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Facility Greenhouse Gas Emissions Reporting Program

Overview of Reported **2013** Emissions

April 2015



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Table of Contents

Highlights	1
1 Facility Greenhouse Gas Emissions Reporting Program	1
2 Reported 2013 Greenhouse Gas Emissions	2
3 Trends in Reported GHG Emissions	8
4 Facility-Reported Emissions and the National GHG Inventory	14
5 Additional Information About the GHGRP.....	16
6 Contact Us	17

List of Tables

- Table 1: Previous and Revised Global Warming Potential Values for the Main Greenhouse Gases..... 3
- Table 2: Impact of Revised GWPs on Reported GHG Emissions, by Gas, 2005–2013..... 5
- Table 3: Reported 2013 GHG Emissions by Province/Territory 7
- Table 4: Total Facility-Reported Emissions, 2005–2013..... 9
- Table 5: Reported GHG Emissions by Province/Territory, 2005–2013 10
- Table 6: Reported GHG Emissions by NAICS Industry Sector, 2005–2013..... 11

List of Figures

Figure 1: 2013 Facility GHG Emissions Reported to Environment Canada.....	2
Figure 2: Types of Methods Used by Facilities.....	3
Figure 3: Impact of Revised GWPs on Total Facility-Reported GHG Emissions, 2005–2013.....	4
Figure 4: Reported 2013 GHG Emissions by Gas (261 Mt CO ₂ eq).....	5
Figure 5: Reported 2013 GHG Emissions by Source (CO ₂ , CH ₄ and N ₂ O Included).....	6
Figure 6: Reported 2013 GHG Emissions by Industry Sector (261 Mt CO ₂ eq).....	7
Figure 7: Reported 2013 GHG Emissions by Subsectors of Manufacturing (77 Mt CO ₂ eq).....	8
Figure 8: Reported 2013 GHG Emissions by Subsectors of Mining, Quarrying, and Oil and Gas Extraction (82 Mt CO ₂ eq).....	9
Figure 9: Provincial/Territorial Long-Term Change, 2005–2013.....	12
Figure 10: Top 10 Short-Term Changes by NAICS ⁸ Industry Subsector, 2012–2013.....	13
Figure 11: Long-Term Sectoral Trend, 2005–2013.....	13
Figure 12: Top Five Long-Term Changes by NAICS Industry Subsector, 2005–2013.....	14
Figure 13: Provincial/Territorial Contribution to 2013 Facility-Reported (GHGRP) Total and NIR Total.....	15
Figure 14: 2013 Facility-Reported Emissions as a Percentage of National and Provincial/Territorial Industrial GHG Emissions ^a (from the NIR).....	15

Highlights

- For the 2013 calendar year, 565 facilities reported their greenhouse gas (GHG) emissions to Environment Canada, totalling 261 megatonnes (Mt) of carbon dioxide equivalent (CO₂ eq). The main emission sources contributing to this reported total are stationary fuel combustion and industrial processes, respectively accounting for 74% and 15% of the combined total for carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O).
- The reported emissions are largely distributed across the Utilities, Manufacturing and Mining, Quarrying, and Oil and Gas Extraction sectors, with electricity generating and oil/gas extraction facilities accounting for just over 60% of the total.
- Total facility-reported emissions in 2013 remained largely unchanged from the 2012 total of 260 Mt, reflecting a similar trend in recent years where year-to-year changes in the overall reported emissions have been relatively small (i.e., 4% or less).
- All emissions data expressed in CO₂ eq values in this report incorporate revised global warming potential (GWP) values that are now used internationally for GHG reporting. Emissions data reported in previous years were recalculated accordingly.
- Since 2005, total emissions from all reporting facilities have decreased overall by 6%. Ontario-based facilities within the Utilities and Manufacturing sectors experienced the largest declines (21 Mt and 11 Mt, respectively) over this nine-year period, while reported emissions increased by 34 Mt from facilities within the Mining, Quarrying, and Oil and Gas Extraction sector, largely in Alberta.
- The GHG emissions data collected from facilities represent just over one third (36%) of Canada's total GHG emissions in 2013 (726 Mt) and 56% of Canada's industrial GHG emissions as reported in Canada's National Inventory Report.¹ The degree of coverage of provincial and territorial industrial emissions varies significantly, depending on the size and number of industrial facilities in each province or territory that have emissions above the 50 kt CO₂ eq reporting threshold.

¹ In this overview report, Canada's industrial GHG emissions include the following GHG categories from the *National Inventory Report: Greenhouse Gas Sources and Sinks in Canada 1990–2013*: Stationary Combustion Sources (except Residential), Other Transportation, Fugitive Sources, Industrial Processes and Product Use, and Waste.

1 Facility Greenhouse Gas Emissions Reporting Program

Environment Canada's Facility Greenhouse Gas Emissions Reporting Program (GHGRP) has completed the collection of GHG emissions information from Canadian facilities for the 2013 calendar year. Any facility with annual GHG emissions of 50 kilotonnes (kt) of carbon dioxide equivalent (CO₂ eq) or higher² is required to report to the program.

The Government of Canada established the GHGRP in March 2004 under the authority of section 46 of the *Canadian Environmental Protection Act, 1999* (CEPA 1999) to collect GHG emissions information annually from the largest emitting Canadian facilities on a mandatory basis. To date, facility-reported GHG information has been collected and published through Environment Canada's

GHGRP for the period 2004 to 2013. This program is part of Canada's ongoing effort to develop, in collaboration with the provinces and territories, a harmonized and efficient mandatory 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, validate industrial emission estimates presented in the National Greenhouse Gas Inventory, and support regulatory initiatives. The data collected are also shared with provinces and territories. The data used in this overview report are current as of October 4, 2014. Subsequent company updates will be included in future data releases.

The federal reporting requirements for 2014 data, scheduled to be submitted by facilities to Environment Canada by June 1, 2015, are set out in the *Notice with respect to reporting of greenhouse gases (GHGs) for 2014*³ published in the *Canada Gazette*.

² The reporting threshold was reduced from 100 kt to 50 kt in 2009, increasing the number of facilities reporting to the program by 49%, with a corresponding 4% increase in the level of emissions being reported.

³ This Notice can be viewed at www.gazette.gc.ca/rp-pr/p1/2014/2014-10-11/html/notice-avis-eng.php.

2 Reported 2013 Greenhouse Gas Emissions

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

A total of 565 facilities reported their GHG emissions to Environment Canada for the 2013 calendar year, collectively emitting a total of 261 megatonnes (Mt) of GHGs (Figure 1).⁴ Of these facilities, 328 reported GHG emission levels greater than 100 kt, accounting for 95% (248 Mt) of the total reported emissions, and 52 emitted GHGs in quantities higher than 1 Mt, accounting for 61% (158 Mt) of the total reported emissions. Twenty-one facilities reported their GHG emissions for the first time. Facilities with emissions falling below the reporting threshold of 50 kt per year can voluntarily report their GHG emissions; 78 facilities did so this year. Reported emissions from voluntary reporters are included in this report and in the dataset published by Environment Canada.

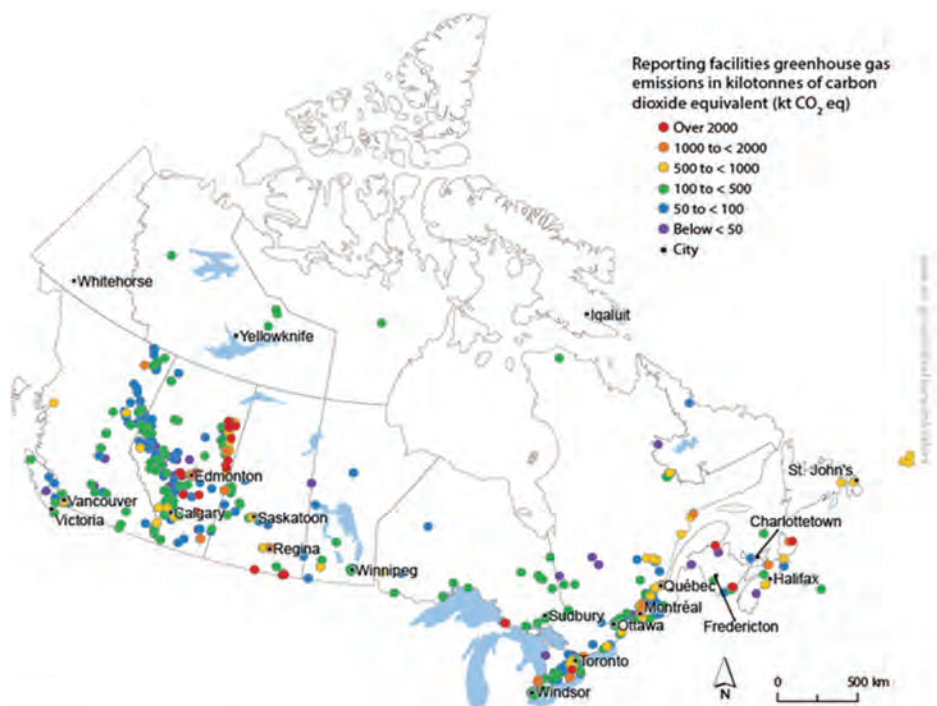
⁴ 1 Mt = 1 million tonnes or 1 000 kt.

2.1 Calculation Methodology

A facility may choose among a number of available methods to calculate its GHG emissions. The methods selected by reporting facilities must be consistent with the guidelines adopted by the United Nations Framework Convention on Climate Change (UNFCCC) and developed by the Intergovernmental Panel on Climate Change (IPCC) 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 (MDM), mass balance (MB), emission factors (EF) and/or engineering estimates (EE).

Overall, methods incorporating the use of EFs were the approach preferred by many facilities (Figure 2). An EF is a measure that indicates the rate at which a GHG is released into the atmosphere due to a given activity, such as burning of a specific fuel type or production of a specific industrial product. The EFs used may be general or technology-specific. Note that many facilities used multiple types of calculation methods to determine their emissions.

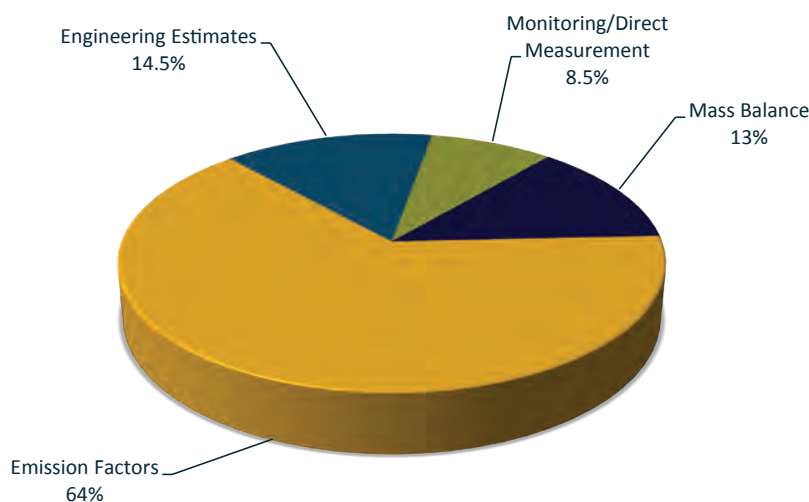
Figure 1: 2013 Facility GHG Emissions Reported to Environment Canada^{a, b}



^a Map excludes pipeline transportation systems.

^b Map provided by the Canadian Environmental Sustainability Indicators program (CESI), available online at www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=31022B8E-1

Figure 2: Types of Methods Used by Facilities



2.2 Greenhouse Gases (GHGs) and Global Warming Potentials

GHGs are not equal in their effect on the atmosphere. Each GHG has a unique 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 specific time horizon. This is called the CO₂ eq value and is calculated by multiplying the amount of the gas by its associated global warming potential (GWP) (Table 1). For example, the GWP for CH₄ is 25, which means

that each tonne of CH₄ emitted to the atmosphere is considered to have a cumulative warming effect over the next 100 years equivalent to emitting 25 tonnes of CO₂.⁵

Environment Canada uses the GWP values adopted by the UNFCCC, which are listed in the annual *Notice with respect to reporting of greenhouse gases (GHGs)*. GWP values have been revised this year, to be consistent with those used for the development of national GHG inventories published in 2015.

⁵ Environment Canada. 2015. *National Inventory Report: Greenhouse Gas Sources and Sinks in Canada 1990–2013*.

Table 1: Previous and Revised Global Warming Potential Values for the Main Greenhouse Gases

Greenhouse Gas	Revised 100-year GWPs ^a	Previous 100-year GWPs ^b
Carbon dioxide (CO ₂)	1	1
Methane (CH ₄)	25	21
Nitrous oxide (N ₂ O)	298	310
Sulphur hexafluoride (SF ₆)	22 800	23 900
Hydrofluorocarbons (HFCs), 13 species	Ranges from 92 to 14 800	Ranges from 140 to 11 700
Perfluorocarbons (PFCs), 7 species	Ranges from 7 390 to 12 200	Ranges from 6 500 to 9 200

a Source (revised GWPs): Intergovernmental Panel on Climate Change. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Available online at www.ipcc.ch/publications_and_data/ar4/wg1/en/errataserrata-errata.html#table214.

b Source (previous GWPs): Intergovernmental Panel on Climate Change. *Climate Change 1995: The Science of Climate Change. Contribution of Working Group I to the Second Assessment Report of the Intergovernmental Panel on Climate Change*. Available online at ipcc.ch/publications_and_data/publications_and_data_reports.shtml.

A complete list of the revised GWPs can be found in the 2013 and 2014 notices issued under the GHGRP. The emissions expressed in CO₂ eq values from facility data reported in previous years have been recalculated to ensure that the entire time series (2004–2013) is consistent and comparable, and that the effect of the GWP change does not affect emission trends. The changes resulting from the application of the revised GWP values did not alter the actual emissions data reported by facilities. The GWP values used by the GHGRP are consistent with those used in Canada’s 2015 edition of the National Greenhouse Gas Inventory. Both reports are using the same approach to incorporate the revised GWP values.

Incorporation of the revised GWP values results in a slight increase (1%) in the total reported emissions in CO₂ eq compared to the total emissions that would have been obtained if calculated with the GWP values used in previous years (Figure 3). The change to the total in CO₂ eq varies for each GHG, with the largest change observed in the total for CH₄ as a result of the recalculations (increase of 2 Mt or 19%) (Table 2).

2.3 Reported GHG Emissions by Gas and by Source

CO₂ represented the majority of the total reported emissions (93%) in 2013, while methane (CH₄) and nitrous oxide (N₂O) emissions each contributed an additional 5% and 1%, 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 1%.

When reporting to the GHGRP, facilities are required to report emissions of CO₂, CH₄ and N₂O according to the following eight source categories:⁶ stationary fuel combustion, industrial processes, venting, flaring, fugitive, on-site transportation, waste and wastewater. Stationary fuel combustion is the largest source of these emissions, representing 74% of the total reported

⁶ Additional information on these emission source categories can be found in the *Technical Guidance on Reporting Greenhouse Gas Emissions*, available at www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=47B640C5-1.

Figure 3: Impact of Revised GWPs on Total Facility-Reported GHG Emissions, 2005–2013

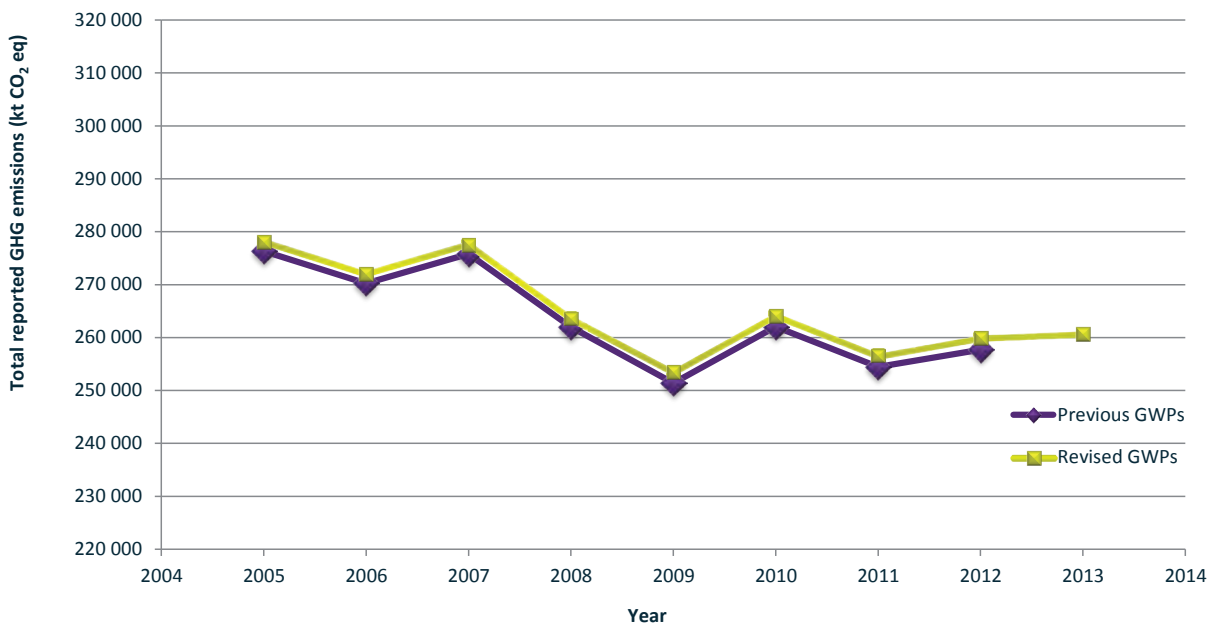
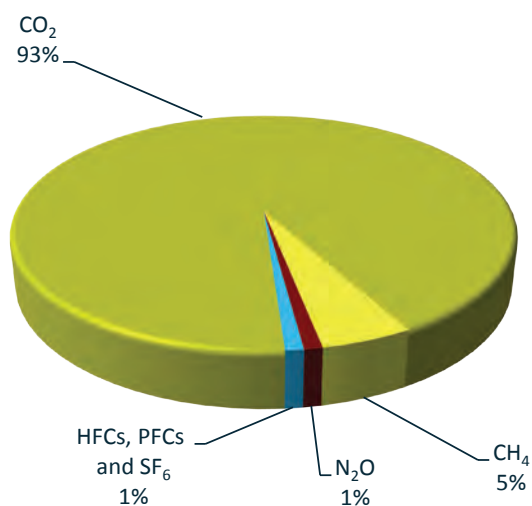


Table 2: Impact of Revised GWPs on Reported GHG Emissions, by Gas, 2005–2013

Gas	2005	2006	2007	2008	2009	2010	2011	2012	2013
<i>(Units: kt CO₂ eq)</i>									
CO ₂ emissions	258 082	253 874	260 700	246 929	235 691	247 020	239 308	242 340	242 771
CH₄ emissions									
using previous GWPs	8 075	8 125	8 068	7 737	9 936	9 925	10 193	10 641	NA ^a
using revised GWPs	9 613	9 672	9 604	9 210	11 828	11 816	12 135	12 667	13 631
% change	19%	19%	19%	19%	19%	19%	19%	19%	NA
N₂O emissions									
using previous GWPs	5 890	4 315	4 343	4 878	3 221	2 862	2 726	2 538	NA
using revised GWPs	5 662	4 148	4 174	4 689	3 096	2 752	2 621	2 439	2 284
% change	-4%	-4%	-4%	-4%	-4%	-4%	-4%	-4%	NA
SF₆ emissions									
using previous GWPs	1 132	1 246	344	173	134	124	81	105	NA
using revised GWPs	1 080	1 188	328	165	128	118	78	100	98
% change	-5%	-5%	-5%	-5%	-5%	-5%	-5%	-5%	NA
HFC emissions									
using previous GWPs	53	41	21	16	283	577	596	523	NA
using revised GWPs	59	45	23	18	309	629	650	568	442
% change	11%	11%	10%	11%	9%	9%	9%	9%	NA
PFC emissions									
using previous GWPs	3 065	2 626	2 302	2 242	2 136	1 555	1 531	1 554	NA
using revised GWPs	3 546	3 034	2 666	2 589	2 469	1 798	1 774	1 797	1 468
% change	16%	16%	16%	15%	16%	16%	16%	16%	NA

a NA = not applicable.

Figure 4: Reported 2013 GHG Emissions by Gas (261 Mt CO₂ eq)


emissions (Figure 5). 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 sources like combustion engines in vehicles. Any waste material burned or incinerated at a facility to produce energy is also included in stationary combustion. Industrial process emissions, the second-largest source of reported emissions at 15%, 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).

2.4 Reported GHG Emissions by Province/Territory

Facilities in the province of Alberta accounted for the largest share of reported emissions, with approximately 51% of the total, followed by facilities in Ontario with 18%. Next were Saskatchewan and Quebec, which accounted for 9% and 8% of reported emissions, respectively (Table 3).

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).⁷ In 2013, three NAICS defined industrial sectors accounted for the majority of GHG emissions: Utilities, primarily those generating electricity from fossil fuels, representing 34% (89 Mt); Manufacturing, accounting for 29% (77 Mt); and Mining, Quarrying, and Oil and Gas Extraction, accounting for 31% (82 Mt) (Figure 6). Further breakdowns of the reported emissions from these main sectors are provided in figures 7 to 8. The remaining 5% (13.5 Mt) of emissions captured under “Other” were reported by various types of facilities, mainly stemming from natural gas transportation pipelines (7.8 Mt) and solid waste landfills (4.6 Mt). Virtually all of the emissions (97%, i.e., 86 Mt) under the Utilities sector are from Electric Power Generation.

⁷ The NAICS is an industry classification system that was developed by the statistics agencies of Canada, the United States and Mexico to enable their national agencies to collect comparable statistical data. It is a comprehensive system that encompasses all economic activities using six-digit codes. In Canada, the NAICS consists of 20 sectors, 102 subsectors, 323 industry groups, 711 industries and 922 national industries.

Figure 5: Reported 2013 GHG Emissions by Source (CO₂, CH₄ and N₂O Included)

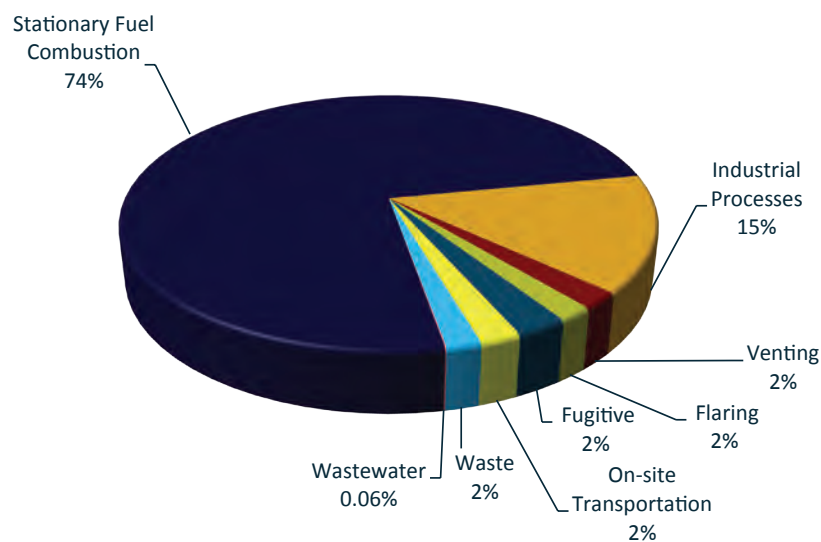
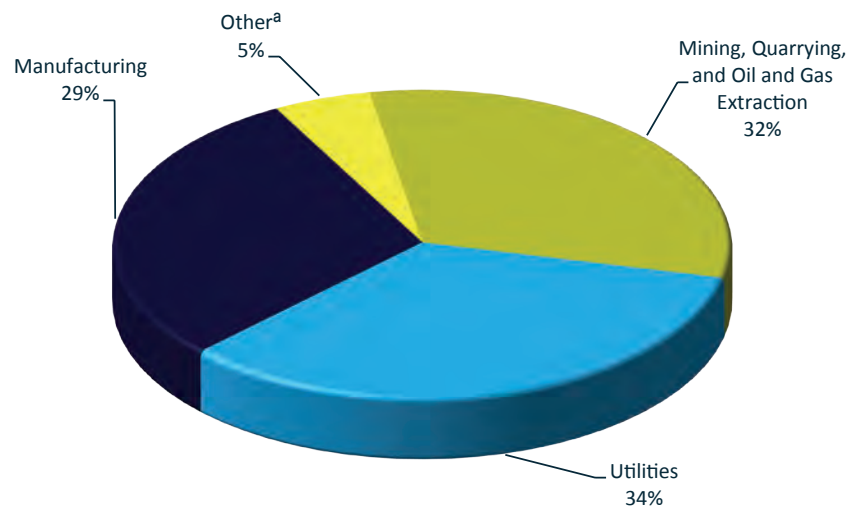


Table 3: Reported 2013 GHG Emissions by Province/Territory

Province/Territory	Number of Facilities	Total Emissions (kt CO ₂ eq)	Percentage of Total Emissions ^a
Newfoundland and Labrador	9	4 479	2%
Prince Edward Island	1	60	0.02%
Nova Scotia	13	9 130	4%
New Brunswick	12	7 475	3%
Quebec	82	19 711	8%
Ontario	144	45 757	18%
Manitoba	13	2 154	1%
Saskatchewan	42	23 848	9%
Alberta	165	132 069	51%
British Columbia	79	15 225	6%
Northwest Territories	4	591	0.2%
Nunavut	1	196	0.1%
Total	565	260 693	

a Totals may not add up due to rounding.

Figure 6: Reported 2013 GHG Emissions by Industry Sector (261 Mt CO₂ eq)



a "Other" includes various types of facilities such as natural gas transportation pipelines, solid waste landfills, airports, universities, hospitals and public administration buildings.

The Manufacturing sector (Figure 7) includes, but is not limited to, facilities engaged in petroleum and coal product manufacturing; iron, steel and ferro-alloy manufacturing; chemical manufacturing; cement and concrete product manufacturing; alumina and aluminium production and manufacturing; pulp and paper mills (within Wood Product and Paper Manufacturing); and base metals production. Base metals (e.g., copper, nickel, zinc) production falls within the subsector Non-ferrous Metal (except Aluminium) Production and Processing.

Activities of reporting facilities within Mining, Quarrying, and Oil and Gas Extraction (Figure 8) can be grouped into three categories:

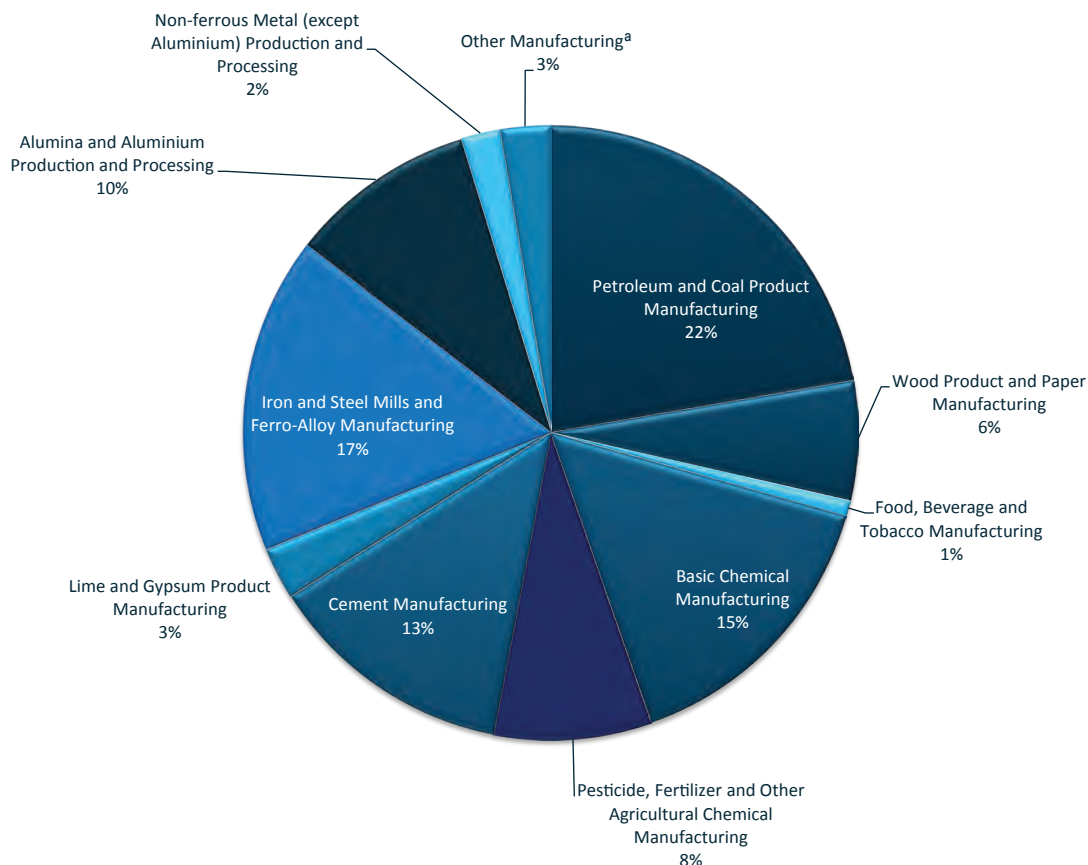
- 1) Conventional extraction of oil and natural gas;
- 2) Non-Conventional oil extraction, which includes oil sands mining, in-situ bitumen production and upgrading; and
- 3) Mining of coal, metal ore (e.g., iron) and non-metallic minerals (e.g., potash and diamonds).

3 Trends in Reported GHG Emissions

The number of facilities reporting GHG emissions to Environment Canada can change from year to year. Changes in production levels, processes and technologies, the types of fuels used at a facility, and facility start-ups/closures can all result in a change in the annual emissions reported, so that a facility may fall below or attain the reporting threshold of 50 kt CO₂ eq from one year to the next. The number of voluntary reporters may also change each year, which can also affect the number of reporting facilities. The reduction in the reporting threshold (from 100 to 50 kt) that occurred in 2009 resulted in approximately a 50% increase in the number of facilities reporting their GHG emissions annually to Environment Canada.

Over the 2005–2013 period, the number of facilities reporting increased from 337 in 2005 to 565 in 2013 (Table 4). Since 2009, facilities with emissions under 100 kt have contributed, on average, 5% to the total reported emissions. Consequently, emissions from these facilities do not contribute significantly to the observed trends in total reported emissions at the national or provincial/territorial levels.

Figure 7: Reported 2013 GHG Emissions by Subsectors of Manufacturing (77 Mt CO₂ eq)



^a "Other Manufacturing" represents other types of manufacturing including Electrical Equipment, Transportation Equipment, Furniture Manufacturing.

3.1 Overall National-Level Trends

The overall GHG emission totals from all facilities that reported across Canada over the period 2005 to 2013 are presented in Table 4. Total reported emissions in 2013, at 261 Mt, were essentially unchanged from the 2012 total of 260 Mt.⁸ This reflects a similar trend in recent years (i.e., since 2010), in which the overall total remained relatively steady with only minor inter-annual variability. Over the 2005–2013 period, total facility-reported emissions decreased by 6% (17 Mt), from 278 Mt to 261 Mt.

⁸ A number of facilities submitted new reports or updates to GHG reports for previous years. Environment Canada includes these updates in its annual data release, resulting in some revisions to previously published data.

3.2 Provincial/Territorial Trends

3.2.1 Short-Term Changes

Facility-reported GHG emissions, aggregated by province and territory, are summarized in Table 5. Emissions in recent years (2010–2013) showed no discernible trends for Quebec, Manitoba, Newfoundland and Labrador, and Saskatchewan (i.e., emission levels largely unchanged).

The overall reported emission level from Ontario-based facilities decreased in recent years, largely a result of a significant decrease in emissions from Fossil-Fuel Electric Power Generation, and to a lesser extent, emission decreases in the Manufacturing sector

Figure 8: Reported 2013 GHG Emissions by Subsectors of Mining, Quarrying, and Oil and Gas Extraction (82 Mt CO₂ eq)

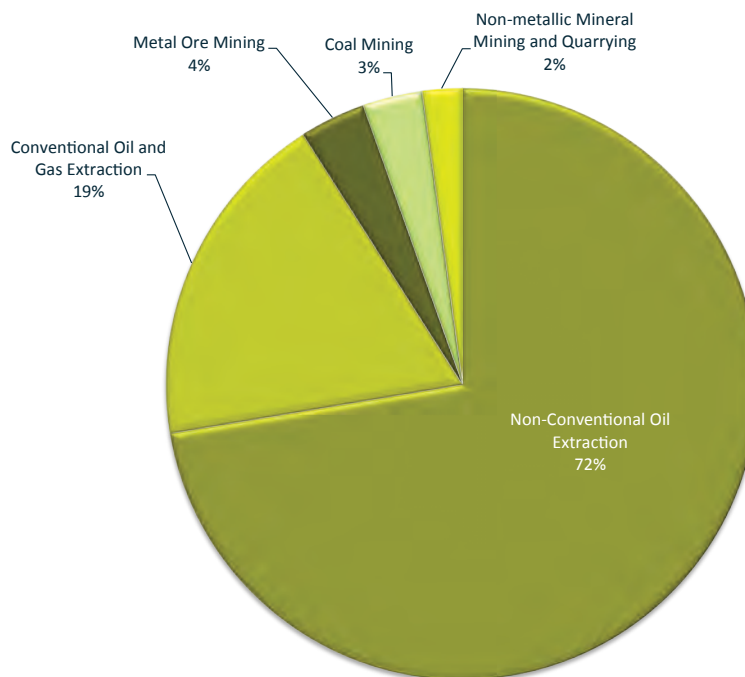


Table 4: Total Facility-Reported Emissions, 2005–2013

	2005	2006	2007	2008	2009 ^a	2010	2011	2012	2013
Number of facilities	337	345	352	351	536	542	547	555	565
GHG emissions (kt CO ₂ eq)	278 043	271 962	277 496	263 601	253 521	264 132	256 565	259 912	260 693
Annual change (%)	NA ^b	-2%	2%	-5%	-4%	4%	-3%	1%	0.3%
Change since 2005 (%)	NA	-2%	-0.2%	-5%	-9%	-5%	-8%	-7%	-6%

^a Reporting threshold changed in 2009.

^b NA = not applicable.

(mostly because of lower production in Iron and Steel Mills and Ferro-Alloy Manufacturing). Since 2010, Ontario has seen a 10.5-Mt decrease in emissions from Fossil-Fuel Electric Power Generation, largely due to the closure of coal plants.

Alberta experienced a steady increase in overall emissions since 2008, largely due to an increase in emissions from Non-Conventional Oil Extraction (22 Mt), lessened by a decrease from Fossil-Fuel Electric Power Generation of about 4 Mt.

Total emissions from reporting facilities in New Brunswick and Nova Scotia exhibited a slight decrease between 2010 and 2013. The subsector contributing the most to this overall decline was Fossil-Fuel Electric Power Generation, with emission decreases of 0.8 Mt in New Brunswick and 1.4 Mt in Nova Scotia since 2010.

Emissions in British Columbia increased slightly (1 Mt) over 2010 to 2013, led mostly by an increase in Conventional Oil and Gas Extraction.

3.2.2 Long-Term Trends

The provincial/territorial long-term trend (i.e., since 2005) for all reporting facilities shown in Figure 9 indicates an overall decline in facility-reported emissions for seven of the provinces and territories.

Utilities were largely responsible for this decline, with emission reductions of 21 Mt in Ontario, 5.7 Mt in Alberta, 4.8 Mt in New Brunswick and 2.8 Mt in Nova Scotia over the period. Ontario also

saw a decrease of 11 Mt in emissions from the Manufacturing sector. Quebec showed an overall decrease in emissions of 2.9 Mt over the long term, with facilities in the Manufacturing sector contributing the most to this provincial change. Manitoba, Newfoundland and Labrador, and Prince Edward Island had smaller decreases in emissions, ranging from 0.04 to 0.9 Mt.

Alberta had a 25-Mt net increase in emissions, largely attributable to an increase in the Mining, Quarrying, and Oil and Gas Extraction sector. Saskatchewan exhibited a minor overall emission increase of 1.2 Mt, led by facilities in the Utilities and Manufacturing sectors. British Columbia, the Northwest Territories and Nunavut showed overall increases in facility-reported emissions, ranging from 0.2 to 1.2 Mt.

3.3 Industry Sector Trends

A summary of facility-reported GHG emissions (disaggregated by NAICS industry sector) over the period 2005 to 2013 is presented in Table 6. This summary provides a complete picture of the types of facilities (mostly industrial operations) that report to the GHGRP in response to the annual GHG reporting requirements.

3.3.1 Short-Term Changes

Changes between 2012 and 2013 are generally consistent with observed trends since 2010, such as the sustained emission increase in the Mining, Quarrying, and Oil and Gas Extraction sector (an increase of 13 Mt over the period). Likewise, facility

Table 5: Reported GHG Emissions by Province/Territory, 2005–2013

Province/Territory (Units: kt CO ₂ eq)	2005	2006	2007	2008	2009	2010	2011	2012	2013
Newfoundland and Labrador	5 398	4 975	5 448	5 291	4 392	4 560	4 267	4 417	4 479
Prince Edward Island	104	100	102	99	74	63	65	53	60
Nova Scotia	11 751	10 810	11 421	11 110	10 788	10 615	9 879	8 826	9 130
New Brunswick	12 654	10 234	10 910	10 287	10 121	8 231	7 854	7 050	7 475
Quebec	22 572	22 687	23 686	20 307	20 784	21 082	20 636	21 046	19 711
Ontario	78 748	71 601	74 412	67 435	50 287	56 607	49 711	50 511	45 757
Manitoba	2 908	2 521	2 484	2 455	2 243	2 000	2 132	1 999	2 154
Saskatchewan	22 611	22 118	23 087	22 012	22 545	22 921	22 594	23 630	23 848
Alberta	106 918	113 851	112 351	110 642	118 087	123 199	123 928	126 969	132 069
British Columbia	14 018	12 745	13 073	13 429	13 610	14 175	14 745	14 658	15 225
Northwest Territories	360	320	522	533	590	545	555	550	591
Nunavut	N/A ^a	N/A	N/A	N/A	N/A	135	199	203	196
Total	278 043	271 962	277 496	263 601	253 521	264 132	256 565	259 912	260 693

a N/A = not available

Table 6: Reported GHG Emissions by NAICS Industry Sector, 2005–2013

NAICS ^a Industry Sector	2005	2006	2007	2008	2009 ^b	2010	2011	2012	2013
<i>(Units: Mt CO₂ eq)</i>									
Total^c	278	272	277	264	254	264	257	260	261
21 - Mining, Quarrying, and Oil and Gas Extraction	48	53	55	55	62	69	72	78	82
Conventional oil and gas extraction	14	14	13	12	15	15	15	14	15
Non-Conventional oil extraction ^d	28	34	35	36	42	47	49	55	59
Coal mining	2	2	2	2	2	3	3	3	3
Metal ore mining	3	3	3	3	3	3	3	4	4
Non-metallic mineral mining and quarrying	1	1	1	1	1	1	2	2	2
22 - Utilities	123	116	122	113	103	106	94	90	89
Electric power generation	122	114	120	112	101	103	92	88	86
Natural gas distribution	1	1	1	1	2	2	2	2	2
Water, sewage and other systems ^e	0.12	0.10	N/A	0.11	0.54	0.44	0.47	0.51	0.52
31-33 Manufacturing	92	89	87	84	75	78	79	79	77
Food and beverages	0.34	0.23	0.23	0.22	0.65	1	1	1	1
Wood products	N/A	N/A	N/A	N/A	0.14	0.15	0.10	0.11	0.12
Paper	5	4	5	4	4	4	4	4	5
Petroleum and coal products	20	20	20	19	19	18	17	17	17
Basic chemical manufacturing	13	12	12	13	11	11	12	11	12
Resin, synthetic rubber, synthetic fibres and filaments	0.07	N/A	N/A	N/A	0.2	0.22	0.20	0.20	0.20
Pesticide, fertilizer, other agricultural chemicals	6	6	6	6	5	6	6	6	6
Cement and concrete products	13	13	13	12	9	10	10	11	10
Lime and gypsum product manufacturing	3	3	3	3	2	2	2	2	2
Iron and steel mills and ferro-alloys	17	17	17	17	11	14	14	15	13
Primary production of alumina and aluminium	10	9	9	9	8	8	8	8	8
Non-ferrous metal (except alum.) smelting and refining	3	3	2	2	2	2	2	2	2
Other manufacturing ^f	1	1	1	0.39	1.40	2	2	2	2
Other^g	15	14	14	12	13	12	12	13	14
Pipeline transportation of natural gas	12	11	10	8	7	6	7	6	8
Support activities for air transportation	N/A	0.12	0.13	0.09	0.10	0.07	0.07	0.06	0.05
Waste management and remediation services	3	3	3	3	5	5	5	5	5
Institutional facilities	N/A	0.02	N/A	N/A	0.38	0.50	0.55	0.65	0.62

Notes:

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.

c Totals may not add up due to rounding.

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

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

f 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 and Furniture Manufacturing.

g 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 and institutional facilities (universities, hospitals and public administration buildings).

emissions within the Utilities sector experienced a continued decline since 2010 (17 Mt).

The 10 industrial subsectors showing the largest changes in emissions between 2012 and 2013 are displayed in Figure 10. Facilities within these subsectors account for just over 82% of the total 2013 emissions. The Non-Conventional Oil Extraction subsector led overall changes, with an increase in emissions of 3.7 Mt, driven by a 2.5% increase in synthetic crude oil production and a 13.2% increase in non upgraded crude bitumen production.⁹ Fossil-Fuel Electric Power Generation reported a net decrease in emissions of 2.3 Mt. This was mainly due to a reduction in generation from fossil fuel sources (largely coal) and an increase in generation from low-emitting sources such as hydroelectric, nuclear and other renewables.¹⁰ Facilities within the Iron and Steel Mills and Ferro-Alloy subsector experienced a 2-Mt decrease, attributed to a lower production of steel.¹¹ Pipeline Transportation of Natural Gas demonstrated a minor change in emissions from 2012, which reflects a similar trend in recent years (Table 6).

9 [AER] Alberta Energy Regulator. 2014. Alberta's Energy Reserves 2013 and Supply/Demand Outlook 2013–2022: ST98-2014. Available online at www.aer.ca/data-and-publications/statistical-reports/st98.

10 Statistics Canada CANSIM 2005–2013, Table 127-0006: Electricity generated from fuels, by electric utility thermal plants (annual).

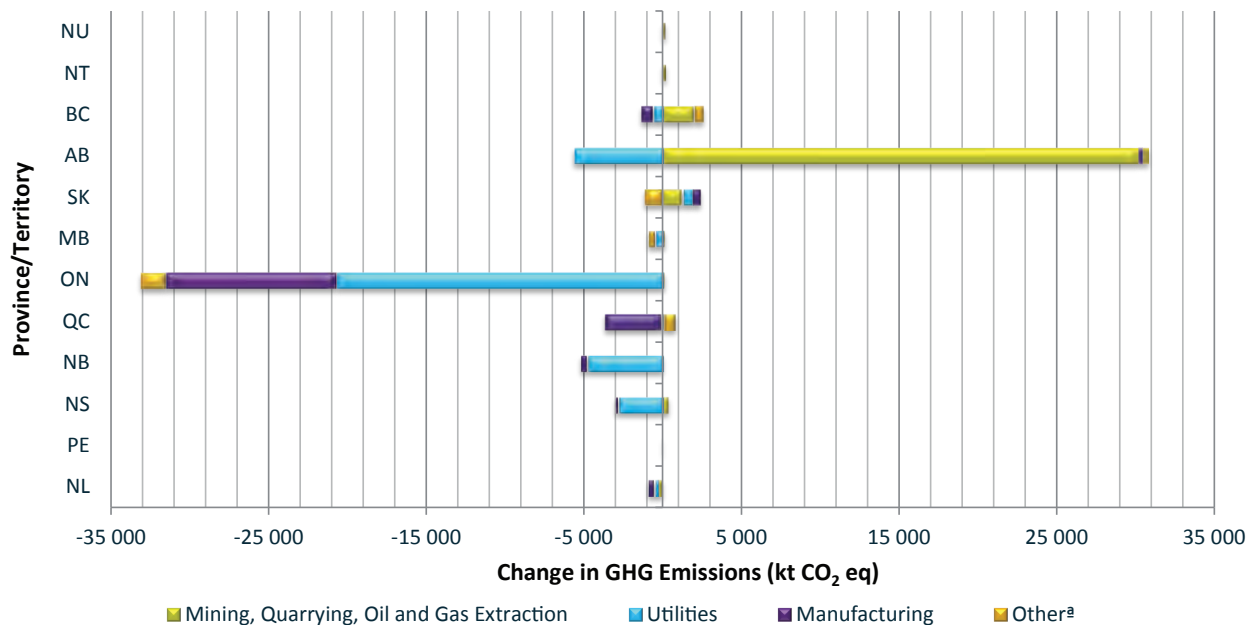
11 Statistics Canada. Report on Energy Supply–Demand in Canada (Annual). Catalogue No. 57-003-XIB.

3.3.2 Long-Term Trends

The long-term trend in reported emissions by NAICS industry sector shows that, since 2005, emissions from facilities in the Utilities and Manufacturing sectors have declined overall, while emissions from Mining, Quarrying, and Oil and Gas Extraction have increased (Figure 11). The Utilities sector exhibits significant variability that reflects the many factors affecting this sector, such as fuel costs (particularly oil and natural gas), weather, generation sources (nuclear, coal, hydro, wind), and demand by the manufacturing and residential sectors. Between 2005 and 2013, emissions from the Utilities sector have fallen significantly as a result of a reduction in electricity production from fossil fuel generation (particularly coal due to plant closures), fuel switching (i.e., from coal to natural gas, a lower carbon fuel) and greater reliance being placed on hydro, nuclear and renewable sources of generation.¹² Facilities captured under the “Other” category (including natural gas transportation pipelines, solid waste landfills, airports, universities, hospitals and public administration buildings) exhibited a slow, overall decline in emissions by 1 Mt since 2005, largely dominated by the 4 Mt reduction from natural gas transportation pipelines offset by an increase of 2 Mt from facilities in Waste Treatment and Disposal over that period.

12 Statistics Canada CANSIM 2005–2013, Table 127-0007: Electric power generation, by class of electricity producer (annual).

Figure 9: Provincial/Territorial Long-Term Change, 2005–2013



^a“Other” includes various types of facilities such as natural gas transportation pipelines, solid waste landfills, airports, universities, hospitals and public administration buildings.

Figure 10: Top 10 Short-Term Changes by NAICS⁸ Industry Subsector, 2012-2013

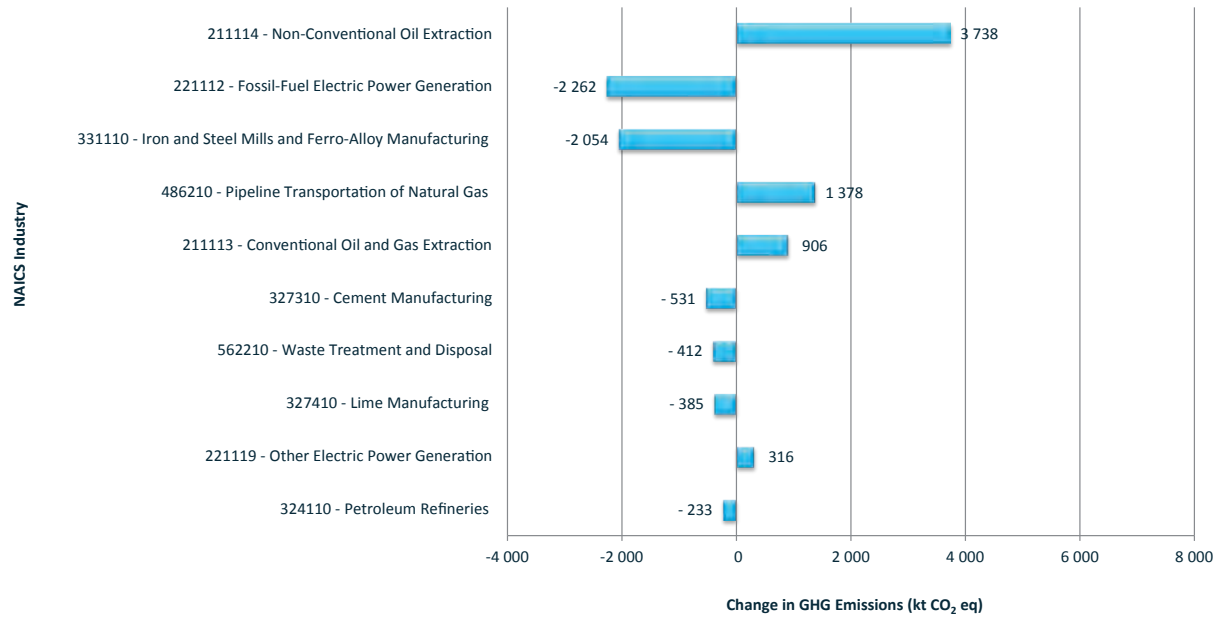
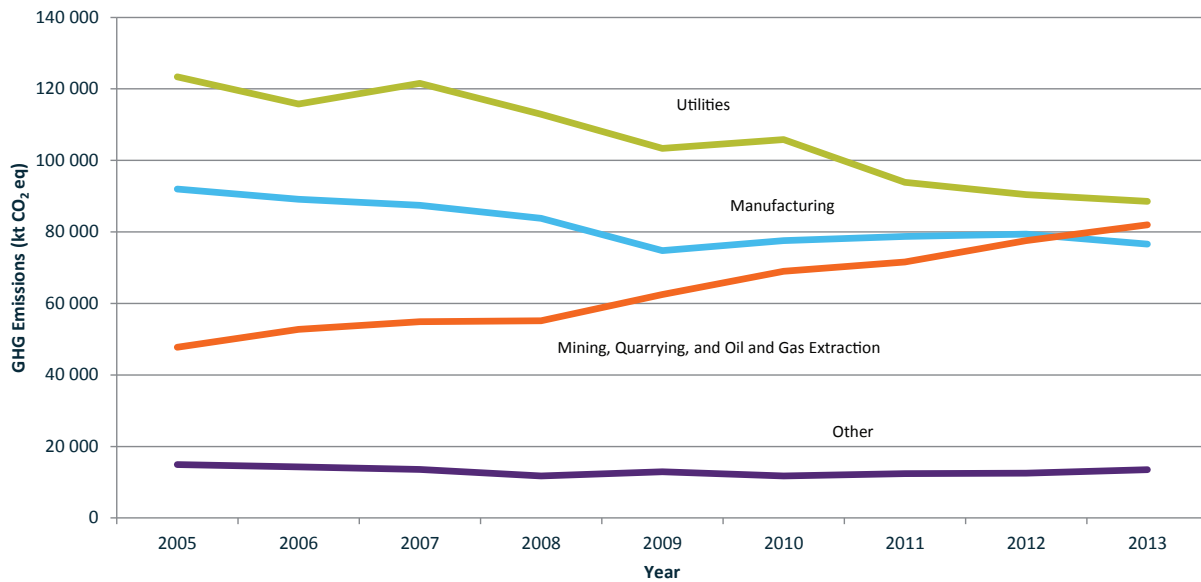


Figure 11: Long-Term Sectoral Trend, 2005–2013



One of the industry subsectors illustrating the largest change in emissions from 2005 to 2013 is Fossil Fuel Electric Power Generation, with a 38-Mt decline (Figure 12). As noted, a major factor contributing to this decline in emissions is a reduction in coal-fired electric power generation, mainly in Ontario, with smaller contributions from electricity generation facilities in Nova Scotia and New Brunswick.

The Non-Conventional Oil Extraction subsector (including oil sands mining, in-situ bitumen production and upgrading) showed the largest overall increase in emissions (31 Mt) since 2005, reflecting this sector's steady growth trend (Table 6). Over the 2005 to 2013 period, non-upgraded bitumen and synthetic crude oil production increased by 134% and 71%, respectively.¹³

Reported emissions from natural gas transportation pipelines decreased by 4.3 Mt from 2005 to 2013, due to a 40% reduction in natural gas throughput volumes.¹⁴ Emissions reported by iron and steel production facilities and petroleum refineries also declined over the same period, by 4.5 and 3.1 Mt each; this is attributable to reduced production levels and plant operation slowdowns.^{15, 16, 17}

13 Alberta Energy Regulator. 2014. Alberta's Energy Reserves 2013 and Supply/Demand Outlook 2012–2021: ST98 -2014. Available online at www.aer.ca/data-and-publications/statistical-reports/st98.

14 Statistics Canada. CANSIM, Table 129-0001 Operating Statistics of Canadian Natural Gas Carriers.

15 Statistics Canada. Report on Energy Supply–Demand in Canada (Annual). #57-003-X.

16 Statistics Canada. Steel, Tubular Products and Steel Wire, Catalogue # 41-019.

17 Based on 2013 data obtained by Environment Canada from the Canadian Steel Producers Association.

4 Facility-Reported Emissions and the National GHG Inventory

The total facility-reported GHG emissions for 2013 collected under the GHGRP represent just over one third (36%) of Canada's total GHG emissions in 2013 (726 Mt) and over half (56%) of Canada's industrial GHG emissions,¹⁸ as reported in Canada's latest National Inventory Report (NIR).¹⁹ The GHGRP applies to the largest GHG-emitting facilities (mostly industrial) and does not cover other sources of GHG emissions (e.g., road transportation, agricultural sources), whereas the NIR is a complete accounting of all GHG sources and sinks in Canada.

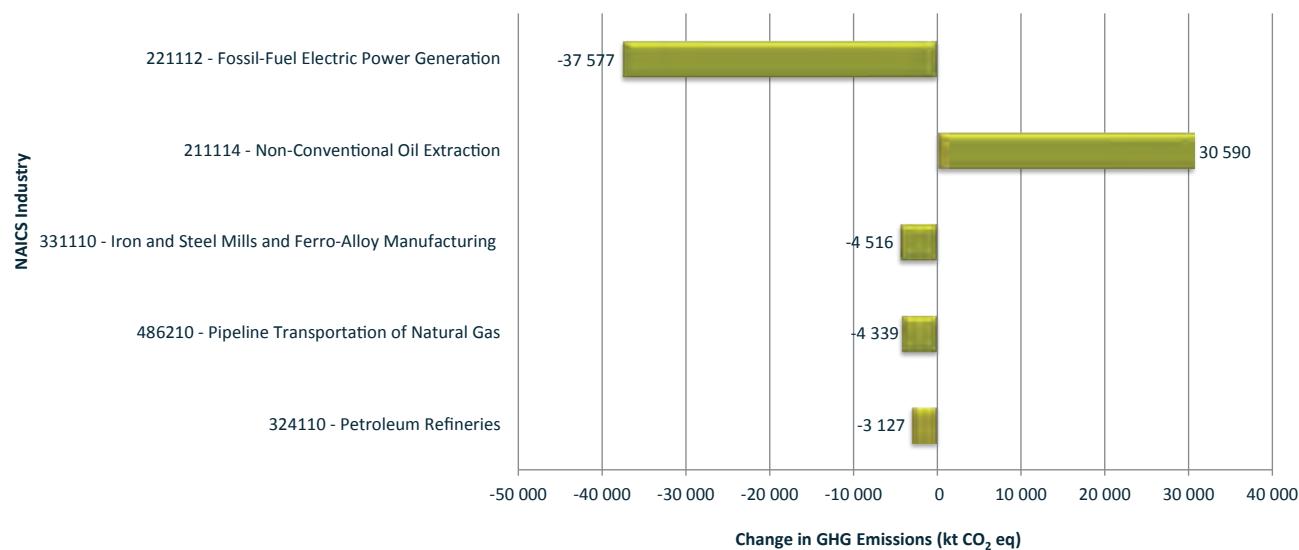
When comparing the provincial and territorial contribution to the facility-reported total from the GHGRP with the national total from the NIR, the distribution of emissions by province shows a similar pattern (Figure 13). The highest emissions are attributed to Alberta, followed by Ontario, Quebec and Saskatchewan. This pattern is reflective of the concentration of large industrial facilities in certain provinces relative to others and the use of fossil fuels for energy production.

Although the facility-reported emissions may capture 56% of industrial GHG emissions nationally, the degree of coverage at the provincial level varies significantly from province

18 In this overview report, Canada's industrial GHG emissions include the following GHG categories from the *National Inventory Report: Greenhouse Gas Sources and Sinks in Canada 1990–2013*: Stationary Combustion Sources (except Residential), Other Transportation, Fugitive Sources, Industrial Processes and Product Use, and Waste.

19 Canada's latest NIR, the *National Inventory Report: Greenhouse Gas Sources and Sinks in Canada 1990–2013*, is available at www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=83A34A7A-1.

Figure 12: Top Five Long-Term Changes by NAICS Industry Subsector, 2005–2013



to province (Figure 14), depending on the size and number of industrial facilities in each province that have emissions above the 50-kt CO₂ eq reporting threshold.

Where appropriate, the facility-reported emissions data are used by Environment Canada to confirm inventory estimates

developed from national and provincial statistics in the NIR. The NIR is produced and submitted annually by Canada to the UNFCCC. The extent to which the facility-reported GHG emissions data could be fully integrated into the NIR is dependent on the level of detail and type of data available.

Figure 13: Provincial/Territorial Contribution to 2013 Facility-Reported (GHGRP) Total and NIR Total

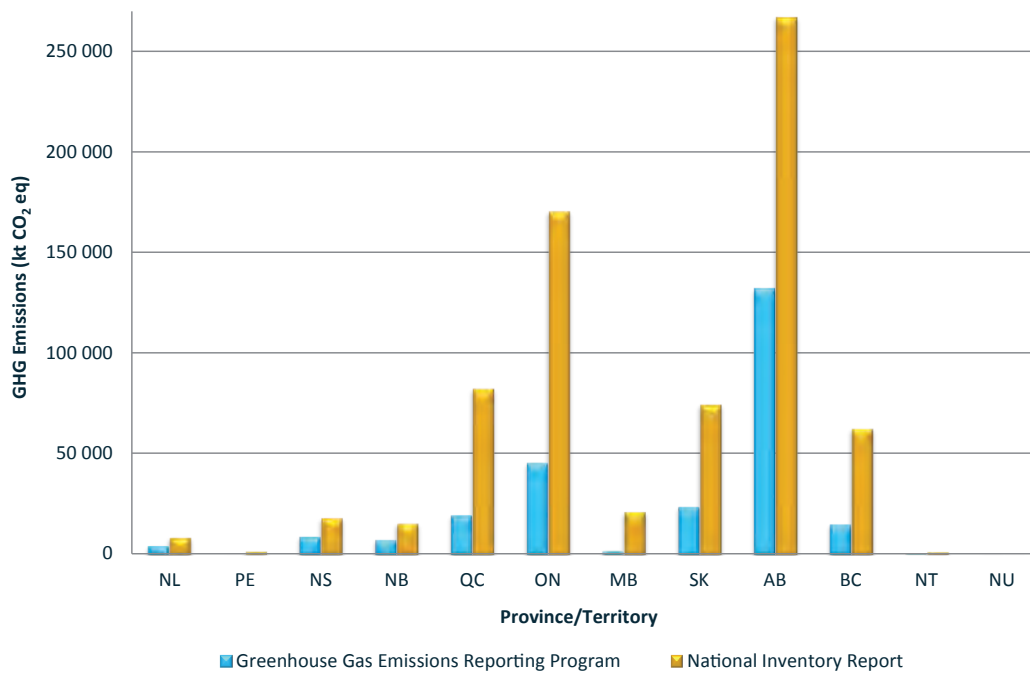
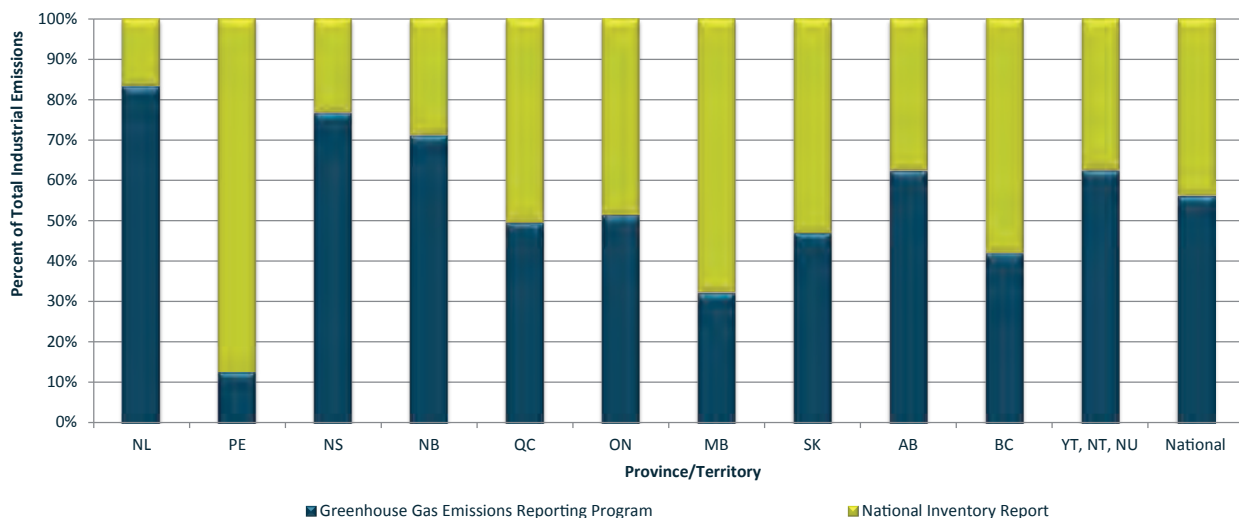


Figure 14: 2013 Facility-Reported Emissions as a Percentage of National and Provincial/Territorial Industrial GHG Emissions^a (from the NIR)



^a In this overview report, Canada's industrial GHG emissions include the following GHG categories from the *National Inventory Report: Greenhouse Gas Sources and Sinks in Canada 1990–2013*: Stationary Combustion Sources (except Residential), Other Transportation, Fugitive Sources, Industrial Processes and Product Use, and Waste.

5 Additional Information About the GHGRP

5.1 Data Quality

Facilities that meet the GHG reporting requirements under the GHGRP must ensure that the reported data are of good quality. Facilities are required by law to submit information that is true, accurate and complete to the best of their knowledge, by the annual June 1 reporting deadline. CEPA 1999 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 Canada.

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

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 National Pollutant Release Inventory (NPRI) identification number, by reporting company, by province/territory or city, or by industrial sector using the NAICS code. Users can also access a Web-based mapping tool on the Canadian Environmental Sustainability Indicators (CESI) website, which shows where reporting facilities are located in Canada.

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

Reported Facility GHG Data

www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=8044859A-1

Reporting to the GHGRP

www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=F3E7B38E-1

Canada's National GHG Inventory

www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=83A34A7A-1

Canadian Environmental Sustainability Indicators

www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=31022B8E-1

5.3 Links to Other Programs

The GHGRP is similar to, yet distinct from, the NPRI. Although both programs are delivered by Environment Canada under the authority of section 46 of CEPA 1999, the NPRI collects data from facilities on pollutant releases (to air, water and land), pollutant disposals and transfers for recycling, whereas the GHGRP collects GHG emissions data from facilities. 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 for requirements that are jurisdiction-specific. Provinces currently using this reporting system include Alberta, British Columbia and Ontario.

6 Contact Us

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

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Telephone: 819-938-3258 (NEW)

Toll-free: 1-877-877-8375

Fax: 819-938-3273 (NEW)

Website: www.ec.gc.ca/ges-ghg

www.ec.gc.ca

Additional information can be obtained at:

Environment Canada

Inquiry Centre

10 Wellington Street, 23rd Floor

Gatineau QC K1A 0H3

Telephone: 1-800-668-6767 (in Canada only) or 819-997-2800

Fax: 819-994-1412

TTY: 819-994-0736

Email: enviroinfo@ec.gc.ca