Trucks	3 090	5 170	6 230	6 430	6 350	5 840	6 310	6 510
Heavy-Duty Gasoline Vehicles	568	597	609	621	602	610	620	546
Motorcycles	14	39	82	86	86	77	75	62
Light-Duty Diesel Vehicles	50	83	99	102	93	62	71	82
Light-Duty Diesel Trucks	211	174	117	137	144	121	159	219
Heavy-Duty Diesel Vehicles	1 840	3 690	4 300	4 510	4 590	4 260	4 860	5 300
Propane and Natural Gas Vehicles	293	10	29	37	47	45	48	54
Railways	1 880	1 470	1 830	1 980	2 120	2 070	2 100	2 100
Marine	615	859	1 060	1 120	1 230	1 220	1 450	1 730
Other Transportation	4 480	6 180	7 130	7 860	7 650	7 080	7 620	7 930
Off-Road Agriculture and Forestry	1 220	1 360	1 350	1 590	1 520	1 340	1 500	1 590
Off-Road Commercial and Institutional	353	435	713	792	800	775	859	895
Off-Road Manufacturing, Mining and Construction	1 690	2 480	2 520	2 980	2 810	2 470	2 760	2 890
Off-Road Residential	36	129	111	110	105	113	105	84
Off-Road Other Transportation	325	795	1 000	1 040	1 030	1 070	1 090	1 060
Pipeline Transport	864	986	1 440	1 350	1 380	1 310	1 310	1 420
c. Fugitive Sources	**5 100**	**7 300**	**5 900**	**6 300**	**6 300**	**6 400**	**6 300**	**6 500**
Coal Mining	900	1 000	1 000	1 000	1 000	1 000	1 000	1 000
Oil and Natural Gas[c]	4 140	6 220	4 890	5 170	5 230	5 370	5 070	5 330
Oil	99	157	106	97	80	57	56	50
Natural Gas	1 130	1 360	867	861	857	799	807	793
Venting	2 560	4 030	3 370	3 660	3 790	4 000	3 550	3 830
Flaring	356	669	541	544	501	520	661	663
d. CO_2 Transport and Storage	-	-	-	-	-	-	-	-
INDUSTRIAL PROCESSES AND PRODUCT USE	**3 190**	**4 530**	**3 700**	**3 980**	**3 810**	**3 600**	**3 440**	**3 190**
a. Mineral Products	**879**	**1 500**	**968**	**1 060**	**999**	**903**	**1 010**	**898**
Cement Production	656	1 260	x	x	x	x	x	x
Lime Production	170	188	x	x	x	x	x	x
Mineral Products Use	53	53	21	22	20	20	19	19
b. Chemical Industry[d]	-	-	-	-	-	-	-	-
Adipic Acid Production	-	-	-	-	-	-	-	-
c. Metal Production	**1 550**	**1 150**	**787**	**769**	**760**	**722**	**511**	**369**
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminium Production	1 550	1 150	787	769	760	722	511	369
SF_6 Used in Magnesium Smelters and Casters	-	2	0.01	0.01	0.01	0.01	0.01	0.01
d. Production and Consumption of Halocarbons, SF_6 and NF_3[e]	**0.13**	**590**	**1 400**	**1 500**	**1 500**	**1 500**	**1 400**	**1 400**
e. Non-Energy Products from Fuels and Solvent Use[d]	**690**	**1 200**	**480**	**550**	**460**	**400**	**400**	**420**
f. Other Product Manufacture and Use	**77**	**93**	**78**	**76**	**88**	**71**	**81**	**79**
AGRICULTURE	**2 000**	**2 700**	**2 200**	**2 300**	**2 300**	**2 300**	**2 300**	**2 200**
a. Enteric Fermentation	**1 500**	**2 000**	**1 600**	**1 600**	**1 600**	**1 600**	**1 600**	**1 600**
b. Manure Management	**310**	**430**	**400**	**410**	**400**	**400**	**400**	**400**
c. Agricultural Soils	**190**	**200**	**210**	**230**	**220**	**240**	**240**	**220**
Direct Sources	120	120	130	150	140	150	150	140
Indirect Sources	70	80	80	80	80	90	90	80
d. Field Burning of Agricultural Residues	-	-	-	-	-	-	-	-
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**25**	**24**	**28**	**33**	**33**	**43**	**46**	**36**
WASTE	**2 700**	**2 700**	**2 300**	**2 300**	**2 300**	**1 900**	**1 800**	**1 800**
a. Solid Waste Disposal (Landfills)	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**1 000**	**1 000**	**1 000**
b. Biological Treatment of Solid Waste	**2**	**50**	**60**	**80**	**90**	**90**	**100**	**100**
c. Wastewater Treatment and Discharge	**200**	**200**	**300**	**300**	**300**	**300**	**300**	**300**
d. Incineration and Open Burning of Waste	**5**	-	-	-	-	-	-	-
e. Industrial Wood Waste Landfills	**400**	**400**	**300**	**300**	**300**	**300**	**300**	**300**
LAND USE, LAND-USE CHANGE AND FORESTRY	**-8600**	**39 000**	**32 000**	**35 000**	**27 000**	**26 000**	**23 000**	**21 000**
a. Forest Land	**-41000**	**-11000**	**-15000**	**-14000**	**-17000**	**-20000**	**-21000**	**-22000**
b. Cropland	**1 300**	**660**	**380**	**530**	**210**	**600**	**710**	**520**
c. Grassland	**-**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**
d. Wetlands	**230**	**79**	**54**	**53**	**51**	**49**	**48**	**47**
e. Settlements	**540**	**-140**	**-58**	**-77**	**-100**	**-78**	**-120**	**-120**
f. Harvested Wood Products[f]	**30 000**	**50 000**	**46 000**	**49 000**	**44 000**	**46 000**	**44 000**	**43 000**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

c. Emission estimates for this source are currently under review and upward revisions to CH_4 emissions in the years prior to 2020 are anticipated in the 2025 edition of this report, pending further data collection and analysis.

d. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

e. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

f. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–21 **2022 GHG Emission Summary for British Columbia**

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[a]	PFCs[a]	SF_6	NF_3	TOTAL
Global Warming Potential			28		265			23 500	16 100	
Unit	kt	kt	kt CO_2 eq	kt	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq
TOTAL[b]	**52 800**	**300**	**8 500**	**5**	**1 400**	**1 400**	**143**	**15**	**-**	**64 300**
ENERGY	**51 200**	**180**	**5 100**	**3**	**700**	**-**	**-**	**-**	**-**	**57 000**
a. Stationary Combustion Sources	**20 800**	**30**	**800**	**0.80**	**200**	**-**	**-**	**-**	**-**	**21 800**
Public Electricity and Heat Production	836	2	45	0.05	10	-	-	-	-	894
Petroleum Refining Industries	447	0.01	0.30	0.00	0.70	-	-	-	-	448
Oil and Gas Extraction	6 780	20	600	0.20	50	-	-	-	-	7 420
Mining	532	0.01	0.30	0.01	3	-	-	-	-	535
Manufacturing Industries	3 860	0.64	18	0.34	90	-	-	-	-	3 970
Construction	101	0.00	0.05	0.00	0.59	-	-	-	-	102
Commercial and Institutional	3 300	0.06	2	0.07	20	-	-	-	-	3 330
Residential	4 390	4	100	0.10	30	-	-	-	-	4 540
Agriculture and Forestry	540	0.01	0.30	0.01	3	-	-	-	-	543
b. Transport[c]	**28 100**	**7**	**190**	**2**	**510**	**-**	**-**	**-**	**-**	**28 800**
Aviation	1 530	0.04	1	0.04	10	-	-	-	-	1 540
Road Transportation	15 300	1	30	0.69	180	-	-	-	-	15 500
Light-Duty Gasoline Vehicles	2 690	0.20	5	0.09	24	-	-	-	-	2 720
Light-Duty Gasoline Trucks	6 450	0.40	10	0.21	55	-	-	-	-	6 510
Heavy-Duty Gasoline Vehicles	533	0.02	0.60	0.05	12	-	-	-	-	546
Motorcycles	61	0.02	0.60	0.00	0.31	-	-	-	-	62
Light-Duty Diesel Vehicles	80	0.00	0.05	0.01	2	-	-	-	-	82
Light-Duty Diesel Trucks	214	0.01	0.20	0.02	5	-	-	-	-	219
Heavy-Duty Diesel Vehicles	5 210	0.20	7	0.31	83	-	-	-	-	5 300
Propane and Natural Gas Vehicles	50	0.10	4	0.00	0.35	-	-	-	-	54
Railways	1 900	0.10	3	0.80	200	-	-	-	-	2 100
Marine	1 710	0.16	5	0.05	10	-	-	-	-	1 730
Other Transportation	7 670	5	150	0.40	100	-	-	-	-	7 930
Off-Road Agriculture and Forestry	1 550	0.10	3	0.10	30	-	-	-	-	1 590
Off-Road Commercial and Institutional	856	1	31	0.03	9	-	-	-	-	895
Off-Road Manufacturing, Mining and Construction	2 820	0.52	15	0.20	50	-	-	-	-	2 890
Off-Road Residential	77	0.21	6	0.00	0.50	-	-	-	-	84
Off-Road Other Transportation	992	2	59	0.03	8	-	-	-	-	1 060
Pipeline Transport	1 370	1	37	0.03	9	-	-	-	-	1 420
c. Fugitive Sources	**2 300**	**149**	**4 170**	**0.00**	**1**	**-**	**-**	**-**	**-**	**6 500**
Coal Mining	-	40	1 000	-	-	-	-	-	-	1 000
Oil and Natural Gas[d]	2 300	109	3 050	0.01	1	-	-	-	-	5 330
Oil	0.11	2	49	0.00	0.90	-	-	-	-	50
Natural Gas	0.67	28	792	-	-	-	-	-	-	793
Venting	1 700	76	2 120	-	-	-	-	-	-	3 830
Flaring	571	3	91	0.00	0.30	-	-	-	-	663
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**1 550**	**-**	**-**	**0.25**	**67**	**1 400**	**143**	**15**	**-**	**3 190**
a. Mineral Products	**898**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**898**
Cement Production	x	-	-	-	-	-	-	-	-	x
Lime Production	x	-	-	-	-	-	-	-	-	x
Mineral Products Use	19	-	-	-	-	-	-	-	-	19
b. Chemical Industry[e]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**230**	**-**	**-**	**-**	**-**	**-**	**139**	**0.09**	**-**	**369**
Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
Aluminium Production	230	-	-	-	-	-	139	0.09	-	369
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	0.01	-	0.01
d. Production and Consumption of Halocarbons, SF_6 and NF_3[f]	**-**	**-**	**-**	**-**	**-**	**1 400**	**2**	**4**	**-**	**1 400**
e. Non-Energy Products from Fuels and Solvent Use[e]	**420**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**420**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.25**	**67**	**-**	**2**	**10**	**-**	**79**
AGRICULTURE	**36**	**63**	**1 800**	**2**	**420**	**-**	**-**	**-**	**-**	**2 200**
a. Enteric Fermentation	**-**	**56**	**1 600**	**-**	**-**	**-**	**-**	**-**	**-**	**1 600**
b. Manure Management	**-**	**7**	**200**	**0.80**	**200**	**-**	**-**	**-**	**-**	**400**
c. Agricultural Soils	**-**	**-**	**-**	**0.83**	**220**	**-**	**-**	**-**	**-**	**220**
Direct Sources	-	-	-	0.52	140	-	-	-	-	140
Indirect Sources	-	-	-	0.30	80	-	-	-	-	80
d. Field Burning of Agricultural Residues	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**36**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**36**
WASTE	**0.10**	**57**	**1 600**	**0.80**	**200**	**-**	**-**	**-**	**-**	**1 800**
a. Solid Waste Disposal (Landfills)	**-**	**40**	**1 000**	**-**	**-**	**-**	**-**	**-**	**-**	**1 000**
b. Biological Treatment of Solid Waste	**-**	**2**	**50**	**0.20**	**50**	**-**	**-**	**-**	**-**	**100**
c. Wastewater Treatment and Discharge	**-**	**4**	**100**	**0.65**	**170**	**-**	**-**	**-**	**-**	**300**
d. Incineration and Open Burning of Waste	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Industrial Wood Waste Landfills	**-**	**10**	**300**	**-**	**-**	**-**	**-**	**-**	**-**	**300**
LAND USE, LAND-USE CHANGE AND FORESTRY	**21 000**	**11**	**310**	**0.47**	**120**	**-**	**-**	**-**	**-**	**21 000**
a. Forest Land	**-23000**	**10**	**300**	**0.40**	**100**	**-**	**-**	**-**	**-**	**-22000**
b. Cropland	**500**	**0.48**	**13**	**0.02**	**5**	**-**	**-**	**-**	**-**	**520**
c. Grassland	**-**	**0.00**	**0.09**	**0.00**	**0.02**	**-**	**-**	**-**	**-**	**0.10**
d. Wetlands	**47**	**0.02**	**0.51**	**0.00**	**0.02**	**-**	**-**	**-**	**-**	**47**
e. Settlements	**-150**	**0.79**	**22**	**0.03**	**9**	**-**	**-**	**-**	**-**	**-120**
f. Harvested Wood Products[g]	**43 000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**43 000**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Chapter 1, Table 1-1 of this report provides a list of global warming potentials (GWPs) used.

c. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

d. Emission estimates for this source are currently under review and upward revisions to CH_4 emissions in the years prior to 2020 are anticipated in the 2025 edition of this report, pending further data collection and analysis.

e. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

f. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

g. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–22 **GHG Emission Summary for Yukon, Selected Years**

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	kt CO_2 eq							
TOTAL[a]	**550**	**564**	**564**	**644**	**691**	**597**	**651**	**662**
ENERGY	**527**	**531**	**513**	**590**	**635**	**540**	**593**	**605**
a. Stationary Combustion Sources	**218**	**193**	**68**	**86**	**107**	**106**	**94**	**85**
Public Electricity and Heat Production	90	22	24	33	48	54	42	39
Petroleum Refining Industries	-	-	-	-	-	-	-	-
Oil and Gas Extraction	0.31	67	-	-	-	-	-	-
Mining	8	x	x	x	14	8	6	6
Manufacturing Industries	6	-	16	16	17	16	17	18
Construction	4	x	x	x	1	1	1	0.62
Commercial and Institutional	77	41	17	23	19	19	21	18
Residential	32	45	6	6	7	9	6	5
Agriculture and Forestry	1	8	-	0.83	-	-	-	-
b. Transport[b]	**309**	**327**	**445**	**504**	**528**	**433**	**499**	**520**
Aviation	35	36	48	54	54	26	33	47
Road Transportation	173	198	271	287	296	265	277	285
Light-Duty Gasoline Vehicles	28	19	23	24	25	22	18	18
Light-Duty Gasoline Trucks	83	87	128	145	154	146	131	143
Heavy-Duty Gasoline Vehicles	14	10	14	16	19	14	12	11
Motorcycles	0.31	0.56	1	2	2	2	2	2
Light-Duty Diesel Vehicles	0.15	0.26	0.32	0.26	0.23	0.27	0.32	0.52
Light-Duty Diesel Trucks	2	1	2	2	2	3	4	8
Heavy-Duty Diesel Vehicles	46	79	103	98	94	79	110	103
Propane and Natural Gas Vehicles	-	-	0.25	0.16	0.21	-	-	-
Railways	-	-	-	-	-	-	-	-
Marine	2	3	0.52	0.46	3	4	4	4
Other Transportation	99	90	126	163	175	138	184	183
Off-Road Agriculture and Forestry	7	3	8	10	10	9	12	12
Off-Road Commercial and Institutional	4	9	7	10	13	8	11	12
Off-Road Manufacturing, Mining and Construction	79	54	92	119	117	98	136	134
Off-Road Residential	0.35	x	x	x	2	2	2	1
Off-Road Other Transportation	9	23	17	23	33	21	23	24
Pipeline Transport	-	x	x	x	-	-	-	-
c. Fugitive Sources	**0.11**	**11**	**0.16**	**0.21**	**0.31**	**0.26**	**0.19**	**0.20**
Coal Mining	-	-	-	-	-	-	-	-
Oil and Natural Gas	0.11	11	0.16	0.21	0.31	0.26	0.20	0.20
Oil	-	-	-	-	-	-	-	-
Natural Gas	0.11	3	0.16	0.21	0.31	0.26	0.20	0.20
Venting	-	7	-	-	-	-	-	-
Flaring	-	1	-	-	-	-	-	-
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**2**	**8**	**20**	**22**	**23**	**24**	**24**	**22**
a. Mineral Products	**0.11**	**0.01**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**
Cement Production	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-
Mineral Products Use	0.11	0.01	0.00	0.00	0.00	0.01	0.00	0.00
b. Chemical Industry[c]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[d]	**-**	**7**	**18**	**21**	**21**	**21**	**20**	**20**
e. Non-Energy Products from Fuels and Solvent Use[c]	**2**	**0.39**	**0.35**	**0.50**	**0.99**	**2**	**2**	**2**
f. Other Product Manufacture and Use	**0.15**	**0.33**	**0.98**	**1**	**2**	**2**	**3**	**0.56**
AGRICULTURE	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
a. Enteric Fermentation	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
b. Manure Management	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Agricultural Soils	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Direct Sources	-	-	-	-	-	-	-	-
Indirect Sources	-	-	-	-	-	-	-	-
d. Field Burning of Agricultural Residues	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE	**20**	**25**	**32**	**33**	**33**	**34**	**34**	**35**
a. Solid Waste Disposal (Landfills)	**20**	**20**	**30**	**30**	**30**	**30**	**30**	**30**
b. Biological Treatment of Solid Waste	**0.01**	**0.10**	**0.20**	**0.40**	**0.40**	**0.40**	**0.50**	**0.50**
c. Wastewater Treatment and Discharge	**5**	**5**	**7**	**7**	**7**	**7**	**7**	**7**
d. Incineration and Open Burning of Waste	**-**	**0.02**	**-**	**-**	**-**	**-**	**-**	**-**
e. Industrial Wood Waste Landfills	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
LAND USE, LAND-USE CHANGE AND FORESTRY	**-4300**	**-4200**	**-4400**	**-4400**	**-4400**	**-4400**	**-4400**	**-4400**
a. Forest Land	**-4400**	**-4300**	**-4400**	**-4400**	**-4400**	**-4400**	**-4400**	**-4400**
b. Cropland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Settlements	**28**	**19**	**11**	**10**	**9**	**9**	**9**	**8**
f. Harvested Wood Products[e]	**46**	**42**	**21**	**13**	**13**	**19**	**18**	**18**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

c. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

d. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990−1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

e. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–23 **2022 GHG Emission Summary for Yukon**

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[a]	PFCs[a]	SF_6	NF_3	TOTAL
Global Warming Potential			28		265			23 500	16 100	
Unit	kt	kt	kt CO_2 eq	kt	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq
TOTAL[b]	**598**	**1**	**36**	**0.03**	**8**	**20**	**0.01**	**-**	**-**	**662**
ENERGY	**596**	**0.09**	**3**	**0.03**	**7**	**-**	**-**	**-**	**-**	**605**
a. Stationary Combustion Sources	**84**	**0.02**	**0.60**	**0.00**	**0.60**	**-**	**-**	**-**	**-**	**85**
Public Electricity and Heat Production	38	0.00	0.09	0.00	0.10	-	-	-	-	39
Petroleum Refining Industries	-	-	-	-	-	-	-	-	-	-
Oil and Gas Extraction	-	-	-	-	-	-	-	-	-	-
Mining	5	0.00	0.00	0.00	0.10	-	-	-	-	6
Manufacturing Industries	18	0.00	0.00	0.00	0.05	-	-	-	-	18
Construction	0.61	0.00	0.00	0.00	0.01	-	-	-	-	0.62
Commercial and Institutional	18	0.00	0.01	0.00	0.20	-	-	-	-	18
Residential	4	0.02	0.50	0.00	0.20	-	-	-	-	5
Agriculture and Forestry	-	-	-	-	-	-	-	-	-	-
b. Transport[c]	**512**	**0.06**	**2**	**0.02**	**6**	**-**	**-**	**-**	**-**	**520**
Aviation	47	0.00	0.05	0.00	0.40	-	-	-	-	47
Road Transportation	282	0.01	0.40	0.01	3	-	-	-	-	285
Light-Duty Gasoline Vehicles	18	0.00	0.03	0.00	0.13	-	-	-	-	18
Light-Duty Gasoline Trucks	142	0.01	0.20	0.00	0.87	-	-	-	-	143
Heavy-Duty Gasoline Vehicles	11	0.00	0.01	0.00	0.24	-	-	-	-	11
Motorcycles	2	0.00	0.02	0.00	0.01	-	-	-	-	2
Light-Duty Diesel Vehicles	0.51	0.00	0.00	0.00	0.01	-	-	-	-	0.52
Light-Duty Diesel Trucks	8	0.00	0.01	0.00	0.17	-	-	-	-	8
Heavy-Duty Diesel Vehicles	101	0.00	0.10	0.01	2	-	-	-	-	103
Propane and Natural Gas Vehicles	-	-	-	-	-	-	-	-	-	-
Railways	-	-	-	-	-	-	-	-	-	-
Marine	4	0.00	0.01	0.00	0.03	-	-	-	-	4
Other Transportation	179	0.04	1	0.01	3	-	-	-	-	183
Off-Road Agriculture and Forestry	12	0.00	0.01	0.00	0.20	-	-	-	-	12
Off-Road Commercial and Institutional	11	0.01	0.14	0.00	0.10	-	-	-	-	12
Off-Road Manufacturing, Mining and Construction	132	0.01	0.19	0.01	2	-	-	-	-	134
Off-Road Residential	1	0.00	0.10	0.00	0.01	-	-	-	-	1
Off-Road Other Transportation	23	0.03	0.79	0.00	0.20	-	-	-	-	24
Pipeline Transport	-	-	-	-	-	-	-	-	-	-
c. Fugitive Sources	**-**	**0.01**	**0.20**	**-**	**-**	**-**	**-**	**-**	**-**	**0.20**
Coal Mining	-	-	-	-	-	-	-	-	-	-
Oil and Natural Gas	-	0.01	0.20	-	-	-	-	-	-	0.20
Oil	-	-	-	-	-	-	-	-	-	-
Natural Gas	-	0.01	0.20	-	-	-	-	-	-	0.20
Venting	-	-	-	-	-	-	-	-	-	-
Flaring	-	-	-	-	-	-	-	-	-	-
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**2**	**-**	**-**	**0.00**	**0.56**	**20**	**0.01**	**-**	**-**	**22**
a. Mineral Products	**0.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.00**
Cement Production	-	-	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-	-	-
Mineral Products Use	0.00	-	-	-	-	-	-	-	-	0.00
b. Chemical Industry[d]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[e]	**-**	**-**	**-**	**-**	**-**	**20**	**0.01**	**-**	**-**	**20**
e. Non-Energy Products from Fuels and Solvent Use[d]	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.00**	**0.56**	**-**	**-**	**-**	**-**	**0.56**
AGRICULTURE	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
a. Enteric Fermentation	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
b. Manure Management	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Agricultural Soils	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Direct Sources	-	-	-	-	-	-	-	-	-	-
Indirect Sources	-	-	-	-	-	-	-	-	-	-
d. Field Burning of Agricultural Residues	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE	**-**	**1**	**34**	**0.00**	**1**	**-**	**-**	**-**	**-**	**35**
a. Solid Waste Disposal (Landfills)	**-**	**1**	**30**	**-**	**-**	**-**	**-**	**-**	**-**	**30**
b. Biological Treatment of Solid Waste	**-**	**0.01**	**0.20**	**0.00**	**0.20**	**-**	**-**	**-**	**-**	**0.50**
c. Wastewater Treatment and Discharge	**-**	**0.20**	**6**	**0.00**	**0.73**	**-**	**-**	**-**	**-**	**7**
d. Incineration and Open Burning of Waste	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Industrial Wood Waste Landfills	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
LAND USE, LAND-USE CHANGE AND FORESTRY	**-4400**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-4400**
a. Forest Land	**-4400**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-4400**
b. Cropland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Settlements	**8**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8**
f. Harvested Wood Products[f]	**18**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**18**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Chapter 1, Table 1-1 of this report provides a list of global warming potentials (GWPs) used.

c. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

d. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

e. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

f. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.

Table A11–24 GHG Emission Summary for Northwest Territories, Selected Years

Greenhouse Gas Categories	1999	2005	2017	2018	2019	2020	2021	2022
	kt CO_2 eq							
TOTAL[a]	**1 260**	**1 730**	**1 410**	**1 420**	**1 420**	**1 210**	**1 280**	**1 350**
ENERGY	**1 220**	**1 670**	**1 340**	**1 350**	**1 350**	**1 140**	**1 210**	**1 280**
a. Stationary Combustion Sources	**598**	**721**	**373**	**388**	**420**	**366**	**399**	**443**
Public Electricity and Heat Production	88	x	x	x	x	x	x	x
Petroleum Refining Industries	-	-	-	-	-	-	-	-
Oil and Gas Extraction	128	215	13	11	57	43	49	56
Mining	104	164	198	201	192	153	183	207
Manufacturing Industries	-	x	x	x	x	x	x	x
Construction	0.83	x	x	x	x	x	x	x
Commercial and Institutional	192	141	50	51	54	58	62	67
Residential	85	102	48	57	57	50	47	54
Agriculture and Forestry	0.02	2	-	-	-	-	-	-
b. Transport[b]	**603**	**929**	**959**	**959**	**912**	**765**	**800**	**828**
Aviation	131	182	136	152	147	102	115	131
Road Transportation	118	502	603	552	501	374	417	430
Light-Duty Gasoline Vehicles	14	14	16	13	14	11	10	9
Light-Duty Gasoline Trucks	52	66	85	78	82	71	72	73
Heavy-Duty Gasoline Vehicles	5	7	8	7	8	7	7	8
Motorcycles	0.24	0.43	1	1	1	0.92	0.96	0.78
Light-Duty Diesel Vehicles	0.11	0.47	2	2	1	1	2	2
Light-Duty Diesel Trucks	2	6	11	9	9	10	12	15
Heavy-Duty Diesel Vehicles	45	408	480	441	386	273	314	323
Propane and Natural Gas Vehicles	-	-	0.05	0.07	0.09	0.07	-	-
Railways	2	4	0.55	0.40	0.25	0.40	0.39	0.39
Marine	24	34	6	4	7	9	10	10
Other Transportation	329	208	214	250	257	280	258	257
Off-Road Agriculture and Forestry	2	1	1	2	2	2	2	2
Off-Road Commercial and Institutional	7	6	6	7	8	8	8	8
Off-Road Manufacturing, Mining and Construction	295	177	179	212	212	234	211	210
Off-Road Residential	0.88	1	1	1	1	1	1	1
Off-Road Other Transportation	20	20	26	29	34	35	35	35
Pipeline Transport	4	3	0.27	0.27	0.27	0.54	0.54	0.54
c. Fugitive Sources	**18**	**22**	**6**	**7**	**16**	**13**	**13**	**14**
Coal Mining	-	-	-	-	-	-	-	-
Oil and Natural Gas	18	23	6	7	16	13	13	14
Oil	2	4	1	1	2	2	2	2
Natural Gas	7	8	4	4	6	5	6	6
Venting	4	4	0.08	0.38	2	1	1	1
Flaring	4	7	0.83	1	7	5	5	5
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**10**	**23**	**30**	**31**	**32**	**31**	**30**	**28**
a. Mineral Products	**0.01**	**0.15**	**0.01**	**0.01**	**0.02**	**0.02**	**0.02**	**0.03**
Cement Production	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-
Mineral Products Use	0.01	0.15	0.01	0.01	0.02	0.02	0.02	0.03
b. Chemical Industry[c]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[d]	**5**	**15**	**26**	**29**	**29**	**28**	**25**	**24**
e. Non-Energy Products from Fuels and Solvent Use[c]	**4**	**7**	**3**	**2**	**3**	**3**	**3**	**3**
f. Other Product Manufacture and Use	**0.46**	**0.45**	**0.52**	**0.56**	**0.55**	**0.62**	**0.58**	**1**
AGRICULTURE	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
a. Enteric Fermentation	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
b. Manure Management	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Agricultural Soils	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Direct Sources	-	-	-	-	-	-	-	-
Indirect Sources	-	-	-	-	-	-	-	-
d. Field Burning of Agricultural Residues	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE	**30**	**31**	**38**	**38**	**39**	**39**	**40**	**40**
a. Solid Waste Disposal (Landfills)	**30**	**30**	**30**	**30**	**40**	**40**	**40**	**40**
b. Biological Treatment of Solid Waste	**-**	**-**	**0.06**	**0.06**	**0.09**	**0.07**	**0.10**	**0.10**
c. Wastewater Treatment and Discharge	**3**	**3**	**4**	**4**	**4**	**4**	**4**	**4**
d. Incineration and Open Burning of Waste	**0.19**	**0.00**	**-**	**-**	**-**	**-**	**-**	**-**
e. Industrial Wood Waste Landfills	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
LAND USE, LAND-USE CHANGE AND FORESTRY	**- 710**	**- 670**	**-1 900**	**-2 000**	**-2 200**	**-2 400**	**-2 500**	**-2 600**
a. Forest Land	**- 830**	**- 710**	**-1 900**	**-2 000**	**-2 200**	**-2 400**	**-2 600**	**-2 600**
b. Cropland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Settlements	**52**	**14**	**14**	**12**	**10**	**9**	**9**	**8**
f. Harvested Wood Products[e]	**68**	**29**	**34**	**31**	**33**	**31**	**31**	**31**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

c. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

d. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990−1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

e. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–25 **2022 GHG Emission Summary for Northwest Territories**

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[a]	PFCs[a]	SF_6	NF_3	TOTAL
Global Warming Potential			28		265			23 500	16 100	
Unit	kt	kt	kt CO_2 eq	kt	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq
TOTAL[b]	**1 260**	**2**	**57**	**0.05**	**14**	**24**	**0.01**	**0.62**	**-**	**1 350**
ENERGY	**1 250**	**0.60**	**17**	**0.05**	**10**	**-**	**-**	**-**	**-**	**1 280**
a. Stationary Combustion Sources	**435**	**0.20**	**5**	**0.01**	**2**	**-**	**-**	**-**	**-**	**443**
Public Electricity and Heat Production	x	x	x	x	x	x	x	x	x	x
Petroleum Refining Industries	-	-	-	-	-	-	-	-	-	-
Oil and Gas Extraction	52	0.10	4	0.00	0.30	-	-	-	-	56
Mining	206	0.01	0.20	0.00	0.80	-	-	-	-	207
Manufacturing Industries	x	x	x	x	x	x	x	x	x	x
Construction	x	x	x	x	x	x	x	x	x	x
Commercial and Institutional	66	0.00	0.02	0.00	0.60	-	-	-	-	67
Residential	52	0.05	1	0.00	0.50	-	-	-	-	54
Agriculture and Forestry	-	-	-	-	-	-	-	-	-	-
b. Transport[c]	**815**	**0.09**	**3**	**0.04**	**11**	**-**	**-**	**-**	**-**	**828**
Aviation	129	0.01	0.30	0.00	1	-	-	-	-	131
Road Transportation	424	0.02	0.50	0.02	6	-	-	-	-	430
Light-Duty Gasoline Vehicles	9	0.00	0.02	0.00	0.07	-	-	-	-	9
Light-Duty Gasoline Trucks	72	0.00	0.10	0.00	0.44	-	-	-	-	73
Heavy-Duty Gasoline Vehicles	8	0.00	0.01	0.00	0.17	-	-	-	-	8
Motorcycles	0.77	0.00	0.01	0.00	0.00	-	-	-	-	0.78
Light-Duty Diesel Vehicles	2	0.00	0.00	0.00	0.04	-	-	-	-	2
Light-Duty Diesel Trucks	15	0.00	0.01	0.00	0.33	-	-	-	-	15
Heavy-Duty Diesel Vehicles	318	0.01	0.40	0.02	5	-	-	-	-	323
Propane and Natural Gas Vehicles	-	-	-	-	-	-	-	-	-	-
Railways	0.35	0.00	0.00	0.00	0.04	-	-	-	-	0.39
Marine	9	0.00	0.03	0.00	0.07	-	-	-	-	10
Other Transportation	252	0.06	2	0.01	4	-	-	-	-	257
Off-Road Agriculture and Forestry	2	0.00	0.00	0.00	0.03	-	-	-	-	2
Off-Road Commercial and Institutional	8	0.01	0.20	0.00	0.09	-	-	-	-	8
Off-Road Manufacturing, Mining and Construction	207	0.01	0.34	0.01	3	-	-	-	-	210
Off-Road Residential	0.99	0.00	0.07	0.00	0.01	-	-	-	-	1
Off-Road Other Transportation	34	0.04	1	0.00	0.40	-	-	-	-	35
Pipeline Transport	0.54	0.00	0.00	0.00	0.00	-	-	-	-	0.54
c. Fugitive Sources	**5**	**0.32**	**9**	**0.00**	**0.00**	**-**	**-**	**-**	**-**	**14**
Coal Mining	-	-	-	-	-	-	-	-	-	-
Oil and Natural Gas	5	0.32	9	0.00	0.00	-	-	-	-	14
Oil	0.00	0.06	2	-	-	-	-	-	-	2
Natural Gas	0.00	0.20	6	-	-	-	-	-	-	6
Venting	0.00	0.05	1	-	-	-	-	-	-	1
Flaring	5	0.01	0.24	0.00	0.00	-	-	-	-	5
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**3**	**-**	**-**	**0.00**	**0.59**	**24**	**0.01**	**0.62**	**-**	**28**
a. Mineral Products	**0.03**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.03**
Cement Production	-	-	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-	-	-
Mineral Products Use	0.03	-	-	-	-	-	-	-	-	0.03
b. Chemical Industry[d]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[e]	**-**	**-**	**-**	**-**	**-**	**24**	**0.01**	**-**	**-**	**24**
e. Non-Energy Products from Fuels and Solvent Use[d]	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.00**	**0.59**	**-**	**-**	**0.62**	**-**	**1**
AGRICULTURE	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
a. Enteric Fermentation	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
b. Manure Management	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Agricultural Soils	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Direct Sources	-	-	-	-	-	-	-	-	-	-
Indirect Sources	-	-	-	-	-	-	-	-	-	-
d. Field Burning of Agricultural Residues	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE	**0.00**	**1**	**40**	**0.00**	**0.60**	**-**	**-**	**-**	**-**	**40**
a. Solid Waste Disposal (Landfills)	**-**	**1**	**40**	**-**	**-**	**-**	**-**	**-**	**-**	**40**
b. Biological Treatment of Solid Waste	**-**	**0.00**	**0.05**	**0.00**	**0.05**	**-**	**-**	**-**	**-**	**0.10**
c. Wastewater Treatment and Discharge	**-**	**0.10**	**3**	**0.00**	**0.53**	**-**	**-**	**-**	**-**	**4**
d. Incineration and Open Burning of Waste	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Industrial Wood Waste Landfills	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
LAND USE, LAND-USE CHANGE AND FORESTRY	**-2600**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-2600**
a. Forest Land	**-2600**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-2600**
b. Cropland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Settlements	**8**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8**
f. Harvested Wood Products[f]	**31**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**31**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Chapter 1, Table 1-1 of this report provides a list of global warming potentials (GWPs) used.

c. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

d. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

e. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

f. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–26 **GHG Emission Summary for Nunavut, Selected Years**

Greenhouse Gas Categories	1999	2005	2017	2018	2019	2020	2021	2022
	kt CO_2 eq							
TOTAL[a]	**417**	**585**	**742**	**736**	**754**	**591**	**628**	**617**
ENERGY	**392**	**554**	**694**	**684**	**700**	**537**	**575**	**564**
a. Stationary Combustion Sources	**104**	**128**	**137**	**164**	**162**	**149**	**155**	**150**
Public Electricity and Heat Production	17	x	x	x	x	x	x	x
Petroleum Refining Industries	-	-	-	-	-	-	-	-
Oil and Gas Extraction	-	-	-	-	-	-	-	-
Mining	87	0.26	-	-	-	-	-	-
Manufacturing Industries	-	x	x	x	x	x	x	x
Construction	-	-	-	-	-	-	-	-
Commercial and Institutional	-	x	-	-	-	-	-	-
Residential	-	-	-	-	-	-	-	-
Agriculture and Forestry	-	-	-	-	-	-	-	-
b. Transport[b]	**289**	**427**	**557**	**520**	**538**	**387**	**420**	**414**
Aviation	112	141	147	171	168	135	157	150
Road Transportation	15	37	71	59	56	44	48	51
Light-Duty Gasoline Vehicles	1	3	5	4	4	3	4	4
Light-Duty Gasoline Trucks	5	12	29	25	25	22	26	28
Heavy-Duty Gasoline Vehicles	0.92	1	2	2	2	2	2	2
Motorcycles	0.01	0.04	0.15	0.14	0.14	0.12	0.15	0.13
Light-Duty Diesel Vehicles	-	0.07	0.08	0.06	0.04	0.04	0.01	0.01
Light-Duty Diesel Trucks	0.30	0.37	0.44	0.31	0.30	0.36	0.41	0.48
Heavy-Duty Diesel Vehicles	7	20	34	27	24	17	16	16
Propane and Natural Gas Vehicles	-	-	-	-	-	-	-	-
Railways	-	-	-	-	-	-	-	-
Marine	142	130	113	107	148	88	91	91
Other Transportation	19	119	227	184	166	120	123	123
Off-Road Agriculture and Forestry	-	-	-	-	-	-	-	-
Off-Road Commercial and Institutional	0.93	4	9	8	7	6	6	6
Off-Road Manufacturing, Mining and Construction	13	100	174	139	124	85	85	84
Off-Road Residential	0.51	1	2	1	1	1	2	1
Off-Road Other Transportation	5	14	42	35	33	28	31	31
Pipeline Transport	-	-	-	-	-	-	-	-
c. Fugitive Sources	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Coal Mining	-	-	-	-	-	-	-	-
Oil and Natural Gas	-	-	-	-	-	-	-	-
Oil	-	-	-	-	-	-	-	-
Natural Gas	-	-	-	-	-	-	-	-
Venting	-	-	-	-	-	-	-	-
Flaring	-	-	-	-	-	-	-	-
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**6**	**10**	**19**	**22**	**24**	**23**	**20**	**20**
a. Mineral Products	**0.01**	**0.15**	**0.01**	**0.01**	**0.02**	**0.02**	**0.02**	**0.03**
Cement Production	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-
Mineral Products Use	0.01	0.15	0.01	0.01	0.02	0.02	0.02	0.03
b. Chemical Industry[c]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[d]	**5**	**9**	**18**	**21**	**22**	**22**	**20**	**18**
e. Non-Energy Products from Fuels and Solvent Use[c]	**0.35**	**0.40**	**0.49**	**0.61**	**0.49**	**0.62**	**0.09**	**0.64**
f. Other Product Manufacture and Use	**0.31**	**0.32**	**0.44**	**0.47**	**0.47**	**0.49**	**0.51**	**0.51**
AGRICULTURE	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
a. Enteric Fermentation	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
b. Manure Management	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Agricultural Soils	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Direct Sources	-	-	-	-	-	-	-	-
Indirect Sources	-	-	-	-	-	-	-	-
d. Field Burning of Agricultural Residues	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE	**18**	**21**	**29**	**30**	**31**	**32**	**32**	**33**
a. Solid Waste Disposal (Landfills)	**20**	**20**	**30**	**30**	**30**	**30**	**30**	**30**
b. Biological Treatment of Solid Waste	**-**	**-**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
c. Wastewater Treatment and Discharge	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
d. Incineration and Open Burning of Waste	**-**	**0.06**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.09**
e. Industrial Wood Waste Landfills	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
LAND USE, LAND-USE CHANGE AND FORESTRY	**0.16**	**0.09**	**0.09**	**0.09**	**0.09**	**0**	**0**	**0**
a. Forest Land	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
b. Cropland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Settlements	**0.16**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**
f. Harvested Wood Products[e]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

c. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

d. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990−1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

e. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–27 **2022 GHG Emission Summary for Nunavut**

Greenhouse Gas Categories	Greenhouse Gases									
	CO_2	CH_4	CH_4	N_2O	N_2O	HFCs[a]	PFCs[a]	SF_6	NF_3	TOTAL
Global Warming Potential			28		265			23 500	16 100	
Unit	kt	kt	kt CO_2 eq	kt	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq	kt CO_2 eq
TOTAL[b]	**558**	**1**	**35**	**0.02**	**5**	**18**	**0.01**	**-**	**-**	**617**
ENERGY	**558**	**0.08**	**2**	**0.02**	**4**	**-**	**-**	**-**	**-**	**564**
a. Stationary Combustion Sources	**149**	**0.00**	**0.10**	**0.00**	**0.30**	**-**	**-**	**-**	**-**	**150**
Public Electricity and Heat Production	x	x	x	x	x	x	x	x	x	x
Petroleum Refining Industries	-	-	-	-	-	-	-	-	-	-
Oil and Gas Extraction	-	-	-	-	-	-	-	-	-	-
Mining	-	-	-	-	-	-	-	-	-	-
Manufacturing Industries	x	x	x	x	x	x	x	x	x	x
Construction	-	-	-	-	-	-	-	-	-	-
Commercial and Institutional	-	-	-	-	-	-	-	-	-	-
Residential	-	-	-	-	-	-	-	-	-	-
Agriculture and Forestry	-	-	-	-	-	-	-	-	-	-
b. Transport[c]	**408**	**0.07**	**2**	**0.01**	**4**	**-**	**-**	**-**	**-**	**414**
Aviation	149	0.00	0.06	0.00	1	-	-	-	-	150
Road Transportation	50	0.00	0.07	0.00	0.49	-	-	-	-	51
Light-Duty Gasoline Vehicles	4	0.00	0.01	0.00	0.03	-	-	-	-	4
Light-Duty Gasoline Trucks	28	0.00	0.05	0.00	0.17	-	-	-	-	28
Heavy-Duty Gasoline Vehicles	2	0.00	0.00	0.00	0.04	-	-	-	-	2
Motorcycles	0.13	0.00	0.00	0.00	0.00	-	-	-	-	0.13
Light-Duty Diesel Vehicles	0.01	0.00	0.00	0.00	0.00	-	-	-	-	0.01
Light-Duty Diesel Trucks	0.47	0.00	0.00	0.00	0.01	-	-	-	-	0.48
Heavy-Duty Diesel Vehicles	16	0.00	0.02	0.00	0.24	-	-	-	-	16
Propane and Natural Gas Vehicles	-	-	-	-	-	-	-	-	-	-
Railways	-	-	-	-	-	-	-	-	-	-
Marine	90	0.01	0.23	0.00	0.60	-	-	-	-	91
Other Transportation	119	0.06	2	0.01	2	-	-	-	-	123
Off-Road Agriculture and Forestry	-	-	-	-	-	-	-	-	-	-
Off-Road Commercial and Institutional	6	0.01	0.20	0.00	0.06	-	-	-	-	6
Off-Road Manufacturing, Mining and Construction	83	0.01	0.15	0.01	1	-	-	-	-	84
Off-Road Residential	1	0.00	0.10	0.00	0.01	-	-	-	-	1
Off-Road Other Transportation	29	0.04	1	0.00	0.30	-	-	-	-	31
Pipeline Transport	-	-	-	-	-	-	-	-	-	-
c. Fugitive Sources	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Coal Mining	-	-	-	-	-	-	-	-	-	-
Oil and Natural Gas	-	-	-	-	-	-	-	-	-	-
Oil	-	-	-	-	-	-	-	-	-	-
Natural Gas	-	-	-	-	-	-	-	-	-	-
Venting	-	-	-	-	-	-	-	-	-	-
Flaring	-	-	-	-	-	-	-	-	-	-
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**0.66**	**-**	**-**	**0.00**	**0.51**	**18**	**0.01**	**-**	**-**	**20**
a. Mineral Products	**0.03**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.03**
Cement Production	-	-	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-	-	-
Mineral Products Use	0.03	-	-	-	-	-	-	-	-	0.03
b. Chemical Industry[d]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[e]	**-**	**-**	**-**	**-**	**-**	**18**	**0.01**	**-**	**-**	**18**
e. Non-Energy Products from Fuels and Solvent Use[d]	**0.64**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.64**
f. Other Product Manufacture and Use	**-**	**-**	**-**	**0.00**	**0.51**	**-**	**-**	**-**	**-**	**0.51**
AGRICULTURE	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
a. Enteric Fermentation	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
b. Manure Management	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Agricultural Soils	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Direct Sources	-	-	-	-	-	-	-	-	-	-
Indirect Sources	-	-	-	-	-	-	-	-	-	-
d. Field Burning of Agricultural Residues	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE	**0.08**	**1**	**33**	**0.00**	**0.40**	**-**	**-**	**-**	**-**	**33**
a. Solid Waste Disposal (Landfills)	**-**	**1**	**30**	**-**	**-**	**-**	**-**	**-**	**-**	**30**
b. Biological Treatment of Solid Waste	**-**	**0.00**	**0.00**	**0.00**	**0.00**	**-**	**-**	**-**	**-**	**0.00**
c. Wastewater Treatment and Discharge	**-**	**0.06**	**2**	**0.00**	**0.40**	**-**	**-**	**-**	**-**	**2**
d. Incineration and Open Burning of Waste	**0.08**	**0.00**	**0.00**	**0.00**	**0.00**	**-**	**-**	**-**	**-**	**0.09**
e. Industrial Wood Waste Landfills	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
LAND USE, LAND-USE CHANGE AND FORESTRY	**0.09**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.09**
a. Forest Land	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
b. Cropland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Settlements	**0.09**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.09**
f. Harvested Wood Products[f]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Chapter 1, Table 1-1 of this report provides a list of global warming potentials (GWPs) used.

c. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

d. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

e. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990–1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

f. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.
x Indicates data has been suppressed to respect confidentiality.

Table A11–28 GHG Emission Summary for Northwest Territories and Nunavut, 1990–1998

Greenhouse Gas Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt CO_2 eq								
TOTAL[a]	**1 790**	**1 760**	**1 580**	**1 880**	**2 050**	**2 110**	**2 120**	**1 940**	**1 760**
ENERGY	**1 740**	**1 710**	**1 530**	**1 810**	**1 900**	**1 970**	**2 070**	**1 880**	**1 700**
a. Stationary Combustion Sources	**917**	**986**	**849**	**947**	**1 010**	**1 150**	**1 020**	**970**	**729**
Public Electricity and Heat Production	156	156	126	137	139	155	118	129	173
Petroleum Refining Industries	8	6	7	5	12	11	4	-	-
Oil and Gas Extraction	277	196	112	137	135	140	150	130	126
Mining	36	42	18	36	109	212	150	158	132
Manufacturing Industries	26	16	18	8	14	20	-	-	-
Construction	6	5	6	3	4	21	0.68	0.70	0.53
Commercial and Institutional	250	367	357	389	401	473	405	370	207
Residential	156	188	192	230	190	118	196	181	90
Agriculture and Forestry	2	9	12	2	2	0.01	-	0.01	0.02
b. Transport[b]	**727**	**614**	**590**	**764**	**821**	**756**	**982**	**896**	**956**
Aviation	257	228	231	264	265	243	266	256	242
Road Transportation	104	97	97	125	133	113	137	133	131
Light-Duty Gasoline Vehicles	15	14	15	21	22	15	22	19	17
Light-Duty Gasoline Trucks	43	41	41	59	63	44	69	62	59
Heavy-Duty Gasoline Vehicles	6	6	6	8	8	6	8	7	7
Motorcycles	0.17	0.16	0.16	0.24	0.27	0.19	0.27	0.23	0.21
Light-Duty Diesel Vehicles	0.13	0.11	0.10	0.10	0.10	0.09	0.08	0.08	0.10
Light-Duty Diesel Trucks	2	2	2	2	2	2	2	2	2
Heavy-Duty Diesel Vehicles	38	35	33	34	38	45	36	43	45
Propane and Natural Gas Vehicles	-	-	-	-	-	-	-	-	-
Railways	1	0.49	0.69	0.71	0.82	0.70	0.86	0.79	1
Marine	116	126	137	148	159	170	169	168	166
Other Transportation	249	163	124	226	263	229	410	339	416
Off-Road Agriculture and Forestry	2	1	0.61	1	1	0.91	2	1	2
Off-Road Commercial and Institutional	12	8	8	11	10	11	10	13	9
Off-Road Manufacturing, Mining and Construction	203	130	93	185	220	183	364	285	377
Off-Road Residential	0.40	0.41	0.44	0.75	0.96	0.74	1	1	1
Off-Road Other Transportation	32	23	21	29	30	34	32	38	27
Pipeline Transport	-	-	-	-	2	0.13	0.09	0.04	-
c. Fugitive Sources	**100**	**110**	**92**	**98**	**69**	**69**	**64**	**16**	**14**
Coal Mining	-	-	-	-	-	-	-	-	-
Oil and Natural Gas	101	107	92	98	69	69	64	16	14
Oil	2	2	2	2	3	3	2	2	2
Natural Gas	3	3	3	3	3	3	3	3	3
Venting	6	6	6	6	6	6	5	5	5
Flaring	90	96	82	87	58	58	54	6	4
d. CO_2 Transport and Storage	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
INDUSTRIAL PROCESSES AND PRODUCT USE	**6**	**14**	**5**	**28**	**108**	**91**	**7**	**8**	**10**
a. Mineral Products	**-**	**-**	**-**	**-**	**-**	**0.03**	**0.03**	**0.03**	**0.00**
Cement Production	-	-	-	-	-	-	-	-	-
Lime Production	-	-	-	-	-	-	-	-	-
Mineral Products Use	-	-	-	-	-	0.03	0.03	0.03	0.00
b. Chemical Industry[c]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Adipic Acid Production	-	-	-	-	-	-	-	-	-
c. Metal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel Production	-	-	-	-	-	-	-	-	-
Aluminium Production	-	-	-	-	-	-	-	-	-
SF_6 Used in Magnesium Smelters and Casters	-	-	-	-	-	-	-	-	-
d. Production and Consumption of Halocarbons, SF_6 and NF_3[d]	**-**	**-**	**-**	**-**	**-**	**3**	**5**	**7**	**8**
e. Non-Energy Products from Fuels and Solvent Use[c]	**6**	**14**	**4**	**28**	**110**	**87**	**2**	**0.76**	**1**
f. Other Product Manufacture and Use	**0.33**	**0.32**	**0.29**	**0.28**	**0.32**	**0.38**	**0.42**	**0.43**	**0.60**
AGRICULTURE	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
a. Enteric Fermentation	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
b. Manure Management	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Agricultural Soils	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Direct Sources	-	-	-	-	-	-	-	-	-
Indirect Sources	-	-	-	-	-	-	-	-	-
d. Field Burning of Agricultural Residues	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Liming, Urea Application and Other Carbon-Containing Fertilizers	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE	**38**	**39**	**40**	**41**	**43**	**44**	**45**	**46**	**47**
a. Solid Waste Disposal (Landfills)	**30**	**30**	**40**	**40**	**40**	**40**	**40**	**40**	**40**
b. Biological Treatment of Solid Waste	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Wastewater Treatment and Discharge	**4**	**4**	**4**	**5**	**5**	**5**	**5**	**5**	**5**
d. Incineration and Open Burning of Waste	**0.18**	**0.18**	**0.18**	**0.19**	**0.19**	**0.19**	**0.20**	**0.19**	**0.19**
e. Industrial Wood Waste Landfills	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
LAND USE, LAND-USE CHANGE AND FORESTRY	**-1 700**	**-1 600**	**-1 500**	**-1 300**	**- 430**	**- 520**	**- 660**	**- 970**	**- 940**
a. Forest Land	**-1 800**	**-1 700**	**-1 600**	**-1 400**	**- 590**	**- 650**	**- 820**	**-1 100**	**-1 100**
b. Cropland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
c. Grassland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
d. Wetlands	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
e. Settlements	**69**	**66**	**63**	**61**	**59**	**57**	**55**	**52**	**52**
f. Harvested Wood Products[e]	**23**	**23**	**29**	**98**	**100**	**80**	**110**	**93**	**93**

Notes:
Totals may not add up due to rounding.
Estimates for the latest year (2022) 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.
Provincial and Territorial GHG emissions by Canadian economic sector are provided in Annex 12 of this report.

a. Provincial totals exclude all GHGs from the Land Use, Land-Use Change and Forestry sector.

b. Emissions from ethanol and biodiesel are included in the Transport categories using gasoline and diesel respectively.

c. Emissions from Ammonia Production, Nitric Acid Production and Petrochemical Production categories are included in Non-Energy Products from Fuels and Solvent Use as CO_2 eq values within provincial and territorial tables to protect confidential data.

d. HFC and PFC consumption began in 1995; HFC emissions occurring as a by-product of HCFC production (HCFC-22 exclusively) only occurred in Canada from 1990−1992 and PFC emissions prior to 1995 are the result of by-product CF_4 emissions from the use of NF_3.

e. Due to limitations in historical commodity production data from StatCan, available only at the national level of spatial resolution, it is not possible to differentiate the emissions by province/territory from Harvested Wood Products resulting from forest harvest and forest conversion before 1990. As a result, the national total may not equal the sum of provinces and territories.

0.00 Indicates emissions were truncated due to rounding.
- Indicates no emissions.

ANNEX 12

PROVINCIAL AND TERRITORIAL GREENHOUSE GAS EMISSION TABLES BY CANADIAN ECONOMIC SECTOR, 1990–2022

This annex contains summary tables (Table A12–2 to Table A12–15) illustrating greenhouse gas (GHG) emissions by province and territory, allocated to Canadian economic sectors, from 1990–2022. To account for the creation of Nunavut in 1999, a time series from 1999–2022 is provided for both Northwest Territories and Nunavut (Table A12–13 and Table A12–14), and the years 1990–1998 are presented as a combined region in Table A12–15. In addition, Table A12–1 provides a brief description of each economic sector.

Provincial and territorial GHG emissions allocated to Intergovernmental Panel on Climate Change (IPCC) sectors are provided in Annex 11 of this report.

Reallocating provincial and territorial emissions from IPCC sectors into Canadian economic sectors is useful for the purposes of analyzing trends and policies, as most people associate GHG emissions with a particular economic activity (e.g. producing electricity, farming, or driving a car). This re-allocation simply re-categorizes emissions under different headings but does not change the overall magnitude of the provincial and territorial emission estimates. Estimates for each economic sector include emissions from energy-related and non-energy-related processes.

Although the Modalities, procedures, and guidelines (MPGs) 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.

Provincial and territorial GHG emission tables are also available in electronic file format online at: https://open.canada.ca.

Table A12–1 **Canadian Economic Sector Descriptions**

Economic Sector	Description
OIL AND GAS	
Upstream Oil and Gas	Stationary combustion, onsite transportation, electricity and steam production, fugitive and process emissions from:
Natural Gas Production and Processing	– natural gas production and processing
Conventional Oil Production	Emissions resulting from:
Conventional Light Oil Production	– conventional light crude oil production
Conventional Heavy Oil Production	– conventional heavy crude oil production
Frontier Oil Production	– offshore and arctic production of crude oil
Oil Sands (Mining, In-Situ, Upgrading)	Stationary combustion, onsite transportation, electricity and steam production, fugitive and process emissions from:
Mining and Extraction	– crude bitumen mining and extraction
In-Situ	– in-situ extraction of crude bitumen in designated oil sands areas including primary extraction, cyclic steam stimulation (CSS), steam-assisted gravity drainage (SAGD) and other experimental techniques
Upgrading	– crude bitumen and heavy oil upgrading to synthetic crude oil
Oil, Natural Gas and CO_2 Transmission	Combustion and fugitive emissions from the transport and storage of crude oil and natural gas.
Downstream Oil and Gas	Emissions resulting from:
Petroleum Refining	– stationary combustion, onsite transportation, electricity and steam production, fugitive and process emissions from petroleum refining industries
Natural Gas Distribution	– combustion and fugitive emissions from local distribution of natural gas up to and including the natural gas meter
ELECTRICITY	Combustion and process emissions from utility electricity generation, steam production (for sale) and transmission. Excludes utility owned cogeneration at industrial sites. Includes post-meter, unintentional leaks from natural gas consumption.
TRANSPORT	Mobile related emissions including all fossil fuels and non-CO_2 emission from biofuels. Includes post-meter, unintentional leaks from natural gas powered vehicles.
Passenger Transport	Mobile related combustion, process and refrigerant emissions from the vehicles that primarily move people around.
Cars, Light Trucks and Motorcycles	– light duty cars and trucks and motorcycles with a Gross Vehicle Weight Rating (GVWR) less than 3856 kg
Bus, Rail and Aviation	– all buses and the passenger component of rail and aviation
Freight Transport	Mobile related combustion, process and refrigerant emissions from the vehicles that primarily move cargo or freight around.
Heavy Duty Trucks, Rail	– vehicles with a Gross Vehicle Weight Rating (GVWR) greater than or equal to 3856 kg. Also includes the freight component of rail
Aviation and Marine	– cargo component of aviation and all domestic navigation (inclusive of all fishing and military operations)
Other: Recreational, Commercial and Residential	Combustion emissions from the non-industrial use of off-road engines (e.g., ATVs, snowmobiles, personal watercraft), including portable engines (e.g., generators, lawn mowers, chain saws). Includes post-meter, unintentional leaks from natural gas powered engines.
HEAVY INDUSTRY	Stationary combustion, onsite transportation, electricity and steam production, and process emissions. Includes post-meter, unintentional leaks from natural gas consumption.
Mining	– metal and non-metal mines, stone quarries, and gravel pits
Smelting and Refining (Non-Ferrous Metals)	– non-ferrous metals (aluminium, magnesium and other production)
Pulp and Paper	– pulp and paper (primarily pulp, paper, and paper product manufacturers)
Iron and Steel	– Iron and steel (steel foundries, casting, rolling mills and iron making)
Cement	– cement and other non-metallic mineral production
Lime and Gypsum	– lime and gypsum product manufacturing
Chemicals and Fertilizers	– chemical (fertilizer manufacturing, organic and inorganic chemical manufacturing)
BUILDINGS	Stationary combustion and process (i.e. air conditioning) emissions, including post-meter, unintentional leaks from natural gas appliances from:
Service Industry	– service industries related to mining, communication, wholesale and retail trade, finance and insurance, real estate, education, etc.; offices, health, arts, accommodation, food, information & cultural; Federal, provincial and municipal establishments; National Defence and Canadian Coast Guard; Train stations, airports and warehouses
Residential	– personal residences (homes, apartment hotels, condominiums and farm houses)
AGRICULTURE	Emissions resulting from:
On Farm Fuel Use	– stationary combustion, onsite transportation and process emissions from the agricultural, hunting and trapping industry (excluding food processing, farm machinery manufacturing, and repair); includes post-meter, unintentional leaks from natural gas consumption
Crop Production	– Application of biosolids and inorganic nitrogen fertilizers, decomposition of crop residues, loss of soil organic carbon, cultivation of organic soils, indirect emissions from leaching and volatilization, field burning of agricultural residues, liming, and urea application
Animal Production	– Animal housing, manure storage, manure deposited by grazing animals, and application of manure to managed soils
WASTE	Non-CO_2 Emissions from biomass resulting from:
Solid Waste	– municipal solid waste management sites (landfills), dedicated wood waste landfills, and other treatment of municipal solid waste
Wastewater	– municipal and industrial wastewater treatment
Waste Incineration	– municipal solid, hazardous and clinical waste, and sewage sludge incineration
COAL PRODUCTION	Stationary combustion, onsite transportation and fugitive emissions from underground and surface coal mines. Includes post-meter, unintentional leaks from natural gas consumption.
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	Stationary combustion, onsite transportation, electricity and steam production, and process emissions, including post-meter, unintentional leaks from natural gas consumption from (excluding LULUCF):
Light Manufacturing	– all other manufacturing industries not included in the Heavy Industry category above
Construction	– construction of buildings, highways etc.
Forest Resources	– forestry and logging service industry

Table A12–2 **GHG Emissions for Newfoundland and Labrador by Canadian Economic Sector, Selected Years**

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	Mt CO_2 eq							
GHG TOTAL	**9.5**	**10.3**	**10.9**	**10.6**	**11.1**	**8.9**	**8.4**	**8.6**
OIL AND GAS	**1.1**	**2.5**	**2.5**	**2.7**	**2.8**	**1.7**	**1.4**	**1.3**
Upstream Oil and Gas	**0.0**	**1.6**	**1.5**	**1.8**	**1.8**	**1.5**	**1.3**	**1.3**
Natural Gas Production and Processing	-	-	-	-	-	-	-	-
Conventional Oil Production	0.0	1.6	1.5	1.8	1.8	1.5	1.3	1.3
Conventional Light Oil Production	-	-	-	-	-	-	-	-
Conventional Heavy Oil Production	-	-	-	-	-	-	-	-
Frontier Oil Production	0.0	1.6	1.5	1.8	1.8	1.5	1.3	1.3
Oil Sands (Mining, In-Situ, Upgrading)	-	-	-	-	-	-	-	-
Mining and Extraction	-	-	-	-	-	-	-	-
In-Situ	-	-	-	-	-	-	-	-
Upgrading	-	-	-	-	-	-	-	-
Oil, Natural Gas and CO_2 Transmission	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downstream Oil and Gas	**1.1**	**1.0**	**1.0**	**0.9**	**1.0**	**0.2**	**0.1**	**0.0**
Petroleum Refining	1.1	1.0	1.0	0.9	1.0	0.2	0.1	0.0
Natural Gas Distribution	-	-	-	-	-	-	-	-
ELECTRICITY	**1.6**	**0.8**	**1.5**	**1.1**	**1.1**	**1.0**	**0.6**	**0.7**
TRANSPORT	**2.7**	**3.3**	**3.8**	**3.6**	**3.9**	**3.3**	**3.5**	**3.7**
Passenger Transport	**1.4**	**1.6**	**2.3**	**2.1**	**2.0**	**1.7**	**1.8**	**1.9**
Cars, Light Trucks and Motorcycles	1.2	1.2	2.0	1.8	1.7	1.6	1.6	1.7
Bus, Rail and Aviation	0.2	0.4	0.3	0.3	0.3	0.2	0.2	0.2
Freight Transport	**1.1**	**1.5**	**1.2**	**1.2**	**1.6**	**1.4**	**1.5**	**1.6**
Heavy Duty Trucks, Rail	0.3	0.5	0.6	0.6	0.7	0.5	0.5	0.5
Aviation and Marine	0.8	1.0	0.6	0.6	0.9	0.9	1.0	1.1
Other: Recreational, Commercial and Residential	**0.1**	**0.2**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**
HEAVY INDUSTRY	**1.9**	**1.8**	**0.7**	**0.9**	**1.1**	**1.0**	**1.2**	**1.2**
Mining	**1.4**	**1.5**	**0.6**	**0.8**	**1.1**	**0.9**	**1.1**	**1.1**
Smelting and Refining (Non-Ferrous Metals)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Pulp and Paper	**0.4**	**0.3**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**
Iron and Steel	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cement	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Lime and Gypsum	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Chemicals and Fertilizers	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
BUILDINGS	**1.1**	**0.8**	**1.1**	**0.9**	**0.9**	**0.8**	**0.7**	**0.7**
Service Industry	**0.3**	**0.4**	**0.6**	**0.4**	**0.5**	**0.4**	**0.4**	**0.4**
Residential	**0.7**	**0.4**	**0.5**	**0.5**	**0.5**	**0.4**	**0.3**	**0.3**
AGRICULTURE	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
On Farm Fuel Use	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Crop Production	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Animal Production	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
WASTE	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
Solid Waste[a]	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
Wastewater	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Waste Incineration	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
COAL PRODUCTION	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	**0.4**	**0.3**	**0.5**	**0.7**	**0.6**	**0.3**	**0.3**	**0.3**
Light Manufacturing	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Construction	**0.2**	**0.2**	**0.5**	**0.5**	**0.5**	**0.3**	**0.3**	**0.2**
Forest Resources	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.1**	**0.1**

Notes:
Totals may not add up due to rounding.
Estimates presented here are under continual improvement. Historical emissions may be updated in future publications as new data become available and methods and models are refined and improved.
National GHG emissions allocated to IPCC sectors are provided in Annex 9 of this report.
Provincial and territorial GHG emissions allocated to IPCC sectors are provided in Annex 11 of this report.
a. Emission estimates for Solid Waste include emissions from municipal solid waste landfills, wood waste landfills and municipal solid waste composting.
0.0 Indicates emissions of less than 0.05 Mt CO_2 eq were truncated due to rounding.
- Indicates no emissions

Table A12–3 **GHG Emissions for Prince Edward Island by Canadian Economic Sector, Selected Years**

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	Mt CO_2 eq							
GHG TOTAL	**1.8**	**1.9**	**1.6**	**1.6**	**1.6**	**1.6**	**1.6**	**1.6**
OIL AND GAS	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Upstream Oil and Gas	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Natural Gas Production and Processing	-	-	-	-	-	-	-	-
Conventional Oil Production	-	-	-	-	-	-	-	-
Conventional Light Oil Production	-	-	-	-	-	-	-	-
Conventional Heavy Oil Production	-	-	-	-	-	-	-	-
Frontier Oil Production	-	-	-	-	-	-	-	-
Oil Sands (Mining, In-Situ, Upgrading)	-	-	-	-	-	-	-	-
Mining and Extraction	-	-	-	-	-	-	-	-
In-Situ	-	-	-	-	-	-	-	-
Upgrading	-	-	-	-	-	-	-	-
Oil, Natural Gas and CO_2 Transmission	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downstream Oil and Gas	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Petroleum Refining	-	-	-	-	-	-	-	-
Natural Gas Distribution	-	-	-	-	-	-	-	-
ELECTRICITY	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
TRANSPORT	**0.5**	**0.7**	**0.8**	**0.7**	**0.7**	**0.6**	**0.7**	**0.7**
Passenger Transport	**0.4**	**0.5**	**0.5**	**0.5**	**0.5**	**0.4**	**0.5**	**0.5**
Cars, Light Trucks and Motorcycles	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.5
Bus, Rail and Aviation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Freight Transport	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**
Heavy Duty Trucks, Rail	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aviation and Marine	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1
Other: Recreational, Commercial and Residential	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**
HEAVY INDUSTRY	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Mining	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**-**
Smelting and Refining (Non-Ferrous Metals)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Pulp and Paper	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Iron and Steel	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cement	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Lime and Gypsum	**0.0**	**0.0**	**0.0**	**-**	**-**	**-**	**0.0**	**-**
Chemicals and Fertilizers	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
BUILDINGS	**0.6**	**0.5**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
Service Industry	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Residential	**0.4**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
AGRICULTURE	**0.4**	**0.4**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**
On Farm Fuel Use	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Crop Production	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Animal Production	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
WASTE	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Solid Waste[a]	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Wastewater	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Waste Incineration	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
COAL PRODUCTION	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	**0.1**	**0.2**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**
Light Manufacturing	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Construction	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Forest Resources	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Notes:
Totals may not add up due to rounding.
Estimates presented here are under continual improvement. Historical emissions may be updated in future publications as new data become available and methods and models are refined and improved.
National GHG emissions allocated to IPCC sectors are provided in Annex 9 of this report.
Provincial and territorial GHG emissions allocated to IPCC sectors are provided in Annex 11 of this report.
a. Emission estimates for Solid Waste include emissions from municipal solid waste landfills, wood waste landfills and municipal solid waste composting.
0.0 Indicates emissions of less than 0.05 Mt CO_2 eq were truncated due to rounding.
- Indicates no emissions

Table A12–4 **GHG Emissions for Nova Scotia by Canadian Economic Sector, Selected Years**

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	Mt CO_2 eq							
GHG TOTAL	**19.6**	**22.8**	**16.0**	**16.5**	**16.2**	**14.8**	**14.7**	**14.8**
OIL AND GAS	**0.7**	**1.6**	**0.3**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**
Upstream Oil and Gas	**0.0**	**0.5**	**0.3**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**
Natural Gas Production and Processing	0.0	0.4	0.3	0.2	0.0	0.0	0.0	0.0
Conventional Oil Production	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conventional Light Oil Production	-	-	-	-	-	-	-	-
Conventional Heavy Oil Production	-	-	-	-	-	-	-	-
Frontier Oil Production	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil Sands (Mining, In-Situ, Upgrading)	-	-	-	-	-	-	-	-
Mining and Extraction	-	-	-	-	-	-	-	-
In-Situ	-	-	-	-	-	-	-	-
Upgrading	-	-	-	-	-	-	-	-
Oil, Natural Gas and CO_2 Transmission	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downstream Oil and Gas	**0.7**	**1.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Petroleum Refining	0.7	1.1	-	-	-	-	-	-
Natural Gas Distribution	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICITY	**6.9**	**10.7**	**6.7**	**7.0**	**6.7**	**6.3**	**6.1**	**5.8**
TRANSPORT	**4.1**	**5.0**	**5.0**	**5.2**	**5.4**	**4.6**	**4.9**	**5.2**
Passenger Transport	**2.6**	**3.0**	**3.3**	**3.4**	**3.3**	**2.7**	**2.9**	**3.1**
Cars, Light Trucks and Motorcycles	2.3	2.7	2.9	2.9	2.9	2.5	2.7	2.8
Bus, Rail and Aviation	0.3	0.3	0.4	0.4	0.4	0.2	0.2	0.3
Freight Transport	**1.2**	**1.6**	**1.4**	**1.4**	**1.8**	**1.6**	**1.7**	**1.8**
Heavy Duty Trucks, Rail	0.7	1.0	0.9	1.0	1.0	0.9	0.9	0.9
Aviation and Marine	0.5	0.6	0.4	0.5	0.8	0.7	0.8	0.9
Other: Recreational, Commercial and Residential	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**
HEAVY INDUSTRY	**1.1**	**1.0**	**0.4**	**0.5**	**0.4**	**0.4**	**0.3**	**0.4**
Mining	**0.2**	**0.4**	**0.1**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**
Smelting and Refining (Non-Ferrous Metals)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Pulp and Paper	**0.4**	**0.3**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**
Iron and Steel	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cement	**0.3**	**0.4**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Lime and Gypsum	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Chemicals and Fertilizers	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.1**
BUILDINGS	**3.0**	**2.7**	**2.0**	**2.1**	**2.1**	**2.0**	**1.9**	**2.0**
Service Industry	**0.8**	**1.3**	**0.7**	**0.8**	**0.8**	**0.7**	**0.8**	**0.8**
Residential	**2.1**	**1.3**	**1.2**	**1.3**	**1.4**	**1.3**	**1.2**	**1.2**
AGRICULTURE	**0.6**	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
On Farm Fuel Use	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Crop Production	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**
Animal Production	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
WASTE	**0.8**	**0.6**	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**
Solid Waste[a]	**0.7**	**0.6**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
Wastewater	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Waste Incineration	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
COAL PRODUCTION	**1.8**	**0.1**	**0.2**	**0.1**	**0.2**	**0.1**	**0.0**	**0.0**
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	**0.6**	**0.5**	**0.4**	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**
Light Manufacturing	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Construction	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.2**	**0.2**
Forest Resources	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.1**	**0.1**

Notes:
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National GHG emissions allocated to IPCC sectors are provided in Annex 9 of this report.
Provincial and territorial GHG emissions allocated to IPCC sectors are provided in Annex 11 of this report.
a. Emission estimates for Solid Waste include emissions from municipal solid waste landfills, wood waste landfills and municipal solid waste composting.
0.0 Indicates emissions of less than 0.05 Mt CO_2 eq were truncated due to rounding.
- Indicates no emissions

Table A12–5 **GHG Emissions for New Brunswick by Canadian Economic Sector, Selected Years**

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	Mt CO_2 eq							
GHG TOTAL	**16.2**	**20.1**	**13.6**	**13.4**	**13.0**	**11.3**	**12.0**	**12.5**
OIL AND GAS	**1.2**	**2.9**	**3.3**	**2.9**	**3.2**	**3.1**	**3.1**	**2.9**
Upstream Oil and Gas	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Natural Gas Production and Processing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Conventional Oil Production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conventional Light Oil Production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conventional Heavy Oil Production	-	-	-	-	-	-	-	-
Frontier Oil Production	-	-	-	-	-	-	-	-
Oil Sands (Mining, In-Situ, Upgrading)	-	-	-	-	-	-	-	-
Mining and Extraction	-	-	-	-	-	-	-	-
In-Situ	-	-	-	-	-	-	-	-
Upgrading	-	-	-	-	-	-	-	-
Oil, Natural Gas and CO_2 Transmission	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downstream Oil and Gas	**1.2**	**2.8**	**3.2**	**2.8**	**3.1**	**3.1**	**3.0**	**2.8**
Petroleum Refining	1.2	2.8	3.2	2.8	3.1	3.0	3.0	2.8
Natural Gas Distribution	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICITY	**6.0**	**8.0**	**3.4**	**3.6**	**3.2**	**2.1**	**2.8**	**3.4**
TRANSPORT	**3.5**	**4.4**	**3.7**	**3.6**	**3.5**	**3.1**	**3.1**	**3.1**
Passenger Transport	**2.3**	**2.5**	**2.3**	**2.3**	**2.3**	**2.0**	**1.9**	**2.0**
Cars, Light Trucks and Motorcycles	2.1	2.2	2.2	2.1	2.1	1.8	1.8	1.8
Bus, Rail and Aviation	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1
Freight Transport	**1.0**	**1.4**	**1.0**	**0.9**	**0.9**	**0.9**	**0.9**	**0.8**
Heavy Duty Trucks, Rail	0.8	1.2	0.8	0.8	0.8	0.7	0.7	0.7
Aviation and Marine	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2
Other: Recreational, Commercial and Residential	**0.2**	**0.5**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**
HEAVY INDUSTRY	**1.8**	**1.3**	**0.8**	**0.8**	**0.7**	**0.6**	**0.6**	**0.7**
Mining	**0.2**	**0.4**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Smelting and Refining (Non-Ferrous Metals)	**0.1**	**0.1**	**0.2**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**
Pulp and Paper	**1.3**	**0.7**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.5**
Iron and Steel	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cement	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Lime and Gypsum	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Chemicals and Fertilizers	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
BUILDINGS	**1.7**	**1.4**	**1.1**	**1.1**	**1.1**	**1.0**	**0.9**	**1.0**
Service Industry	**0.6**	**0.7**	**0.4**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
Residential	**1.1**	**0.8**	**0.7**	**0.7**	**0.6**	**0.5**	**0.4**	**0.4**
AGRICULTURE	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
On Farm Fuel Use	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Crop Production	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Animal Production	**0.3**	**0.3**	**0.2**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**
WASTE	**0.8**	**0.8**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**
Solid Waste[a]	**0.7**	**0.7**	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**	**0.5**
Wastewater	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Waste Incineration	**-**	**0.0**	**-**	**-**	**-**	**-**	**-**	**-**
COAL PRODUCTION	**0.0**	**0.0**	**-**	**-**	**-**	**-**	**-**	**-**
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	**0.6**	**0.7**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
Light Manufacturing	**0.2**	**0.4**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Construction	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Forest Resources	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**

Notes:
Totals may not add up due to rounding.
Estimates presented here are under continual improvement. Historical emissions may be updated in future publications as new data become available and methods and models are refined and improved.
National GHG emissions allocated to IPCC sectors are provided in Annex 9 of this report.
Provincial and territorial GHG emissions allocated to IPCC sectors are provided in Annex 11 of this report.
a. Emission estimates for Solid Waste include emissions from municipal solid waste landfills, wood waste landfills and municipal solid waste composting.
0.0 Indicates emissions of less than 0.05 Mt CO_2 eq were truncated due to rounding.
- Indicates no emissions

Table A12–6 **GHG Emissions for Quebec by Canadian Economic Sector, Selected Years**

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	Mt CO_2 eq							
GHG TOTAL	**84.4**	**85.6**	**79.5**	**80.7**	**82.1**	**74.3**	**77.4**	**79.1**
OIL AND GAS	**3.9**	**4.4**	**2.0**	**2.4**	**2.3**	**2.3**	**2.3**	**2.3**
Upstream Oil and Gas	**0.3**	**0.3**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Natural Gas Production and Processing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conventional Oil Production	-	-	-	-	-	-	-	-
Conventional Light Oil Production	-	-	-	-	-	-	-	-
Conventional Heavy Oil Production	-	-	-	-	-	-	-	-
Frontier Oil Production	-	-	-	-	-	-	-	-
Oil Sands (Mining, In-Situ, Upgrading)	-	-	-	-	-	-	-	-
Mining and Extraction	-	-	-	-	-	-	-	-
In-Situ	-	-	-	-	-	-	-	-
Upgrading	-	-	-	-	-	-	-	-
Oil, Natural Gas and CO_2 Transmission	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1
Downstream Oil and Gas	**3.7**	**4.1**	**1.8**	**2.3**	**2.2**	**2.2**	**2.2**	**2.2**
Petroleum Refining	3.6	4.0	1.8	2.3	2.2	2.1	2.1	2.2
Natural Gas Distribution	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ELECTRICITY	**1.5**	**0.6**	**0.3**	**0.3**	**0.3**	**0.4**	**0.3**	**0.3**
TRANSPORT	**24.6**	**30.1**	**32.0**	**31.8**	**32.0**	**27.1**	**29.2**	**30.8**
Passenger Transport	**18.2**	**20.1**	**21.1**	**21.1**	**21.4**	**17.6**	**19.2**	**20.0**
Cars, Light Trucks and Motorcycles	16.7	18.5	19.1	19.0	19.4	16.2	17.7	18.2
Bus, Rail and Aviation	1.6	1.5	2.0	2.0	2.0	1.4	1.5	1.8
Freight Transport	**4.9**	**7.4**	**8.2**	**8.1**	**7.8**	**6.8**	**7.3**	**8.1**
Heavy Duty Trucks, Rail	4.0	6.3	7.3	7.1	6.8	6.0	6.2	7.0
Aviation and Marine	0.9	1.1	1.0	1.0	1.0	0.9	1.0	1.0
Other: Recreational, Commercial and Residential	**1.4**	**2.6**	**2.6**	**2.7**	**2.8**	**2.7**	**2.8**	**2.7**
HEAVY INDUSTRY	**24.7**	**19.9**	**16.9**	**17.3**	**18.2**	**17.0**	**17.4**	**17.7**
Mining	**2.0**	**1.9**	**2.1**	**2.8**	**3.0**	**2.5**	**2.9**	**2.9**
Smelting and Refining (Non-Ferrous Metals)	**12.6**	**9.7**	**7.5**	**6.7**	**7.0**	**7.5**	**7.6**	**7.8**
Pulp and Paper	**4.5**	**2.8**	**1.4**	**1.6**	**1.6**	**1.6**	**1.6**	**1.5**
Iron and Steel	**1.3**	**0.9**	**1.2**	**1.3**	**1.1**	**0.3**	**0.3**	**0.3**
Cement	**2.5**	**2.4**	**2.8**	**2.8**	**3.6**	**3.2**	**3.4**	**3.3**
Lime and Gypsum	**0.5**	**0.9**	**0.8**	**0.7**	**0.7**	**0.6**	**0.6**	**0.7**
Chemicals and Fertilizers	**1.2**	**1.2**	**1.2**	**1.3**	**1.3**	**1.3**	**1.0**	**1.2**
BUILDINGS	**11.8**	**12.4**	**10.2**	**10.2**	**10.5**	**9.4**	**9.6**	**9.8**
Service Industry	**4.6**	**6.4**	**6.6**	**6.4**	**6.5**	**5.9**	**6.2**	**6.3**
Residential	**7.2**	**6.0**	**3.6**	**3.9**	**4.0**	**3.5**	**3.4**	**3.5**
AGRICULTURE	**7.3**	**8.2**	**8.4**	**8.9**	**8.8**	**8.8**	**8.7**	**8.9**
On Farm Fuel Use	**0.6**	**0.7**	**1.0**	**1.0**	**1.1**	**1.0**	**1.0**	**1.0**
Crop Production	**1.4**	**1.6**	**2.0**	**2.5**	**2.3**	**2.5**	**2.4**	**2.6**
Animal Production	**5.3**	**6.0**	**5.5**	**5.4**	**5.5**	**5.4**	**5.4**	**5.3**
WASTE	**5.0**	**5.4**	**5.1**	**5.0**	**4.9**	**4.7**	**4.7**	**4.6**
Solid Waste[a]	**4.5**	**4.9**	**4.7**	**4.6**	**4.5**	**4.3**	**4.3**	**4.2**
Wastewater	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
Waste Incineration	**0.2**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
COAL PRODUCTION	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	**5.6**	**4.7**	**4.7**	**4.6**	**5.0**	**4.6**	**5.1**	**4.7**
Light Manufacturing	**3.7**	**2.9**	**2.6**	**2.6**	**2.8**	**2.5**	**2.9**	**2.8**
Construction	**1.3**	**1.3**	**1.6**	**1.6**	**1.7**	**1.6**	**1.7**	**1.5**
Forest Resources	**0.6**	**0.5**	**0.4**	**0.5**	**0.5**	**0.4**	**0.4**	**0.4**

Notes:
Totals may not add up due to rounding.
Estimates presented here are under continual improvement. Historical emissions may be updated in future publications as new data become available and methods and models are refined and improved.
National GHG emissions allocated to IPCC sectors are provided in Annex 9 of this report.
Provincial and territorial GHG emissions allocated to IPCC sectors are provided in Annex 11 of this report.
a. Emission estimates for Solid Waste include emissions from municipal solid waste landfills, wood waste landfills and municipal solid waste composting.
0.0 Indicates emissions of less than 0.05 Mt CO_2 eq were truncated due to rounding.
- Indicates no emissions

Table A12–7 **GHG Emissions for Ontario by Canadian Economic Sector, Selected Years**

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	Mt CO_2 eq							
GHG TOTAL	**178.4**	**203.0**	**158.4**	**164.2**	**165.5**	**148.5**	**151.1**	**157.0**
OIL AND GAS	**10.4**	**11.9**	**7.5**	**7.8**	**8.3**	**7.7**	**8.2**	**8.7**
Upstream Oil and Gas	**3.4**	**4.0**	**1.7**	**1.9**	**1.8**	**1.6**	**1.7**	**2.0**
Natural Gas Production and Processing	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.2
Conventional Oil Production	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conventional Light Oil Production	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conventional Heavy Oil Production	-	-	-	-	-	-	-	-
Frontier Oil Production	-	-	-	-	-	-	-	-
Oil Sands (Mining, In-Situ, Upgrading)	-	-	-	-	-	-	-	-
Mining and Extraction	-	-	-	-	-	-	-	-
In-Situ	-	-	-	-	-	-	-	-
Upgrading	-	-	-	-	-	-	-	-
Oil, Natural Gas and CO_2 Transmission	3.1	3.6	1.6	1.7	1.6	1.4	1.5	1.8
Downstream Oil and Gas	**7.0**	**7.9**	**5.8**	**5.9**	**6.4**	**6.1**	**6.5**	**6.7**
Petroleum Refining	6.5	7.2	5.2	5.3	5.8	5.5	5.8	6.1
Natural Gas Distribution	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6
ELECTRICITY	**25.7**	**32.8**	**2.2**	**3.5**	**3.4**	**3.2**	**3.4**	**3.8**
TRANSPORT	**41.5**	**57.1**	**53.6**	**55.2**	**55.6**	**45.3**	**47.2**	**49.9**
Passenger Transport	**30.2**	**36.8**	**35.8**	**36.9**	**37.6**	**28.9**	**29.1**	**31.4**
Cars, Light Trucks and Motorcycles	27.5	33.6	32.3	33.1	33.8	26.6	26.6	28.2
Bus, Rail and Aviation	2.7	3.2	3.5	3.8	3.7	2.3	2.4	3.1
Freight Transport	**8.9**	**15.7**	**13.8**	**14.1**	**13.9**	**12.5**	**14.0**	**14.5**
Heavy Duty Trucks, Rail	8.2	15.1	13.2	13.4	13.2	11.8	13.0	13.5
Aviation and Marine	0.7	0.6	0.6	0.6	0.6	0.7	1.0	1.0
Other: Recreational, Commercial and Residential	**2.4**	**4.6**	**4.0**	**4.2**	**4.2**	**3.9**	**4.2**	**4.0**
HEAVY INDUSTRY	**42.2**	**34.8**	**29.2**	**29.3**	**28.5**	**26.4**	**28.5**	**28.6**
Mining	**1.1**	**1.0**	**1.5**	**1.3**	**1.4**	**1.5**	**1.7**	**1.7**
Smelting and Refining (Non-Ferrous Metals)	**1.5**	**1.9**	**1.0**	**0.9**	**1.1**	**0.8**	**0.7**	**0.8**
Pulp and Paper	**3.3**	**2.0**	**1.5**	**1.6**	**1.7**	**1.5**	**1.6**	**1.8**
Iron and Steel	**15.0**	**15.0**	**13.9**	**14.4**	**13.5**	**11.5**	**13.1**	**12.5**
Cement	**4.6**	**6.3**	**4.4**	**4.3**	**4.3**	**4.4**	**4.4**	**4.2**
Lime and Gypsum	**1.7**	**1.7**	**1.3**	**1.2**	**1.1**	**1.0**	**1.1**	**1.3**
Chemicals and Fertilizers	**14.9**	**6.7**	**5.6**	**5.5**	**5.3**	**5.6**	**6.0**	**6.2**
BUILDINGS	**27.6**	**36.1**	**37.9**	**40.1**	**41.1**	**38.1**	**35.5**	**36.6**
Service Industry	**9.8**	**15.2**	**19.5**	**20.6**	**21.0**	**19.4**	**17.2**	**17.7**
Residential	**17.8**	**20.8**	**18.5**	**19.5**	**20.1**	**18.7**	**18.3**	**18.9**
AGRICULTURE	**10.9**	**11.0**	**11.3**	**11.4**	**11.7**	**12.1**	**12.1**	**12.4**
On Farm Fuel Use	**1.3**	**1.6**	**2.4**	**2.5**	**2.7**	**2.4**	**2.6**	**2.8**
Crop Production	**2.2**	**1.9**	**2.7**	**2.5**	**2.6**	**3.3**	**3.1**	**3.2**
Animal Production	**7.4**	**7.5**	**6.3**	**6.3**	**6.4**	**6.4**	**6.4**	**6.4**
WASTE	**7.3**	**7.9**	**7.0**	**7.0**	**7.1**	**7.2**	**7.4**	**7.5**
Solid Waste[a]	**6.6**	**7.0**	**6.0**	**5.9**	**6.1**	**6.1**	**6.4**	**6.5**
Wastewater	**0.6**	**0.8**	**0.9**	**0.9**	**0.9**	**0.9**	**1.0**	**1.0**
Waste Incineration	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
COAL PRODUCTION	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	**12.9**	**11.5**	**9.6**	**10.0**	**9.8**	**8.6**	**8.8**	**9.4**
Light Manufacturing	**9.9**	**8.0**	**6.4**	**6.5**	**6.3**	**5.8**	**6.0**	**6.4**
Construction	**2.7**	**3.3**	**3.0**	**3.3**	**3.1**	**2.5**	**2.5**	**2.7**
Forest Resources	**0.3**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**

Notes:
Totals may not add up due to rounding.
Estimates presented here are under continual improvement. Historical emissions may be updated in future publications as new data become available and methods and models are refined and improved.
National GHG emissions allocated to IPCC sectors are provided in Annex 9 of this report.
Provincial and territorial GHG emissions allocated to IPCC sectors are provided in Annex 11 of this report.
a. Emission estimates for Solid Waste include emissions from municipal solid waste landfills, wood waste landfills and municipal solid waste composting.
0.0 Indicates emissions of less than 0.05 Mt CO_2 eq were truncated due to rounding.
- Indicates no emissions

Table A12–8 **GHG Emissions for Manitoba by Canadian Economic Sector, Selected Years**

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	Mt CO_2 eq							
GHG TOTAL	**18.2**	**20.6**	**21.6**	**22.4**	**22.1**	**21.1**	**20.6**	**21.6**
OIL AND GAS	**1.5**	**1.0**	**0.9**	**1.0**	**1.0**	**0.9**	**1.0**	**0.9**
Upstream Oil and Gas	**1.5**	**0.9**	**0.8**	**1.0**	**1.0**	**0.8**	**0.9**	**0.9**
Natural Gas Production and Processing	-	-	-	-	-	-	-	-
Conventional Oil Production	0.3	0.3	0.7	0.7	0.7	0.6	0.6	0.6
Conventional Light Oil Production	0.3	0.3	0.7	0.7	0.7	0.6	0.6	0.6
Conventional Heavy Oil Production	-	-	-	-	-	-	-	-
Frontier Oil Production	-	-	-	-	-	-	-	-
Oil Sands (Mining, In-Situ, Upgrading)	-	-	-	-	-	-	-	-
Mining and Extraction	-	-	-	-	-	-	-	-
In-Situ	-	-	-	-	-	-	-	-
Upgrading	-	-	-	-	-	-	-	-
Oil, Natural Gas and CO_2 Transmission	1.2	0.6	0.2	0.3	0.3	0.2	0.3	0.3
Downstream Oil and Gas	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Petroleum Refining	0.0	-	-	-	-	-	-	-
Natural Gas Distribution	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICITY	**0.5**	**0.4**	**0.1**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**
TRANSPORT	**5.0**	**5.7**	**6.5**	**6.9**	**6.7**	**5.9**	**6.1**	**6.4**
Passenger Transport	**3.1**	**3.2**	**3.4**	**3.7**	**3.8**	**3.2**	**3.3**	**3.4**
Cars, Light Trucks and Motorcycles	2.6	2.6	2.9	3.2	3.2	2.8	3.0	3.0
Bus, Rail and Aviation	0.5	0.5	0.5	0.6	0.6	0.3	0.3	0.4
Freight Transport	**1.4**	**1.8**	**2.0**	**2.1**	**2.0**	**1.8**	**1.9**	**1.9**
Heavy Duty Trucks, Rail	1.3	1.7	1.9	2.0	1.9	1.7	1.8	1.8
Aviation and Marine	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other: Recreational, Commercial and Residential	**0.5**	**0.7**	**1.0**	**1.0**	**1.0**	**0.9**	**0.9**	**1.0**
HEAVY INDUSTRY	**1.4**	**1.6**	**1.3**	**1.4**	**1.3**	**1.3**	**1.2**	**1.4**
Mining	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.2**
Smelting and Refining (Non-Ferrous Metals)	**0.3**	**0.2**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Pulp and Paper	**0.3**	**0.2**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**
Iron and Steel	**0.1**	**0.0**	**0.1**	**0.1**	**0.1**	**0.0**	**0.1**	**0.1**
Cement	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Lime and Gypsum	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Chemicals and Fertilizers	**0.3**	**0.9**	**0.8**	**0.9**	**0.9**	**0.8**	**0.8**	**0.9**
BUILDINGS	**3.1**	**2.7**	**2.9**	**3.1**	**3.2**	**3.0**	**2.9**	**3.2**
Service Industry	**1.4**	**1.6**	**1.7**	**1.8**	**1.8**	**1.8**	**1.7**	**1.9**
Residential	**1.7**	**1.1**	**1.2**	**1.3**	**1.3**	**1.3**	**1.2**	**1.4**
AGRICULTURE	**5.0**	**7.0**	**7.3**	**7.4**	**7.4**	**7.7**	**7.2**	**7.2**
On Farm Fuel Use	**0.8**	**1.0**	**1.4**	**1.5**	**1.4**	**1.4**	**1.3**	**1.3**
Crop Production	**1.5**	**1.4**	**2.4**	**2.4**	**2.4**	**2.8**	**2.4**	**2.6**
Animal Production	**2.6**	**4.6**	**3.5**	**3.6**	**3.5**	**3.5**	**3.4**	**3.3**
WASTE	**0.9**	**1.3**	**1.4**	**1.4**	**1.4**	**1.2**	**1.2**	**1.4**
Solid Waste[a]	**0.8**	**1.2**	**1.3**	**1.3**	**1.3**	**1.1**	**1.1**	**1.3**
Wastewater	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Waste Incineration	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**-**
COAL PRODUCTION	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	**0.8**	**1.0**	**1.4**	**1.1**	**1.1**	**1.1**	**1.0**	**1.1**
Light Manufacturing	**0.4**	**0.5**	**0.9**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**
Construction	**0.3**	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**	**0.3**
Forest Resources	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Notes:
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Provincial and territorial GHG emissions allocated to IPCC sectors are provided in Annex 11 of this report.
a. Emission estimates for Solid Waste include emissions from municipal solid waste landfills, wood waste landfills and municipal solid waste composting.
0.0 Indicates emissions of less than 0.05 Mt CO_2 eq were truncated due to rounding.
- Indicates no emissions

Table A12–9 **GHG Emissions for Saskatchewan by Canadian Economic Sector, Selected Years**

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	Mt CO_2 eq							
GHG TOTAL	**49.0**	**80.5**	**87.6**	**89.0**	**86.6**	**74.8**	**76.8**	**75.9**
OIL AND GAS	**17.4**	**37.7**	**36.9**	**37.0**	**35.3**	**27.0**	**26.8**	**27.0**
Upstream Oil and Gas	**16.1**	**36.6**	**35.4**	**35.5**	**33.7**	**25.7**	**25.3**	**25.5**
Natural Gas Production and Processing	1.9	3.2	2.2	2.1	2.0	1.3	1.2	1.2
Conventional Oil Production	11.7	28.4	29.3	29.2	27.6	20.6	19.8	19.8
Conventional Light Oil Production	4.3	6.4	14.0	14.4	13.9	9.6	7.2	6.8
Conventional Heavy Oil Production	7.4	22.0	15.2	14.8	13.7	11.0	12.6	13.0
Frontier Oil Production	-	-	-	-	-	-	-	-
Oil Sands (Mining, In-Situ, Upgrading)	-	2.6	2.1	2.3	2.3	2.1	2.4	2.2
Mining and Extraction	-	-	-	-	-	-	-	-
In-Situ	-	-	-	-	-	-	-	-
Upgrading	-	2.6	2.1	2.3	2.3	2.1	2.4	2.2
Oil, Natural Gas and CO_2 Transmission	2.5	2.4	1.8	2.0	1.9	1.6	2.0	2.3
Downstream Oil and Gas	**1.2**	**1.1**	**1.6**	**1.5**	**1.5**	**1.3**	**1.5**	**1.5**
Petroleum Refining	0.7	0.9	1.4	1.2	1.3	1.1	1.2	1.2
Natural Gas Distribution	0.6	0.3	0.2	0.2	0.2	0.2	0.2	0.2
ELECTRICITY	**11.1**	**14.3**	**15.3**	**14.9**	**14.8**	**12.6**	**14.7**	**13.3**
TRANSPORT	**4.9**	**7.0**	**9.9**	**10.0**	**9.8**	**8.8**	**9.0**	**8.7**
Passenger Transport	**2.5**	**3.1**	**4.5**	**4.5**	**4.4**	**3.8**	**3.9**	**3.8**
Cars, Light Trucks and Motorcycles	2.2	2.8	4.2	4.1	4.1	3.6	3.7	3.5
Bus, Rail and Aviation	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.3
Freight Transport	**1.7**	**2.8**	**3.8**	**4.1**	**3.9**	**3.7**	**3.7**	**3.7**
Heavy Duty Trucks, Rail	1.6	2.8	3.8	4.0	3.9	3.6	3.7	3.6
Aviation and Marine	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Other: Recreational, Commercial and Residential	**0.7**	**1.0**	**1.6**	**1.5**	**1.5**	**1.4**	**1.4**	**1.3**
HEAVY INDUSTRY	**1.7**	**2.3**	**3.3**	**4.1**	**3.6**	**3.7**	**4.1**	**4.2**
Mining	**1.1**	**1.4**	**2.5**	**3.0**	**2.5**	**2.4**	**3.0**	**3.2**
Smelting and Refining (Non-Ferrous Metals)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Pulp and Paper	**0.3**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Iron and Steel	**0.0**	**0.1**	**0.1**	**0.2**	**0.1**	**0.1**	**0.2**	**0.1**
Cement	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Lime and Gypsum	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Chemicals and Fertilizers	**0.2**	**0.6**	**0.6**	**0.9**	**0.9**	**1.1**	**0.8**	**0.9**
BUILDINGS	**3.2**	**3.4**	**3.7**	**4.1**	**4.3**	**3.9**	**3.9**	**4.2**
Service Industry	**1.0**	**1.7**	**1.8**	**1.9**	**2.0**	**1.9**	**1.8**	**2.0**
Residential	**2.1**	**1.7**	**2.0**	**2.2**	**2.3**	**2.1**	**2.0**	**2.2**
AGRICULTURE	**8.9**	**13.8**	**16.2**	**16.7**	**16.5**	**16.7**	**16.3**	**16.3**
On Farm Fuel Use	**2.8**	**2.9**	**5.1**	**5.5**	**5.4**	**5.5**	**5.2**	**5.0**
Crop Production	**1.7**	**2.7**	**4.7**	**4.9**	**4.9**	**5.0**	**4.8**	**5.2**
Animal Production	**4.4**	**8.3**	**6.3**	**6.3**	**6.2**	**6.2**	**6.3**	**6.1**
WASTE	**1.0**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**
Solid Waste[a]	**0.9**	**1.3**	**1.3**	**1.3**	**1.3**	**1.3**	**1.3**	**1.3**
Wastewater	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Waste Incineration	**-**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
COAL PRODUCTION	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	**0.8**	**0.6**	**0.8**	**0.8**	**0.8**	**0.6**	**0.6**	**0.7**
Light Manufacturing	**0.5**	**0.2**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**	**0.4**
Construction	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**
Forest Resources	**0.1**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**

Notes:
Totals may not add up due to rounding.
Estimates presented here are under continual improvement. Historical emissions may be updated in future publications as new data become available and methods and models are refined and improved.
National GHG emissions allocated to IPCC sectors are provided in Annex 9 of this report.
Provincial and territorial GHG emissions allocated to IPCC sectors are provided in Annex 11 of this report.
a. Emission estimates for Solid Waste include emissions from municipal solid waste landfills, wood waste landfills and municipal solid waste composting.
0.0 Indicates emissions of less than 0.05 Mt CO_2 eq were truncated due to rounding.
- Indicates no emissions

Table A12–10 GHG Emissions for Alberta by Canadian Economic Sector, Selected Years

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	Mt CO_2 eq							
GHG TOTAL	**177.2**	**251.1**	**287.3**	**286.5**	**287.1**	**268.5**	**271.0**	**269.9**
OIL AND GAS	**73.2**	**119.7**	**152.2**	**159.3**	**158.8**	**151.7**	**158.8**	**158.3**
Upstream Oil and Gas	**69.5**	**115.0**	**146.9**	**154.0**	**153.6**	**147.5**	**154.6**	**153.6**
Natural Gas Production and Processing	31.4	60.5	48.6	49.6	48.5	46.6	48.3	45.9
Conventional Oil Production	18.7	17.3	18.5	19.1	18.4	16.3	17.1	17.0
Conventional Light Oil Production	13.6	14.2	14.7	15.1	14.6	13.0	13.6	13.5
Conventional Heavy Oil Production	5.1	3.1	3.8	4.0	3.8	3.4	3.5	3.6
Frontier Oil Production	-	-	-	-	-	-	-	-
Oil Sands (Mining, In-Situ, Upgrading)	15.3	33.2	75.3	80.1	81.5	79.4	83.6	84.3
Mining and Extraction	2.3	5.8	13.1	15.1	15.7	15.2	15.6	16.5
In-Situ	4.6	12.7	41.8	43.6	43.5	41.7	45.2	45.1
Upgrading	8.4	14.6	20.4	21.4	22.2	22.6	22.9	22.7
Oil, Natural Gas and CO_2 Transmission	4.2	4.0	4.6	5.1	5.3	5.1	5.6	6.4
Downstream Oil and Gas	**3.7**	**4.7**	**5.3**	**5.3**	**5.2**	**4.2**	**4.1**	**4.7**
Petroleum Refining	3.2	4.4	5.1	5.1	5.0	4.0	3.9	4.4
Natural Gas Distribution	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2
ELECTRICITY	**39.8**	**47.6**	**42.5**	**31.4**	**31.0**	**27.1**	**22.6**	**19.4**
TRANSPORT	**15.2**	**22.0**	**26.6**	**27.9**	**28.0**	**22.6**	**23.0**	**23.4**
Passenger Transport	**9.2**	**11.9**	**14.0**	**14.5**	**14.8**	**11.4**	**11.4**	**11.9**
Cars, Light Trucks and Motorcycles	8.0	10.3	11.9	12.2	12.6	10.2	10.1	10.2
Bus, Rail and Aviation	1.3	1.6	2.1	2.2	2.2	1.3	1.3	1.7
Freight Transport	**4.4**	**8.0**	**9.8**	**10.8**	**10.6**	**8.9**	**9.1**	**9.0**
Heavy Duty Trucks, Rail	4.1	7.8	9.6	10.6	10.4	8.6	8.7	8.6
Aviation and Marine	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4
Other: Recreational, Commercial and Residential	**1.6**	**2.1**	**2.8**	**2.6**	**2.6**	**2.3**	**2.5**	**2.4**
HEAVY INDUSTRY	**12.8**	**17.7**	**17.5**	**17.9**	**18.3**	**17.8**	**18.2**	**18.0**
Mining	**0.3**	**0.4**	**0.8**	**0.8**	**0.8**	**0.9**	**0.6**	**0.4**
Smelting and Refining (Non-Ferrous Metals)	**0.5**	**0.6**	**0.8**	**0.8**	**0.7**	**0.6**	**0.6**	**0.8**
Pulp and Paper	**0.5**	**0.8**	**1.2**	**1.8**	**1.9**	**1.6**	**1.6**	**1.5**
Iron and Steel	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Cement	**1.2**	**1.8**	**1.7**	**1.8**	**1.8**	**1.6**	**1.8**	**1.7**
Lime and Gypsum	**0.2**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**
Chemicals and Fertilizers	**9.9**	**13.7**	**12.8**	**12.3**	**12.8**	**12.8**	**13.3**	**13.2**
BUILDINGS	**12.2**	**16.2**	**20.3**	**21.7**	**21.8**	**20.9**	**20.3**	**21.3**
Service Industry	**5.3**	**8.4**	**11.3**	**12.2**	**12.4**	**11.8**	**11.6**	**12.1**
Residential	**6.9**	**7.7**	**9.0**	**9.4**	**9.4**	**9.2**	**8.7**	**9.2**
AGRICULTURE	**14.7**	**21.1**	**19.7**	**20.1**	**20.4**	**20.4**	**20.4**	**21.0**
On Farm Fuel Use	**2.1**	**2.7**	**3.4**	**3.2**	**3.3**	**2.9**	**3.0**	**3.0**
Crop Production	**2.2**	**2.5**	**3.4**	**3.7**	**3.9**	**4.4**	**4.1**	**4.5**
Animal Production	**10.5**	**16.0**	**12.9**	**13.1**	**13.2**	**13.2**	**13.4**	**13.4**
WASTE	**2.2**	**3.3**	**4.5**	**4.6**	**4.5**	**4.6**	**4.6**	**4.6**
Solid Waste[a]	**1.7**	**2.8**	**3.9**	**4.0**	**4.0**	**4.1**	**4.2**	**4.2**
Wastewater	**0.5**	**0.5**	**0.5**	**0.6**	**0.5**	**0.4**	**0.4**	**0.4**
Waste Incineration	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
COAL PRODUCTION	**0.9**	**0.7**	**0.8**	**0.7**	**0.8**	**0.4**	**0.2**	**0.8**
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	**6.3**	**2.8**	**3.2**	**3.0**	**3.4**	**2.9**	**2.9**	**3.1**
Light Manufacturing	**4.8**	**1.4**	**2.0**	**1.9**	**2.2**	**1.9**	**2.0**	**2.1**
Construction	**1.0**	**1.1**	**0.9**	**0.7**	**0.9**	**0.7**	**0.7**	**0.7**
Forest Resources	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**

Notes:
Totals may not add up due to rounding.
Estimates presented here are under continual improvement. Historical emissions may be updated in future publications as new data become available and methods and models are refined and improved.
National GHG emissions allocated to IPCC sectors are provided in Annex 9 of this report.
Provincial and territorial GHG emissions allocated to IPCC sectors are provided in Annex 11 of this report.
a. Emission estimates for Solid Waste include emissions from municipal solid waste landfills, wood waste landfills and municipal solid waste composting.
0.0 Indicates emissions of less than 0.05 Mt CO_2 eq were truncated due to rounding.
- Indicates no emissions

Table A12–11 GHG Emissions for British Columbia by Canadian Economic Sector, Selected Years

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	Mt CO_2 eq							
GHG TOTAL	**51.1**	**62.7**	**62.8**	**65.0**	**64.0**	**60.2**	**62.2**	**64.3**
OIL AND GAS	**8.4**	**13.5**	**15.0**	**15.1**	**14.4**	**14.7**	**14.3**	**15.2**
Upstream Oil and Gas[a]	**6.9**	**12.9**	**14.3**	**14.5**	**13.8**	**14.2**	**13.7**	**14.6**
Natural Gas Production and Processing	4.7	10.7	12.1	12.3	11.7	12.2	11.8	12.6
Conventional Oil Production	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4
Conventional Light Oil Production	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4
Conventional Heavy Oil Production	-	-	-	-	-	-	-	-
Frontier Oil Production	-	-	-	-	-	-	-	-
Oil Sands (Mining, In-Situ, Upgrading)	-	-	-	-	-	-	-	-
Mining and Extraction	-	-	-	-	-	-	-	-
In-Situ	-	-	-	-	-	-	-	-
Upgrading	-	-	-	-	-	-	-	-
Oil, Natural Gas and CO_2 Transmission	1.6	1.4	1.6	1.5	1.6	1.5	1.5	1.6
Downstream Oil and Gas	**1.5**	**0.6**	**0.7**	**0.6**	**0.6**	**0.5**	**0.6**	**0.6**
Petroleum Refining	1.3	0.5	0.6	0.5	0.5	0.4	0.5	0.5
Natural Gas Distribution	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ELECTRICITY	**0.9**	**1.0**	**0.1**	**0.3**	**0.6**	**0.2**	**0.4**	**0.3**
TRANSPORT	**15.0**	**19.5**	**21.8**	**22.7**	**22.6**	**20.4**	**22.1**	**23.2**
Passenger Transport	**9.2**	**11.7**	**12.3**	**12.7**	**12.4**	**10.4**	**10.9**	**11.5**
Cars, Light Trucks and Motorcycles	7.7	9.9	10.4	10.6	10.3	9.1	9.6	9.7
Bus, Rail and Aviation	1.5	1.9	1.9	2.1	2.0	1.2	1.3	1.8
Freight Transport	**5.0**	**6.4**	**7.6**	**8.0**	**8.4**	**8.1**	**9.1**	**9.7**
Heavy Duty Trucks, Rail	4.2	5.3	6.3	6.7	6.9	6.6	7.2	7.5
Aviation and Marine	0.9	1.1	1.3	1.4	1.5	1.5	1.9	2.2
Other: Recreational, Commercial and Residential	**0.7**	**1.4**	**1.8**	**1.9**	**1.9**	**1.9**	**2.0**	**2.0**
HEAVY INDUSTRY	**8.9**	**7.2**	**6.6**	**6.9**	**6.5**	**5.6**	**5.5**	**5.2**
Mining	**0.5**	**0.4**	**0.6**	**0.9**	**0.8**	**0.8**	**0.7**	**0.8**
Smelting and Refining (Non-Ferrous Metals)	**2.0**	**1.7**	**1.2**	**1.1**	**1.2**	**1.1**	**0.9**	**0.7**
Pulp and Paper	**4.1**	**1.8**	**2.2**	**2.2**	**2.4**	**2.1**	**2.2**	**2.0**
Iron and Steel	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cement	**1.1**	**2.0**	**2.1**	**2.2**	**1.6**	**1.1**	**1.3**	**1.2**
Lime and Gypsum	**0.2**	**0.3**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Chemicals and Fertilizers	**1.0**	**0.9**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.3**
BUILDINGS	**7.7**	**8.5**	**8.5**	**8.4**	**8.7**	**8.8**	**9.0**	**9.4**
Service Industry	**3.1**	**3.8**	**3.8**	**3.9**	**4.1**	**4.1**	**4.2**	**4.4**
Residential	**4.6**	**4.7**	**4.7**	**4.5**	**4.7**	**4.7**	**4.8**	**5.0**
AGRICULTURE	**2.4**	**2.9**	**3.0**	**3.2**	**3.1**	**3.1**	**3.1**	**3.1**
On Farm Fuel Use	**0.4**	**0.2**	**0.8**	**0.9**	**0.9**	**0.8**	**0.8**	**0.8**
Crop Production	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Animal Production	**1.9**	**2.5**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
WASTE	**2.7**	**2.7**	**2.3**	**2.3**	**2.3**	**1.9**	**1.8**	**1.8**
Solid Waste[b]	**2.5**	**2.5**	**2.0**	**2.0**	**2.0**	**1.6**	**1.5**	**1.5**
Wastewater	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
Waste Incineration	**0.0**	-	-	-	-	-	-	-
COAL PRODUCTION	**1.8**	**2.1**	**2.0**	**2.3**	**2.3**	**2.1**	**2.5**	**2.4**
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	**3.3**	**5.3**	**3.4**	**3.9**	**3.4**	**3.3**	**3.4**	**3.5**
Light Manufacturing	**1.5**	**3.3**	**1.4**	**1.6**	**1.3**	**1.5**	**1.4**	**1.5**
Construction	**0.6**	**0.7**	**0.8**	**0.9**	**0.8**	**0.6**	**0.8**	**0.7**
Forest Resources	**1.2**	**1.3**	**1.1**	**1.3**	**1.3**	**1.1**	**1.2**	**1.3**

Notes:
Totals may not add up due to rounding.
Estimates presented here are under continual improvement. Historical emissions may be updated in future publications as new data become available and methods and models are refined and improved.
National GHG emissions allocated to IPCC sectors are provided in Annex 9 of this report.
Provincial and territorial GHG emissions allocated to IPCC sectors are provided in Annex 11 of this report.
a. Emission estimates for this source are currently under review and upward revisions to CH_4 emissions in the years prior to 2020 are anticipated in the 2025 edition of this report, pending further data collection and analysis.
b. Emission estimates for Solid Waste include emissions from municipal solid waste landfills, wood waste landfills and municipal solid waste composting.
0.0 Indicates emissions of less than 0.05 Mt CO_2 eq were truncated due to rounding.
- Indicates no emissions

Table A12–12 **GHG Emissions for Yukon by Canadian Economic Sector, Selected Years**

Greenhouse Gas Categories	1990	2005	2017	2018	2019	2020	2021	2022
	Mt CO_2 eq							
GHG TOTAL	**0.5**	**0.6**	**0.6**	**0.6**	**0.7**	**0.6**	**0.7**	**0.7**
OIL AND GAS	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Upstream Oil and Gas	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Natural Gas Production and Processing	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Conventional Oil Production	-	-	-	-	-	-	-	-
Conventional Light Oil Production	-	-	-	-	-	-	-	-
Conventional Heavy Oil Production	-	-	-	-	-	-	-	-
Frontier Oil Production	-	-	-	-	-	-	-	-
Oil Sands (Mining, In-Situ, Upgrading)	-	-	-	-	-	-	-	-
Mining and Extraction	-	-	-	-	-	-	-	-
In-Situ	-	-	-	-	-	-	-	-
Upgrading	-	-	-	-	-	-	-	-
Oil, Natural Gas and CO_2 Transmission	-	-	-	-	-	-	-	-
Downstream Oil and Gas	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Petroleum Refining	-	-	-	-	-	-	-	-
Natural Gas Distribution	-	-	-	-	-	-	-	-
ELECTRICITY	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**
TRANSPORT	**0.2**	**0.3**	**0.4**	**0.4**	**0.4**	**0.3**	**0.4**	**0.4**
Passenger Transport	**0.1**	**0.1**	**0.2**	**0.2**	**0.3**	**0.2**	**0.2**	**0.3**
Cars, Light Trucks and Motorcycles	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Bus, Rail and Aviation	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1
Freight Transport	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Heavy Duty Trucks, Rail	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aviation and Marine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other: Recreational, Commercial and Residential	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
HEAVY INDUSTRY	**0.1**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Mining	**0.1**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Smelting and Refining (Non-Ferrous Metals)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Pulp and Paper	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Iron and Steel	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cement	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Lime and Gypsum	**0.0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Chemicals and Fertilizers	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
BUILDINGS	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Service Industry	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Residential	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
AGRICULTURE	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
On Farm Fuel Use	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Crop Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Animal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Solid Waste[a]	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Wastewater	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Waste Incineration	**-**	**0.0**	**-**	**-**	**-**	**-**	**-**	**-**
COAL PRODUCTION	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Light Manufacturing	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Construction	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Forest Resources	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Notes:
Totals may not add up due to rounding.
Estimates presented here are under continual improvement. Historical emissions may be updated in future publications as new data become available and methods and models are refined and improved.
National GHG emissions allocated to IPCC sectors are provided in Annex 9 of this report.
Provincial and territorial GHG emissions allocated to IPCC sectors are provided in Annex 11 of this report.
a. Emission estimates for Solid Waste include emissions from municipal solid waste landfills, wood waste landfills and municipal solid waste composting.
0.0 Indicates emissions of less than 0.05 Mt CO_2 eq were truncated due to rounding.
- Indicates no emissions

Table A12–13 **GHG Emissions for Northwest Territories by Canadian Economic Sector, Selected Years**

Greenhouse Gas Categories	1999	2005	2017	2018	2019	2020	2021	2022
	Mt CO_2 eq							
GHG TOTAL	**1.3**	**1.7**	**1.4**	**1.4**	**1.4**	**1.2**	**1.3**	**1.4**
OIL AND GAS	**0.2**	**0.3**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**
Upstream Oil and Gas	**0.2**	**0.3**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**
Natural Gas Production and Processing	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Conventional Oil Production	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1
Conventional Light Oil Production	-	-	-	-	-	-	-	-
Conventional Heavy Oil Production	-	-	-	-	-	-	-	-
Frontier Oil Production	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1
Oil Sands (Mining, In-Situ, Upgrading)	-	-	-	-	-	-	-	-
Mining and Extraction	-	-	-	-	-	-	-	-
In-Situ	-	-	-	-	-	-	-	-
Upgrading	-	-	-	-	-	-	-	-
Oil, Natural Gas and CO_2 Transmission	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downstream Oil and Gas	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Petroleum Refining	-	-	-	-	-	-	-	-
Natural Gas Distribution	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICITY	**0.1**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
TRANSPORT	**0.3**	**0.8**	**0.8**	**0.8**	**0.7**	**0.5**	**0.6**	**0.6**
Passenger Transport	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.3**	**0.3**
Cars, Light Trucks and Motorcycles	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Bus, Rail and Aviation	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2
Freight Transport	**0.1**	**0.5**	**0.5**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**
Heavy Duty Trucks, Rail	0.1	0.4	0.5	0.4	0.3	0.2	0.3	0.3
Aviation and Marine	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0
Other: Recreational, Commercial and Residential	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
HEAVY INDUSTRY	**0.4**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
Mining	**0.4**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
Smelting and Refining (Non-Ferrous Metals)	**-**	**0.0**	**-**	**-**	**-**	**-**	**-**	**-**
Pulp and Paper	**-**	**0.0**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel	**-**	**0.0**	**-**	**-**	**-**	**-**	**-**	**-**
Cement	**-**	**0.0**	**-**	**-**	**-**	**-**	**-**	**-**
Lime and Gypsum	**-**	**0.0**	**-**	**-**	**-**	**-**	**-**	**-**
Chemicals and Fertilizers	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
BUILDINGS	**0.3**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Service Industry	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Residential	**0.1**	**0.1**	**0.0**	**0.1**	**0.1**	**0.1**	**0.0**	**0.1**
AGRICULTURE	**0.0**	**0.0**	**-**	**-**	**-**	**-**	**-**	**-**
On Farm Fuel Use	**0.0**	**0.0**	**-**	**-**	**-**	**-**	**-**	**-**
Crop Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Animal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Solid Waste[a]	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Wastewater	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Waste Incineration	**0.0**	**0.0**	**-**	**-**	**-**	**-**	**-**	**-**
COAL PRODUCTION	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	**0.0**	**x**	**x**	**x**	**x**	**x**	**x**	**x**
Light Manufacturing	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Construction	**0.0**	**x**	**x**	**x**	**x**	**x**	**x**	**x**
Forest Resources	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Notes:
Totals may not add up due to rounding.
Estimates presented here are under continual improvement. Historical emissions may be updated in future publications as new data become available and methods and models are refined and improved.
National GHG emissions allocated to IPCC sectors are provided in Annex 9 of this report.
Provincial and territorial GHG emissions allocated to IPCC sectors are provided in Annex 11 of this report.
a. Emission estimates for Solid Waste include emissions from municipal solid waste landfills, wood waste landfills and municipal solid waste composting.
0.0 Indicates emissions of less than 0.05 Mt CO_2 eq were truncated due to rounding.
- Indicates no emissions
x Indicates data has been suppressed to respect confidentiality

Table A12–14 **GHG Emissions for Nunavut by Canadian Economic Sector, Selected Years**

Greenhouse Gas Categories	1999	2005	2017	2018	2019	2020	2021	2022
	Mt CO_2 eq							
GHG TOTAL	**0.4**	**0.6**	**0.7**	**0.7**	**0.8**	**0.6**	**0.6**	**0.6**
OIL AND GAS	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Upstream Oil and Gas	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Natural Gas Production and Processing	-	-	-	-	-	-	-	-
Conventional Oil Production	-	-	-	-	-	-	-	-
Conventional Light Oil Production	-	-	-	-	-	-	-	-
Conventional Heavy Oil Production	-	-	-	-	-	-	-	-
Frontier Oil Production	-	-	-	-	-	-	-	-
Oil Sands (Mining, In-Situ, Upgrading)	-	-	-	-	-	-	-	-
Mining and Extraction	-	-	-	-	-	-	-	-
In-Situ	-	-	-	-	-	-	-	-
Upgrading	-	-	-	-	-	-	-	-
Oil, Natural Gas and CO_2 Transmission	-	-	-	-	-	-	-	-
Downstream Oil and Gas	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Petroleum Refining	-	-	-	-	-	-	-	-
Natural Gas Distribution	-	-	-	-	-	-	-	-
ELECTRICITY	**0.0**	**x**	**x**	**x**	**x**	**x**	**x**	**x**
TRANSPORT	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**
Passenger Transport	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.2**
Cars, Light Trucks and Motorcycles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bus, Rail and Aviation	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1
Freight Transport	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.2**	**0.1**
Heavy Duty Trucks, Rail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aviation and Marine	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1
Other: Recreational, Commercial and Residential	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
HEAVY INDUSTRY	**0.1**	**0.1**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Mining	**0.1**	**0.1**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Smelting and Refining (Non-Ferrous Metals)	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Pulp and Paper	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron and Steel	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Cement	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Lime and Gypsum	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Chemicals and Fertilizers	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
BUILDINGS	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Service Industry	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Residential	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
AGRICULTURE	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
On Farm Fuel Use	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Crop Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Animal Production	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
WASTE	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Solid Waste[a]	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Wastewater	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Waste Incineration	**-**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
COAL PRODUCTION	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	**0.0**	**x**	**x**	**x**	**x**	**x**	**x**	**x**
Light Manufacturing	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Construction	**0.0**	**x**	**x**	**x**	**x**	**x**	**x**	**x**
Forest Resources	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes:
Totals may not add up due to rounding.
Estimates presented here are under continual improvement. Historical emissions may be updated in future publications as new data become available and methods and models are refined and improved.
National GHG emissions allocated to IPCC sectors are provided in Annex 9 of this report.
Provincial and territorial GHG emissions allocated to IPCC sectors are provided in Annex 11 of this report.
a. Emission estimates for Solid Waste include emissions from municipal solid waste landfills, wood waste landfills and municipal solid waste composting.
0.0 Indicates emissions of less than 0.05 Mt CO_2 eq were truncated due to rounding.
- Indicates no emissions
x Indicates data has been suppressed to respect confidentiality

Table A12–15 **GHG Emissions for Northwest Territories and Nunavut by Canadian Economic Sector, 1990–1998**

Greenhouse Gas Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Mt CO_2 eq								
GHG TOTAL	**1.8**	**1.8**	**1.6**	**1.9**	**2.0**	**2.1**	**2.1**	**1.9**	**1.8**
OIL AND GAS	**0.4**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**
Upstream Oil and Gas	**0.4**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**
Natural Gas Production and Processing	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Conventional Oil Production	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
Conventional Light Oil Production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conventional Heavy Oil Production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Frontier Oil Production	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
Oil Sands (Mining, In-Situ, Upgrading)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining and Extraction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
In-Situ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Upgrading	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil, Natural Gas and CO_2 Transmission	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downstream Oil and Gas	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Petroleum Refining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas Distribution	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICITY	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.2**	**0.1**	**0.1**	**0.2**
TRANSPORT	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
Passenger Transport	**0.3**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
Cars, Light Trucks and Motorcycles	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Bus, Rail and Aviation	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Freight Transport	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
Heavy Duty Trucks, Rail	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1
Aviation and Marine	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other: Recreational, Commercial and Residential	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**
HEAVY INDUSTRY	**0.2**	**0.1**	**0.1**	**0.2**	**0.3**	**0.4**	**0.5**	**0.4**	**0.5**
Mining	**0.2**	**0.1**	**0.1**	**0.2**	**0.3**	**0.4**	**0.5**	**0.4**	**0.5**
Smelting and Refining (Non-Ferrous Metals)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Pulp and Paper	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Iron and Steel	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cement	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Lime and Gypsum	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Chemicals and Fertilizers	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
BUILDINGS	**0.4**	**0.6**	**0.6**	**0.6**	**0.7**	**0.7**	**0.6**	**0.6**	**0.3**
Service Industry	**0.3**	**0.4**	**0.4**	**0.4**	**0.5**	**0.6**	**0.4**	**0.4**	**0.2**
Residential	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.2**	**0.2**	**0.1**
AGRICULTURE	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
On Farm Fuel Use	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Crop Production	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Animal Production	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
WASTE	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Solid Waste[a]	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Wastewater	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Waste Incineration	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
COAL PRODUCTION	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
LIGHT MANUFACTURING, CONSTRUCTION AND FOREST RESOURCES	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**
Light Manufacturing	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Construction	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Forest Resources	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Notes:
Totals may not add up due to rounding.
Estimates presented here are under continual improvement. Historical emissions may be updated in future publications as new data become available and methods and models are refined and improved.
National GHG emissions allocated to IPCC sectors are provided in Annex 9 of this report.
Provincial and territorial GHG emissions allocated to IPCC sectors are provided in Annex 11 of this report.
a. Emission estimates for Solid Waste include emissions from municipal solid waste landfills, wood waste landfills and municipal solid waste composting.
0.0 Indicates emissions of less than 0.05 Mt CO_2 eq were truncated due to rounding.
- Indicates no emissions

ANNEX 13

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, provincial, and territorial 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_6) emissions associated with switchgear and other electrical equipment, which is accounted for in the Industrial Processes and Product Use [IPPU] 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, can be either public or private generators and are reported under North American Industrial Classification System (NAICS) code 22111. 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. Any industry that generates electricity, but whose main business is something other than electric power generation, is reported under the NAICS code associated with their primary business activity. However, in some cases, a

company may have divided their operations so that the electric power generation is a separate business entity (even if the operations are on the same site). In this case, the electric power generation is included under the Public Electricity and Heat Production category.

The analysis in this section only includes main activity producers. This analysis relies on a variety of data sources; fuel consumption and electricity production data are published by Statistics Canada in the *Report on Energy Supply and Demand in Canada* (RESD) (Statistics Canada, n.d. [a]), in the publication *Electric Power Generation, Transmission and Distributio*n (EPGTD) (Statistics Canada, n.d. [b]) and online via Statistics Canada data tables 25-10-0019-01, 25-10-0020-01, 25-10-0021-01 and 25-10-0084-01 (Statistics Canada, n.d. [c], n.d. [d], n.d. [e], n.d. [f]).

A "generation intensity" indicator is derived to reflect the GHG emissions intensity of electricity as it is delivered to the electricity grid. Electricity generation intensity values were derived for each fuel type using GHG emission estimates and electricity generation data. The methodology used to develop the GHG emissions is discussed in Chapter 3 and Annex 3.1 of this report. GHG emissions are based on the total fuel consumed by the public utility sector, as provided in the RESD,[1] while generation data are from Statistics Canada data tables (2005–2022) and the EPGTD publication (1990–2004).

A "consumption intensity" indicator was also derived to reflect the GHG emissions intensity of electricity as it is delivered to the consumer. Accordingly, electric energy losses (mainly) in transmission and distribution are subtracted from overall total electricity generation, while SF_6 emissions associated with equipment used in electricity transmission and distribution are added to overall total GHG emissions. The electric energy losses in transmission, distribution and anywhere else are taken to be the utility sector's share of "unallocated energy," as presented in Table A13–1 to Table A13–14 and calculated from data provided by Statistics Canada (n.d. [e]) or regional electricity system operators. Likewise, the SF_6 emission values are based on the electric utility sector's share of total SF_6 emissions from equipment used in electricity transmission and distribution.

Electricity intensity values for Canada, the provinces and the territories are provided in Table A13–1 to Table A13–14.

1 Occasionally, Statistics Canada revises some of its historic data, which can affect the values provided in Table A13–1 to Table A13–14.

Table A13–1 Electricity Generation and GHG Emission Details for Canada

	1990	2005	2010	2015	2017	2018	2019	2020	2021	2022[a]
GREENHOUSE GAS EMISSIONS[b]										
	kt CO_2 equivalent									
Combustion	**94 100**	**124 000**	**102 000**	**83 100**	**79 100**	**70 700**	**69 400**	**61 800**	**60 600**	**56 300**
Coal	80 100	97 900	78 500	57 800	57 700	44 600	42 800	34 600	31 400	24 400
Natural Gas	2 720	14 500	18 900	19 900	16 700	21 500	22 400	23 700	26 200	27 900
Other Fuels[c]	11 300	11 300	4 700	5 390	4 750	4 590	4 140	3 410	3 040	4 100
Other Emissions[d]	**–**	**52**	**53**	**87**	**80**	**78**	**80**	**68**	**72**	**76**
OVERALL TOTAL[e, f, g]	**94 100**	**124 000**	**102 000**	**83 100**	**79 200**	**70 700**	**69 400**	**61 800**	**60 700**	**56 400**
ELECTRICITY GENERATION[h, i]										
	GWh									
Combustion[j]	**101 000**	**140 000**	**117 000**	**108 000**	**99 100**	**98 700**	**97 700**	**90 600**	**92 800**	**89 200**
Coal	82 200	93 900	74 300	57 800	55 600	47 000	44 500	35 900	32 000	24 400
Natural Gas	4 140	29 800	33 600	41 200	35 200	43 500	45 800	47 800	54 200	57 400
Other Fuels	14 800	16 700	8 650	8 560	8 250	8 210	7 360	6 840	6 630	7 390
Refined Petroleum Products	14 700	10 800	3 010	3 550	3 050	2 750	2 400	2 140	2 100	2 700
Biomass	14	1 780	2 310	1 980	2 170	2 210	1 880	2 110	2 240	1 960
Other	91	4 070	3 330	3 030	3 030	3 260	3 080	2 590	2 290	2 720
Nuclear	**68 800**	**86 800**	**85 500**	**96 000**	**95 600**	**95 000**	**95 500**	**92 600**	**87 400**	**82 300**
Hydro	**263 000**	**327 000**	**321 000**	**345 000**	**361 000**	**353 000**	**349 000**	**355 000**	**359 000**	**373 000**
Other Renewables[k]	**26**	**1 580**	**8 780**	**27 500**	**32 100**	**34 300**	**33 600**	**36 300**	**36 200**	**39 000**
Other Generation[l, m]	**–**	**32**	**10 100**	**280**	**410**	**340**	**330**	**500**	**640**	**670**
OVERALL TOTAL[f]	**433 000**	**556 000**	**542 000**	**577 000**	**588 000**	**581 000**	**577 000**	**575 000**	**576 000**	**584 000**
GREENHOUSE GAS INTENSITY[n]										
	Generation Intensity (g GHG / kWh electricity generated)									
CO_2 intensity (g CO_2 / kWh)	220	220	190	140	130	120	120	110	100	100
CH_4 intensity (g CH_4 / kWh)	0.004	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
N_2O intensity (g N_2O / kWh)	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.002	0.002	0.002
GENERATION INTENSITY (g CO_2 eq / kWh)[f]	**220**	**220**	**190**	**140**	**130**	**120**	**120**	**110**	**110**	**100**
	Losses									
Unallocated Energy (GWh)[o, p]	31 000	33 000	40 000	46 000	43 000	41 000	42 000	44 000	39 000	37 000
SF_6 Emissions (kt CO_2 eq)[q]	210	170	190	200	150	170	130	160	160	140
	Consumption Intensity (g GHG / kWh electricity consumed)									
CONSUMPTION INTENSITY (g CO_2 eq / kWh)[r]	**230**	**240**	**200**	**160**	**150**	**130**	**130**	**120**	**110**	**100**

Notes:

Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 – Electric Power Generation.

a. Preliminary data.
b. Emissions based on data taken from the *Report on Energy Supply-Demand in Canada*, Catalogue No. 57-003-XIB, Statistics Canada.
c. 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.
d. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
e. GHG emissions from the flooding of land for hydro dams are not included.
f. Totals may not add up to overall total due to rounding.
g. CO_2 from carbon capture and storage has been removed from the total.
h. Taken from StatCan Data Tables 25-10-0019-01 (2005–2019), 25-10-0084-01 (2020–2022), and 25-10-0020-01 (2005–2022).
i. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-XIB, Statistics Canada (for 1990–2004).
j. From 2014 onward, this includes most of the electricity generated from the by-product steam associated with the fuel combustion. Prior to 2014, it was not possible to break this data into the original fuel source, so it was included in Other Generation.
k. Other Renewables – includes electricity generation by wind, tidal and solar.
l. NAICS category 221119, Other Electric Power Generation.
m. Prior to 2014, this includes electricity generation from steam from waste heat. From 2014 onward, most of the electricity generation from steam from waste heat is reported as part of its original fuel source.
n. Intensity values have been rounded so as to present the estimated level of accuracy.
o. Adapted from StatCan Data Table 25-10-0021-001 (2005-2022), Cat. No. 57-202-XIB (1990-2004) or regional electricity system operators.
p. Includes transmission line losses, metering differences and other losses.
q. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
r. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation

Table A13–2 Electricity Generation and GHG Emission Details for Newfoundland and Labrador

	1990	2005	2010	2015	2017	2018	2019	2020	2021	2022[a]
GREENHOUSE GAS EMISSIONS[b]										
	kt CO_2 equivalent									
Combustion	**1 640**	**820**	**740**	**1 340**	**1 530**	**1 130**	**1 140**	**950**	**650**	**690**
Coal	–	–	–	–	–	–	–	–	–	–
Natural Gas	–	–	–	–	–	–	–	–	–	–
Other Fuels[c]	1 640	820	740	1 340	1 530	1 130	1 140	950	650	690
Other Emissions[d]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[e, f, g]	**1 640**	**820**	**740**	**1 340**	**1 530**	**1 130**	**1 140**	**950**	**650**	**690**
ELECTRICITY GENERATION[h, i]										
	GWh									
Combustion[j]	**2 090**	**1 360**	**916**	**1 560**	**1 800**	**1 260**	**1 320**	**1 090**	**760**	**800**
Coal	–	–	–	–	–	–	–	–	–	–
Natural Gas	–	–	–	–	–	–	–	–	–	–
Other Fuels	2 090	1 360	920	1 560	1 800	1 260	1 320	1 090	760	800
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Hydro	**34 300**	**38 900**	**39 400**	**38 800**	**36 500**	**41 800**	**40 800**	**38 500**	**39 400**	**39 500**
Other Renewables[k]	**–**	**–**	**180**	**170**	**190**	**210**	**180**	**180**	**160**	**160**
Other Generation[l, m]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[f]	**36 400**	**40 300**	**40 500**	**40 500**	**38 500**	**43 300**	**42 300**	**39 800**	**40 300**	**40 400**
GREENHOUSE GAS INTENSITY[n]										
	Generation Intensity (g GHG / kWh electricity generated)									
CO_2 intensity (g CO_2 / kWh)	45	20	18	33	39	26	27	24	16	17
CH_4 intensity (g CH_4 / kWh)	0.0005	0.0002	0.0003	0.0005	0.0006	0.0004	0.0004	0.0003	0.0002	0.0002
N_2O intensity (g N_2O / kWh)	0.001	0.0	0.0	0.001	0.001	0.001	0.001	0.0	0.0	0.0
GENERATION INTENSITY (g CO_2 eq / kWh)[f]	**45**	**20**	**18**	**33**	**40**	**26**	**27**	**24**	**16**	**17**
	Losses									
Unallocated Energy (GWh)[o, p]	990	860	1 200	1 900	1 620	1 930	1 900	1 800	2 100	1 900
SF_6 Emissions (kt CO_2 eq)[q]	0.97	0.52	0.55	3.5	1.7	2.2	1.9	3.6	3.2	2.9
	Consumption Intensity (g GHG / kWh electricity consumed)									
CONSUMPTION INTENSITY (g CO_2 eq / kWh)[r]	**46**	**21**	**19**	**35**	**41**	**27**	**28**	**25**	**17**	**18**

Notes:

Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 – Electric Power Generation.

a. Preliminary data.
b. Emissions based on data taken from the *Report on Energy Supply-Demand in Canada*, Catalogue No. 57-003-XIB, Statistics Canada.
c. 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.
d. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
e. GHG emissions from the flooding of land for hydro dams are not included.
f. Totals may not add up to overall total due to rounding.
g. CO_2 from carbon capture and storage has been removed from the total.
h. Taken from StatCan Data Tables 25-10-0019-01 (2005–2019), 25-10-0084-01 (2020–2022), and 25-10-0020-01 (2005–2022).
i. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-XIB, Statistics Canada (for 1990–2004).
j. From 2014 onward, this includes most of the electricity generated from the by-product steam associated with the fuel combustion. Prior to 2014, it was not possible to break this data into the original fuel source, so it was included in Other Generation.
k. Other Renewables – includes electricity generation by wind, tidal and solar.
l. NAICS category 221119, Other Electric Power Generation.
m. Prior to 2014, this includes electricity generation from steam from waste heat. From 2014 onward, most of the electricity generation from steam from waste heat is reported as part of its original fuel source.
n. Intensity values have been rounded so as to present the estimated level of accuracy.
o. Adapted from StatCan Data Table 25-10-0021-001 (2005-2022), Cat. No. 57-202-XIB (1990-2004) or regional electricity system operators.
p. Includes transmission line losses, metering differences and other losses.
q. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
r. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
0.0 Indicates emissions or electricity generation value less than 0.1

Table A13–3 Electricity Generation and GHG Emission Details for Prince Edward Island

	1990	2005	2010	2015	2017	2018	2019	2020	2021	2022[a]
GREENHOUSE GAS EMISSIONS[b]										
	kt CO_2 equivalent									
Combustion	**100**	**5.6**	**1.9**	**14**	**8.6**	**2.8**	**1.1**	**0.3**	**1.9**	**1.1**
Coal	–	–	–	–	–	–	–	–	–	–
Natural Gas	–	–	–	–	–	–	–	–	–	–
Other Fuels[c]	100	5.6	1.9	14	8.6	2.8	1.1	0.3	1.9	1.1
Other Emissions[d]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[e, f, g]	**100**	**5.6**	**1.9**	**14**	**8.6**	**2.8**	**1.1**	**0.3**	**1.9**	**1.1**
ELECTRICITY GENERATION[h, i]										
	GWh									
Combustion[j]	**81**	**6.3**	**3.8**	**9.8**	**5.6**	**3.0**	**0.93**	**0.25**	**1.8**	**1.1**
Coal	–	–	–	–	–	–	–	–	–	–
Natural Gas	–	–	–	–	–	–	–	–	–	–
Other Fuels	81	6.3	3.8	9.8	5.6	3.0	0.93	0.25	1.8	1.1
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Hydro	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Other Renewables[k]	**–**	**40**	**460**	**610**	**600**	**640**	**650**	**660**	**600**	**490**
Other Generation[l, m]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[f]	**81**	**46**	**460**	**620**	**610**	**640**	**650**	**660**	**600**	**490**
GREENHOUSE GAS INTENSITY[n]										
	Generation Intensity (g GHG / kWh electricity generated)									
CO_2 intensity (g CO_2 / kWh)	1 300	120	4.0	22	14	4.0	2.0	0.0	3.0	2.0
CH_4 intensity (g CH_4 / kWh)	0.01	0.002	0.00008	0.0007	0.0005	0.0003	0.0001	0.0	0.0002	0.0001
N_2O intensity (g N_2O / kWh)	0.03	0.002	0.0001	0.0004	0.0002	0.0	0.0	0.0	0.0	0.0
GENERATION INTENSITY (g CO_2 eq / kWh)[f]	**1 300**	**120**	**4.0**	**23**	**14**	**4.0**	**2.0**	**0.0**	**3.0**	**2.0**
	Losses									
Unallocated Energy (GWh)[o, p]	unk	unk	8.6	20	7.0	24	24	25	23	21
SF_6 Emissions (kt CO_2 eq)[q]	0.0	–	–	–	–	–	–	–	–	0.0
	Consumption Intensity (g GHG / kWh electricity consumed)									
CONSUMPTION INTENSITY (g CO_2 eq / kWh)[r]	**	**	**	**	**	**	**	**	**	**

Notes:

Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 – Electric Power Generation.

a. Preliminary data.
b. Emissions based on data taken from the *Report on Energy Supply-Demand in Canada*, Catalogue No. 57-003-XIB, Statistics Canada.
c. 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.
d. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
e. GHG emissions from the flooding of land for hydro dams are not included.
f. Totals may not add up to overall total due to rounding.
g. CO_2 from carbon capture and storage has been removed from the total.
h. Taken from StatCan Data Tables 25-10-0019-01 (2005–2019), 25-10-0084-01 (2020–2022), and 25-10-0020-01 (2005–2022).
i. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-XIB, Statistics Canada (for 1990–2004).
j. From 2014 onward, this includes most of the electricity generated from the by-product steam associated with the fuel combustion. Prior to 2014, it was not possible to break this data into the original fuel source, so it was included in Other Generation.
k. Other Renewables – includes electricity generation by wind, tidal and solar.
l. NAICS category 221119, Other Electric Power Generation.
m. Prior to 2014, this includes electricity generation from steam from waste heat. From 2014 onward, most of the electricity generation from steam from waste heat is reported as part of its original fuel source.
n. Intensity values have been rounded so as to present the estimated level of accuracy.
o. Adapted from StatCan Data Table 25-10-0021-001 (2005-2022), Cat. No. 57-202-XIB (1990-2004) or regional electricity system operators.
p. Includes transmission line losses, metering differences and other losses.
q. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
r. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
0.0 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 A13–4 Electricity Generation and GHG Emission Details for Nova Scotia

	1990	2005	2010	2015	2017	2018	2019	2020	2021	2022[a]
GREENHOUSE GAS EMISSIONS[b]										
	kt CO_2 equivalent									
Combustion	**6 870**	**10 700**	**8 780**	**6 980**	**6 650**	**6 970**	**6 670**	**6 280**	**6 040**	**5 790**
Coal	5 080	5 460	6 340	4 400	4 690	4 840	4 820	4 240	4 440	3 680
Natural Gas	–	x	x	690	730	790	780	990	920	880
Other Fuels[c]	1 790	x	x	1 890	1 230	1 340	1 070	1 050	680	1 220
Other Emissions[d]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[e, f, g]	**6 870**	**10 700**	**8 780**	**6 980**	**6 650**	**6 970**	**6 670**	**6 280**	**6 040**	**5 790**
ELECTRICITY GENERATION[h, i]										
	GWh									
Combustion[j]	**8 440**	**11 100**	**10 300**	**8 220**	**7 680**	**7 890**	**7 410**	**7 410**	**7 260**	**6 740**
Coal	6 020	6 770	6 790	4 870	4 840	4 980	4 990	4 470	4 660	3 850
Natural Gas	–	180	2 270	1 300	1 440	1 420	1 360	1 860	1 670	1 630
Other Fuels	2 430	4 110	1 270	2 050	1 400	1 490	1 060	1 080	930	1 250
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Hydro	**1 120**	**1 040**	**970**	**1 010**	**850**	**940**	**1 030**	**750**	**780**	**880**
Other Renewables[k]	**26**	**110**	**410**	**820**	**1 270**	**1 410**	**1 270**	**1 280**	**1 190**	**1 150**
Other Generation[l, m]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[f]	**9 590**	**12 200**	**11 700**	**10 000**	**9 800**	**10 240**	**9 710**	**9 430**	**9 230**	**8 770**
GREENHOUSE GAS INTENSITY[n]										
	Generation Intensity (g GHG / kWh electricity generated)									
CO_2 intensity (g CO_2 / kWh)	710	870	750	690	680	680	680	660	650	660
CH_4 intensity (g CH_4 / kWh)	0.007	0.02	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03
N_2O intensity (g N_2O / kWh)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
GENERATION INTENSITY (g CO_2 eq / kWh)[f]	**720**	**880**	**750**	**690**	**680**	**680**	**690**	**670**	**650**	**660**
	Losses									
Unallocated Energy (GWh)[o, p]	580	770	670	570	660	670	640	640	600	540
SF_6 Emissions (kt CO_2 eq)[q]	24	30	28	34	41	26	6.2	4.2	5.7	5.7
	Consumption Intensity (g GHG / kWh electricity consumed)									
CONSUMPTION INTENSITY (g CO_2 eq / kWh)[r]	**770**	**940**	**800**	**740**	**730**	**730**	**740**	**720**	**700**	**700**

Notes:

Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 – Electric Power Generation.

a. Preliminary data.
b. Emissions based on data taken from the *Report on Energy Supply-Demand in Canada*, Catalogue No. 57-003-XIB, Statistics Canada.
c. 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.
d. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
e. GHG emissions from the flooding of land for hydro dams are not included.
f. Totals may not add up to overall total due to rounding.
g. CO_2 from carbon capture and storage has been removed from the total.
h. Taken from StatCan Data Tables 25-10-0019-01 (2005–2019), 25-10-0084-01 (2020–2022), and 25-10-0020-01 (2005–2022).
i. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-XIB, Statistics Canada (for 1990–2004).
j. From 2014 onward, this includes most of the electricity generated from the by-product steam associated with the fuel combustion. Prior to 2014, it was not possible to break this data into the original fuel source, so it was included in Other Generation.
k. Other Renewables – includes electricity generation by wind, tidal and solar.
l. NAICS category 221119, Other Electric Power Generation.
m. Prior to 2014, this includes electricity generation from steam from waste heat. From 2014 onward, most of the electricity generation from steam from waste heat is reported as part of its original fuel source.
n. Intensity values have been rounded so as to present the estimated level of accuracy.
o. Adapted from StatCan Data Table 25-10-0021-001 (2005-2022), Cat. No. 57-202-XIB (1990-2004) or regional electricity system operators.
p. Includes transmission line losses, metering differences and other losses.
q. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
r. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
x Indicates data not shown due to statistical limitations

Table A13–5 Electricity Generation and GHG Emission Details for New Brunswick

	1990	2005	2010	2015	2017	2018	2019	2020	2021	2022[a]
GREENHOUSE GAS EMISSIONS[b]										
	kt CO_2 equivalent									
Combustion	**6 010**	**8 440**	**4 960**	**4 140**	**3 750**	**4 160**	**3 730**	**2 700**	**3 380**	**3 990**
Coal	1 170	2 900	1 800	1 560	1 850	2 070	1 750	1 140	1 390	1 850
Natural Gas	–	x	x	1 040	580	660	680	830	920	590
Other Fuels[c]	4 840	x	x	1 540	1 320	1 430	1 300	730	1 070	1 550
Other Emissions[d]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[e, f, g]	**6 010**	**8 440**	**4 960**	**4 140**	**3 750**	**4 160**	**3 730**	**2 700**	**3 380**	**3 990**
ELECTRICITY GENERATION[h, i]										
	GWh									
Combustion[j]	**7 630**	**12 100**	**6 220**	**5 630**	**4 390**	**4 780**	**4 010**	**3 240**	**3 950**	**4 340**
Coal	1 270	2 920	2 080	1 650	2 090	2 330	1 820	1 170	1 440	1 990
Natural Gas	–	1 970	1 840	2 320	1 300	980	1 030	1 370	1 580	820
Other Fuels	6 360	7 210	2 300	1 650	1 000	1 480	1 150	700	940	1 530
Nuclear	**5 340**	**4 380**	**–**	**4 280**	**5 120**	**4 870**	**5 020**	**4 790**	**4 420**	**3 540**
Hydro	**3 460**	**3 820**	**3 330**	**2 620**	**2 600**	**2 530**	**2 990**	**2 760**	**2 630**	**3 430**
Other Renewables[k]	**–**	**–**	**390**	**790**	**780**	**820**	**890**	**900**	**760**	**620**
Other Generation[l, m]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[f]	**16 400**	**20 300**	**10 600**	**13 300**	**12 900**	**13 000**	**12 900**	**11 700**	**11 800**	**11 900**
GREENHOUSE GAS INTENSITY[n]										
	Generation Intensity (g GHG / kWh electricity generated)									
CO_2 intensity (g CO_2 / kWh)	360	410	460	310	290	320	290	230	290	330
CH_4 intensity (g CH_4 / kWh)	0.004	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02
N_2O intensity (g N_2O / kWh)	0.007	0.008	0.008	0.005	0.004	0.005	0.004	0.004	0.005	0.005
GENERATION INTENSITY (g CO_2 eq / kWh)[f]	**370**	**420**	**470**	**310**	**290**	**320**	**290**	**230**	**290**	**330**
	Losses									
Unallocated Energy (GWh)[o, p]	990	1 060	650	670	630	700	580	580	520	450
SF_6 Emissions (kt CO_2 eq)[q]	0.73	–	0.36	0.85	1.5	1.4	0.75	1.0	1.0	2.3
	Consumption Intensity (g GHG / kWh electricity consumed)									
CONSUMPTION INTENSITY (g CO_2 eq / kWh)[r]	**390**	**440**	**500**	**330**	**310**	**340**	**300**	**240**	**300**	**350**

Notes:

Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 – Electric Power Generation.

a. Preliminary data.
b. Emissions based on data taken from the *Report on Energy Supply-Demand in Canada*, Catalogue No. 57-003-XIB, Statistics Canada.
c. 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.
d. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
e. GHG emissions from the flooding of land for hydro dams are not included.
f. Totals may not add up to overall total due to rounding.
g. CO_2 from carbon capture and storage has been removed from the total.
h. Taken from StatCan Data Tables 25-10-0019-01 (2005–2019), 25-10-0084-01 (2020–2022), and 25-10-0020-01 (2005–2022).
i. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-XIB, Statistics Canada (for 1990–2004).
j. From 2014 onward, this includes most of the electricity generated from the by-product steam associated with the fuel combustion. Prior to 2014, it was not possible to break this data into the original fuel source, so it was included in Other Generation.
k. Other Renewables – includes electricity generation by wind, tidal and solar.
l. NAICS category 221119, Other Electric Power Generation.
m. Prior to 2014, this includes electricity generation from steam from waste heat. From 2014 onward, most of the electricity generation from steam from waste heat is reported as part of its original fuel source.
n. Intensity values have been rounded so as to present the estimated level of accuracy.
o. Adapted from StatCan Data Table 25-10-0021-001 (2005-2022), Cat. No. 57-202-XIB (1990-2004) or regional electricity system operators.
p. Includes transmission line losses, metering differences and other losses.
q. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
r. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
x Indicates data not shown due to statistical limitations

Table A13–6 Electricity Generation and GHG Emission Details for Quebec

	1990	2005	2010	2015	2017	2018	2019	2020	2021	2022[a]
GREENHOUSE GAS EMISSIONS[b]										
	kt CO_2 equivalent									
Combustion	**1 490**	**610**	**420**	**210**	**240**	**240**	**240**	**290**	**250**	**230**
Coal	–	–	–	–	–	–	–	–	–	–
Natural Gas	110	270	220	0.0	0.80	2.0	1.2	0.8	1.6	1.4
Other Fuels[c]	1 380	350	200	210	240	240	240	290	250	230
Other Emissions[d]	**–**	**4.6**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[e, f, g]	**1 490**	**620**	**420**	**210**	**240**	**240**	**240**	**290**	**250**	**230**
ELECTRICITY GENERATION[h, i]										
	GWh									
Combustion[j]	**1 980**	**1 390**	**1 510**	**960**	**1 310**	**1 350**	**1 240**	**1 270**	**1 270**	**1 190**
Coal	–	–	–	–	–	–	–	–	–	–
Natural Gas	–	210	200	0.0	0.0	0.0	0.0	0.0	1.8	1.4
Other Fuels	1 980	1 170	1 310	960	1 310	1 350	1 240	1 270	1 270	1 190
Nuclear	**4 070**	**4 480**	**3 550**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Hydro	**112 000**	**155 000**	**161 000**	**175 000**	**182 000**	**180 000**	**180 000**	**176 000**	**183 000**	**185 000**
Other Renewables[k]	**–**	**420**	**1 550**	**6 420**	**9 530**	**10 200**	**10 700**	**10 800**	**10 500**	**10 100**
Other Generation[l, m]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[f]	**118 000**	**161 000**	**168 000**	**182 000**	**193 000**	**191 000**	**191 000**	**188 000**	**195 000**	**196 000**
GREENHOUSE GAS INTENSITY[n]										
	Generation Intensity (g GHG / kWh electricity generated)									
CO_2 intensity (g CO_2 / kWh)	13	3.7	2.5	1.1	1.2	1.3	1.2	1.5	1.3	1.2
CH_4 intensity (g CH_4 / kWh)	0.0004	0.0010	0.0004	0.0	0.0	0.0	0.0002	0.0	0.0	0.0
N_2O intensity (g N_2O / kWh)	0.0003	0.0004	0.0001	0.0	0.0	0.0	0.0001	0.0	0.0	0.0
GENERATION INTENSITY (g CO_2 eq / kWh)[f]	**13**	**3.8**	**2.5**	**1.1**	**1.2**	**1.3**	**1.2**	**1.5**	**1.3**	**1.2**
	Losses									
Unallocated Energy (GWh)[o, p]	7 280	9 060	15 600	17 250	18 000	17 890	17 800	16 870	17 440	16 250
SF_6 Emissions (kt CO_2 eq)[q]	38	31	32	76	23	60	39	71	71	71
	Consumption Intensity (g GHG / kWh electricity consumed)									
CONSUMPTION INTENSITY (g CO_2 eq / kWh)[r]	**14**	**4.3**	**3.0**	**1.7**	**1.5**	**1.7**	**1.6**	**2.1**	**1.8**	**1.7**

Notes:

Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 – Electric Power Generation.

a. Preliminary data.
b. Emissions based on data taken from the *Report on Energy Supply-Demand in Canada*, Catalogue No. 57-003-XIB, Statistics Canada.
c. 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.
d. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
e. GHG emissions from the flooding of land for hydro dams are not included.
f. Totals may not add up to overall total due to rounding.
g. CO_2 from carbon capture and storage has been removed from the total.
h. Taken from StatCan Data Tables 25-10-0019-01 (2005–2019), 25-10-0084-01 (2020–2022), and 25-10-0020-01 (2005–2022).
i. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-XIB, Statistics Canada (for 1990–2004).
j. From 2014 onward, this includes most of the electricity generated from the by-product steam associated with the fuel combustion. Prior to 2014, it was not possible to break this data into the original fuel source, so it was included in Other Generation.
k. Other Renewables – includes electricity generation by wind, tidal and solar.
l. NAICS category 221119, Other Electric Power Generation.
m. Prior to 2014, this includes electricity generation from steam from waste heat. From 2014 onward, most of the electricity generation from steam from waste heat is reported as part of its original fuel source.
n. Intensity values have been rounded so as to present the estimated level of accuracy.
o. Adapted from StatCan Data Table 25-10-0021-001 (2005-2022), Cat. No. 57-202-XIB (1990-2004) or regional electricity system operators.
p. Includes transmission line losses, metering differences and other losses.
q. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
r. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

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

Table A13–7 Electricity Generation and GHG Emission Details for Ontario

	1990	2005	2010	2015	2017	2018	2019	2020	2021	2022[a]
GREENHOUSE GAS EMISSIONS[b]										
	kt CO_2 equivalent									
Combustion	**25 600**	**33 900**	**20 200**	**6 340**	**2 600**	**4 160**	**3 960**	**4 320**	**4 620**	**5 140**
Coal	24 400	28 700	12 600	–	–	–	–	–	–	–
Natural Gas	8.0	4 960	7 340	6 260	2 450	4 040	3 910	4 260	4 530	5 060
Other Fuels[c]	1 160	230	180	80	140	120	57	63	82	79
Other Emissions[d]	**–**	**1.4**	**0.23**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[e, f, g]	**25 600**	**33 900**	**20 200**	**6 340**	**2 600**	**4 160**	**3 970**	**4 320**	**4 620**	**5 140**
ELECTRICITY GENERATION[h, i]										
	GWh									
Combustion[j]	**29 200**	**40 900**	**27 200**	**15 900**	**7 000**	**10 600**	**10 100**	**9 400**	**10 100**	**11 800**
Coal	27 800	29 400	12 300	–	–	–	–	–	–	–
Natural Gas	3.2	10 000	14 100	15 300	6 090	9 780	9 370	8 640	9 400	11 260
Other Fuels	1 430	1 440	860	640	890	820	740	720	730	570
Nuclear	**59 400**	**78 000**	**82 000**	**91 800**	**90 400**	**90 200**	**90 500**	**87 800**	**83 000**	**78 800**
Hydro	**38 700**	**34 600**	**31 800**	**34 800**	**39 500**	**37 800**	**37 800**	**38 500**	**34 700**	**39 600**
Other Renewables[k]	**–**	**26**	**3 190**	**12 200**	**11 800**	**13 600**	**12 700**	**13 100**	**12 500**	**14 600**
Other Generation[l, m]	**–**	**–**	**3 630**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[f]	**127 000**	**153 000**	**148 000**	**155 000**	**149 000**	**152 000**	**151 000**	**149 000**	**140 000**	**145 000**
GREENHOUSE GAS INTENSITY[n]										
	Generation Intensity (g GHG / kWh electricity generated)									
CO_2 intensity (g CO_2 / kWh)	200	220	140	40	17	27	26	29	32	35
CH_4 intensity (g CH_4 / kWh)	0.002	0.011	0.014	0.010	0.004	0.007	0.007	0.007	0.008	0.009
N_2O intensity (g N_2O / kWh)	0.003	0.004	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001
GENERATION INTENSITY (g CO_2 eq / kWh)[f]	**200**	**220**	**140**	**41**	**17**	**27**	**26**	**29**	**33**	**35**
	Losses									
Unallocated Energy (GWh)[o, p]	10 300	12 400	15 500	16 800	12 600	10 500	13 500	15 300	9 120	9 110
SF_6 Emissions (kt CO_2 eq)[q]	79	52	61	58	58	59	51	70	55	38
	Consumption Intensity (g GHG / kWh electricity consumed)									
CONSUMPTION INTENSITY (g CO_2 eq / kWh)[r]	**220**	**240**	**150**	**46**	**19**	**30**	**29**	**33**	**36**	**38**

Notes:

Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 – Electric Power Generation.

a. Preliminary data.
b. Emissions based on data taken from the *Report on Energy Supply-Demand in Canada*, Catalogue No. 57-003-XIB, Statistics Canada.
c. 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.
d. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
e. GHG emissions from the flooding of land for hydro dams are not included.
f. Totals may not add up to overall total due to rounding.
g. CO_2 from carbon capture and storage has been removed from the total.
h. Taken from StatCan Data Tables 25-10-0019-01 (2005–2019), 25-10-0084-01 (2020–2022), and 25-10-0020-01 (2005–2022).
i. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-XIB, Statistics Canada (for 1990–2004).
j. From 2014 onward, this includes most of the electricity generated from the by-product steam associated with the fuel combustion. Prior to 2014, it was not possible to break this data into the original fuel source, so it was included in Other Generation.
k. Other Renewables – includes electricity generation by wind, tidal and solar.
l. NAICS category 221119, Other Electric Power Generation.
m. Prior to 2014, this includes electricity generation from steam from waste heat. From 2014 onward, most of the electricity generation from steam from waste heat is reported as part of its original fuel source.
n. Intensity values have been rounded so as to present the estimated level of accuracy.
o. Adapted from StatCan Data Table 25-10-0021-001 (2005-2022), Cat. No. 57-202-XIB (1990-2004) or regional electricity system operators.
p. Includes transmission line losses, metering differences and other losses.
q. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
r. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation

Table A13–8 Electricity Generation and GHG Emission Details for Manitoba

	1990	2005	2010	2015	2017	2018	2019	2020	2021	2022[a]
GREENHOUSE GAS EMISSIONS[b]										
	kt CO_2 equivalent									
Combustion	**520**	**350**	**81**	**100**	**54**	**25**	**24**	**28**	**43**	**32**
Coal	x	x	x	71	30	5.6	–	–	–	–
Natural Gas	x	x	x	32	12	7.2	13	16	29	19
Other Fuels[c]	49	19	14	–	13	12	12	13	14	13
Other Emissions[d]	**–**	**8.8**	**12**	**21**	**16**	**16**	**16**	**13**	**13**	**16**
OVERALL TOTAL[e, f, g]	**520**	**360**	**92**	**120**	**69**	**41**	**40**	**41**	**56**	**48**
ELECTRICITY GENERATION[h, i]										
	GWh									
Combustion[j]	**400**	**450**	**84**	**110**	**62**	**30**	**32**	**35**	**60**	**45**
Coal	380	420	44	63	29	5.3	–	–	–	–
Natural Gas	0.90	11	23	29	17	9.7	17	19	43	29
Other Fuels	22	15	17	14	15	15	15	16	17	16
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Hydro	**19 800**	**36 400**	**33 300**	**34 800**	**36 000**	**30 700**	**32 900**	**36 200**	**28 000**	**36 700**
Other Renewables[k]	**–**	**53**	**340**	**900**	**930**	**870**	**880**	**960**	**960**	**970**
Other Generation[l, m]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[f]	**20 200**	**36 900**	**33 700**	**35 800**	**37 000**	**31 600**	**33 900**	**37 200**	**29 000**	**37 800**
GREENHOUSE GAS INTENSITY[n]										
	Generation Intensity (g GHG / kWh electricity generated)									
CO_2 intensity (g CO_2 / kWh)	26	9.7	2.7	3.4	1.9	1.3	1.2	1.1	1.9	1.2
CH_4 intensity (g CH_4 / kWh)	0.0004	0.0002	0.0002	0.0003	0.0001	0.0001	0.0001	0.0001	0.0003	0.0002
N_2O intensity (g N_2O / kWh)	0.001	0.0002	0.0	0.0001	0.0	0.0	0.0	0.0	0.0	0.0
GENERATION INTENSITY (g CO_2 eq / kWh)[f]	**26**	**9.8**	**2.7**	**3.5**	**1.9**	**1.3**	**1.2**	**1.1**	**1.9**	**1.3**
	Losses									
Unallocated Energy (GWh)[o, p]	2 100	1 860	1 610	2 850	3 260	2 440	2 090	3 150	2 140	3 020
SF_6 Emissions (kt CO_2 eq)[q]	4.4	4.1	4.4	1.0	1.2	2.5	1.9	1.4	2.2	2.0
	Consumption Intensity (g GHG / kWh electricity consumed)									
CONSUMPTION INTENSITY (g CO_2 eq / kWh)[r]	**29**	**10**	**3.0**	**3.8**	**2.1**	**1.5**	**1.3**	**1.3**	**2.2**	**1.4**

Notes:

Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 – Electric Power Generation.

a. Preliminary data.
b. Emissions based on data taken from the *Report on Energy Supply-Demand in Canada*, Catalogue No. 57-003-XIB, Statistics Canada.
c. 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.
d. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
e. GHG emissions from the flooding of land for hydro dams are not included.
f. Totals may not add up to overall total due to rounding.
g. CO_2 from carbon capture and storage has been removed from the total.
h. Taken from StatCan Data Tables 25-10-0019-01 (2005–2019), 25-10-0084-01 (2020–2022), and 25-10-0020-01 (2005–2022).
i. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-XIB, Statistics Canada (for 1990–2004).
j. From 2014 onward, this includes most of the electricity generated from the by-product steam associated with the fuel combustion. Prior to 2014, it was not possible to break this data into the original fuel source, so it was included in Other Generation.
k. Other Renewables – includes electricity generation by wind, tidal and solar.
l. NAICS category 221119, Other Electric Power Generation.
m. Prior to 2014, this includes electricity generation from steam from waste heat. From 2014 onward, most of the electricity generation from steam from waste heat is reported as part of its original fuel source.
n. Intensity values have been rounded so as to present the estimated level of accuracy.
o. Adapted from StatCan Data Table 25-10-0021-001 (2005-2022), Cat. No. 57-202-XIB (1990-2004) or regional electricity system operators.
p. Includes transmission line losses, metering differences and other losses.
q. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
r. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

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

Table A13–9 **Electricity Generation and GHG Emission Details for Saskatchewan**

	1990	2005	2010	2015	2017	2018	2019	2020	2021	2022[a]
GREENHOUSE GAS EMISSIONS[b]										
	kt CO_2 equivalent									
Combustion	**11 100**	**15 300**	**16 200**	**16 200**	**16 700**	**16 300**	**16 000**	**13 900**	**16 100**	**14 800**
Coal	x	x	x	12 500	12 500	11 700	11 400	8 700	11 100	9 800
Natural Gas	x	x	x	3 620	4 180	4 620	4 600	5 170	4 970	4 950
Other Fuels[c]	6.5	4.3	12	9.1	9.4	9.4	5.8	4.7	5.5	12
Other Emissions[d]	**–**	**18**	**30**	**39**	**41**	**41**	**41**	**35**	**38**	**35**
OVERALL TOTAL[e, f, g]	**11 100**	**15 300**	**16 200**	**16 200**	**16 700**	**16 400**	**16 000**	**13 900**	**16 100**	**14 800**
ELECTRICITY GENERATION[h, i]										
	GWh									
Combustion[j]	**9 660**	**14 800**	**15 100**	**19 100**	**20 300**	**19 400**	**19 300**	**18 800**	**20 500**	**18 900**
Coal	9 340	12 200	12 100	12 100	11 700	10 300	10 000	7 900	9 700	8 500
Natural Gas	310	2 610	3 040	6 990	8 660	9 020	9 270	10 890	10 840	10 380
Other Fuels	8.8	12	18	0.41	0.44	0.42	0.20	0.28	0.17	0.18
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Hydro	**4 210**	**4 570**	**3 870**	**3 430**	**3 850**	**3 590**	**3 670**	**4 420**	**2 980**	**3 300**
Other Renewables[k]	**–**	**92**	**510**	**620**	**740**	**690**	**710**	**740**	**780**	**1 230**
Other Generation[l, m]	**–**	**–**	**630**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[f]	**13 900**	**19 500**	**20 100**	**23 100**	**25 200**	**23 900**	**23 900**	**24 100**	**24 500**	**23 700**
GREENHOUSE GAS INTENSITY[n]										
	Generation Intensity (g GHG / kWh electricity generated)									
CO_2 intensity (g CO_2 / kWh)	800	780	800	700	660	680	670	570	650	620
CH_4 intensity (g CH_4 / kWh)	0.02	0.03	0.04	0.05	0.05	0.06	0.06	0.06	0.06	0.06
N_2O intensity (g N_2O / kWh)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02
GENERATION INTENSITY (g CO_2 eq / kWh)[f]	**800**	**790**	**810**	**700**	**660**	**690**	**670**	**580**	**660**	**630**
	Losses									
Unallocated Energy (GWh)[o, p]	1 330	1 360	1 840	1 970	1 720	1 660	1 630	1 700	1 580	1 500
SF_6 Emissions (kt CO_2 eq)[q]	1.8	1.3	1.4	0.75	0.82	0.28	0.50	0.48	0.94	0.60
	Consumption Intensity (g GHG / kWh electricity consumed)									
CONSUMPTION INTENSITY (g CO_2 eq / kWh)[r]	**890**	**840**	**890**	**770**	**710**	**740**	**720**	**620**	**700**	**670**

Notes:

Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 – Electric Power Generation.

a. Preliminary data.
b. Emissions based on data taken from the *Report on Energy Supply-Demand in Canada*, Catalogue No. 57-003-XIB, Statistics Canada.
c. 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.
d. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
e. GHG emissions from the flooding of land for hydro dams are not included.
f. Totals may not add up to overall total due to rounding.
g. CO_2 from carbon capture and storage has been removed from the total.
h. Taken from StatCan Data Tables 25-10-0019-01 (2005–2019), 25-10-0084-01 (2020–2022), and 25-10-0020-01 (2005–2022).
i. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-XIB, Statistics Canada (for 1990–2004).
j. From 2014 onward, this includes most of the electricity generated from the by-product steam associated with the fuel combustion. Prior to 2014, it was not possible to break this data into the original fuel source, so it was included in Other Generation.
k. Other Renewables – includes electricity generation by wind, tidal and solar.
l. NAICS category 221119, Other Electric Power Generation.
m. Prior to 2014, this includes electricity generation from steam from waste heat. From 2014 onward, most of the electricity generation from steam from waste heat is reported as part of its original fuel source.
n. Intensity values have been rounded so as to present the estimated level of accuracy.
o. Adapted from StatCan Data Table 25-10-0021-001 (2005-2022), Cat. No. 57-202-XIB (1990-2004) or regional electricity system operators.
p. Includes transmission line losses, metering differences and other losses.
q. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
r. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
x Indicates data not shown due to statistical limitations

Table A13–10 Electricity Generation and GHG Emission Details for Alberta

	1990	2005	2010	2015	2017	2018	2019	2020	2021	2022[a]
GREENHOUSE GAS EMISSIONS[b]										
	kt CO_2 equivalent									
Combustion	**39 700**	**52 000**	**49 000**	**46 700**	**46 800**	**36 600**	**36 300**	**32 300**	**28 400**	**24 500**
Coal	38 000	46 800	43 400	39 200	38 600	26 000	24 800	20 500	14 500	9 000
Natural Gas	1 700	5 120	5 580	7 510	8 140	10 600	11 500	11 800	13 900	15 500
Other Fuels[c]	11	68	18	17	0.0	0.0	10	10	8.6	8.3
Other Emissions[d]	**–**	**10**	**5.6**	**19**	**16**	**15**	**16**	**13**	**13**	**15**
OVERALL TOTAL[e, f, g]	**39 700**	**52 000**	**49 000**	**46 800**	**46 800**	**36 600**	**36 300**	**32 300**	**28 400**	**24 600**
ELECTRICITY GENERATION[h, i]										
	GWh									
Combustion[j]	**39 900**	**54 200**	**51 700**	**54 100**	**54 800**	**51 500**	**51 600**	**47 300**	**46 300**	**43 000**
Coal	37 300	42 200	41 000	39 100	37 000	29 400	27 700	22 400	16 300	10 000
Natural Gas	2 510	11 600	10 200	14 500	17 300	21 500	23 200	24 300	29 400	32 500
Other Fuels	22	420	500	520	590	660	670	640	620	530
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Hydro	**2 060**	**2 240**	**1 480**	**1 980**	**2 060**	**1 990**	**2 040**	**2 150**	**2 160**	**380**
Other Renewables[k]	**–**	**840**	**1 630**	**4 090**	**4 630**	**4 140**	**3 970**	**5 960**	**7 020**	**8 360**
Other Generation[l, m]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[f]	**41 900**	**57 300**	**56 400**	**60 400**	**61 700**	**57 800**	**57 700**	**55 800**	**55 800**	**52 200**
GREENHOUSE GAS INTENSITY[n]										
	Generation Intensity (g GHG / kWh electricity generated)									
CO_2 intensity (g CO_2 / kWh)	940	900	860	770	750	630	620	580	500	470
CH_4 intensity (g CH_4 / kWh)	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.08
N_2O intensity (g N_2O / kWh)	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
GENERATION INTENSITY (g CO_2 eq / kWh)[f]	**950**	**910**	**870**	**770**	**760**	**630**	**630**	**580**	**510**	**470**
	Losses									
Unallocated Energy (GWh)[o, p]	3 380	4 870	2 490	2 210	2 200	2 060	1 590	1 590	1 600	1 640
SF_6 Emissions (kt CO_2 eq)[q]	1.7	0.45	1.0	3.3	1.4	2.4	4.1	2.9	2.9	1.9
	Consumption Intensity (g GHG / kWh electricity consumed)									
CONSUMPTION INTENSITY (g CO_2 eq / kWh)[r]	**1 030**	**990**	**910**	**800**	**790**	**660**	**650**	**600**	**520**	**490**

Notes:

Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 – Electric Power Generation.

a. Preliminary data.
b. Emissions based on data taken from the *Report on Energy Supply-Demand in Canada*, Catalogue No. 57-003-XIB, Statistics Canada.
c. 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.
d. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
e. GHG emissions from the flooding of land for hydro dams are not included.
f. Totals may not add up to overall total due to rounding.
g. CO_2 from carbon capture and storage has been removed from the total.
h. Taken from StatCan Data Tables 25-10-0019-01 (2005–2019), 25-10-0084-01 (2020–2022), and 25-10-0020-01 (2005–2022).
i. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-XIB, Statistics Canada (for 1990–2004).
j. From 2014 onward, this includes most of the electricity generated from the by-product steam associated with the fuel combustion. Prior to 2014, it was not possible to break this data into the original fuel source, so it was included in Other Generation.
k. Other Renewables – includes electricity generation by wind, tidal and solar.
l. NAICS category 221119, Other Electric Power Generation.
m. Prior to 2014, this includes electricity generation from steam from waste heat. From 2014 onward, most of the electricity generation from steam from waste heat is reported as part of its original fuel source.
n. Intensity values have been rounded so as to present the estimated level of accuracy.
o. Adapted from StatCan Data Table 25-10-0021-001 (2005-2022), Cat. No. 57-202-XIB (1990-2004) or regional electricity system operators.
p. Includes transmission line losses, metering differences and other losses.
q. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
r. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
0.0 Indicates emissions or electricity generation value less than 0.1

Table A13–11 Electricity Generation and GHG Emission Details for British Columbia

	1990	2005	2010	2015	2017	2018	2019	2020	2021	2022[a]
GREENHOUSE GAS EMISSIONS[b]										
	kt CO_2 equivalent									
Combustion	**800**	**1 330**	**1 560**	**780**	**630**	**810**	**1 040**	**730**	**950**	**880**
Coal	–	–	–	–	–	–	–	–	–	–
Natural Gas	x	x	x	733	581	752	967	671	898	815
Other Fuels[c]	x	x	x	49	50	59	73	57	55	69
Other Emissions[d]	**–**	**4.6**	**6.0**	**7.2**	**6.5**	**6.9**	**7.4**	**6.7**	**8.3**	**9.3**
OVERALL TOTAL[e, f, g]	**800**	**1 330**	**1 560**	**790**	**640**	**820**	**1 050**	**730**	**960**	**890**
ELECTRICITY GENERATION[h, i]										
	GWh									
Combustion[j]	**1 390**	**3 820**	**3 050**	**1 610**	**1 410**	**1 580**	**2 280**	**1 680**	**2 280**	**1 980**
Coal	–	–	–	–	–	–	–	–	–	–
Natural Gas	1 310	3 140	1 850	790	460	750	1 420	680	1 210	780
Other Fuels	79	690	1 210	820	950	830	870	1 000	1 070	1 200
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Hydro	**46 400**	**50 300**	**45 000**	**52 400**	**57 100**	**52 900**	**48 000**	**55 000**	**64 100**	**63 000**
Other Renewables[k]	**–**	**–**	**120**	**870**	**1 590**	**1 690**	**1 650**	**1 760**	**1 750**	**1 380**
Other Generation[l, m]	**–**	**–**	**3 630**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[f]	**47 800**	**54 100**	**51 800**	**54 800**	**60 100**	**56 200**	**52 000**	**58 400**	**68 100**	**66 400**
GREENHOUSE GAS INTENSITY[n]										
	Generation Intensity (g GHG / kWh electricity generated)									
CO_2 intensity (g CO_2 / kWh)	17	24	29	14	10	14	19	12	13	13
CH_4 intensity (g CH_4 / kWh)	0.004	0.011	0.033	0.021	0.020	0.022	0.026	0.021	0.020	0.024
N_2O intensity (g N_2O / kWh)	0.0004	0.0016	0.0017	0.0009	0.0007	0.0007	0.0008	0.0007	0.0008	0.0007
GENERATION INTENSITY (g CO_2 eq / kWh)[f]	**17**	**25**	**30**	**14**	**11**	**15**	**20**	**13**	**14**	**14**
	Losses									
Unallocated Energy (GWh)[o, p]	2 210	2 120	1 940	3 170	3 730	3 950	3 190	3 830	4 590	4 120
SF_6 Emissions (kt CO_2 eq)[q]	59	49	60	21	20	12	23	3.9	13	10
	Consumption Intensity (g GHG / kWh electricity consumed)									
CONSUMPTION INTENSITY (g CO_2 eq / kWh)[r]	**19**	**27**	**33**	**16**	**12**	**16**	**22**	**14**	**15**	**15**

Notes:

Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 – Electric Power Generation.

a. Preliminary data.
b. Emissions based on data taken from the *Report on Energy Supply-Demand in Canada*, Catalogue No. 57-003-XIB, Statistics Canada.
c. 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.
d. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
e. GHG emissions from the flooding of land for hydro dams are not included.
f. Totals may not add up to overall total due to rounding.
g. CO_2 from carbon capture and storage has been removed from the total.
h. Taken from StatCan Data Tables 25-10-0019-01 (2005–2019), 25-10-0084-01 (2020–2022), and 25-10-0020-01 (2005–2022).
i. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-XIB, Statistics Canada (for 1990–2004).
j. From 2014 onward, this includes most of the electricity generated from the by-product steam associated with the fuel combustion. Prior to 2014, it was not possible to break this data into the original fuel source, so it was included in Other Generation.
k. Other Renewables – includes electricity generation by wind, tidal and solar.
l. NAICS category 221119, Other Electric Power Generation.
m. Prior to 2014, this includes electricity generation from steam from waste heat. From 2014 onward, most of the electricity generation from steam from waste heat is reported as part of its original fuel source.
n. Intensity values have been rounded so as to present the estimated level of accuracy.
o. Adapted from StatCan Data Table 25-10-0021-001 (2005-2022), Cat. No. 57-202-XIB (1990-2004) or regional electricity system operators.
p. Includes transmission line losses, metering differences and other losses.
q. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
r. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
x Indicates data not shown due to statistical limitations

Table A13–12 Electricity Generation and GHG Emission Details for Yukon

	1990	2005	2010	2015	2017	2018	2019	2020	2021	2022[a]
GREENHOUSE GAS EMISSIONS[b]										
	kt CO_2 equivalent									
Combustion	**90**	**22**	**18**	**18**	**24**	**33**	**48**	**54**	**42**	**39**
Coal	–	–	–	–	–	–	–	–	–	–
Natural Gas	–	–	–	0.79	3.8	12	30	22	9.8	10
Other Fuels[c]	90	22	18	17	20	21	18	32	32	28
Other Emissions[d]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[e, f, g]	**90**	**22**	**18**	**18**	**24**	**33**	**48**	**54**	**42**	**39**
ELECTRICITY GENERATION[h, i]										
	GWh									
Combustion[j]	**62**	**22**	**25**	**26**	**37**	**59**	**92**	**91**	**65**	**66**
Coal	–	–	–	–	–	–	–	–	–	–
Natural Gas	–	–	–	1.3	9.9	30	66	48	22	26
Other Fuels	62	22	25	24	27	29	26	44	44	40
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Hydro	**420**	**320**	**380**	**420**	**450**	**420**	**380**	**440**	**510**	**500**
Other Renewables[k]	**–**	**0.89**	**0.09**	**0.65**	**0.03**	**–**	**–**	**–**	**–**	**2.0**
Other Generation[l, m]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[f]	**480**	**340**	**410**	**450**	**480**	**480**	**470**	**530**	**570**	**570**
GREENHOUSE GAS INTENSITY[n]										
	Generation Intensity (g GHG / kWh electricity generated)									
CO_2 intensity (g CO_2 / kWh)	190	64	44	41	49	69	100	100	70	70
CH_4 intensity (g CH_4 / kWh)	0.005	0.002	0.001	0.002	0.003	0.007	0.017	0.012	0.006	0.006
N_2O intensity (g N_2O / kWh)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GENERATION INTENSITY (g CO_2 eq / kWh)[f]	**190**	**64**	**44**	**41**	**49**	**69**	**100**	**100**	**70**	**70**
	Losses									
Unallocated Energy (GWh)[o, p]	47	45	33	54	55	56	45	42	45	43
SF_6 Emissions (kt CO_2 eq)[q]	–	–	–	–	0.52	0.71	0.95	0.94	2.1	–
	Consumption Intensity (g GHG / kWh electricity consumed)									
CONSUMPTION INTENSITY (g CO_2 eq / kWh)[r]	**210**	**74**	**48**	**46**	**56**	**80**	**120**	**110**	**80**	**70**

Notes:

Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 – Electric Power Generation.

a. Preliminary data.
b. Emissions based on data taken from the *Report on Energy Supply-Demand in Canada*, Catalogue No. 57-003-XIB, Statistics Canada.
c. 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.
d. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
e. GHG emissions from the flooding of land for hydro dams are not included.
f. Totals may not add up to overall total due to rounding.
g. CO_2 from carbon capture and storage has been removed from the total.
h. Taken from StatCan Data Tables 25-10-0019-01 (2005–2019), 25-10-0084-01 (2020–2022), and 25-10-0020-01 (2005–2022).
i. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-XIB, Statistics Canada (for 1990–2004).
j. From 2014 onward, this includes most of the electricity generated from the by-product steam associated with the fuel combustion. Prior to 2014, it was not possible to break this data into the original fuel source, so it was included in Other Generation.
k. Other Renewables – includes electricity generation by wind, tidal and solar.
l. NAICS category 221119, Other Electric Power Generation.
m. Prior to 2014, this includes electricity generation from steam from waste heat. From 2014 onward, most of the electricity generation from steam from waste heat is reported as part of its original fuel source.
n. Intensity values have been rounded so as to present the estimated level of accuracy.
o. Adapted from StatCan Data Table 25-10-0021-001 (2005-2022), Cat. No. 57-202-XIB (1990-2004) or regional electricity system operators.
p. Includes transmission line losses, metering differences and other losses.
q. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
r. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
0.0 Indicates emissions or electricity generation value less than 0.1

Table A13–13 Electricity Generation and GHG Emission Details for the Northwest Territories

	1990	2005	2010	2015	2017	2018	2019	2020	2021	2022[a]
GREENHOUSE GAS EMISSIONS[b]										
	kt CO_2 equivalent									
Combustion	**160**	**91**	**65**	**120**	**62**	**67**	**60**	**62**	**56**	**59**
Coal	–	–	–	–	–	–	–	–	–	–
Natural Gas	x	x	x	6.3	7.9	4.0	3.0	4.0	5.4	5.6
Other Fuels[c]	x	x	x	110	54	63	57	58	51	53
Other Emissions[d]	**–**	**4.6**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[e, f, g]	**160**	**96**	**65**	**120**	**62**	**67**	**60**	**62**	**56**	**59**
ELECTRICITY GENERATION[h, i]										
	GWh									
Combustion[j]	**230**	**78**	**85**	**160**	**90**	**90**	**82**	**86**	**76**	**79**
Coal	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	23	27	11	16	6.6	7.6	11	15	15
Other Fuels	230	54	58	150	70	80	74	75	61	63
Nuclear	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Hydro	**230**	**260**	**250**	**160**	**250**	**250**	**270**	**260**	**270**	**240**
Other Renewables[k]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Other Generation[l, m]	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
OVERALL TOTAL[f]	**450**	**340**	**340**	**320**	**340**	**340**	**350**	**350**	**340**	**320**
GREENHOUSE GAS INTENSITY[n]										
	Generation Intensity (g GHG / kWh electricity generated)									
CO_2 intensity (g CO_2 / kWh)	340	280	190	360	180	200	170	180	160	180
CH_4 intensity (g CH_4 / kWh)	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
N_2O intensity (g N_2O / kWh)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GENERATION INTENSITY (g CO_2 eq / kWh)[f]	**340**	**280**	**190**	**360**	**180**	**200**	**170**	**180**	**170**	**180**
	Losses									
Unallocated Energy (GWh)[o, p]	21	19	21	18	19	19	20	20	19	18
SF_6 Emissions (kt CO_2 eq)[q]	–	–	–	–	–	–	–	0.05	–	0.62
	Consumption Intensity (g GHG / kWh electricity consumed)									
CONSUMPTION INTENSITY (g CO_2 eq / kWh)[r]	**360**	**300**	**200**	**390**	**200**	**210**	**180**	**190**	**180**	**190**

Notes:

Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 – Electric Power Generation.

a. Preliminary data.
b. Emissions based on data taken from the *Report on Energy Supply-Demand in Canada*, Catalogue No. 57-003-XIB, Statistics Canada.
c. 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.
d. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
e. GHG emissions from the flooding of land for hydro dams are not included.
f. Totals may not add up to overall total due to rounding.
g. CO_2 from carbon capture and storage has been removed from the total.
h. Taken from StatCan Data Tables 25-10-0019-01 (2005–2019), 25-10-0084-01 (2020–2022), and 25-10-0020-01 (2005–2022).
i. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-XIB, Statistics Canada (for 1990–2004).
j. From 2014 onward, this includes most of the electricity generated from the by-product steam associated with the fuel combustion. Prior to 2014, it was not possible to break this data into the original fuel source, so it was included in Other Generation.
k. Other Renewables – includes electricity generation by wind, tidal and solar.
l. NAICS category 221119, Other Electric Power Generation.
m. Prior to 2014, this includes electricity generation from steam from waste heat. From 2014 onward, most of the electricity generation from steam from waste heat is reported as part of its original fuel source.
n. Intensity values have been rounded so as to present the estimated level of accuracy.
o. Adapted from StatCan Data Table 25-10-0021-001 (2005-2022), Cat. No. 57-202-XIB (1990-2004) or regional electricity system operators.
p. Includes transmission line losses, metering differences and other losses.
q. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
r. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

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

Table A13–14 Electricity Generation and GHG Emission Details for Nunavut

	1990	2005	2010	2015	2017	2018	2019	2020	2021	2022[a]
GREENHOUSE GAS EMISSIONS[b]										
	kt CO_2 equivalent									
Combustion	**	x	x	110	140	160	160	150	160	150
Coal	**	–	–	–	–	–	–	–	–	–
Natural Gas	**	x	x	–	–	–	–	–	–	–
Other Fuels[c]	**	x	x	110	140	160	160	150	160	150
Other Emissions[d]	**	–	–	–	–	–	–	–	–	–
OVERALL TOTAL[e, f, g]	**	x	x	110	140	160	160	150	160	150
ELECTRICITY GENERATION[h, i]										
	GWh									
Combustion[j]	**	140	160	160	190	190	190	200	190	190
Coal	**	–	–	–	–	–	–	–	–	–
Natural Gas	**	–	–	–	–	–	–	–	–	–
Other Fuels	**	140	160	160	190	190	190	200	190	190
Nuclear	**	–	–	–	–	–	–	–	–	–
Hydro	**	–	–	–	–	–	–	–	–	–
Other Renewables[k]	**	–	–	–	–	–	–	–	–	–
Other Generation[l, m]	**	–	–	–	–	–	–	–	–	–
OVERALL TOTAL[f]	**	140	160	160	190	190	190	200	190	190
GREENHOUSE GAS INTENSITY[n]										
	Generation Intensity (g GHG / kWh electricity generated)									
CO_2 intensity (g CO_2 / kWh)	**	x	x	720	720	840	840	760	790	780
CH_4 intensity (g CH_4 / kWh)	**	x	x	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N_2O intensity (g N_2O / kWh)	**	x	x	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GENERATION INTENSITY (g CO_2 eq / kWh)[f]	**	x	x	720	720	840	850	770	800	780
	Losses									
Unallocated Energy (GWh)[o, p]	**	6.7	3.4	5.7	8.9	10	5.2	8.6	9.0	8.7
SF_6 Emissions (kt CO_2 eq)[q]	**	–	–	–	–	–	–	–	–	–
	Consumption Intensity (g GHG / kWh electricity consumed)									
CONSUMPTION INTENSITY (g CO_2 eq / kWh)[r]	**	880	760	750	760	890	870	800	830	820

Notes:

Data presented include emissions, generation and intensity for facilities classified under NAICS code 22111 – Electric Power Generation.

a. Preliminary data.
b. Emissions based on data taken from the *Report on Energy Supply-Demand in Canada*, Catalogue No. 57-003-XIB, Statistics Canada.
c. 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.
d. GHG emissions from on-site combustion of fuel not directly related to electricity generation.
e. GHG emissions from the flooding of land for hydro dams are not included.
f. Totals may not add up to overall total due to rounding.
g. CO_2 from carbon capture and storage has been removed from the total.
h. Taken from StatCan Data Tables 25-10-0019-01 (2005–2019), 25-10-0084-01 (2020–2022), and 25-10-0020-01 (2005–2022).
i. Taken from the *Electric Power Generation, Transmission and Distribution* (EPGTD) publication, Catalogue No. 57-202-XIB, Statistics Canada (for 1990–2004).
j. From 2014 onward, this includes most of the electricity generated from the by-product steam associated with the fuel combustion. Prior to 2014, it was not possible to break this data into the original fuel source, so it was included in Other Generation.
k. Other Renewables – includes electricity generation by wind, tidal and solar.
l. NAICS category 221119, Other Electric Power Generation.
m. Prior to 2014, this includes electricity generation from steam from waste heat. From 2014 onward, most of the electricity generation from steam from waste heat is reported as part of its original fuel source.
n. Intensity values have been rounded so as to present the estimated level of accuracy.
o. Adapted from StatCan Data Table 25-10-0021-001 (2005-2022), Cat. No. 57-202-XIB (1990-2004) or regional electricity system operators.
p. Includes transmission line losses, metering differences and other losses.
q. The electric utility sector's share of emissions from electrical equipment from CRF Category 2.F.viii (Production and Consumption of Halocarbons and SF_6).
r. Consumption intensity values are impacted by unallocated energy and SF_6 transmission emissions.

– Indicates no emissions or no electricity generation
0.0 Indicates emissions or electricity generation value less than 0.1
x Indicates data not shown due to statistical limitations
** Data is only available aggregated with Northwest Territories. Please refer to Table A13–13 for values.

REFERENCES

Annex 8, Rounding Protocol

ICF Consulting. 2004. *Quantitative Assessment of Uncertainty in Canada's National GHG Inventory Estimates for 2001*. Unpublished report. Contract No. K-2362-3-0060. Submitted to Environment Canada.

ICF Consulting 2005. *Quantitative Assessment of Uncertainty in Canada's National GHG Inventory Estimates for 2001—Supplementary Analysis*. Unpublished report. Contract No. K2362-04-0121. Submitted to Environment Canada.

[IPCC] Intergovernmental Panel on Climate Change. 2001. *Climate Change 2001: The Scientific Basis*. Contribution of Working Group 1 to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge (UK): Cambridge University Press. Available online at: https://www.ipcc.ch/report/ar3/wg1/.

[IPCC] Intergovernmental Panel on Climate Change. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Prepared by the National Greenhouse Gas Inventories Programme. Eggleston HS, Buendia L, Miwa K, Ngara T, Tanabe K, editors. Kanagawa (JP): Institute for Global Environmental Studies. Available online at: www.ipcc-nggip.iges.or.jp/public/2006gl/index.html.

[IPCC/OECD/IEA] Intergovernmental Panel on Climate Change, Organisation for Economic Co-operation and Development, and International Energy Agency. 1997. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. Available online at: http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.html.

Annex 10, Canada's Greenhouse Gas Emission Tables by Canadian Economic Sector, 1990–2022

[CEEDC] Canadian Energy and Emissions Data Centre. no date. *Database on Energy, Production and Intensity Indicators for Canadian Industry*. NAICS 2122 Metal Ore Mining and NAICS 2123 Non-metallic Mineral Mining and Quarrying. [consulted 2022 Dec 14]. Available online at: https://cieedacdb.rem.sfu.ca/naics-database-download/.

Cheminfo Services Inc. and Clearstone Engineering Ltd. 2014. *Compilation of a National Inventory of Greenhouse Gas and Fugitive VOC Emissions by the Canadian Coal Mining Industry*. Final report submitted to the Energy Group, Pollutant Inventories and Reporting Division, Environment Canada.

Environment Canada. 2014. *Technical Report on Canada's Upstream Oil and Gas Industry*. Vols. 1 – 4. Prepared for Environment Canada. Calgary (AB): Clearstone Engineering Ltd.

[ECCC] Environment and Climate Change Canada. 2021. *Oil Sands Combustion Model*. Prepared by S. Smyth, Pollutant Inventories and Reporting Division, Environment and Climate Change Canada. Gatineau (QC).

[StatCan] Statistics Canada. No date [a]. Table 25-10-0017-01 Electric Power generation, annual fuel consumed by electric utility thermal plants. Available online at: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2510001701.

[StatCan] Statistics Canada. No date [b]. *Report on Energy Supply and Demand in Canada*. Catalogue No. 57-003-X. Available online at: https://www150.statcan.gc.ca/n1/en/catalogue/57-003-X.

Annex 13, Electricity in Canada: Summary and Intensity Tables

Statistics Canada. No date (a). *Report on Energy Supply and Demand in Canada*. Catalogue No. 57-003-X. Available online at: https://www150.statcan.gc.ca/n1/pub/57-003-x/57-003-x2023002-eng.htm.

Statistics Canada. No date (b). *Electric Power Generation, Transmission and Distribution* (annual). Catalogue No. 57-202-X. Available online at: https://www150.statcan.gc.ca/n1/en/catalogue/57-202-X.

Statistics Canada. No date (c). Table 25-10-0019-01 Electricity from fuels, annual generation by electric utility thermal plants. [released 2022 November 16, accessed 2022 November 28]. Available online at: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2510001901.

Statistics Canada. No date (d). Table 25-10-0020-01 Electric power, annual generation by class of producer. [released 2023 October 30, accessed 2023 November 30]. Available online at: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2510002001.

Statistics Canada. No date (e). Table 25-10-0021-01 Electric power, electric utilities and industry, annual supply and disposition [released 2023 October 30, accessed 2023 November 30]. Available online at: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2510002101.

Statistics Canada. No date (f). Table 25-10-0084-01 Electric power generation, fuel consumed and cost of fuel by electricity generating thermal plants [released 2023 October 31, accessed 2023 November 30]. Available online at: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2510008401.