

OVERVIEW OF 2021 REPORTED EMISSIONS



2023



Cat. No.: En81-6/1E-PDF
ISSN: 2371-1035
EC21276

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Aperçu des émissions déclarées de 2021—Déclaration des gaz à effet de serre par les installations

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HIGHLIGHTS

- 1733 facilities reported their greenhouse gas (GHG) emissions in 2021 to Environment and Climate Change Canada (ECCC), totalling 285 megatonnes (Mt)¹ of carbon dioxide equivalent (CO₂ eq.). Total emissions were 4% greater than the reported total in 2020 (275 Mt), due mainly to increased emissions in the Mining, Quarrying, and Oil and Gas Extraction and Manufacturing sectors (4 Mt and 3.6 Mt, respectively).
- Increased emissions in 2021 are largely a result of increased production levels for facilities after a 2020 year marked with production slow-downs and disruptions associated with the COVID-19 pandemic.
- Similar to previous years, the majority of reported emissions are distributed across three sectors: (i) Mining, Quarrying, and Oil and Gas Extraction (41%), (ii) Manufacturing (30%), and (iii) Utilities (21%)—amongst all facilities, those engaged in oil/gas extraction and electricity generation account for 58% of the total reported emissions in 2021.
- 58 facilities reported emissions of 1 Mt of CO₂ eq. or more in 2021, accounting for over half (54% or 154 Mt) of the total facility-reported emissions. 503 facilities reported emission levels in the 50 kilotonne (kt) to 1 Mt range (38%), while 1172 facilities emitted below 50 kt in 2021, accounting for the remaining 8% (23 Mt).
- Since 2005, total emissions from facilities in the Utilities and Manufacturing sectors declined by 62 Mt and 6 Mt respectively, while emissions reported by facilities in the Mining, Quarrying, and Oil and Gas Extraction sector increased by 70 Mt (mainly due to continued growth in the oil and gas sector and, to a lesser extent, an increased number of facilities reporting since 2017). These sectoral trends mirror those reported in Canada's Official GHG Inventory.
- The reported emissions reduction in Utilities (62 Mt) since 2005 were primarily from the Electricity sector in Ontario and Alberta, driven by switching to less GHG intensive fuels to generate electricity and increased use of renewable energy sources. The reported decrease from the Manufacturing sector (6 Mt) since 2005 were mostly attributed to the petroleum refining sector and manufacturers of aluminium, cement, and iron and steel.
- The GHG emissions data reported by facilities during the 2021 reporting cycle represent 43% of Canada's total GHG emissions (670 Mt in 2021) and 64 % of Canada's industrial GHG emissions, as reported in Canada's Official GHG Inventory.²
- The 2021 reporting cycle is the fifth year under the expanded federal GHG reporting program (GHGRP). Under the expansion to date, the reporting threshold was lowered from 50 kt to 10 kt CO₂ eq. (in 2017) and facilities in 14 industry sectors were required to provide additional data and use prescribed methods to determine emissions.³
- Starting in 2022, key program changes were introduced through the publication of a 2-year notice for the reporting of 2022 and 2023 emissions. Environment and Climate Change Canada continues to assess potential changes to reporting requirements and further expansion in future years.

1 1 Mt = 1 million tonnes or 1000 kilotonnes (kt).

2 In this overview report, Canada's industrial GHG emissions include those from the following GHG categories from the *National Inventory Report 1990–2021: Greenhouse Gas Sources and Sinks in Canada : Stationary Combustion Sources (except Residential), Other Transportation, Fugitive Sources, Industrial Processes and Product Use, and Waste*. The National Inventory Report is available on Canada's official greenhouse gas inventory website: canada.ca/ghg-inventory.

3 The reporting requirements were expanded progressively over the years 2017 and 2018. The 2021 GHGRP Gazette notice describes the complete reporting requirements for 2021 data. It can be accessed in the *Canada Gazette*: <https://www.gazette.gc.ca/rp-pr/p1/2021/2021-12-18/html/sup2-eng.html>.

GREENHOUSE GAS REPORTING PROGRAM

The Government of Canada established the Greenhouse Gas Reporting Program (GHGRP) in March 2004 under the authority of section 46 of the *Canadian Environmental Protection Act, 1999* (CEPA) to collect GHG emissions information annually from the largest emitting Canadian facilities. A notice is published annually in the *Canada Gazette* that describes the reporting requirements under the program, and any facility subject to the reporting criteria is required to report. To date, facility-reported GHG information has been collected and published through the GHGRP for the period of 2004 to 2021. This program is part of ongoing efforts to develop and maintain, in collaboration with Canadian provinces and territories, a harmonized and efficient GHG reporting system that minimizes duplication and reporting burden for industry and governments. Key objectives of the program are to provide Canadians with consistent information on GHG emissions, inform the development of the National Greenhouse Gas Inventory and support regulatory initiatives. Data collected are also shared with provinces and territories.

In December 2016, Environment and Climate Change Canada (ECCC) published a Notice of Intent to inform stakeholders of its intent to expand the GHGRP. It is pursuing this expansion in order to: enable the direct use of the reported data in Canada's Official GHG Inventory, increase the consistency and comparability of GHG data across jurisdictions, and obtain a more comprehensive picture of Canadian facility emissions. Starting with 2017 data, the reporting threshold was lowered from 50 kilotonnes (kt) to 10 kt of GHGs in carbon dioxide equivalent (CO₂ eq.) units. Facilities in targeted industry sectors were also required to use prescribed methods issued by ECCC to quantify their emissions and to report additional information on their calculations. These industry sectors were cement, lime, aluminium, iron and steel manufacturing, mining, ethanol production, electricity and heat generation, ammonia production, nitric acid production, hydrogen production, petroleum refineries, pulp and paper production, and base metal production. Since 2017, ECCC also began collecting information from facilities engaged in CO₂ capture, transport, injection and geological storage activities as part of the GHGRP expansion.

ECCC will continue to assess potential changes and further expand reporting requirements under the GHGRP, with the aim of facilitating the direct use of the facility data in the National GHG Inventory, thus better reflecting emission changes occurring at individual facilities. Further expansion will also continue to focus on improving the granularity, consistency and comparability of GHG data across Canada.

ECCC has completed the collection and review of GHG emissions information for the 2021 calendar year. Any facility with annual GHG emissions of 10 kt CO₂ eq. or higher in 2021 was required to report to the program. The *Notice with respect to reporting of greenhouse gases (GHGs) for 2021*, published in the *Canada Gazette* on December 18, 2021,⁴ reflects the federal reporting requirements for 2021 data, submitted by facilities to ECCC in 2022. The data used in this overview report are current as of November 17, 2022. Subsequent company updates or new reports received will be included in future data releases.

The *Notice with respect to reporting of greenhouse gases (GHGs) for 2022 and 2023*⁵ was published in the *Canada Gazette* on January 28, 2023. This notice covers two years of reporting, setting out the federal reporting requirements for 2022 and 2023 data, scheduled to be submitted by facilities to ECCC by June 1, 2023, and June 3, 2024, respectively. This combined notice continues the expanded requirements for the sectors and activities identified above while also introducing several changes that were consulted on in summer 2022 (see ECCC's response to stakeholder feedback⁶). Further expansion of the program will be assessed in future reporting cycles.

4 The *Notice with respect to reporting of greenhouse gases (GHGs) for 2021* can be accessed in the *Canada Gazette*: <https://canadagazette.gc.ca/rp-pr/p1/2021/2021-12-18/html/sup2-eng.html>.

5 The *Notice with respect to reporting of greenhouse gases (GHGs) for 2022 and 2023* can be accessed in the *Canada Gazette*: <https://canadagazette.gc.ca/rp-pr/p1/2023/2023-01-28/html/sup1-eng.html>.

6 <https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/facility-reporting/consultations/response.html>

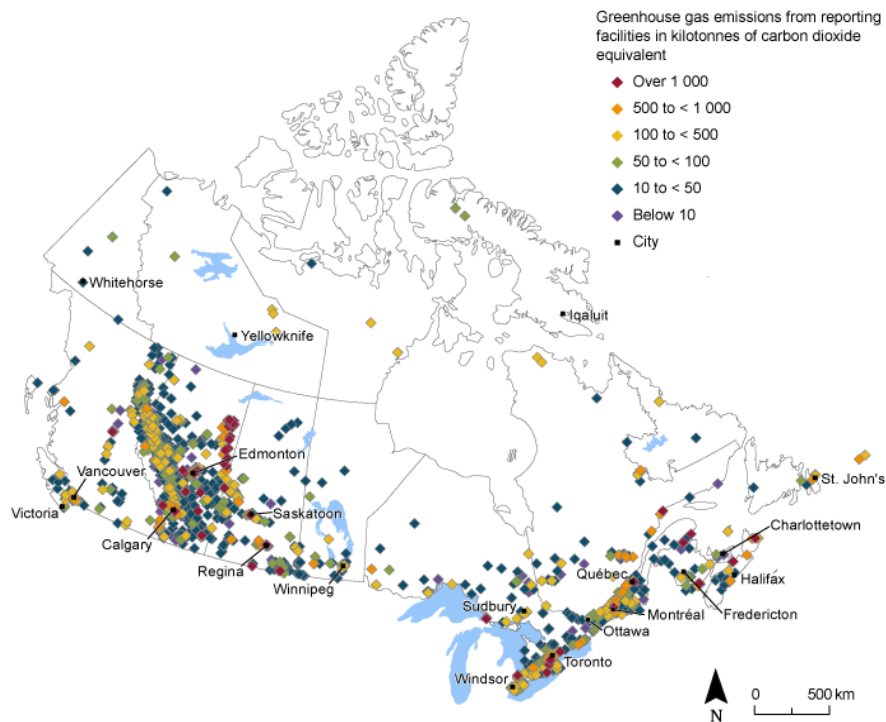
REPORTED 2021 GREENHOUSE GAS EMISSIONS

For the purposes of the GHGRP, a facility⁷ is defined as an integrated facility, pipeline transportation system, or offshore installation. An integrated facility is defined as all buildings, equipment, structures, on-site transportation machinery, and stationary items that are located on a single site, on multiple sites or between multiple sites that are owned or operated by the same person or persons and that function as a single integrated site, excluding public roads.

A total of 1733 facilities reported their GHG emissions to Environment and Climate Change Canada for the 2021 calendar year, collectively emitting a total of 285 Mt of GHGs⁸ (Figure 1). Of these facilities, 561 reported GHG emission levels greater than 50 kt, accounting for 92% (262 Mt) of the total reported emissions, and, out of the 1733 facilities, 58 emitted more than 1 Mt, accounting for over half (54% or 154 Mt) of the overall total emissions (Figure 2a). Those with emissions over 1 Mt fall within several industrial sectors that include oil sands extraction (45%), electric power generation (25%), petroleum refineries (9%), and primary metal manufacturing (8%) such as iron, steel, and aluminium (Figure 2b).

Among all reported facilities, 1020 reported GHG emission levels in the 10 to 50 kt range, accounting for 8% (23 Mt) of the total reported emissions. These facilities belong to a number of sectors, such as oil and gas extraction (484 facilities), waste treatment and disposal (72 facilities), and food manufacturing (59 facilities).

Figure 1 **Map of Facilities Reporting 2021 Greenhouse Gas (GHG) Emissions to Environment and Climate Change Canada**



Notes:

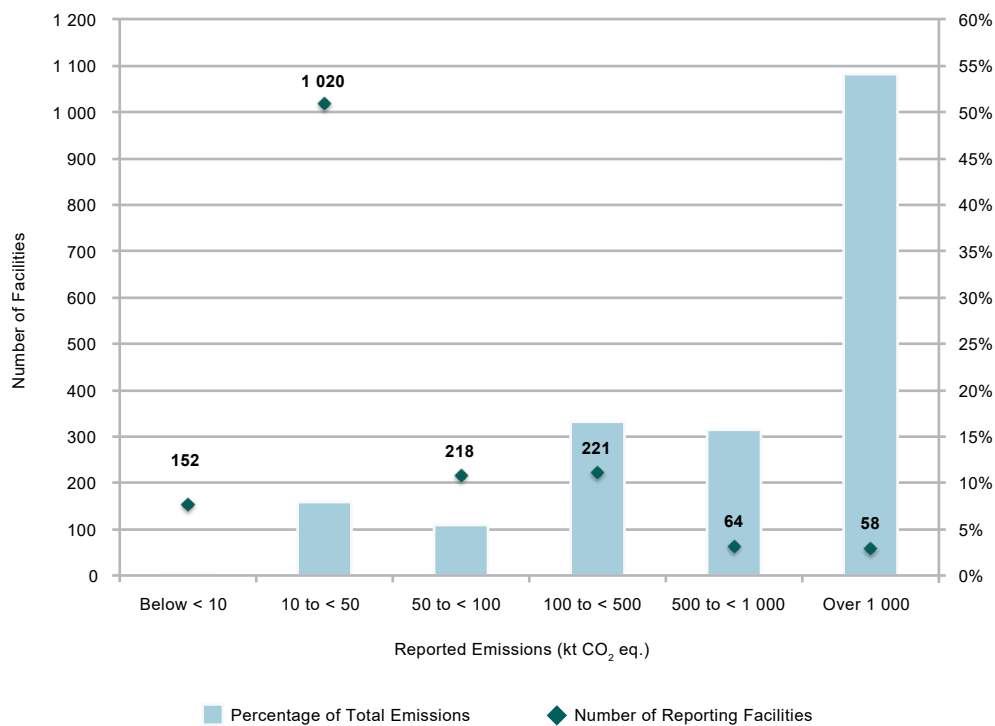
- Map excludes pipeline transportation systems.
- Map provided by the Canadian Environmental Sustainability Indicators program.

⁷ The term “facility” was updated in the 2017 notice as part of the GHGRP expansion to provide clarification that equipment used for on-site transportation is included and to reflect new requirements for reporting on carbon capture, transport and storage.

⁸ Unless explicitly stated otherwise, all emissions data presented in this report are expressed in CO₂ eq. units.

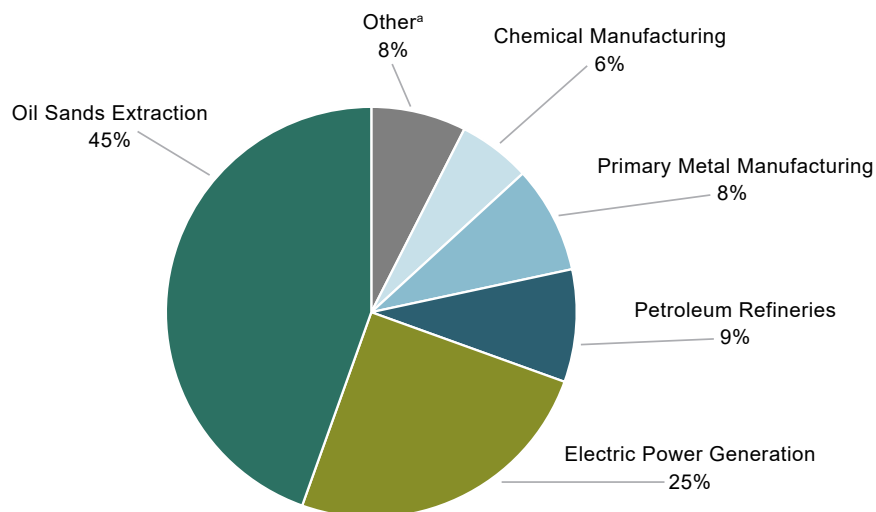
Facilities with emissions falling below the reporting threshold of 10 kt per year can voluntarily report their GHG emissions; 152 facilities did so for the 2021 calendar year, representing 0.2% (0.70 Mt). All voluntarily reported emissions are included in this report and in the data set published by Environment and Climate Change Canada.

Figure 2a **Contribution of Facilities in Various Emission Ranges to Total Reported Emissions (2021)**



Notes:
 Facilities in the 0-10 kt range voluntarily reported their emissions.
 Totals may not add up due to rounding.

Figure 2b **Breakdown of 2021 Emissions from Facilities with Reported Emissions over 1000 kt CO₂ eq. by Sector**



Note:
 a. "Other" includes various types of facilities such as natural gas transportation pipelines and cement manufacturers.

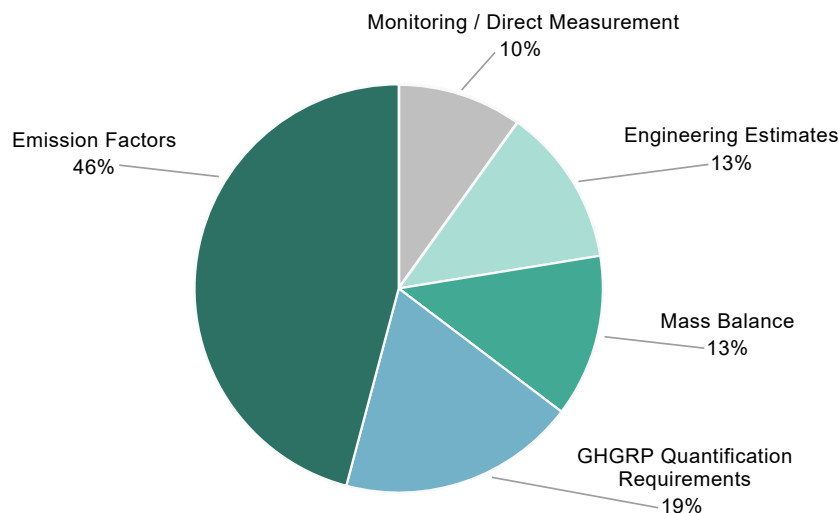
2.1. Emission Calculation Methods

Facilities reporting to the GHGRP (except those subject to expanded requirements) may choose among a number of available methods to calculate their GHG emissions. The methods selected by these facilities must be consistent with the methodological guidelines developed by the Intergovernmental Panel on Climate Change (IPCC) and adopted by the United Nations Framework Convention on Climate Change (UNFCCC) for the preparation of national GHG inventories. Reporting facilities must indicate the types of methods used to determine the quantities of emissions reported. Such methods may include monitoring or direct measurement, mass balance, emission factors, and/or engineering estimates.

As specified in section 1, facilities in 14 industry sectors or engaged in activities covered under phases 1 and 2 of the GHGRP expansion are required to use specific quantification methods, described in Canada's Greenhouse Gas Quantification Requirements.⁹

Overall, methods incorporating the use of emission factors were the approach preferred by most facilities (Figure 3). An emission factor is a statistical measure of the rate at which a GHG is released into the atmosphere due to a given activity, such as burning a specific fuel type or producing a specific industrial product. The emission factors used may be general or technology-specific. Many facilities used more than one calculation method to determine their emissions.

Figure 3 **Types of Methods Used by Facilities to Determine GHG Emissions**



2.2. Greenhouse Gases and Global Warming Potentials

GHGs are not equal in their effect on the atmosphere. Each GHG has its own average atmospheric lifetime and heat-trapping potential. GHG emissions are often calculated and reported in terms of how much CO₂ would be required to produce a similar warming effect over a given time horizon. This is called the carbon dioxide equivalent (CO₂ eq.) value and is calculated by multiplying the amount of the gas by its associated metric such as the global warming potential (GWP) (Table 1). ECCC uses GWP values¹⁰ consistent with those used in Canada's Official GHG Inventory, a complete list of which can be found in the *Notice with respect to reporting of greenhouse gases (GHGs) for 2021*. Starting with the collection of 2022 emissions, the GHGRP has incorporated the use of updated GWP values, taken from the Fifth Assessment Report of the IPCC.

⁹ Canada's Greenhouse Gas Quantification Requirements: <https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/facility-reporting/reporting/quantification-requirements.html>.

¹⁰ United Nations Framework Convention on Climate Change (UNFCCC), 2014. FCCC/CP/2013/10/Add.3. Decision 24/CP.19. Revision of the UNFCCC Reporting on annual inventories for Parties included in Annex I to the Convention, November 2013.

Table 1 **Global Warming Potential Values for the Main Greenhouse Gases**

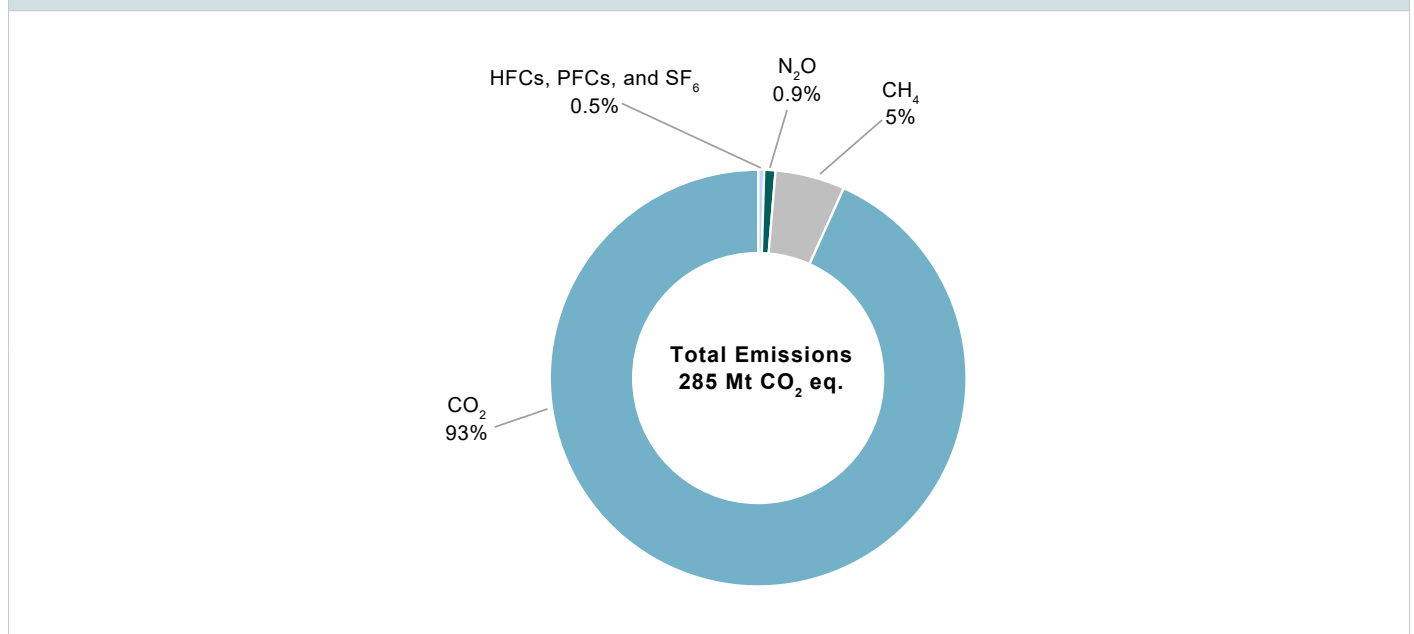
Greenhouse Gas	100-year GWPs ^a
Carbon dioxide (CO ₂)	1
Methane (CH ₄)	25
Nitrous oxide (N ₂ O)	298
Sulphur hexafluoride (SF ₆)	22 800
Hydrofluorocarbons (HFCs), 13 species	Ranges from 92 to 14 800
Perfluorocarbons (PFCs), 7 species	Ranges from 7 390 to 12 200

Note:
a. GWPs were updated in 2013 and applied to all years.

2.3. Reported GHG Emissions by Gas and by Source

CO₂ represented the majority (93%) of the total reported emissions in 2021, while methane (CH₄) and nitrous oxide (N₂O) emissions contributed 5% and 0.9%, respectively (Figure 4). Facilities are also required to report emissions of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆) stemming from industrial processes or industrial product use. The combined emissions of these gases accounted for the remaining 0.5% (1.3 Mt).

Figure 4 **Reported 2021 Greenhouse Gas Emissions by Gas**



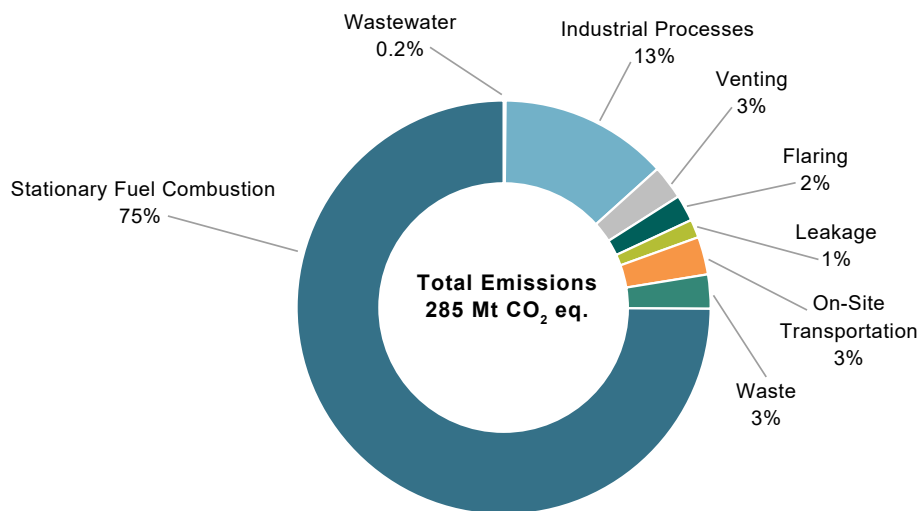
When reporting to the GHGRP, facilities are required to report GHG emissions under the following emission source categories:¹¹ stationary fuel combustion, industrial processes, fugitive sources including venting, flaring and leakage, on-site transportation, waste and wastewater.¹² Stationary fuel combustion is the largest source of reported emissions, representing 75% of the total (Figure 5) and CO₂ is the predominant gas released from this activity. This source includes emissions resulting from the burning of fuels for the purpose of producing energy (e.g., to generate electricity, heat or steam), but does not include emissions from combustion engines in vehicles or mobile equipment, which are grouped under on-site transportation. Any waste material burned or incinerated at a facility to produce energy is also included in stationary combustion. CO₂ emissions from the combustion of biomass materials must be reported to the GHGRP, but are not included in the facility-reported total. Industrial process emissions, the second-largest source of reported emissions

11 Additional information on these emission source categories can be found in the latest Technical Guidance on Reporting Greenhouse Gas Emissions: <https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/facility-reporting/reporting/technical-guidance-2021.html>.

12 Some source categories were modified and updated as part of the GHGRP expansion and are applicable to the data reported since 2017.

at 13%, refer to emissions stemming from specific industrial processes involving chemical or physical reactions other than combustion. Such reactions occur, for example, in the processes of mineral production (e.g., lime, cement), metal production (e.g., iron, steel, aluminium) and chemical production (e.g., nitric acid and ammonia production). Key sources of reported CH₄ emissions include waste emissions from the disposal and treatment of solid waste at landfills and fugitive emissions from fossil fuel production (coal, oil, and natural gas).

Figure 5 **Reported 2021 Greenhouse Gas Emissions by Emission Source**



Note: Totals may not add up due to rounding.

2.4. Reported GHG Emissions by Province/Territory

Facilities in the province of Alberta accounted for the largest share of reported emissions, with approximately 53% of the total, followed by facilities in Ontario (16%), Saskatchewan (10%) and Quebec (8%) (Table 2). The number of facilities, the quantity and type of fuel consumed, and the predominant industry largely explain this regional distribution. For example, over half of the reported emissions from Alberta are from the oil and gas extraction sector, while in provinces like Ontario and Quebec, reported emissions from the manufacturing sector dominate the facility-level emissions collected under the program. More information on the regional distribution of reported emission across different industry sectors is provided in section 3.2.

Table 2 **Reported 2021 Greenhouse Gas Emissions by Province/Territory**

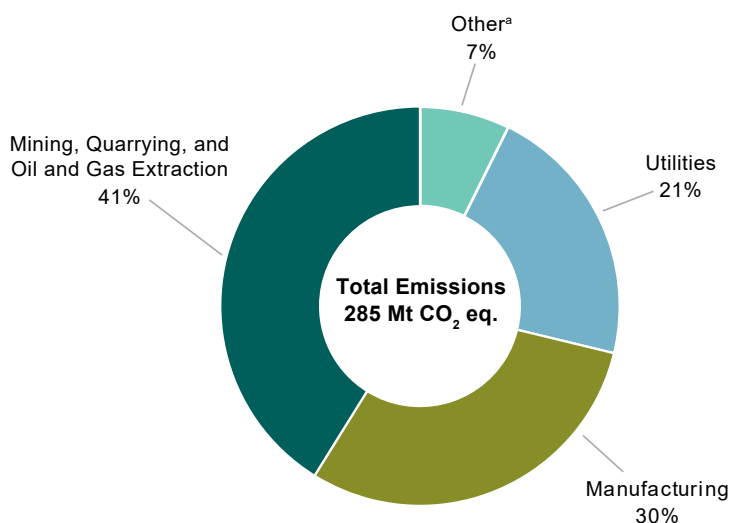
Province/Territory	Number of Facilities	Total Emissions (kt CO ₂ eq.)	Percentage of Total Emissions
Newfoundland and Labrador	14	3 402	1%
Prince Edward Island	3	91	0.03%
Nova Scotia	19	6 720	2%
New Brunswick	26	6 591	2%
Quebec	187	22 587	8%
Ontario	382	46 093	16%
Manitoba	43	2 610	1%
Saskatchewan	138	28 609	10%
Alberta	708	150 970	53%
British Columbia	200	16 604	6%
Nunavut	5	586	0.2%
Northwest Territories	5	560	0.2%
Yukon	3	50	0.02%
Total	1 733	285 472	100%

2.5. Reported GHG Emissions by Sector

When completing a report for the GHGRP, a reporter is required to identify the main activities occurring at its facility using the North American Industry Classification System (NAICS).¹³ In 2021, three NAICS defined industry sectors accounted for the majority of GHG emissions: the Mining, Quarrying, and Oil and Gas Extraction sector (NAICS 21), representing 41% (117 Mt) of total reported emissions; the Manufacturing sector (NAICS 31-33), accounting for 30% (86 Mt); and the Utilities sector (NAICS 22), primarily facilities generating electricity from fossil fuels, accounting for 21% (61 Mt) (Figure 6).

The remaining 7% (21 Mt) of emissions captured under “Other” were reported by various types of facilities, mainly natural gas transportation pipelines (10 Mt) and waste management facilities (8 Mt).

Figure 6 **Reported 2021 Greenhouse Gas Emissions by Industry Sector**



Note:

a. “Other” is not a NAICS sector but a grouping of various NAICS codes reported by the following types of facilities: natural gas transportation pipelines, solid waste landfills, airports, universities, hospitals, and public administration buildings.

Activities of reporting facilities in the Mining, Quarrying, and Oil and Gas Extraction sector can be further broken down into three main categories: Oil sands extraction, Oil and gas extraction (except oil sands), and Mining.

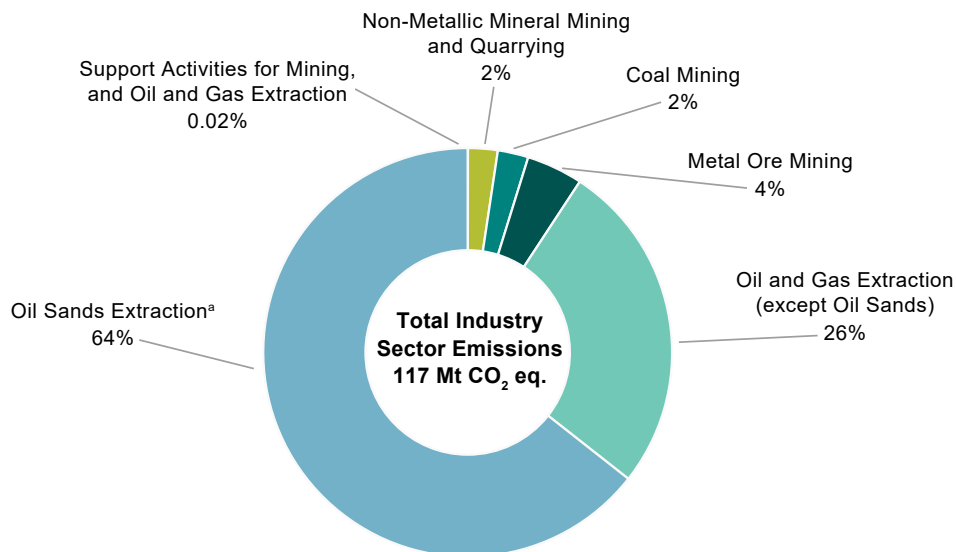
Oil sands extraction is the dominant sub-category of the Mining, Quarrying, and Oil and Gas Extraction sector with 64% of the sector’s reported emissions, and includes facilities involved in oil sands mining as well as in-situ bitumen production and heavy oil/bitumen upgrading (Figure 7).

Oil and gas extraction (except oil sands) is the second largest contributor with 26% of sectorial emissions in 2021. In 2016, this subsector accounted for 17% of all reported emissions from the Mining, Quarrying, and Oil and Gas Extraction sector. However, as more natural gas processing plants, oil/gas battery operations and compressor stations were required to report to the GHGRP due to the threshold change in 2017, the number of reporting facilities in this subsector rose from 113 to 656 between 2016 and 2021. This increased number of newly reporting facilities resulted in an increased coverage of annual emissions from facilities in this particular subsector.

As for the mining sector, metal ore mining (e.g., iron ore) contributed 4% to the total emissions of the Mining, Quarrying, and Oil and Gas Extraction sector in 2021, while the mining of coal and non-metallic minerals (e.g., potash and diamonds) contributed 2% each.

¹³ The NAICS is an industry classification system that was developed by the statistics agencies of Canada, the United States and Mexico to enable them to collect comparable statistical data. It is a comprehensive system that encompasses all economic activities using six-digit codes. In Canada, the NAICS 2017 version 3 consists of 20 sectors, 102 subsectors, 322 industry groups, 708 industries and 923 national industries. NAICS 2017 can be accessed on Statistics Canada’s website (<https://www.statcan.gc.ca/en/concepts/industry>).

Figure 7 **Reported 2021 Greenhouse Gas Emissions by Subsectors of Mining, Quarrying, and Oil and Gas Extraction**



Notes:

a. Includes facilities engaged in oils sands mining, in-situ bitumen production and upgrading.

The Manufacturing sector includes a wide range of industrial activities, with important contributors to the reported 2021 emissions being (Figure 8):

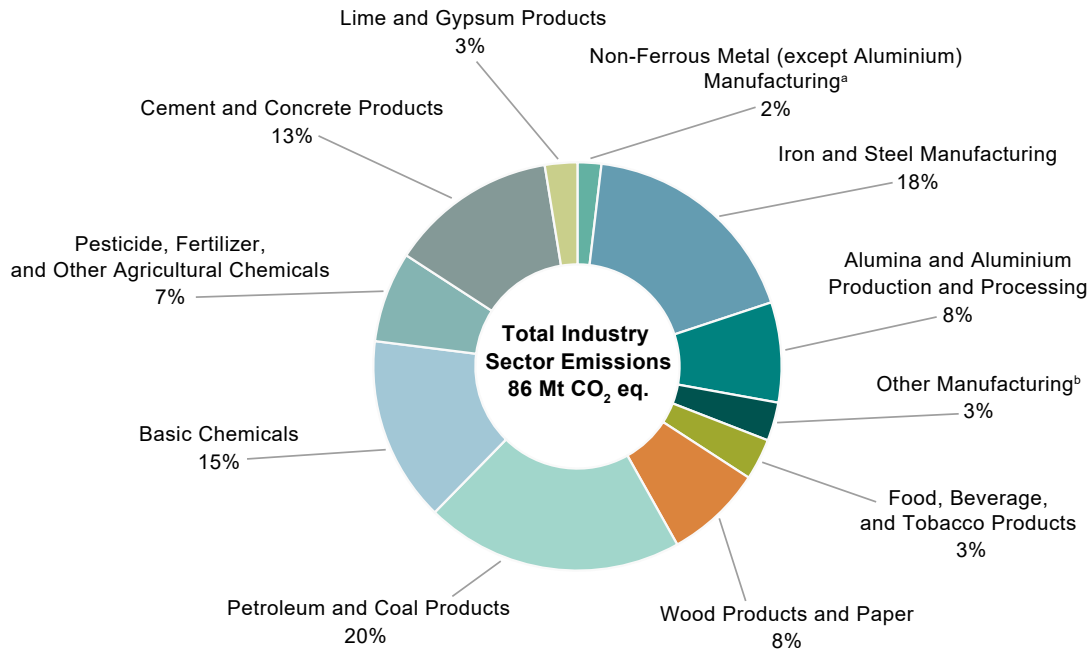
1. Petroleum and coal product manufacturing (20% of sector emissions)
2. Iron and steel manufacturing (18%)
3. Basic chemical manufacturing (e.g., ethylene, polyethylene, hydrogen gas) (15%)
4. Cement and concrete product manufacturing (13%)

Similar to the Mining, Quarrying, and Oil and Gas Extraction sector, a number of facilities within the Manufacturing sector that currently report their emissions began reporting as a result of the threshold change. For example, the number of reporting facilities in the Food, Beverage, and Tobacco Products manufacturing subsector grew from 14 in 2016 to 91 in 2021, and their respective contribution to the reported total for Manufacturing increased from 1% to 3%.

Reported emissions from facilities with activities outside of the Mining, Quarrying, and Oil and Gas Extraction, Manufacturing, and Utilities sectors, are grouped under the “Other” category. Natural gas transportation pipelines account for 48% of the reported emissions in this group, followed by facilities in the Waste Management and Remediation Services sector (mostly landfills), with 38% of reported emissions (Figure 9).

In the Waste Management and Remediation Services subsector, more facilities are now required to report to the GHGRP following the 2017-threshold change from 50 to 10 kt CO₂ eq. As a result, the number of reporting facilities in this subsector experienced a notable increase from 54 in 2016 to 131 in 2021. Though facilities in the Waste Management and Remediation Services subsector represented only a small portion (8%) of all reporting facilities for 2021, these facilities are an important source of reported methane emissions, accounting for 47% (or 7 Mt CO₂ eq.) of the total reported methane emissions (15 Mt CO₂ eq.) in 2021.

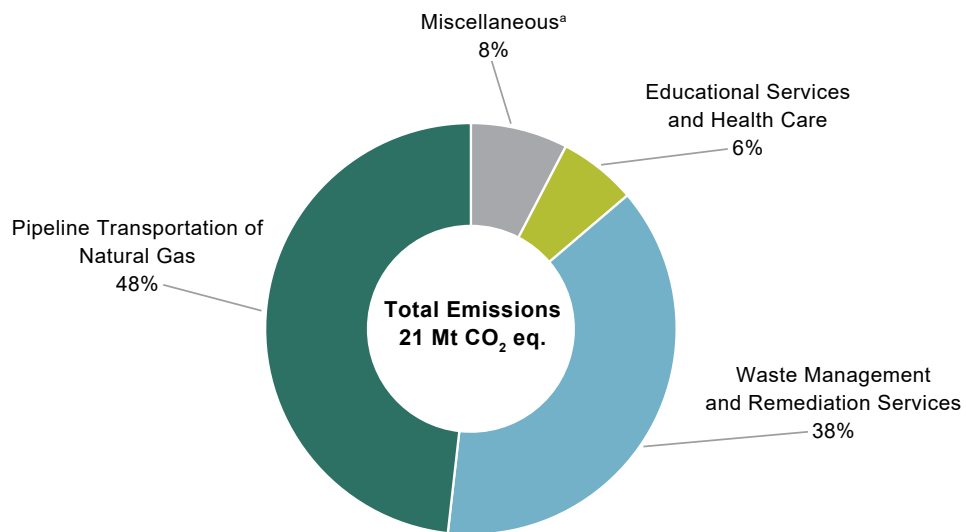
Figure 8 **Reported 2021 Greenhouse Gas Emissions by Subsectors of Manufacturing**



Notes:

- a. Non-Ferrous Metal (except Aluminium) Manufacturing includes the production of base metals (e.g., copper, nickel, zinc).
- b. "Other Manufacturing" represents other types of manufacturing, including electrical equipment, transportation equipment and furniture manufacturing.

Figure 9 **Reported 2021 Greenhouse Gas Emissions by Facility Types Grouped Under "Other" Category**



Note:

- a. "Miscellaneous" is a grouping of various NAICS codes reported by facilities such as greenhouses and public administration buildings.

TRENDS IN REPORTED GHG EMISSIONS

The number of facilities reporting GHG emissions to ECCC can change from year to year. The lowering of the mandatory reporting threshold from 50 kt to 10 kt resulted in an increase in the number of facilities reporting. Changes in production levels, processes and technologies, the types of fuels used at a facility, new facility operations starting up, facility closures and unplanned events can all result in a change in the annual emissions reported. A facility may fall below or attain the reporting threshold from one year to the next or the number of voluntary reporters may also change, affecting the number of reporting facilities. Over the 2005–2021 period, the number of reporting facilities increased from 337 to 1733 (Table 3).

3.1. National-Level Trends

The overall total reported GHG emissions for all facilities were 285 Mt in 2021, an increase of 10 Mt (4%) from 2020 reported emissions (Table 3).¹⁴

Over the 2005–2021 period, the number of reporting facilities increased from 337 to 1733, while overall emissions from facilities increased by 3% (7.5 Mt). The significant increase in the number of reporting facilities since 2005 is largely attributed to the lower thresholds introduced in 2009 (50 kt) and in 2017 (10 kt). Emission changes were also partly impacted, given more emissions were progressively reported to the program over this period.

For facilities emitting 50 kt of CO₂ eq. or more, total reported emissions were 262 Mt in 2021, compared to 251 Mt for 2020 (Table 3). Over the 2005–2021 period, the number of reporting facilities in this range increased from 323 to 561, largely due to the lower threshold introduced in 2009. By contrast, the combined emissions from facilities in this range have decreased by 6% (15 Mt) since 2005 (Table 3).

For facilities emitting between 10 and 50 kt of CO₂ eq., total reported emissions were 23 Mt in 2021. Reported emissions from these facilities have remained constant since 2017 (23 Mt) when the 10-kt reporting threshold was implemented.

In 2005, facilities in the Manufacturing sector represented the largest portion of reporting facilities with 162 facilities (50%), followed by the Utilities sector, with 75 facilities (22%), and the Mining, Quarrying, and Oil and Gas Extraction sector, with 72 facilities (21%). However, with each threshold change, first in 2009 and then in 2017, the number of reporting facilities in the Mining, Quarrying, and Oil and Gas Extraction sector grew, and in 2017, this sector overtook the Manufacturing sector to become the industry sector with the highest number of reporting facilities. For 2021, 798 facilities in the Mining, Quarrying, and Oil and Gas Extraction sector reported their emissions, which represents 46% of all reporting facilities (Figure 10). The large number of reporting facilities in the Mining, Quarrying, and Oil and Gas Extraction sector is a reflection of the nature of this industry, particularly the oil and gas extraction (except oil sands) industry, which is made up of many small operations, such as natural gas processing plants, oil/gas battery operations, and compressor stations.

Table 3 Facility-Reported GHG Emissions, Selected Years

	2005	2009 ^a	2010	2011	2012	2013	2014	2015	2016	2017 ^a	2018	2019	2020	2021
Total Facility Reported Emissions														
Number of Facilities	337	537	544	548	560	579	586	574	614	1700	1761	1764	1738	1733
GHG Emissions (kt CO ₂ eq.)	277 997	253 113	263 649	256 150	259 404	261 074	264 138	264 493	264 374	293 996	294 631	294 733	274 761	285 472
Facilities with emissions greater than 50 kt CO₂ eq.														
Number of Facilities	323	464	479	476	487	498	502	491	506	528	546	558	539	561
GHG Emissions (kt CO ₂ eq.)	277 761	252 150	262 308	254 699	258 153	259 244	262 263	262 648	262 328	270 176	270 364	270 770	250 742	262 240
Annual Change	N/A	-4.2%	4.0%	-2.9%	1.4%	0.4%	1.2%	0.1%	-0.1%	3.0%	0.1%	0.2%	-7.4%	4.6%
Change since 2005	N/A	-9.2%	-5.6%	-8.3%	-7.1%	-6.7%	-5.6%	-5.4%	-5.6%	-2.7%	-2.7%	-2.5%	-9.7%	-5.6%

Notes:

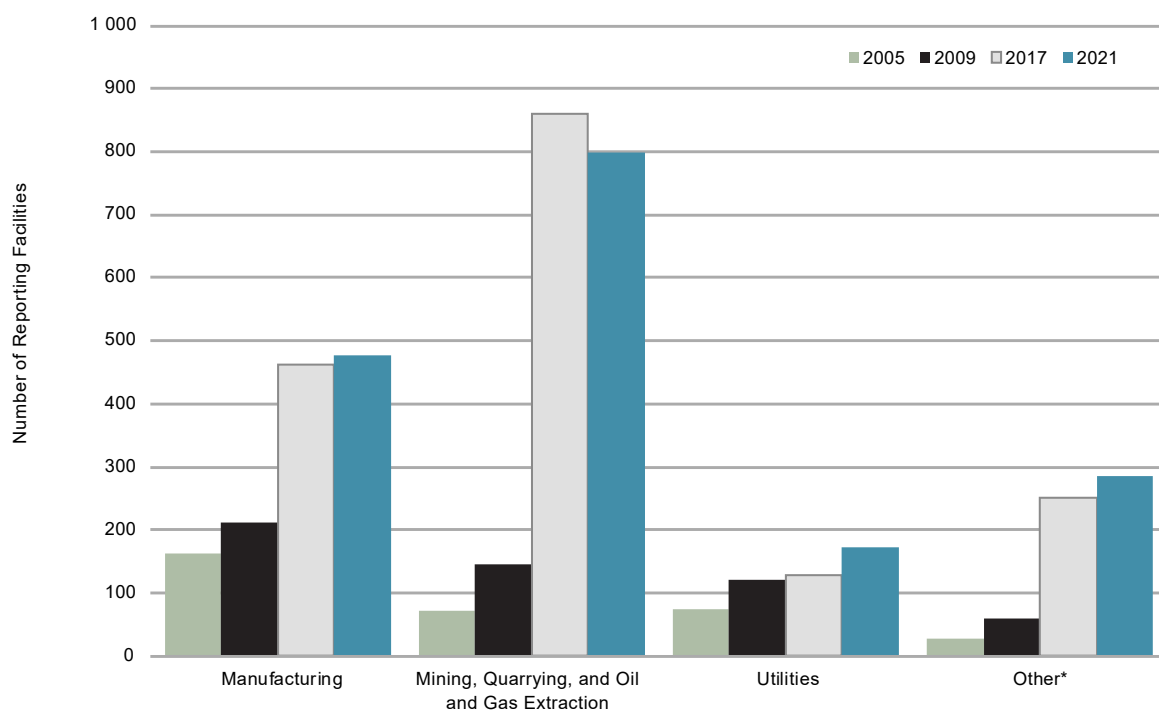
N/A = Not available

The complete data set (i.e. yearly data since 2004), is available on ECCC Website: Facility-reported greenhouse gas data (<https://www.canada.ca/ghg-reporting>).

a. The reporting threshold changed in 2009 from 100 kt to 50 kt and, from 50 kt to 10 kt in 2017.

¹⁴ A number of facilities submitted new reports or updates to GHG reports for previous years. Environment and Climate Change Canada includes these updates in its annual data release, resulting in some revisions to previously published data.

Figure 10 Number of Reporting Facilities by Sector in Selected Years between 2005 and 2021



Note:

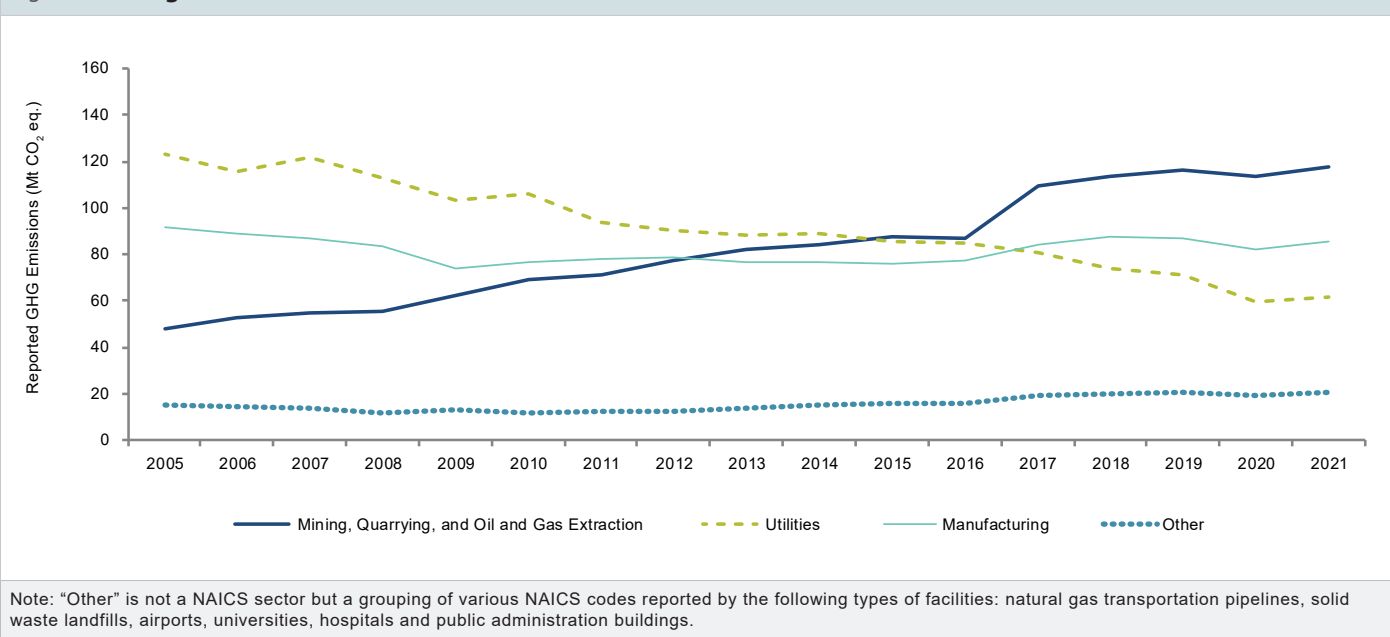
* "Other" is not a NAICS sector but a grouping of various NAICS codes reported by the following types of facilities: natural gas transportation pipelines, solid waste landfills, airports, universities, hospitals and public administration buildings.

3.2. Industry Sector and Provincial/Territorial Trends

The summary of facility-reported emissions by NAICS industry sector provides a picture of the types of facilities (mostly industrial operations) that report to the GHGRP in response to the annual GHG reporting requirements (Figure 11 and Table 4). The provincial breakdown of each main industry sector highlights the regional presence of key industries accounting for the reported emissions (e.g., large component of emissions from the Manufacturing sector in Ontario, Quebec and Alberta) (Table 5). Facilities that emitted 10 kt or more were included in the analysis presented in this section. Therefore, observed emission changes from 2005 through 2021 reflect the impact of changing the reporting threshold on the number of reporting facilities in some industry sectors (notably in Mining, Quarrying, Oil and Gas Extraction).

Overall, GHG emissions reported by the Utilities sector have steadily decreased over the last decade. On the other hand, the Mining, Quarrying, Oil and Gas Extraction sector has experienced a sustained increase in emissions since 2005, surpassing those reported by Utilities in 2015 (Figure 11). This can be attributed in part to new facilities with emissions in the 10 to 50 kt range reporting since 2017 in this sector. Trends observed from facility-reported sector emissions are similar to trends observed in the National GHG Inventory. Various factors have led to these trends and are further discussed in this section.

Figure 11 Long-Term Sectoral Trends, 2005–2021



3.2.1. Short-Term Changes

Short-term changes focus on changes in reported emissions from facilities in the main industry sectors over the past five years (from 2017 to 2021).

IMPACT OF THE COVID-19 PANDEMIC ON 2020 AND 2021 EMISSION LEVELS

Following a 2020 year marked with lower reported emissions and disruptions on facility operations in the context of the COVID-19 pandemic, the year 2021 saw an overall increase in reported emissions of 10 Mt. Reported emissions for 2021 increased as a result of increased production in the oil sands extraction and manufacturing sectors amid ongoing economic recovery from the pandemic. In contrast, reported emissions from the electric power generation sector for 2021 remain similar to 2020 levels and below pre-pandemic levels, suggesting that factors such as fuel switching and reduced coal consumption contributed to the significant drop in reported emissions observed in 2020 for this sector to a greater extent than the COVID-19 pandemic, particularly in Alberta and Saskatchewan.

Since 2017, total reported emissions have decreased by 3% (9 Mt). This can largely be attributed to the steady year-over-year decreases in reported emissions from facilities in the Utilities sector, where overall emissions have declined by 24% (20 Mt) between 2017 and 2021 (Figure 12).

Table 4 Reported Greenhouse Gas Emissions by North American Industry Classification System (NAICS) Industry Sector, Selected Years

NAICS ^a Industry Sector	2005	2009 ^b	2010	2011	2012	2013	2014	2015	2016	2017 ^b	2018	2019	2020	2021
	Mt CO ₂ eq.													
Total	278	253	264	256	259	261	264	264	264	294	295	295	275	285
21 – Mining, Quarrying, and Oil and Gas Extraction (total)	48	62	69	72	77	82	84	87	87	109	114	116	113	117
Oil and gas extraction (except oil sands)	14	15	15	15	14	15	15	15	15	30	31	31	31	31
Oil sands extraction ^c	28	42	47	49	55	59	61	65	64	69	72	74	72	76
Coal mining	2	2	3	3	3	3	3	2	2	3	3	3	3	3
Metal ore mining	3	3	3	3	4	4	3	4	4	5	5	5	5	5
Non-metallic mineral mining and quarrying	0.8	1	1	2	2	2	2	2	2	2	3	3	3	3
Support activities for mining, and oil and gas extraction	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.06	0.05	0.07	0.08	0.02	0.03
22 – Utilities (total)	123	103	106	94	90	89	89	86	85	81	74	71	60	61
Electric power generation	122	101	103	92	88	86	87	84	83	79	72	69	58	59
Natural gas distribution	1	2	2	2	2	2	2	1	1	1	1	1	1	1
Water, sewage and other systems ^d	0.1	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.9	0.8	0.8	0.8
31-33 Manufacturing (total)	92	74	77	78	79	76	76	76	77	84	87	87	82	86
Food, beverages, and tobacco products	0.3	0.7	0.8	0.7	0.7	1	1	1	1	3	3	3	3	3
Wood products and paper	5	4	4	4	5	5	5	5	5	6	6	7	6	7
Petroleum and coal products	20	19	18	17	17	17	17	17	17	18	17	18	17	18
Basic chemicals	13	11	10	11	11	11	11	11	11	12	13	13	13	13
Pesticide, fertilizer, other agricultural chemicals	6	5	6	6	6	6	6	6	6	6	6	6	6	6
Cement and concrete products	13	9	10	10	11	10	10	11	10	11	11	11	11	11
Lime and gypsum products	3	2	2	2	2	2	2	2	2	2	2	2	2	2
Iron and steel manufacturing ^e	17	11	14	14	15	13	14	13	14	14	16	16	14	15
Alumina and aluminum production and processing	10	8	8	8	8	8	7	7	7	7	6	6	7	7
Non-ferrous metal (except alum.) manufacturing ^f	3	2	2	2	2	2	2	2	2	2	2	2	2	2
Other manufacturing ^g	0.7	1	2	2	2	2	2	2	2	3	3	3	3	3
Other^h (total)	15	13	12	12	13	14	15	15	16	19	20	20	19	21
Pipeline transportation of natural gas	12	7	6	7	6	8	9	9	9	9	10	10	9	10
Waste management and remediation services	3	5	5	5	5	5	6	6	6	8	7	8	8	8
Educational services and health care	N/A	0.4	0.5	0.5	0.7	0.6	0.6	0.7	0.6	1	1	1	1	1
Miscellaneous	N/A	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	1	1	1	1	2

Notes:

N/A = not available

Totals may not add up due to rounding.

a. Facilities required to report to the GHGRP provide a primary NAICS code that describes the main activities occurring at the facility.

b. The reporting threshold changed in 2009 from 100 kt to 50 kt and in 2017 from 50 kt to 10 kt.

c. Includes facilities engaged in oils sands mining, in-situ bitumen production and upgrading.

d. Includes sewage treatment facilities, heating and steam generation plants.

e. Not a NAICS sector but a grouping of various NAICS codes reported by facilities engaged in types of manufacturing such as Iron and steel mills and ferro-alloy manufacturing, Steel product manufacturing from purchased steel (NAICS 3312), and Ferrous metal foundries.

f. Not a NAICS sector but a grouping of various NAICS codes reported by facilities engaged in types of manufacturing such as Non-ferrous metal (except aluminium) production and processing and Non-ferrous metal foundries.

g. Not a NAICS sector but a grouping of various NAICS codes reported by facilities engaged in other types of manufacturing such as Electrical equipment, Transportation equipment, Furniture manufacturing, and others.

h. Not a NAICS sector but a grouping of various NAICS codes reported by the following types of facilities: natural gas transportation pipelines, solid waste landfills, airports, universities, hospitals and public administration buildings.

Table 5 Reported Greenhouse Gas Emissions by Industry Sector and by Province/ Territory, Selected Years

Industry Sector	2005	2009 ^a	2010	2011	2012	2013	2014	2015	2016	2017 ^a	2018	2019	2020	2021
Province/Territory	Mt CO ₂ eq.													
Total	278	253	264	256	259	261	264	264	264	294	295	295	275	285
21 – Mining, Quarrying, and Oil and Gas Extraction (total)	48	62	69	72	77	82	84	87	87	109	114	116	113	117
Alberta	35	50	54	56	62	65	67	71	70	86	90	92	90	94
British Columbia	5	5	6	6	7	7	7	6	6	8	8	8	8	8
Manitoba	N/A	0.06	0.05	0.1	0.2	0.2	0.1	0.1	0.1	0.3	0.3	0.4	0.3	0.3
New Brunswick	N/A	N/A	0.06	0.06	0.06	0.02	N/A	0.06	N/A	0.01	0.01	0.01	0.004	0.007
Newfoundland and Labrador	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Northwest Territories	0.4	0.5	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5
Nova Scotia	N/A	0.3	0.3	0.2	0.2	0.4	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.2
Nunavut	N/A	N/A	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.6
Ontario	0.2	0.2	0.2	0.1	0.1	0.3	0.3	0.3	0.4	1	1	1	1	1
Quebec	2	1	2	2	2	2	2	2	2	2	2	2	2	2
Saskatchewan	3	3	3	3	4	4	4	5	5	8	8	8	8	8
Yukon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.02	0.02	0.004	0.01	0.01
22 – Utilities (total)	123	103	106	94	90	89	89	86	85	81	74	71	60	61
Alberta	50	48	48	46	44	44	49	47	47	46	38	36	30	28
British Columbia	2	2	2	0.9	0.9	1	1	0.8	0.9	0.8	0.9	1	0.9	1
Manitoba	0.6	0.2	0.06	0.08	0.07	0.09	0.07	0.1	N/A	0.06	0.03	0.06	0.05	0.06
New Brunswick	9	6	5	4	4	4	4	4	4	3	4	3	2	3
Newfoundland and Labrador	1	0.8	0.7	0.7	0.7	0.8	1	1	1	1	1	1	0.8	0.6
Northwest Territories	N/A	0.06	N/A	N/A	N/A	N/A	N/A	0.06	0	0.02	0.02	0.02	0.02	0.02
Nova Scotia	11	9	9	9	8	8	7	7	7	7	7	7	6	6
Nunavut	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.06	0.06	0.05	N/A
Ontario	36	20	25	18	18	15	10	10	9	6	6	6	6	7
Prince Edward Island	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.01	0.003	0.002	0.003
Quebec	0.5	1	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4
Saskatchewan	15	16	16	15	16	15	15	16	15	16	16	16	13	15
Yukon	N/A	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.04	0.04	0.04
31-33 Manufacturing (total)	92	74	77	78	79	76	76	76	77	84	87	87	82	86
Alberta	18	17	17	18	18	19	18	19	19	20	22	22	22	22
British Columbia	6	5	5	5	5	5	5	5	5	5	5	5	5	5
Manitoba	1	1	1	1	1	1	1	1	1	1	1	1	1	1
New Brunswick	4	4	4	4	4	4	3	4	4	4	3	4	4	4
Newfoundland and Labrador	1	1	1	0.9	1	0.9	1	1	1	1	1	2	0.4	0.2
Nova Scotia	1	1	1	1	1	0.9	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Ontario	38	26	27	28	29	27	28	27	28	30	33	32	29	32
Prince Edward Island	0.1	0.07	0.06	0.07	0.05	0.06	0.06	0.05	0.06	0.06	0.06	0.08	0.08	0.09
Quebec	20	17	18	17	17	17	17	17	16	19	18	18	18	19
Saskatchewan	2	2	3	2	3	3	3	3	3	3	3	3	3	3
Other^b (total)	15	13	12	12	13	14	15	15	16	19	20	20	19	21
Alberta	4	3	3	3	4	4	4	4	5	6	7	7	6	7
British Columbia	1	2	2	2	2	2	2	2	2	3	3	2	2	2
Manitoba	1	0.7	0.7	0.7	0.6	0.7	0.8	0.9	0.8	0.8	0.9	0.9	0.8	0.9
New Brunswick	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.01	0.03	0.04	0.1	0.5	0.4
Newfoundland and Labrador	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.05	0.06	0.06	0.05	0.07
Nova Scotia	N/A	0.06	0.04	0.04	N/A	N/A	N/A	N/A	0.006	0.08	0.09	0.1	0.2	0.2
Ontario	5	4	3	4	3	4	4	5	5	6	5	6	6	6
Quebec	0.3	0.9	1	0.8	1	1	2	1	1	2	2	2	2	2
Saskatchewan	3	2	2	2	2	2	2	2	2	2	2	2	2	2

Notes:

For the complete data set (i.e. yearly data since 2004), visit the ECCC Website: Facility-reported greenhouse gas data (<https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/facility-reporting/data.html>).

N/A = not available

Totals may not add up due to rounding.

a. The reporting threshold changed in 2009 from 100 kt to 50 kt and in 2017 from 50 kt to 10 kt.

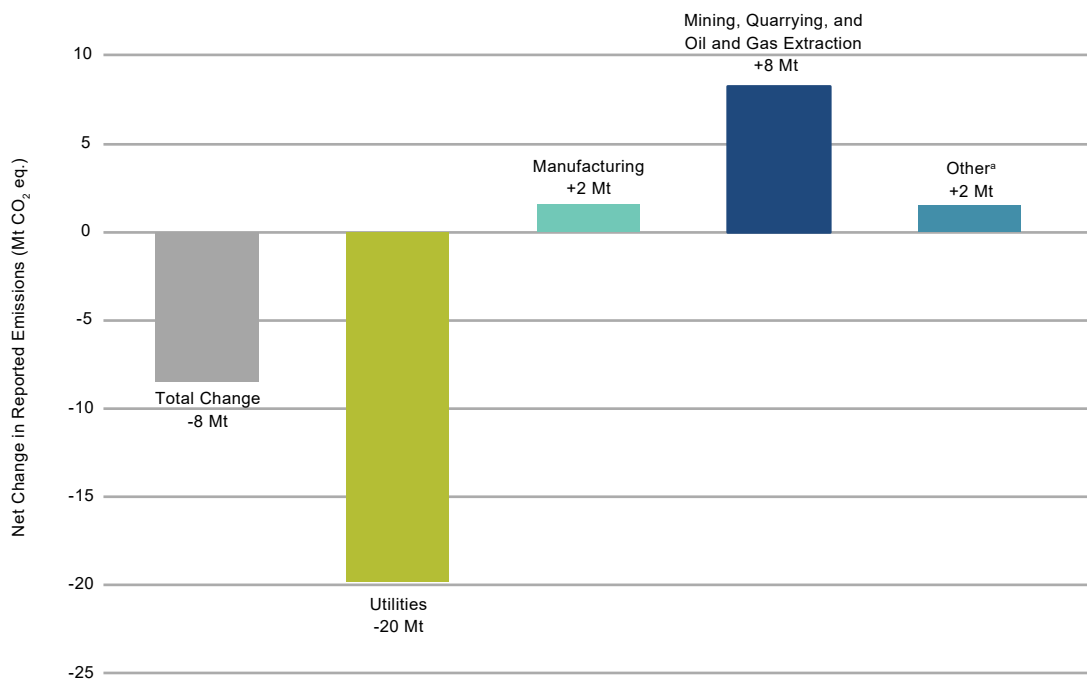
b. "Other" is not a NAICS sector but a grouping of various NAICS codes reported by the following types of facilities: natural gas transportation pipelines, solid waste landfills, airports, universities, hospitals and public administration buildings.

The observed decrease in the Utilities sector is due to emission reductions in one subsector in particular, the electric power generation subsector, which experienced a significant decrease in reported emissions of 20 Mt since 2017 (Table 4), with 93% of this decrease (18 Mt) occurring in Alberta. During the same period, the Utilities sector in Saskatchewan also experienced a decrease in emissions, with reported emissions declining by 5% (1 Mt) since 2017. Between 2019 and 2020, reported emissions from electric power plants in Saskatchewan experienced a sharp decrease of 3 Mt (24%), which was then partially offset by an increase of 2 Mt in the reported emissions from these electric power plants in 2021, with interannual fluctuations in coal consumption explaining the emission changes. Overall, the observed emission reductions in the Utilities sector since 2017 are the result of reduced fossil fuel usage, coal in particular,¹⁵ for electricity generation and increased reliance on renewable electricity sources in Alberta.¹⁶

Over the same period, emissions from the Manufacturing sector did not change significantly, showing an overall increase in emissions of 2% (2 Mt) since 2017 (Table 4). The majority of this increase since 2017 can be linked to an emission increase in the iron and steel manufacturing sector in Ontario (1.2 Mt), despite a small decrease between 2019 and 2020 (Table 4 and Table 5). The observed decrease of 2 Mt in 2020 for the iron and steel manufacturing sector is due, in part, to reduced production at one facility in Ontario as a result of a rehabilitation project, as well as temporary facility shutdowns in Quebec as a result of the COVID-19 pandemic.¹⁷

While the above sectors' emissions have declined or experienced small fluctuations up and down since 2017, reported emissions from the Mining, Quarrying, and Oil and Gas Extraction sector increased by 8% (8 Mt). Oil sands extraction contributed the most to this increase, with reported emissions from this sector increasing by 7 Mt between 2017 and 2021, especially in Alberta, consistent with observed increases in synthetic crude oil production (+11%) and in crude bitumen production (+15%) during this period.¹⁸ In 2021, reported emissions from the oil sands extraction reached 76 Mt, surpassing their pre-pandemic levels (74 Mt in 2019) (Table 4).

Figure 12 **Changes in Reported Emissions by Sector (2017–2021)**



Note:

a. "Other" is not a NAICS sector but a grouping of various NAICS codes reported by the following types of facilities: natural gas transportation pipelines, solid waste landfills, airports, universities, hospitals and public administration buildings.

¹⁵ Based on GHG emission data reported by facilities to the GHGRP.

¹⁶ Statistics Canada. Table 25-10-0019-01 Electricity from fuels, annual generation by electric utility thermal plants.

¹⁷ Based on GHG emission data reported by facilities to the GHGRP.

¹⁸ [AER] Alberta Energy Regulator. 2022. Alberta's Energy Reserves and Supply/Demand Outlook. [Updated May 2022]. Available at: <https://www.aer.ca/providing-information/data-and-reports/statistical-reports/st98>.

3.2.2. Long-Term Trends

The major long-term emission patterns illustrate two large off-setting trends of a 70 Mt increase in emissions in Mining, Quarrying and Oil and Gas Extraction since 2005, compensated by 62 Mt and 6 Mt emission decreases in Utilities and Manufacturing respectively (Table 4). Long-term trends were impacted to a certain extent by the addition of newly reporting facilities since 2017, particularly in the Mining, Quarrying, and Oil and Gas Extraction sector.

Up to and including the year 2014, the Utilities sector consistently accounted for the largest portion of reported emissions (Figure 11), with electric power generation being the main contributor. However, emissions from fossil-fuel electric power generation experienced a significant decline of 63 Mt throughout 2005 to 2021 (Table 4), largely from the discontinuation of coal-fired electricity production in Ontario, New Brunswick and Nova Scotia, and more recently, in Alberta (Table 5). Over the same period, the number of large-emitting facilities (1 Mt or above) in the fossil-fuel electric power generation subsector declined from 24 in 2005 to 15 in 2021. Other contributors to the decrease in utility emissions include fuel switching (e.g., from coal to natural gas or other lower carbon fuel) and increased reliance on hydro, nuclear and renewable sources of generation.^{19, 20}

Between 2005 and 2021, overall emissions from the Manufacturing sector remain below (7%, or 6 Mt) their 2005 levels (Figure 11), with Ontario and Quebec facilities in specific industry sectors contributing the most to this overall decrease. Ontario facilities saw a net decrease of 6 Mt (Table 5) compared to 2005, largely observed in iron/steel, cement, primary magnesium production, and chemical manufacturing (e.g., halted adipic acid production in 2009) (Table 4). Quebec facilities showed an overall 1.5-Mt decrease in emissions from 2005 to 2021 (Table 5), with aluminium production and petroleum refining facilities contributing the most to this change (Table 4). Emission decreases resulted from technological change in aluminium production,^{21, 22, 23} and the closure of a magnesium production facility and aluminium smelters in Quebec.

In contrast, Alberta facilities in the Manufacturing sector saw a 33% increase (5 Mt) in reported emissions since 2009, with 38% (2.1 Mt) of the observed increase in the basic chemicals sector, and 17% (1.0 Mt) in the petroleum and coal products sector, driven by the opening of a new refinery in Alberta in 2017. Between 2005 and 2021, overall emissions from the petroleum and coal products sector have decreased by 14% (3 Mt) as a result of refinery closures. Since 2005, four refineries have either closed or been converted to terminal facilities, in several provinces (Ontario (2005), Quebec (2010), Nova Scotia (2013), and Newfoundland and Labrador (2020)).

The Mining, Quarrying, and Oil and Gas extraction sector has shown an increasing trend over the last decade (Figure 11). Most of the increase (between 2005 and 2021) was driven by oil sands extraction facilities in Alberta (49 Mt growth since 2005), as existing facilities expanded operations and new facilities came online, and by thermal oil extraction in Saskatchewan, reflecting this sector's steady growth trend. In more recent years, the increase in reported emissions from the Mining, Quarrying, and Oil and Gas extraction sector is partly due to the increased number of facilities reporting their emissions to the program, mostly in the oil and gas extraction (except oil sands) subsector, as a result of the lowering of the reporting threshold.

19 Statistics Canada. Table 25-10-0019-01 Electricity from fuels, annual generation by electric utility thermal plants.

20 Statistics Canada. Table 25-10-0020-01 Electric power, annual generation by class of producer.

21 Based on GHG emission data reported by facilities to the GHGRP.

22 Environment Canada. 2008. Environmental Performance Agreement Concerning Atmospheric Emissions of Polycyclic Aromatic Hydrocarbons between EC and Alcoa.

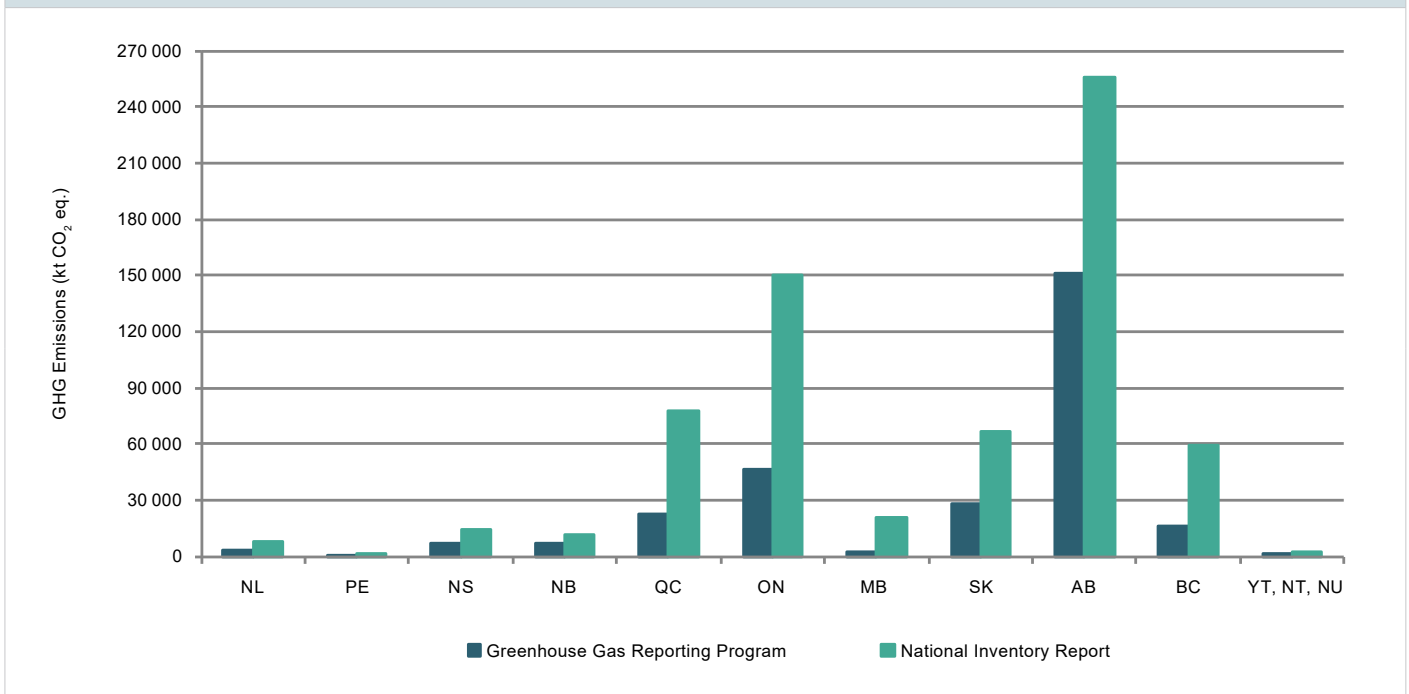
23 Environment Canada. 2008. Environmental Performance Agreement Concerning Atmospheric Emissions of Polycyclic Aromatic Hydrocarbons between EC and Rio Tinto Alcan.

FACILITY-REPORTED EMISSIONS AND THE NATIONAL GHG INVENTORY

The total facility-reported GHG emissions for 2021 collected under the GHGRP represent 43 % of Canada's total GHG emissions in 2021 (670 Mt) and 64% of Canada's industrial GHG emissions.²⁴ The GHGRP applies to large GHG-emitting facilities (mostly industrial) and does not cover diffuse sources of GHG emissions such as road transportation, residential housing (e.g. home heating) and agricultural sources, whereas the National GHG Inventory is a complete accounting of all GHG sources and sinks in Canada.

When comparing the provincial and territorial breakdown of the facility-reported emissions to the corresponding information in the National GHG Inventory, the distribution of emissions by province shows a similar pattern (Figure 13). Alberta has the highest emissions, followed by Ontario. Saskatchewan accounted for the third largest portion of total reported emissions in the GHGRP, while Quebec is the third major contributor to the total emissions of the National GHG Inventory. This pattern of industrial emissions captured by the GHGRP reflects the regional concentration of large industrial facilities and trends in the use of fossil fuels for energy production.

Figure 13 Provincial/Territorial Contribution to 2021 Facility-Reported Greenhouse Gas Reporting Program Total and the National Inventory Total

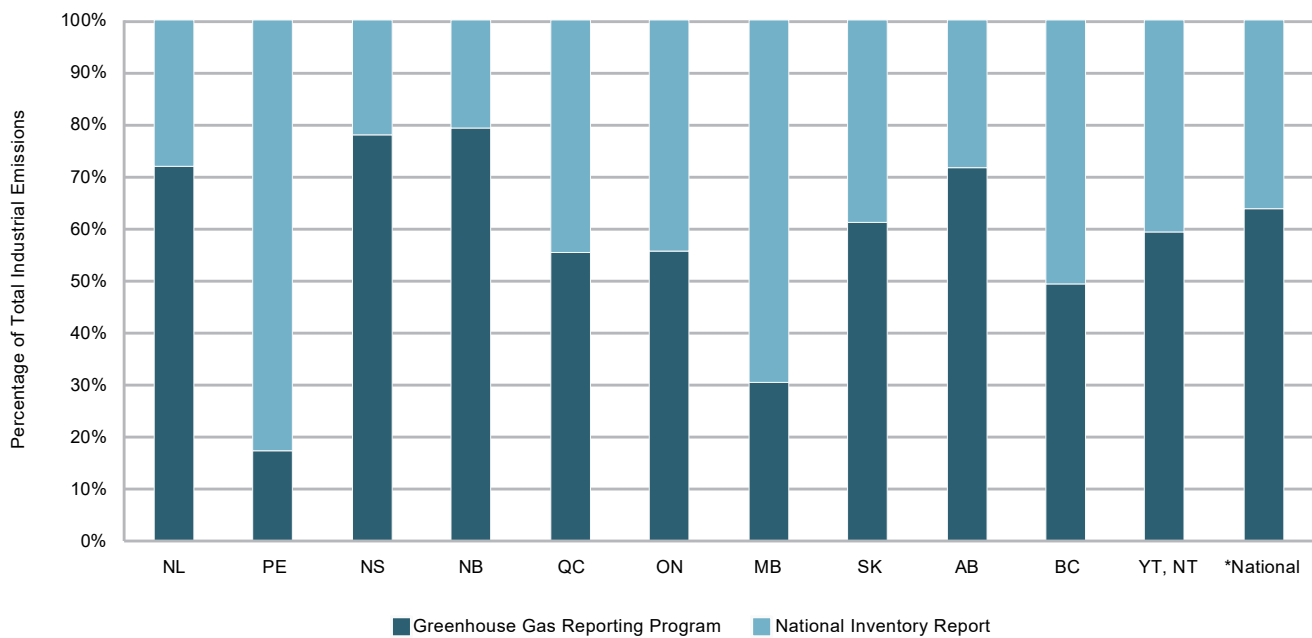


²⁴ In this overview report, Canada's industrial GHG emissions include emissions from the following GHG categories from the *National Inventory Report 1990–2021: Greenhouse Gas Sources and Sinks in Canada: Stationary Combustion Sources (except Residential), Other Transportation, Fugitive Sources, Industrial Processes and Product Use, and Waste*. Based on preliminary data from the latest National Inventory Report.

Although the facility-reported emissions may capture 64% of industrial GHG emissions nationally, the degree of coverage at the provincial level varies from province to province (Figure 14), due to the size and number of industrial facilities in each province that have emissions above the 10 kt CO₂ eq. reporting threshold. The degree of coverage is fairly high for some provinces and territories. For example, the reported emissions in 2021 captured approximately 79% of industrial emissions in New Brunswick, and 78% of total industrial emissions in Nova Scotia.

Where appropriate, the facility-reported emissions data are used by Environment and Climate Change Canada in the national GHG inventory, which is developed largely from national and provincial statistics based on internationally-recognised emission estimation methodologies. The extent to which the facility-reported GHG emissions data could be fully integrated into the national inventory is dependent on the level of detail and type of data available. This integration of the facility-reported data is a key objective for the recent expansion to reporting under the GHGRP. More information on the specific uses of facility-reported data, collected through the GHGRP, in the National GHG Inventory is provided in Chapter 1 of the latest National Inventory Report.²⁵

Figure 14 2021 Facility-Reported Emissions as a Percentage of National and Provincial/Territorial Industrial Greenhouse Gas Emissions from the National Inventory



Notes:

In this overview report, Canada's industrial GHG emissions include the following GHG categories from the *National Inventory Report 1990–2021: Greenhouse Gas Sources and Sinks in Canada*: Stationary Combustion Sources (except Residential), Transportation, Fugitive Sources, Industrial Processes and Product Use, and Waste.
 * The national total does not include data for Nunavut.

25 The *National Inventory Report 1990–2021: Greenhouse Gas Sources and Sinks in Canada* is available on Canada's official greenhouse gas inventory website: canada.ca/ghg-inventory.

ADDITIONAL INFORMATION ABOUT THE GREENHOUSE GAS REPORTING PROGRAM

5.1. Data Quality

Facilities that meet the GHG reporting requirements under the GHGRP must ensure that the reported data are reliable. Facilities are required by law to submit information that is true, accurate and complete to the best of their knowledge. CEPA sets out penalties for companies that fail to report or that knowingly submit false or misleading information. Reporters have a legal obligation to keep copies of the information submitted, along with any calculations, measurements and other data on which the information is based. All information must be kept for a period of three years from the date on which it was required to be reported to Environment and Climate Change Canada.

The data provided in this report are for information purposes only. Environment and Climate Change Canada conducted a number of data quality checks of the submitted data for compliance purposes and for completeness, and it will continue to analyze the data, which may result in periodic updates.

The data received from facilities are subject to various levels of review as part of the quality control/quality assurance (QC/QA) process set out under the GHGRP to resolve data gaps or inconsistencies and potential reporting errors. Examples²⁶ of the types of checks completed are:

- Review of emitters failing to report emissions (may be below the threshold or notified below threshold)
- Review of significant changes in emissions from previous to current year
- Comparison of expected emissions for specific industries
- Comparison of reported data with alternate or independent sources of the same data
- Review of methods used and results of emission calculations

5.2. Public Access

The GHGRP provides public access to information from all facilities that reported GHG emissions to the program through an annual online publication. In addition to this summary report, the facility-level data are presented in the form of tables, a searchable database and a downloadable format. Users can search by emissions of a specific gas or emissions of all gases, by facility name or GHGRP identification number, by National Pollutant Release Inventory (NPRI) identification number, by reporting company, by province/territory or city, or by industry sector, using the NAICS²⁷ code. Users can also access a web-based mapping tool on the Canadian Environmental Sustainability Indicators website, which shows where reporting facilities are located in Canada.

To access the data or obtain further information on the GHGRP or the National Greenhouse Gas Inventory program, consult the following websites:

Reported Facility GHG Data

<https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/facility-reporting/data.html>

Reporting to the GHGRP

<https://www.canada.ca/ghg-reporting>

Canada's Official GHG Inventory

<https://www.canada.ca/ghg-inventory>

Canadian Environmental Sustainability Indicators

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

²⁶ These are only some of the QC/QA processes that the GHGRP performs on the data to ensure a sufficient and reliable dataset. Many more process checks are also performed.

²⁷ The NAICS is an industry classification system that was developed by the statistics agencies of Canada, the United States and Mexico to enable them to collect comparable statistical data. It is a comprehensive system that encompasses all economic activities using six-digit codes. In Canada, the NAICS 2017 consists of 20 sectors, 102 subsectors, 322 industry groups, 708 industries and 923 national industries.

5.3. Links to National Pollutant Release Inventory and Provincial Reporting

The GHGRP is similar to, yet distinct from, the NPRI. Although both programs are delivered by ECCC under the authority of section 46 of CEPA, the NPRI collects data from facilities on pollutant releases (to air, water and land), disposals and transfers for recycling, whereas the GHGRP collects data from facilities on GHG emissions. Facilities reporting to the GHGRP are asked to report their NPRI identification number to facilitate searching and comparison of emissions from facilities that report to both programs.

A number of provincial jurisdictions also require facilities to report GHG emissions information annually under specific provincial regulations. Efforts have been undertaken to streamline the reporting process between the national and various provincial jurisdictions, resulting in the launch of a single-window reporting system to help reduce the reporting burden on industry and the overall cost to government. This single-window system allows one-time entry for information commonly required at both levels, while accommodating requirements that are jurisdiction-specific. Provinces currently using this reporting system include Alberta, British Columbia, Ontario, New Brunswick, Nova Scotia and Saskatchewan.

Facilities in the industry sectors subject to the recently expanded federal reporting requirements, and who already report similar data to provincial GHG reporting programs/regulations in British Columbia, Nova Scotia, Quebec, and Newfoundland and Labrador, had the option to include their 2021 provincial report as part of their GHGRP report.

The GHGRP processes the provincial reports and amends the federal report to include relevant data from those provincial reports that meet the expanded requirements. The GHGRP checks the provincial data provided in order to ensure sufficient and reliable data that fully complies with the federal requirements, and will contact the facility reporter to resolve any gaps or data issues in the submitted data. It should be noted that, starting with the reporting of 2022 data, the option to include a provincial report will no longer be available to facilities subject to expanded federal reporting requirements.

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CONTACT US

If you have questions about this report or for more information about its content, please contact the GHGRP:

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