

Canadian System of Environmental–Economic Accounts: Energy use and greenhouse gas emissions, 2018

Released at 8:30 a.m. Eastern time in The Daily, Friday, March 26, 2021

Canada's economy has been growing at a faster pace than its industrial greenhouse gas (GHG) emissions. The economy grew 2.4% a year on average from 2009 to 2018, while industrial GHG emissions (+0.8%) rose at one-third the pace. The main reason for the difference is how Canadians sourced energy to heat and power their homes and businesses over that decade.

The data on energy use and GHG emissions presented in this release reflect the economic activities of industries, households and governments that contributed to Canada's gross domestic product (GDP) in 2018. These data therefore reveal trends prior to the COVID-19 pandemic. Physical distancing measures and various restrictions on economic activity because of COVID-19 have altered these trends, and changes will be confirmed once the data for 2020 become available.

These GHG emission estimates are based on the United Nations System of Environmental–Economic Accounting (SEEA) guidelines and are closely linked to economic statistics. They differ from the GHG emission estimates released by Environment and Climate Change Canada (ECCC), which is responsible for producing the National Inventory Report on Greenhouse Gas Sources and Sinks in Canada. ECCC's inventory is the official benchmark for GHG emissions in Canada and is based on the guidelines from the United Nations Framework Convention on Climate Change.

For more information on the methodological differences between these two data products, see the graphic [Complementary approaches to reporting Canada's greenhouse gas emissions](#).

The coal phase-out for electricity generation has lowered industrial GHG emissions

From 2009 to 2018, the Canadian economy (+23.2%), the total energy used by industries (+11.9%) and industrial GHG emissions (+7.6%) all increased. However, emissions rose at less than one-third the pace of economic growth and almost two-thirds that of industrial energy use.

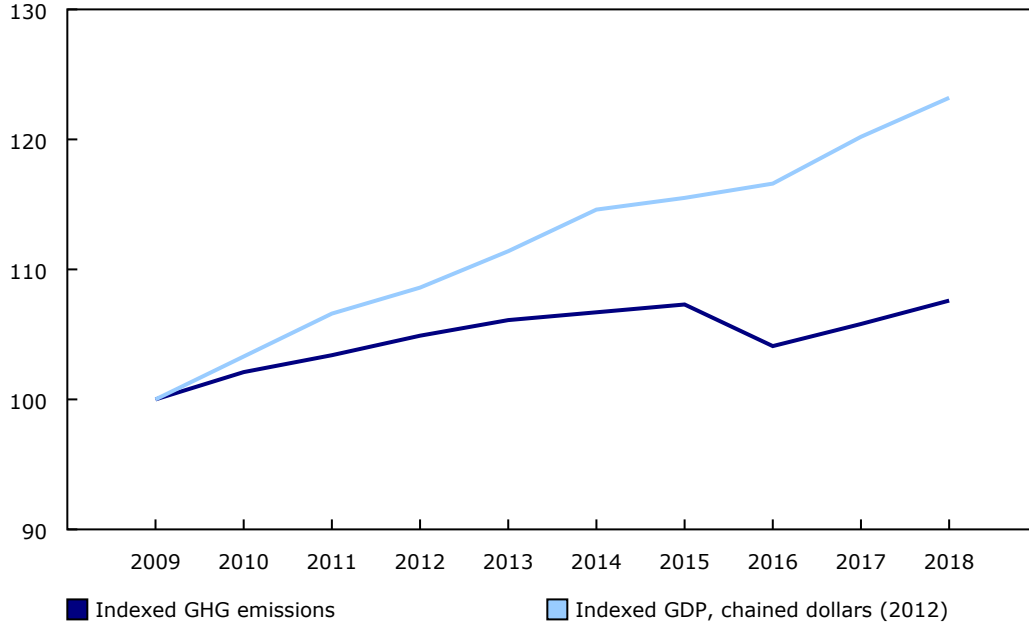
One reason why economic growth and industrial energy use are growing faster than GHG emissions is that the electric power generation, transmission and distribution industry has been shifting away from coal toward less GHG-intensive energy sources for generating electricity. From 2009 to 2018, GHG emissions from this industry fell by 32.5%, while GDP for the industry rose 12.8%.

Overall, direct industrial GHG emission intensity was down 0.7% to 0.33 kilotonnes per million dollars of GDP from 2017 to 2018, while direct industrial energy intensity rose 0.5% to 4.73 terajoules per million dollars of GDP.



Chart 1
Industrial greenhouse gas (GHG) emissions have grown at a slower pace than total gross domestic product (GDP)

Index (2009 = 100)

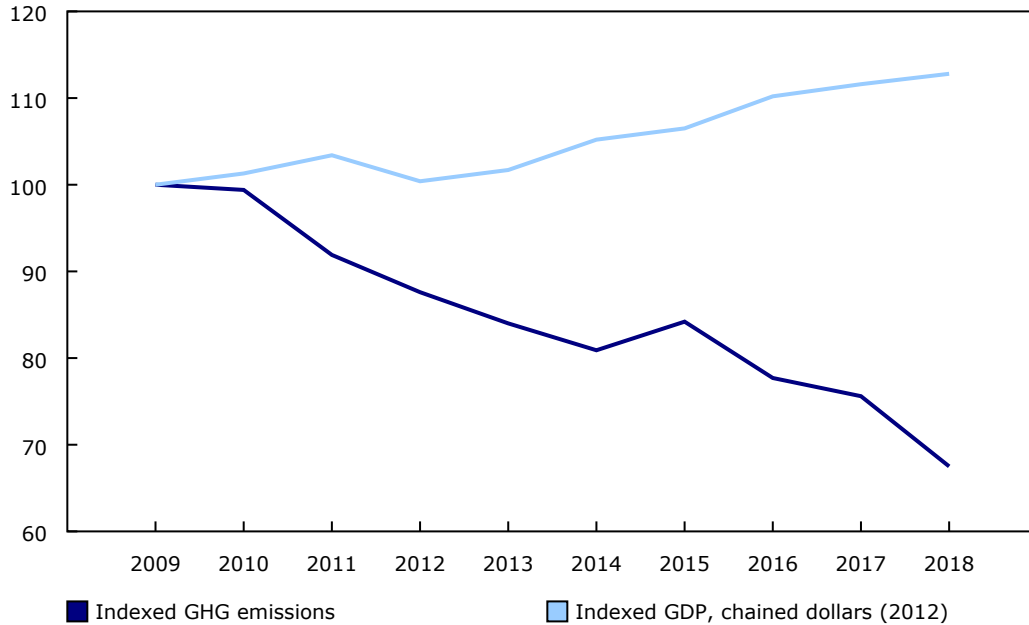


Source(s): Tables [38-10-0097-01](#) and [36-10-0402-01](#).

Chart 2

Divergence between greenhouse gas (GHG) emissions and gross domestic product (GDP) in the electric power generation, transmission and distribution industry

Index (2009 = 100)



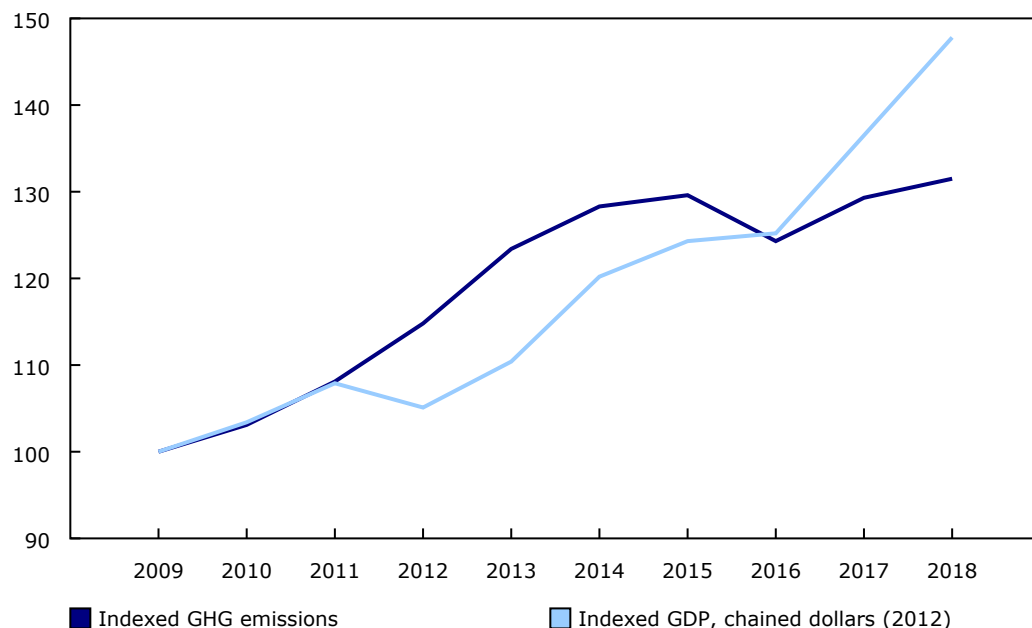
Source(s): Tables [38-10-0097-01](#) and [36-10-0402-01](#).

The oil and gas extraction industry remains Canada's top industrial energy user

The oil and gas extraction industry remained Canada's top industrial user of energy in 2018, with 16.5% of total energy used by this industry. Oil and gas extraction has been the highest GHG-emitting industry for the decade from 2009 to 2018, and it was responsible for 20.9% of Canada's total GHG emissions in 2018. The oil and gas extraction industry has shown growth in GHG emissions and GDP over this decade.

Chart 3
Indexed greenhouse gas (GHG) emissions and gross domestic product (GDP) for the oil and gas extraction industry

Index (2009 = 100)



Source(s): Tables [38-10-0097-01](#) and [36-10-0402-01](#).

Households account for almost one-quarter of the total energy used in Canada

The residential sector continued to consume more energy than any individual industrial sector, accounting for almost one-quarter (24.3%) of Canada's total energy use in 2018, up 0.4 percentage points from 2017. This amounted to 79.6 gigajoules of household energy use per person, or the equivalent to the energy required to browse the Internet for about 50 years straight.

Although households accounted for almost one-quarter of the energy used in 2018, they were responsible for less than one-fifth (19.1%) of Canada's total GHG emissions in 2018, mainly because of the large share of household energy coming from electricity.

Household emissions per capita represent the average amount of household GHG emissions generated by a single Canadian and exclude all industrial emissions. Examples of household final consumption include buying gasoline for a vehicle or natural gas to heat a home. A region's available fuel mix, climate, average household size and average household income all influence per capita emissions.

In 2018, Canada's per capita household GHG emissions increased 3.5% to 4.1 tonnes per person.

For international context, other countries with SEEA-based air emissions accounts, such as the United Kingdom, France, Norway and Germany, reported household emissions per capita ranging from 1.0 to 2.3 tonnes for 2018.

British Columbia has the lowest per capita household GHG emissions among the provinces, while Atlantic Canada has among the highest

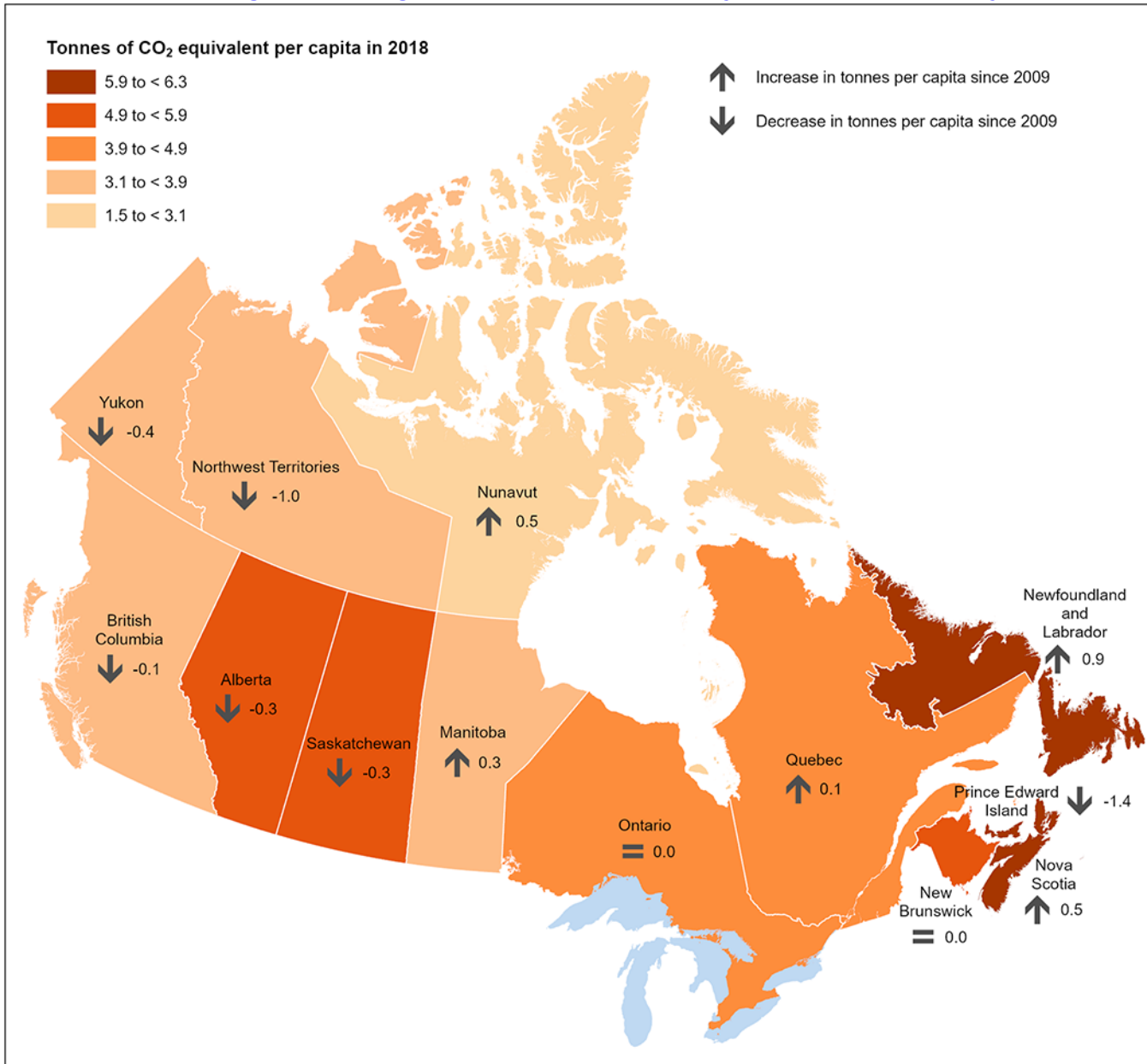
British Columbia (3.1 tonnes) produced the lowest per capita household GHG emissions among the provinces in 2018. Manitoba (3.5 tonnes), Ontario (4.0 tonnes) and Quebec (3.9 tonnes) were also all below the national per capita level of 4.1 tonnes.

Per capita household GHG emissions were highest in Prince Edward Island (6.3 tonnes) and Newfoundland and Labrador and Nova Scotia (both at 6.0 tonnes). One reason for the high household GHG emissions in the Atlantic provinces is the prevalence of fuel oil to heat homes.

The territories had the lowest per capita household GHG emissions (2.9 tonnes) in Canada in 2018.

Among the provinces, Newfoundland and Labrador (+0.9 tonnes) had the largest increase in per capita household GHG emissions from 2009 to 2018, while Prince Edward Island (-1.4 tonnes) had the largest decline.

Map 1 – Household greenhouse gas emissions per capita, by province and territory, 2018



Source(s): Statistics Canada, Population estimates on July 1st, by age and sex, table 17-10-0005-01.
 Statistics Canada, Physical flow account for greenhouse gas emissions, table 38-10-0097-01.

Alberta GHG emissions driven by the oil and gas extraction industry

Variations in GHG emissions across Canada reflect the distinct land, geography and population of each province and territory.

Canada is a resource-rich country, and many resources are extracted and used here in Canada or exported. The extraction of many of these resources—whether they are renewable, such as those obtained from logging, or non-renewable, such as those from mining or the oil and gas extraction industry—contributes to Canada’s annual GHG emissions and to its economic growth.

The oil and gas extraction industry was the largest GHG-emitting industry in Alberta in 2018, accounting for 46.4% of the province's total emissions. Emissions from this industry grew 43.3% over the decade from 2009 to 2018 in Alberta, in tandem with resource development.

Households the largest emitters in central Canada

Both Ontario and Quebec counted households as their greatest source of direct GHG emissions in 2018, with 32.4% and 33.4% shares, respectively.

Pulp, paper and paperboard mills account for nearly one-fifth of emissions in British Columbia

Pulp, paper and paperboard mills (19.5%) and households (18.5%) were the largest sources of GHG emissions in British Columbia in 2018.

Crop and animal production important contributors to emissions in several provinces

In 2018, crop and animal production industries accounted for the largest share of total GHG emissions in Manitoba (38.0%) and the second largest in Prince Edward Island (24.4%), after households (50.4%).

In Saskatchewan, crop and animal production (25.5%), oil and gas extraction (24.2%), and electric power generation (21.1%) made up almost three-quarters of that province's total GHG emissions.

Electric power generation and oil and gas extraction industries among top emitters in Atlantic Canada

Electric power generation, transmission and distribution was the most significant source of GHG emissions in Nova Scotia (38.1%) in 2018. In New Brunswick, the highest contributors were households (21.3%); electric power generation, transmission and distribution (20.5%); and pulp, paper and paperboard mills (20.2%).

In Newfoundland and Labrador, households (25.5%) were the primary GHG emitters in 2018, followed by the oil and gas extraction industry (21.3%).

Mining industry is the largest GHG emitter in Nunavut and the Northwest Territories

The mining industry accounted for almost half of GHG emissions in Nunavut (49.1%) and over one-third (37.6%) in the Northwest Territories in 2018.

In Yukon, households (24.3%) were responsible for almost one-quarter of total GHG emissions, followed by metal ore mining (17.7%).

Note to readers

The basis for these greenhouse gas (GHG) estimates is Statistics Canada's physical flow accounts (PFA), which record the annual flows of selected natural resources, products and residuals between the Canadian economy and the environment. Data are presented to reflect the activities of industries, households and governments, and they follow the classification system of industries and commodities used in [Statistics Canada's supply and use tables](#). Following the United Nations System of Environmental–Economic Accounting (SEEA), the use of this classification system enables the environmental accounts to be integrated with Canada's economic statistics, such as the gross domestic product.

Environment and Climate Change Canada is responsible for producing the official [National Inventory Report on Greenhouse Gas Sources and Sinks in Canada](#). This inventory, which fulfills Canada's reporting obligations under the United Nations Framework Convention on Climate Change (UNFCCC), is consistent with guidelines published by the Intergovernmental Panel on Climate Change and is the official benchmark for GHG emissions in Canada. National inventories under the UNFCCC and the GHG accounts under the United Nations SEEA are based on different methodological frameworks that result in different GHG estimates. The sector definitions of

the two products differ and should therefore not be directly compared. For more information on the methodological differences, see the [Canadian System of Environmental–Economic Accounts—Physical Flow Accounts metadata page](#) and the graphic [Complementary approaches to reporting Canada's greenhouse gas emissions](#).

Preliminary data for 2018 from the PFA are now available for national energy use ([38-10-0096-01](#)) and national, provincial and territorial GHG emissions ([38-10-0097-01](#)). Estimates for 2009 to 2017 for energy use and GHG emissions were also updated with revised source data.

The products [Physical flow account for energy use: Interactive tool](#) and [Physical flow account for greenhouse gas emissions: Interactive tool](#), both part of the Data Visualization Products series ([71-607-X](#)), are also available. For the latest in energy information in Canada, visit the [Canadian Centre for Energy Information website](#).

Available tables: [38-10-0096-01](#) and [38-10-0097-01](#).

Definitions, data sources and methods: survey number [5115](#).

For more information, or to enquire about the concepts, methods or data quality of this release, contact us (toll-free 1-800-263-1136; 514-283-8300; STATCAN.infostats-infostats.STATCAN@canada.ca) or Media Relations (613-951-4636; STATCAN.mediahotline-ligneinfomedias.STATCAN@canada.ca).