



Environment  
Canada

Environnement  
Canada

# Facility Greenhouse Gas Emissions Reporting

## Overview of Reported **2012** Emissions

April 2014



Canada 

Cat. No.: En81-6/1-2012E-PDF

Unless otherwise specified, you may not reproduce materials in this publication, in whole or in part, for the purposes of commercial redistribution without prior written permission from Environment Canada's copyright administrator. To obtain permission to reproduce Government of Canada materials for commercial purposes, apply for Crown Copyright Clearance by contacting:

Environment Canada  
Inquiry Centre  
10 Wellington Street, 23rd Floor  
Gatineau QC K1A 0H3  
Telephone: 819-997-2800  
Toll Free: 1-800-668-6767 (in Canada only)  
Fax: 819-994-1412  
TTY: 819-994-0736  
Email: [enviroinfo@ec.gc.ca](mailto:enviroinfo@ec.gc.ca)

Photos: © Photos.com – 2014, Environment Canada

© Her Majesty the Queen in Right of Canada, represented by the Minister of the Environment, 2014

Aussi disponible en français

# Table of Contents

Highlights .....1

1 Facility Greenhouse Gas Emissions Reporting Program .....1

2 Reported 2012 Greenhouse Gas Emissions .....2

3 Trends in Reported GHG Emissions .....7

4 Facility-reported Emissions and the National GHG Inventory ..... 12

5 Additional Information about the GHGRP ..... 14

6 Contact Us ..... 15

## Highlights

- For the 2012 calendar year, 549 facilities reported their greenhouse gas (GHG) emissions to Environment Canada, totalling 257 megatonnes (Mt) of carbon dioxide equivalent (CO<sub>2</sub> eq).<sup>1</sup> The main emission sources contributing to this reported total are stationary fuel combustion and industrial processes, respectively accounting for 75% and 15% of the combined total for carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O).
- Total facility-reported emissions in 2012 remained largely unchanged from the 2011 total of 254 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).
- Since 2005, total emissions from all reporting facilities have decreased overall by 7%. Ontario-based facilities within the Utilities and Manufacturing sectors experienced the largest declines (18 Mt and 9 Mt, respectively) over this eight-year period, while reported emissions increased 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 (37%) of Canada's total GHG emissions in 2012 (699 Mt) and 57% of Canada's industrial GHG emissions as reported in Canada's National Inventory Report.<sup>2</sup> 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 CO<sub>2</sub> eq reporting threshold.

1 Unless explicitly stated otherwise, all emissions data presented in this report are expressed in CO<sub>2</sub> eq units.

2 In this overview report, Canada's industrial GHG emissions include the following GHG categories from the *National Inventory Report 1990–2012: Greenhouse Gas Sources and Sinks in Canada*: Stationary Combustion Sources (except Residential), Other Transportation, Fugitive Sources, Industrial Processes, 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 2012 calendar year. Any facility with annual GHG emissions of 50 kilotonnes (kt) of carbon dioxide equivalent (CO<sub>2</sub> eq) or higher<sup>3</sup> 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 2012. 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 December 5, 2013. Subsequent company updates will be included in future data releases.

The federal reporting requirements for 2013 data, scheduled to be submitted by facilities to Environment Canada by June 1, 2014, are set out in the *Notice with respect to reporting of greenhouse gases (GHGs) for 2013*<sup>4</sup> published in the *Canada Gazette*.

3 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.

4 This Notice can be viewed online at <http://gazette.gc.ca/rp-pr/p1/2013/2013-11-02/html/notice-avis-eng.html>.

## 2 Reported 2012 Greenhouse Gas Emissions

*Note: Unless explicitly stated otherwise, all emissions data presented in this report are expressed in CO<sub>2</sub> eq units.*

A total of 549 facilities reported their GHG emissions to Environment Canada for the 2012 calendar year, collectively emitting a total of 257 megatonnes (Mt) of GHGs.<sup>5</sup> Of these facilities, 313 reported GHG emission levels greater than 100 kt, accounting for 95% of the total reported emissions; and 58 emitted GHGs in quantities higher than 1 Mt, accounting for 63% of the total reported emissions. Fifteen 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; 68 facilities did so this year. Reported emissions from voluntary reporters are included in this report and in the dataset published by Environment Canada.

---

<sup>5</sup> 1 Mt = one million tonnes or one thousand kt.

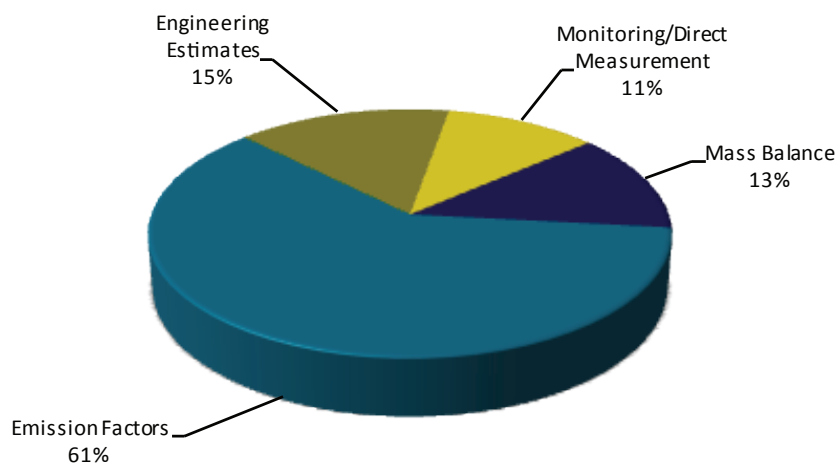
### 2.1 Calculation Methodology

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 1). 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: Types of methods used by facilities**



**Table 1: GHGs and Global Warming Potentials (GWPs)**

Greenhouse Gas	100-year GWP
Carbon dioxide (CO <sub>2</sub> )	1
Methane (CH <sub>4</sub> )	21
Nitrous oxide (N <sub>2</sub> O)	310
Sulphur hexafluoride (SF <sub>6</sub> )	23 900
Hydrofluorocarbons (HFCs), 13 species	Ranges from 140 to 11 700
Perfluorocarbons (PFCs), 7 species	Ranges from 6 500 to 9 200

\* Source: Intergovernmental Panel on Climate Change 2nd Assessment Report for Working Group I: The Science of Climate Change [http://www.ipcc.ch/publications\_and\_data/publications\_and\_data\_reports.shtml]

## 2.2 Reported GHG Emissions by Gas and by Source

CO<sub>2</sub> represented the majority of the total reported emissions (94%), while methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) emissions each contributed an additional 4% and 1%, respectively. Facilities are also required to report emissions of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF<sub>6</sub>), stemming from industrial processes or industrial product use; the combined emissions of these gases accounted for the remaining 1%.

GHG emissions are often calculated and reported in terms of how much CO<sub>2</sub> would be required to produce a similar warming effect over a specific time horizon. This is called the CO<sub>2</sub> eq value and is calculated by multiplying the amount of the gas by its associated global warming potential (GWP) (Table 1).<sup>6</sup> For example, the GWP for CH<sub>4</sub> is 21, which means that each tonne of CH<sub>4</sub> emitted to the atmosphere is considered to have a cumulative warming effect over the next 100 years equivalent to emitting 21 tonnes of CO<sub>2</sub>.

When reporting to the GHGRP, facilities are required to report emissions of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O according to the following eight source categories<sup>7</sup>: 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 75% of the total reported emissions (Figure 3). 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).

## 2.3 Reported GHG Emissions by Province/Territory

Facilities in Alberta accounted for the largest share of reported emissions, with approximately 49% of the total, followed by Ontario with 19%. Next were Saskatchewan and Quebec, which accounted for 9% and 8% of reported emissions, respectively (Table 2).

## 2.4 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

<sup>6</sup> GHGs are not equal in their effect on the atmosphere. Each GHG has a unique average atmospheric lifetime and heat-trapping potential. The GWPs used by the GHGRP are consistent with those used in Canada's national GHG inventory. A complete list of GWPs is found in the *Notice with respect to reporting of greenhouse gases (GHGs) for 2012*.

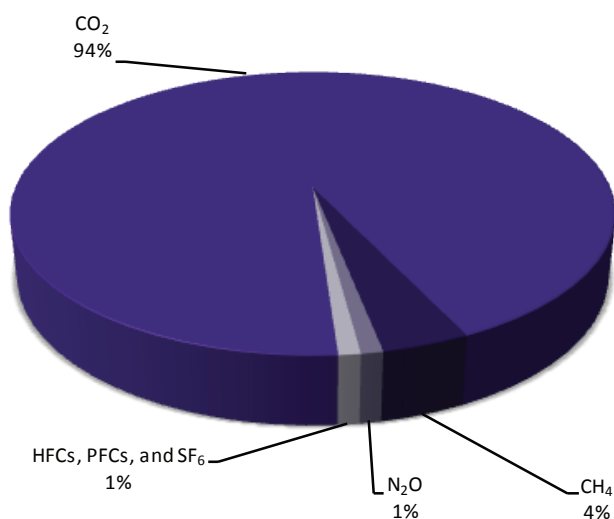
<sup>7</sup> Additional information on these emission source categories can be found in the *Technical Guidance on Reporting Greenhouse Gas Emissions*, available at [www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=47B640C5-1](http://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=47B640C5-1).

**Table 2: Reported 2012 GHG emissions by province/territory**

Province/Territory	Number of Facilities	Total Emissions (kt CO <sub>2</sub> eq)	Percentage of Total Emissions
Newfoundland and Labrador	8	4 405	2%
Prince Edward Island	1	53	0.02%
Nova Scotia	11	8 822	3%
New Brunswick	13	6 421	2%
Quebec	79	20 569	8%
Ontario	143	49 909	19%
Manitoba	12	1 897	1%
Saskatchewan	40	23 459	9%
Alberta	162	126 371	49%
British Columbia	75	14 225	6%
Northwest Territories	4	549	0.2%
Nunavut	2	203	0.1%
<b>Total</b>	<b>549</b>	<b>256 883</b>	

Note: Totals may not add up due to rounding.

**Figure 2: Reported 2012 GHG emissions by gas (257 Mt CO<sub>2</sub> eq)**

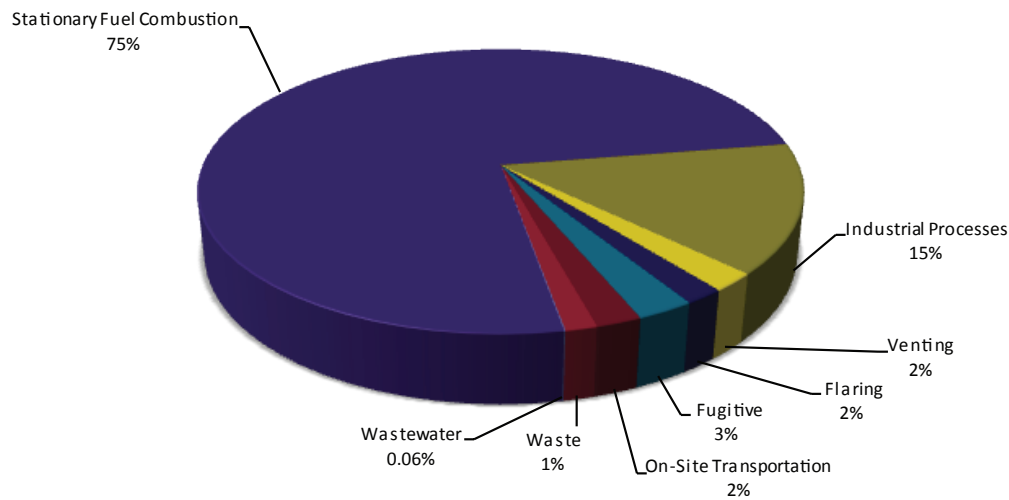
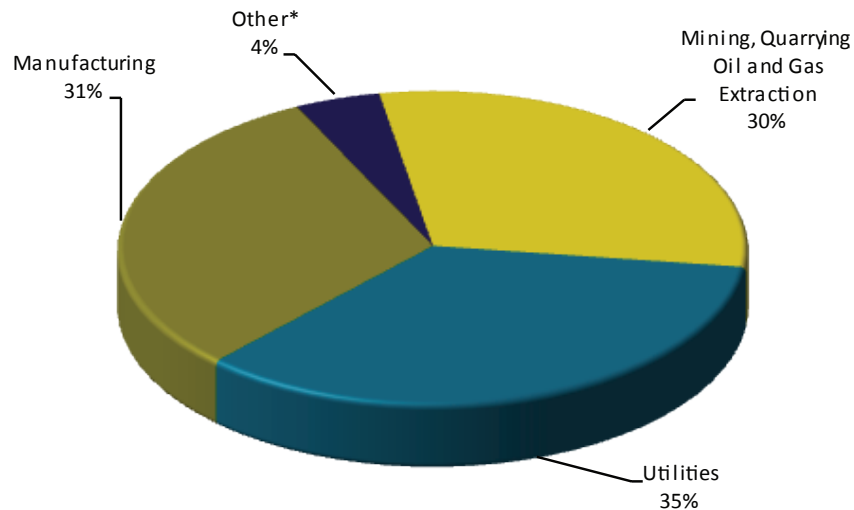


System (NAICS).<sup>8</sup> In 2012, three NAICS-defined industrial sectors accounted for the majority of GHG emissions: Utilities, primarily those generating electricity from fossil fuels, representing 35% (90 Mt); Manufacturing, accounting for 31% (79 Mt); and Mining, Quarrying, and Oil and Gas

Extraction, accounting for 30% (77 Mt) (Figure 4). Further breakdowns of the reported emissions from these main-sectors are provided in figures 5 to 6. The remaining 4% (11 Mt) of emissions captured under “Other” were reported by various types of facilities, mainly stemming from natural gas transportation pipelines (6 Mt) and solid waste landfills (4 Mt). Virtually all of the emissions (98%, i.e. 88 Mt) under the Utilities Sector are from Electric Power Generation, Transmission and Distribution.

<sup>8</sup> 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 which 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 3: Reported 2012 GHG emissions by source (CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O included)****Figure 4: Reported 2012 GHG emissions by industry sector (257 Mt CO<sub>2</sub> eq)**

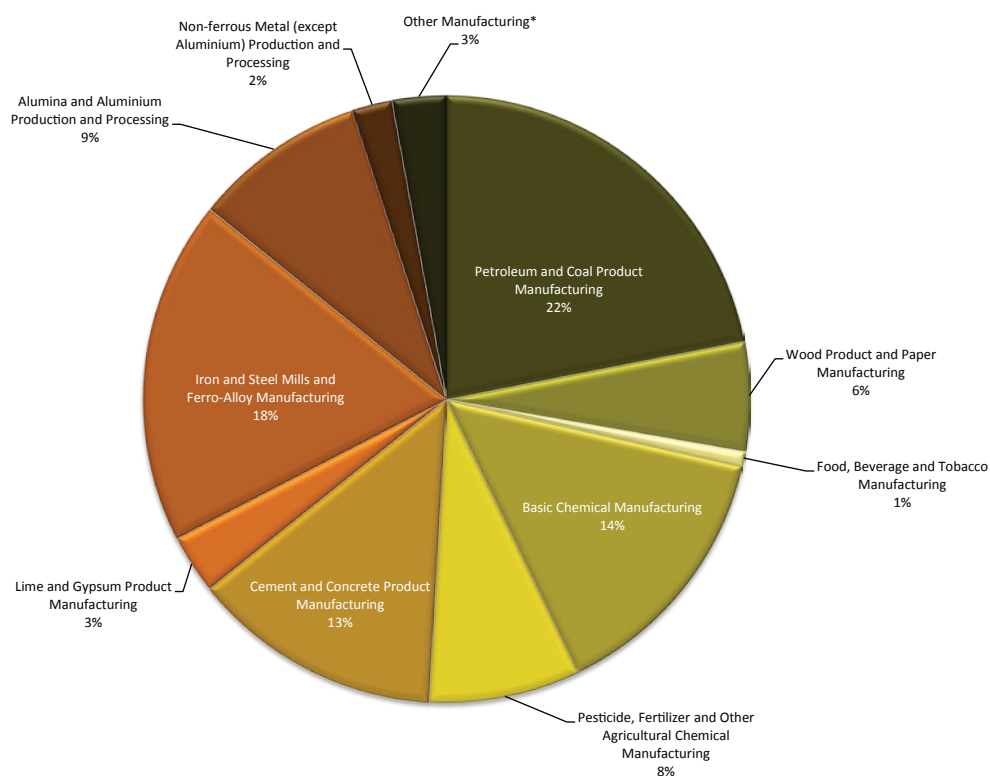
\* "Other" includes various types of facilities such as natural gas transportation pipelines, solid waste landfills, airports, universities, hospitals and public administration buildings.

The Manufacturing sector (Figure 5) 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 6) 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).

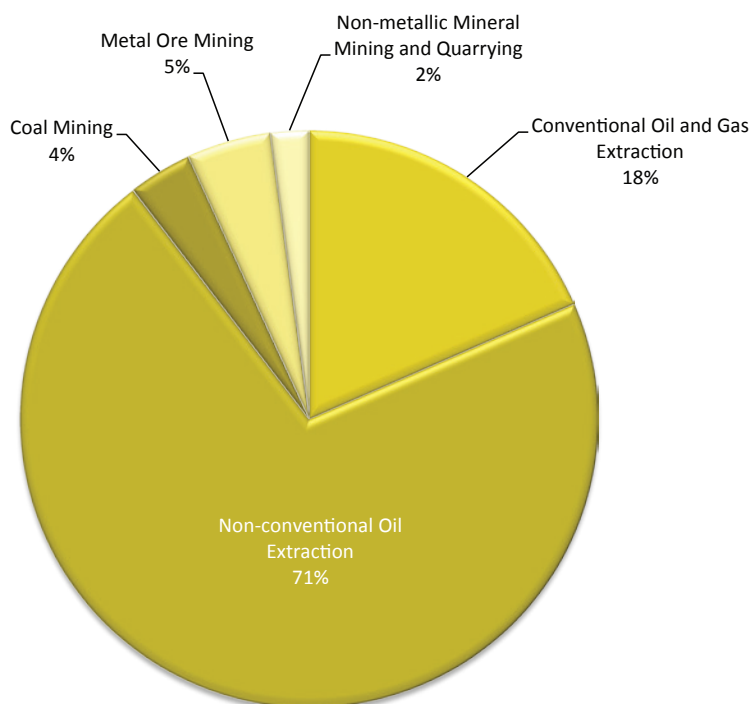


**Figure 5: Reported 2012 GHG emissions by subsectors of Manufacturing (79 Mt CO<sub>2</sub> eq)**



\*"Other Manufacturing" represents other types of manufacturing including Electrical Equipment, Transportation Equipment, Furniture Manufacturing.

**Figure 6: Reported 2012 GHG emissions by subsectors of Mining, Quarrying, Oil and Gas Extraction (77 Mt CO<sub>2</sub> eq)**



## 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 CO<sub>2</sub> 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 2005–2012 period, the number of facilities reporting increased from 337 in 2005 to 549 in 2012 (Table 3). Since 2009, facilities with emissions under 100 kt have contributed annually, on average, 5% to the overall reported emission total. This, however, did not contribute significantly to the observed changes in emissions at the national and provincial/territorial levels, as the emissions from these facilities are small in magnitude.

### 3.1 Overall National-level Trends

The overall GHG emission totals from all facilities that reported across Canada over the period 2004 to 2012 are presented in Table 3. Total reported emissions in 2012, at 257 Mt, were largely unchanged from the 2011 total

of 254 Mt.<sup>9</sup> This reflects a similar trend in recent years (i.e. since 2009), in which the overall total remained relatively steady with only minor interannual variability. Over the 2005–2012 period, total facility-reported emissions decreased by 7% (19 Mt), from 276 Mt to 257 Mt.

## 3.2 Provincial/Territorial Trends

### 3.2.1 Short-term Changes

Facility-reported GHG emissions, aggregated by province and territory, are summarized in Table 4. Emissions in recent years (2009–2012) showed no discernible trends for Quebec, Manitoba, Newfoundland and Labrador, Saskatchewan and British Columbia. The 1-Mt increase for Saskatchewan in 2012 is largely attributable to emission increases from Fossil-Fuel Electric Power Generation and the Non-Conventional Oil Extraction subsectors.

Except for 2010, the overall reported emission level from Ontario-based facilities remained essentially unchanged since 2009. The brief surge of emissions in Ontario for 2010 was mainly driven by a 4.5-Mt emission increase in Fossil-Fuel Electric Power Generation and a 2-Mt increase in the Manufacturing sector. Total emissions subsequently declined in 2011 by 7.2 Mt, largely a result of a 7.6-Mt decrease in emissions from Fossil-Fuel Electric Power Generation.

Alberta experienced a steady increase in overall emissions year over year since 2009. The net increase of 3 Mt from

<sup>9</sup> A number of facilities submitted 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.

**Table 3: Total facility-reported emissions, 2004–2012**

	2004	2005	2006	2007	2008	2009*	2010	2011	2012
Number of facilities	326	337	345	352	351	536	540	543	549
GHG emissions (kt CO <sub>2</sub> eq)	276 960	276 298	270 226	275 827	262 027	251 346	262 283	254 286	256 883
Annual change (%)	NA	NA	-2%	2%	-5%	-4%	4%	-3%	1%
Change since 2005 (%)	NA	NA	-2%	-0.2%	-5%	-9%	-5%	-8%	-7%

Note:

\* Reporting threshold changed in 2009.

NA = not applicable.

**Table 4: Reported GHG emissions by province/territory, 2004–2012**

Province/ Territory	2004	2005	2006	2007	2008	2009	2010	2011	2012
Newfoundland and Labrador	5 369	5 349	4 953	5 427	5 273	4 378	4 546	4 255	4 405
Prince Edward Island	107	104	100	102	99	74	63	65	53
Nova Scotia	11 798	11 769	10 822	11 415	11 104	10 773	10 602	9 869	8 822
New Brunswick	12 977	12 651	10 228	10 902	10 284	10 118	8 228	7 854	6 421
Quebec	23 334	22 131	22 308	23 373	20 002	20 358	20 667	20 202	20 569
Ontario	76 871	78 486	71 167	73 932	67 000	49 725	56 295	49 038	49 909
Manitoba	2 461	2 816	2 438	2 402	2 367	2 132	1 891	2 031	1 897
Saskatchewan	22 017	22 474	21 975	22 930	21 885	22 426	22 799	22 465	23 459
Alberta	107 192	106 398	113 381	112 002	110 297	117 525	122 677	123 387	126 371
British Columbia	14 469	13 762	12 536	12 821	13 182	13 247	13 837	14 366	14 225
Northwest Territories	366	359	319	521	534	590	545	554	549
Nunavut	-	-	-	-	-	-	135	199	203
<b>Total</b>	<b>276 960</b>	<b>276 298</b>	<b>270 226</b>	<b>275 827</b>	<b>262 027</b>	<b>251 346</b>	<b>262 283</b>	<b>254 286</b>	<b>256 883</b>

Alberta facilities between 2011 and 2012 is largely due to an increase in emissions from Non-conventional Oil Extraction (5.7 Mt), lessened by a decrease from Fossil-Fuel Electric Power Generation of 2.5 Mt and a number of smaller decreases in other sectors.

For New Brunswick and Nova Scotia, total emissions from reporting facilities in both provinces exhibited a general downward trend between 2009 and 2012. The subsector contributing the most to this overall decline was Fossil-Fuel Electric Power Generation, with emission decreases of 3.5 Mt in New Brunswick and 1.8 Mt in Nova Scotia since 2009.

### 3.2.2 Long-term Trends

The provincial/territorial long-term trend (i.e. since 2005) for all reporting facilities shows an overall decline in facility-reported emissions for seven of the provinces and territories (Figure 7). Utilities were largely responsible for this decline, with emission reductions of 18 Mt in Ontario and 5.7 Mt in New Brunswick over the period. Ontario also saw a decrease of 9 Mt in emissions from the Manufacturing sector. Nova Scotia and Quebec showed overall decreases in emissions of 3 Mt and 1.6 Mt, respectively, over the long term, with facilities in the Utilities sector in Nova Scotia and the Manufacturing sector in Quebec contributing the most to these provincial changes. Manitoba,

Newfoundland and Labrador, and Prince Edward Island had smaller decreases in emissions, ranging from 0.05 to 0.9 Mt.

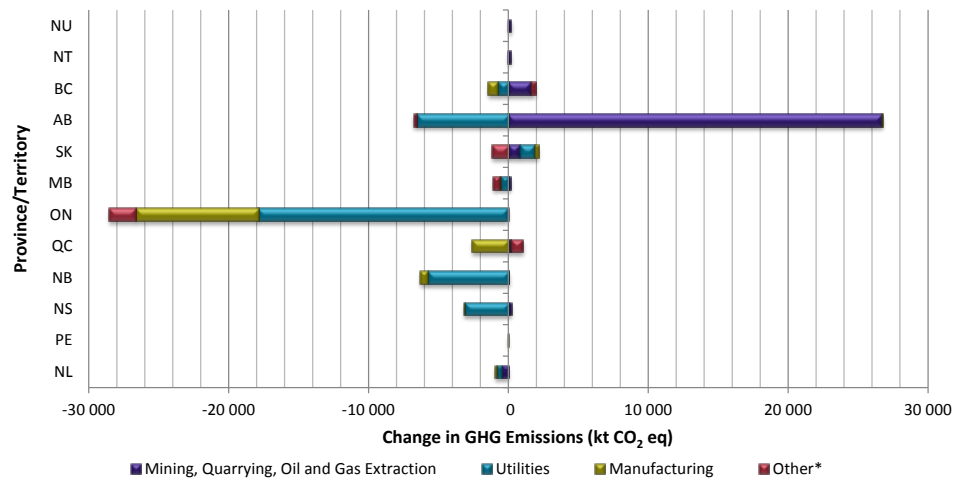
Alberta had a 20-Mt net increase in emissions, largely attributable to an increase in the Mining, Quarrying, and Oil and Gas Extraction sector. Saskatchewan exhibited a minor overall emission increase of 1 Mt, led by facilities in the Utilities sector. British Columbia, the Northwest Territories and Nunavut showed overall increases in facility-reported emissions, ranging from 0.2 to 0.5 Mt.

## 3.3 Industry Sector Trends

A summary of facility-reported GHG emissions (disaggregated by NAICS industry sector), over the period 2004 to 2012, is presented in Table 5. 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

The 10 industrial subsectors showing the largest changes in emissions between 2011 and 2012 are displayed in Figure 8. Facilities within these subsectors account

**Figure 7: Provincial/territorial long-term change, 2005–2012**

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

for just over 75% of the total 2012 emissions. The Non-conventional Oil Extraction subsector led overall changes, with an increase in emissions of 6 Mt, driven by a 4% increase in synthetic crude oil production and a 17.5% increase in non-upgraded crude bitumen production.<sup>10</sup> Fossil-Fuel Electric Power Generation reported a net decrease in emissions at 3.6 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 hydro-, nuclear- and other renewable-electric generation plants.<sup>11</sup> Cement production experienced a very slight growth in emissions of approximately 0.4 Mt, indicating increased demand in the construction market. Facilities within the Iron and Steel Mills and Ferro-Alloy Manufacturing and Non-ferrous Metal (except Aluminium) Smelting and Refining subsectors experienced marginal emission increases, attributed to the continuous recovery of these industries from the 2008–2009 market slowdown.

Changes between 2011 and 2012 are generally consistent with observed trends since 2009, such as the sustained emission increase in the Mining, Quarrying, and Oil and Gas Extraction sector (an increase of 15 Mt over the period) and, to a lesser extent, the Manufacturing sector (5-Mt increase); likewise, facility emissions within the Utilities sector experienced a continued decline since 2009 (13 Mt).

### 3.3.2 Long-term Trends

The long-term trend in reported emissions by NAICS<sup>8</sup> 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 9). 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 2012, emissions from the Utilities sector have fallen significantly as a result of a reduction in electricity production from fossil fuel (particularly coal) generation, with greater reliance being placed on hydro, nuclear and renewable sources of generation.<sup>12</sup> 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 since 2005, largely dominated by the 6-Mt reduction from natural gas transportation pipelines.

One of the industry subsectors illustrating the largest change in emissions from 2005 to 2012 is Fossil Fuel Electric Power Generation, with a 36-Mt decline (Figure 10). As noted, a major factor contributing to this

<sup>10</sup> [AER] Alberta Energy Regulator. 2013. Alberta's Energy Reserves 2012 and Supply/Demand Outlook 2013–2022: ST98-2013. Available online at [www.aer.ca/data-and-publications/statistical-reports/st98](http://www.aer.ca/data-and-publications/statistical-reports/st98).

<sup>11</sup> Statistics Canada CANSIM 2005–2012 Table 127-0006: Electricity generated from fuels, by electric utility thermal plants (annual).

<sup>12</sup> Statistics Canada CANSIM 2005–2012 Table 127-0007: Electric power generation, by class of electricity producer (annual).

**Table 5: Reported GHG emissions by NAICS industry sector, 2004-2012**

NAICS <sup>a</sup> Industry Sector	2004	2005	2006	2007	2008	2009 <sup>b</sup>	2010	2011	2012
<i>(Units: Mt CO<sub>2</sub> eq)</i>									
<b>Total<sup>c</sup></b>	<b>277</b>	<b>276</b>	<b>270</b>	<b>276</b>	<b>262</b>	<b>251</b>	<b>262</b>	<b>254</b>	<b>257</b>
<b>21 - Mining, Quarrying, and Oil and Gas Extraction</b>	<b>48</b>	<b>47</b>	<b>52</b>	<b>55</b>	<b>55</b>	<b>62</b>	<b>68</b>	<b>71</b>	<b>77</b>
Conventional oil and gas extraction	14	14	14	13	12	15	14	15	14
Non-conventional oil extraction <sup>d</sup>	29	28	33	35	36	42	47	49	55
Coal mining	1	2	2	2	2	2	3	3	3
Metal ore mining	3	3	3	3	3	3	4	3	4
Non-metallic mineral mining and quarrying	1	1	1	1	1	1	1	2	2
<b>22 - Utilities</b>	<b>121</b>	<b>123</b>	<b>116</b>	<b>121</b>	<b>113</b>	<b>103</b>	<b>106</b>	<b>94</b>	<b>90</b>
Electric power generation	120	122	115	120	112	101	103	92	88
Natural gas distribution	1	1	1	1	1	2	2	2	2
Water, sewage and other systems <sup>e</sup>					0.11	1	0.44	0.47	0.51
<b>31-33 Manufacturing</b>	<b>96</b>	<b>92</b>	<b>89</b>	<b>87</b>	<b>83</b>	<b>74</b>	<b>77</b>	<b>78</b>	<b>79</b>
Food and beverages	0.24	0.34	0.23	0.23	0.22	1	1	1	1
Wood products						0.14	0.15	0.13	0.13
Paper	7	5	4	5	4	4	4	4	4
Petroleum and coal products	21	20	20	20	19	19	18	17	17
Basic chemical manufacturing	15	14	12	12	13	11	11	12	11
Resin, synthetic rubber, synthetic fibres and filaments	0.09	0.07				0.21	0.22	0.20	0.20
Pesticide, fertilizer, other agricultural chemicals	7	6	6	6	6	5	6	6	6
Cement and concrete products	13	13	13	13	12	9	10	10	11
Lime and gypsum product manufacturing	3	3	3	3	3	2	2	2	2
Iron and steel mills and ferro-alloys	18	17	17	17	17	11	14	14	15
Primary production of alumina and aluminium	9	9	9	9	9	8	8	8	7
Non-ferrous metal (except alum.) smelting and refining	4	3	3	2	2	2	1	2	2
Other manufacturing <sup>f</sup>	1	1	1	1	0.40	1	2	2	2
<b>Other<sup>g</sup></b>	<b>12</b>	<b>14</b>	<b>13</b>	<b>13</b>	<b>11</b>	<b>12</b>	<b>11</b>	<b>11</b>	<b>11</b>
Pipeline transportation of natural gas	10	12	11	10	8	7	6	6	6
Support activities for air transportation			0.12	0.13	0.09	0.10	0.07	0.07	0.06
Waste management and remediation services	1	2	3	3	3	4	4	4	4
Institutional facilities			0.02			0.38	0.50	0.52	0.60

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.

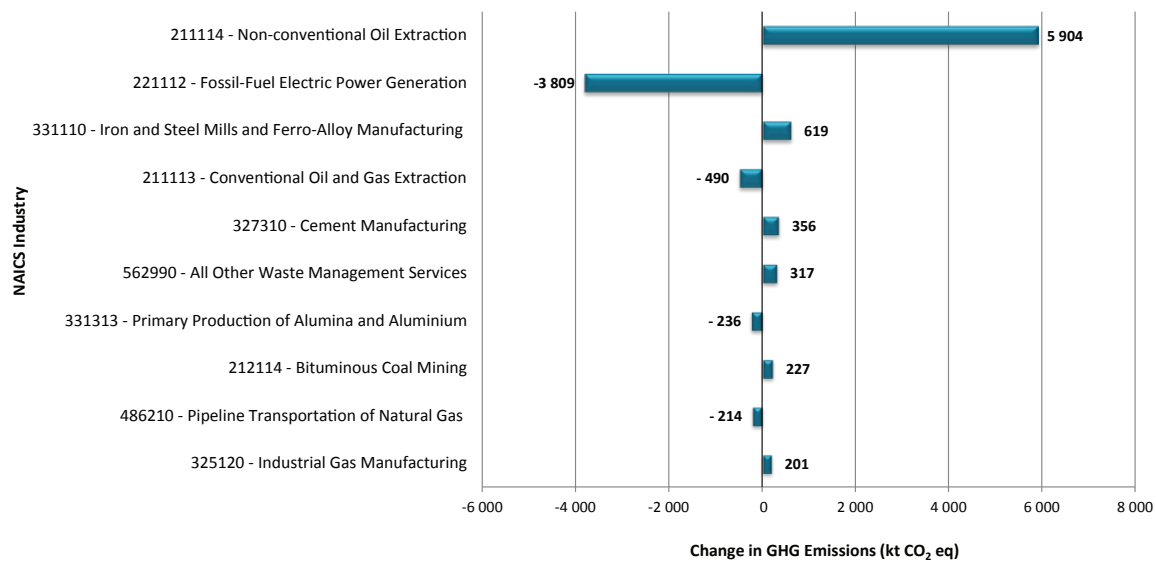
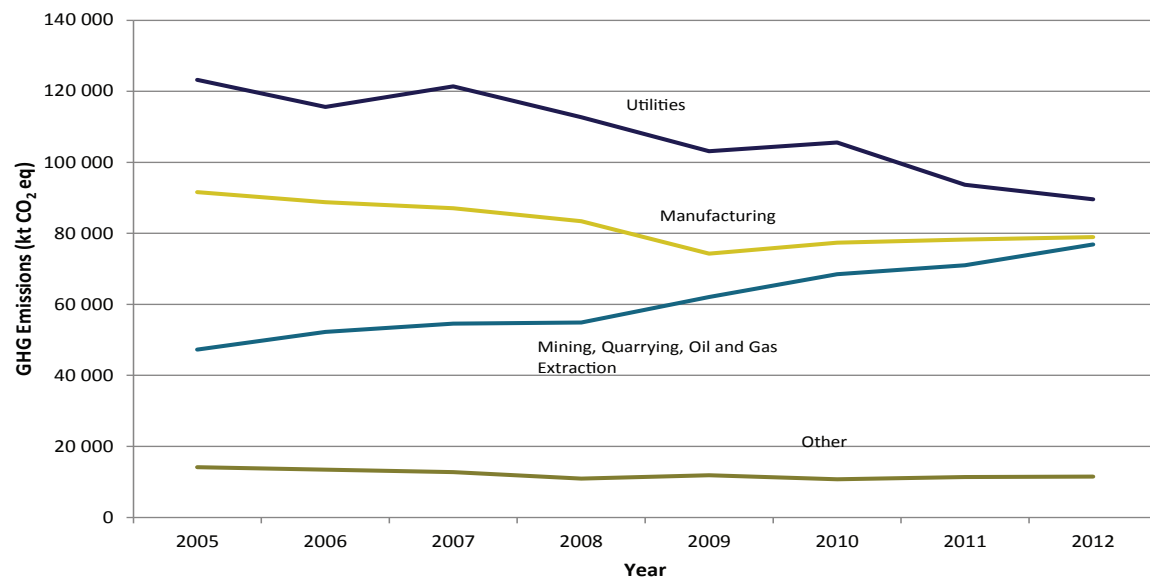
c. Totals may not add up due to rounding.

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).

**Figure 8: Top 10 short-term changes by NAICS industry subsector, 2011-2012****Figure 9: Long-term sectoral trend, 2005-2012**

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.

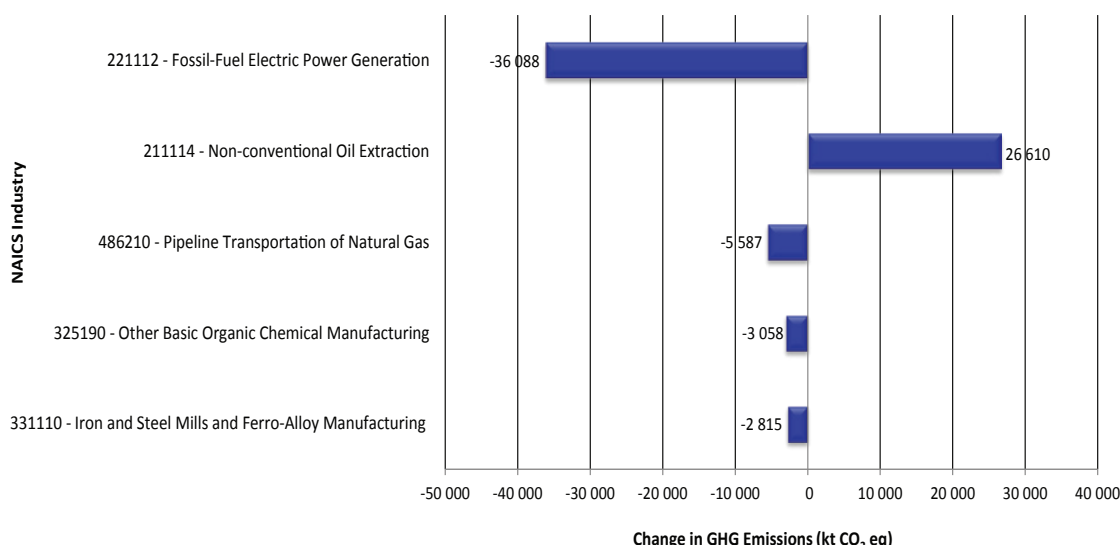
The Non-conventional Oil Extraction subsector (including oil sands mining, in-situ bitumen production and upgrading) showed the largest overall increase in emissions (27 Mt) since 2005, reflecting this sector's steady growth trend (Table 5). Over the 2005 to 2012 period,

non-upgraded bitumen and synthetic crude oil production increased by 107% and 64%, respectively.<sup>13</sup>

Reported emissions from natural gas transportation pipelines decreased by 6 Mt from 2005 to 2012, due to

<sup>13</sup> Energy Resources Conservation Board. 2012. Alberta's Energy Reserves 2011 and Supply/Demand Outlook 2012-2021: ST98-2012. June 2012. Available online at <http://www.aer.ca/data-and-publications/statistical-reports/st98>.

**Figure 10: Top five long-term changes by NAICS industry subsector, 2005–2012**



a 32% reduction in natural gas throughput volumes.<sup>14</sup> Emissions reported by iron and steel production facilities and other basic organic chemical manufacturing<sup>15</sup> have also declined over the same period, by 3 Mt each; this is attributable to reduced production levels due to reduction in demand and plant shutdowns, respectively.

## 4 Facility-reported Emissions and the National GHG Inventory

The total facility-reported GHG emissions for 2012 collected under the GHGRP represent just over one third (37%) of Canada's total GHG emissions in 2012 (699 Mt) and over half (57%) of Canada's industrial GHG emissions,<sup>16</sup> as reported in Canada's latest National Inventory Report (NIR).<sup>17</sup> Importantly, 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 11). 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 57% of industrial GHG emissions nationally, the degree of coverage at the provincial level varies significantly from province to province (Figure 12), depending on the size and number of industrial facilities in each province that have emissions above the 50-kt CO<sub>2</sub> 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.

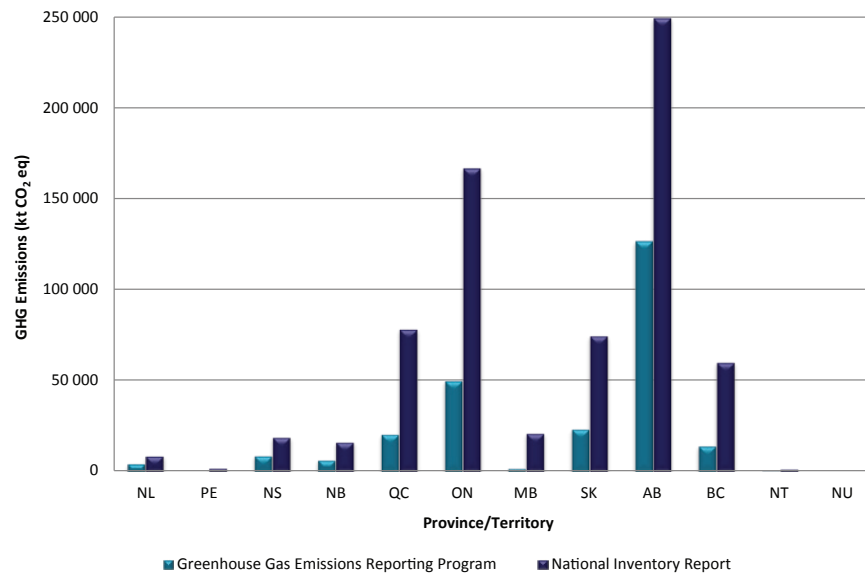
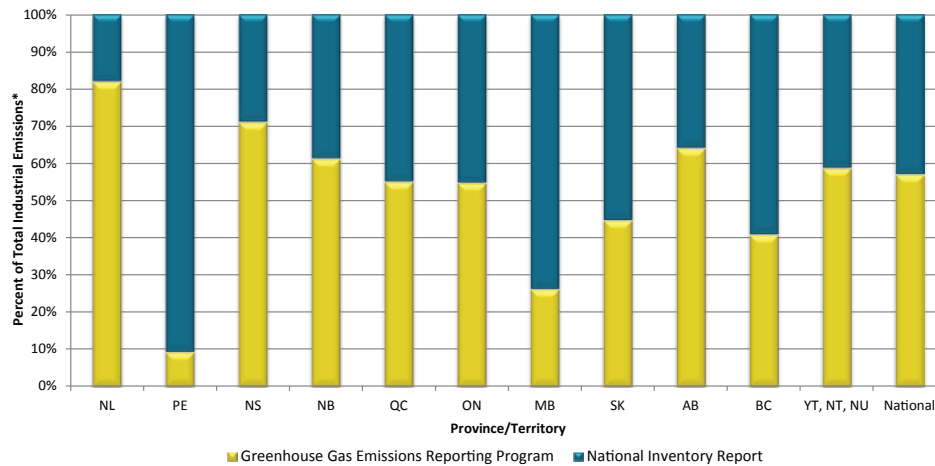
<sup>14</sup> Source: Statistics Canada, CANSIM Table 129-0001.

<sup>15</sup> This is a subsector under the broader NAICS industry group Basic Chemical Manufacturing.

<sup>16</sup> In this overview report, Canada's industrial GHG emissions include the following GHG categories from the *National Inventory Report 1990–2012: Greenhouse Gas Sources and Sinks in Canada*: Stationary Combustion Sources (except Residential), Other Transportation, Fugitive Sources, Industrial Processes and Waste.

<sup>17</sup> Canada's latest NIR, the *National Inventory Report 1990–2012: Greenhouse Gas Sources and Sinks in Canada*, is available at [www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=83A34A7A-1](http://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=83A34A7A-1).



**Figure 11: Provincial/territorial contribution to 2012 facility-reported (GHGRP) total and NIR total****Figure 12: 2012 Facility-reported emissions as a percentage of national and provincial/territorial industrial GHG emissions\* (from the NIR)**

\* In this overview report, Canada's industrial GHG emissions include the following GHG categories from the *National Inventory Report 1990–2012: Greenhouse Gas Sources and Sinks in Canada*: Stationary Combustion Sources (except Residential), Other Transportation, Fugitive Sources, Industrial Processes 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 are required to submit a Statement of Certification, signed by an authorized official, stating that the information contained in the emission report is accurate and complete, to the best of their knowledge. 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 GHG Inventory program, consult the following websites:

### *Reported facility GHG data*

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

Greenhouse Gas Emissions Reporting  
Program (GHGRP)

Email: [ges-ghg@ec.gc.ca](mailto:ges-ghg@ec.gc.ca)

Telephone: 819-994-0684

Toll free: 1-877-877-8375

Fax: 819-953-2347

Website: [www.ec.gc.ca/ges-ghg/](http://www.ec.gc.ca/ges-ghg/)

**[www.ec.gc.ca](http://www.ec.gc.ca)**

Additional information can be obtained at:

Environment Canada

Inquiry Centre

10 Wellington Street, 23<sup>rd</sup> 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](mailto:enviroinfo@ec.gc.ca)