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Canada

Government of Canada's Greenhouse Gas Emissions Inventory 2021-22

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du Canada 2021-2022

Government of Canada's Greenhouse Gas Emissions Inventory

The [Greening Government Strategy](#) established climate and environmental commitments for the Government of Canada's internal operations. The Government of Canada's operations will be net-zero emissions by 2050 including:

- Government owned and leased real property
- Mobility: fleets, business travel and commuting
- Procurement of goods and services
- National safety and security operations ¹

Visit the [Open Government portal](#) for more information about GHG emissions from federal facilities and fleets.

To implement net-zero in real property and fleet operations ², the Government of Canada will reduce absolute Scope 1 and Scope 2 GHG emissions by 40% by 2025 and at least 90% below 2005 levels by 2050. On this emissions reduction pathway, the government will aspire to reduce emissions by an additional 10% each 5 years starting in 2025.

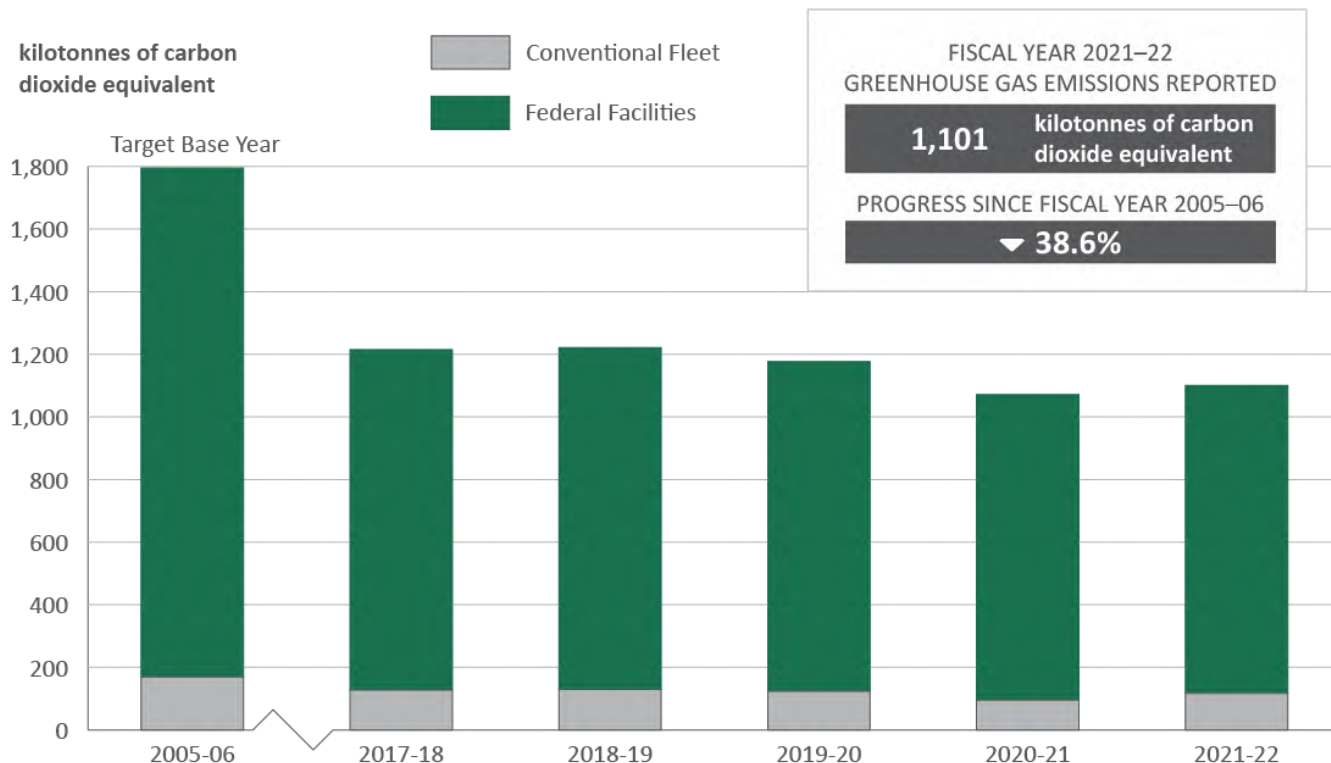
Scope 1 GHG emissions are produced by sources that are owned or controlled by the government. For example, the greenhouse gases emitted from the combustion of fuels in vehicles or in buildings. Scope 2 GHG emissions are those generated indirectly from the consumption of purchased energy (electricity, heating, and cooling). Scope 3 GHG emissions are indirect such as the emissions produced in the supply chain of the goods and services we buy.

▼ Progress Summary

Progress on all reported sources of GHG emissions for facilities, fleets, and employee work-related air travel. Updated data for fiscal year 2021 to 2022 represent the second year of the COVID-19 pandemic. It shows an increase in energy use and GHG emissions from the unprecedented lows of the first year pandemic (2020 to 2021). The increases were evident as

public health restrictions on building occupancy and employee work-related air travel were eased. However, energy use and GHG emissions remain below the pre-pandemic levels of 2019-2020.

Figure 1: Federal greenhouse gas emissions from facilities and conventional fleet operations for fiscal years 2005 to 2006 and 2021 to 2022



▼ Figure 1 - Text version

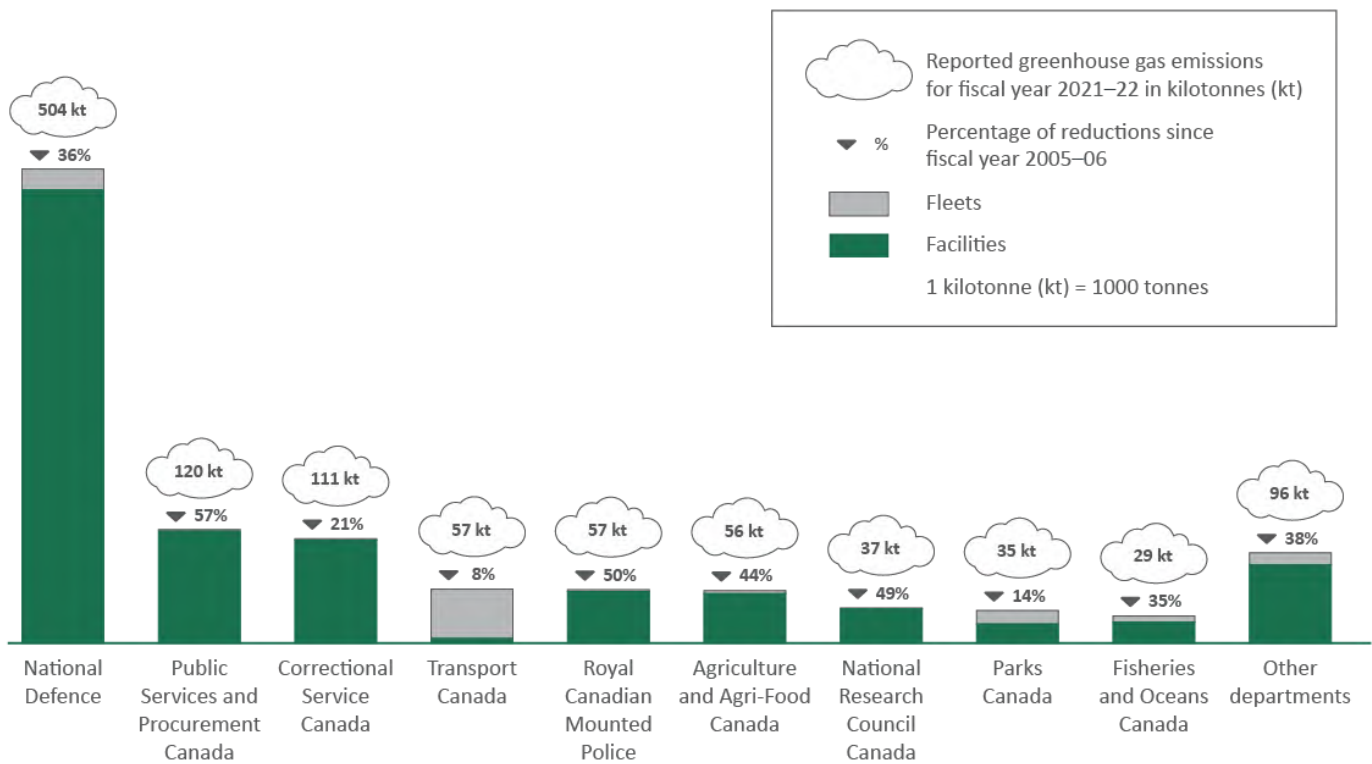
In fiscal year 2021 to 2022 the federal government reported 1,101 kilotonnes of carbon dioxide equivalent, which represents a 38.6% reduction since fiscal year 2005 to 2006. Between fiscal years 2017 to 2018 and 2018 to 2019, the GHG inventory was expanded to cover all core departments owning facilities and/or fleets with more than 50 vehicles, increasing the number of reporting organizations from 15 to 27. Therefore, when comparing data from between fiscal years 2010 to 2011 and 2016 to 2017 to post-2017 years, one must account for this change. Comparisons of the current year with the 2005 to 2006 base year are always valid, because as departments were added, their emissions in fiscal year 2005 to 2006 were also added.

Data for the bar graph

Federal greenhouse gas emissions for facilities and conventional fleet operations by source between fiscal years 2005 to 2006 and 2021 to 2022

Fiscal Year	Federal Facilities Emissions (kt CO2 eq)	Conventional Fleet Emissions (kt CO2 eq)	Total Emissions (kt CO2 eq)	Percentage change compared with fiscal year 2005 to 2006
2005-06	1,626	169	1,795	-
2017-18	1,088	127	1,215	-32.3%
2018-19	1,092	129	1,221	-31.9%
2019-20	1,054	123	1,177	-34.4%
2020-21	976	95	1,071	-40.3%
2021-22	984	117	1,101	-38.6%

Figure 2: Greenhouse gas emissions from facilities and conventional fleet operations by federal organization in fiscal year 2021 to 2022 and the percentage change in emissions compared with fiscal year 2005 to 2006



▼ Figure 2 - Text version

The bar graph shows the total greenhouse gas emissions (in kilotonnes of carbon equivalent) reported in fiscal year 2021 to 2022, for facilities and conventional fleet operations by federal organization. The greenhouse gas emissions are separated by facilities or fleet. The percentage change compared with fiscal year 2005 to 2006 is also shown for each federal organization.

Data for the bar graph

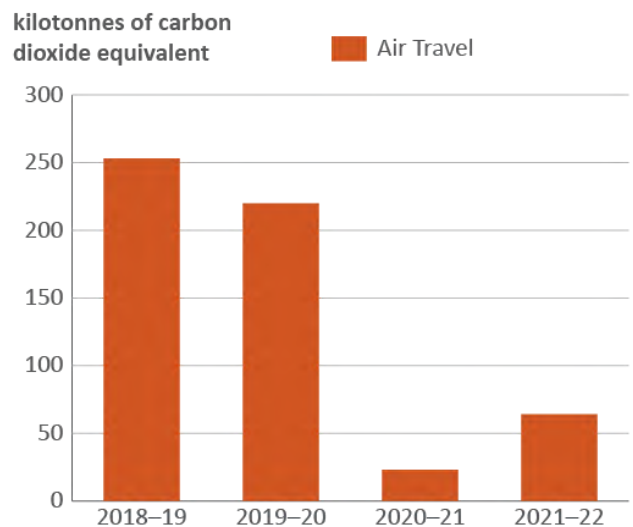
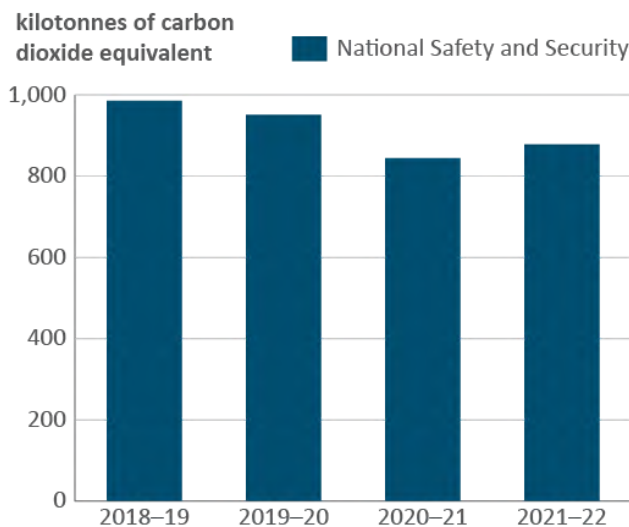
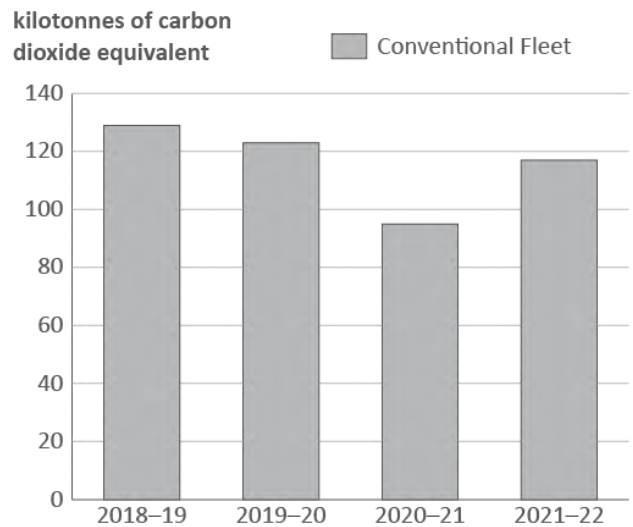
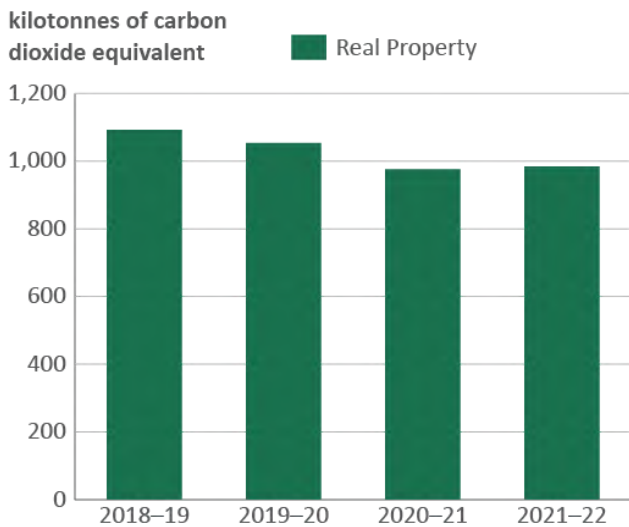
Federal greenhouse gas emissions for facilities and conventional fleet operations by source between fiscal years 2005 to 2006 and 2021 to 2022

Federal organization	Emissions from facilities for fiscal year 2021 to 2022 (kt CO2 eq)	Emissions from fleets for fiscal year 2021 to 2022 (kt CO2 eq)	Total Emissions for fiscal year 2021 to 2022 (kt CO2 eq)	Percentage change compared with fiscal year 2005 to 2006
National Defence	482.2	22.0	504.2	-36%
Public Services and Procurement Canada	118.9	0.6	119.6	-57%
Correctional Service Canada	109.2	1.8	111.0	-21%
Transport Canada	4.8	52.5	57.3	-8%
Royal Canadian Mounted Police	54.7	2.0	56.8	-50%
Agriculture and Agri-Food Canada	52.6	3.2	55.8	-44%
National Research Council Canada	36.3	1.0	37.2	-49%
Parks Canada	20.2	14.4	34.6	-14%
Fisheries and Oceans Canada	22.3	6.5	28.8	-35%
Canadian Food Inspection Agency	17.5	3.0	20.5	-38%
Natural Resources Canada	19.4	0.8	20.2	-42%

Federal organization	Emissions from facilities for fiscal year 2021 to 2022 (kt CO2 eq)	Emissions from fleets for fiscal year 2021 to 2022 (kt CO2 eq)	Total Emissions for fiscal year 2021 to 2022 (kt CO2 eq)	Percentage change compared with fiscal year 2005 to 2006
Environment and Climate Change Canada	10.5	2.5	13.0	-40%
Canada Border Services Agency	7.3	4.0	11.3	-12%
Health Canada	9.1	0.2	9.4	-58%
Public Health Agency of Canada	7.2	0.0	7.2	2%
Public Safety Canada	5.6	0.01	5.7	-19%
Library and Archives Canada	2.8	0.0	2.8	-6%
Indigenous Services Canada	0.1	1.5	1.6	-33%
Canadian Space Agency	1.3	0.01	1.3	-46%
Shared Services Canada ³	0.6	0.4	1.0	N/A
Innovation, Science and Economic Development Canada	0.6	0.3	0.9	-70%
Canadian Forces Morale and Welfare Services	0.5	0.0	0.5	-81%
Crown-Indigenous Relations and Northern Affairs Canada	0.4	0.04	0.4	-8%
National Battlefields Commission ⁴	0.2	0.0	0.2	43%
Canada Revenue Agency	0.0	0.1	0.1	-68%
Employment and Social Development Canada	0.0	0.04	0.04	-97%

Federal organization	Emissions from facilities for fiscal year 2021 to 2022 (kt CO2 eq)	Emissions from fleets for fiscal year 2021 to 2022 (kt CO2 eq)	Total Emissions for fiscal year 2021 to 2022 (kt CO2 eq)	Percentage change compared with fiscal year 2005 to 2006
Immigration, Refugees and Citizenship Canada	0.0	0.02	0.02	-77%
Total	984	117	1,101	-38.6%

Figure 3: Federal greenhouse gas emissions progress from federal facilities, conventional fleet, national safety and security fleet and employee work-related air travel between fiscal years 2018 to 2019 and 2021 to 2022



▼ Figure 3 - Text version

The bar graphs show the GHG emissions (in kilotonnes of carbon dioxide equivalent) reported between fiscal years 2018 to 2019 and 2021 to 2022, for federal facilities, conventional fleet, national safety and security fleet operations and employee work-related air travel.

Data for the bar graph

Federal greenhouse gas emissions progress from federal facilities, conventional fleet, national safety and security fleet and employee work-related air travel between fiscal years 2018 to 2019 and 2020 to 2021

Fiscal Year	Federal Real Property Emissions (kt CO2 eq)	Conventional Fleet Emissions (kt CO2 eq)	National Safety and Security Fleet Emissions (kt CO2 eq)	Air Travel Emissions (kt CO2 eq)
2018-19	1,092	129	986	252
2019-20	1,054	123	951	220
2020-21	976	95	844	23
2021-22	984	117	878	64

Key results

- 27 federal organizations reported GHG emissions between fiscal years 2018 to 2019 and 2021 to 2022
- The federal facilities and conventional fleet emissions for fiscal year 2021 to 2022 totalled 1,101 kilotonnes (kt) of carbon dioxide equivalent (CO2 eq), which represents a decrease of 694 kt CO2 eq or 38.6% (excluding National Safety and Security emissions), compared with fiscal year 2005 to 2006
- In 2020-21, the COVID-19 pandemic caused a dramatic reduction in emissions, as public health mandates reduced building occupancy, in addition to the use of fleet vehicles and employee work-related air travel. As public health restrictions began to ease in 2021-22, emissions rose, but remain below the pre-pandemic levels of 2019-20
- GHG emissions from federal facilities in fiscal year 2021 to 2022 totalled 984 kt CO2 eq, which is a reduction of 642 kt CO2 eq or 39.5% compared with fiscal year 2005 to 2006

- In fiscal year 2021 to 2022, the federal conventional fleet generated 117 kt CO2 eq, which was 30.8% lower than fleet emissions in fiscal year 2005 to 2006

▼ Facilities

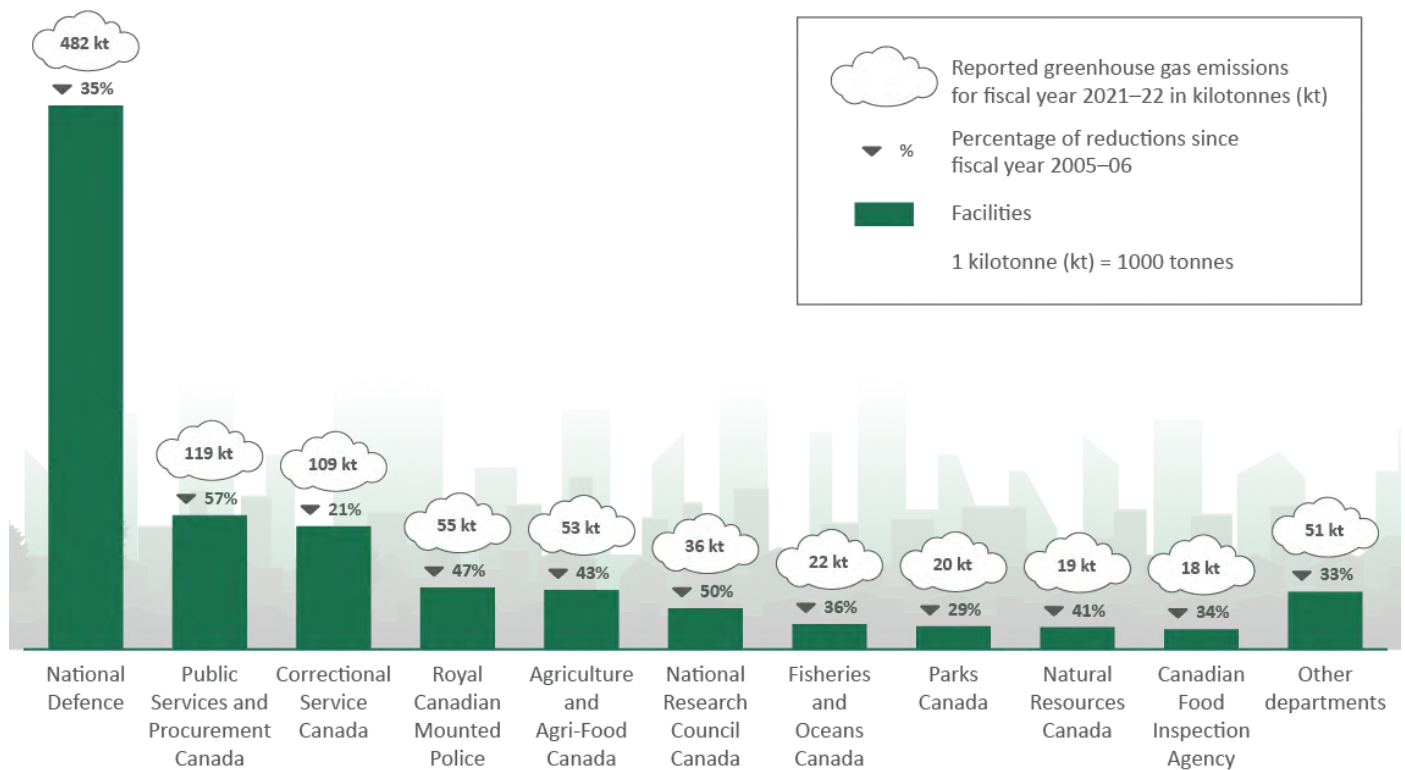
Scope: 1,2

Greenhouse gas emissions from federal facilities

The federal government has one of the largest and most diverse portfolios of facilities in the country, including:

- the buildings on Parliament Hill
- aircraft hangars on military bases
- laboratories
- correctional institutions
- office buildings and warehouses

Figure 4: Greenhouse gas emissions by federal organization for facilities in fiscal year 2021 to 2022 and the percentage change in emissions compared with fiscal year 2005 to 2006



▼ Figure 4 - Text version

The bar graph shows the total GHG emissions (in kilotonnes of carbon equivalent) reported in fiscal year 2021 to 2022, for facilities by federal organization. Above each bar is the organization's emissions in 2021 to 2022, as well as the percentage change compared with fiscal year 2005 to 2006 for each federal organization.

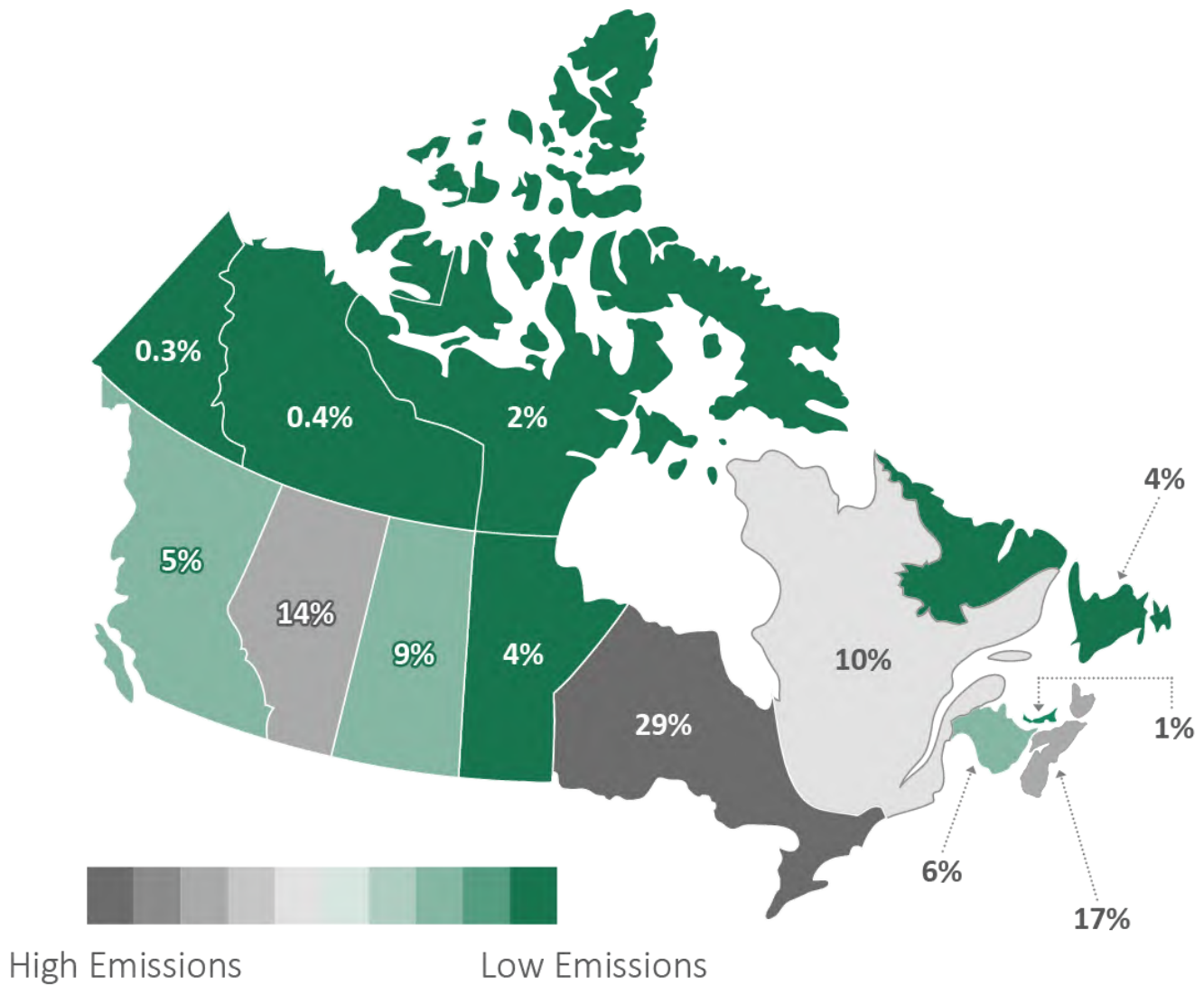
Data for the bar graph

Greenhouse gas emissions by federal organization for facilities in fiscal year 2021 to 2022 and the percentage change in emissions compared with fiscal year 2005 to 2006

Federal organization	Emissions from facilities for fiscal year 2021 to 2022 (kt CO₂ eq)	Percentage change compared with fiscal year 2005 to 2006
National Defence	482.2	-35%
Public Services and Procurement Canada	118.9	-57%
Correctional Service Canada	109.2	-21%
Royal Canadian Mounted Police	54.7	-47%
Agriculture and Agri-Food Canada	52.6	-43%
National Research Council Canada	36.3	-50%
Fisheries and Oceans Canada	22.3	-36%
Parks Canada	20.2	-29%
Natural Resources Canada	19.4	-41%
Canadian Food Inspection Agency	17.5	-34%
Environment and Climate Change Canada	10.5	-39%
Health Canada	9.1	-56%
Canada Border Services Agency	7.3	-14%
Public Health Agency of Canada	7.2	2%
Public Safety Canada	5.6	-19%
Transport Canada	4.8	-23%
Library and Archives Canada	2.8	-6%

Federal organization	Emissions from facilities for fiscal year 2021 to 2022 (kt CO2 eq)	Percentage change compared with fiscal year 2005 to 2006
Canadian Space Agency	1.3	-46%
Shared Services Canada ³	0.6	N/A
Innovation, Science and Economic Development Canada	0.6	-51%
Canadian Forces Morale and Welfare Services	0.5	-81%
Crown-Indigenous Relations and Northern Affairs Canada	0.4	2%
National Battlefields Commission ⁴	0.2	43%
Indigenous Services Canada	0.1	-52%
Total	984	-39.5%

Figure 5: Greenhouse gas emissions from federal facilities in fiscal year 2021 to 2022 by region



▼ Figure 5 - Text version

The figure is a map of Canada that shows the regional distribution of GHG emissions from federal facilities in fiscal year 2021 to 2022.

Data for the figure

Greenhouse gas emissions from federal facilities in fiscal year 2021 to 2022 by region

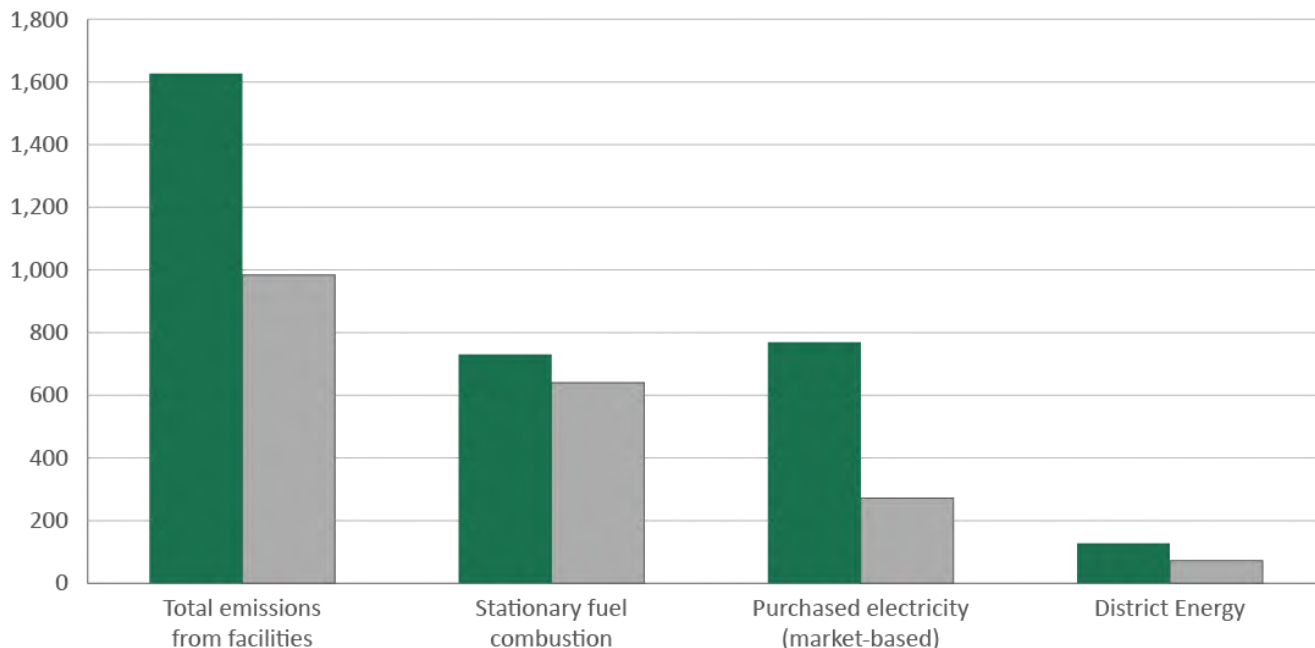
Region	Emissions from stationary combustion (kt CO2 eq)	Emissions from electricity (kt CO2 eq)	Emissions from district energy (kt CO2 eq)	Total from all sources (kt CO2 eq)	Percentage share of total GHG emissions
Ontario	203.9	22.0	57.8	283.8	29%

Region	Emissions from stationary combustion (kt CO2 eq)	Emissions from electricity (kt CO2 eq)	Emissions from district energy (kt CO2 eq)	Total from all sources (kt CO2 eq)	Percentage share of total GHG emissions
Nova Scotia	50.1	115.6	0.9	166.6	17%
Alberta	93.7	39.7	0.0	133.4	14%
Quebec	95.5	0.9	2.7	99.1	10%
Saskatchewan	31.9	50.0	5.5	87.5	9%
New Brunswick	25.8	28.3	0.7	54.8	6%
British Columbia	42.0	1.7	1.5	45.3	5%
Newfoundland and Labrador	41.0	2.5	0.0	43.5	4%
Manitoba	35.2	0.3	1.9	37.4	4%
Nunavut	11.2	4.3	0.0	15.5	2%
Prince Edward Island	3.9	4.9	1.1	10.0	1%
Northwest Territories	3.2	1.1	0.0	4.3	0.4%
Yukon	2.0	0.8	0.0	2.8	0.3%
Total	640	272	72	984	100%

Figure 6: Greenhouse gas emissions from federal facilities by energy source for fiscal years 2005 to 2006 and 2021 to 2022

kilotonnes of carbon dioxide equivalent

Fiscal year 2005 to 2006 Fiscal year 2021 to 2022



▼ Figure 6 - Text version

The bar graph shows the GHG emissions generated by federal facilities in kilotonnes of carbon dioxide equivalent in total and by source for fiscal years 2005 to 2006 and 2021 to 2022.

Data for the bar graph

Greenhouse gas emissions from federal facilities by energy source for fiscal years 2005 to 2006 and 2021 to 2022

Source of Energy	Emissions for fiscal year 2005 to 2006 (kt CO2 eq)	Emissions in for fiscal year 2021 to 2022 (kt CO2 eq)	Percentage change compared with fiscal year 2005 to 2006
Stationary fuel combustion			
Natural gas	542.0	538.1	-0.7%
Light fuel oil	59.4	57.6	-3%
Heavy fuel oil	73.1	0.5	-99%
Jet fuel	26.8	20.3	-24%
Diesel	17.7	10.0	-44%
Propane	11.0	13.1	19%

Kerosene	0.0	0.1	N/A
Purchased electricity			
Market-based	769.0	272.3	-65%
Location-based	769.0	355.3	-54%
District energy			
Heating	103.0	71.7	-30%
Cooling	23.8	0.7	-97%
Facilities total (market)	1,626	984	-39%
Facilities total (location)	1,626	1,067	-34%

Due to a change in the 2005 natural gas emission factor published in the 2022 [National Inventory Report](#) (NIR), emissions data may vary slightly from values reported in 2021 to 2022 Departmental Results Reports and/or Departmental Sustainable Development Strategy Reports.

Key results

- 24 federal organizations reported GHG emissions generated by federal facilities in fiscal year 2021 to 2022
- The emissions for fiscal year 2021 to 2022 totalled 984 kilotonnes (kt) of carbon dioxide equivalent (CO₂ eq) for facilities, which represents a decrease of 642 kt CO₂ eq or 39.5% compared with fiscal year 2005 to 2006
- In fiscal year 2021 to 2022, the top 5 emitting organizations (National Defence, Public Services and Procurement Canada, Correctional Service Canada, Royal Canadian Mounted Police and Agriculture and Agri-Food Canada) generated 83% of the Government of Canada's facilities emissions
- In fiscal year 2021 to 2022, operations in the top 6 regions (Ontario, Nova Scotia, Alberta, Quebec, Saskatchewan, and New Brunswick) generated 84% of the Government of Canada's facilities emissions
- A significant amount of emissions generated by purchased electricity comes from electricity use in regions that have high-carbon electricity grids, including Nova Scotia (42%), Saskatchewan (18%), Alberta (15%) and New Brunswick (10%)
- Breakdown of emissions from natural gas used in federal facilities:

- 37% in Ontario
- 17% in Alberta
- 17% in Quebec
- 7% in British Columbia
- 44% of emissions from light fuel oil came from operations in Newfoundland and Labrador and an additional 47% of emissions from light fuel oil were generated in the other Atlantic provinces and Quebec
- 76% of GHG emissions from district energy came from plants located in the National Capital Region
- Stationary fuel combustion, primarily used to generate heat at facilities, was the source of a significant amount (65%) of GHG emissions in fiscal year 2021 to 2022, but has decreased by 12% compared with fiscal year 2005 to 2006
- Purchased electricity generated a significant amount (28%) of GHG emissions in fiscal year 2021 to 2022, but emissions from electricity use have decreased by 65% compared with fiscal year 2005 to 2006.
- The 641 kt CO₂ eq reduction in emissions from federal facilities compared with fiscal year 2005 to 2006 can be attributed to:
 - a reduction in the GHG intensity of electricity purchased across Canada, which accounted for a reduction of 320 kt CO₂ eq
 - contracting mechanisms, such as renewable energy certificates, which accounted for an additional reduction of 84 kt CO₂ eq
 - The reduction in GHG emissions from district heating (31 kt CO₂ eq) and cooling (23 kt CO₂ eq) was significant, but it had a small impact on emission levels since district heating and cooling represents a smaller share of overall energy use
 - The remaining 183 kt reduction in emissions can be attributed to the rationalization of the government's portfolio of buildings, energy efficiency measures and fuel switching resulting in reductions of energy use in the form of:
 - stationary fuel combustion (90 kt CO₂ eq)
 - purchased electricity (94 kt CO₂ eq)
 - lower occupancy of facilities due to the second year of the COVID-19 pandemic also contributed to reductions over the last year, although these reductions were offset by public health requirements to increase indoor air ventilation

▼ More information

Stationary fuel combustion generates heating, cooling, and electricity at federal facilities. Sources of stationary fuel combustion within facilities often include:

- boilers and furnaces to produce heat
- absorption chillers or gas-driven compression units used for cooling
- generators, turbines or co-generation equipment that produce electricity
- other equipment used in facilities, such as lab equipment and kitchen appliances

These GHG emissions are considered to be “direct” because they are generated at the facility.

Purchased electricity refers to the purchase of conventional, grid-tied electricity. GHG emissions from purchased electricity are considered to be “indirect” because the electricity is generated off-site.

Federal organizations use 2 accounting methods to calculate GHG emissions from purchased electricity:

1. The location-based method considers the average GHG intensity of the electricity grids that provide electricity, regardless of any contractual arrangements that an organization has for clean electricity. To quantify indirect emissions using the location-based method, reporting organizations use emission factors that are based on the geographic location of each facility and that correspond to the grid-average emission factor of power-generating facilities that supply power to the grid.
2. The market-based method reflects GHG emissions from sources of electricity that reporting organizations have chosen. For example, an organization may establish a contractual arrangement to procure clean electricity from specific sources through the use of clean power purchase agreements or renewable energy certificates. For all remaining electricity use at a facility that is not covered by a contractual arrangement, the appropriate grid-average emission factor based on the location of the facility will apply. Progress toward the federal GHG reduction target will be measured using the market-based methodology.

District energy represents the energy used for heating or cooling that is generated off-site. GHG emissions from district energy are also considered to be indirect because the emissions occur at the facility where heating or cooling is generated.

Visit the [Open Government portal](#) for more information on GHG emissions generated by federal facilities.

▼ Fleets

Scope: 1,2

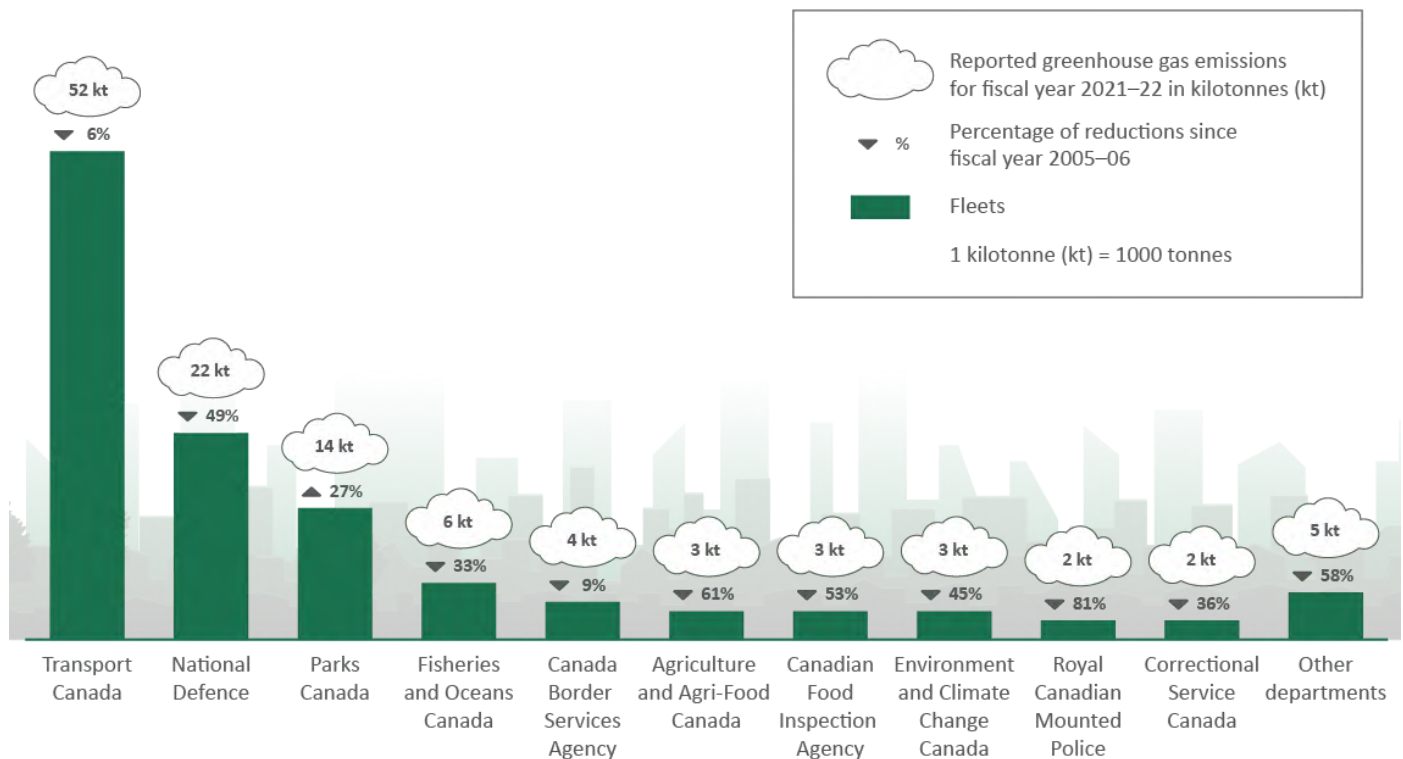
Greenhouse gas emissions generated by federal conventional fleets

Operating a fleet results in the combustion of fossil fuels and the emission of GHGs. The Government of Canada has a large and diverse conventional fleet that includes:

- on-road vehicles and equipment, such as:
 - cars
 - vans
 - trucks
 - other vehicles
- off-road vehicles and equipment, such as:
 - marine vessels (boats and ships)
 - aircraft
 - other mobile equipment (for example all-terrain vehicles, lawn mowers and generators)

Federal conventional fleets consist of vehicles and equipment primarily used to transport people and cargo in the conduct of government business, and excludes fleet used for National Safety and Security operations.

Figure 7: Greenhouse gas emissions by federal organization for conventional fleet in fiscal year 2021 to 2022 and the percentage change in emissions compared with fiscal year 2005 to 2006



▼ Figure 7 - Text version

The bar graph shows the total GHG emissions (in kilotonnes of carbon equivalent) reported in fiscal year 2021 to 2022, for conventional fleet by federal organization. Above each bar is the organization's emissions in 2021 to 2022, as well as the percentage change compared with fiscal year 2005 to 2006 for each federal organization.

Data for the bar graph

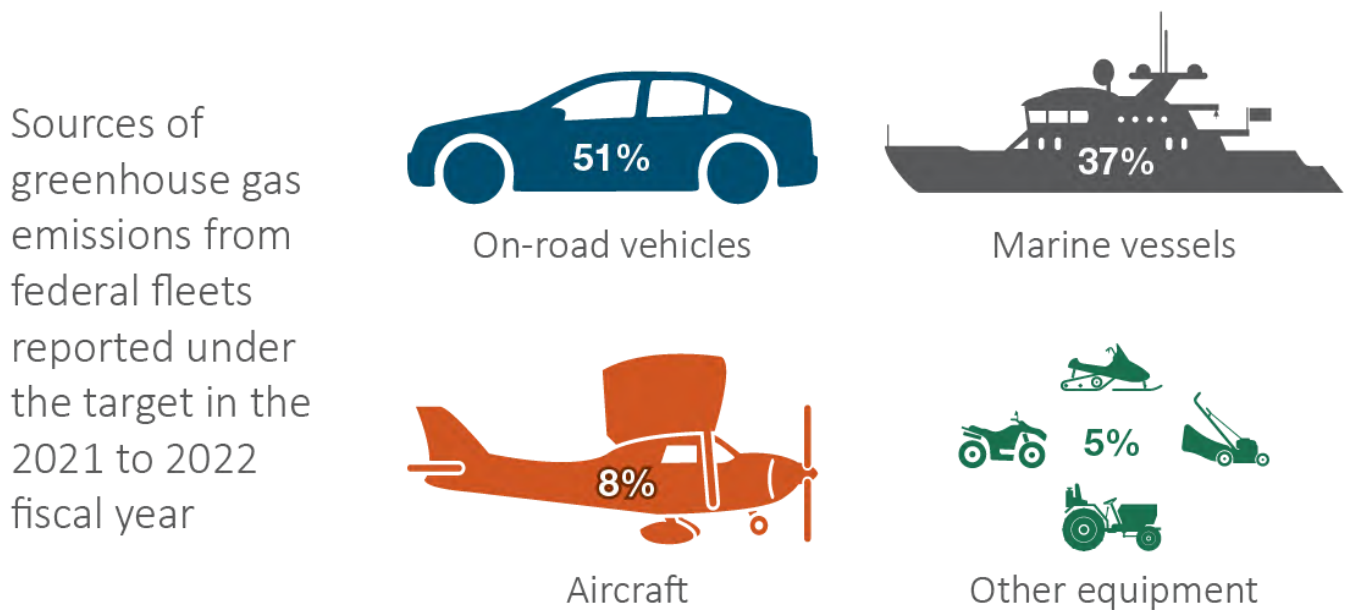
Greenhouse gas emissions by federal organization for conventional fleet in fiscal year 2021 to 2022 and the percentage change in emissions compared with fiscal year 2005 to 2006

Federal organization	Emissions from conventional fleet for fiscal year 2021 to 2022 (kt CO2 eq)	Percentage change compared with fiscal year 2005 to 2006
Transport Canada	52.5	-6%
National Defence	22.0	-49%
Parks Canada	14.4	27%
Fisheries and Oceans Canada	6.5	-33%

Federal organization	Emissions from conventional fleet for fiscal year 2021 to 2022 (kt CO2 eq)	Percentage change compared with fiscal year 2005 to 2006
Canada Border Services Agency	4.0	-9%
Agriculture and Agri-Food Canada	3.2	-61%
Canadian Food Inspection Agency	3.0	-53%
Environment and Climate Change Canada	2.5	-45%
Royal Canadian Mounted Police	2.0	-81%
Correctional Service Canada	1.8	-36%
Indigenous Services Canada	1.5	-32%
National Research Council Canada	1.0	-24%
Natural Resources Canada	0.8	-56%
Public Services and Procurement Canada	0.6	-57%
Shared Services Canada ³	0.4	N/A
Innovation, Science and Economic Development Canada	0.3	-82%
Health Canada	0.2	-85%
Canada Revenue Agency	0.1	-68%
Crown-Indigenous Relations and Northern Affairs Canada	0.04	-47%
Employment and Social Development Canada	0.04	-97%
Immigration, Refugees and Citizenship Canada	0.02	-77%
Canadian Space Agency	0.01	N/A

Federal organization	Emissions from conventional fleet for fiscal year 2021 to 2022 (kt CO2 eq)	Percentage change compared with fiscal year 2005 to 2006
Public Safety Canada	0.01	N/A
Total	117	-30.9%

Figure 8: Greenhouse gas emissions from federal conventional fleets by vehicle type in fiscal year 2021 to 2022



▼ Figure 8 - Text version

Sources of GHG emissions from the federal fleet by vehicle type in fiscal year 2021 to 2022. From highest to lowest: on-road (51%), marine vessels (37%), aircraft (8%), and other mobile equipment (5%).

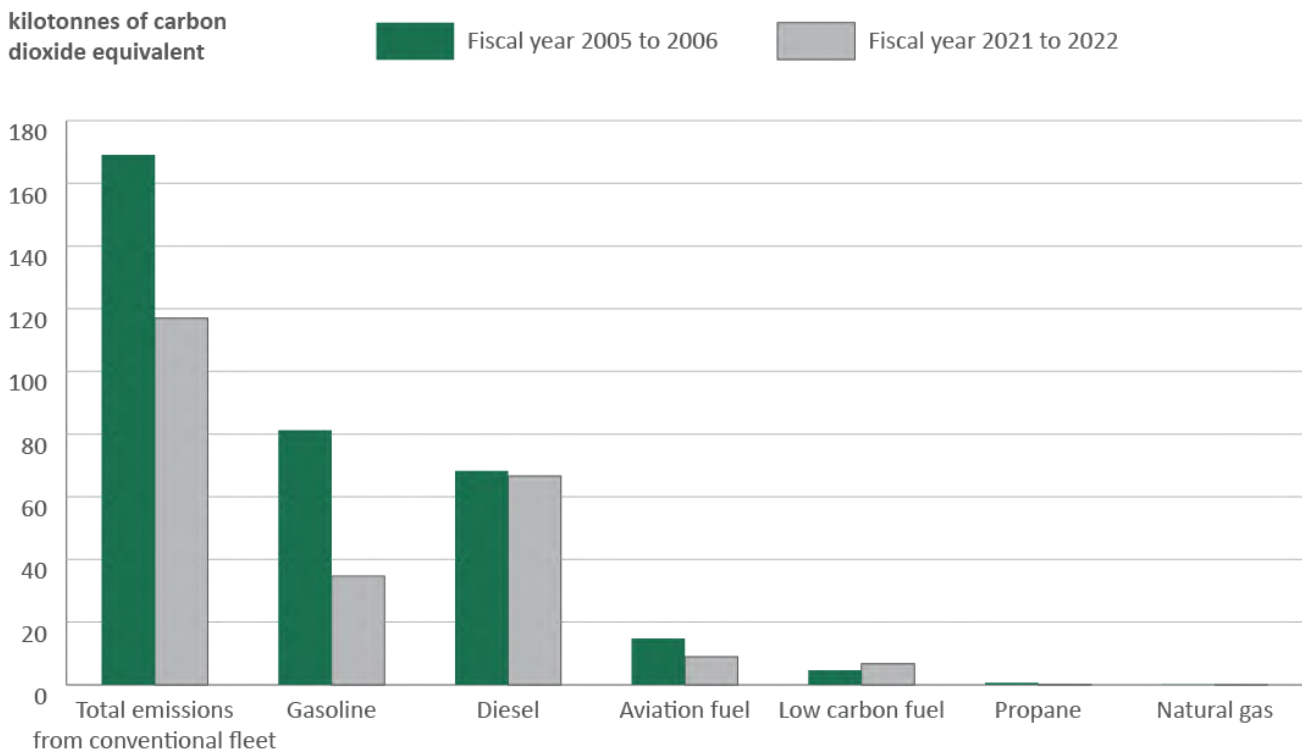
Data for the graphic

Greenhouse gas emissions from the federal conventional fleet by vehicle type in fiscal year 2021 to 2022

Vehicle type	Emissions for fiscal year 2005 to 2006 (kt CO2 eq)	Emissions for fiscal year 2021 to 2022 (kt CO2 eq)	Percentage of 2021 to 2022 total emissions
On road vehicles	109	59	51%

Vehicle type	Emissions for fiscal year 2005 to 2006 (kt CO2 eq)	Emissions for fiscal year 2021 to 2022 (kt CO2 eq)	Percentage of 2021 to 2022 total emissions
Marine vessels	36	43	37%
Aircraft	15	9	8%
Other mobile equipment	9	6	5%
Total	169	117	100%

Figure 9: Greenhouse gas emissions from the federal conventional fleet by fuel type for fiscal years 2005 to 2006 and 2021 to 2022



▼ Figure 9 - Text version

The bar graph shows the GHG emissions generated by the federal conventional fleet in kilotonnes of carbon dioxide equivalent by fuel type for fiscal years 2005 to 2006 and 2021 to 2022.

Data for the bar graph

Greenhouse gas emissions from the federal conventional fleet by source for fiscal years 2005 to 2006 and 2021 to 2022

Fuel type	Emissions for fiscal year 2005 to 2006 (kt CO2 eq)	Emissions for fiscal year 2021 to 2022 (kt CO2 eq)	Percentage change compared with fiscal year 2005 to 2006
Gasoline	81.2	34.7	-57%
Diesel	68.2	66.6	-2%
Aviation fuel	14.7	8.9	-39%
Low carbon fuel	4.6	6.7	45%
Propane	0.56	0.05	- 91%
Natural gas	0.00009	0	-100%
Total	169	117	- 31%

Key results

- 23 federal organizations reported GHG emissions generated by federal conventional fleets in fiscal year 2021 to 2022
- The emissions for fiscal year 2021 to 2022 totalled 117 kilotonnes (kt) of carbon dioxide equivalent (CO2 eq) for conventional fleets, which represents a decrease of 52 kt CO2 eq or 30.9% compared with fiscal year 2005 to 2006
- In fiscal year 2021 to 2022, the top 5 emitting organizations (Transport Canada, National Defence, Parks Canada, Fisheries and Oceans Canada and Canada Border Service Agency) generated 84.9% of the Government of Canada's conventional fleet GHG emissions
- The federal conventional fleet generated approximately 10.6% of combined federal facilities and conventional fleet GHG emissions in fiscal year 2021 to 2022
- Around half of the fleet's GHG emissions (51%) were generated by on-road vehicles, while the balance was generated by marine vessels (37%), aircraft (8%) and other mobile equipment (5%) owned by federal organizations
- In fiscal year 2021 to 2022, GHG emissions from the federal fleet were down by 30.9% compared with fiscal year 2005 to 2006:
 - Although not as pronounced as in 2020 to 2021, the reduction over the last year was primarily driven by public health restrictions due to the pandemic
 - In previous years, reductions were also due to vehicle right-sizing and the purchase of more efficient vehicles

- GHG emissions from gasoline were the source of most of the fleet's emission reductions, decreasing by 47 kilotonnes (kt) of carbon dioxide equivalent (CO₂ eq), or 57% compared with fiscal year 2005 to 2006
- GHG emissions from diesel were reduced by 1.6 kt of CO₂ eq or 2% compared with fiscal year 2005 to 2006. The marine fleet accounted for 63% of emissions from diesel fuel, 32% from on-road vehicles and 6% from other mobile equipment
- GHG emissions from aviation fuel have decreased by 39% compared with fiscal year 2005 to 2006
- The use of low carbon fuels, such as biodiesel and ethanol-blended gasoline, have increased by 31% compared with fiscal year 2005 to 2006
- GHG emissions from propane and natural gas were reduced significantly by 91% and 100% respectively

Visit the [Open Government portal](#) for more information on GHG emissions generated by federal fleets.

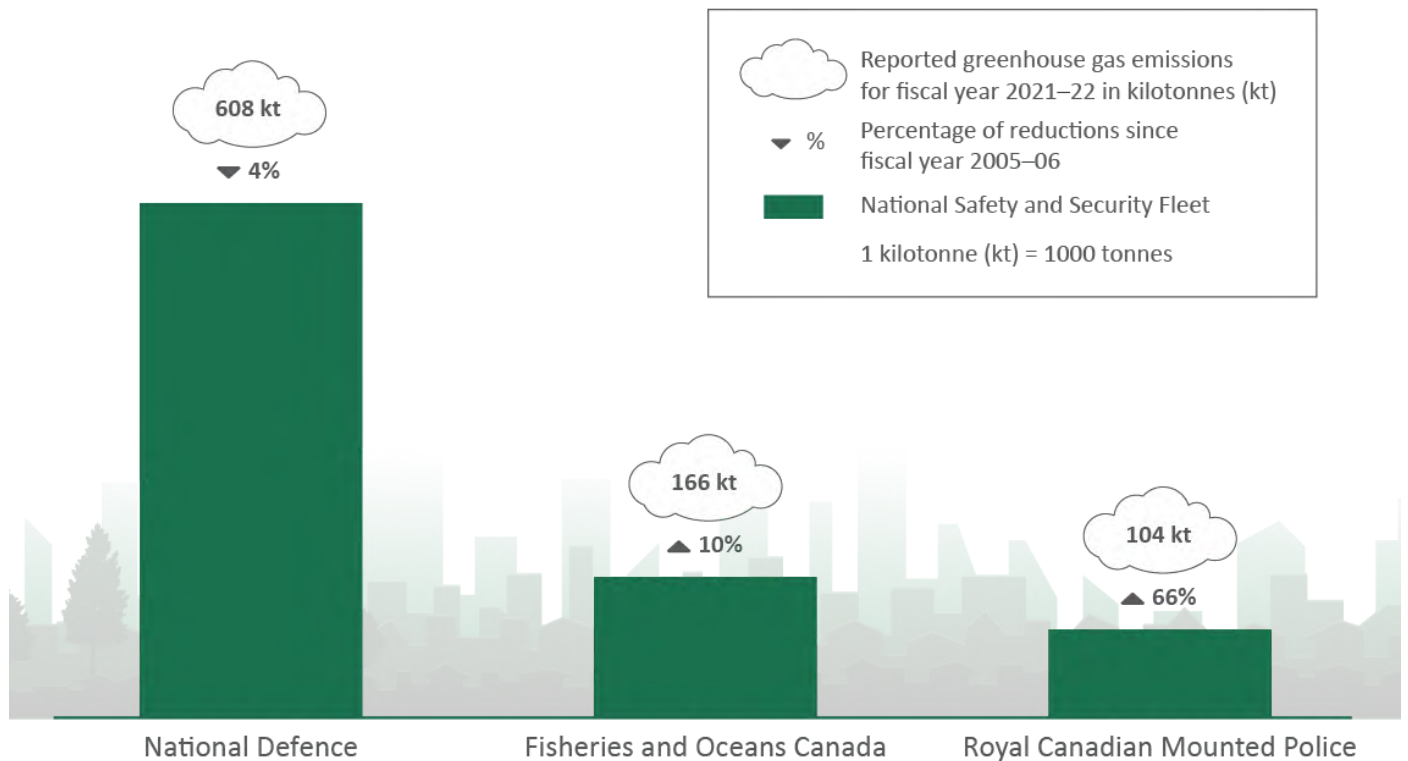
▼ Security

Scope: 1,2

Greenhouse gas emissions from national safety and security operations

National safety and security operations include activities such as law enforcement by the Royal Canadian Mounted Police, search and rescue by the Canadian Coast Guard, and the operation of military vehicles and equipment by the Department of National Defence. These emissions are included in the Government of Canada's target of net-zero emissions by 2050⁵.

Figure 10: Greenhouse gas emissions by federal organization for national safety and security fleet in fiscal year 2021 to 2022 and the percentage change in emissions compared with fiscal year 2005 to 2006



▼ Figure 10 - Text version

The bar graph shows GHG emissions (in kilotonnes of carbon equivalent) reported in fiscal year 2021 to 2022, for national safety and security fleet by federal organization. Above each bar is the organization’s emissions in 2021 to 2022, as well as the percentage change compared with fiscal year 2005 to 2006 for each federal organization.

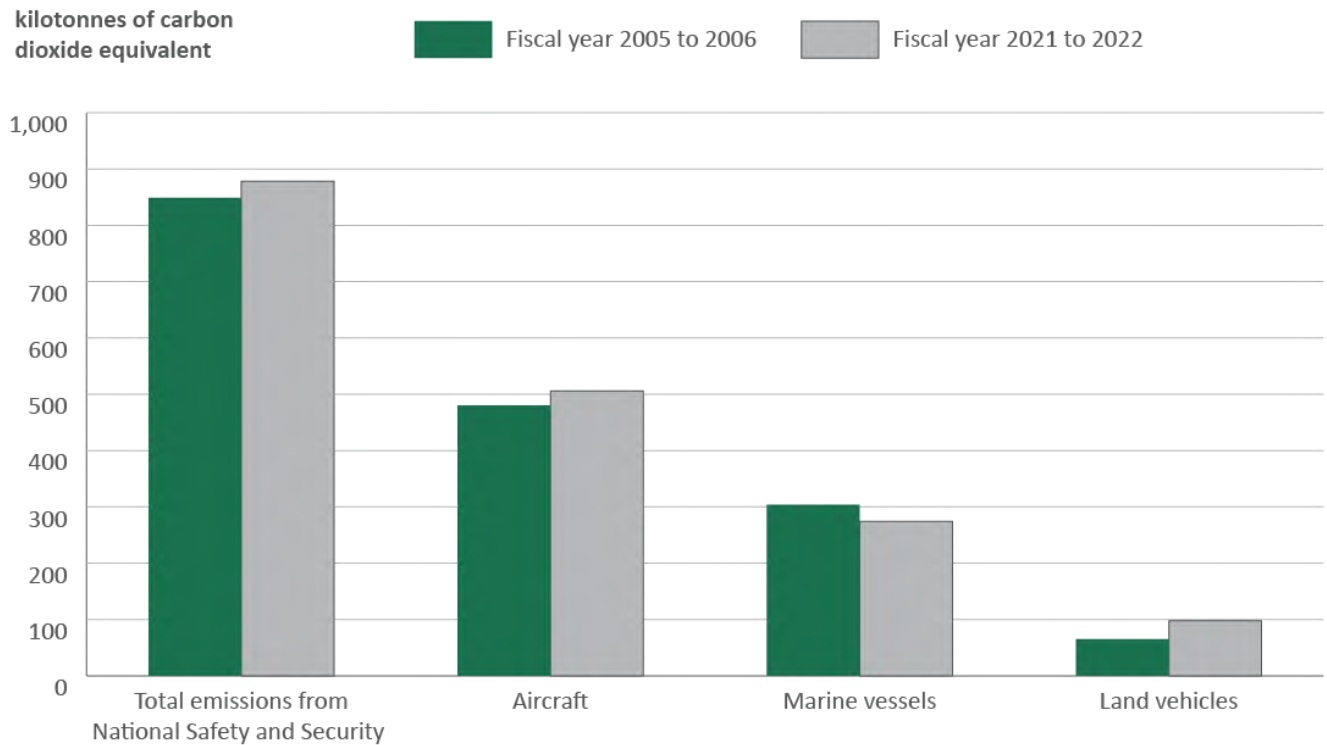
Data for the bar graph

Greenhouse gas emissions by federal organization for national safety and security fleet in fiscal year 2021 to 2022 and the percentage change in emissions compared with fiscal year 2005 to 2006

Federal organization	Emissions for fiscal year 2021 to 2022 (kt CO ₂ eq)	Percentage change compared with fiscal year 2005 to 2006
National Defence	608	-4%
Fisheries and Oceans Canada	166	10%

Federal organization	Emissions for fiscal year 2021 to 2022 (kt CO2 eq)	Percentage change compared with fiscal year 2005 to 2006
Royal Canadian Mounted Police	104	66%

Figure 11: Greenhouse gas emissions from the national safety and security fleet for fiscal years 2005 to 2006 and 2021 to 2022 by fleet type



▼ Figure 11 - Text version

The bar graph shows the GHG emissions generated by the national safety and security fleet in kilotonnes of carbon dioxide equivalent as a total and by fleet type for fiscal years 2005 to 2006 and 2021 to 2022.

Data for the bar graph

Greenhouse gas emissions from the national safety and security fleet for fiscal years 2005 to 2006 and 2021 to 2022 by fleet type

National safety and security fleet type	Emissions for fiscal year 2005 to 2006 (kt CO2 eq)	Emissions for fiscal year 2021 to 2022 (kt CO2 eq)	Percentage change compared with fiscal year 2005 to 2006
Aircraft	479.7	505.9	5%
Marine	304.3	273.9	-10%
Land vehicles	65.3	98.0	50%
Total	849	878	3%

Key results

- In fiscal year 2021 to 2022, the federal national safety and security fleet emitted 878 kilotonnes (kt) of carbon dioxide equivalent (CO2 eq)
- In fiscal year 2021 to 2022, the Department of National Defence national safety and security fleet emitted 608 kt CO2 eq:
 - 81% of the emissions came from aircraft
 - 18% came from marine vessels
 - 1% came from other land vehicles
- In fiscal year 2021 to 2022, the Canadian Coast Guard national safety and security fleet emitted 166 kt CO2 eq:
 - 97% of the emissions came from marine vessels
 - 3% came from aircraft
- In fiscal year 2021 to 2022, the Royal Canadian Mounted Police (RCMP) national safety and security fleet emitted 104 kt CO2 eq:
 - 89% of the emissions came from on-road vehicles. An overall 78% increase in GHG emissions since fiscal year 2005 to 2006 is attributed to a 38% increase in the number of RCMP on-road NSS vehicles. This includes additional emissions due to the need to convert to larger vehicles. These measures were required to ensure the RCMP can meet its operational requirements. The RCMP is currently assessing the feasibility of incorporating electric vehicles into its policing fleet to reduce the growth in GHG emissions.
 - 9% came from aircraft
 - 2% came from marine vessels

▼ More information

By 2023, NSS fleet departments will develop and regularly update Operational Fleet Decarbonization Plans that outline how they will reduce their emissions from operations in line with the overall 2050 target.

In addition, NSS departments will adopt best practices to improve efficiency and reduce emissions and environmental impacts in the areas of:

- fuel procurement, including low-carbon fuels
- fleet procurement, including purchasing energy - efficient platforms
- operational efficiency and net-zero research and innovation

The Government of Canada is taking a leadership role to put itself on a 2050 net-zero pathway by committing to buy low-carbon fuels for use in the federal domestic air and marine fleets. Budget 2021 provided \$227.9 million over eight years, starting in 2023-24, to the Treasury Board Secretariat to implement a Low-Carbon Fuel Procurement Program within the Greening Government Fund.

▼ Air Travel

Scope 3

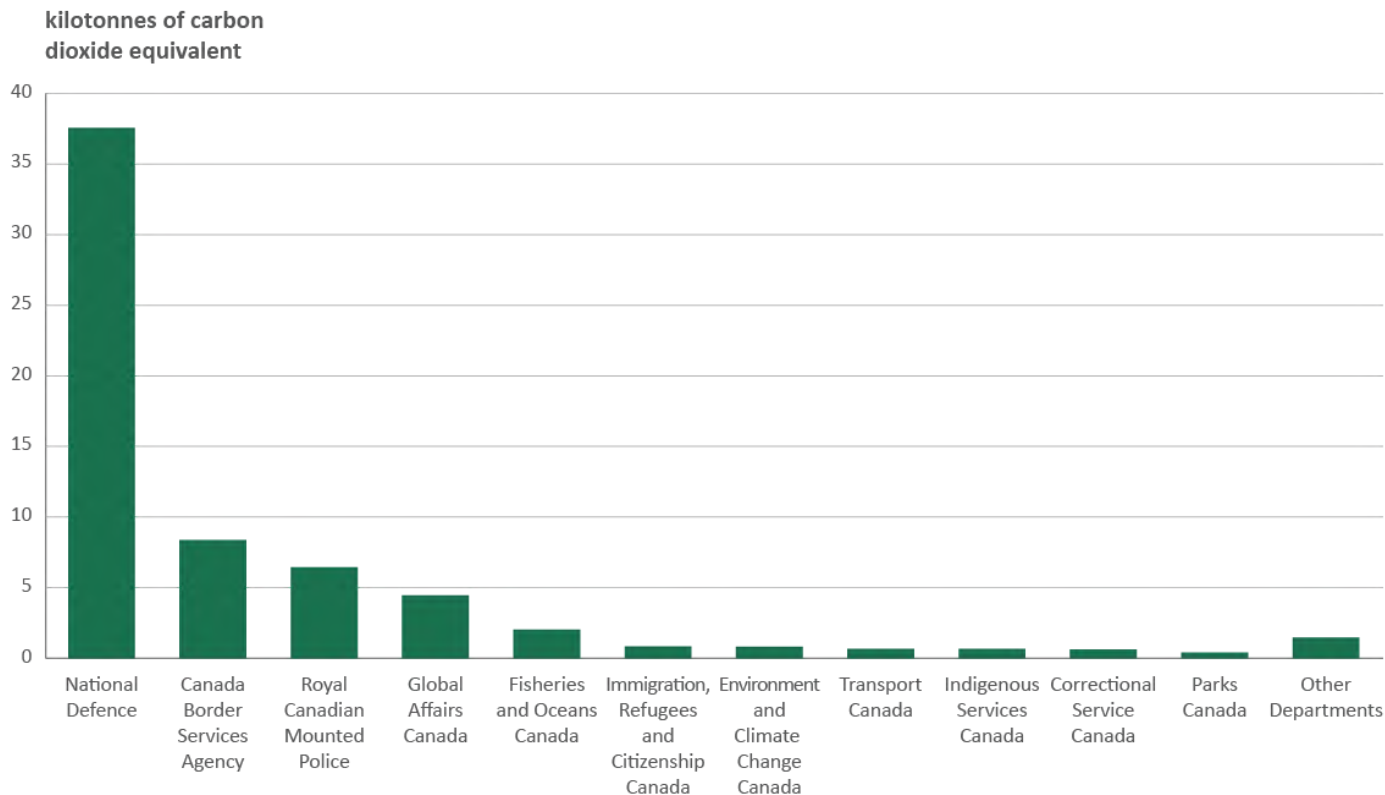
Greenhouse gas emissions from public service employee work-related air travel

Through the Greening Government Strategy, the Government of Canada made a commitment to track greenhouse gas (GHG) emissions from air travel by public service employees starting in fiscal year 2018-19. These emissions are included in the federal GHG inventory and the federal GHG reduction target for 2050.

We are also promoting lower-carbon alternatives to work-related air travel, including the use of teleconference technology or substituting air travel with other forms of travel such as rail, where feasible.

As a way to further incent departments to adopt lower-carbon alternatives to work-related travel the Greening Government Fund was established through Treasury Board Secretariat in 2018. Federal departments and agencies that generate GHG emissions in excess of 1 kilotonne per year from air travel contribute \$50 per tonne annually (which will rise with the federal carbon pollution pricing system going forward) to the Greening Government Fund. The fund supports projects that allow departments to explore innovative approaches to reducing GHG emissions.

Figure 12: Greenhouse gas emissions for employee work-related air travel by federal organization in fiscal year 2021 to 2022



▼ Figure 12 - Text version

The bar graph shows the total GHG emissions (in kilotonnes of carbon equivalent) for employee work-related air travel reported in fiscal year 2021 to 2022, by the top 11 emitting federal organizations. The remainder are grouped as “other”.

Data for the bar graph

Greenhouse gas emissions for employee work-related air travel by federal organization in fiscal year 2021 to 2022

Federal organization	Emissions for fiscal year 2021 to 2022 (kt CO2 eq)
National Defence	37.6
Canada Border Services Agency	8.4
Royal Canadian Mounted Police	6.5
Global Affairs Canada	4.5
Fisheries and Oceans Canada	2.0

Federal organization	Emissions for fiscal year 2021 to 2022 (kt CO2 eq)
Immigration, Refugees and Citizenship Canada	0.8
Environment and Climate Change Canada	0.8
Transport Canada	0.7
Indigenous Services Canada	0.7
Correctional Service Canada	0.6
Parks Canada	0.4
Natural Resources Canada	0.2
Canadian Heritage	0.2
Department of Finance	0.2
Canadian Space Agency	0.1
Public Health Agency of Canada	0.1
Public Services and Procurement Canada	0.1
Innovation, Science and Economic Development	0.1
National Research Council	0.1
Agriculture and Agri-Food Canada	0.1
Justice Canada	0.1
Health Canada	0.05
Employment and Social Development Canada	0.04
Public Safety Canada	0.02
Canadian Food Inspection Agency	0.02
Veterans Affairs Canada	0.02
Canada Revenue Agency	0.005
Library and Archives Canada	0.002
Total	64.4

Key results

- In fiscal year 2021 to 2022, emissions decreased by 70% since 2019 to 2020 due to COVID-19 pandemic travel restrictions.
- The top 5 emitting organizations (National Defence, Canada Border Services Agency, Royal Canadian Mounted Police, Global Affairs Canada, and Fisheries and Oceans Canada) generated 89% of GHG emissions attributable to employee work-related air travel.

▼ Procurement

Scope 3

Procurement

Working with CIRAIG (International Reference Centre for the Life Cycle of Products, Processes and Services) the government has estimated the embodied carbon footprint of the goods and services bought by its central procurement organizations: Public Service and Procurement Canada and Shared Services Canada. This embodied carbon consists of the Scope 3 greenhouse gases released during the lifecycle of a good or the delivery of a service as shown in Figure 13 below. The “use” phase is counted as Scope 1 and 2 emissions. An estimation of the greenhouse gases released in the supply chain for major procurement categories is shown in figure 14 below.

Figure 13: Lifecycle supply chain for goods and services showing all stages where greenhouse gases might be released



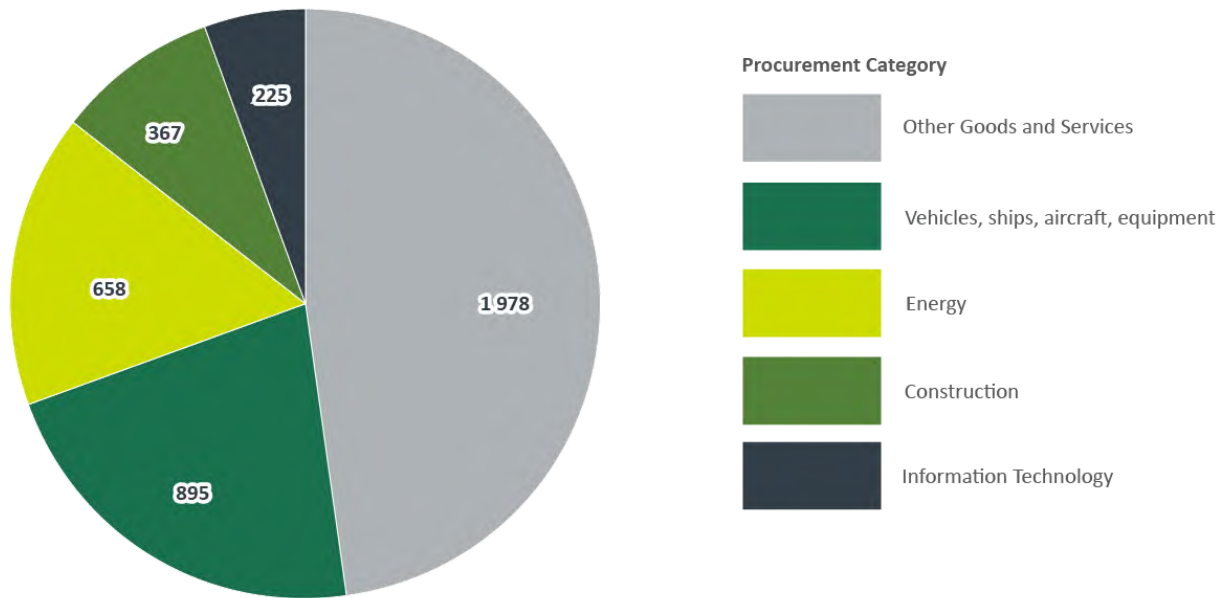
► Figure 13 - Text version

This analysis estimated the emissions attributed to the goods and services procured by Public Services and Procurement Canada and Shared Services Canada over the period from 2016 to 2020. The average annual emissions were 4,124 kt CO₂ eq for the extraction, processing, manufacturing and distribution lifecycle stages. These Scope 3 emissions were calculated using open IO-Canada, a model for environmentally extended input-output

analysis (EEIO), which uses spending to estimate the embodied carbon in goods and services procured. Figure 14 summarizes the government's estimated embodied carbon emissions associated with its procurement.

Figure 14: 2016 to 2020 Average annual estimated greenhouse gas emissions attributable to centralized procurement by category

Average Annual Emissions Attributed to Procurement (kt CO₂ eq)



► [Figure 14 - Text version](#)

More Information

CIRAIG's analysis was captured in three reports. The first report estimated the embodied carbon footprint of goods and services procured by Public Services and Procurement Canada in Quebec. Subsequently, the same exercise was completed for the rest of Canada. As a third phase CIRAIG developed an estimate of the footprint of the government's IT operations for Shared Services Canada.

[Carbon footprint of procurements by Public Services and Procurements Canada \(Quebec excluded\) - CIRAIG](#)

This study evaluated the life-cycle greenhouse gas emissions associated with procurement in the 5 Public Services and Procurement Canada regions, namely Pacific (British Columbia and the Yukon Territory), Western (Manitoba, Saskatchewan, Alberta, Nunavut, and the Northwest Territories), Ontario, the National Capital Region (Ottawa and Gatineau), and

Atlantic (New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland and Labrador). It identified the procurement categories to prioritize for action based on those that generate the most greenhouse gas emissions.

Carbon footprint of purchases by Public Services and Procurement Canada – Quebec Region - CIRAIG

This study identified the procurement categories in the Public Services and Procurement Canada - Quebec region that generated the most greenhouse gas emissions.

Environmental footprint of procurement by Shared Services Canada - CIRAIG

This study builds on and extends the previous carbon footprint studies conducted in 2018 and 2019 by the CIRAIG for Public Services and Procurement Canada. The study used the same methodology to estimate the carbon footprint of Shared Services Canada's procurement, but it was expanded to cover energy and water consumption.

▼ Methodology

Methodology used to account for greenhouse gas emissions

The methodology selected for quantifying GHG emissions from federal operations is meant to:

- reasonably minimize uncertainty
- yield accurate and consistent results
- be technically feasible and cost-effective

Federal organizations follow the Federal GHG Accounting and Reporting Guidance, which provides direction on calculating and reporting GHG emissions in accordance with the Greening Government Strategy. The methodology is based on the GHG Protocol: A Corporate Accounting and Reporting Standard, developed by the World Resources Institute and the World Business Council for Sustainable Development. The GHG Protocol is an internationally accepted standard for GHG accounting at the organizational level.

Over time, additional sources of GHG may be added and adjustments to methodologies may be made in order to improve the federal government's accounting for and reporting of GHG emissions from federal operations.

Emission factors

- GHG emissions are determined using activity data (for example, energy data) in conjunction with an appropriate emission factor
- Emission factors are calculated ratios that relate GHG emissions to a measure of activity at a specific emissions source
- Emission factors are usually expressed in terms of GHG emissions per unit of fuel or energy
- Emission factors used to calculate GHG emissions from federal operations are sourced from the [national inventory report: greenhouse gas sources and sinks in Canada](#), published by Environment and Climate Change Canada

Global warming potentials

- GHGs are converted into units of carbon dioxide equivalent (CO₂ eq) by multiplying the emissions of each gas by its global warming potential
- Global warming potential is a factor that describes the degree of warming that results from one unit of a given GHG relative to one unit of CO₂
- The global warming potential of methane (CH₄) and nitrous oxide (N₂O) are 28 and 265 respectively, based on the Intergovernmental Panel on Climate Change, Fifth Assessment Report, 2014

Additional notes

- Some year-to-year changes in GHG emissions may be due to data collection gaps, methodology or error correction refinements, while others may be the result of one-time or specific events or actions (such as natural disasters or operational disruptions)
- Variations in seasonal weather conditions (for example, the effect of heating or cooling days on building energy use) also influence annual GHG emissions

Footnotes

- 1 Canada's National Safety and Security (NSS) fleet is comprised of aircraft, marine vessels, and tactical land vehicles from DND, RCMP and Coast Guard. For the NSS fleet the 2050 target will consider availability, affordability, and operational feasibility. A combination of permanent carbon dioxide removal and operational measures will be used to contribute to net-zero emissions.
- 2 The 40% and 90% absolute emission reduction targets do not apply to the National Safety and Security (NSS) fleet

- 3 Shared Services Canada did not exist in 2005-06
 - 4 National Battlefields Commission baseline data is under development
 - 5 Canada's National Safety and Security (NSS) fleet is comprised of aircraft, marine vessels, and tactical land vehicles from DND, RCMP and Coast Guard. For the NSS fleet the 2050 target will consider availability, affordability, and operational feasibility. A combination of permanent carbon dioxide removal and operational measures will be used to contribute to net-zero emissions.
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