

BRITISH COLUMBIA'S GREENHOUSE GAS EMISSIONS 2005 TO 2019.

Prior to the COP216 gathering in Glasgow the BC government released its latest summary of greenhouse gas emissions (GHG) to 2019.¹ BC's GHG emissions reporting is based on the National Inventory Report from Environment and Climate Change Canada. Due to the lag time to verify and review the data from the federal government, the latest year reported is 2019.

In that year B.C.'s gross GHG emissions were 68.6 million tonnes of carbon dioxide equivalent (Mt CO₂ e). This represents an increase of 0.2% from 2018 and 4.8% from 2005 levels.² In the same 14-year period the GHG emissions for Canada declined by 1.2% (9 million tonnes).

In 2019, the 730 million tonnes emitted by Canada comprised approximately 1.8% of global emissions, while the emissions from BC comprised approximately 9.0% of the Canadian total and 0.16% of the global total emissions. Table 1 shows the change in the BC emissions from 2005 to 2019, and by major category.

Part A BC's GHG Emissions

The government reports GHG emissions using a standard international format. In the 14-year period some economic sectors showed a marked increase in emissions, while other sectors showed decreases. The change for key sectors is shown in Table 1.

Table 1—BC EMISSIONS CHANGE by SELECTED SECTOR (million tonnes of CO₂e)

	2005	2019	Difference	Per Cent
TOTAL	65,827	68,629	2,802	4.3
Road Transport				
Gas-Light Duty	8,361	9,383	1,022	12.2
Gas-Other	7,131	9,625	2,494	35.0
Total	15,492	18,908	3,516	22.1
Oil & Gas				
Extraction	5,391	8,418	3,026	56.1

¹ https://www2.gov.bc.ca/assets/gov/environment/climate-change/action/cleanbc/2021_climate_change_accountability_report.pdf

² I chose 2005 as the base year as the 14-month period provides a reasonable timeframe to measure progress.

Fugitive	4,398	3,179	(1,219)	(27.7)
Total	9,789	11,596	1,809	18.5
Residential	4,515	4,105	(410)	(9.1)
Manufacturing	6,187	4,943	(1,244)	(20.1)
Industrial Process	4,632	3,762	(870)	(18.8)
Agriculture	2,745	2,480	(265)	(9.7)
Forestry	2,854	2,940	86	3.0

Source: Provincial Inventory 1990-2019, <https://www2.gov.bc.ca/gov/content/environment/climate-change/data/provincial-inventory>

The growth in the exploration and extraction of oil and gas is reflected in the 56% increase in emissions, but this was partly offset by a significant decrease in fugitive emissions. The increase in road transport emissions reflects the growth in population and the increase in economic activity (see Part II).

Part B BC's Performance in Context

The summary provided by the government does not provide any context as to how the change in BC's emissions compares to other large provinces, or how the change compares to changes in economic indicators. Using national data (which varies slightly from the BC figures) shows that Ontario and Quebec had absolute declines in emissions.

Table 2—CHANGE in TOTAL EMISSIONS (million tonnes of CO₂e)

		2005	2019	Difference	Per Cent
1	ONTARIO	206	163	(43)	(20.9)
2	QUEBEC	88	84	(4)	(4.5)
3	CANADA	739	730	(9)	(1.2)
4	BRITISH COLUMBIA	63	66	3	4.8
5	MANITOBA	21	23	2	9.5
6	SASKATCHEWAN	68	75	7	10.3
7	ALBERTA	235	276	41	17.4

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

Ability to Reduce Emissions

The change in total emissions can shift dramatically where provinces have the ability to shift to less polluting or renewable power sources. The decline in Ontario's emissions primarily results from ending coal-fired electricity generation. New Brunswick (not shown) reported a steeper decline by switching from coal generation to purchasing

hydroelectricity from Quebec. Saskatchewan and Alberta are moving from coal-fired electricity generation to the use of less polluting natural gas.³

Provinces which already generate most of their electricity from hydro (BC, Manitoba, Ontario, and Quebec) or nuclear sources (Ontario) do not have as much opportunity for these “easy wins”⁴ available from converting to cleaner fuels and low GHG emitting electricity sources.

Ways to Measure Progress⁵

While many commentators prefer to measure the change in GHG emissions in absolute totals,⁶ those seeking context also focus on derivatives or ratios. For example, if emissions increased by 5% but the population grew by 15% the increase in emissions could be seen to have resulted in a net benefit with fewer emissions per person. Conversely, if a province recorded a significant decline in emissions as a result of a severe downturn in economic output and population loss, this result may not be desired by policymakers.

The most common comparisons are the change in emissions per capita and the change in emissions per the gross domestic product (GDP). These comparative measures provide context to assist in understanding the reasons for the change in the emissions. Comparing the ratios between the larger provinces also provides more context to the BC results.

Change in Emissions per Person

Changes in population are important in analyzing the change in GHG emissions over time. Table 2 shows that Ontario reported a 32% decline in the emissions per person during the period. This impressive result was due to population growth (up 16.4%) combined with the drop in emissions due to the end of coal-fired electricity.

³ Saskatchewan is also purchasing hydroelectricity from Manitoba see https://www.bcpolicyperspectives.com/media/attachments/view/doc/commentary_saskpower_16_december_2019/pdf/commentary_saskpower_16_december_2019.pdf

⁴ However, the price of the alternative power tends to be higher than coal or natural gas.

⁵ My source for the comparative provincial data is from Statistics Canada reports: Population from <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000901&cubeTimeFrame.startMonth=10&cubeTimeFrame.startYear=1999&cubeTimeFrame.endMonth=10&cubeTimeFrame.endYear=2019&referencePeriods=19991001%2C20191001> GDP from <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610022201&pickMembers%5B0%5D=1.10&pickMembers%5B1%5D=2.1&cubeTimeFrame.startYear=1999&cubeTimeFrame.endYear=2001&referencePeriods=19990101%2C20010101>

⁶ For example, <https://thenarwhal.ca/bc-ghg-emissions-2018-climate-targets/> for the 2020 report, or <https://www.pembina.org/pub/all-hands-on-deck>

BC recorded a 21.8% increase in population. When combined with the modest increase in emissions the ratio of emissions per person declined by 14%. This favourable result received little comment in the media.

Table 3—GHG EMISSIONS TONNES/POPULATION 2005 AND 2019

		2005	2019	Difference	Per Cent
1	ONTARIO	16.4	11.1	(5.3)	(32.3)
2	QUEBEC	11.6	9.8	(1.8)	(15.5)
3	CANADA	22.8	19.3	(3.5)	(15.4)
4	BRITISH COLUMBIA	15.0	12.9	(2.1)	(14.0)
5	ALBERTA	70.2	62.9	(7.3)	(10.4)
6	SASKATCHEWAN	68.5	63.8	(4.7)	(6.9)
7	MANITOBA	17.8	16.7	(1.1)	(6.2)

Carbon Intensity

The carbon intensity of the economy measures the change in the GHG emissions compared to the change in the gross domestic product (GDP). In 2005 the GDP/ tonne of CO₂ for BC was \$3,173; by 2019 the GDP/tonne of CO₂ increased to \$4,503. This was an improvement of almost 42% in carbon intensity during the 14-year period.

Table 4—DOLLARS of GDP/TONNE of GHG

		2005	2019	Difference	Per Cent
1	ONTARIO	2,835	4,474	1,639	57.8
2	BRITISH COLUMBIA	3,173	4,503	1,329	41.9
3	QUEBEC	3,625	5,024	1,399	38.6
4	CANADA	2,092	2,852	760	36.3
5	SASKATCHEWAN	712	932	220	30.9
6	MANITOBA	2,440	3,129	689	28.2
7	ALBERTA	948	1,031	83	8.8

Ontario's concentration of value-added manufacturing, combined with the ending of the coal-fired electricity generation, allowed it to show the best performance in reducing carbon intensity.⁷ BC placed a highly creditable second place, although more analysis is required to determine how much of the gain is due to more efficient consumption (such as heat pumps and lower emitting vehicles) compared to de-industrialization. The lower

⁷ The Ontario government now subsidizes electricity rates to keep the rates competitive with the cost of electricity in nearby American states, and to appease residential and small business customers who witnessed large increases in their electricity bills.

values of GDP/tonne of emissions for Saskatchewan and Alberta reflect the importance of fossil fuels to the economies of the two provinces.

Summary

The 14-year trend in BC's GHG emissions is highly creditable, especially considering that there were no relatively easy gains available through converting from coal-fired electricity generation. The 4.8% increase (3 million tonnes) in emissions occurred during a period of significant population increase and economic growth.

The BC government has an ambitious target to reduce the total GHG emissions to 40% of the 65.6 million tonnes (approximately 26,300 tonnes) by 2030. This absolute reduction is not qualified by population growth, or the change in economic activity.

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The writer is a retired senior BC government public servant whose paper describing the BC government's manipulation of the finances of BC Hydro from 2008 to 2014 was published by *BC Studies* in November 2016. *BC Studies* published his paper on the 40-year financial history of ICBC in 2013. He was an intervener in the BC Utilities Commission's recent reviews of ICBC's and B.C. Hydro's rate requests.

