Greenhouse gas emissions by province and territory, Canada, 1990, 2005 and 2017

Province or territory	1990 greenhouse gas emissions (megatonnes of carbon dioxide equivalent)	2005 greenhouse gas emissions (megatonnes of carbon dioxide equivalent)	2017 greenhouse gas emissions (megatonnes of carbon dioxide equivalent)
Newfoundland and Labrador (NL)	9.4	9.9	10.5
Prince Edward Island (PE)	1.9	2.0	1.8
Nova Scotia (NS)	19.6	23.2	15.6
New Brunswick (NB)	16.1	20.0	14.3
Quebec (QC)	86.1	86.5	78.0
Ontario (ON)	180.0	203.9	158.7
Manitoba (MB)	18.3	20.1	21.7
Saskatchewan (SK)	44.4	68.0	77.9
Alberta (AB)	172.6	231.1	272.8
British Columbia (BC)	51.6	63.1	62.1
Yukon (YT)	0.5	0.5	0.5
Northwest Territories (NT)	1.6 [A]	1.6	1.3
Nunavut (NU)	n/a	0.4	0.6

Note: [A] 1990 emissions data for the Northwest Territories include emissions for Nunavut, which was part of the Northwest Territories until 1999. n/a = not applicable.

https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/greenhouse-gas-emissions.html

Sharply rising emissions in Alberta, Sask, and Manitoba. NS = 20% below 1990 levels. Canada = 19% higher than 1990.

Greenhouse gas emissions, Canada, 1990 to 2017

Year	Total greenhouse gas emissions (megatonnes of carbon dioxide equivalent)
1990	602
1991	593
1992	610
1993	612
1994	634
1995	651
1996	672
1997	687
1998	695
1999	707
2000	731
2001	720
2002	724
2003	741
2004	743
2005	730
2006	721
2007	744
2008	723
2009	682
2010	693
2011	703
2012	711
2013	722
2014	723
2015	722
2016	708

2017	716

Note: Data are presented as rounded figures. However, all calculations have been performed using unrounded data.

https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/greenhouse-gas-emissions.html

Energy Consumption and Greenhouse Gas (GHG) Emissions

Total Energy Consumption

- End-use demand in Nova Scotia was 164 (PJ) in 2016. The largest sector for energy demand was transportation at 44% of total demand, followed by residential at 24%, industrial at 19%, and commercial at 13% (**Figure 5**). Nova Scotia's total energy demand was the 9th largest in Canada, and the 13th largest on a per capita basis.
- RPPs, including gasoline, diesel, and heating oil, were the largest fuel type consumed in Nova Scotia, accounting for 99 PJ, or 60%. Electricity and natural gas accounted for 37 PJ (23%) and 15 PJ (9%), respectively (**Figure 6**).

Refined Petroleum Products

- Gasoline consumed in Nova Scotia is primarily imported from refineries in the U.S. East Coast and Europe. About a third of Nova Scotia's gasoline is produced in New Brunswick.
- Total 2017 demand for RPPs in Nova Scotia was estimated at 48 Mb/d, or 3% of total Canadian RPP demand. Of Nova Scotia's total demand, an estimated 25 Mb/d was for motor gasoline and an estimated 12 Mb/d was for diesel.
- Nova Scotia's per capita RPP consumption in 2017 was 2 946 litres (27.5 barrels), or 2% above the national average of 2 886 litres per capita.
- RPP prices in Nova Scotia have been regulated by NSUARB since 2009. Previously, RPP prices were set by the Minister of Service Nova Scotia. The Utility and Review Board sets wholesale prices, minimum and maximum retail mark-ups, and maximum retail prices, including for gasoline.

Natural Gas

- In 2017, Nova Scotia consumed an average of 68 MMcf/d of natural gas, which represented less than 1% of total Canadian demand.
- Nova Scotia's largest consuming sector for natural gas was the industrial sector, which consumed 50 MMcf/d in 2017. The commercial and residential sectors consumed 18 MMcf/d and 1 MMcf/d, respectively.

Electricity

- In 2016, annual electricity consumption per capita in Nova Scotia was 11.1 megawatt hours (MW.h). Nova Scotia ranked 10th in Canada for per

capita electricity consumption and consumed 26% less than the national average.

- Nova Scotia's largest consuming sector for electricity in 2016 was residential at 4.3 TW.h. The commercial and industrial sectors consumed 3.2 TW.h and 2.7 TW.h, respectively. Nova Scotia's electricity demand has declined 8% since 2005.
- In 2016, Nova Scotia generated 2 274 gigawatt hours of electricity from renewable sources, or approximately 24% of total generation. As part of its Renewable Energy Standard, Nova Scotia seeks to increase this number to 40% by 2020.

GHG Emissions

- Nova Scotia's GHG emissions in 2016 were 16.5 megatonnes (MT) of carbon dioxide equivalent (CO_2e).[Footnote 1] Nova Scotia's emissions have declined 20% since 1990.
- Nova Scotia emissions per capita are 16.5 tonnes CO_2e – 15% below the Canadian average of 19.4 tonnes per capita.
- The largest emitting sectors in Nova Scotia are electricity generation at 42% of emissions, transportation at 31%, and buildings (residential and commercial) at 13% (**Figure 7**).
- Nova Scotia's GHG emissions from the oil and gas sector in 2016 were 0.5 MT CO_2e attributable to natural gas production and processing.
- In 2016, Nova Scotia's power sector emitted 6.6 MT CO_2e emissions, which represents about 8.4% of Canadian emissions from power generation.

https://www.cer-rec.gc.ca/nrg/ntgrtd/mrkt/nrgsstmprfls/ns-eng.html?=undefined&wbdisable=true

Reducing greenhouse gases: Alberta, Ontario and Nova Scotia shed light on how electricity is an emerging solution

Greenhouse gas emissions (GHG) in Canada's electricity sector have declined by 34% since 2005 and further reductions are expected

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June 18, 2019 12:00 ET | **Source:** The Conference Board of Canada

Ottawa, June 18, 2019 (GLOBE NEWSWIRE) -- Opportunities for Canadian provinces to achieve greater reductions in greenhouse gas emissions in the electricity sector are abundant —using approaches adapted to a province's energy resources and economy—concludes a new report published by The Conference Board of Canada. The *Powering Down Emissions* report studies Alberta, Ontario and Nova Scotia's individual pathways to further reducing GHG emissions in their electricity sectors—with a significant impact on the environment.

"Canada-wide, the electricity sector is undergoing fundamental transformation. In each province, electricity generators are playing a leadership role in the move to a cleaner economy. Our report demonstrates the critical role that the electricity sector is already playing in reducing Canada's greenhouse gas emissions," said Dr. Ovo Adagha, the lead researcher on the project. "Every province can achieve results with a different plan of action, as evidenced in Nova Scotia, Ontario and Alberta. Provinces are capitalizing on their unique opportunities and challenges and creating bespoke roadmaps for future improvement."

Highlights from *Powering Down Emissions*, June 2019:

Alberta:

- Electricity demand in Alberta has grown **15%** since 2005.
- Despite rising demand, GHG emissions from Alberta's electricity sector have declined over the past decade and fell by **5.4%** in 2016.
- The decline in emissions can be attributed to a shift in Alberta's generation capacity towards natural gas and renewable energy generation over time.
- Alberta's coal phase-out program will **reduce coal-fired electricity** generation capacity by 60% in 2026, while GHG emissions levels will decline by 47% between 2019 and 2030.

Ontario

- In 2018 Ontario's electricity demand **rose by 4%**, after years of decline.
- About **90%** of electricity in Ontario came from non- GHG-emitting sources in 2016

- The phase out of coal-fired generation, infrastructure investments, and conservation have contributed to Ontario's electricity sector GHG emissions declining by **more than 80%** since 2005.
- Ontario's electricity sector emissions will **decline by 17%** between 2019 and 2030 due to gains in energy efficiency and growing relevance of energy storage technology.

Nova Scotia

- Nova Scotia's electricity demand has **declined by 8%** since 2005.
- Over 70% of electricity generation in Nova Scotia is from hydrocarbon sources **(coal, 62%; natural gas, 16%).**
- Nova Scotia's electricity sector GHG emissions have fallen by **more than 38%** since 2005 because of GHG reduction measures.
- Nova Scotia's electricity sector emissions **will decline by about one-third by 2030** as a result of a move toward increased renewable energy production.

This report was funded by The Conference Board of Canada's Centre for a Clean Energy Growth Economy (CEGE). Centre for a Clean Energy Growth Economy (CEGE) is building on Canada's business and intellectual strengths to provide independent evidence for the path forward without sacrificing growth, wealth creation, sustainability, and social well-being.

Report spokespersons are Dr. Ovo Adagha (Senior Research Associate, Energy and Environment) and Michael Burt (Executive Director, Global, Industrial and Education Economics), at The Conference Board of Canada.

A copy of the *Powering Down Emissions, Case Studies in Electricity Generation in Three Provinces* report is available at https://www.conferenceboard.ca/e-library/abstract.aspx?did=10308 (free).

#environment #electricity #GreenhouseGas #Ontario #NovaScotia #Alberta

https://www.globenewswire.com/news-release/2019/06/18/1870538/0/en/Reducing-greenhouse-gases-Alberta-Ontario-and-Nova-Scotia-shed-light-on-how-electricity-is-an-emerging-solution.html

COUNTRY COMPARISON IS AT https://en.wikipedia.org/wiki/List_of_countries_by_greenhouse_gas_emissions_per_capita

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September 10, 2019
PROVINCIAL AND TERRITORIAL GREENHOUSE GAS EMISSIONS, 2017

CHARTS DID NOT REPRODUCE HERE. See:

https://www.novascotia.ca/finance/statistics/archive_news.asp?id=15125&dg=&df=&dto=0&dti=3

Statistics Canada has updated data for greenhouse gas (GHG) emissions at the provincial and territorial level through 2017. Statistics Canada notes:

"Statistics Canada's physical flow accounts (PFA) record the annual flows of selected natural resources, products and residuals between the Canadian economy and the environment. As such, 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.

"Environment and Climate Change Canada (ECCC) is responsible for producing Canada's National Inventory Report on Greenhouse Gas Sources and Sinks(NIR). This inventory fulfills Canada's reporting obligations under the United Nations Framework Convention on Climate Change (UNFCCC), and is the official benchmark for greenhouse gas (GHG) emissions in Canada.

"Despite drawing from common sources, the estimates in Statistics Canada's GHG emissions account differ from those reported in the NIR. This is because the reporting requirements of the UNFCCC differ from the methodological guidelines of the United Nations System of Environmental–Economic Accounting, which is used to create the GHG account described in this article. The sector definitions of the NIR also differ from those of the PFA and therefore should not be directly compared."

In 2017, Nova Scotian industries and households produced 18.0 tonnes of GHG emissions per capita. GHG emissions per capita were highest in Alberta (66.3 tonnes per capita) and lowest in Quebec (10.9 tonnes per capita).

On a per capita basis, GHG emissions declined 3.8 per cent (compound annual growth rate, CAGR) in Nova Scotia from 2009 to 2017. This is largely due to declines in emissions from electric power generation and manufacturing industries. Household emissions have remained relatively constant since 2009, as declining emissions from electricity and other fuels was offset by higher emissions from motor fuels. In 2017, Nova Scotia's per capita GHG emissions increased 0.3 per cent, the same per capita pace as national average emissions growth.

GHG emissions per million dollars of nominal GDP were highest in Saskatchewan and Alberta and lowest in Ontario and Quebec in 2016. Nova Scotia industries and households emitted 400.5 tonnes per million dollars of GDP, higher than the Canadian average of 355.6 tonnes per million dollars of GDP. GHG emissions per million dollars of GDP declined in every province from 2009 to 2017, with Nova Scotia recording the largest decline (-6.1 per cent CAGR) and Alberta (-1.6 per cent) and Newfoundland and Labrador (-1.7 per cent) recording the smallest declines.

Nova Scotia's emissions amount to 2.3 per cent of national GHG emissions; less than the province's share of national population, but greater than the province's share of national GDP. Larger urban provinces - Ontario, Quebec and British Columbia - represent a lower share of national emissions than their population or GDP. Notably, these provinces, along with Manitoba have hydroelectric and nuclear power stations that generate fewer GHGs from electric power production. In Alberta and Saskatchewan, higher emissions from oil & gas extraction, agriculture, and electric power generation contribute to a higher share of national emissions than population or GDP.

Across Canada, industrial emissions were generally larger than household emissions (except Prince Edward Island).

Differences in available fuels, climate, household size and household incomes are some of the factors that can influence household per capita emissions across the provinces. Household GHGs per capita from motor fuels (i.e. gasoline) were highest in Saskatchewan and lowest in British Columbia in 2017. British Columbia, Ontario and Quebec have a higher share of the population living in urban areas and less dependency on motor fuels. Household GHGs from electricity and other fuels were highest in the Atlantic provinces and lowest in Manitoba and British Columbia. In the Atlantic provinces, household natural gas is not widely available and other fuels are more common for heat and electricity compared to other provinces.

Industrial emissions account for much of the variation in emissions per capita from one province to another. The highest industrial emissions per capita were in Saskatchewan and Alberta, followed (distantly) by New Brunswick and Newfoundland and Labrador.

Industrial emissions are concentrated in three sectors of the economy: oil and gas extraction, electric power generation and agriculture.

Oil and gas extraction emissions are highest in Alberta (30.7 tonnes per capita) and Saskatchewan (16.9 tonnes per capita). Newfoundland and Labrador's oil and gas extraction sector (4.1 tonnes per capita) produces less emissions than the national average for that sector. Most other provinces have comparatively few oil and gas resources in production. Nova Scotia's oil and gas extraction generated 0.36 tonnes per capita of emissions in 2017.

Electric power emissions are highest in Saskatchewan (14.2 tonnes per capita), followed by Alberta (10.9 tonnes per capita), Nova Scotia (6.7 tonnes per capita) and New Brunswick (5.1 tonnes per capita). Many other provinces make use of hydroelectric or nuclear generation to produce power without substantial GHG emissions.

Agricultural emissions are highest in Saskatchewan (16.6 tonnes per capita) followed by Manitoba (6.1 tonnes per capita), Alberta (5.3 tonnes per capita) and Prince Edward Island (3.0 tonnes per capita). Nova Scotia's agricultural emissions per capita were 0.5 tonnes per capita.

The remainder of emissions from goods industries include substantial emissions from petroleum refining, pulp/paper, steel and chemical manufacturing. Service industry emissions include notable emissions from transportation (air, rail, water, truck) and pipelines.

Statistics Canada. Table 38-10-0097-01 Physical flow account for greenhouse gas emissions