Yukon

Greenhouse gas emission methodology

December 2025

Methodology for determining greenhouse gas emissions

This report is intended to meet the requirement in the *Clean Energy Act* on the Government of Yukon to report on methodology used to determine the greenhouse gas emissions for the territory, and a description of any change from the previous methodology used for the previous report.

Greenhouse gases

Greenhouse gas (GHG) emissions absorb and trap heat in the Earth's atmosphere. Their concentration in the atmosphere has increased significantly over the past several decades and raised the planet's average temperature. Carbon dioxide (CO_2) accounts for the majority of human-caused GHG emissions; however, several other GHGs more potent than CO_2 are also released by human activity.

The Government of Yukon aligns its inventory with guidance and methodologies established by the United Nations Framework Convention on Climate Change and GHG emissions are reported in tonnes of **carbon dioxide equivalent (CO_2e)**. The conversion to a common unit requires factors called **global warming potentials (GWPs)**, listed in Table 1**.** For example, methane has a GWP of 28, which means that one tonne of methane has the same climate impact as 28 tonnes of carbon dioxide.

Table 1: Global warming potentials of greenhouse gases emitted in the Yukon, used to convert non-CO_2 greenhouse gases to units of carbon dioxide equivalent.

Greenhouse gas	Global warming potential[1]
Carbon Dioxide (CO_2)	1
Methane (CH_4)	28
Nitrous Oxide (N_20)	265
Hydrofluorocarbon (HFC)	4 – 12,400
Perfluorocarbon (PFC)	7,190 – 11,100
Sulfur Hexafluoride (SF_6)	23,500

[1] Intergovernmental Panel on Climate Change, Fifth Assessment Report.

Data sources

The Government of Yukon is committed to using the best available data for all sectors, and uses two main data sources to measure the Yukon's GHG emissions:

- The National Inventory Report, which is produced annually by the Government of Canada and reports the GHG emissions of all provinces and territories.
- The **Yukon's fuel tax databases**, which track the total volume of fuel purchased in the Yukon based on the amount of tax paid. The Yukon Bureau of Statistics uses the databases to calculate GHG emissions from different fuel types.

For more information on how emissions are calculated for each fuel type, see Table 3.

Methodological updates

The methods used to measure GHG emissions are constantly improving. If an improved methodology is adopted by the Government of Yukon, the new method is also used to recalculate and revise GHG emissions from previous years. The retroactive application of new methods, referred to as "backcasting", enables accurate year-to-year comparisons of GHG emissions and helps track progress. Updates to previous years can be found below.

Table 2. Revisions to the Yukon's historical greenhouse gas emissions in kilotonne carbon dioxide equivalent (kt CO_2e). Minor changes (<1 kt CO_2e) are highlighted in light yellow and larger (>1 kt CO_2e) changes are dark yellow. Some highlighted numbers appear the same due to rounding.

		Captured as part of the requirements under the *Clean Energy Act*							Reporting not required under the *Act*	
		Aviation	Heating	Electricity Generation	Non-Mining Off-Road Fuel	All Other	On-Road Diesel	On-Road Gasoline	Mining	**Total**
2009	Old	33.8	128	17.6	31.2	49	137.4	138.1	80.2	615.3
	New	33.8	128	17.6	30.9	49.3	137.4	138.2	80.2	615.3
2010	Old	43.4	118.6	19.7	33.7	52.3	174.1	143	80.8	665.6
	New	43.4	118.6	19.7	33.1	52.6	174.1	143	80.8	665.4
2011	Old	56.4	137.2	29.1	38.2	55	137.3	148.4	107	708.6

	New	56.4	137.2	29.1	37.2	55.2	137.3	148.5	107	707.9
2012	Old	44.5	136.8	19.2	48	55.7	131.1	131.8	115.7	682.7
	New	44.5	136.8	19.2	46.8	55.8	131.1	131.8	115.7	681.7
2013	Old	39	126.1	18.7	41.4	44.7	109.6	124.5	109.4	613.5
	New	39	126.1	18.7	40.3	44.7	109.6	124.5	109.4	612.3
2014	Old	42.8	123.5	18.1	31.7	47.3	100.7	131.7	93.3	589.1
	New	42.8	123.5	18.1	30.8	47.2	100.7	131.7	93.3	588.1
2015	Old	49.3	104	20.1	27.4	48.2	117.8	146.9	61.2	575
	New	49.3	104	20.1	26.4	48.1	117.8	146.9	61.2	573.8
2016	Old	44.7	108.2	20.3	33.9	49.7	109.1	157.1	67.6	590.7
	New	44.7	108.2	20.3	32.8	49.1	109.1	157.2	67.6	589.1
2017	Old	46.5	146.6	25.7	33.8	51.8	105	165.7	70.6	645.8
	New	46.5	146.6	25.5	32.6	51.5	105	165.5	70.6	643.9
2018	Old	50.3	135.7	36.7	44.2	55.1	99.6	187.3	83.8	692.7
	New	50.3	135.7	36.3	42.4	54.1	99.6	187	83.8	689.2
2019	Old	49.8	120.9	49.5	57.7	56.7	96.3	199.6	68.2	698.8
	New	49.7	120.9	49.4	55.8	56.3	96.3	199.4	68.2	696.1
2020	Old	17.4	134	54.7	39.5	57.7	82.1	182.8	105.5	673.8
	New	17.4	134	54.8	36.5	56.8	82.2	183.8	105.5	671
2021	Old	31	132.2	41.3	48.3	58.8	114.2	163.1	128.7	717.5
	New	31	132.2	40.9	44.4	58.2	114.3	164	128.8	713.8
2022	Old	47.2	137.9	41.5	49.2	57.1	111.7	173.5	117.3	735.4
	New	47.2	137.9	41.8	45.2	56.8	111.9	174.3	114.2	729.3
2023	New	51.2	126.6	37.2	46.7	58.6	112.2	190.9	109.6	732.9

Table 3: Fuel types included in the Yukon's GHG emissions inventory.

Fuel type	Description	Data source	Methodology
Aviation fuel	Aviation gas, jet fuel and any other aviation fuels sold within the Yukon.	Yukon Bureau of Statistics: Fuel tax databases	Emissions calculated based on the total amount of aviation fuel purchased in the Yukon.
Heating	Diesel and propane used to heat buildings.	Yukon Bureau of Statistics: Fuel tax databases	Emissions calculated based on the total amount of heating fuel purchased in the Yukon.
Electricity generation	Diesel and liquefied natural gas used to generate electricity.	Yukon Bureau of Statistics: Fuel tax databases Yukon Bureau of Statistics: Calculations based on Yukon Energy Corporation and ATCO Electric Yukon annual public reporting	Emissions calculated based on: A. the total volume of diesel and liquid natural gas combusted by the Yukon's public utilities; and B. the total amount of tax-exempt fuel purchased by private entities for electricity generation purposes under the Fuel Tax Exempt Program.
Mining	Diesel purchased for use at a mine site.	Yukon Bureau of Statistics: Fuel tax databases	Emissions calculated based on the total amount of tax-exempt fuel purchased for mining purposes under the Fuel Tax Exempt Program.
Off-road fuel	Diesel and gasoline not intended for use on official roadways. This includes fuel used for snowmobiles and all-terrain vehicles.	National Inventory Report	Emissions calculated based on the outputs of a simulation model that estimates off-road fuel consumption using factors like number and type of off-road

			vehicles, hours of annual run-time and average cargo weight.
On-road diesel	Diesel used in registered vehicles intended to be used on official roadways only.	National Inventory Report	Emissions calculated based on the outputs of a simulation model that estimates on-road fuel consumption using factors like number and type of registered vehicles, average annual kilometres driven per vehicle type and uptake of emission control technology.
On-road gasoline	Gasoline used in registered vehicles intended to be used on official roadways only.	National Inventory Report	
All other sources	Emission sources not included in the above categories. This mainly includes direct emissions from waste management and industrial processes and product use (IPPU).	National Inventory Report	Methane emitted from waste management sites is calculated based on a rate of decay model and the population serviced by each site. IPPU emission methodologies vary significantly based on the specific process/product. Ninety-one per cent of Yukon's IPPU emissions come from the use of hydrofluorocarbons (refrigerants), which are measured based on bulk import data.