

# 2014 GHGRP DATA HIGHLIGHTS

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## GHGRP 2014: Reported Data

For reporting year (RY) 2014, over 8,000 facilities and suppliers reported to the greenhouse gas reporting program. Among these reporters,

- 8,080 facilities in nine industry sectors reported direct emissions
- Reported direct emissions totaled 3.20 billion metric tons carbon dioxide equivalent (CO<sub>2</sub>e), about half of total U.S. greenhouse gas emissions.
- 957 suppliers reported
- 92 facilities reported injecting CO<sub>2</sub> underground

All greenhouse gas data presented here reflect the information reported to EPA as of 08/18/2014. The reported emissions **exclude biogenic CO<sub>2</sub> unless otherwise noted and use the Global Warming Potentials from the [IPCC's Fourth Assessment Report](#).**

Summary GHGRP data has been broken into several sections. Click the links below to expand each section.

### Greenhouse Gas Reporting Program Background

As directed by Congress, EPA's Greenhouse Gas Reporting Program (GHGRP) collects annual greenhouse gas information from the top emitting sectors of the U.S. economy (Table 1). The GHGRP is the only dataset containing facility-level greenhouse gas (GHG) emissions data from major industrial sources across the United States. With three years of reporting for most sectors, GHGRP data are providing important new information on industrial emissions—showing variation in emissions across facilities within an industry, variation in industrial emissions across geographic areas, and changes in emissions over time at the sector and facility level. EPA is using this facility-level data to improve estimates of national greenhouse gas emissions, including using it to improve the [U.S. Greenhouse Gas Inventory](#). The data are also being used to inform regulatory actions and voluntary emission reduction efforts.

This document summarizes national industrial sector emissions and trends.

**Table 1: GHGRP Sector Classifications**

Industry Sector	Number of Reporters	Emissions (million metric tons CO <sub>2</sub> e)
<a href="#">Power Plants</a>	1,544	2,101.1
<a href="#">Petroleum and Natural Gas Systems</a>	2,350	236.1
Onshore Petroleum & Nat. Gas Prod.	523	102.7
Offshore Petroleum & Nat. Gas Prod.	128	6.8
Natural Gas Processing	464	59.6
Natural Gas Trans./Compression	520	22.4
Underground Natural Gas Storage	53	1.8
Natural Gas Local Distribution Co.	181	14.8
Liquefied Natural Gas Imp./Exp. Eq.	8	0.6
Liquefied Natural Gas Storage	5	**
Other Petroleum & Nat. Gas Systems	488	27.5

Industry Sector	Number of Reporters	Emissions (million metric tons CO <sub>2</sub> e)
<b><u>Refineries</u></b>	141	174.9
<b><u>Chemicals</u></b>	460	176.5
Non-Fluorinated Chemicals		
Adipic Acid Production	3	7.2
Ammonia Manufacturing	23	24.2
Hydrogen Production	107	44.0
Nitric Acid Production	34	11.2
Petrochemical Production	65	54.1
Phosphoric Acid Production	12	1.7
Silicon Carbide Production	1	0.1
Titanium Dioxide Production	7	2.5
Other Chemicals Production	217	20.1
Fluorinated Chemicals		
Fluorinated GHG Production	15	6.3
HCFC-22 Prod./HFC-23 Dest.	4	5.0
<b><u>Waste</u></b>	1,620	112.8
Industrial Waste Landfills	178	9.1
Municipal Landfills	1,233	91.5
Solid Waste Combustion	67	9.9
Wastewater Treatment	149	2.3
<b><u>Metals</u></b>	300	103.4
Aluminum Production	10	5.9
Ferrous Alloy Production	10	2.1
Iron and Steel Production	127	82.9
Lead Production	12	1.1
Magnesium Production	10	1.2
Zinc Production	6	0.7
Other Metals Production	125	9.6
<b><u>Minerals</u></b>	381	117.4
Cement Production	95	67.6
Glass Production	110	8.1
Lime Manufacturing	76	31.7
Soda Ash Manufacturing	4	5.4
Other Minerals	98	4.6
<b><u>Pulp and Paper</u></b>	233	39.1
Pulp and Paper Manufacturing	110	27.1
Other Paper Producers	123	12.0
<b><u>Other</u></b>	1,428	142.4
Food Processing	331	31.5

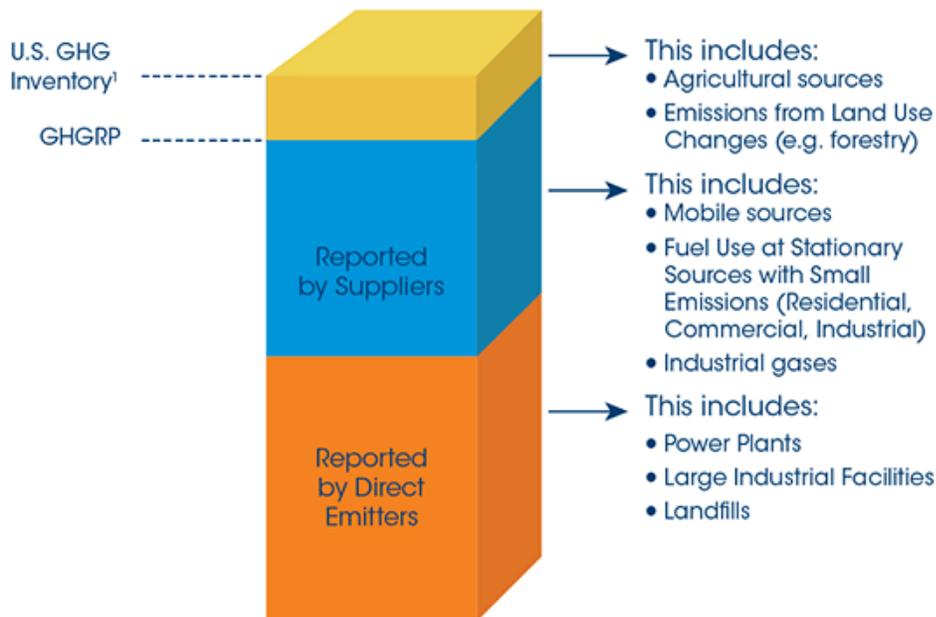
Industry Sector	Number of Reporters	Emissions (million metric tons CO <sub>2</sub> e)
Ethanol Production	172	18.3
Manufacturing	295	16.9
Universities	112	9.5
Military	43	2.5
Other	172	11.5
Underground Coal Mines	128	43.2
Electronics Manufacturing	52	5.7
Electrical Equipment Manufacturers	7	0.2
Electrical Equipment Use	116	3.1

\*\* Total reported emissions are less than 0.05 million metric tons CO<sub>2</sub>e.

The GHGRP does not represent total U.S. GHG emissions, but provides facility level data for large sources of direct emissions, thus including the majority of U.S. GHG emissions. The GHGRP data collected from direct emitters represent about half of all U.S. emissions. When including greenhouse gas information reported by suppliers to the GHGRP, emissions coverage reaches approximately 85–90% (See Figure 1). The [Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013](#) contains information on all GHG emissions sources and sinks in the United States.

[Learn more](#) about the differences between the Inventory and the GHGRP.

## GHGRP Covers the Majority of U.S. GHG Emissions



<sup>1</sup> Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2012, April 2014.

Suppliers report the quantity of GHGs that would be emitted if the fuels and industrial GHGs that they place into the economy each year are used/released. Reporting by suppliers helps account for the greenhouse gas emissions by the numerous low-emitting sources that are not required to report emissions under the GHGRP (e.g., mobile sources, residential sources). [Learn more about suppliers and their 2014 reported data.](#)

**Table 2: Overview of GHG Data Reported (2014)**

<b>Direct emitters</b>	
Number of facilities reported	8,080
Reported direct emissions (billion metric tons CO <sub>2</sub> e)	3.20
<b>Suppliers of fuel and industrial gases</b>	
Number of suppliers	957
<b>Underground injection of carbon dioxide</b>	
Number of carbon dioxide injection facilities	92

**Who reports?**

For 2014, 8,080 direct emitters submitted a GHG report. The Petroleum and Natural Gas Systems sector had the largest number of reporting facilities, followed by the Waste Sector and the Power Plants Sector. Among suppliers, [suppliers](#) of Natural Gas and Natural Gas Liquids had the largest number of reporting facilities.

**Table 3: Number of Direct Emitters that Reported (2014)**

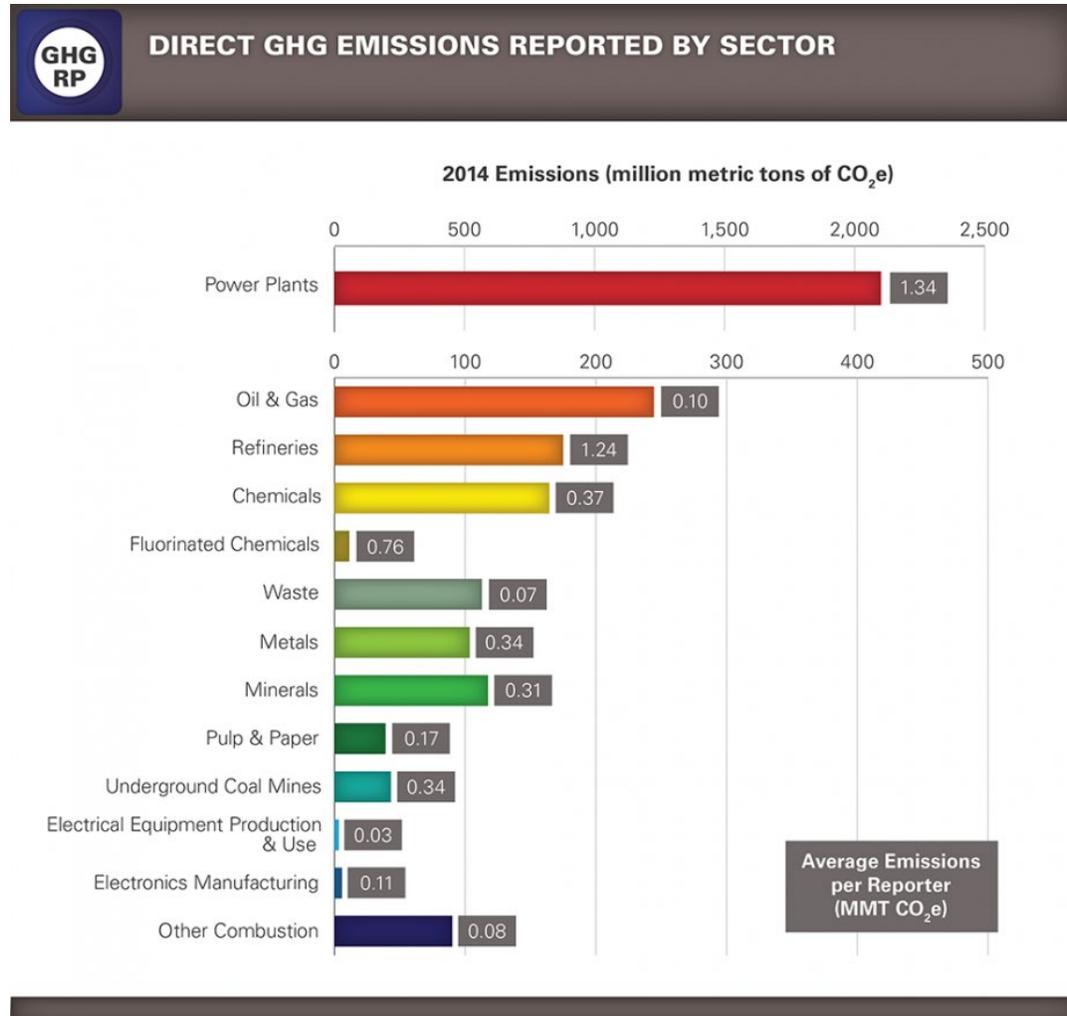
<b>Industry Sector</b>	<b>Number of Reporters<sup>1</sup></b>
Power Plants	1,544
Petroleum and Natural Gas Systems	2,350
Refineries	141
Chemicals	460
• <i>Fluorinated Chemicals</i>	15
• <i>Non-fluorinated Chemicals</i>	445
Waste	1,620
Metals	300
Minerals	381
Pulp and Paper	233
Other	1,428
• <i>Underground Coal Mines</i>	128
• <i>Electrical Equipment Production &amp; Use</i>	123
• <i>Electronics Manufacturing</i>	52
• <i>Other Combustion</i>	1,125

**Reported Emissions**

In 2014, 3.20 billion metric tons CO<sub>2</sub>e were reported by direct emitters. The largest emitting sector was the Power Plant Sector with 2.1 billion metric tons CO<sub>2</sub>e, followed by the Petroleum and Natural Gas Systems Sector with 236 million metric tons (MMT) CO<sub>2</sub>e and the Chemicals Manufacturing Sector with 177 MMT CO<sub>2</sub>e. This information, as well as average emissions per reporter, is shown in the following chart.

<sup>1</sup> Totals sum to more than 8,080 because facilities whose activities fall within more than one sector are counted multiple times.

Figure 2: Direct GHG Emissions Reported by Sector (2014)



[View this information in FLIGHT.](#)

### Emissions Trends

National level trends in greenhouse gas emissions are available through the [Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013](#). The Greenhouse Gas Reporting Program is different from the U.S. GHG Inventory in that it collects information from the largest stationary sources in the U.S. and provides nearly complete emissions coverage for many of the largest emitting industries. Trends in emissions reported for individual industries are discussed in the industry-specific reports.

Total U.S. emissions increased by 2.0% from 2012 to 2013, based on the U.S. GHG Inventory. Between 2012 and 2013, emissions reported to the GHGRP increased by 0.5% (Table 4). This increase was driven by a 0.8% increase in emissions from power plants.

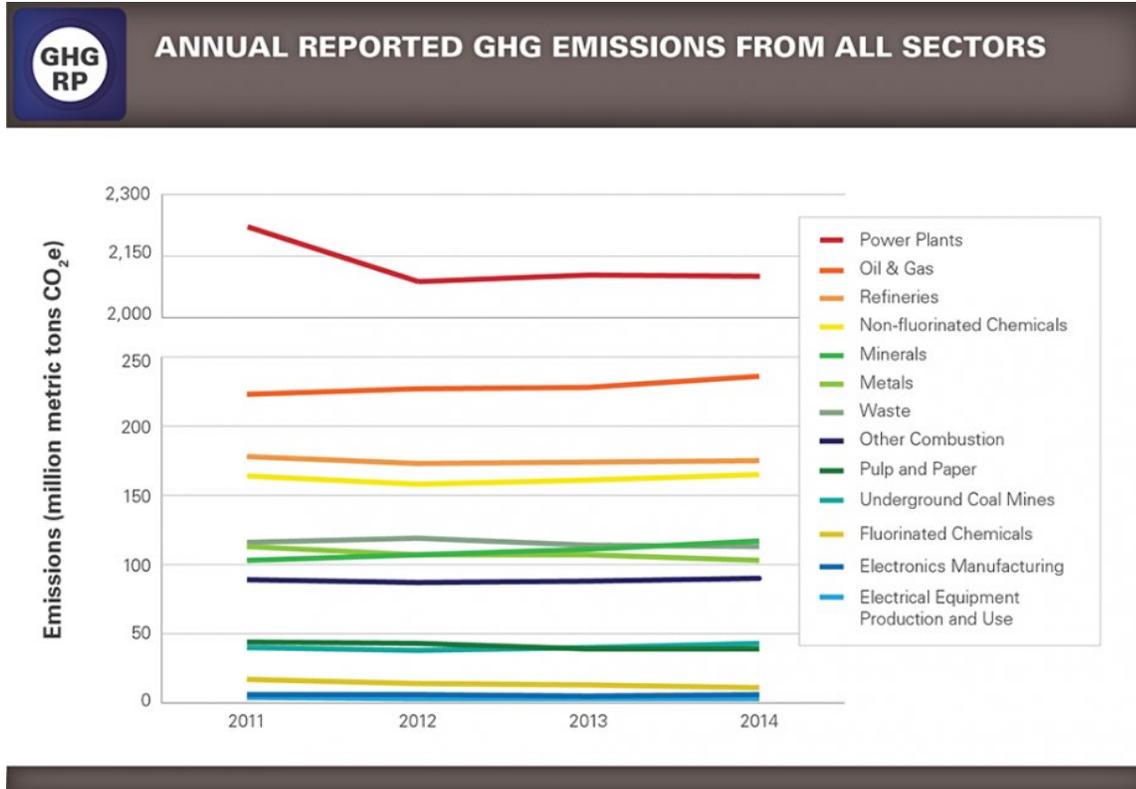
The U.S. GHG Inventory is not yet available for 2014. For sources reporting to the GHGRP, emissions increased by 0.5% from 2013 to 2014; this increase was driven by a 3.5% increase in emissions from the Oil & Gas sector. Over the past four reporting years (2011-2014), GHGRP reported emissions have declined by 3.2%. This decline is caused primarily by a 5.4% decline in reported emissions by power plants. Since 2010, emissions from power plants have decreased by 9.8%.

**Table 4: Emissions Trends for U.S. GHG Inventory and GHGRP (2011-2014)**

Industry Sector	2011	2012	2013	2014
<b>U.S. GHG Inventory</b>				
Total emissions (million metric tons CO <sub>2</sub> e)	6,776.6	6,545.1	6,673.0	Not available
Percent change in emissions from previous year	-1.8%	-3.4%	2.0%	Not available
<b>GHGRP</b>				
Number of direct emitting facilities	7,620	7,861	7,935	8,080
Direct emissions (million metric tons CO <sub>2</sub> e)	3,319.2	3,170.3	3,187.4	3,203.8
Percent change in emissions from previous year	—	-4.5%	0.5%	0.5%

**Table 5: Emission Trends by Sector (2011-2014)**

Sector	2011 Emissions (MMT CO <sub>2</sub> e)	2012 Emissions (MMT CO <sub>2</sub> e)	2013 Emissions (MMT CO <sub>2</sub> e)	2014 Emissions (MMT CO <sub>2</sub> e)
Power Plants	2,221.2	2,088.0	2,103.8	2,101.1
Petroleum and Natural Gas Systems	222.4	226.3	228.2	236.1
Refineries	178.2	172.8	173.5	174.9
Chemicals	180.7	172.4	174.4	176.5
• <i>Fluorinated Chemicals</i>	17.4	14.1	13.1	11.4
• <i>Non-fluorinated Chemicals</i>	163.3	158.3	161.3	165.2
Waste	115.9	119.0	113.8	112.8
Metals	112.8	106.9	106.8	103.4
Minerals	103.2	107.5	111.4	117.4
Pulp and Paper	44.2	42.5	39.1	39.1
Other	140.8	134.8	136.3	142.4
• <i>Underground Coal Mines</i>	40.3	38.0	40.1	43.2
• <i>Electrical Equipment Production &amp; Use</i>	4.3	3.4	3.5	3.3
• <i>Electronics Manufacturing</i>	6.8	6.5	5.0	5.7
• <i>Other Combustion</i>	89.3	87.0	87.7	90.1

Figure 3: Trends in Direct GHG Emissions (2011-2014)<sup>2,3</sup>

[View this information in FLIGHT.](#)

### Emissions by GHG

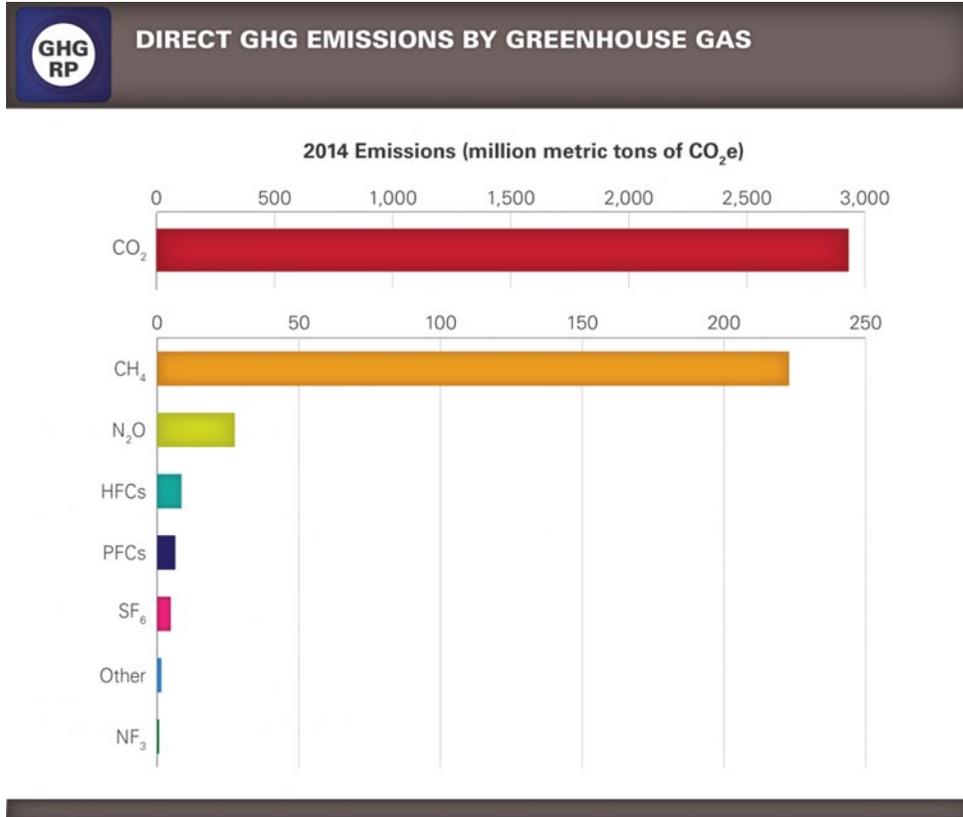
Carbon dioxide is the GHG emitted in the largest quantities. The 2.9 billion metric tons of CO<sub>2</sub> reported for 2014 represent 91.5% of the GHGs reported in 2014.<sup>4</sup> Methane emissions represent 7.0% of reported 2014 GHG emissions, N<sub>2</sub>O represents 0.9%, and fluorinated gases (HFCs, PFCs, SF<sub>6</sub>) represent 0.7% (Figure 4).

<sup>2</sup> Non-fluorinated Chemicals and Fluorinated Chemicals are components of “Chemicals” in FLIGHT.

<sup>3</sup> Other Combustion, Underground Coal Mines, Electronics Manufacturing and Electrical Equipment Production & Use comprise “Other” in FLIGHT.

<sup>4</sup> The Inventory of U.S. Greenhouse Gas Emissions And Sinks for 2014 is not yet available. In 2013, CO<sub>2</sub> represented 83% of total U.S. GHG emissions.

Figure 4: Direct Emissions by GHG (2014)



The table below lists the primary sectors emitting each GHG.

Table 6: Largest Sources of GHG Emissions

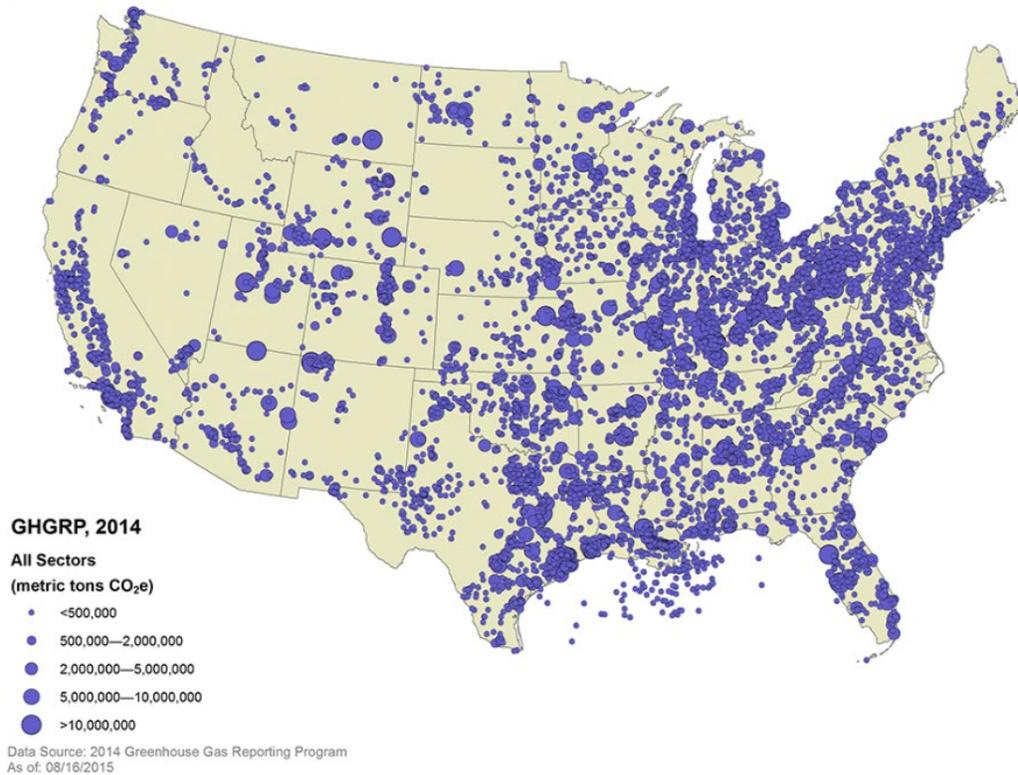
Greenhouse Gas	Source Categories Contributing Most to Emissions <sup>5</sup>	Sectors Contributing Most to Emissions
CO <sub>2</sub>	Electricity Generation (D), Stationary Combustion (C)	Power Plants
CH <sub>4</sub>	Municipal Landfills (HH), Petroleum & Natural Gas Systems (W)	Waste, Petroleum & Natural Gas Systems
N <sub>2</sub> O	Nitric Acid Production (V), Electricity Generation (D), Adipic Acid Production (E)	Chemicals, Power Plants
SF <sub>6</sub>	SF <sub>6</sub> from Electrical Equipment (DD), Magnesium Production (T)	Other, Metals
NF <sub>3</sub>	Electronics Manufacturers (I)	Other
HFCs	HCFC-22 Production and HFC-23 Destruction (O)	Chemicals
PFCs	Aluminum Production (F), Electronics Manufacturers (I)	Metals, Other

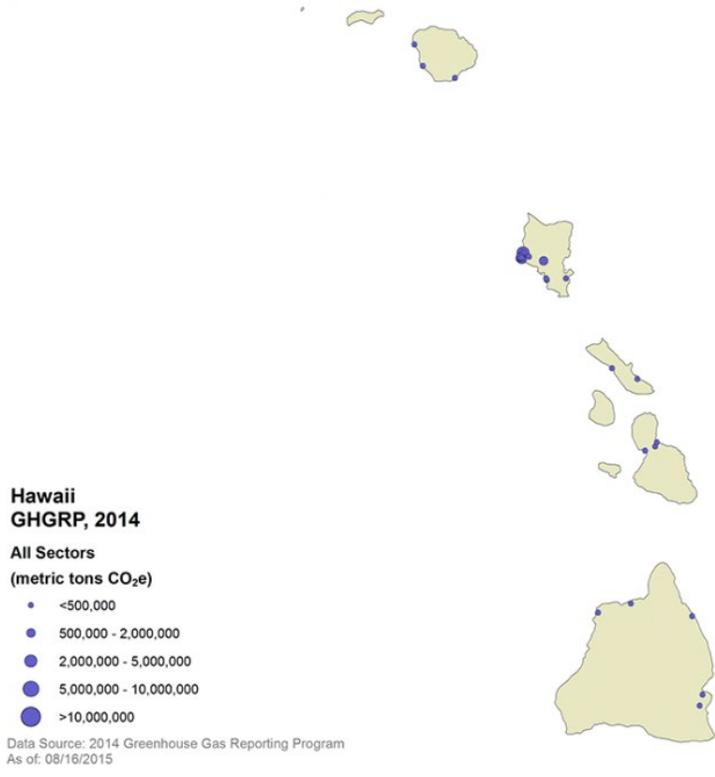
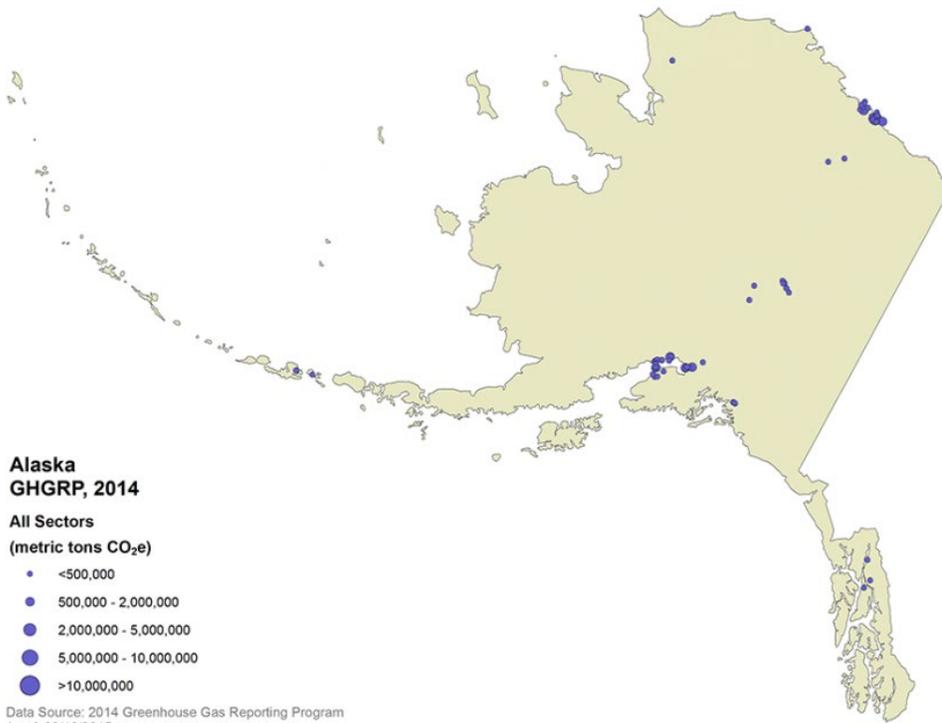
<sup>5</sup> These source categories account for 75 percent or more of the reported emissions of the corresponding GHG. The subpart under which the emissions were reported is shown in parentheses.

## Geographic Distribution of Emissions

These maps show the locations of direct-emitting facilities. The size of a circle corresponds to the quantity of emissions reported by that facility. There are also facilities located in Alaska, Hawaii, Puerto Rico, the U.S. Virgin Islands, and Guam.

**Figure 5: Location and Total Reported Emissions from GHGRP Facilities (2014)**



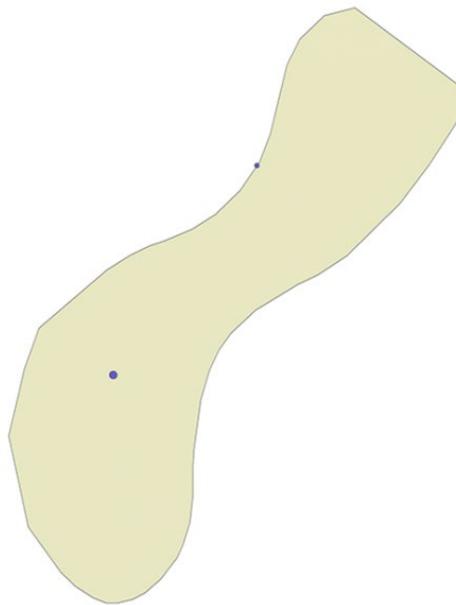




**Puerto Rico and the Virgin Islands  
GHGRP, 2014**

- All Sectors  
(metric tons CO<sub>2</sub>e)
- <500,000
  - 500,000 - 2,000,000
  - 2,000,000 - 5,000,000
  - 5,000,000 - 10,000,000
  - >10,000,000

Data Source: 2014 Greenhouse Gas Reporting Program  
As of: 08/16/2015



**Guam  
GHGRP, 2014**

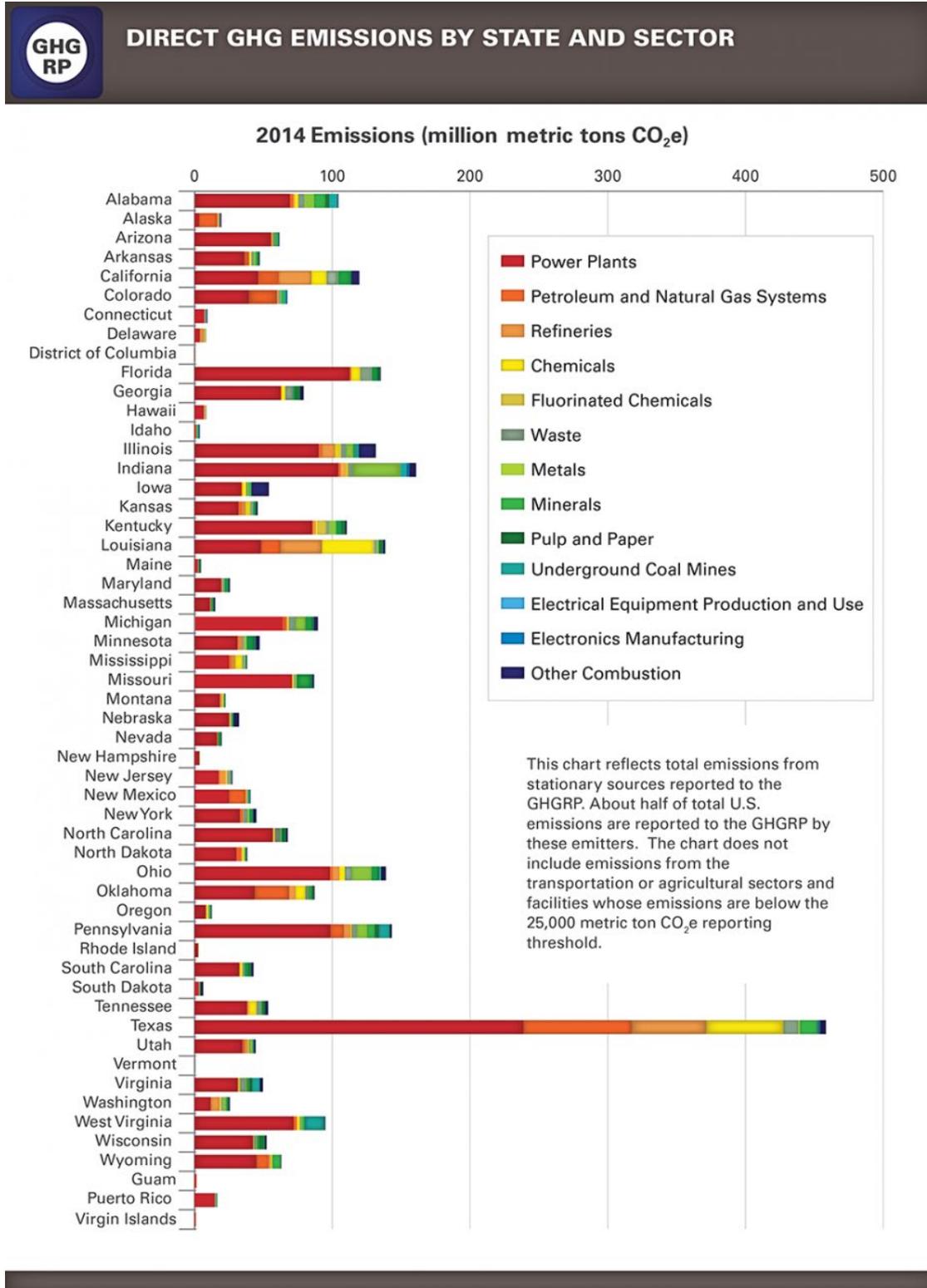
- All Sectors  
(metric tons CO<sub>2</sub>e)
- <500,000
  - 500,000 - 2,000,000
  - 2,000,000 - 5,000,000
  - 5,000,000 - 10,000,000
  - >10,000,000

Data Source: 2014 Greenhouse Gas Reporting Program  
As of: 08/16/2015

Readers can identify facilities in their state, territory, county, or city by visiting [FLIGHT](#).

Because it generally applies to facilities that emit greater than 25,000 metric tons CO<sub>2</sub>e per year, the GHGRP provides total reported emissions from large stationary sources in each state. Figure 6 shows the reported emissions in each state broken out by industrial sector.

Figure 6: Direct GHG Emissions by State and Sector (2014)

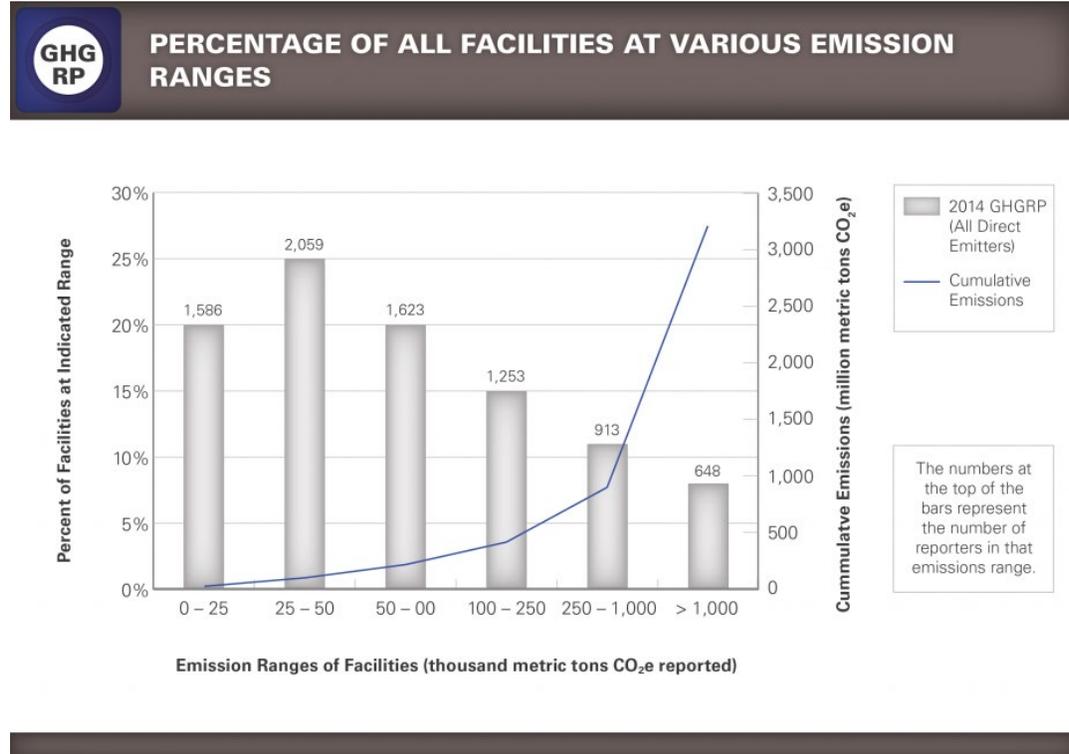


[View this information in FLIGHT.](#)

### Emissions Range

The GHGRP provides a comprehensive dataset that can be used to determine the number of facilities at various emissions levels in many industry sectors. The GHGRP can also be used to determine the total GHG emissions from individual facilities, including emissions from fossil fuel combustion and other processes. This information is valuable for planning future policies. GHGRP data provide policy makers with a better understanding of the number of facilities and total emissions that would be covered by potential GHG reduction policies for various industries.

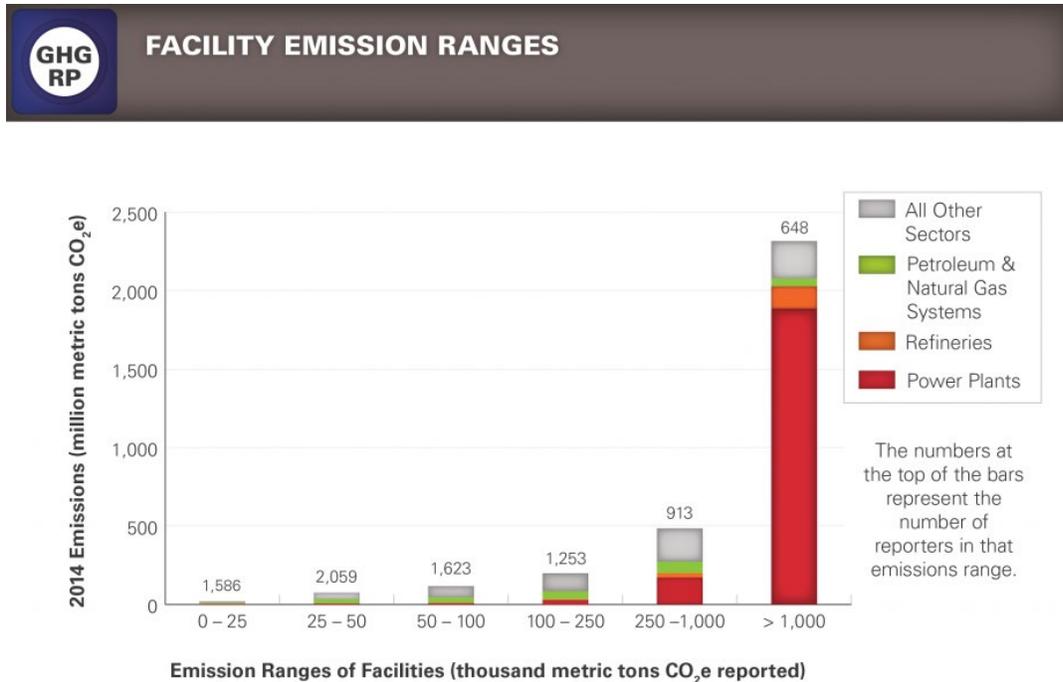
**Figure 7: Percentage of All Reporting Facilities at Various Emission Ranges (2014)**



Eighty percent of reporting facilities had emissions less than 250,000 metric tons CO<sub>2</sub>e. In 2014, the 648 largest-emitting facilities—those emitting more than one million metric tons CO<sub>2</sub>e—accounted for almost 2.3 billion metric tons CO<sub>2</sub>e. These emissions represent 71.7% of the total 3.20 billion metric tons CO<sub>2</sub>e reported. These high-emitting facilities are mainly power plants, but also include petroleum refineries and facilities in the Chemicals and Metals sectors.

You can use [FLIGHT](#) to list and [sort facilities based on total reported emissions](#) and find the largest emitting facilities in the country or a specific state or county. This tool also allows you to sort facilities by specific industry types.

Figure 8: Facility Emission Ranges (2014)



### GHGRP Calculation Methods Used

The GHGRP prescribes methodologies that must be used to determine GHG emissions from each source category. Reporters generally have the flexibility to choose among several methods to compute GHG emissions. The decision of which method to use may be influenced by the existing environmental monitoring systems in place and other factors. Reporters can change emission calculation methods from year to year and within the same year, as long as they meet the requirements for use of the method selected.

Additional information on the [methodologies that reporters use to determine GHG emissions](#).

### Report Verification

All reports submitted to EPA are evaluated by electronic validation and verification checks. If potential errors are identified, EPA will notify the reporter, who can resolve the issue either by providing an acceptable response describing why the flagged issue is not an error or by correcting the flagged issue and resubmitting their annual GHG report.

Additional information describing [EPA's verification process in more details](#).

### For More Information

For more detailed information from each industrial sector, view the industry sections below.

Use [FLIGHT](#) to view maps of facility locations, obtain summary data for individual facilities, create customized searches, and display search results graphically.

Downloadable spreadsheets containing summary data reported to the GHGRP from each reporter are available on the [Data Downloads](#) page.

All other publicly available data submitted to the GHGRP are available for download through [Envirofacts](#).

The [U.S. Greenhouse Gas Inventory](#) contains information on all sources of GHG emissions and sinks in the United States from 1990 to 2013.

All GHG emissions data reflect the global warming potential (GWP) values from the Fourth Assessment Report (AR4) of the 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 [Core Writing Team, Pachauri, R.K. and Reisinger, A. (eds)]. IPCC, Geneva, Switzerland, 2007*). The AR4 values also can be found in the current version of Table A-1 in subpart A of 40 CFR part 98.

## GHGRP 2014: Power Plants

The power plant sector consists of facilities that produce electricity by combusting fossil fuels and/or biomass. The sector includes units that are subject to the Acid Rain Program and any other electricity generators that are otherwise required to report to the EPA CO<sub>2</sub> mass emissions year-round according to 40 CFR part 75. This sector also includes combustion units serving electricity generators that are located at facilities with primary NAICS codes of 221330 (Steam and Air-Conditioning Supply)<sup>6</sup> or 2211xx (Electric Power Generation, Transmission and Distribution), which includes some part 75 reporters that report heat input to the EPA on a year-round basis. The emissions from this sector are solely from stationary fuel combustion sources.

### Power Plant Sector — Greenhouse Gas Emissions Reported to the GHGRP

(All emission values presented in million metric tons CO<sub>2</sub>e unless otherwise noted)

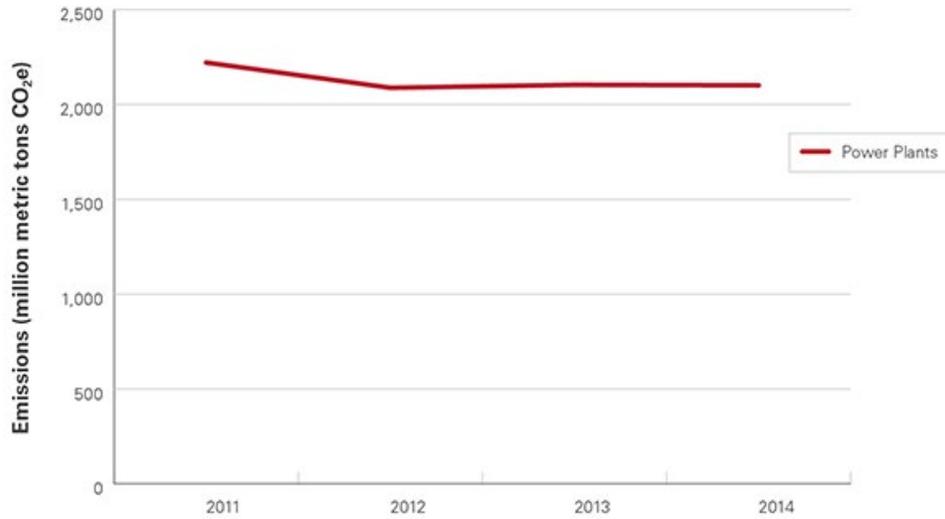
	2011	2012	2013	2014
<b>Number of facilities:</b>	1,591	1,607	1,574	1,544
<b>Total emissions (CO<sub>2</sub>e):</b>	2,221.2	2,088.0	2,103.8	2,101.1
<b>Emissions by greenhouse gas (CO<sub>2</sub>e)</b>				
• Carbon dioxide (CO <sub>2</sub> )	2,207.8	2,076.1	2,091.6	2,088.7
• Methane (CH <sub>4</sub> )	4.2	3.7	3.7	4.0
• Nitrous oxide (N <sub>2</sub> O)	9.2	8.2	8.4	8.4

Totals may not equal sum of individual GHGs due to independent rounding.

CO<sub>2</sub> emissions from the combustion of biomass are NOT included in emissions totals provided above.

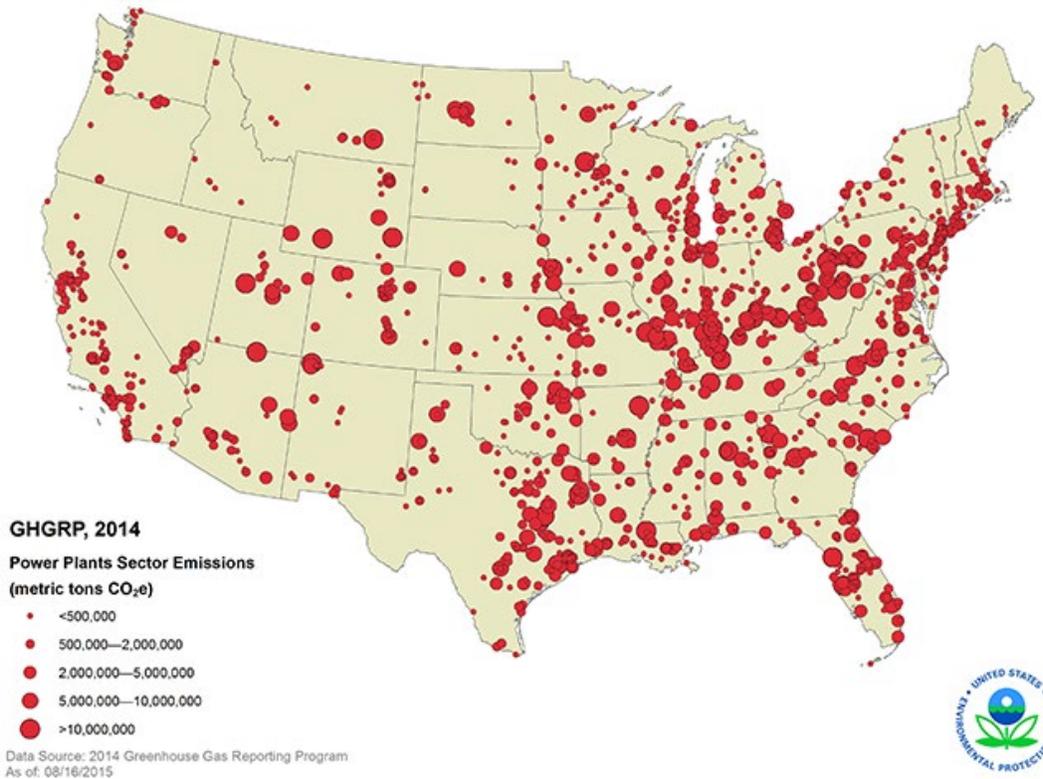
<sup>6</sup> Establishments primarily engaged in providing steam, heated air, or cooled air. The steam distribution may be through mains.

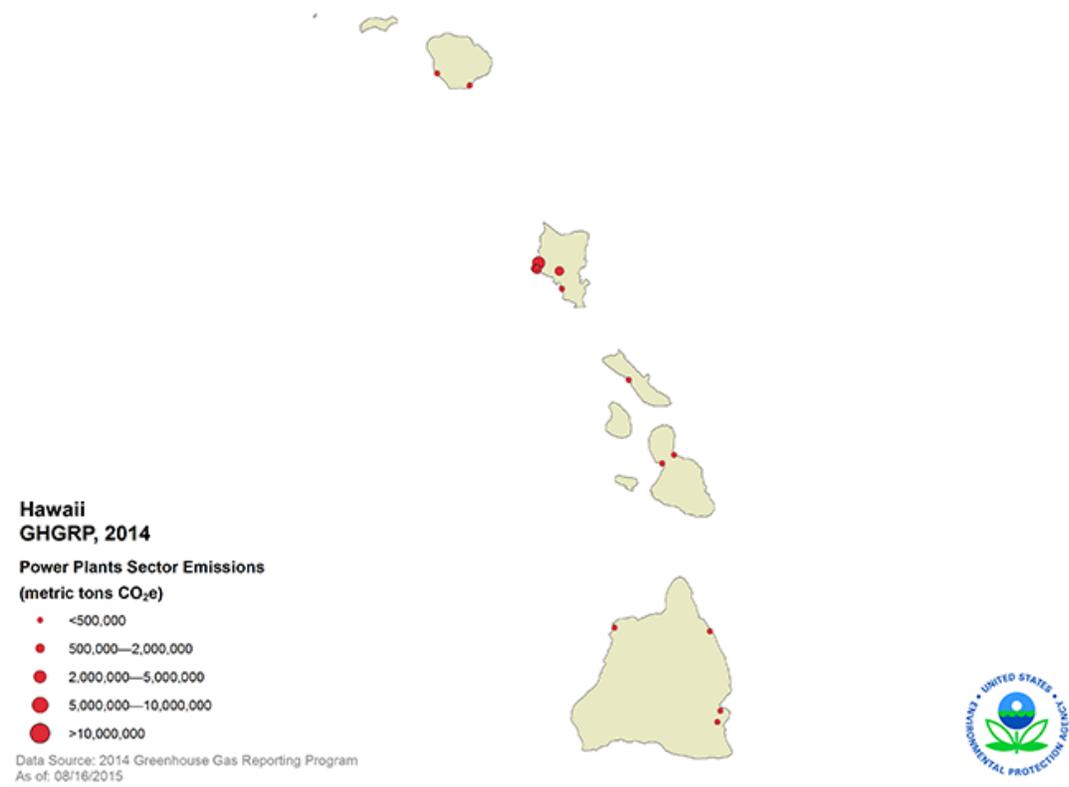
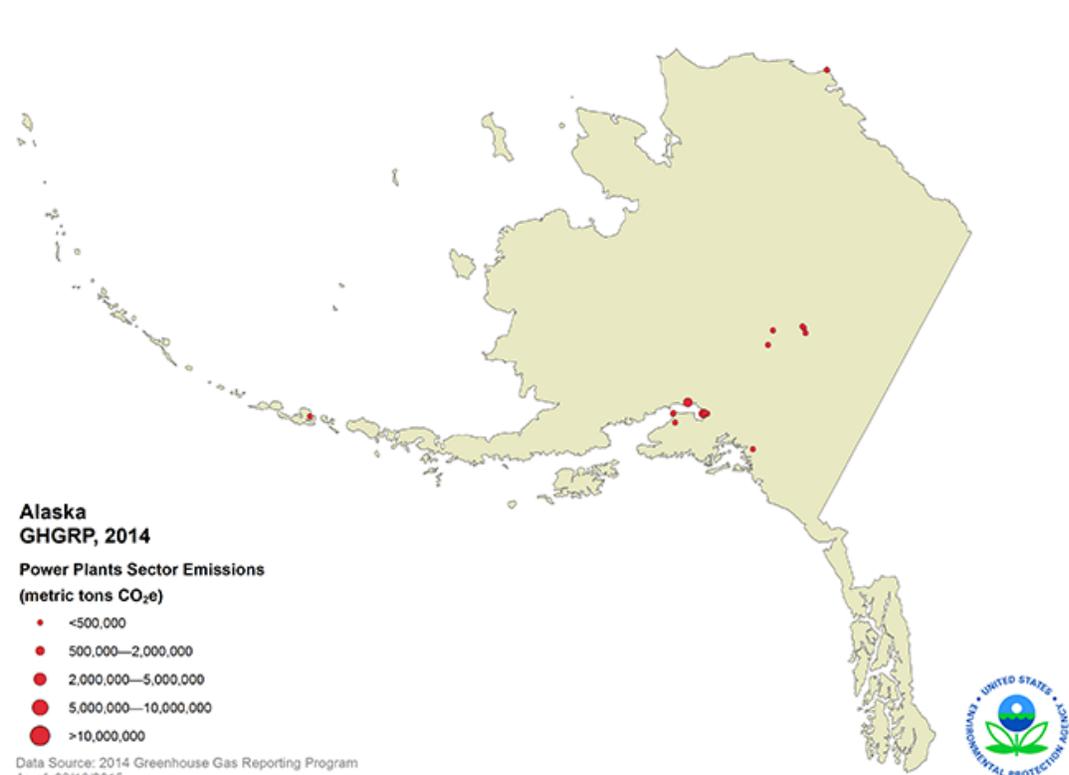
**Trend of Annual Reported GHG Emissions in the Power Plant Sector (as of 8/16/15)**

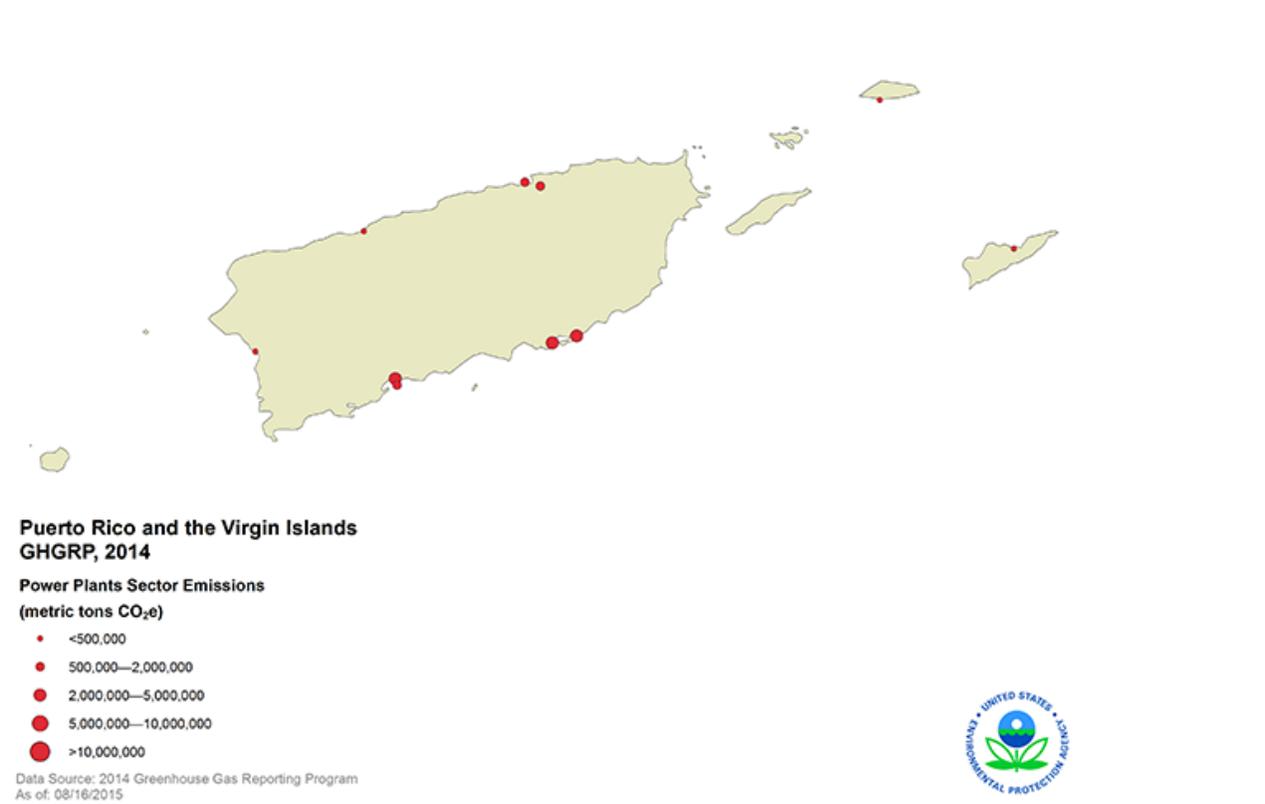


**Location and emissions range for each reporting facility in the power plant sector (as of 8/16/15).**

These maps show the locations of direct-emitting facilities. The size of a circle corresponds to the quantity of emissions reported by that facility.







## Other EPA Resources

- [U.S. Greenhouse Gas Inventory Report](#)

## GHGRP 2014: Petroleum & Natural Gas Systems

This sector consists of the following industry segments of the petroleum and natural gas industry.

- **Onshore Production.** Production of petroleum and natural gas associated with onshore production wells and related equipment.
- **Offshore Production.** Production of petroleum and natural gas from offshore production platforms.
- **Natural Gas Processing.** Processing of field quality gas to produce pipeline quality natural gas.
- **Natural Gas Transmission.** Compressor stations used to transfer natural gas through transmission pipelines.
- **Underground Natural Gas Storage.** Facilities that store natural gas in underground formations.
- **Natural Gas Distribution.** Distribution systems that deliver natural gas to customers.
- **Liquefied Natural Gas (LNG) Import/Export.** Liquefied Natural Gas import and export terminals.
- **LNG Storage.** Liquefied Natural Gas storage equipment.
- **Other Petroleum and Natural Gas Systems.** Stationary fuel combustion emissions from petroleum and natural gas source categories that are not otherwise listed.

### Petroleum and Natural Gas Systems Sector — Greenhouse Gas Emissions Reported to the GHGRP

(all emission values presented in million metric tons CO<sub>2</sub>e unless otherwise noted)

	2011	2012	2013	2014
<b>Number of facilities:</b>	1,918	2,090	2,180	2,350
<b>Total emissions (CO<sub>2</sub>e):</b>	222.4	226.3	228.2	236.1
<b>Emissions by greenhouse gas (CO<sub>2</sub>e)</b>				
• Carbon dioxide (CO <sub>2</sub> )	138.7	145.4	150.8	163.0
• Methane (CH <sub>4</sub> )	83.6	80.9	77.2	73.0
• Nitrous oxide (N <sub>2</sub> O)	0.1	0.1	0.1	0.1

Totals may not equal sum of individual GHGs due to independent rounding.

CO<sub>2</sub> emissions from the combustion of biomass are NOT included in emissions totals provided above.

### Number of reporters and 2014 emissions (CO<sub>2</sub>e) per petroleum and natural gas systems industry sector

Industry Sector	2014 Number of Reporters	2014 Emissions (million metric tons CO <sub>2</sub> e per year)
Onshore Production	523	102.7

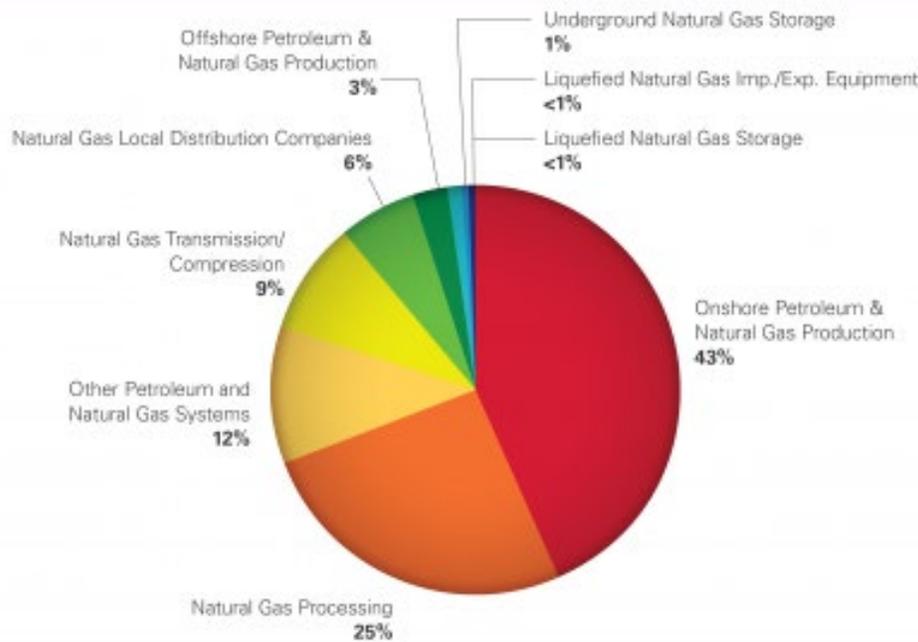
Industry Sector	2014 Number of Reporters	2014 Emissions (million metric tons CO <sub>2</sub> e per year)
Offshore Production	128	6.8
Natural Gas Processing	464	59.6
Natural Gas Transmission	520	22.4
Underground Natural Gas Storage	53	1.8
Natural Gas Distribution	181	14.8
Liquefied Natural Gas (LNG) Import/Export	7	0.6
LNG Storage	5	**
Other Petroleum and Natural Gas Systems	488	27.5

Totals may not equal sum of individual GHGs due to independent rounding.

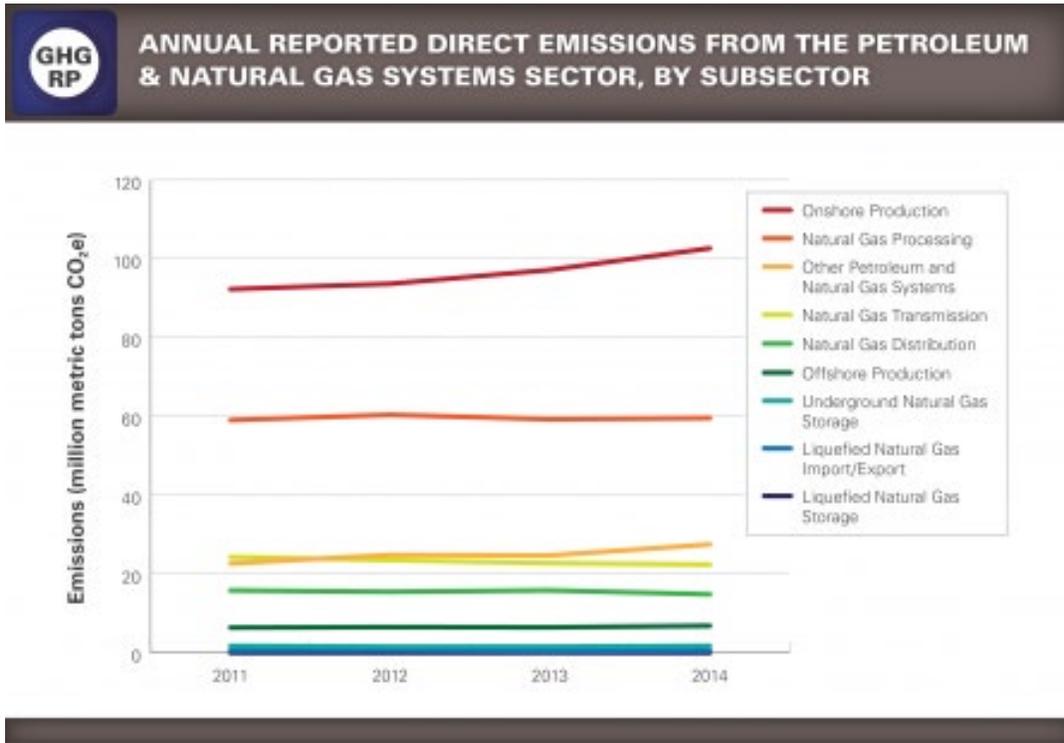
\*\* Total reported emissions are less than 0.05 million metric tons CO<sub>2</sub>e.

**Total Reported Direct Emissions from Petroleum and Natural Gas Systems, by Subsector (as of 8/16/15).**

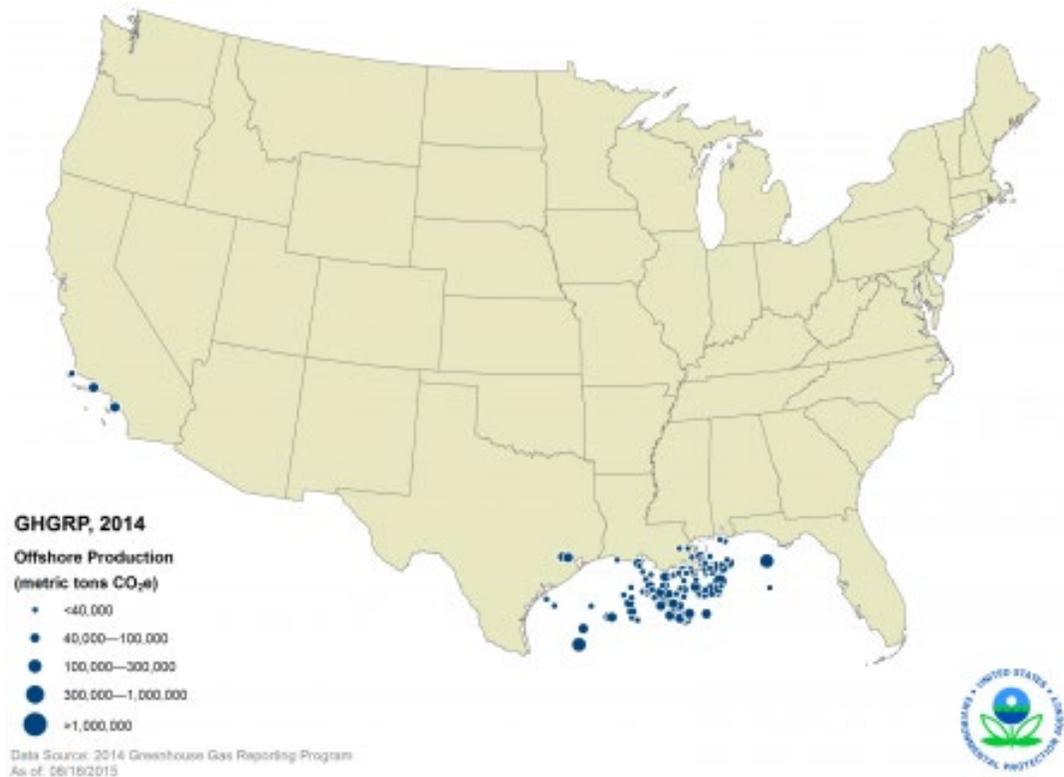
 **2014 TOTAL REPORTED EMISSIONS FROM THE PETROLEUM & NATURAL GAS SYSTEMS SECTOR, BY SUBSECTOR**



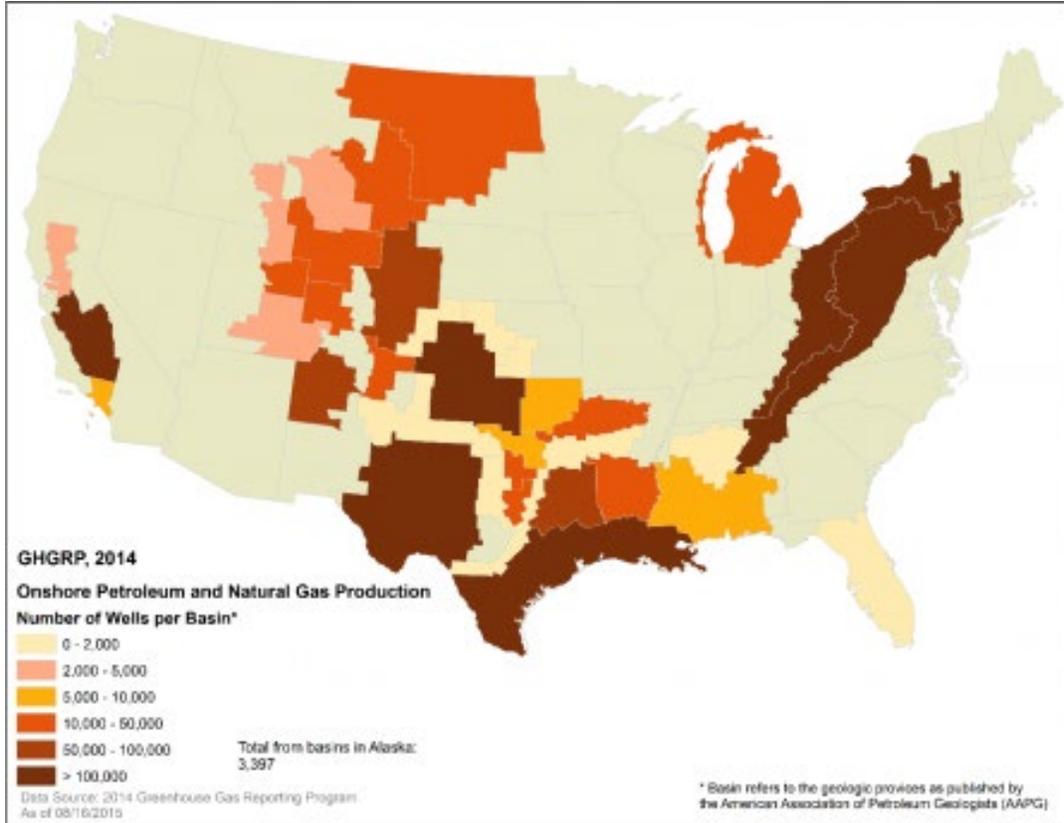
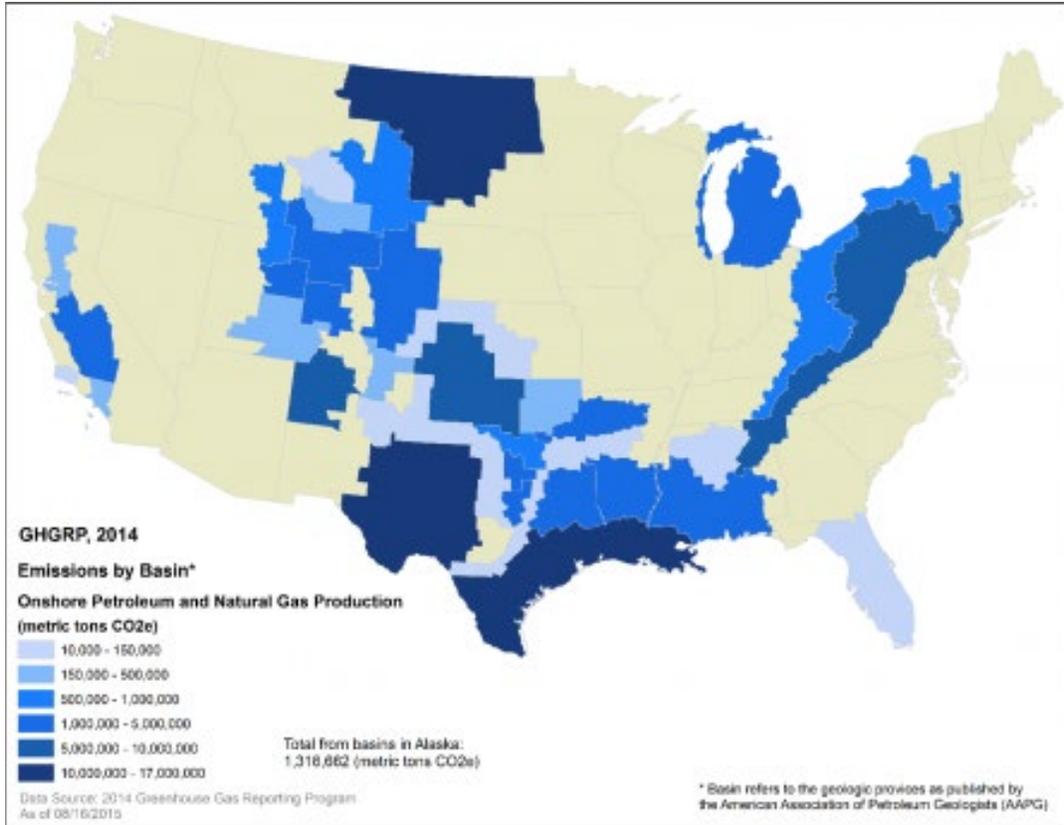
Trend of Annual Reported GHG Emissions for Petroleum and Natural Gas Systems (as of 8/16/15)

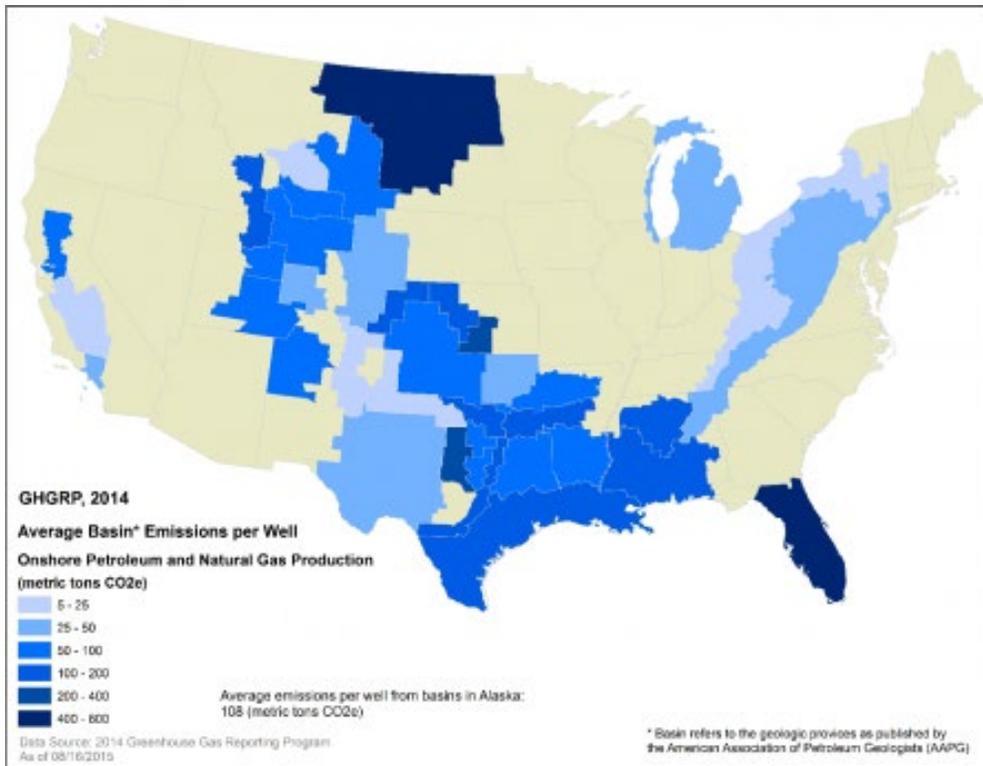


Facility locations and reported emissions (CO<sub>2</sub>e) for offshore production

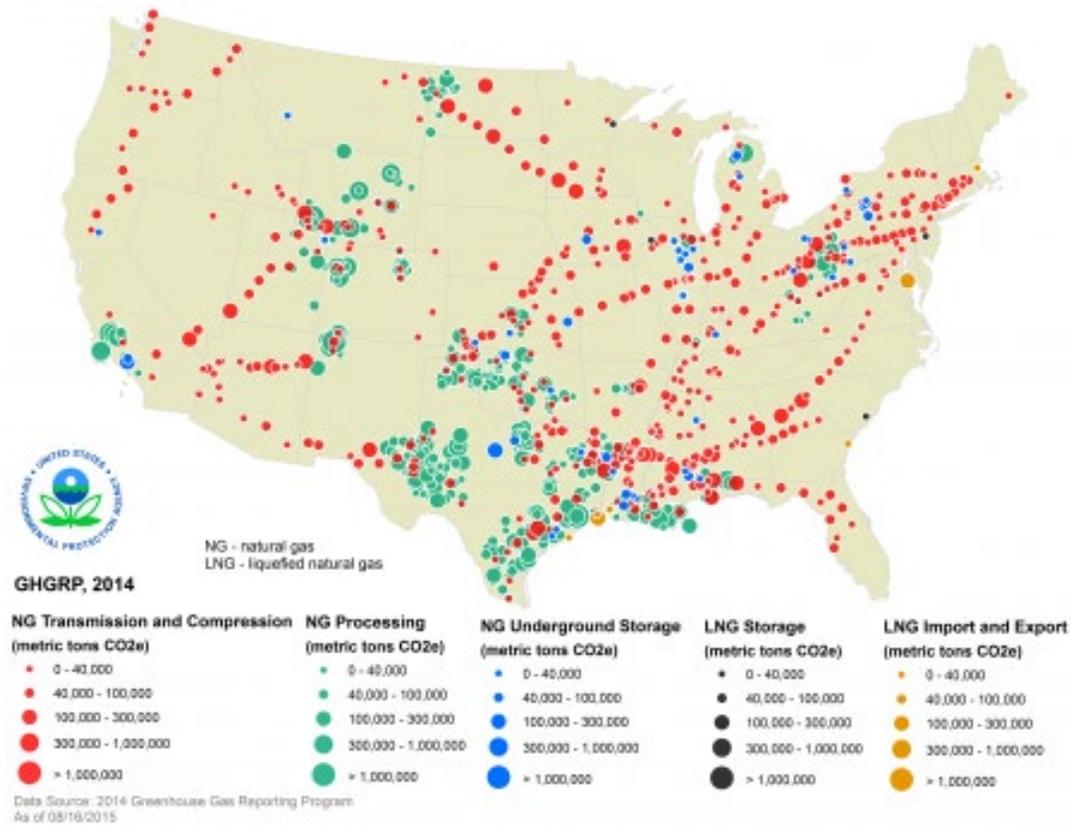


Reported emissions (CO<sub>2</sub>e) and well count by geologic basin for onshore production facilities

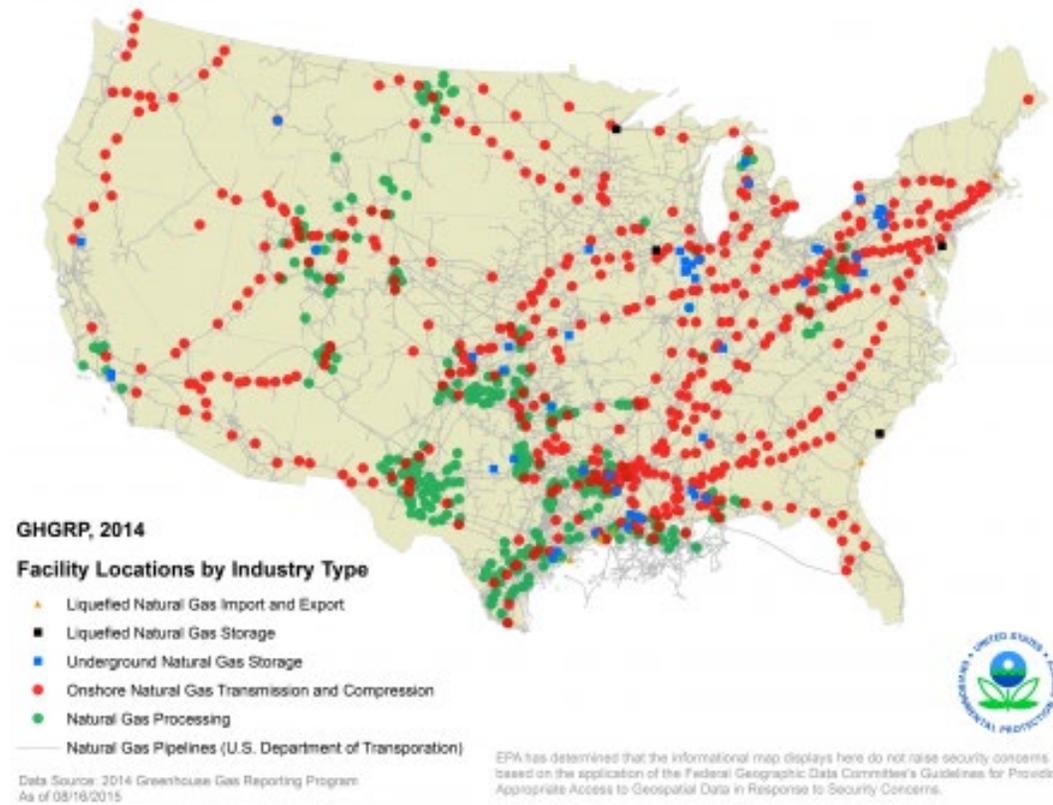




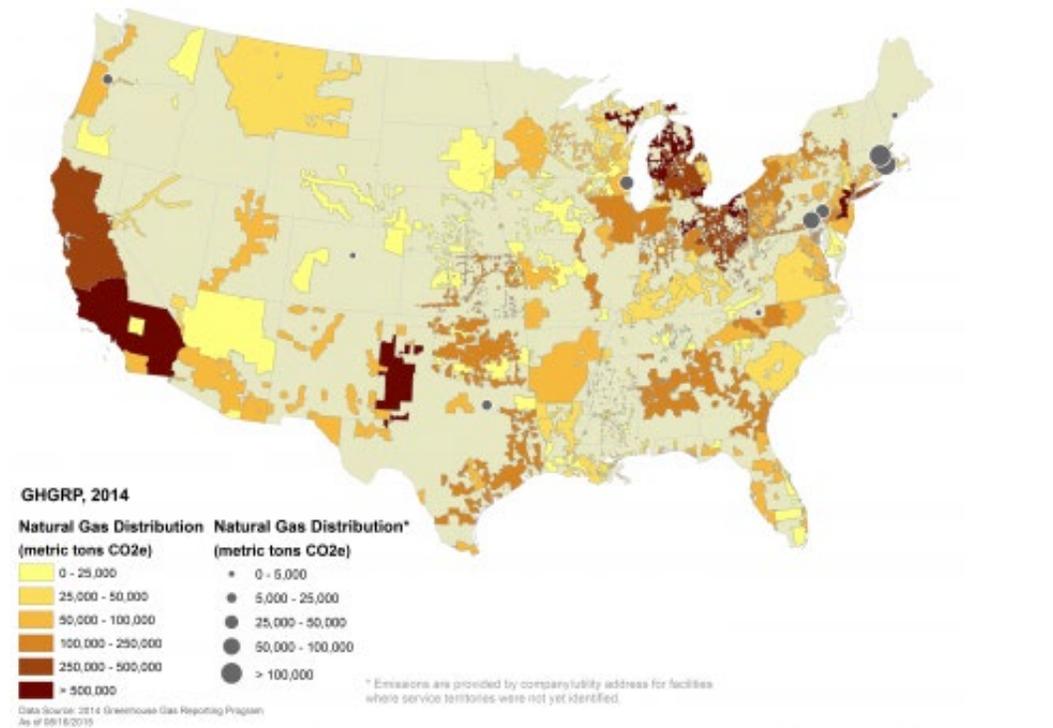
**Reported emissions (CO<sub>2</sub>e) by facility for industry types: natural gas processing, natural gas transmission, underground natural gas storage, LNG storage, LNG import/export.**



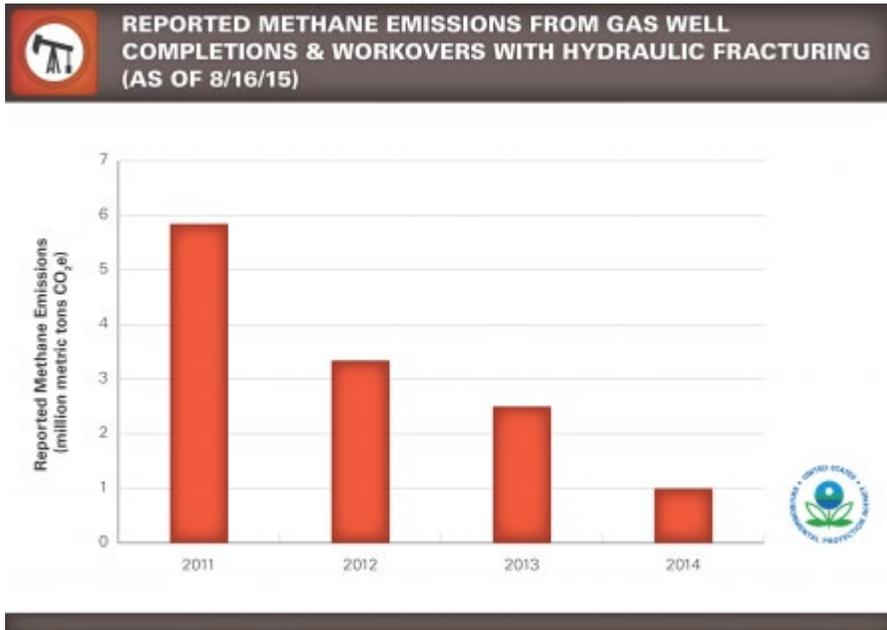
**Facility locations for industry types: natural gas processing, natural gas transmission, underground natural gas storage, LNG storage, LNG import/export**



**Reported emissions (CO<sub>2</sub>e) by natural gas utility service territory for natural gas distribution facilities**



**Reported methane emissions (CO<sub>2</sub>e) for gas well completions and workovers with hydraulic fracturing.**



**Other EPA Resources**

- [U.S. Greenhouse Gas Inventory Report](#)

## GHGRP 2014: Refineries

The refinery sector consists of facilities that produce gasoline, gasoline blending stocks, naphtha, kerosene, distillate fuel oils, residual fuel oils, lubricants, or asphalt (bitumen) by the distillation of petroleum or the re-distillation, cracking, or reforming of unfinished petroleum derivatives. GHG process emissions from this sector include emissions from venting, flares, and fugitive leaks from equipment (e.g., valves, flanges, pumps). In addition to emissions from petroleum refining processes, the sector includes combustion emissions from stationary combustion units located at these facilities. Process emissions from hydrogen production plants and petrochemical manufacturing facilities located at refineries are included in the chemical manufacturing sector. Emissions from industrial waste landfills and industrial wastewater treatment at these facilities are included in the waste sector.

### Refineries Sector — Greenhouse Gas Emissions Reported to the GHGRP

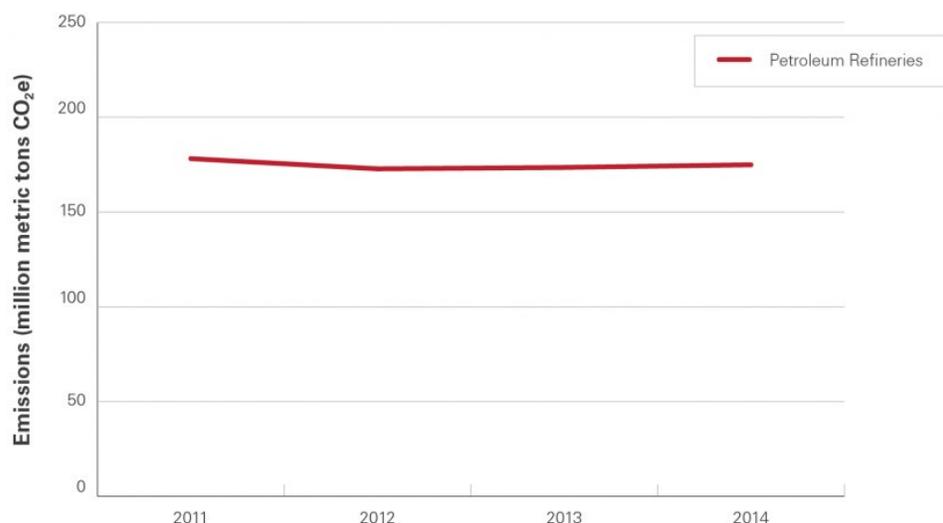
(all emission values presented in million metric tons CO<sub>2</sub>e unless otherwise noted)

	2011	2012	2013	2014
<b>Number of facilities:</b>	150	147	146	141
<b>Total emissions (CO<sub>2</sub>e):</b>	178.2	172.8	173.5	174.9
<b>Emissions by greenhouse gas (CO<sub>2</sub>e)</b>				
• Carbon dioxide (CO <sub>2</sub> )	176.9	171.5	172.2	173.7
• Methane (CH <sub>4</sub> )	0.9	0.8	0.8	0.8
• Nitrous oxide (N <sub>2</sub> O)	0.5	0.5	0.5	0.5

Totals may not equal sum of individual GHGs due to independent rounding.

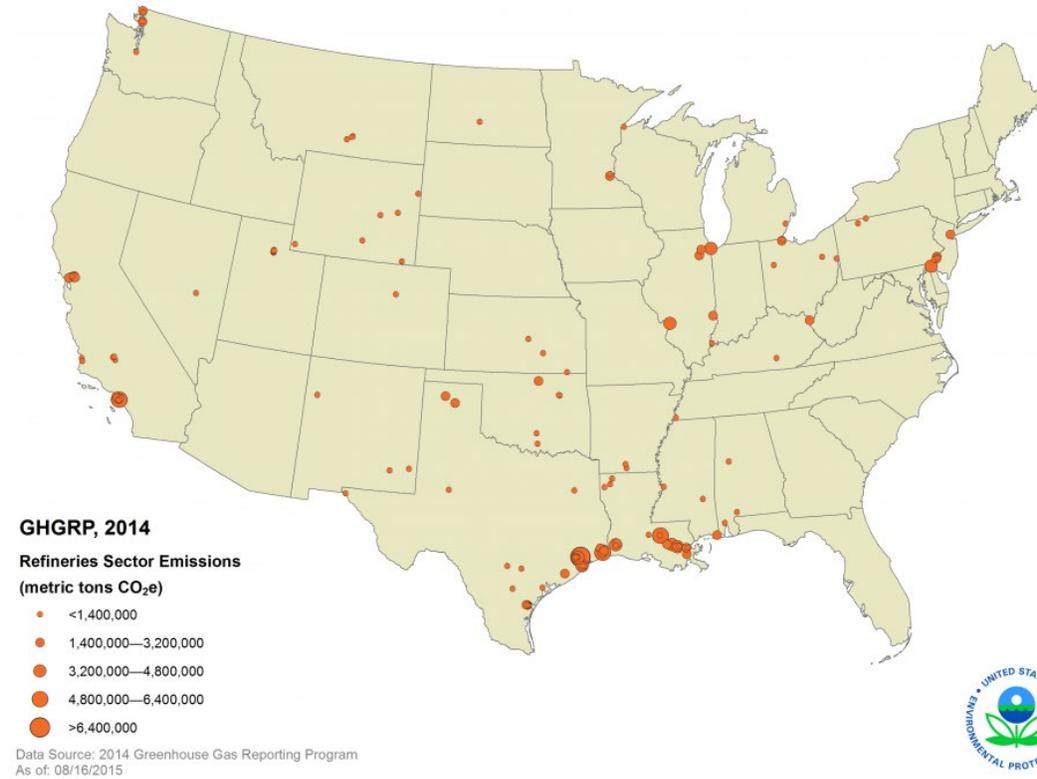
CO<sub>2</sub> emissions from the combustion of biomass are NOT included in emissions totals provided above.

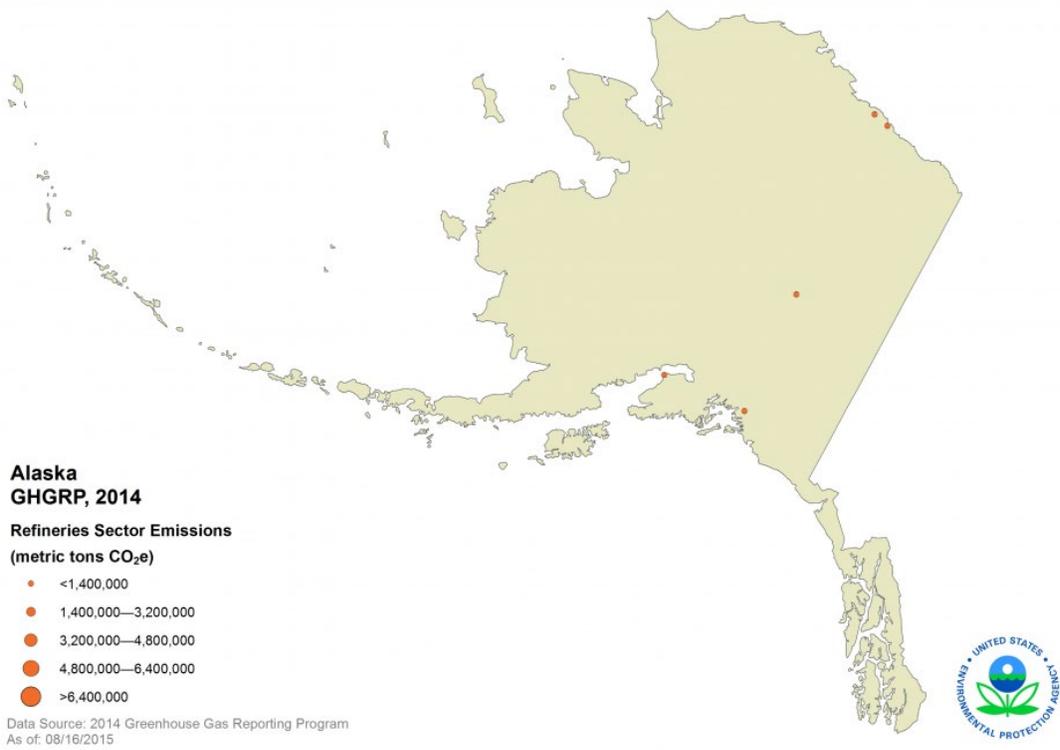
### Trend of Annual Reported GHG Emissions in the Refinery Sector (as of 8/16/15).

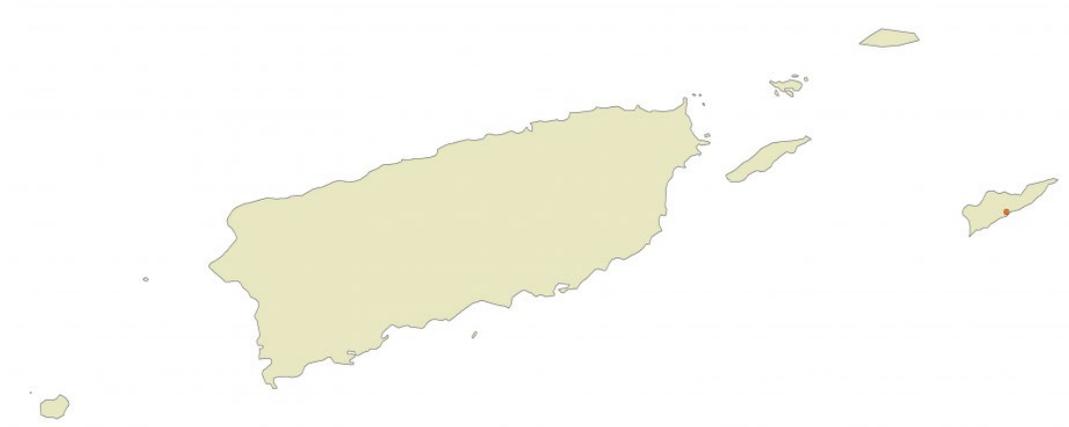


**Location and emissions range for each reporting facility in the refinery sector (as of 8/16/15).**

These maps show the locations of direct-emitting facilities. The size of a circle corresponds to the quantity of emissions reported by that facility.







**Puerto Rico and the Virgin Islands  
GHGRP, 2014**

**Refineries Sector Emissions  
(metric tons CO<sub>2</sub>e)**

- <1,400,000
- 1,400,000—3,200,000
- 3,200,000—4,800,000
- 4,800,000—6,400,000
- >6,400,000

Data Source: 2014 Greenhouse Gas Reporting Program  
As of: 08/16/2015



**Other EPA Resources**

- [U.S. Greenhouse Gas Inventory Report](#)

## GHGRP 2014: Chemicals

The chemical manufacturing sector consists of facilities that manufacture organic or inorganic chemicals. For this summary, the sector is broken down into facilities that produce fluorinated chemicals and non-fluorinated chemicals. The non-fluorinated chemicals subsector comprises facilities that produce adipic acid, ammonia, hydrogen (both merchant and non-merchant plants), nitric acid, petrochemicals, phosphoric acid, silicon carbide, and titanium dioxide. The fluorinated chemicals subsector comprises facilities that produce HCFC-22 (or destroy HFC-23) and other fluorinated chemicals. A more detailed description of these subsectors is provided below. A total of 460 chemicals facilities reported in 2014.

### Chemicals Sector — Greenhouse Gas Emissions Reported to the GHGRP

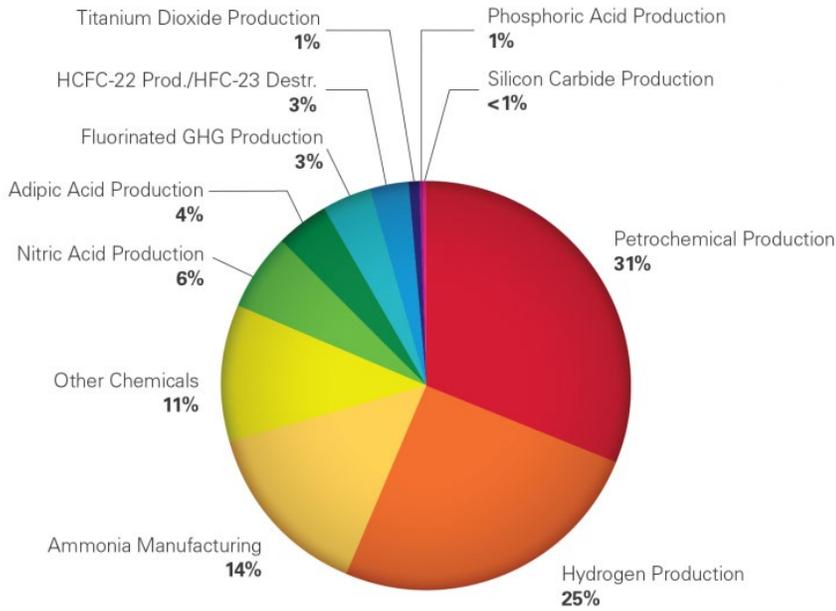
(all emissions values presented in million metric tons CO<sub>2</sub>e)

	2011	2012	2013	2014
<b>Number of facilities:</b>	458	468	473	460
<b>Total emissions (CO<sub>2</sub>e):</b>	180.7	172.4	174.4	176.5
<b>Emissions by greenhouse gas (CO<sub>2</sub>e)</b>				
• Carbon dioxide (CO <sub>2</sub> ):	142.7	142.9	147.1	149.1
• Methane (CH <sub>4</sub> ):	0.2	0.2	0.2	0.3
• Nitrous oxide (N <sub>2</sub> O):	21.3	16.0	14.8	16.6
• Fluorinated GHGs:	16.6	13.3	12.3	10.5
<b>Emissions by subsector</b>				
• Non-fluorinated chemicals	163.3	158.3	161.3	165.2
• Fluorinated chemicals	17.4	14.1	13.1	11.4

Totals may not equal sum of individual GHGs due to independent rounding.

**Total Reported Direct Emissions from Chemicals (All Subsectors), by Subsector (as of 8/16/15).**

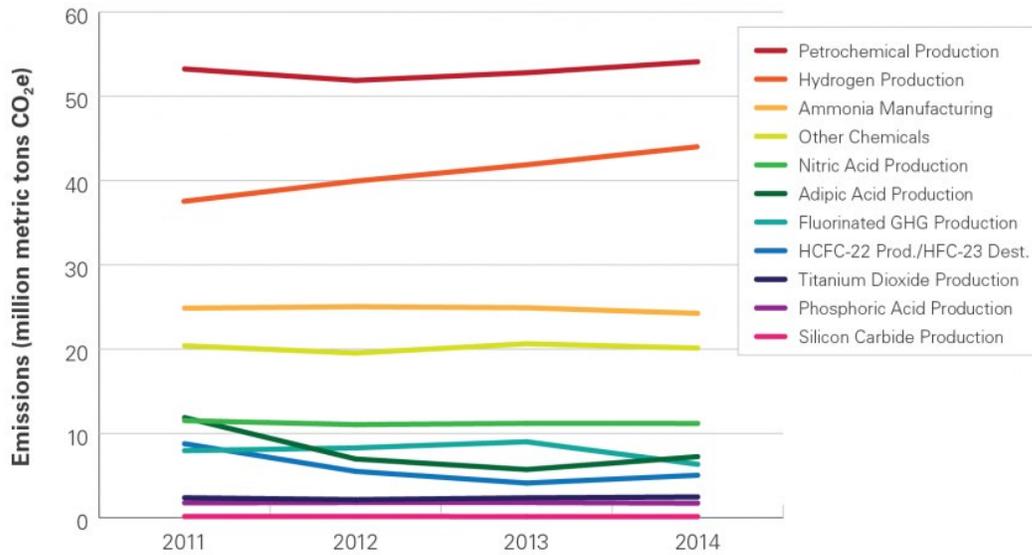
**2014 TOTAL REPORTED EMISSIONS FROM THE CHEMICALS SECTOR, BY SUBSECTOR**



Sum of percentages may not equal 100% due to independent rounding.

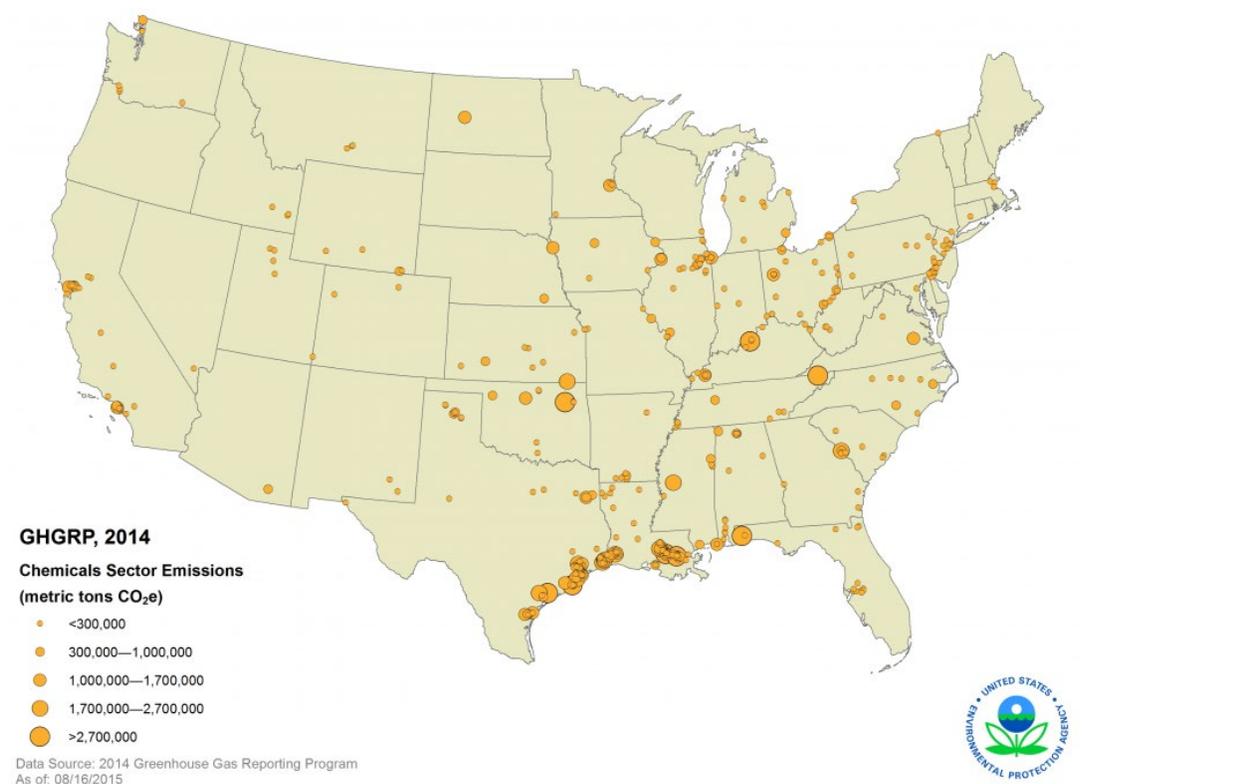
**Trend of Annual Reported GHG Emissions for Chemicals (All Subsectors) (as of 8/16/15).**

**ANNUAL REPORTED DIRECT EMISSIONS FROM THE CHEMICALS SECTOR, BY SUBSECTOR**



**Location and emissions range for each reporting facility for Chemicals (All Subsectors) (as of 8/16/15)**

This map shows the locations of direct-emitting facilities. The size of a circle corresponds to the quantity of emissions reported by that facility.



## Chemicals (Non-fluorinated)

The non-fluorinated chemical manufacturing subsector consists of facilities that produce adipic acid, ammonia, hydrogen (both merchant and non-merchant plants), nitric acid, petrochemicals (acrylonitrile, carbon black, ethylene, ethylene dichloride, ethylene oxide, and methanol), phosphoric acid, silicon carbide, soda ash, and titanium dioxide. In addition to emissions from these chemical production processes, the subsector includes combustion emissions from facilities that produce pesticides, fertilizer, pharmaceuticals, and other organic and inorganic chemicals. A total of 445 facilities reported 2014 emissions under the non-fluorinated chemicals subsector. A small number of facilities in this subsector collect CO<sub>2</sub> either for use in their other production processes, to transfer to other users, or to sequester or otherwise inject underground; this subsector includes the CO<sub>2</sub> from those process emissions. For example, some of the process emissions reported for ammonia manufacturing plants includes CO<sub>2</sub> that is later consumed on site for urea production. This CO<sub>2</sub> is not released to the ambient air from the ammonia manufacturing process unit(s).

### Chemicals (Non-Fluorinated) Subsectors — Greenhouse Gas Emissions Reported to the GHGRP

(all emissions value presented in million metric tons CO<sub>2</sub>e)

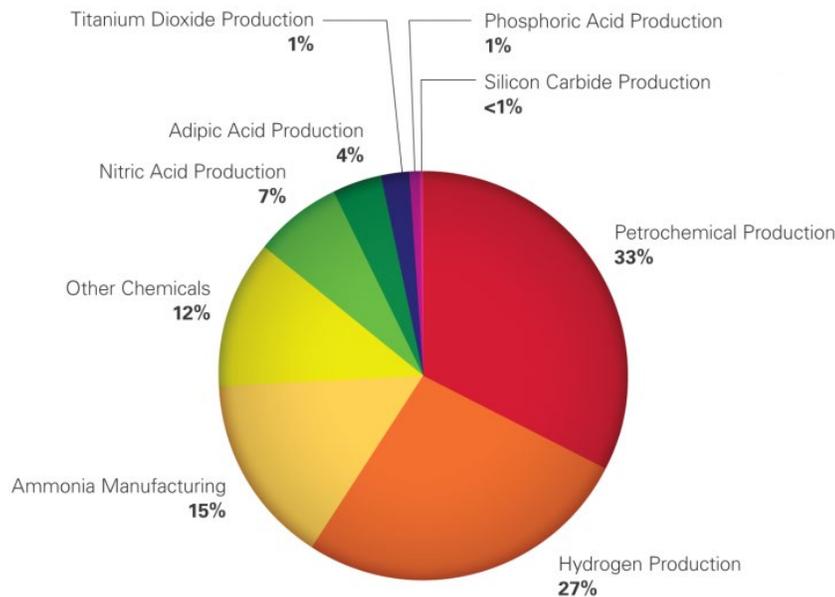
	2011	2012	2013	2014
<b>Number of facilities:</b>	442	452	457	445
<b>Total emissions (CO<sub>2</sub>e):</b>	163.3	158.3	161.3	165.2
<b>Emissions by greenhouse gas (CO<sub>2</sub>e)</b>				
• Carbon dioxide (CO <sub>2</sub> ):	141.8	142.1	146.3	148.3
• Methane (CH <sub>4</sub> ):	0.2	0.2	0.2	0.3
• Nitrous oxide (N <sub>2</sub> O):	21.3	16.0	14.8	16.6

**Number of reporters and 2014 emissions (CO<sub>2</sub>e) for the Non-Fluorinated Chemicals industry subsector**

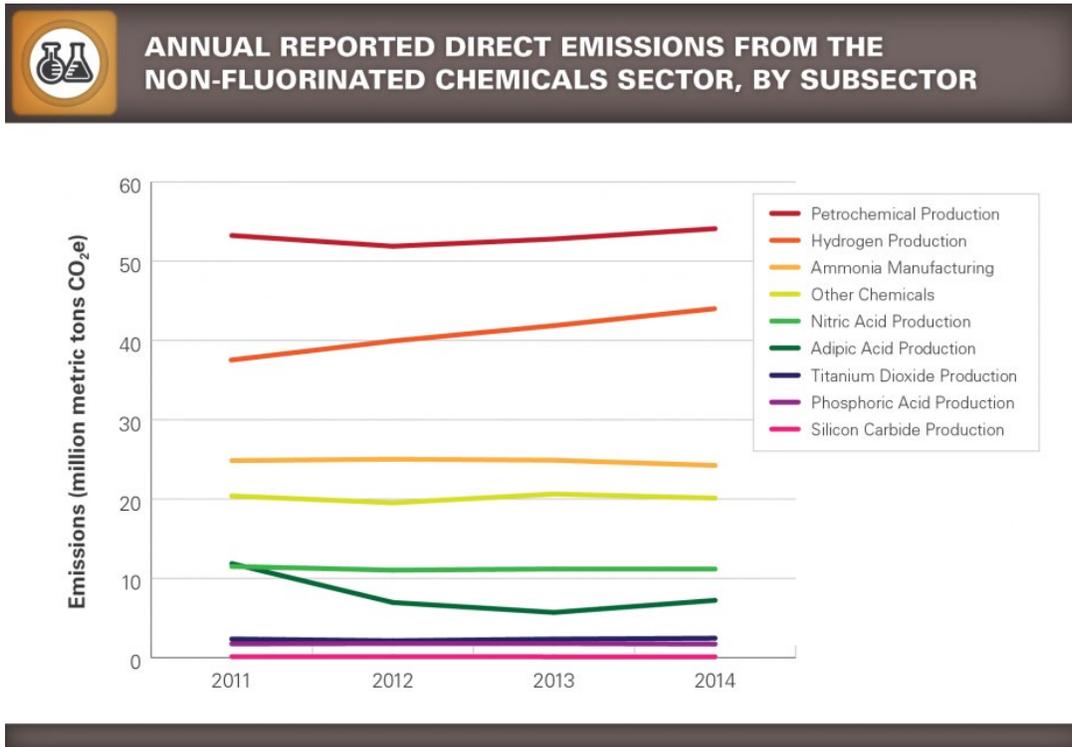
Industry Sector	2014 Number of Reporters	2014 Emissions (million metric tons CO <sub>2</sub> e)
Adipic Acid Production	3	7.2
Ammonia Manufacturing	23	24.2
Hydrogen Production	107	44.0
Nitric Acid Production	34	11.2
Petrochemical Production	65	54.1
Phosphoric Acid Production	12	1.7
Silicon Carbide Production	1	0.1
Titanium Dioxide Production	7	2.5
Other Chemicals	217	20.1

**Total Reported Direct Emissions from Chemicals (Non-fluorinated), by Subsector, (as of 8/16/15).**

 **2014 TOTAL REPORTED EMISSIONS FROM THE CHEMICALS (NON-FLUORINATED) SECTOR, BY SUBSECTOR**

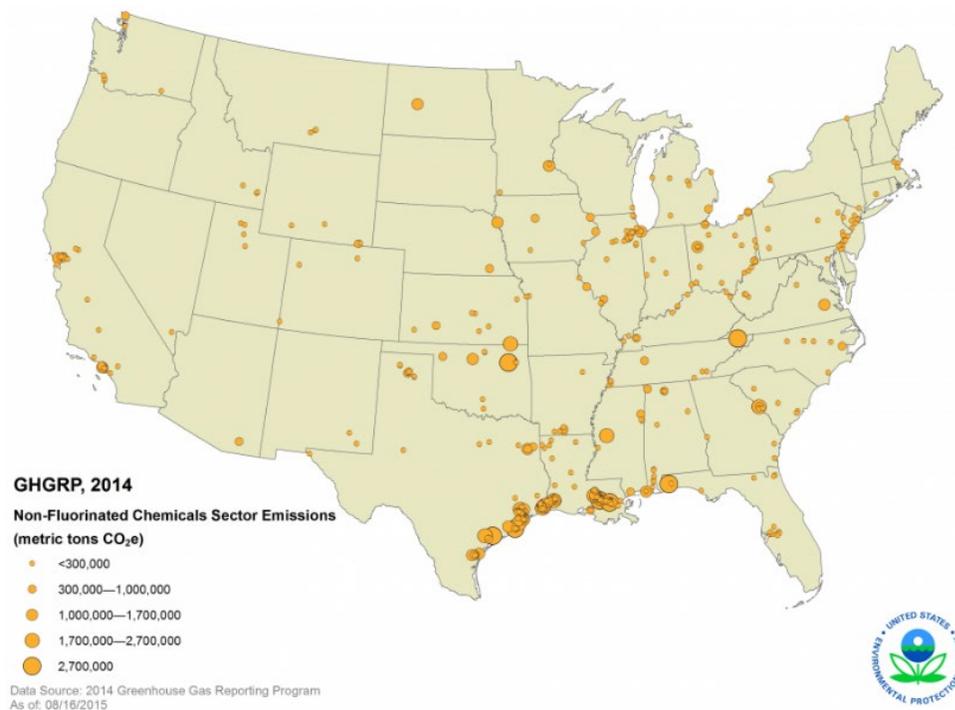


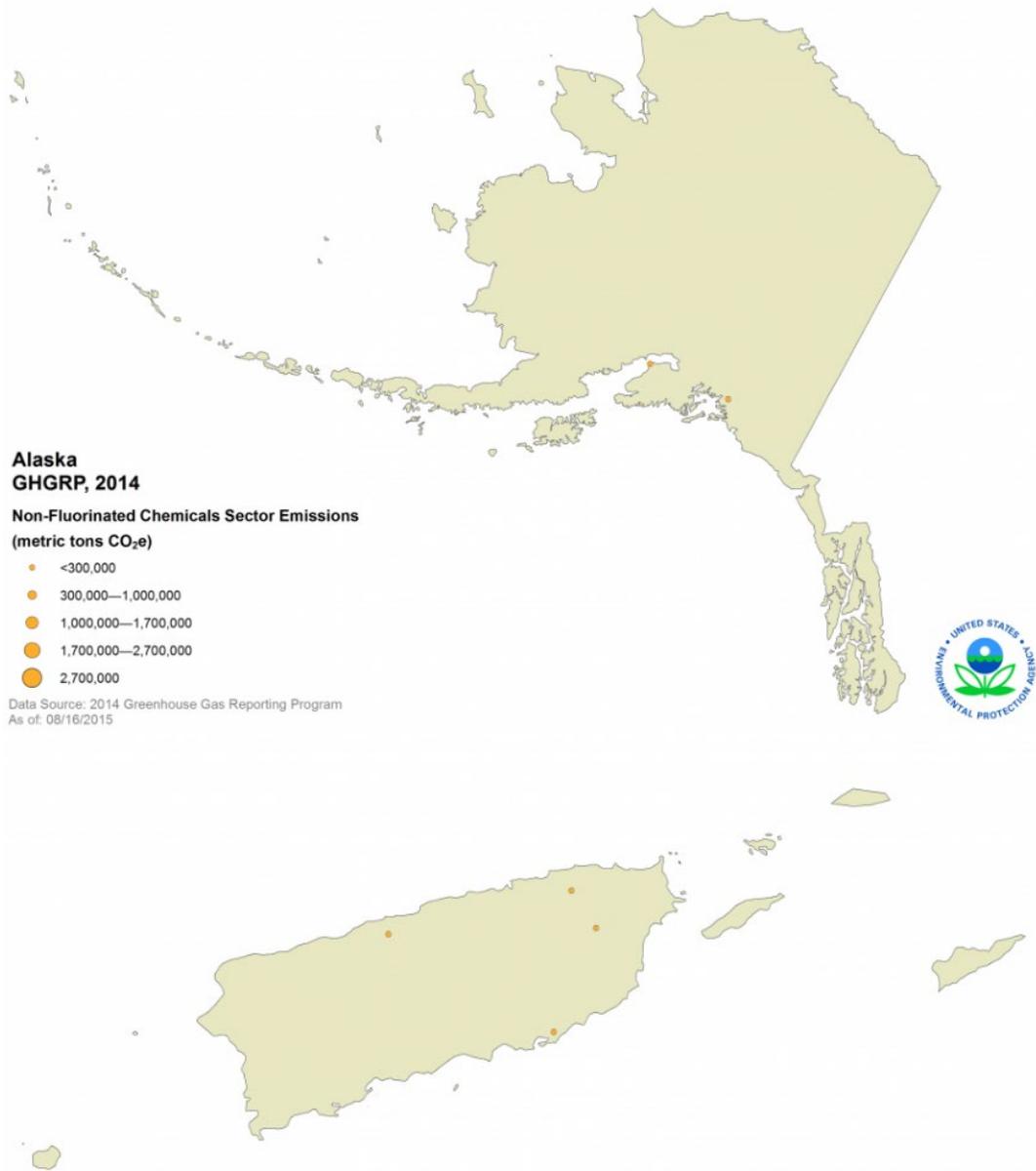
**Trend of Annual Reported GHG Emissions for Chemicals (Non-fluorinated), by Subsector (as of 8/16/15).**

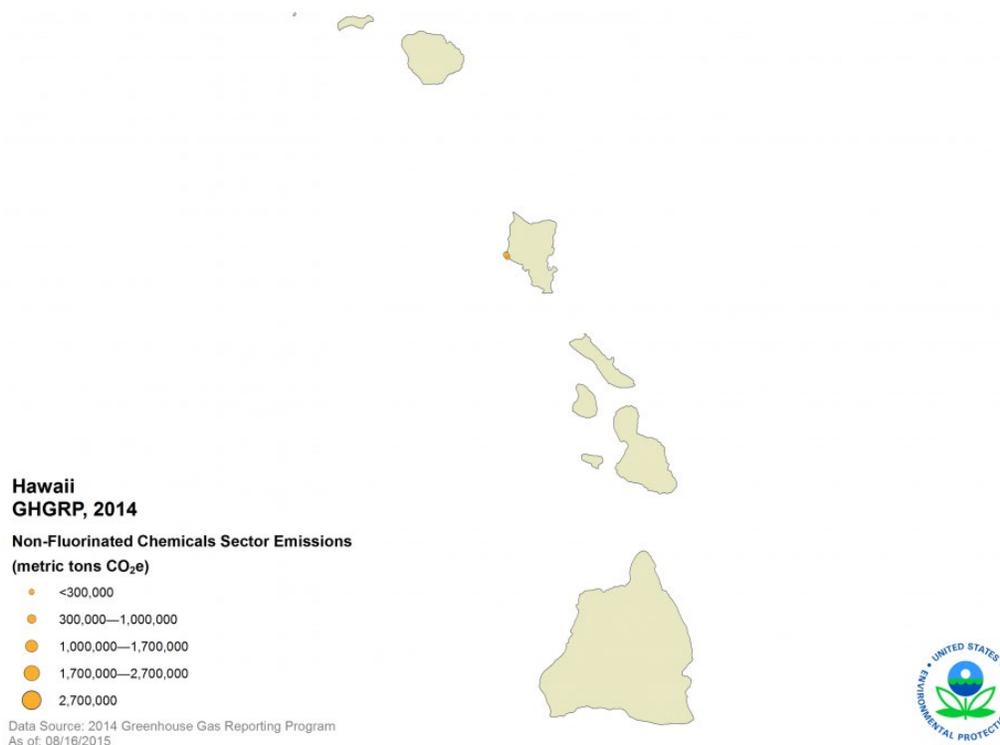


**Location and emissions range for each reporting facility for Chemicals (Non-fluorinated) (as of 8/16/15).**

These maps show the locations of direct-emitting facilities. The size of a circle corresponds to the quantity of emissions reported by that facility.







## Fluorinated Chemicals

The fluorinated chemical subsector includes facilities that produce hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), nitrogen trifluoride (NF<sub>3</sub>), other fluorinated GHGs such as fluorinated ethers, and chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), including chlorodifluoromethane (HCFC-22). The subsector also includes facilities that destroy HFC-23, which is a by-product of HCFC-22 production and which may be emitted from the destruction process. This subsector does not include industries that use these fluorinated GHGs (i.e. semiconductors).

### Fluorinated Chemicals Subsector — Greenhouse Gas Emissions Reported to the GHGRP

(all emissions values presented are in million metric tons CO<sub>2</sub>e)

	2011	2012	2013	2014
<b>Number of facilities:</b>	16	16	16	15
<b>Total emissions (CO<sub>2</sub>e):</b>	17.4	14.1	13.1	11.4
<b>Emissions by greenhouse gas (CO<sub>2</sub>e)</b>				
• Carbon dioxide (CO <sub>2</sub> ):	0.8	0.8	0.8	0.8
• Methane (CH <sub>4</sub> ):	**	**	**	**
• Nitrous oxide (N <sub>2</sub> O):	**	**	**	**
• Fluorinated GHGs:	16.6	13.3	12.3	10.5

Totals may not equal sum of individual GHGs due to independent rounding.

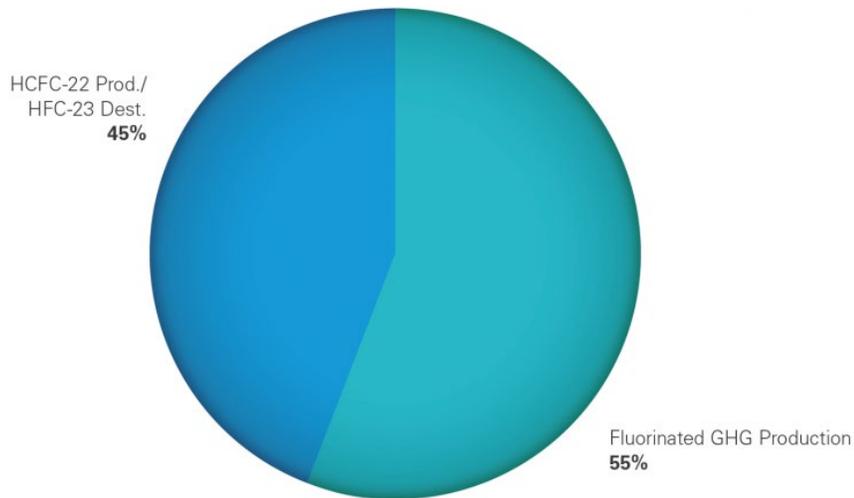
\*\* Total reported emissions are less than 0.05 million metric tons CO<sub>2</sub>e.

**Number of reporters and 2014 emissions (CO<sub>2</sub>e) for the Fluorinated Chemicals industry subsector**

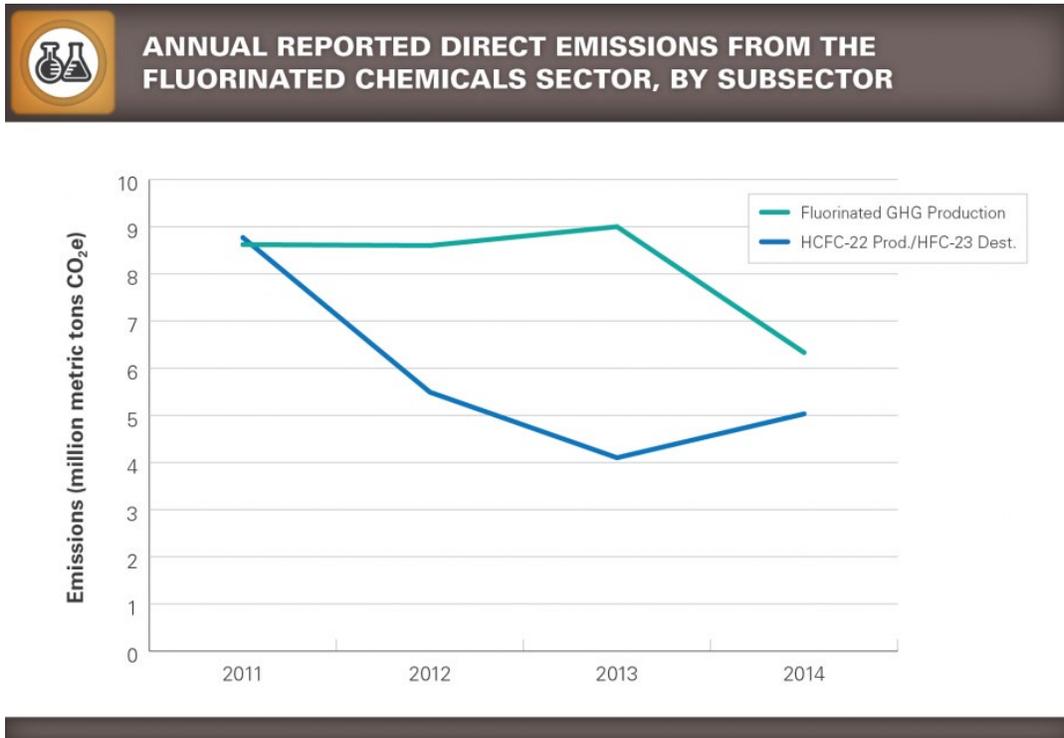
Industry Sector	2014 Number of Reporters	2014 Emissions (million metric tons CO <sub>2</sub> e)
Fluorinated GHG Production	15	6.3
HCFC-22 Production/HFC-23 Destruction	4	5.0

**Total Reported Direct Emissions from Fluorinated Chemicals, by Subsector (as of 8/16/15).**

**2014 TOTAL REPORTED EMISSIONS FROM THE CHEMICALS (FLUORINATED) SECTOR, BY SUBSECTOR**

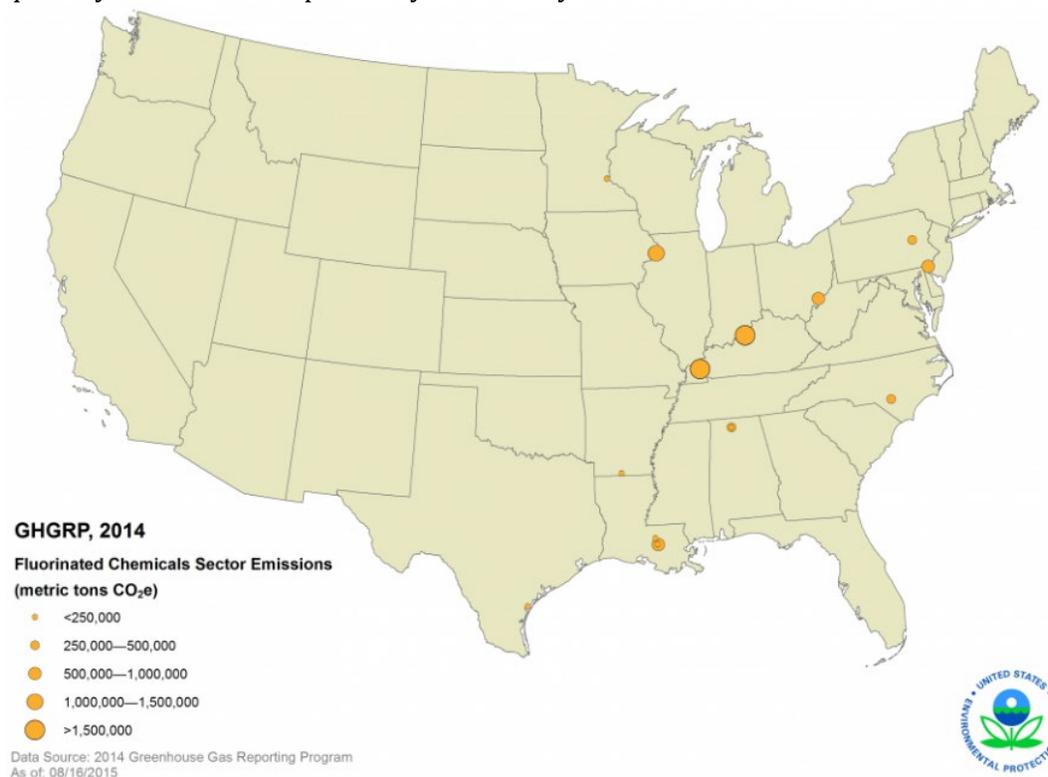


**Trend of Annual Reported GHG Emissions from Fluorinated Chemicals, by Subsector (as of 8/16/15).**



**Location and emissions range for each reporting facility in Fluorinated Chemicals (as of 8/16/15).**

This map shows the locations of direct-emitting facilities. The size of a circle corresponds to the quantity of emissions reported by that facility.



## Other EPA Resources

- [U.S. Greenhouse Gas Inventory Report](#)

## GHGRP 2014: Waste

The waste sector consists of municipal solid waste (MSW) landfills, industrial waste landfills, industrial wastewater treatment systems, and facilities that operate combustors or incinerators for the disposal of nonhazardous solid waste. Emissions from fossil fuel combustion at facilities with industrial waste landfills, and industrial wastewater treatment systems are included in other sectors.

**MSW landfills.** This category consists of landfills that accepted MSW on or after January 1, 1980 and generate methane in amounts equivalent to 25,000 metric tons of CO<sub>2</sub>e or more per year. This category includes emissions from the landfill, landfill gas collection systems, and destruction devices for landfill gases (including boilers, engines, and flares).

**Industrial Waste Landfills.** This category consists of industrial waste landfills that accepted industrial waste on or after January 1, 1980 and that have a total landfill design capacity of 300,000 metric tons or more. The category excludes landfills for hazardous waste and those that receive only construction and demolition or inert wastes. This category includes emissions from the landfill, landfill gas collection systems, and destruction devices for landfill gases (including flares).

**Industrial Wastewater Treatment.** This category consists of anaerobic processes used to treat nonhazardous industrial wastewater and industrial wastewater treatment sludge at facilities that perform pulp and paper manufacturing, food processing, ethanol production, or petroleum refining.

**Solid Waste Combustion.** This category consists of combustors and incinerators for the disposal of nonhazardous solid waste.

### Waste Sector — Greenhouse Gas Emissions Reported to the GHGRP

(all emission values presented in million metric tons CO<sub>2</sub>e unless otherwise noted)

	2011	2012	2013	2014
<b>Number of facilities:</b>	1,640	1,645	1,628	1,620
<b>Total emissions (CO<sub>2</sub>e):</b>	115.9	119.0	113.8	112.8
<b>Emissions by greenhouse gas (CO<sub>2</sub>e)</b>				
• Carbon dioxide (CO <sub>2</sub> )	10.4	10.2	10.5	10.8
• Methane (CH <sub>4</sub> )	105.1	108.4	102.9	101.7
• Nitrous oxide (N <sub>2</sub> O)	0.4	0.4	0.4	0.4

Totals may not equal sum of individual GHGs due to independent rounding.

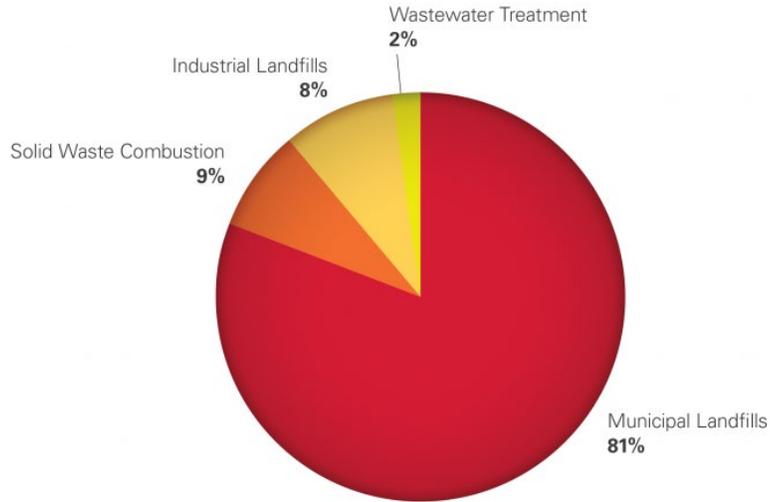
CO<sub>2</sub> emissions from the combustion of biomass are NOT included in emissions totals provided above.

### Number of reporters and 2014 emissions (CO<sub>2</sub>e) per waste industry subsector

Industry Sector	2014 Number of Reporters	2014 Emissions (million metric tons CO <sub>2</sub> e per year)
MSW Landfills	1,233	91.5
Industrial Wastewater Treatment	149	2.3
Industrial Waste Landfills	178	9.1
Solid Waste Combustion	67	9.9

**Total Reported Direct Emissions from Waste, by Subsector (as of 8/16/15).**

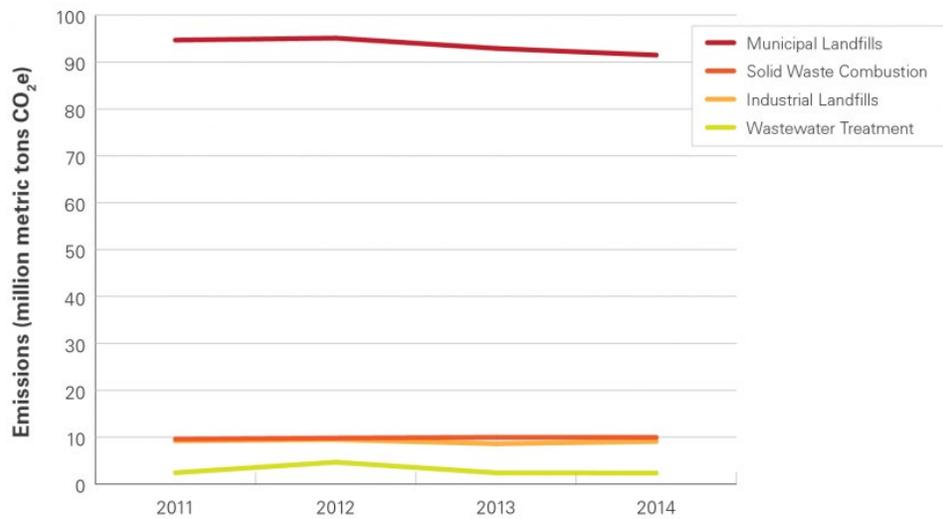
**2014 TOTAL REPORTED EMISSIONS FROM THE WASTE SECTOR, BY SUBSECTOR**



Sum of percentages may not equal 100% due to independent rounding.

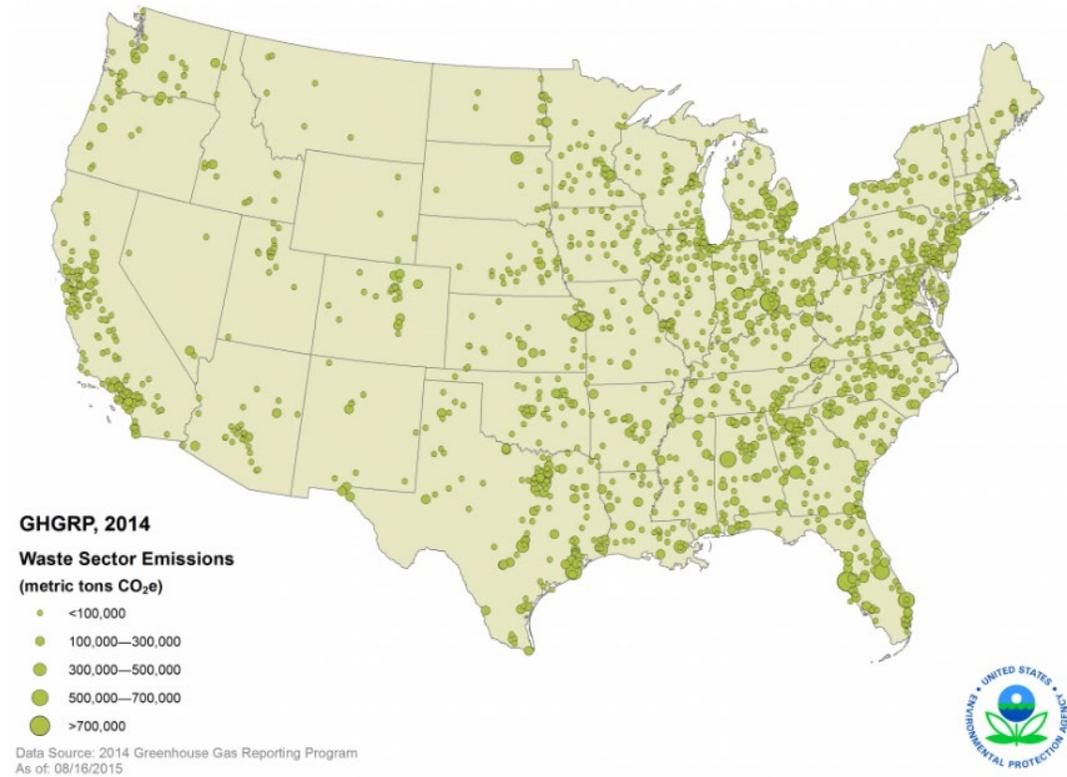
**Trend of Annual Reported GHG Emissions by Subsector (as of 8/16/15).**

**ANNUAL REPORTED DIRECT EMISSIONS FROM THE WASTE SECTOR, BY SUBSECTOR**



**Location and emissions range for each reporting facility in the waste sector (as of 8/16/15).**

These maps show the locations of direct-emitting facilities. The size of a circle corresponds to the quantity of emissions reported by that facility.



## Other EPA Resources

- [U.S. Greenhouse Gas Inventory Report](#)

## GHGRP 2014: Metals

The metals sector consists of metal production facilities that smelt, refine, and/or cast ferrous and nonferrous metals, including primary aluminum, ferroalloy, iron and steel, lead, magnesium, and zinc, from ore, pig, or scrap using electrometallurgical and other methods. The sector also includes foundries and any other metal production facility operating under NAICS codes beginning with 331 (Primary Metal Manufacturing). Primary aluminum, ferroalloy, iron and steel, lead, magnesium, and zinc production facilities report GHG emissions from metal smelting, refining, and/or casting activities, as well as from stationary fuel combustion sources. All other metal production facilities report only the GHG emissions from stationary fuel combustion sources.

### Metals Sector — Greenhouse Gas Emissions Reported to the GHGRP

(all emissions values presented in million metric tons CO<sub>2</sub>e)

	2011	2012	2013	2014
<b>Number of facilities:</b>	299	300	300	300
<b>Total emissions (CO<sub>2</sub>e):</b>	112.8	106.9	106.8	103.4
<b>Emissions by greenhouse gas (CO<sub>2</sub>e)</b>				
• Carbon dioxide (CO <sub>2</sub> ):	107.8	102.6	102.7	100.0
• Methane (CH <sub>4</sub> ):	**	**	**	**
• Nitrous oxide (N <sub>2</sub> O):	**	**	**	**
• Hydrofluorocarbons (HFCs):	**	**	0.1	0.1
• Perfluorocarbons (PFCs):	3.5	2.9	3.0	2.5
• Sulfur hexafluoride (SF <sub>6</sub> ):	1.5	1.3	1.0	0.7

Totals may not equal sum of individual GHGs due to independent rounding.

\*\* Total reported emissions are less than 0.05 million metric tons CO<sub>2</sub>e.

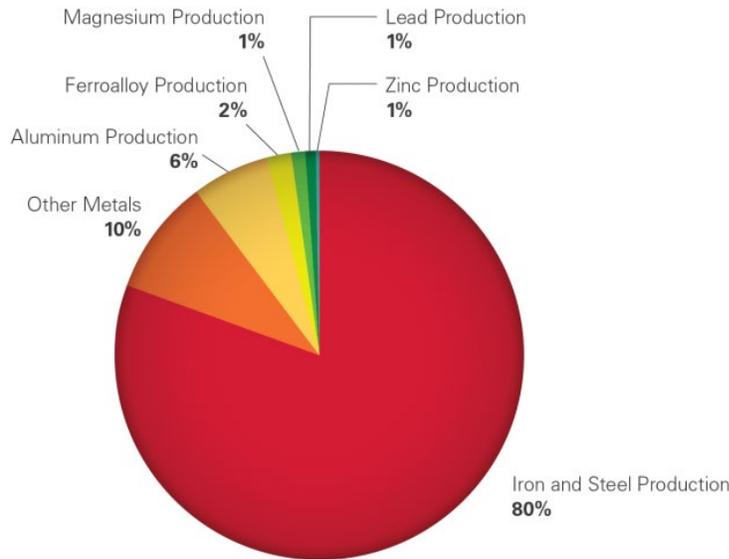
CO<sub>2</sub> emissions from the combustion of biomass are NOT included in emissions totals provided above.

### Number of reporters and 2014 emissions (CO<sub>2</sub>e) per metal industry subsector

Industry Sector	2014 Number of Reporters	2014 Emissions (million metric tons CO <sub>2</sub> e per year)
Aluminum Production	10	5.9
Ferroalloy Production	10	2.1
Iron and Steel Production	127	82.9
Lead Production	12	1.1
Magnesium Production	10	1.2
Zinc Production	6	0.7
Other Metals	125	9.6

**2014 Total Reported Direct Emissions from Metals, by Subsector (as of 8/16/15).**

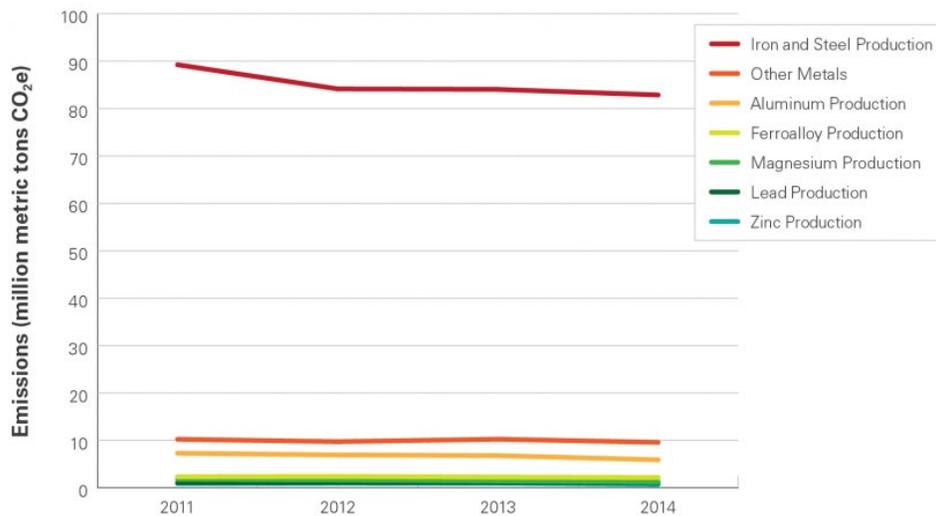
**2014 TOTAL REPORTED EMISSIONS FROM THE METALS SECTOR, BY SUBSECTOR**



Sum of percentages may not equal 100% due to independent rounding.

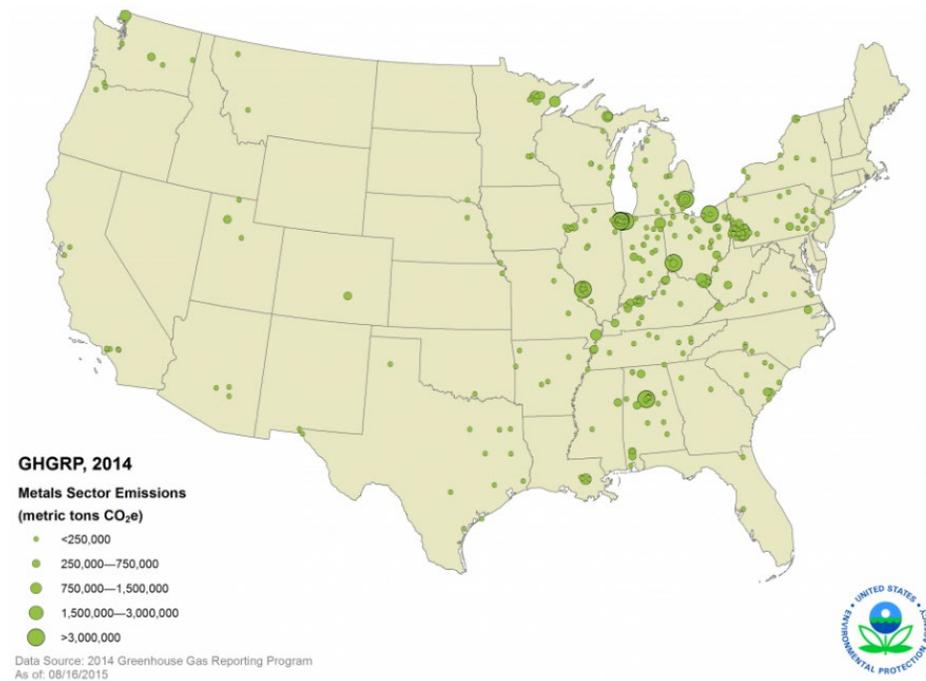
**Trend of Annual Reported GHG Emissions by Subsector (as of 8/16/15).**

**ANNUAL REPORTED DIRECT EMISSIONS FROM THE METALS SECTOR, BY SUBSECTOR**



## Location and emissions range for each reporting facility in the metals sector in 2014 (as of 8/16/15).

This map shows the locations of direct-emitting facilities. The size of a circle corresponds to the quantity of emissions reported by that facility.



## Other EPA Resources

- [U.S. Greenhouse Gas Inventory Report](#)

## GHGRP 2014: Minerals

The minerals sector consists of cement production, glass manufacturing, lime production, soda ash production, and any other mineral production facility operating under NAICS codes beginning with 327 (Non-metallic Mineral Product Manufacturing). Facilities under this sector transform mined or quarried non-metallic minerals — such as sand, gravel, stone, clay, and refractory materials — into products for intermediate or final consumption. Glass, cement, soda ash and lime facilities report both process emissions from the calcination of carbonate-based raw materials and GHG emissions from stationary fuel combustion sources. All other mineral production facilities report only GHG emissions from stationary fuel combustion sources. A small number of facilities in this sector collect CO<sub>2</sub> either for use in their other production processes (e.g., sugar refining), to transfer to other users, or to sequester or otherwise inject underground. This sector includes the CO<sub>2</sub> emissions reported for those processes.

### Minerals Sector — Greenhouse Gas Emissions Reported to the GHGRP

(all emissions values presented in million metric tons CO<sub>2</sub>e)

	2011	2012	2013	2014
<b>Number of facilities:</b>	367	369	378	381
<b>Total emissions (CO<sub>2</sub>e):</b>	103.2	107.5	111.4	117.4
<b>Emissions by greenhouse gas (CO<sub>2</sub>e)</b>				
• Carbon dioxide (CO <sub>2</sub> ):	102.9	107.2	111.1	116.9
• Methane (CH <sub>4</sub> ):	0.1	0.1	0.1	0.1
• Nitrous oxide (N <sub>2</sub> O):	0.2	0.2	0.2	0.4

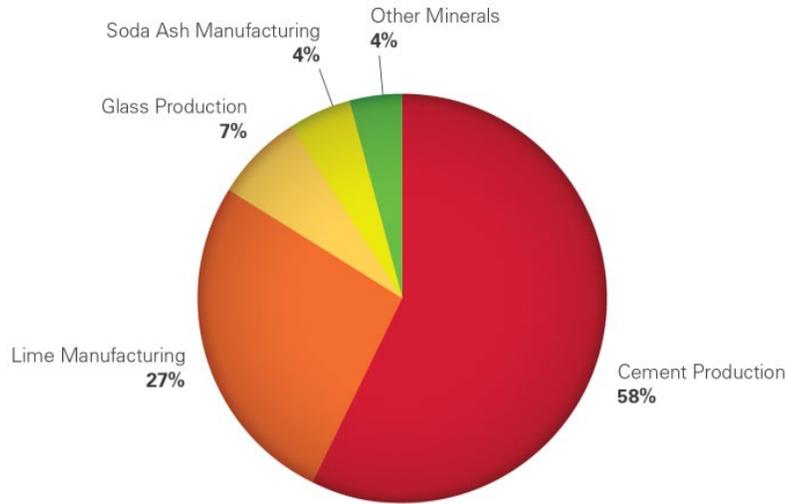
CO<sub>2</sub> emissions from the combustion of biomass are NOT included in emissions totals provided above.

### Number of reporters and 2014 emissions (CO<sub>2</sub>e) per waste industry subsector

Industry Sector	2014 Number of Reporters	2014 Emissions (million metric tons CO <sub>2</sub> e per year)
Cement Production	95	67.6
Lime Production	76	31.7
Glass Production	110	8.1
Soda Ash Manufacturing	4	5.4
Other Minerals	98	4.6

2014 Total Reported Direct Emissions from Minerals, by Subsector (as of 8/16/15).

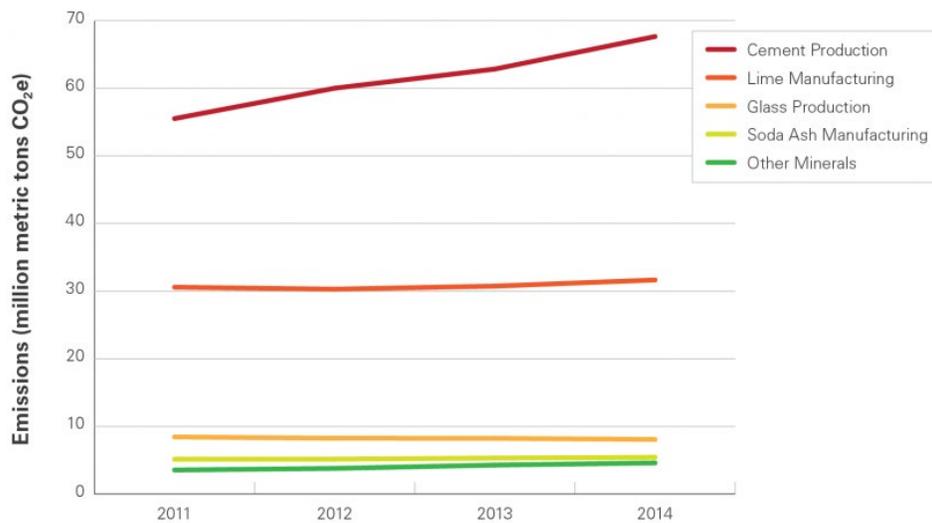
**2014 TOTAL REPORTED EMISSIONS FROM THE MINERALS SECTOR, BY SUBSECTOR**



Sum of percentages may not equal 100% due to independent rounding.

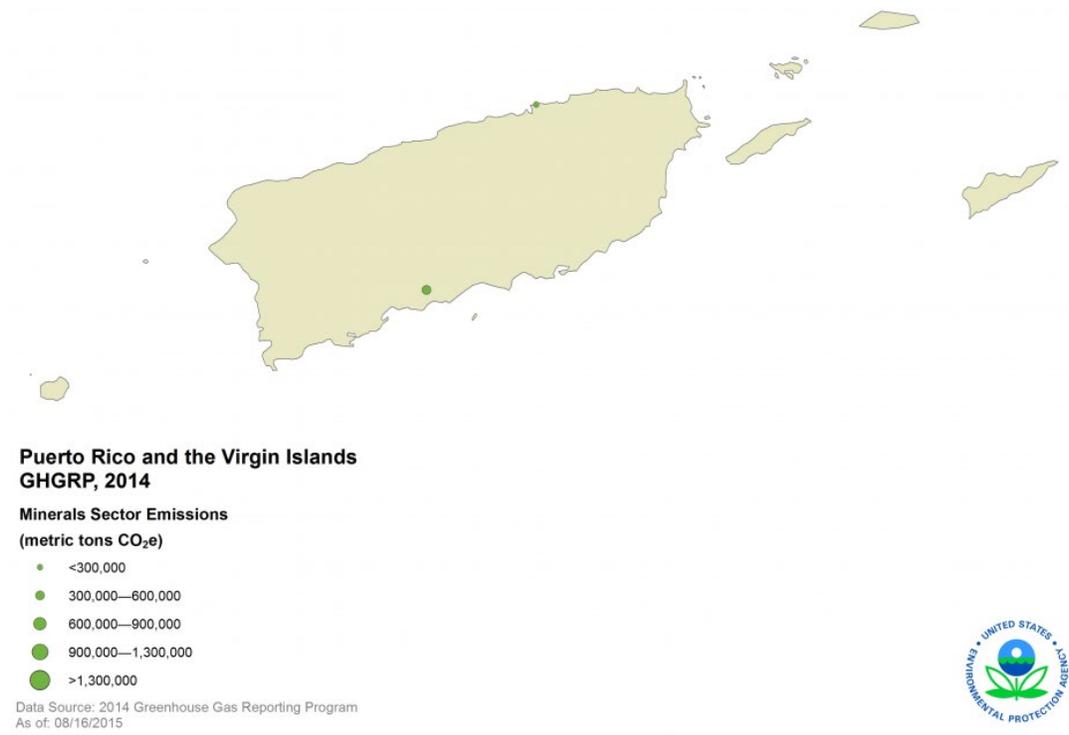
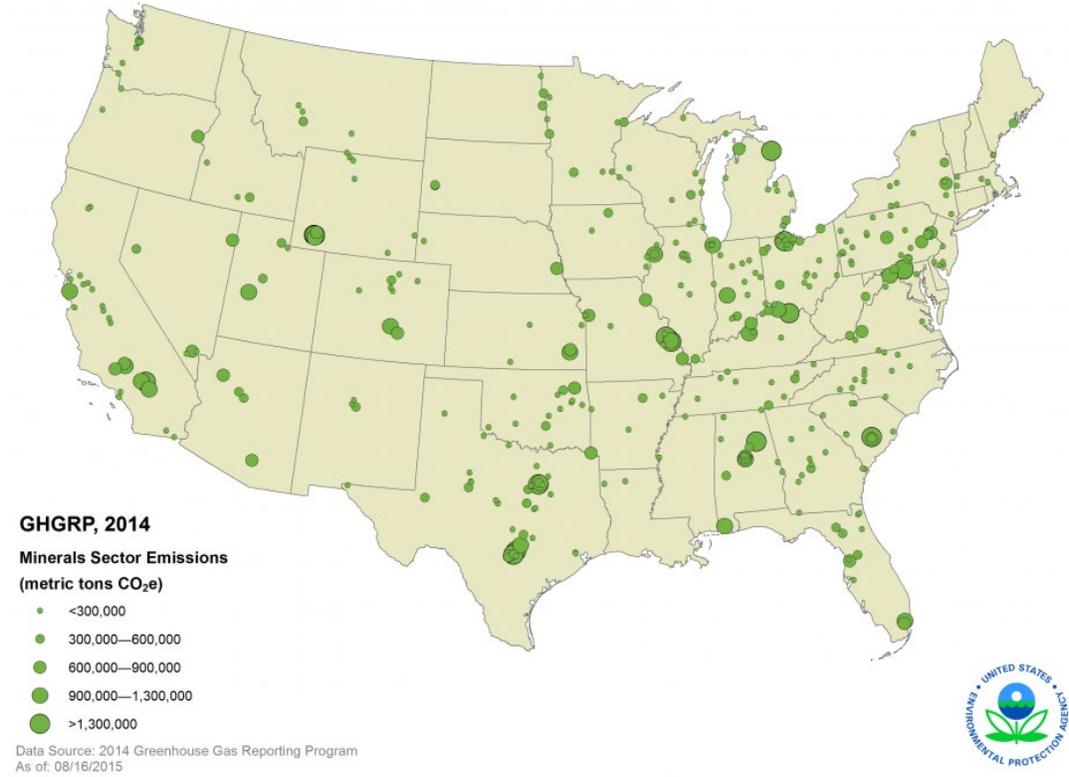
Trend of Annual Reported GHG Emissions by Subsector (as of 8/16/15)

**ANNUAL REPORTED DIRECT EMISSIONS FROM THE MINERALS SECTOR, BY SUBSECTOR**



**Location and emissions range for each reporting facility in the minerals sector (as of 8/16/15).**

These maps show the locations of direct-emitting facilities. The size of a circle corresponds to the quantity of emissions reported by that facility.



## Other EPA Resources

- [U.S. Greenhouse Gas Inventory Report](#)

## GHGRP 2014: Pulp and Paper

The pulp and paper sector consists of facilities that produce market pulp or that manufacture pulp and paper. Facilities that have pulping processes report the GHG emissions from chemical recovery units, lime kilns, and stationary fuel combustion units. In addition to emissions from pulp production processes, the sector includes combustion emissions from facilities that produce paper products from purchased pulp, produce secondary fiber from recycled paper, convert paper into paperboard products, operate coating and laminating processes, print products (such as books, labels, business cards, stationery, and business forms), and perform support activities (such as data imaging, plate-making services, and bookbinding). Emissions from industrial landfills and industrial wastewater treatment at facilities in the pulp and paper sector are included in the waste sector.

### Pulp and Paper Sector — Greenhouse Gas Emissions Reported to the GHGRP

(all emissions values presented in million metric tons CO<sub>2</sub>e)

	2011	2012	2013	2014
<b>Number of facilities:</b>	233	232	232	233
<b>Total emissions (CO<sub>2</sub>e):</b>	44.2	42.5	39.1	39.1
<b>Emissions by greenhouse gas (CO<sub>2</sub>e)</b>				
• Carbon dioxide (CO <sub>2</sub> ):	41.2	39.6	38.3	38.3
• Methane (CH <sub>4</sub> ):	1.1	1.1	0.2	0.2
• Nitrous oxide (N <sub>2</sub> O):	1.9	1.9	0.6	0.6

Totals may not equal sum of individual GHGs due to independent rounding.

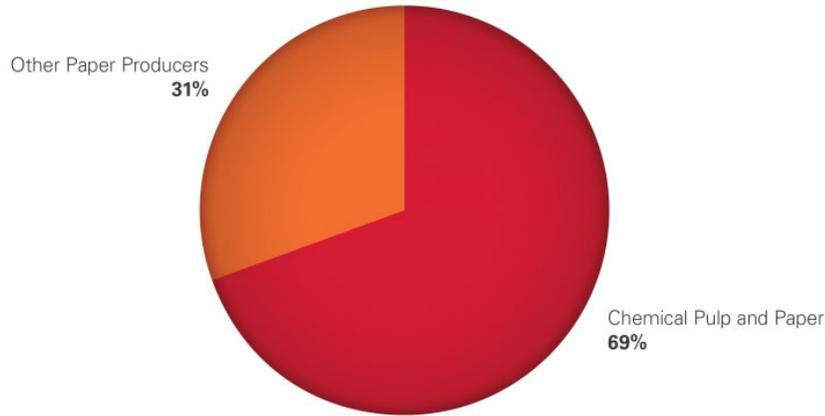
CO<sub>2</sub> emissions from the combustion of biomass are NOT included in emissions totals provided above.

### Number of reporters and 2014 emissions (CO<sub>2</sub>e) per pulp and paper industry subsector

Industry Sector	2014 Number of Reporters	2014 Emissions (million metric tons CO <sub>2</sub> e)
Chemical Pulp and Paper Production	110	27.1
Other Paper Producers	123	12.0

2014 Total Reported Direct Emissions from Pulp and Paper, by Subsector (as of 8/16/15).

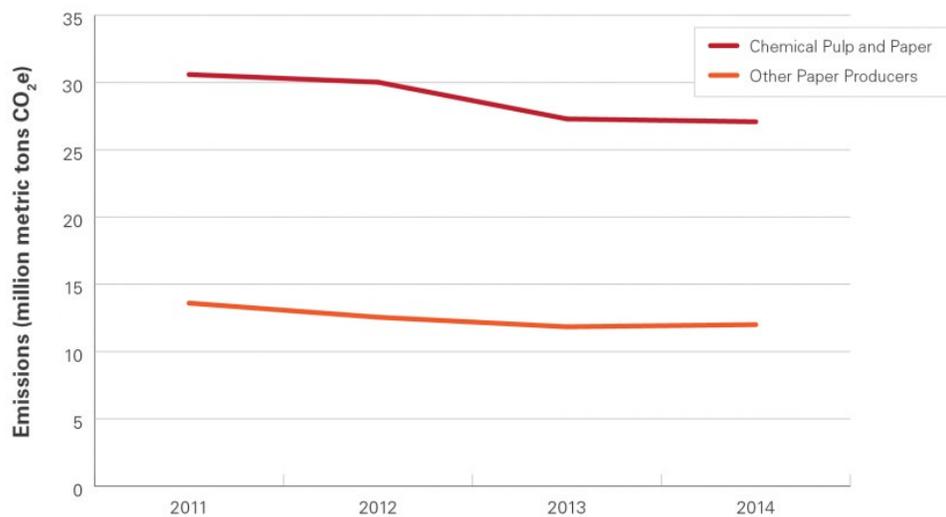
**2014 TOTAL REPORTED EMISSIONS FROM THE PULP & PAPER SECTOR, BY SUBSECTOR**



Sum of percentages may not equal 100% due to independent rounding.

Trend of Annual Reported GHG Emissions by Subsector (as of 8/16/15)

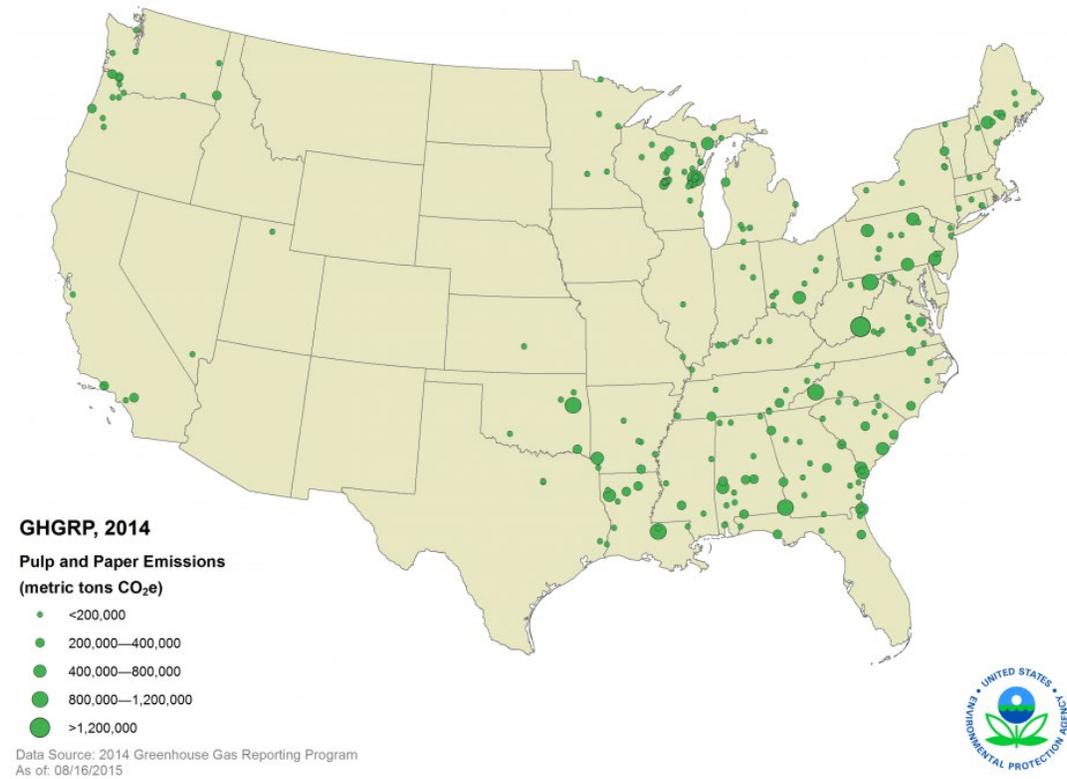
**ANNUAL REPORTED DIRECT EMISSIONS FROM THE PULP & PAPER SECTOR, BY SUBSECTOR**



Emissions from the pulp and paper sector declined from 2012 to 2013 in part due to a change in the emission factors used to estimate GHG emissions from the combustion of spent pulping liquor and wood residuals.

## Location and emissions range for each reporting facility in the pulp and paper sector (as of 8/16/15).

This map shows the locations of direct-emitting facilities. The size of a circle corresponds to the quantity of emissions reported by that facility.



## Other EPA Resources

- [U.S. Greenhouse Gas Inventory Report](#)

## GHGRP 2014: Other Sectors

This sector consists of underground coal mines, electronics manufacturing, electrical equipment manufacturing and electrical transmission and distribution systems. The sector also includes stationary fuel combustion from miscellaneous commercial, institutional, and industrial facilities not covered under other sectors (e.g., ethanol production, food processing, and other manufacturing processes). Emissions from industrial waste landfills and industrial wastewater treatment at these facilities are included in the waste sector.

### Other Sector — Greenhouse Gas Emissions Reported to the GHGRP

(all emissions values presented in million metric tons CO<sub>2</sub>e)

	2011	2012	2013	2014
<b>Number of facilities:</b>	1,367	1,397	1,412	1,428
<b>Total emissions (CO<sub>2</sub>e):</b>	140.8	134.8	136.3	142.4
<b>Emissions by greenhouse gas (CO<sub>2</sub>e)</b>				
• Carbon dioxide (CO <sub>2</sub> ):	90.9	88.2	88.2	90.9
• Methane (CH <sub>4</sub> ):	40.2	37.9	40.0	42.9
• Nitrous oxide (N <sub>2</sub> O):	0.5	0.6	0.4	0.4
• Hydrofluorocarbons (HFCs):	0.2	0.2	0.2	0.3
• Hydrofluoroethers (HFEs):	**	**	**	**
• Perfluorocarbons (PFCs):	3.8	3.6	3.1	2.7
• Sulfur hexafluoride (SF <sub>6</sub> ):	4.6	3.7	3.8	4.0
• Nitrogen trifluoride (NF <sub>3</sub> ):	0.6	0.6	0.5	0.4
• Other:	**	**	**	0.7

Totals may not equal sum of individual GHGs due to independent rounding.

\*\* Total reported emissions are less than 0.05 million metric tons CO<sub>2</sub>e.

CO<sub>2</sub>e emissions from the combustion of biomass are NOT included in emissions totals provided above.

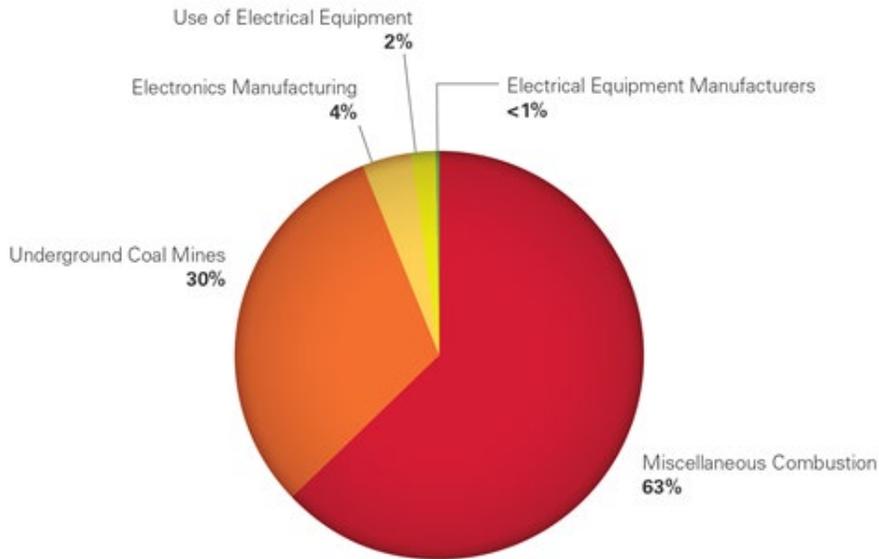
### Number of reporters and 2014 emissions (CO<sub>2</sub>e) per other industry subsector

Industry Subsector	2014 Number of Reporters	2014 Emissions (million metric tons)
Miscellaneous Combustion		
• Food Processing	331	31.5
• Ethanol Production	172	18.3
• Other Manufacturing	295	16.9
• Universities	112	9.5
• Military	43	2.5
• Other Combustion	172	11.5
Underground Coal Mines	128	43.2
Electronics Manufacturing	52	5.7
Production and Use of Electrical Equipment		
• Electrical Equipment Manufacturers	7	0.2

• Electrical Equipment Use	116	3.1
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**Total Reported Direct Emissions from Other, by Subsector (as of 8/16/15).**

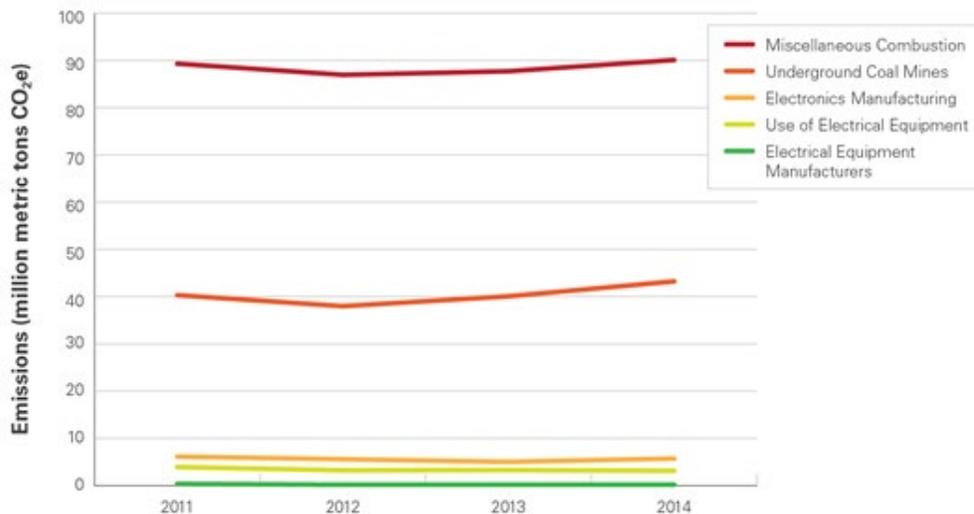
**2014 TOTAL REPORTED EMISSIONS FROM THE OTHER SECTOR, BY SUBSECTOR**



Sum of percentages may not equal 100% due to independent rounding.

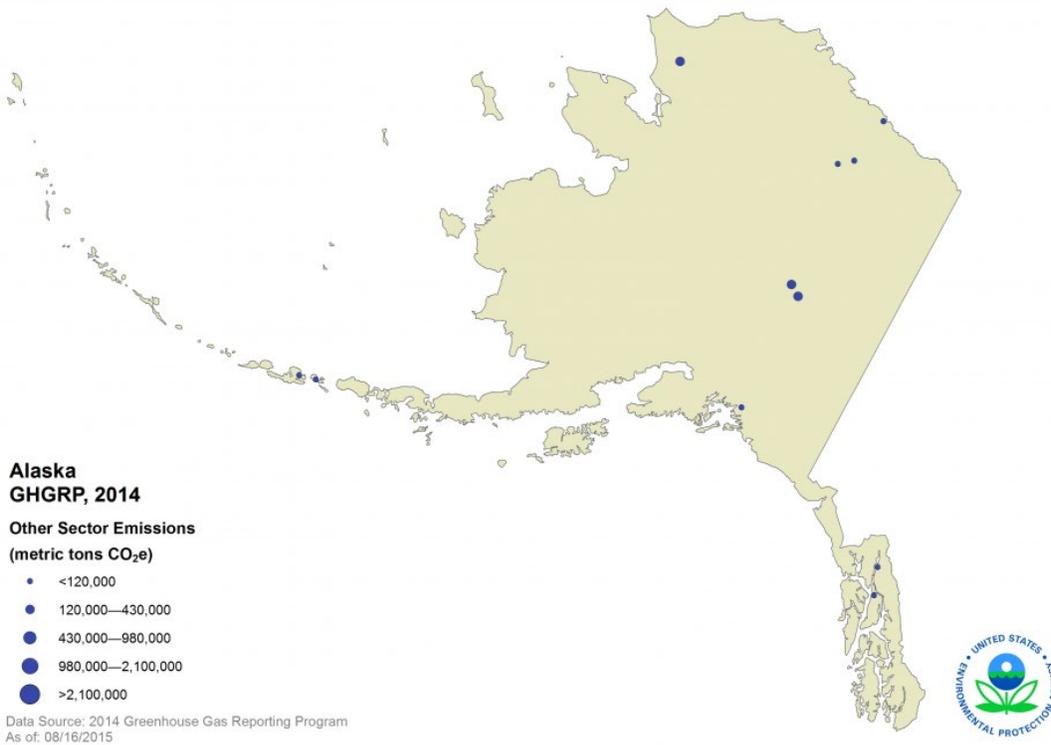
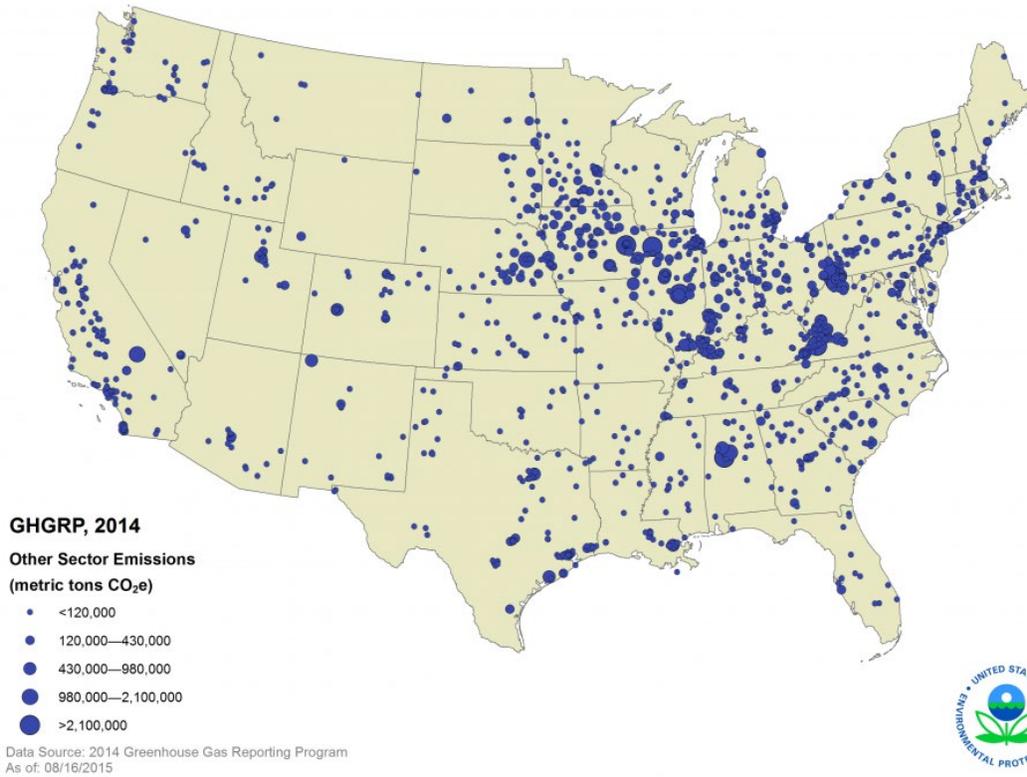
**Trend of Annual Reported GHG Emissions by Subsector (as of 8/16/15).**

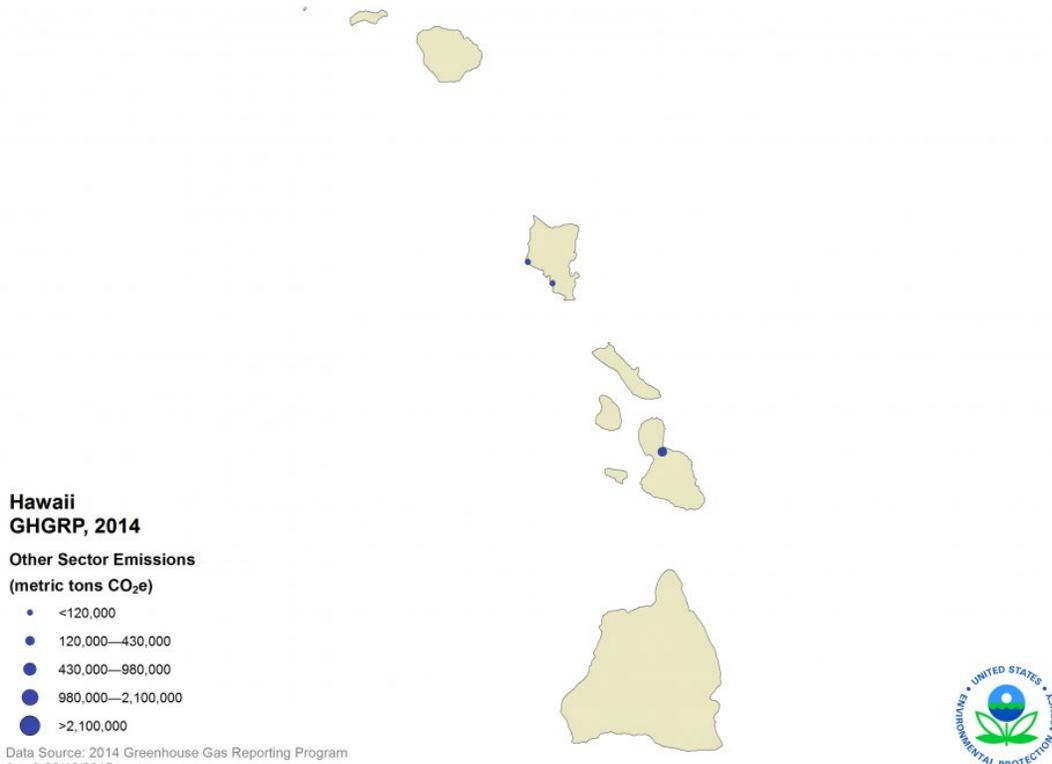
**ANNUAL REPORTED DIRECT EMISSIONS FROM THE OTHER COMBUSTION SECTOR, BY SUBSECTOR**



**Location and emissions range for each reporting facility in the Other Sector (as of 8/16/15).**

These maps show the locations of direct-emitting facilities. The size of a circle corresponds to the quantity of emissions reported by that facility.





## Other EPA Resources

- [U.S. Greenhouse Gas Inventory Report](#)

## GHGRP 2014: Miscellaneous Combustion

Miscellaneous combustion comprises facilities that reported GHG emissions from stationary fuel combustion sources only and that are not part of any other sector. This category includes food processing, ethanol production, manufacturing operations, universities, military installations, and any combustion sources not included elsewhere, such as mining operations and hospitals.

### Miscellaneous Combustion — Greenhouse Gas Emissions Reported to the GHGRP

(all emissions values presented in million metric tons CO<sub>2</sub>e)

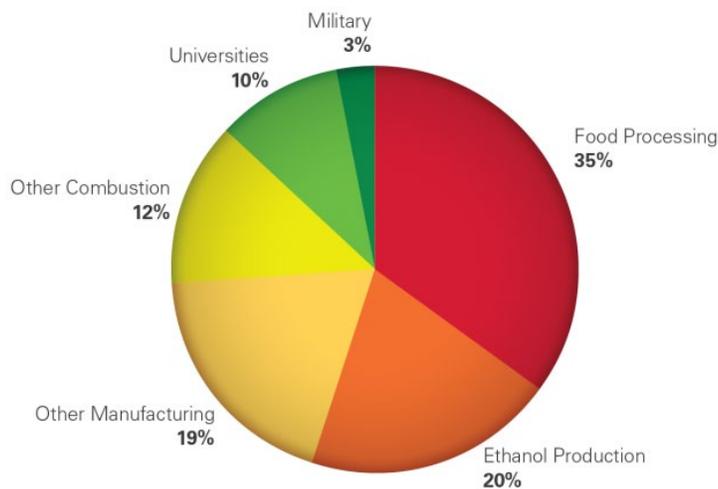
	2011	2012	2013	2014
<b>Number of facilities:</b>				
• Food Processing	310	319	325	331
• Ethanol Production	163	166	164	172
• Other Manufacturing	285	290	291	295
• Universities	111	114	113	112
• Military	43	44	43	43
• Other Combustion	159	167	170	172
<b>Total emissions (CO<sub>2</sub>e):</b>				
• Food Processing	30.9	30.7	30.9	31.5
• Ethanol Production	18.2	17.4	17.1	18.3
• Other Manufacturing	17.1	16.2	16.7	16.9
• Universities	9.4	9.0	9.3	9.5
• Military	2.7	2.6	2.5	2.5
• Other Combustion	11.0	11.1	11.1	11.5
<b>Emissions by greenhouse gas (CO<sub>2</sub>e) Food Processing</b>				
• Carbon dioxide (CO <sub>2</sub> ):	30.7	30.5	30.7	31.3
• Methane (CH <sub>4</sub> ):	0.1	0.1	0.1	0.1
• Nitrous oxide (N <sub>2</sub> O):	0.1	0.1	0.1	0.1
<b>Ethanol Production</b>				
• Carbon dioxide (CO <sub>2</sub> ):	18.2	17.2	17.1	18.3
• Methane (CH <sub>4</sub> ):	**	**	**	**
• Nitrous oxide (N <sub>2</sub> O):	**	0.2	**	**
<b>Other Manufacturing</b>				
• Carbon dioxide (CO <sub>2</sub> ):	17.0	16.1	16.6	16.8
• Methane (CH <sub>4</sub> ):	**	**	**	**
• Nitrous oxide (N <sub>2</sub> O):	0.1	0.1	0.1	**
<b>Universities</b>				
• Carbon dioxide (CO <sub>2</sub> ):	9.4	9.0	9.3	9.4
• Methane (CH <sub>4</sub> ):	**	**	**	**
• Nitrous oxide (N <sub>2</sub> O):	**	**	**	**
<b>Military</b>				
• Carbon dioxide (CO <sub>2</sub> ):	2.7	2.6	2.5	2.5

	2011	2012	2013	2014
• Methane (CH <sub>4</sub> ):	**	**	**	**
• Nitrous oxide (N <sub>2</sub> O):	**	**	**	**
<b>Other Combustion</b>				
• Carbon dioxide (CO <sub>2</sub> ):	10.9	11.1	11.1	11.4
• Methane (CH <sub>4</sub> ):	**	**	**	**
• Nitrous oxide (N <sub>2</sub> O):	**	**	**	**

Totals may not equal sum of individual GHGs due to independent rounding.

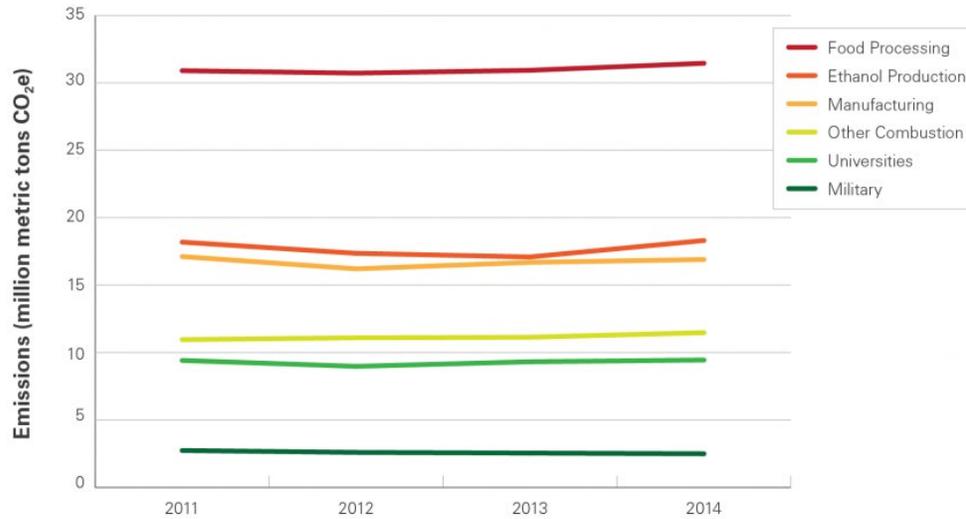
\*\* Total reported emissions are less than 0.05 million metric tons CO<sub>2</sub>e.

**2014 Total Reported Direct Emissions from Miscellaneous Combustion, by Subsector (as of 8/16/15).**



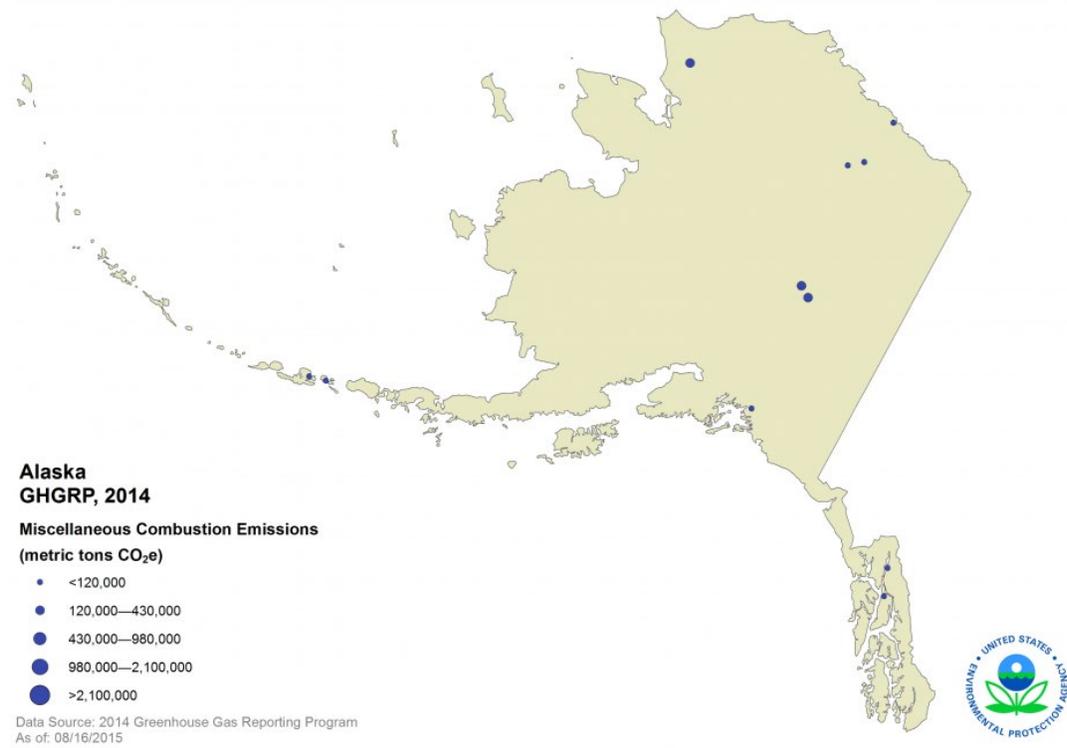
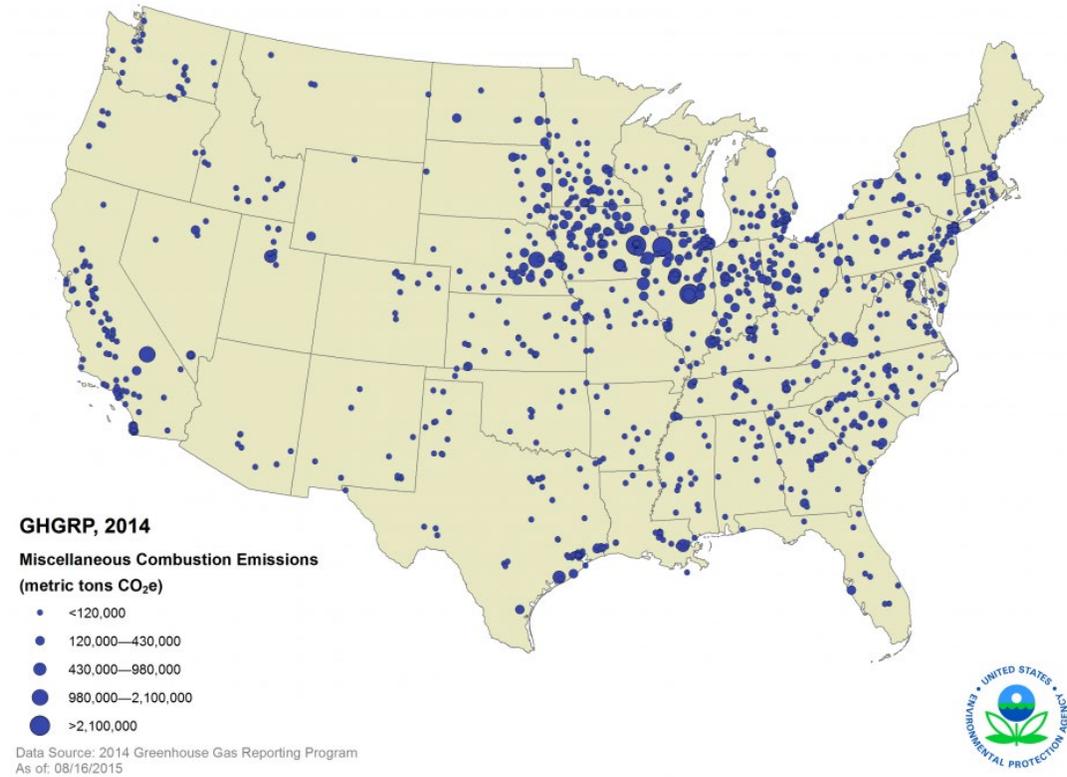
Sum of percentages may not equal 100% due to independent rounding.

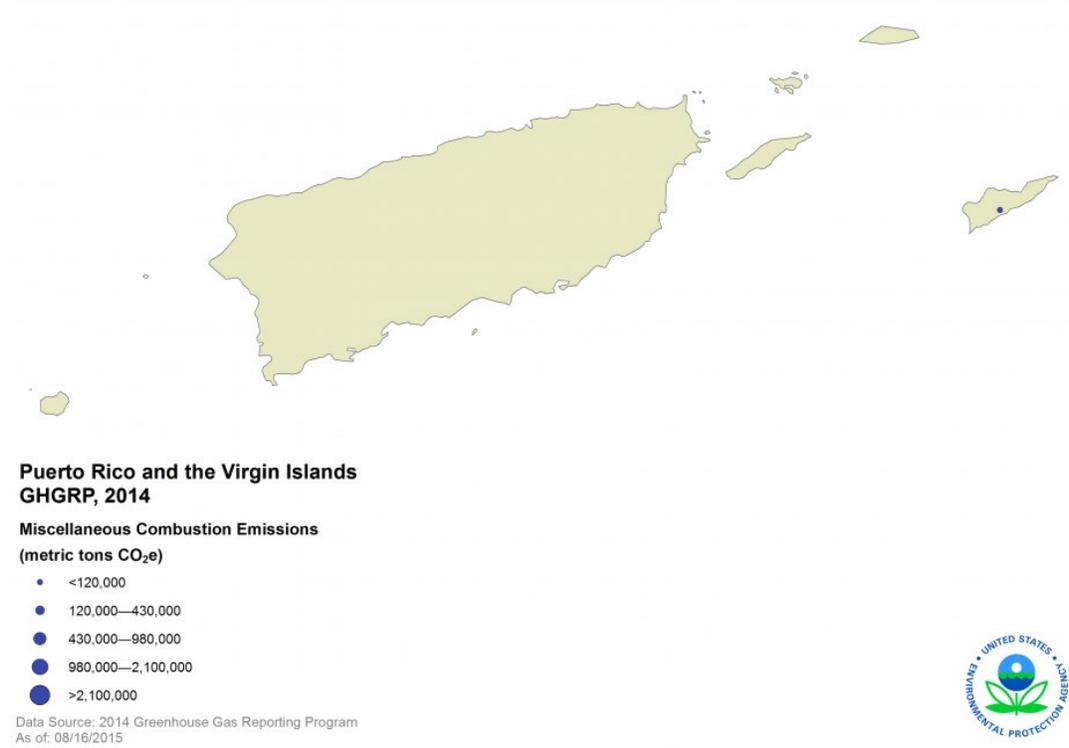
**Trend of Annual Reported GHG Emissions from Miscellaneous Combustion, by Subsector (as of 8/16/15).**



**Location and emissions range for each reporting facility in the Miscellaneous Combustion sector (as of 8/16/15).**

These maps show the locations of direct-emitting facilities. The size of a circle corresponds to the quantity of emissions reported by that facility.





## Other EPA Resources

- [U.S. Greenhouse Gas Inventory Report](#)

## GHGRP 2014: Underground Coal Mines

The Underground Coal Mines sector consists of all underground coal mines that liberate 36,500,000 actual cubic feet of methane (equivalent to approximately 17,579 metric tons CO<sub>2</sub>e) or more per year. Facilities in this sector include both underground coal mines under development and those categorized by the Mine Safety and Health Administration as active mines. Surface mines and abandoned mines are excluded from this category. Facility owners or operators must report the total annual methane liberated from ventilation and degasification systems as well as GHG emissions from any other source categories at the facility, such as stationary combustion devices.

### Underground Coal Mines — Greenhouse Gas Emissions Reported to the GHGRP

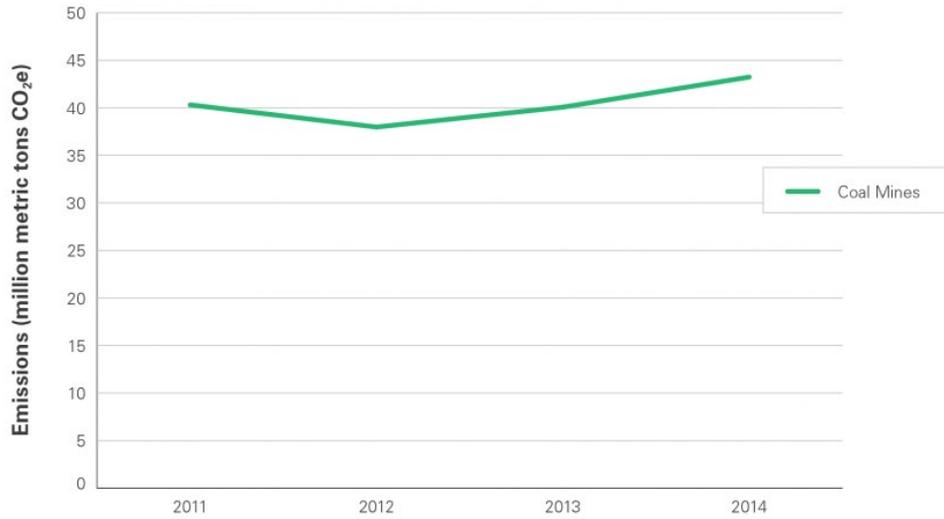
(all emissions values presented in million metric tons CO<sub>2</sub>e)

	2011	2012	2013	2014
<b>Number of facilities:</b>	114	115	126	128
<b>Total emissions (CO<sub>2</sub>e):</b>	40.3	38.0	40.1	43.2
<b>Emissions by greenhouse gas (CO<sub>2</sub>e)</b>				
• Carbon dioxide (CO <sub>2</sub> ):	0.3	0.2	0.2	0.5
• Methane (CH <sub>4</sub> ):	40.0	37.8	39.9	42.7
• Nitrous oxide (N <sub>2</sub> O):	**	**	**	**

\*\* Total reported emissions are less than 0.05 million metric tons CO<sub>2</sub>e.

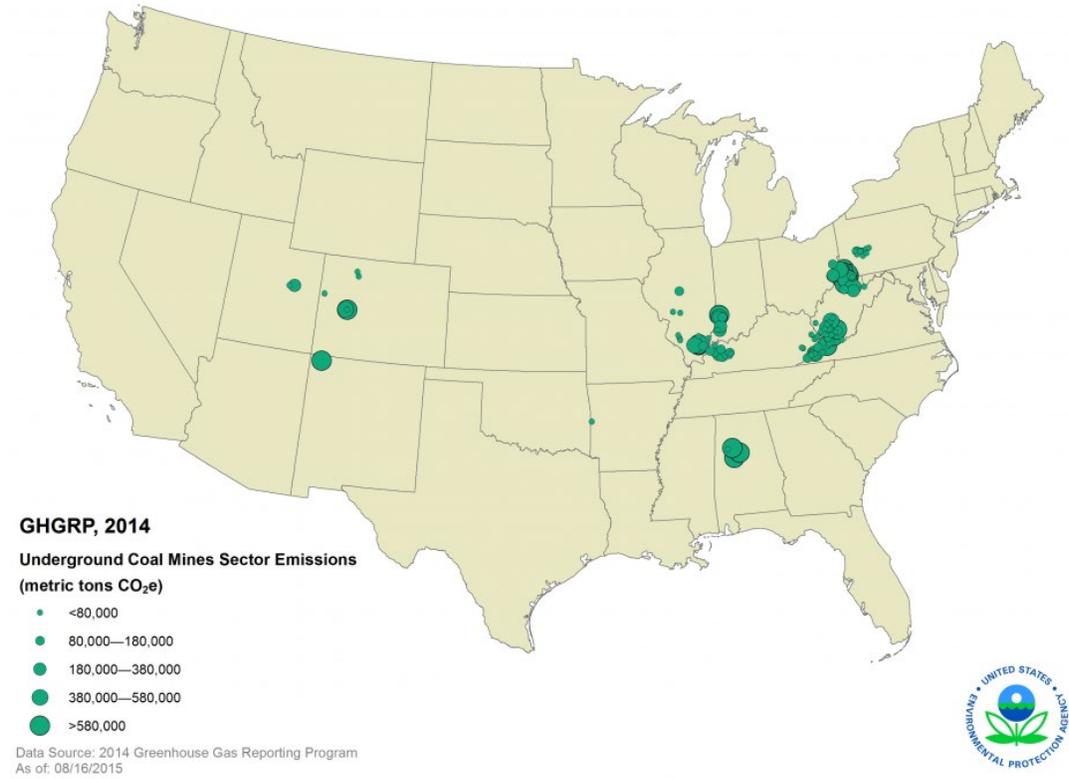
CO<sub>2</sub> emissions from the combustion of biomass are NOT included in the emissions totals provided above.

**Trend of Annual Reported Direct Emissions from the Underground Coal Mines Sector (as of 8/16/15).**



**Location and emissions range for each reporting facility in the underground coal mines sector (as of 8/16/15).**

This map shows the locations of direct-emitting facilities. The size of a circle corresponds to the quantity of emissions reported by that facility.



## Other EPA Resources

- [U.S. Greenhouse Gas Inventory Report](#)

## GHGRP 2014: Electronics Manufacturing

This source category includes, but is not limited to, facilities that manufacture semiconductors (including light-emitting diodes), micro-electromechanical systems (MEMS), liquid crystal displays (LCDs), and photovoltaic cells (PV). Specifically, this subsector consists of electronics manufacturing facilities with production processes that use plasma-generated fluorine atoms and other reactive fluorine-containing fragments to etch thin films, clean chambers for depositing thin films, clean wafers, or remove residual material. The source category also includes electronics manufacturing facilities with chemical vapor deposition processes or other production processes that use N<sub>2</sub>O, and with processes that use fluorinated GHGs as heat transfer fluids (HTF) to control temperature or clean surfaces.

### Electronics Manufacturing — Greenhouse Gas Emissions Reported to the GHGRP

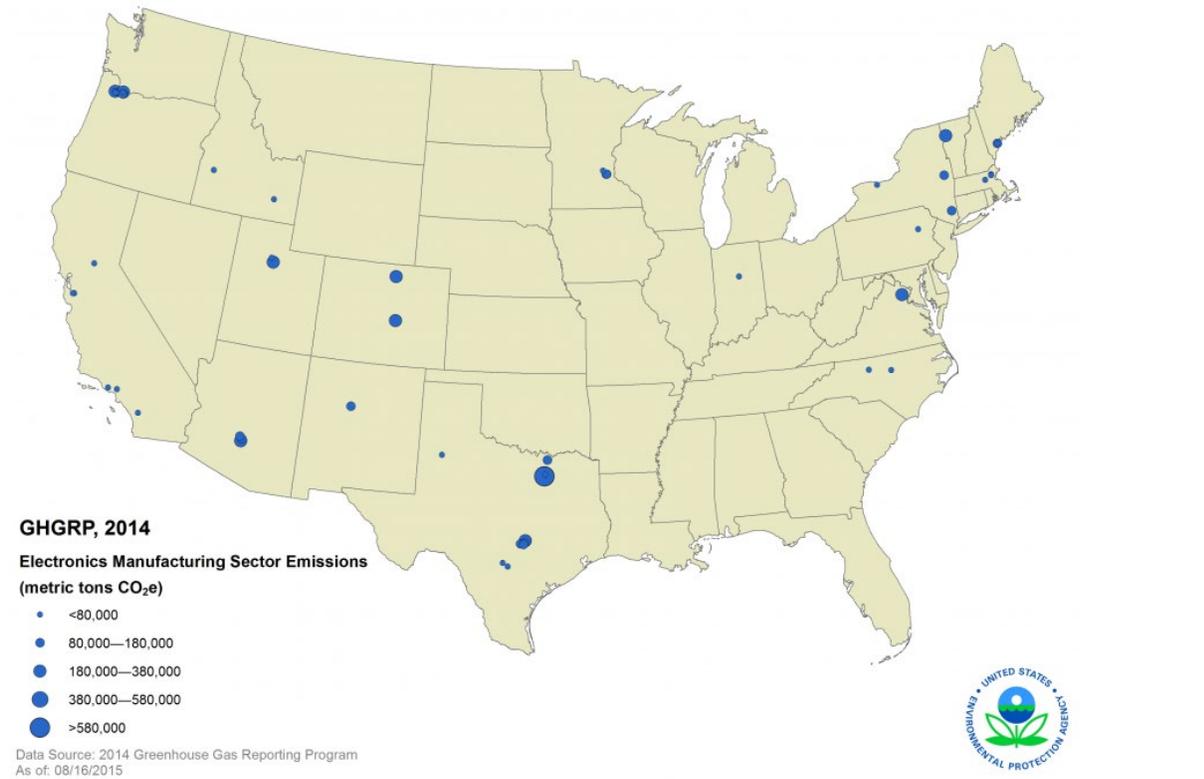
(all emissions values presented in million metric tons CO<sub>2</sub>e)

	2011	2012	2013	2014
<b>Number of facilities:</b>	53	53	53	52
<b>Total emissions (CO<sub>2</sub>e):</b>	6.8	6.5	5.0	5.7
<b>Emissions by greenhouse gas (CO<sub>2</sub>e)</b>				
• Carbon dioxide (CO <sub>2</sub> ):	1.6	1.5	0.7	0.7
• Methane (CH <sub>4</sub> ):	**	**	**	**
• Nitrous oxide (N <sub>2</sub> O):	0.2	0.2	0.2	0.2
• Hydrofluorocarbons (HFCs):	0.2	0.2	0.2	0.3
• Hydrofluoroethers (HFEs):	**	**	**	**
• Perfluorocarbons (PFCs):	3.8	3.6	3.1	2.7
• Sulfur hexafluoride (SF <sub>6</sub> ):	0.3	0.3	0.3	0.7
• Nitrogen trifluoride (NF <sub>3</sub> ):	0.6	0.6	0.5	0.4
• Other	**	**	**	0.7

Emissions of CO<sub>2</sub> and CH<sub>4</sub> are from stationary fuel combustion sources.

**Location and emissions range for each reporting facility in the Electronics Manufacturing sector (as of 8/16/15).**

This map shows the locations of direct-emitting facilities. The size of a circle corresponds to the quantity of emissions reported by that facility.



## GHGRP 2014: Electrical Equipment Production and Use

This source category comprises electrical transmission and distribution systems and facilities that manufacture or refurbish electrical equipment.

The electrical transmission and distribution subsector consists of all electric transmission and distribution equipment insulated with or containing sulfur hexafluoride (SF<sub>6</sub>) or perfluorocarbons (PFCs) within an electric power system. This equipment includes but is not limited to gas-insulated substations; circuit breakers; switchgear, including closed-pressure and hermetically sealed-pressure switchgear; gas-insulated lines containing SF<sub>6</sub> or PFCs; and gas containers such as pressurized cylinders, gas carts, electric power transformers, and other containers of SF<sub>6</sub> or PFCs. Emissions are from leakage of fluorinated greenhouse gases during the servicing and use of the equipment.

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### Production and Use of Electrical Equipment — Greenhouse Gas Emissions Reported to the GHGRP

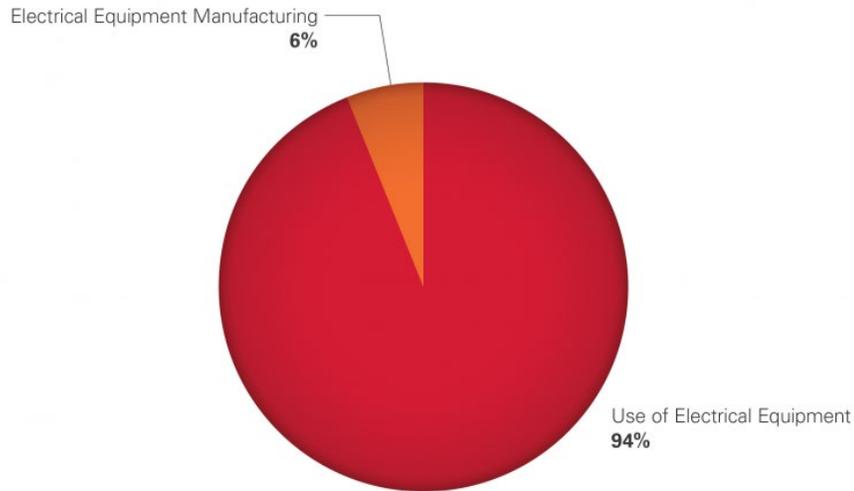
(all emissions values presented in million metric tons CO<sub>2</sub>e)

	2011	2012	2013	2014
<b>Number of facilities:</b>				
• Carbon dioxide (CO <sub>2</sub> ):	123	123	121	116
• Methane (CH <sub>4</sub> ):	6	6	6	7
<b>Total emissions (CO<sub>2</sub>e):</b>				
• Carbon dioxide (CO <sub>2</sub> ):	3.9	3.2	3.3	3.1
• Methane (CH <sub>4</sub> ):	0.3	0.2	0.2	0.2
<b>Emissions by greenhouse gas (CO<sub>2</sub>e)</b>				
• Carbon dioxide (CO <sub>2</sub> ):	**	**	**	**
• Methane (CH <sub>4</sub> ):	**	**	**	**
• Nitrous oxide (N <sub>2</sub> O):	**	**	**	**
• Perfluorocarbons (PFCs):	**	**	**	**
• Sulfur hexafluoride (SF <sub>6</sub> ):	4.3	3.4	3.5	3.3

Totals may not equal sum of individual GHGs due to independent rounding.

\*\* Total reported emissions are less than 0.05 million metric tons CO<sub>2</sub>e.

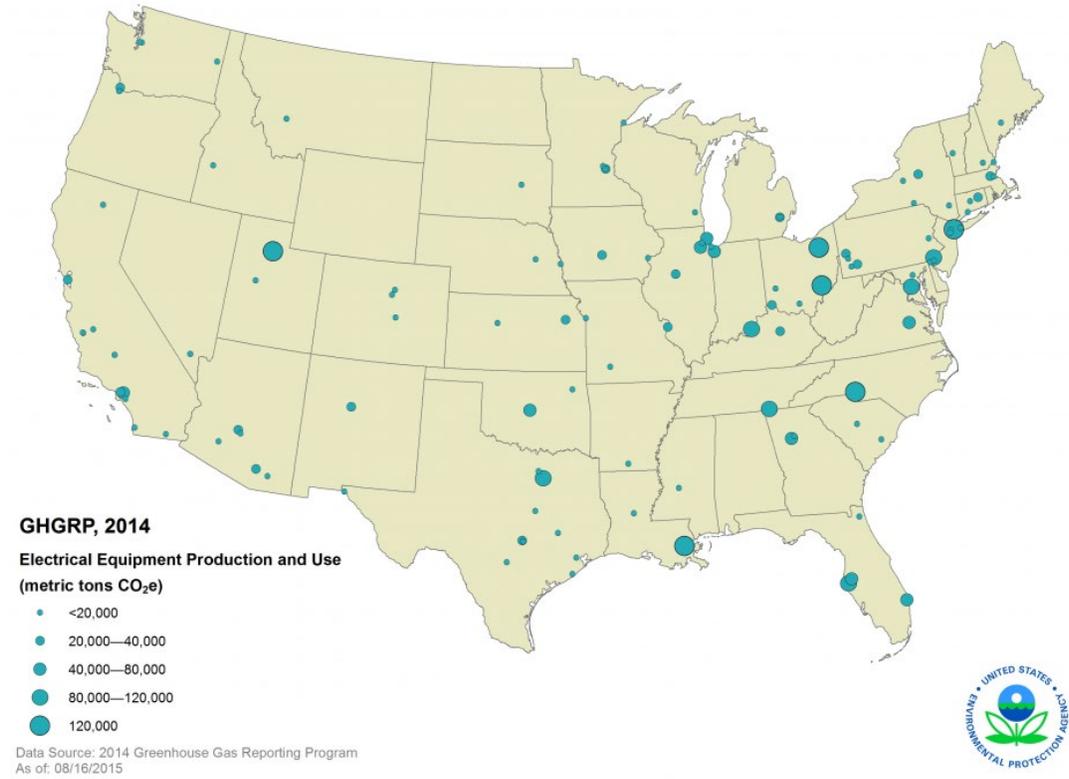
**2014 Total Reported Direct Emissions from Production and Use of Electrical Equipment Sector, by Subsector (as of 8/16/15).**



Sum of percentages may not equal 100% due to independent rounding.

**Location and emissions range for each reporting facility in the Electronics Manufacturing sector (as of 8/16/15).**

These maps show the locations of direct-emitting facilities. The size of a circle corresponds to the quantity of emissions reported by that facility.





**Puerto Rico and the Virgin Islands  
GHGRP, 2014**

**Electrical Equipment Production and Use  
(metric tons CO<sub>2</sub>e)**

- <20,000
- 20,000—40,000
- 40,000—80,000
- 80,000—120,000
- 120,000

Data Source: 2014 Greenhouse Gas Reporting Program  
As of: 08/16/2015



## GHGRP 2014: Supplier Highlights

For reporting year (RY) 2014, over 900 suppliers of fuels and industrial gases reported to EPA's Greenhouse Gas Reporting Program (GHGRP).

Suppliers do not report direct emissions, but instead report the quantity of GHGs that would be emitted if the fuels and industrial GHGs that they produce, import, or export each year were combusted, released, or oxidized. Emissions associated with these fuels and industrial gases do not occur at the supplier's facility but instead occur throughout the country, wherever they are used. An example of this is gasoline, which is supplied into the U.S. economy by a relatively small number of entities and consumed by many individual vehicles throughout the country.

The GHG quantity reported by suppliers might not always result in GHG emissions, and the emissions might not take place during that particular reporting year. However, the data from suppliers provide important information on the structure and flow of products through the economy and these products may ultimately result in greenhouse gas emissions. In addition, data reported by fossil fuel and industrial gas suppliers can account for greenhouse gases emitted by the numerous sources that use these products but do not report under the GHGRP due to their low individual emissions (passenger vehicles, for example). Emissions reported by suppliers can be accessed through the [suppliers section](#) of FLIGHT.

For 2014, 957 suppliers submitted a GHG report. The majority of GHG emissions associated with the transportation, residential, and commercial sectors are accounted for by these suppliers.

**Table 1: Number of Suppliers that Reported (2014)**

Industry Sector	Number of Reporters <sup>7</sup>
Suppliers of Coal-Based Liquid Fuels	1
Suppliers of Petroleum Products	230
Suppliers of Natural Gas and Natural Gas Liquids	
• <i>Natural Gas Local Distribution Companies</i>	376
• <i>Natural Gas Liquids Fractionators</i>	127
Suppliers of Industrial GHGs and Products Containing GHGs	
• <i>Industrial GHGs</i>	58
• <i>Imports and Exports of Equipment Pre-charged with Fluorinated GHGs or Containing Fluorinated GHGs in Closed-cell Foams</i>	37
Suppliers of Carbon Dioxide	146

<sup>7</sup> Totals sum to more than 957, because suppliers that fall into more than one sector are counted multiple times.

## GHGRP 2014: Suppliers of Natural Gas and Natural Gas Liquids

This sector consists of entities that supply natural gas and natural gas liquids. Natural gas supply is reported by Local Distribution Companies (LDCs) and natural gas liquids (NGL) fractionators.

**NGL Fractionators** are installations that receive natural gas or natural gas liquids from producers and fractionate these raw inputs into individual products (ethane, propane, normal butane, isobutane, or pentanes plus) and supply those products into the economy.

**Local Distribution Companies** receive natural gas from a transmission pipeline company and physically deliver the gas to end users.

These suppliers do not report direct emissions, but instead report the quantity of CO<sub>2</sub> that would be emitted if the fuels they supply each year were combusted. Emissions associated with these fuels do not occur at the supplier's facility but instead occur throughout the country, wherever they are used. The full GHG quantity reported by suppliers might not always result in GHG emissions, and the emissions might not take place during that particular reporting year. An example is ethane supplied by NGL fractionators, which is often used to produce plastics.

The GHG quantities reported by suppliers can be accessed through the [suppliers section](#) of FLIGHT. Some natural gas and natural gas liquids suppliers also report direct emissions from petroleum and natural gas operations.

### Natural Gas and Natural Gas Liquids Suppliers Sector – Carbon Dioxide Quantity Reported to the GHGRP

(million metric tons CO<sub>2</sub>)

	2011	2012	2013	2014
<b>Local Distribution Companies</b>				
Number of reporters:	379	385	382	376
CO <sub>2</sub> Quantity	715.1	707.5	770.7	789.1
<b>Natural Gas Liquids Fractionators</b>				
Number of reporters:	115	119	124	127
CO <sub>2</sub> Quantity <sup>8</sup>	211.2	233.8	222.8	261.6

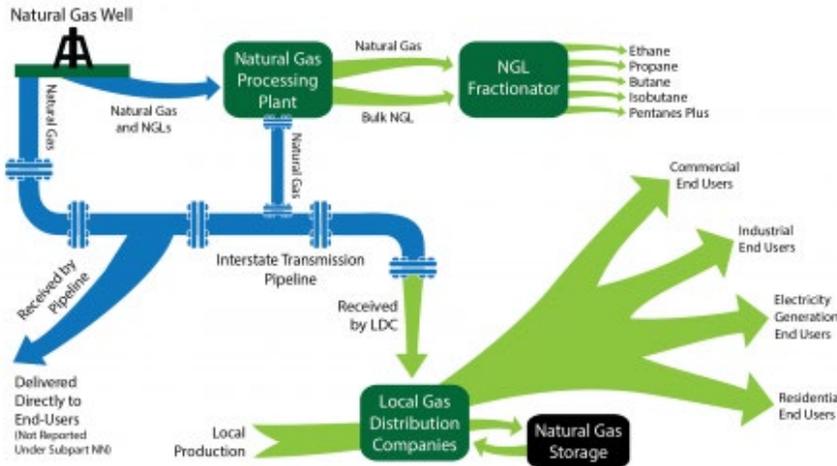
### Natural Gas Deliveries Reported by LDCs (Mscf)

End-User	2011	2012	2013	2014
<b>Total Reported Deliveries</b>	<b>12,820,369,446</b>	<b>12,776,494,730</b>	<b>13,926,227,039</b>	<b>14,349,171,707</b>
Residential Customers	4,638,755,302	4,085,770,019	4,847,978,042	5,005,168,064
Commercial Customers	3,069,522,830	2,830,406,362	3,187,270,603	3,346,258,635
Industrial Customers	3,253,235,333	3,460,194,284	3,649,497,111	3,740,500,219
Electricity Generating Facilities	1,858,855,981	2,403,124,066	2,241,481,284	2,257,244,788

Mscf means thousand standard cubic feet of gas.

<sup>8</sup> Excludes CO<sub>2</sub> reported by NGL Fractionators whose reported quantities are classified as confidential business information (CBI).

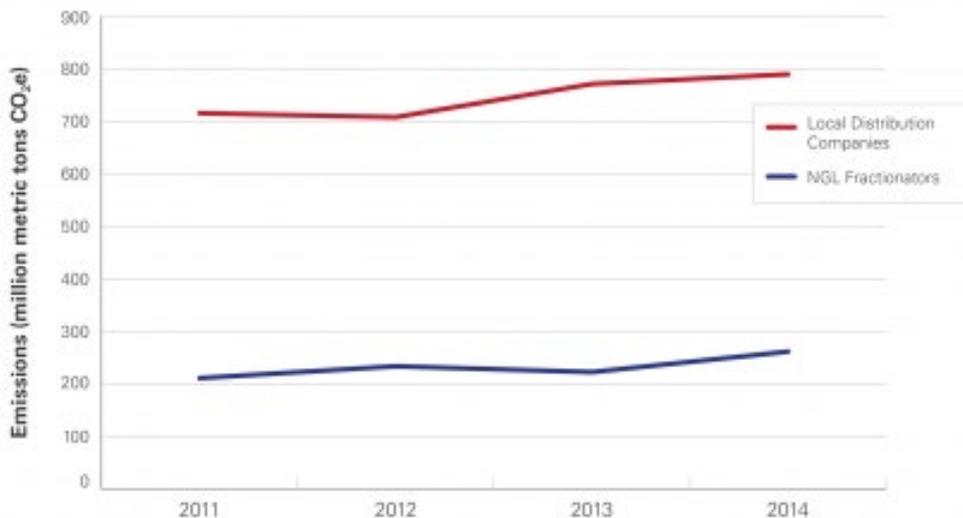
Graphic of the natural gas and NGL supply chain.



Quantities marked with green arrows are reported to EPA by NGL Fractionators or Local Distribution Companies under Subpart NN.

Trend of Annual Reported CO<sub>2</sub> Quantity associated with natural gas and NGL supply.

**ANNUAL CO<sub>2</sub> QUANTITY REPORTED BY LOCAL DISTRIBUTION COMPANIES AND NGL FRACTIONATORS**



\*\* Excludes CO<sub>2</sub> reported by NGL Fractionators whose reported quantities are classified as confidential business information (CBI). Among suppliers of natural gas liquids the default emission factors used for 2013 for propane, butane and isobutane increased by a few percent over those used in 2012 due to technical corrections. The default emission factor for ethane meanwhile decreased by over 30 percent. As a result of these changes, NGL fractionators reported a lower CO<sub>2</sub> value in 2013 than would have been reported if the factors had not been updated. The default emission factor for natural gas supplied for 2013 also decreased by about 1%. As a result of this change, LDCs reported a lower CO<sub>2</sub> value in 2013 than would have been reported if the factor had not been updated.

## GHGRP 2014: Suppliers of Petroleum Products

This sector comprises petroleum refineries and importers and exports of petroleum products and natural gas liquids. These suppliers do not report direct emissions, but instead report the quantity of CO<sub>2</sub> that would be emitted if the fuels and other products they supply each year were combusted. Petroleum refineries also report the volume of all feedstocks entering the refinery.

Emissions associated with these products do not occur at the supplier's facility but instead occur throughout the country, wherever they are used. The full GHG quantity reported by suppliers might not always result in GHG emissions, and the emissions might not take place during that particular reporting year. An example is ethylene, which is a byproduct from petroleum refining that is often used to produce plastics.

The GHG quantities reported by suppliers can be accessed through the [suppliers section](#) of FLIGHT. Petroleum refineries also report direct emissions under other applicable subparts.

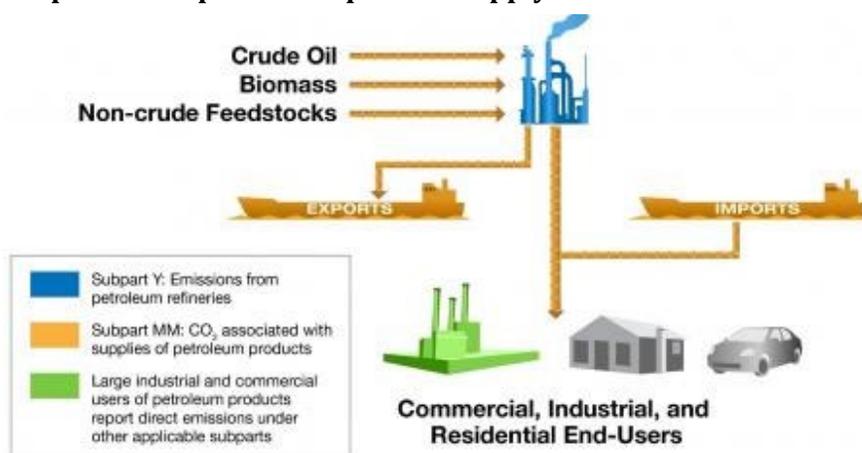
### Petroleum Product Suppliers Sector - Number of Reporters

	2012	2013	2014
<b>Importers</b>	84	84	84
<b>Exporters</b>	58	58	60
<b>Petroleum Refineries</b>	138	136	135

### Petroleum Refineries – CO<sub>2</sub> Quantity Associated with Supplied Products<sup>9</sup> (million metric tons CO<sub>2</sub>)

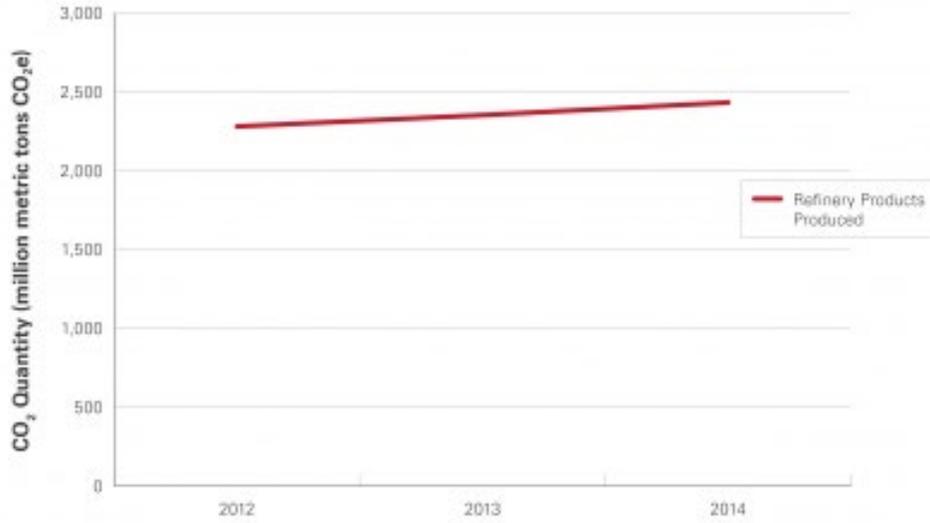
	2012	2013	2014
<b>Petroleum Refineries</b>	2,280.1	2,351.6	2,432.1

### Graphic of the petroleum product supply chain



<sup>9</sup> Carbon dioxide quantities shown in this table exclude petroleum refineries whose carbon dioxide quantities are considered [confidential business information](#).

### Trend of Annual Reported CO<sub>2</sub> Quantity Associated with Refinery Petroleum Products Produced



## GHGRP 2014: Suppliers of Industrial GHGs and Products Containing GHGs

This sector comprises industrial greenhouse gas (GHG) suppliers and entities that import or export certain products that contain fluorinated greenhouse gases. These suppliers do not report direct emissions, but instead report the equivalent quantity of CO<sub>2</sub> that would be emitted if the gases that they produce, import, or export each year were released to the atmosphere.

**Industrial GHG Suppliers.** Entities that manufacture, import, or export fluorinated greenhouse gases or nitrous oxide in bulk report as suppliers of industrial GHGs under Subpart OO of the GHGRP. The number of reporters displayed in the table below includes all reporters subject to Subpart OO, not just those reporting supply of the specific compounds listed in the table titled Quantity (Net Supply) of GHGs Reported.

**Importers and Exporters** of (1) equipment that is pre-charged with fluorinated greenhouse gases (e.g., electrical equipment and air conditioners) and (2) closed cell foams containing fluorinated greenhouse gases (e.g., insulation contained inside refrigerators; insulation boardstock) report under Subpart QQ.

### Number of Reporters Subject to Subparts OO and QQ

Industry Sector	2010	2011	2012	2013	2014
<b>Industrial GHG Suppliers (OO)</b>	56	59	62	59	58
Producers (Facilities)	21	24	25	24	22
Importers	26	32	35	31	32
Exporters	16	20	22	23	22
<b>Importers and Exporters of Fluorinated Gases in Products (QQ)</b>	N/A <sup>a</sup>	34	38	39	37
Importers	N/A <sup>a</sup>	29	32	33	34
Exporters	N/A <sup>a</sup>	26	29	30	30

<sup>a</sup> Importers and Exporters of Fluorinated Gases in Products were not required to report 2010 data.

The number of importers, exporters and producers exceeds the total for each sector because some reporters qualify as multiple types of suppliers.

### Quantity (Net Supply) of GHGs Reported

(Quantities are presented in million metric tons per year of net CO<sub>2</sub>e<sup>a</sup>)

Industry Sector	2010	2011	2012	2013	2014
<b>Industrial GHG Suppliers</b>					
Saturated HFCs, excluding HFC-23 <sup>b</sup>	235	241	227	278	254
Sulfur hexafluoride (SF <sub>6</sub> )	c	c	35	c	c
Other GHGs	c	c	c	c	c
<b>Importers and Exporters of Fluorinated Gases in Products</b>	N/A <sup>d</sup>	c	c	c	c

<sup>a</sup> Net supply or net CO<sub>2</sub>e means CO<sub>2</sub>e quantities of bulk gas produced + imported – exported – transformed – destroyed.

<sup>b</sup> As of 9/25/15. All other data is as of 8/16/15.

<sup>c</sup> To avoid revealing sensitive business information, these quantities have not been published. EPA is investigating which reported quantities may be aggregated and released to the general public.

<sup>d</sup> Importers and Exporters of Fluorinated Gases in Products were not required to report 2010 data.