2013 GHGRP Data Highlights

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GHGRP 2013: Reported Data

For reporting year (RY) 2013, over 8,000 facilities and suppliers reported to the greenhouse gas reporting program. Among these reporters,

- 7,879 facilities in nine industry sectors reported direct emissions.
- Reported direct emissions totaled 3.18 billion metric tons carbon dioxide equivalent (CO_2e), about half of total U.S. greenhouse gas emissions.
- 965 suppliers reported.
- 92 facilities reported injecting CO_2 underground.

All greenhouse gas data presented here reflect the information reported to EPA as of 08/18/2014. The reported emissions **exclude biogenic CO_2 unless otherwise noted and use the Global Warming Potentials from the IPCC's Fourth Assessment Report.**

Summary GHGRP data has been broken

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 four 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_2e)
Power Plants	1,572	2,100.9
Petroleum and Natural Gas Systems	2,164	224.1
Onshore Petroleum & Nat. Gas Prod.	503	94.8
Offshore Petroleum & Nat. Gas Prod.	94.8	6.2
Natural Gas Processing	433	59.0
Natural Gas Trans./Compression	487	22.7
Underground Natural Gas Storage	48	48
Natural Gas Local Distribution Co.	173	15.1

Industry Sector	Number of Reporters	Emissions (million metric tons CO_2e)
Liquefied Natural Gas Imp./Exp. Eq.	8	0.4
Liquefied Natural Gas Storage	5	**
Other Petroleum & Nat. Gas Systems	415	24.6
Refineries	145	176.7
Chemicals	473	174.6
Non-Fluorinated Chemicals		
Adipic Acid Production	3	5.8
Ammonia Manufacturing	23	25.1
Hydrogen Production	109	41.9
Nitric Acid Production	35	10.9
Petrochemical Production	65	52.7
Phosphoric Acid Production	12	1.8
Silicon Carbide Production	1	0.1
Titanium Dioxide Production	7	2.4
Other Chemicals Production	226	20.6
Fluorinated Chemicals		
Fluorinated GHG Production	16	9.4
HCFC-22 Prod./HFC-23 Dest.	4	4.1
Waste	1,611	114.0
Industrial Waste Landfills	174	8.6
Municipal Landfills	1,220	93.0
Solid Waste Combustion	68	10.0
Industrial Wastewater Treatment	155	2.5
Metals	296	106.8
Aluminum Production	11	6.8
Ferroalloy Production	10	2.3
Iron and Steel Production	126	84.2
Lead Production	13	1.0

Industry Sector	Number of Reporters	Emissions (million metric tons CO_2e)
Magnesium Production	9	1.4
Zinc Production	6	0.9
Other Metals Production	122	10.2
Minerals	376	111.3
Cement Production	96	62.8
Glass Production	109	8.2
Lime Manufacturing	75	30.7
Soda Ash Manufacturing	4	5.3
Other Minerals	94	4.0
Pulp and Paper	233	39.1
Pulp and Paper Manufacturing	110	27.3
Other Paper Producers	123	11.8
Other	1,399	136.9
Food Processing	322	30.8
Ethanol Production	163	17.1
Manufacturing	291	16.7
Universities	112	9.2
Military	43	2.5
Other Combustion	170	11.1
Underground Coal Mines	118	41.5
Electronics Manufacturing	53	4.5
Electrical Equipment Manufacturers	6	0.2
Electrical Equipment Use	121	3.3

a The data presented here reflects data reported to the GHGRP as of 08/18/2014.

b Biogenic emissions are NOT included in the total emissions.

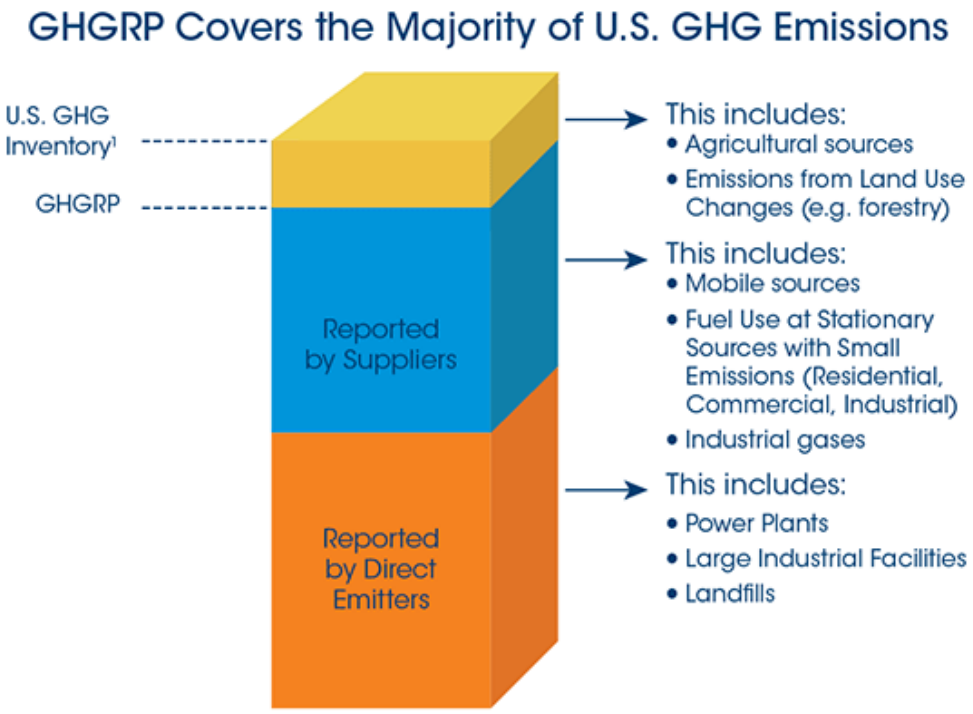
** Total reported emissions are less than 0.05 million metric tons CO2e.

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: 1990-2012 contains information on all GHG emissions sources and sinks in the United States.

Learn more about the differences between the Inventory and the GHGRP.

Figure 1: U.S. Greenhouse Gas Inventory and the Greenhouse Gas Reporting Program



[1] 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).

Table 2: Overview of GHG Data Reported (2013)

Direct emitters	
Number of facilities reporting	7,879
Reported direct emissions (billion metric tons CO_2e)	3.18
Suppliers of fuel and industrial gases	
Number of suppliers	965
Underground injection of carbon dioxide	
Number of carbon dioxide injection facilities	92

Who Reports?

For 2013, 7,865 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 (2013)

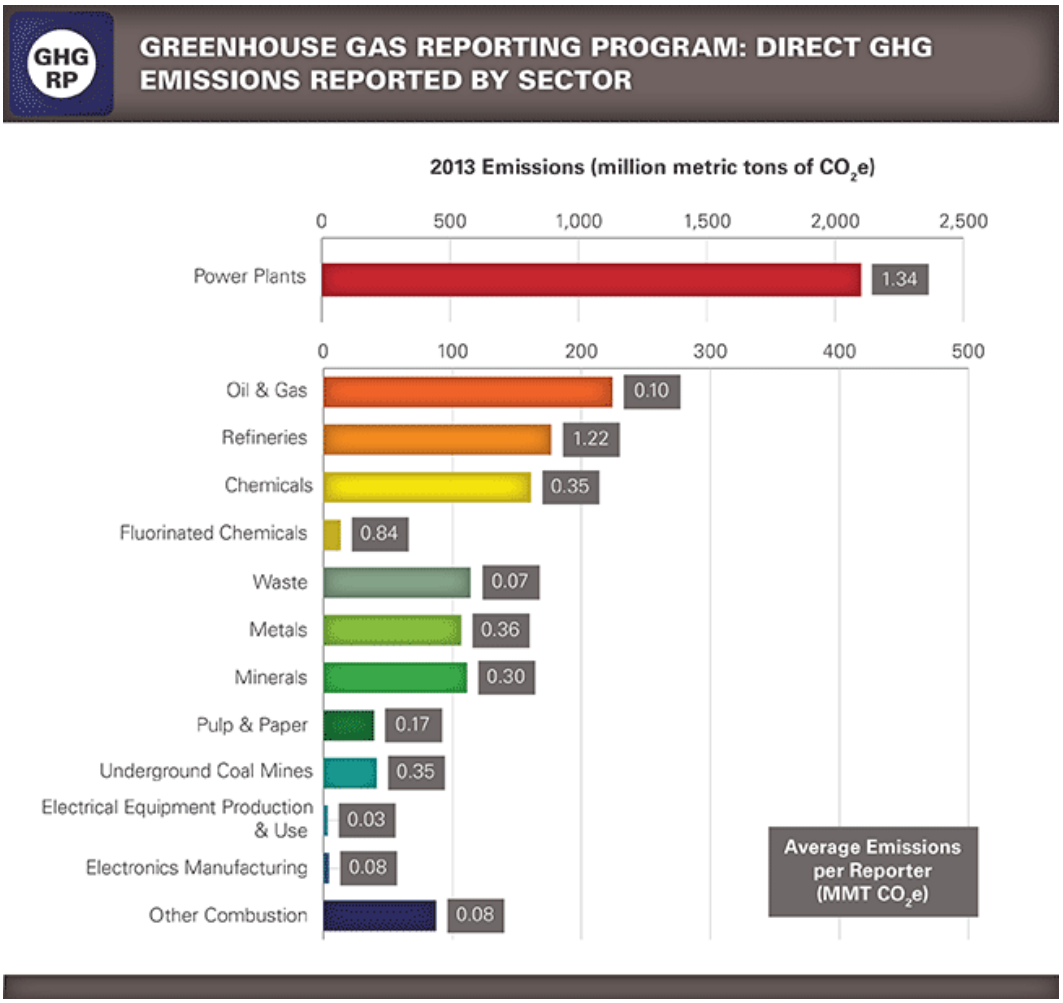
Industry Sector	Number of Reporters[1]
Power Plants	1,572
Petroleum and Natural Gas Systems	2,164
Refineries	145
Chemicals	473
• *Fluorinated Chemicals*	16
• *Non-fluorinated Chemicals*	457
Waste	1,611
Metals	296
Minerals	376
Pulp and Paper	233
Other	1,399
• *Underground Coal Mines*	118
• *Electrical Equipment Production & Use*	127
• *Electronics Manufacturing*	53
• *Other Combustion*	1,101

Reported Emissions

In 2013, 3.18 billion metric tons CO_2e were reported by direct emitters. The largest emitting sector was the Power Plant Sector with 2.1 billion metric tons CO_2e, followed by the Petroleum and Natural Gas Systems Sector with 224 million metric tons (MMT) CO_2e and the Petroleum Refinery Sector with 177 MMT CO_2e. This information, as well as average emissions per reporter, is shown in the following chart.

[1] Totals sum to more than 7,879 because facilities whose activities fall within more than one sector are counted multiple times.

Figure 2: Direct GHG Emissions Reported by Sector (2013)



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 decreased by 3.4% from 2011 to 2012, based on the U.S. GHG Inventory. Between 2011 and 2012, emissions reported to the GHGRP declined by 4.5% (Table 4). This decline was driven by a 4.7% decline in emissions from power plants.

The U.S. GHG Inventory is not yet available for 2013. For sources reporting to the GHGRP, emissions increased by 0.62% from 2012 to 2013; this increase was driven by a similar increase in power plant emissions. Over the past three reporting years (2011-2013), GHGRP reported emissions have declined by 3.9%. 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%.

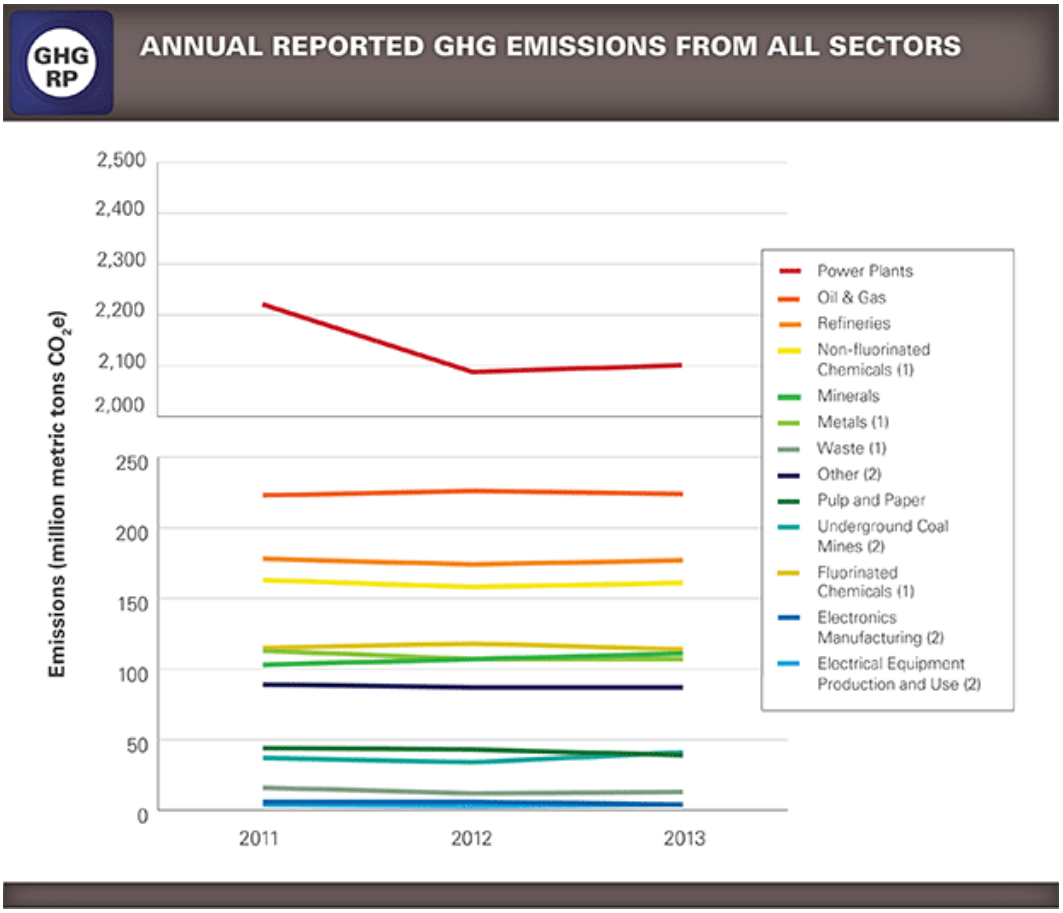
Table 4: Emissions Trends for U.S. GHG Inventory and GHGRP (2011-2013)

Industry Sector	2011	2012	2013
U.S. GHG Inventory			
Total emissions (million metric tons CO_2e)	6,753	6,525.6	Not available
Percent change in emissions from previous year	-1.77%	-3.37%	Not available
GHGRP			
Number of direct emitting facilities	7,592	7,808	7,879
Direct emissions (million metric tons CO_2e)	3,314.2	3,164.8	3,184.3
Percent change in emissions from previous year	—	-4.5%	0.6%

Table 5: Emissions Trends by Sector (2011-2013)

Sector	2011 Emissions (MMT CO_2e)	2012 Emissions (MMT CO_2e)[3]	2013 Emissions (MMT CO_2e)
Power Plants	2,221.3	2,088.1	2,100.9
Oil and Gas	223.1	226.4	224.1
Refineries	178.3	174.0	176.7
Chemicals	179.2	170.9	174.6
• *Fluorinated Chemicals*	15.7	12.4	13.5
• *Non-fluorinated Chemicals*	163.5	158.5	161.1
Waste	115.4	118.5	114.0
Metals	112.8	106.9	106.8
Minerals	103.2	107.5	111.3
Pulp and Paper	44.2	42.5	39.1
Other	136.8	130.0	136.9
• *Underground Coal Mines*	37.1	34.0	42.5
• *Electrical Equipment Production & Use*	4.3	3.5	3.5
• *Electronics Manufacturing*	6.1	5.6	4.5
• *Other Combustion*	89.3	86.9	87.4

Figure 3: Trends in Direct GHG Emissions (2011-2013)



View this information in FLIGHT.

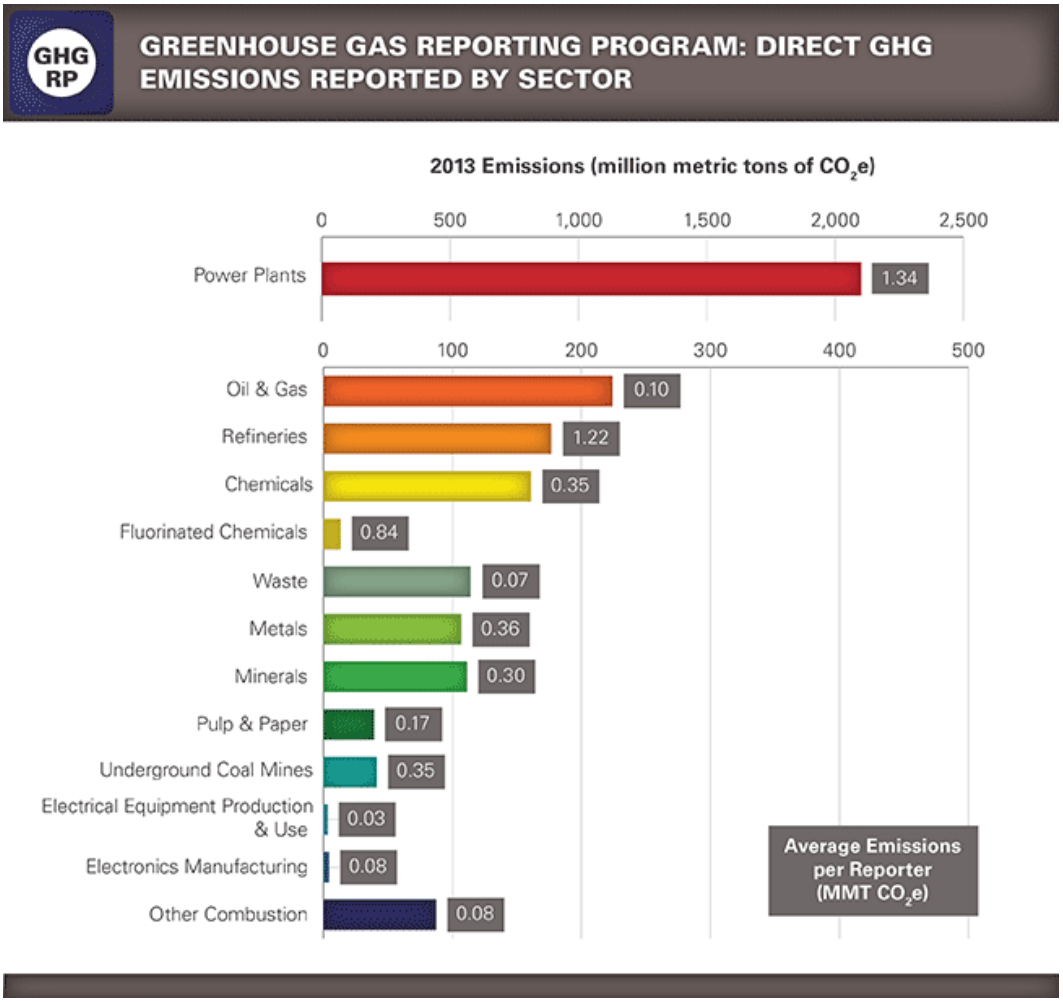
[1] Non-fluorinated Chemicals and Fluorinated Chemicals are components of "Chemicals" in FLIGHT.
[2] Other Combustion, Underground Coal Mines, Electronics Manufacturing and Electrical Equipment Production & Use comprise "Other" in FLIGHT.

Emissions by GHG

Carbon dioxide is the GHG emitted in the largest quantities. The 2.9 billion metric tons of CO2 reported for 2013 represent 91.4% of the GHGs reported in 2013.[2] Methane emissions represent about 7% of reported 2013 GHG emissions, N2O represents about 0.8%, and fluorinated gases (HFCs, PFCs, SF6) represent about 0.7% (Figure 4).

[2] The Inventory of U.S. Greenhouse Gas Emissions And Sinks for 2013 is not yet available. In 2012, CO2 represented 54% of total U.S. GHG emissions.

Figure 4: Direct Emissions by GHG (2010-2013)



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[3]	Sectors Contributing Most to Emissions
CO_2	Electricity Generation (D), Stationary Combustion (C)	Power Plants
CH_4	Municipal Landfills (HH), Petroleum & Natural Gas Systems (W)	Waste, Petroleum & Natural Gas Systems
N_2O	Nitric Acid Production (V), Electricity Generation (D), Adipic Acid Production (E)	Chemicals, Power Plants
SF_6	SF_6 from Electrical Equipment (DD), Magnesium Production (T)	Other, Metals

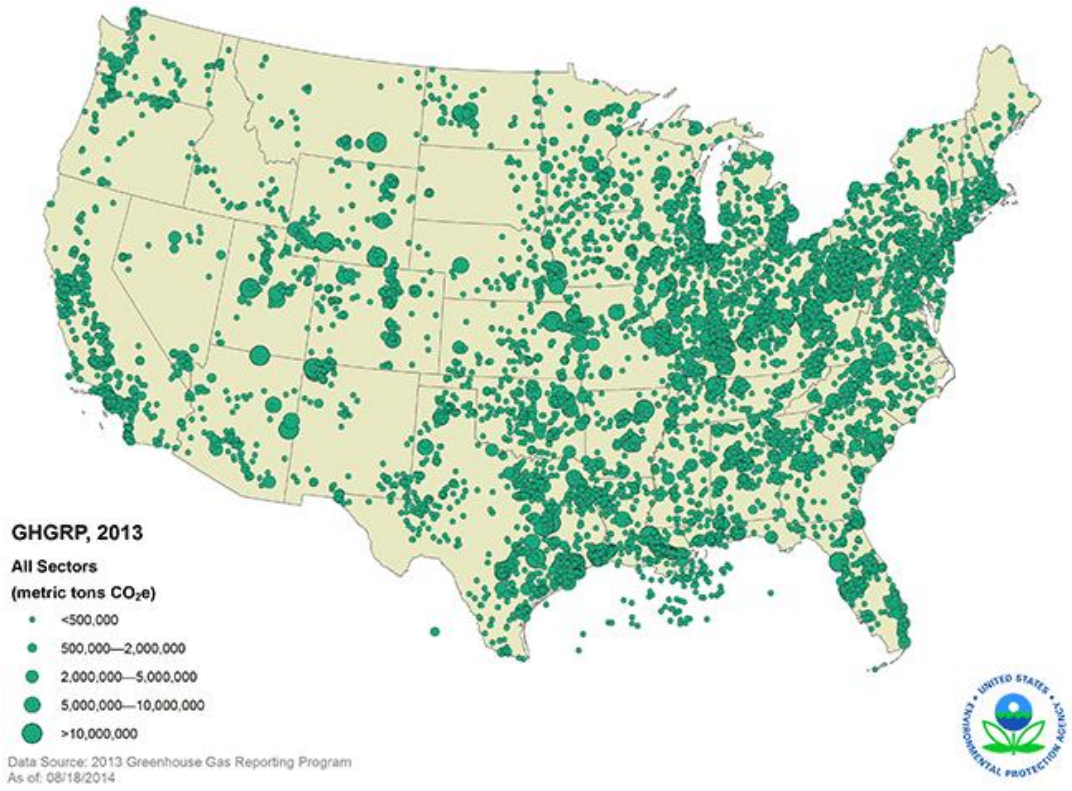
[3] These source categories account for 75 percent or more of the reported emissions of the corresponding GHG. The subpart under which the emissions were reported is shown in parentheses.

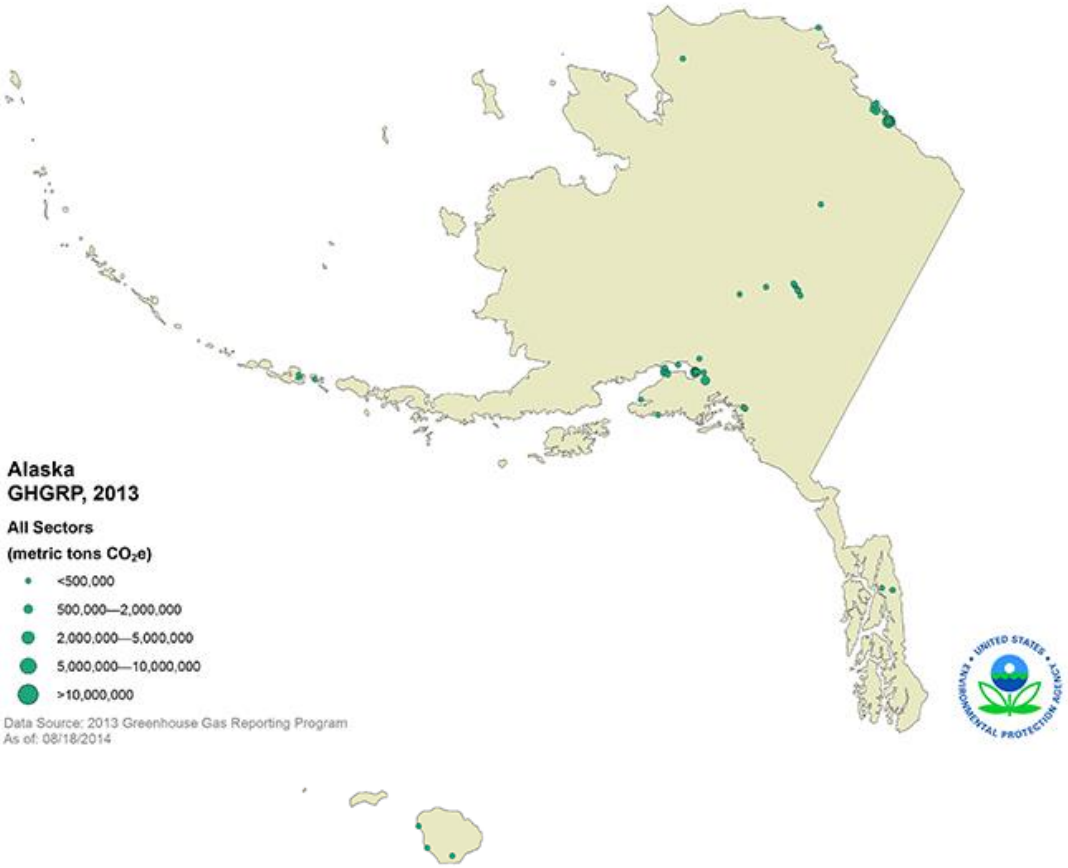
Greenhouse Gas	Source Categories Contributing Most to Emissions[3]	Sectors Contributing Most to Emissions
NF_3	Electronics Manufacturers (I)	Other
HFCs	HCFC-22 Production and HFC-23 Destruction (O)	Chemicals
PFCs	Aluminum Production (F), Electronics Manufacturers (I)	Metals, Other

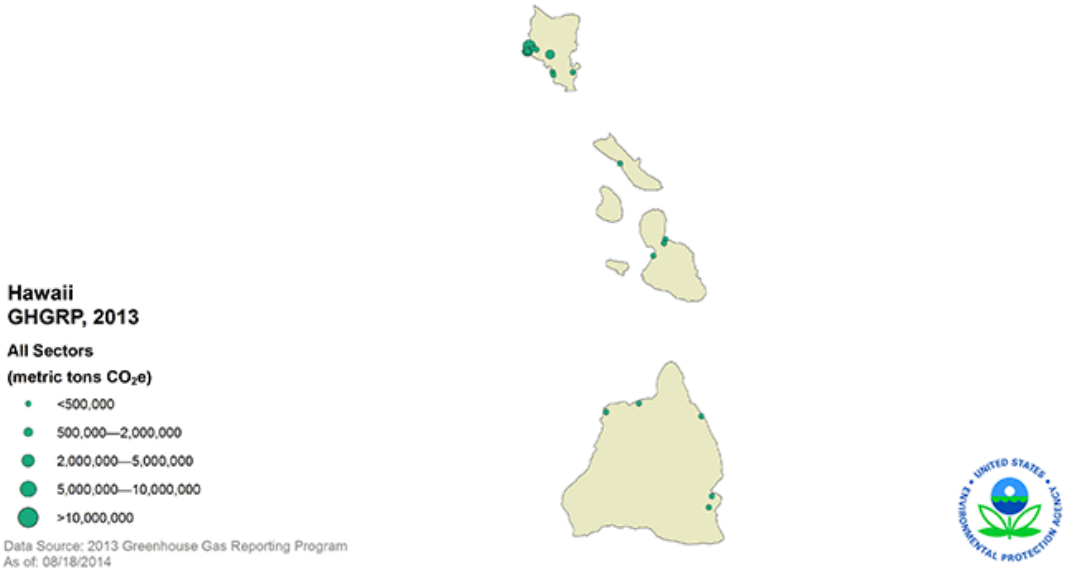
Geographic Distribution of Emissions

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 (2013)




Alaska
GHGRP, 2013
All Sectors
(metric tons CO_2e)
<500,000
500,000—2,000,000
2,000,000—5,000,000
5,000,000—10,000,000
>10,000,000
Data Source: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014

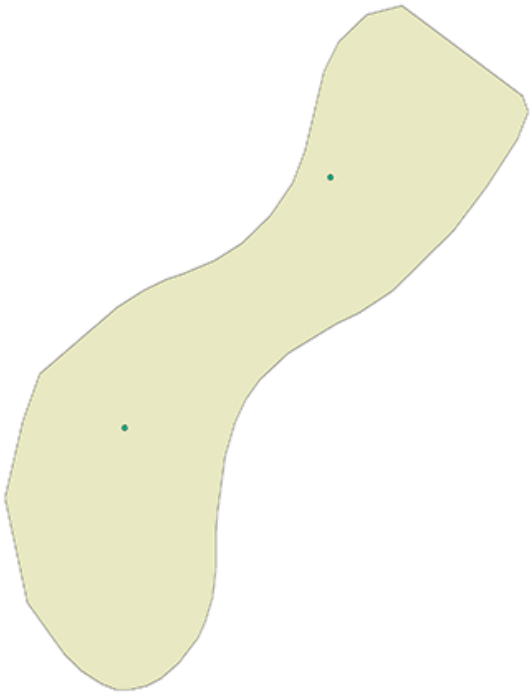

Hawaii
GHGRP, 2013
All Sectors
(metric tons CO_2e)
<500,000
500,000—2,000,000
2,000,000—5,000,000
5,000,000—10,000,000
>10,000,000
Data Source: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014

Puerto Rico and the Virgin Islands
GHGRP, 2013

All Sectors
(metric tons CO_2e)

- <500,000
- 500,000—2,000,000
- 2,000,000—5,000,000
- 5,000,000—10,000,000
- >10,000,000

Data Source: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014



Guam
GHGRP, 2013

All Sectors
(metric tons CO_2e)

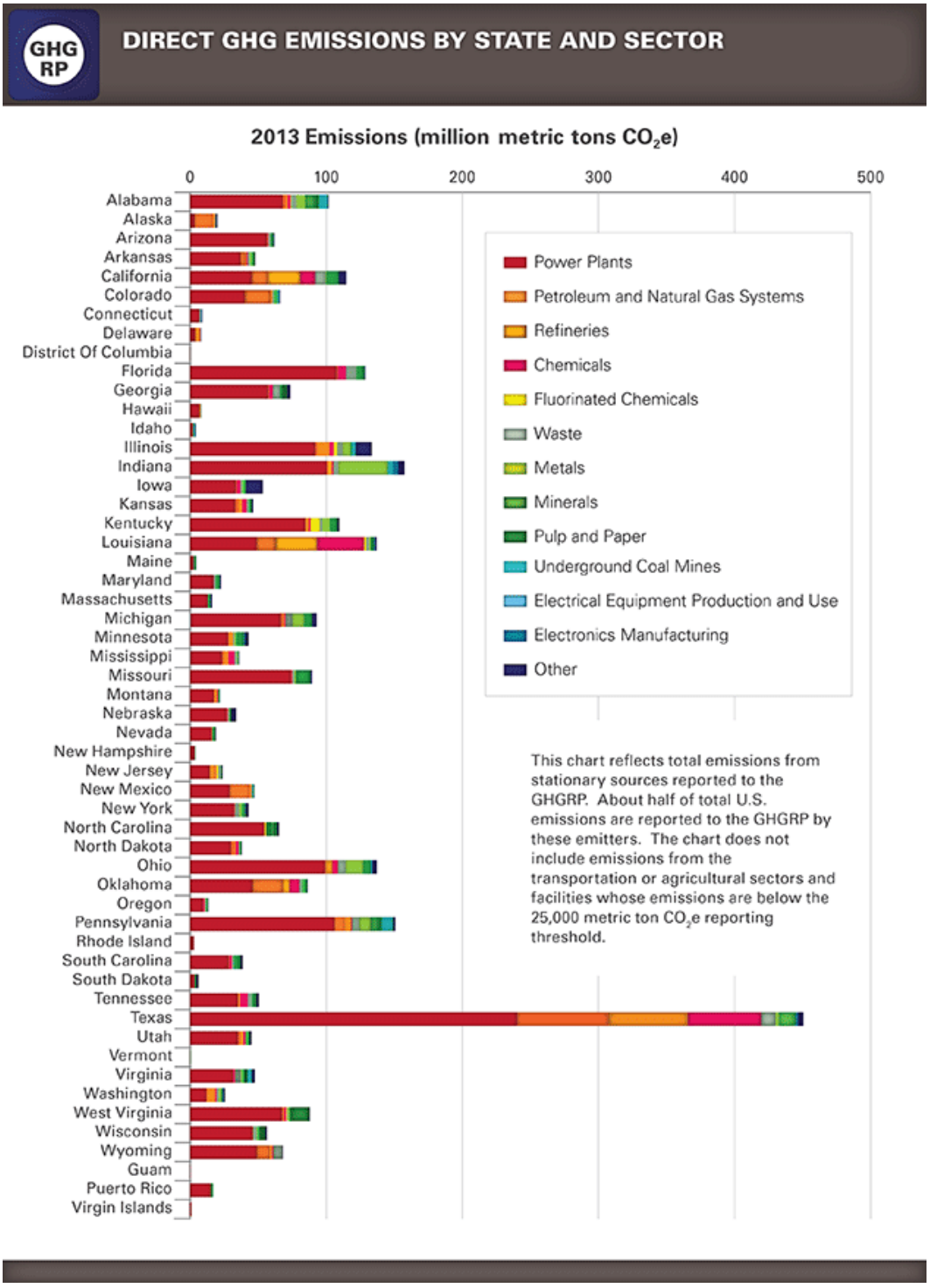
- <500,000
- 500,000—2,000,000
- 2,000,000—5,000,000
- 5,000,000—10,000,000
- >10,000,000

Data Source: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014

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_2e 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 (2013)



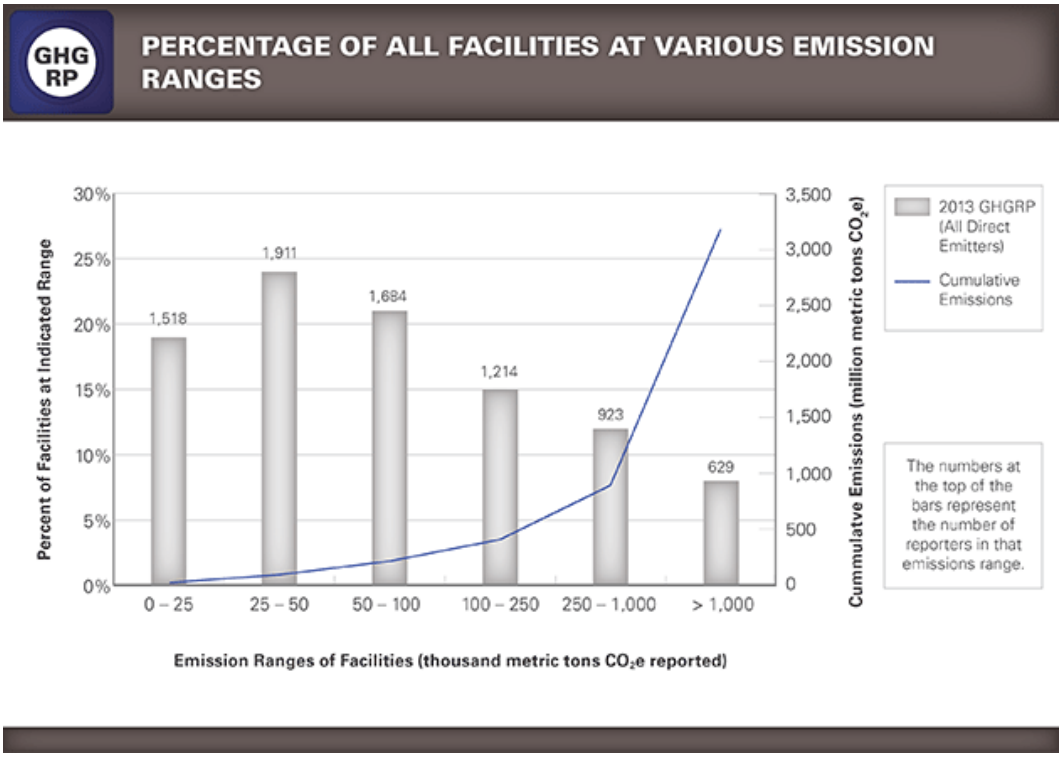
View this information in FLIGHT.

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

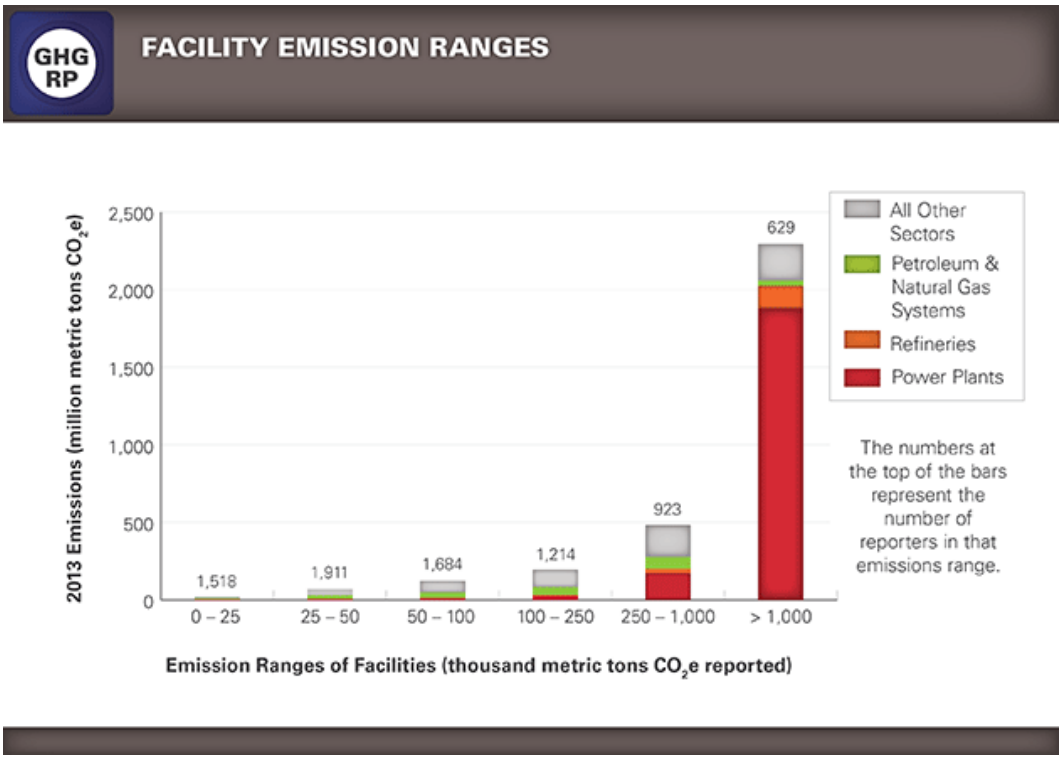
data provide policy makers with a better understanding of the number of facilities and total emissions that would be covered by potential GHG reduction policies for various industries.

Figure 7: Percentage of All Reporting Facilities at Various Emission Ranges (2013)



Eighty percent of reporting facilities had emissions less than 250,000 metric tons CO2e. In 2013, the 629 largest-emitting facilities—those emitting more than one million metric tons CO2e—accounted for almost 2.3 billion metric tons CO2e. These emissions represent 84.8% of the total 3.18 billion metric tons CO2e 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 (2013)



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.

For additional information on the methodologies that reporters use to determine GHG emissions, please read the GHGRP Methodology Factsheet.

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.

For additional information describing EPA's verification process in more details, please read the GHGRP Verification Factsheet.

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 2012.

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 2013: 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 EPA CO_2 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[4]) and 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_2e unless otherwise noted)

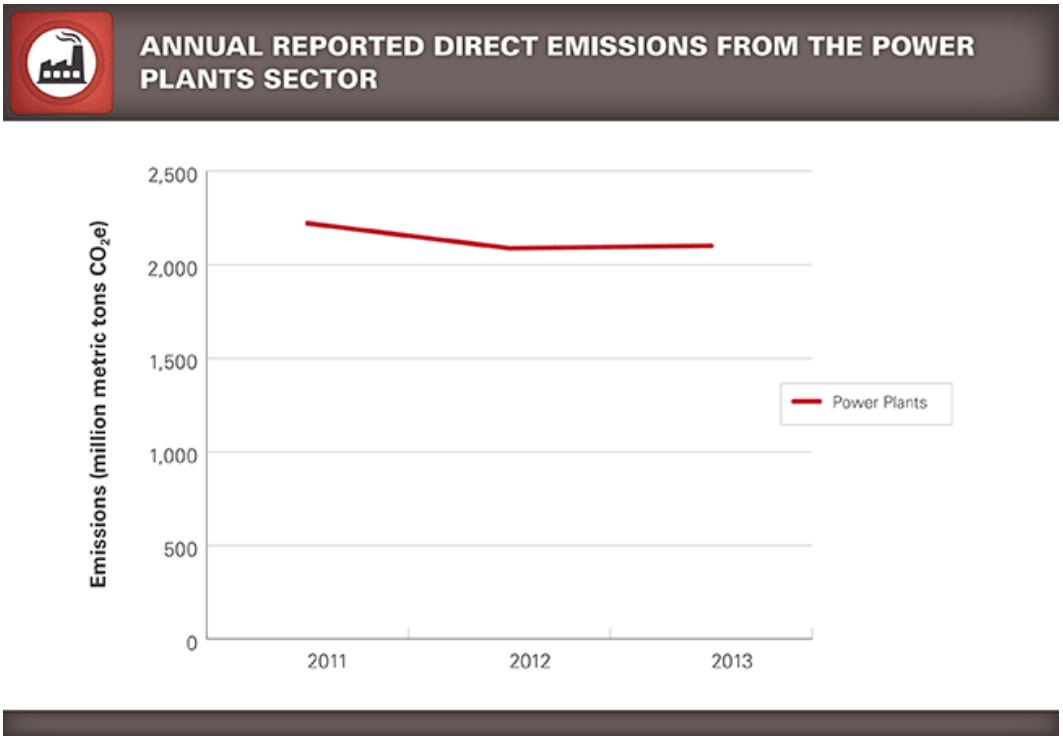
	2011	2012	2013
Number of facilities:	1,589	1,601	1,572
Total emissions (CO_2e):	2,221	2,088	2,101
Emissions by greenhouse gas (CO_2e)			
• Carbon dioxide (CO_2)	2,208.0	2,076.2	2,088.7
• Methane (CH_4)	4.2	3.7	3.7
• Nitrous oxide (N_2O)	9.2	8.2	8.4

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

CO_2 emissions from the combustion of biomass are NOT included in emissions totals provided above.

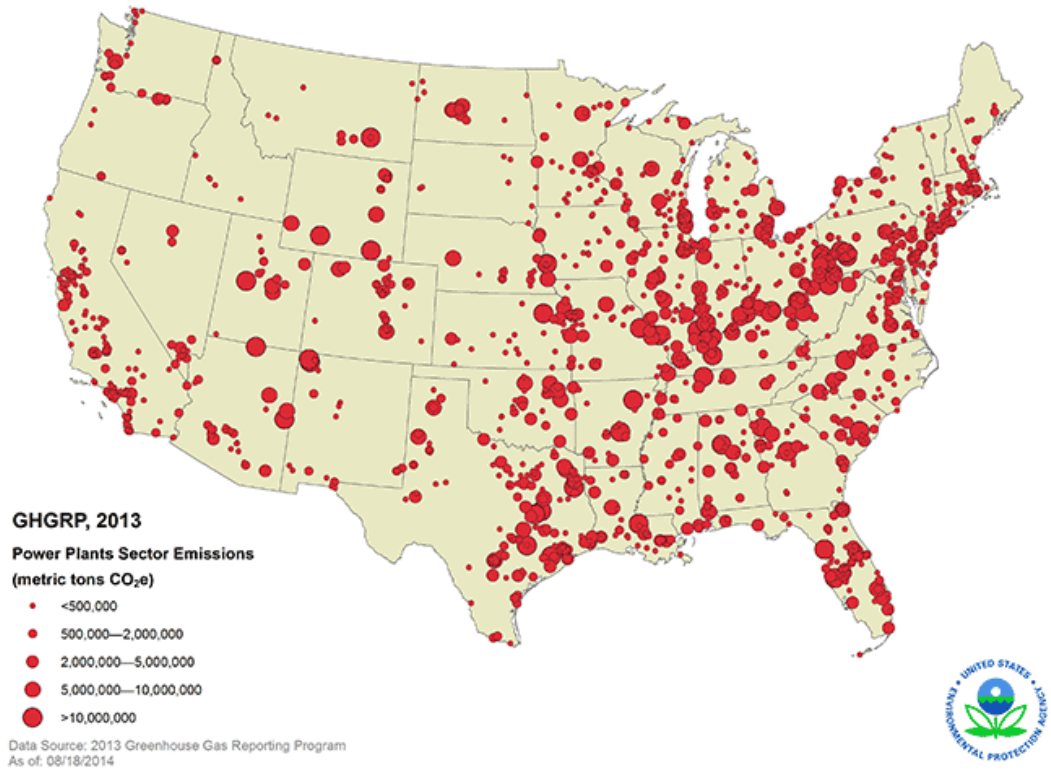
[4] Establishments primarily engaged in providing steam, heated air, or cooled air. The steam distribution may be through mains.

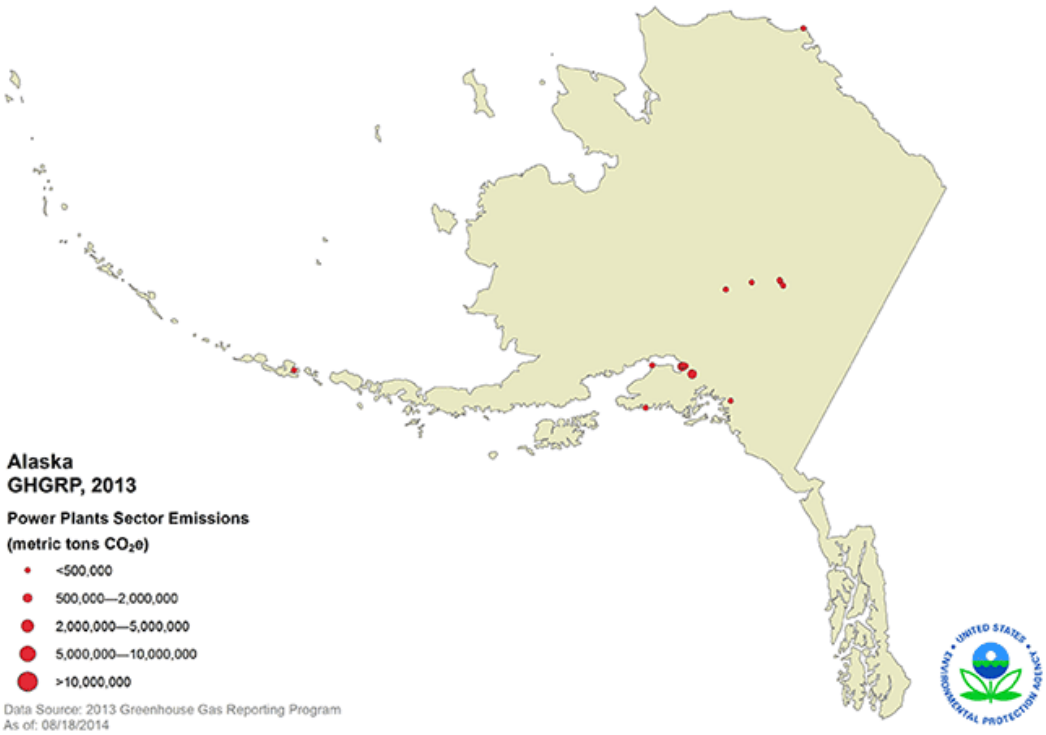
Trend of Annual Reported GHG Emissions in the Power Plant Sector (as of 8/18/14)

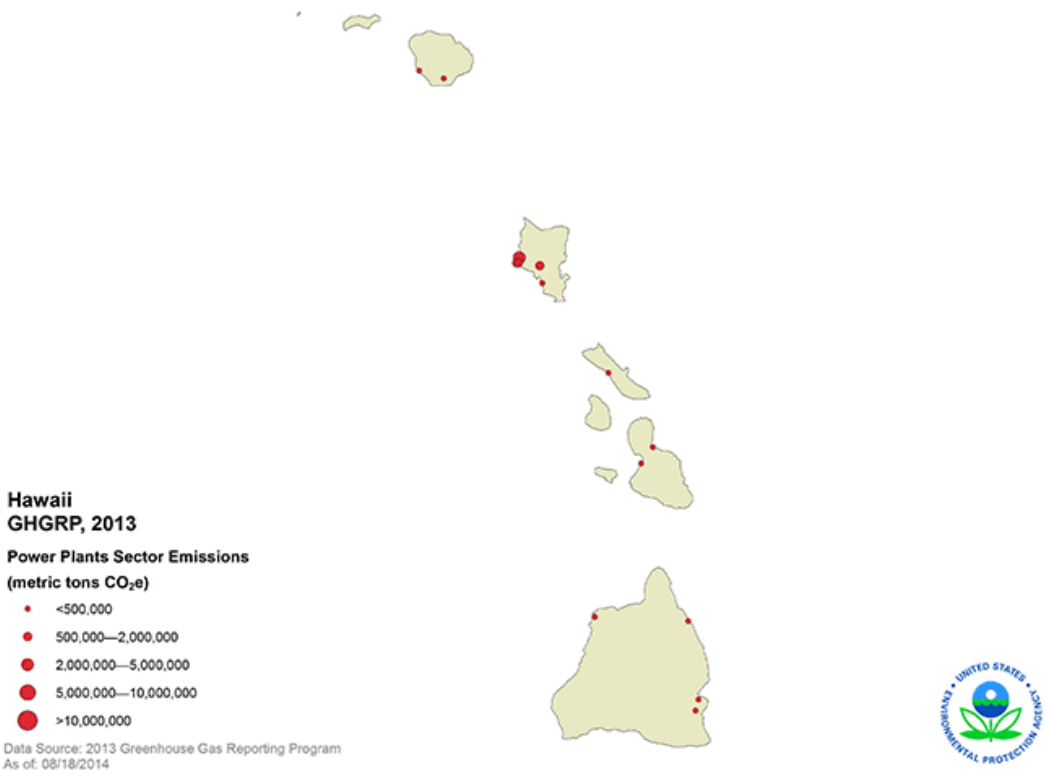


Location and emissions range for each reporting facility in the power plant sector (as of 8/18/14).

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




Alaska
GHGRP, 2013
Power Plants Sector Emissions
(metric tons CO_2e)
<500,000
500,000—2,000,000
2,000,000—5,000,000
5,000,000—10,000,000
>10,000,000
Data Source: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014


Hawaii
GHGRP, 2013
Power Plants Sector Emissions
(metric tons CO_2e)
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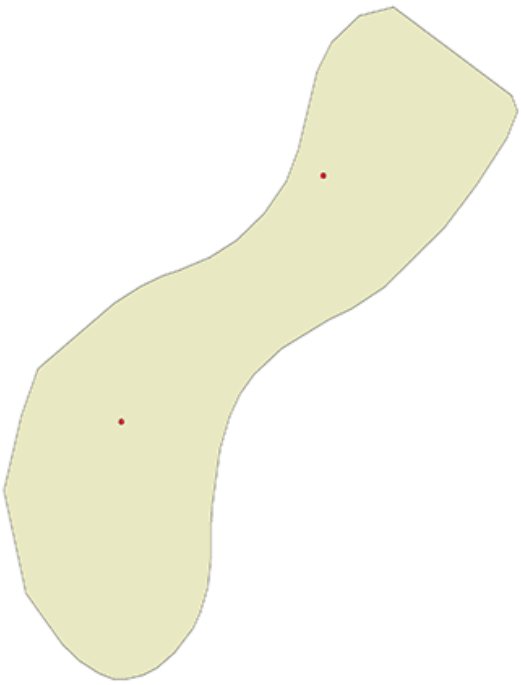
500,000—2,000,000
2,000,000—5,000,000
5,000,000—10,000,000
>10,000,000
Data Source: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014

Puerto Rico and the Virgin Islands
GHGRP, 2013

Power Plants Sector Emissions
(metric tons CO_2e)

- <500,000
- 500,000—2,000,000
- 2,000,000—5,000,000
- 5,000,000—10,000,000
- >10,000,000

Data Source: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014



Guam
GHGRP, 2013

Power Plants Sector Emissions
(metric tons CO_2e)

- <500,000
- 500,000—2,000,000
- 2,000,000—5,000,000
- 5,000,000—10,000,000
- >10,000,000

Data Source: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014

Other EPA Resources

- U.S. Greenhouse Gas Inventory Report

GHGRP 2013: Petroleum and 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.
- **Liquified Natural Gas (LNG) Import/Export.** Liquified Natural Gas import and export terminals.
- **LNG Storage.** Liquified 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_2e unless otherwise noted)

	2011	2012	2013
Number of facilities:	1,913	2,073	2,164
Total emissions (CO_2e):	223.1	226.4	224.1
Emissions by greenhouse gas (CO_2e)			
• Carbon dioxide (CO_2)	138.8	146.3	150.0
• Methane (CH_4)	84.1	80.0	74.0
• Nitrous oxide (N_2O)	0.2	0.1	0.1

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

CO_2 emissions from the combustion of biomass are NOT included in emissions totals provided above.

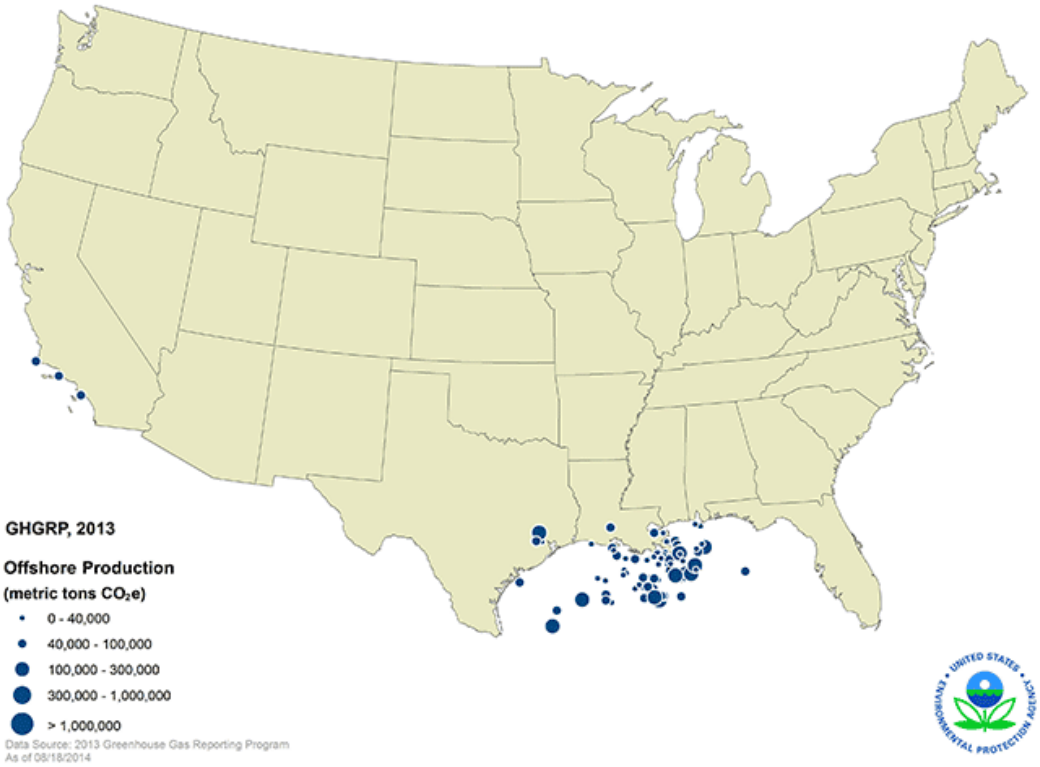
Number of reporters and 2013 emissions (CO_2e) per petroleum and natural gas systems industry sector

Industry Sector	2013 Number of Reporters	2013 Emissions (million metric tons CO_2e per year)
Onshore Production	503	94.8
Offshore Production	107	6.2
Natural Gas Processing	433	59.0
Natural Gas Transmission	487	22.7
Underground Natural Gas Storage	48	1.3
Natural Gas Distribution	173	15.1
Liquified Natural Gas (LNG) Import/Export	8	0.4
LNG Storage	5	**
Other Petroleum and Natural Gas Systems	415	24.6

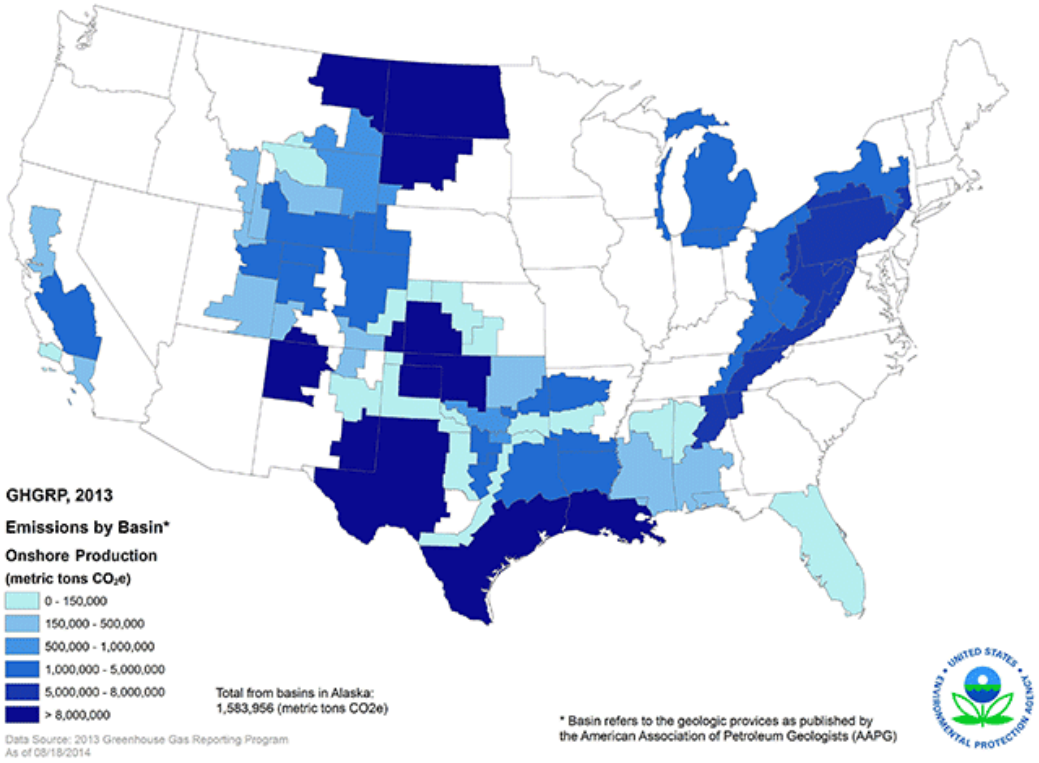
Totals may not equal sum of individual GHGs due to independent rounding.

** Total reported emissions are less than 0.05 million metric tons CO_2e.

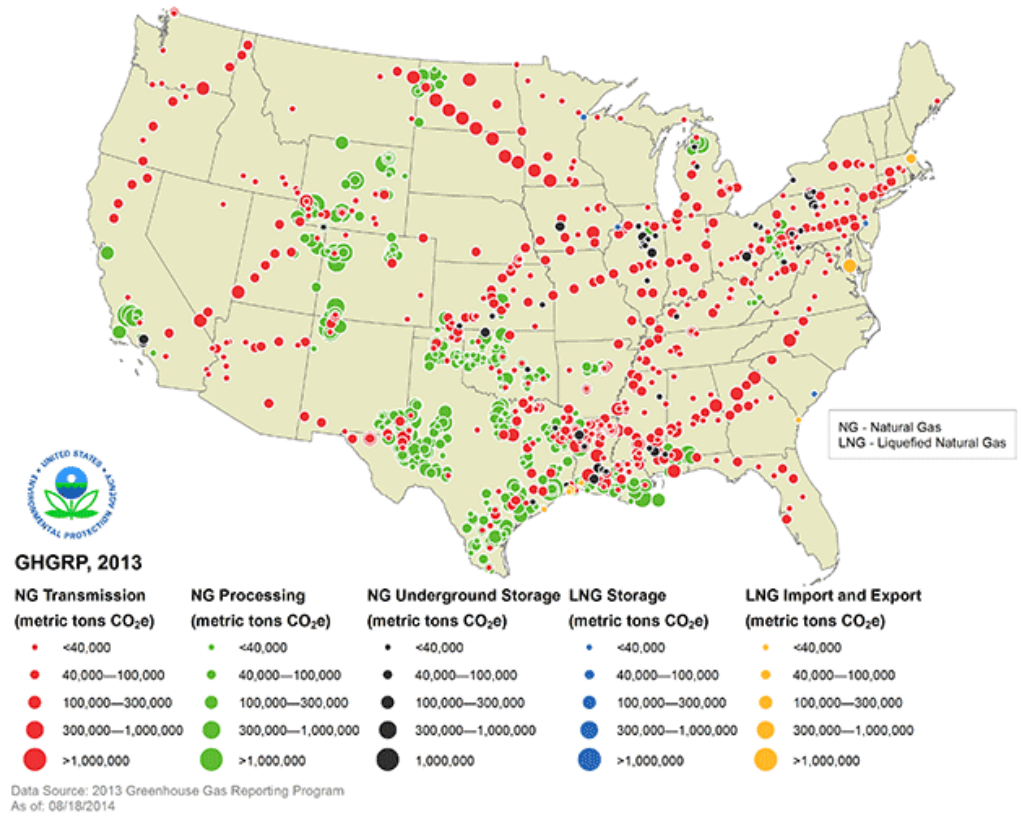
Facility locations and total emissions (CO_2e) for offshore petroleum and natural gas production



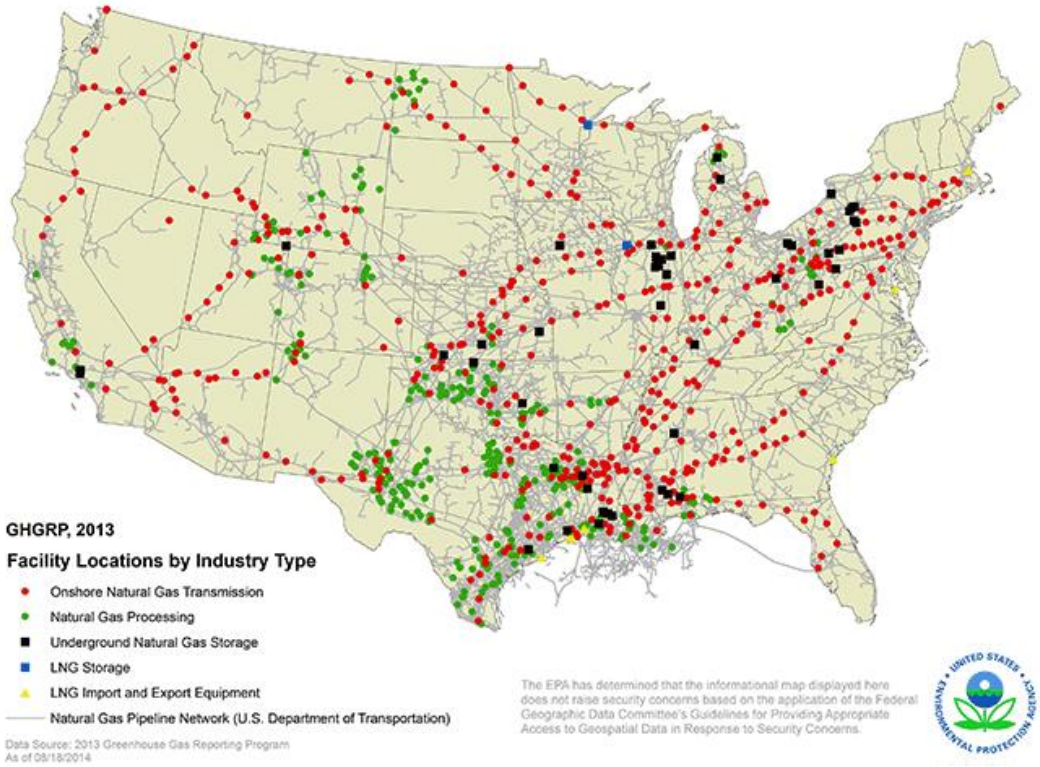
Reported emissions (CO_2e) by geologic basin for onshore petroleum and natural gas production facilities



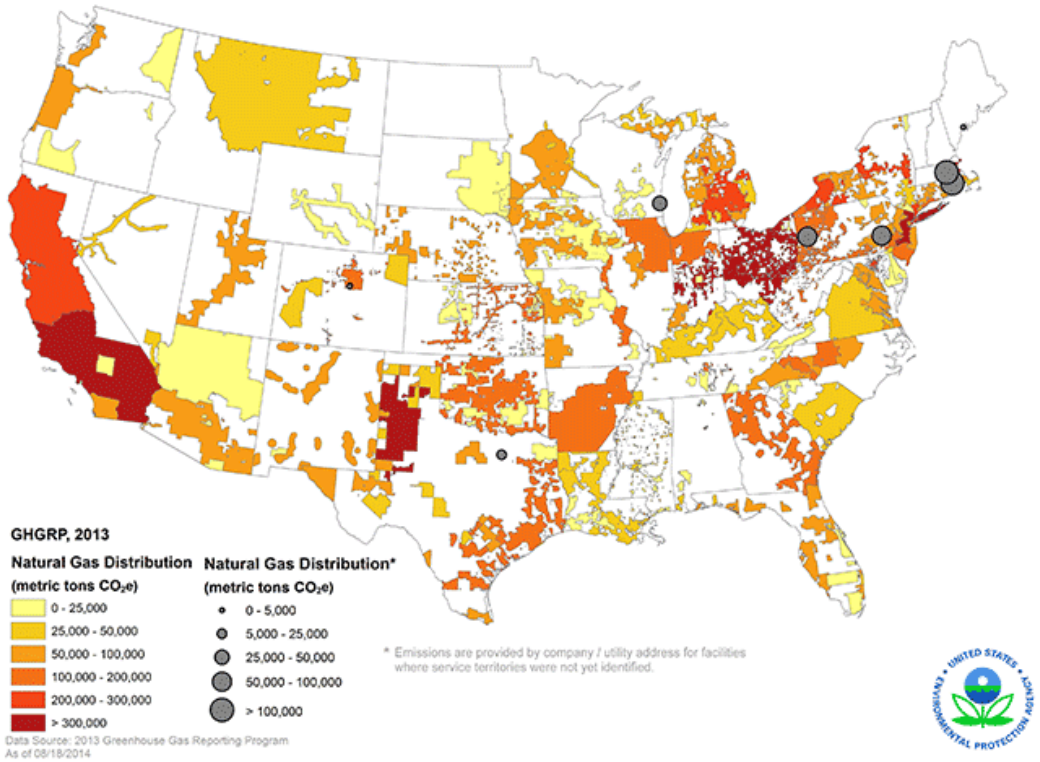
Reported emissions (CO_2e) by facility for industry types: onshore natural gas processing, onshore natural gas transmission compression, underground natural gas storage, liquefied natural gas (LNG) storage, LNG import and export equipment



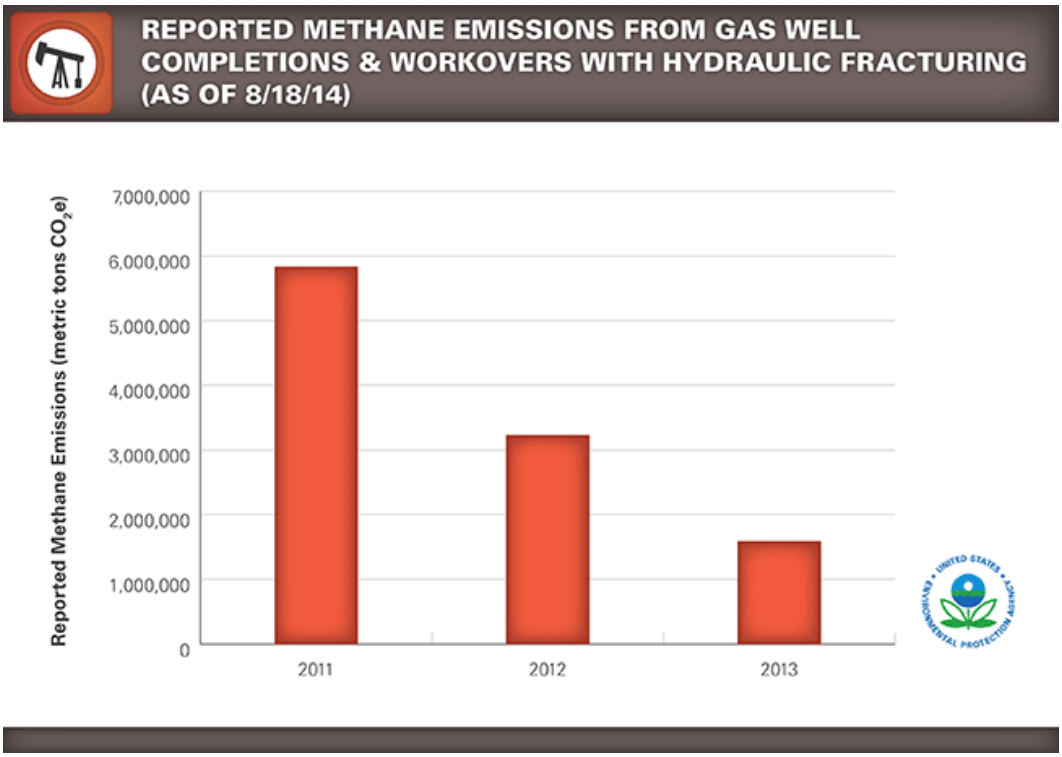
Facility locations for industry types: natural gas processing, natural gas transmission compression, underground natural gas storage, LNG storage, LNG import/export



Reported emissions (CO_2e) by natural gas utility service territory for natural gas distribution facilities



Reported methane emissions (CO_2e) for gas well completions and workovers with hydraulic fracturing



Other EPA Resources

- U.S. Greenhouse Gas Inventory Report

GHGRP 2013: 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

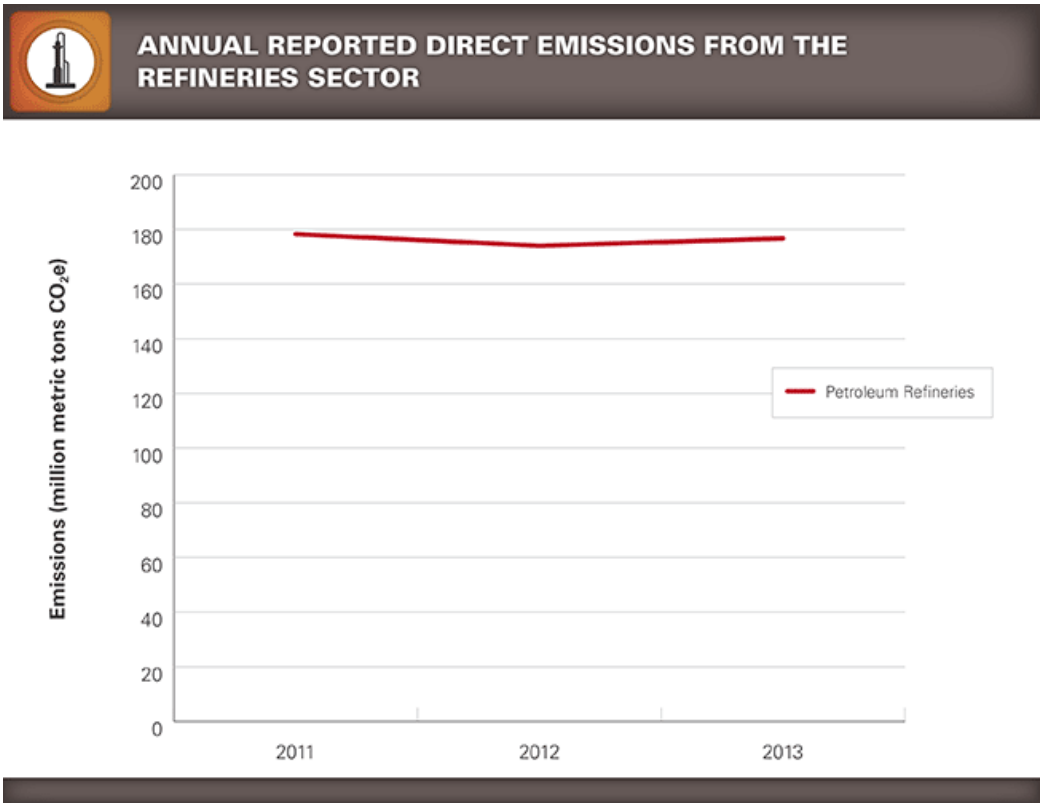
(all emission values presented in million metric tons CO_2ed)

	2011	2012	2013
Number of facilities:	149	147	145
Total emissions (CO_2e):	178.3	174.0	176.7
Emissions by greenhouse gas (CO_2e)			
• Carbon dioxide (CO_2)	176.9	172.6	175.2
• Methane (CH_4)	0.9	0.9	1.0
• Nitrous oxide (N_2O)	0.5	0.5	0.5

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

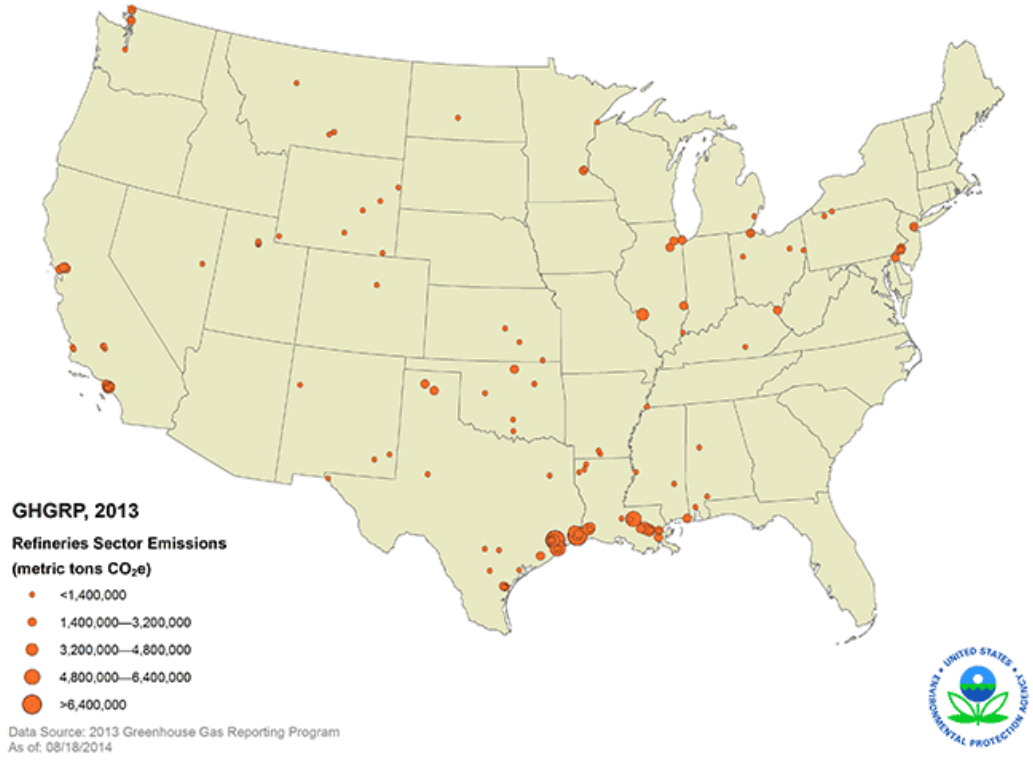
CO_2 emissions from the combustion of biomass are NOT included in emissions totals provided above.

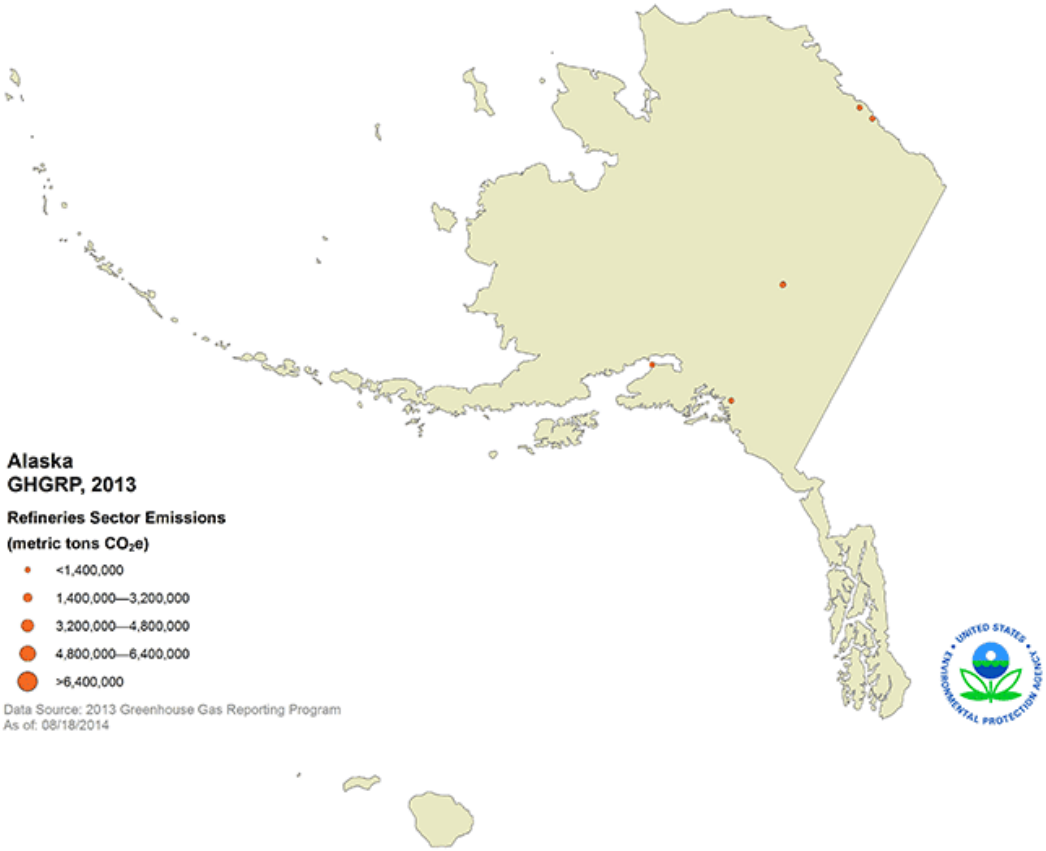
Trend of Annual Reported GHG Emissions in the Refinery Sector (as of 8/18/14).

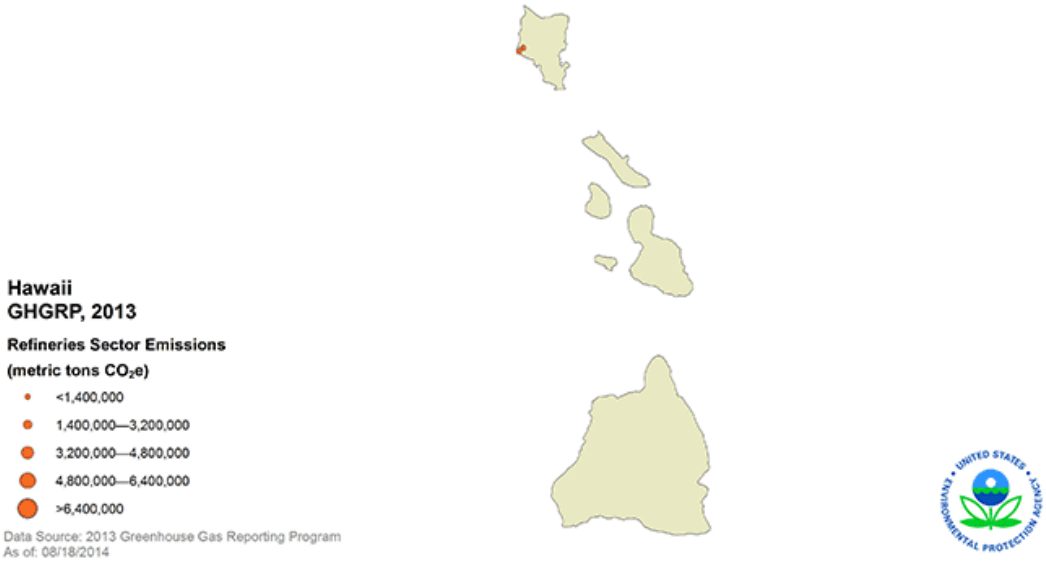


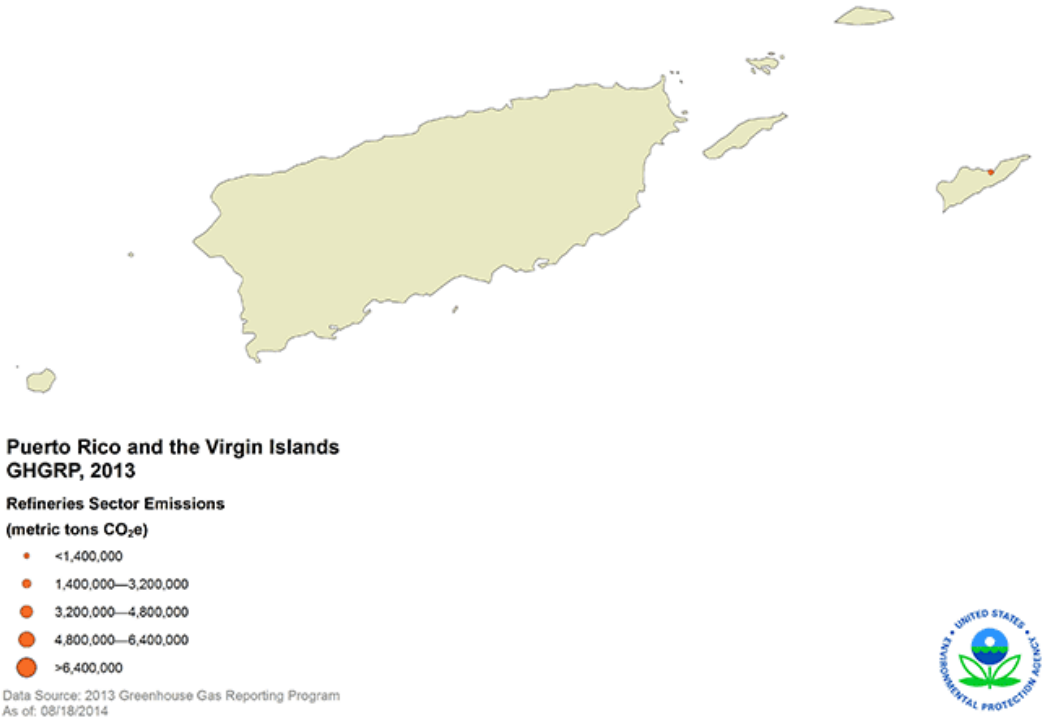
Location and emissions range for each reporting facility in the refinery sector (as of 8/18/14).

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




Alaska
GHGRP, 2013
Refineries Sector Emissions
(metric tons CO_2e)
<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: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014


Hawaii
GHGRP, 2013
Refineries Sector Emissions
(metric tons CO_2e)
<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: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014



Other EPA Resources

- U.S. Greenhouse Gas Inventory Report

GHGRP 2013: 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 (and destroy HFC-23) and other fluorinated chemicals. A more detailed description of these subsectors is provided below. A total of 473 chemicals facilities reported in 2013**.**

Chemicals Sector — Greenhouse Gas Emissions Reported to the GHGRP

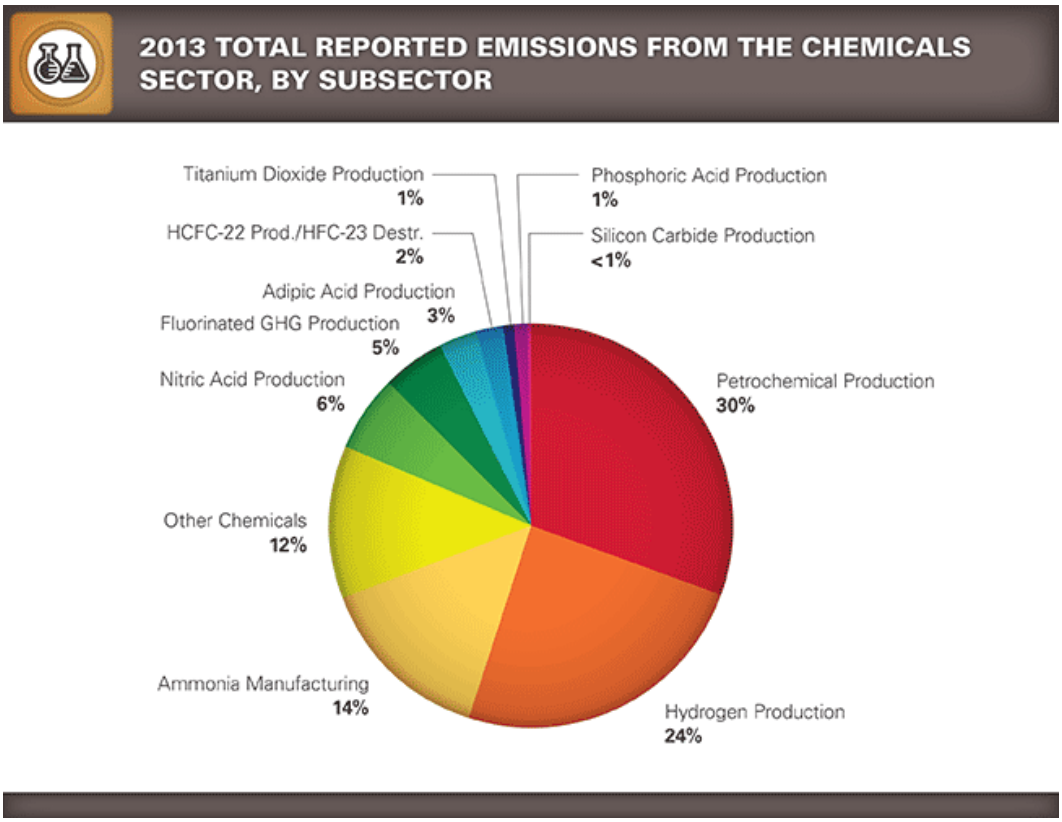
(all emission values presented in million metric tons CO_2e)

	2011	2012	2013
Number of facilities:	458	467	473
Total emissions (CO_2e):	179.2	170.9	174.6
Emissions by greenhouse gas (CO_2e)			
• Carbon dioxide (CO_2)	142.8	142.8	146.9
• Methane (CH_4)	0.4	0.2	0.2
• Nitrous oxide (N_2O)	21.2	16.2	14.9
• Fluorinated GHGs	14.9	11.7	12.7
Emissions by subsector			
• Non-fluorinated chemicals	163.5	158.5	161.1
• Fluorinated chemicals	15.7	12.4	13.5

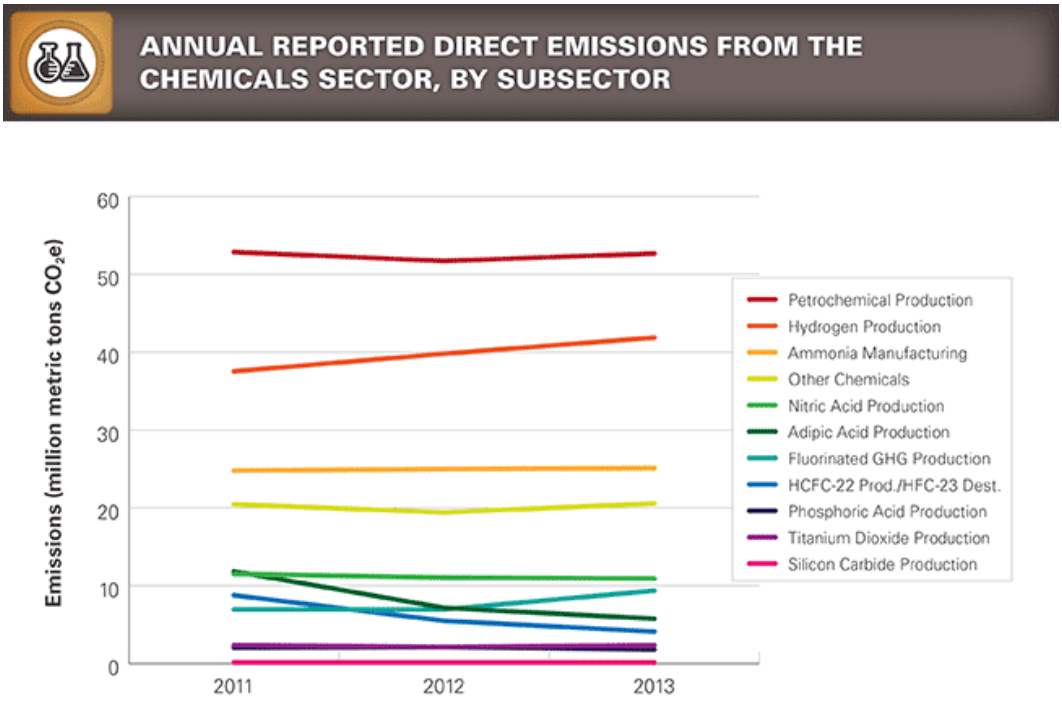
Totals may not equal sum of individual GHGs due to independent rounding.

CO_2 emissions from the combustion of biomass are NOT included in emissions totals provided above.

Total Reported Direct Emissions from Chemicals (All Subsectors), by Subsector (as of 8/18/14).



Trend of Annual Reported GHG Emsisions for Chemicals (All Subsectors) (as of 8/18/14).

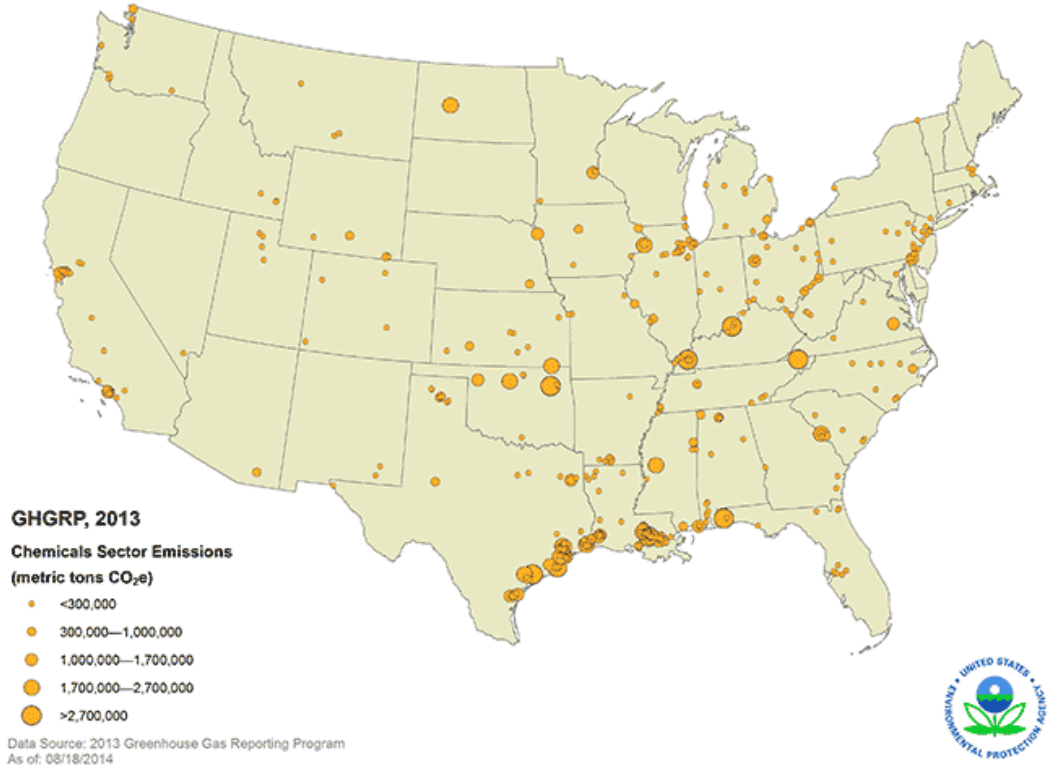


The emission trend for fluorinated gas production is affected by the use of different GWPs in 2013 than in 2011 and 2012. This inconsistency in GWPs is expected to be removed in the near future. To date, fluorinated gas producers have reported their emissions only in terms of CO_2e under

temporary reporting provisions. Under a rule proposed in November 2013, fluorinated gas producers would submit full reports for all past years using a single set of GWPs.

Location and emissions range for each reporting facility for Chemicals (All Subsectors) (as of 8/18/14).

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 chemical manufacturing sector consists of facilities that produce adipic acid, ammonia, hydrogen (both merchant and non-merchant plants), nitric acid, petrochemicals (i.e., acrylonitrile, carbon black, ethylene, ethylene dichloride, ethylene oxide, methanol), phosphoric acid, silicon carbide, soda ash, and titanium dioxide. Besides the emissions from these chemical production processes, the sector includes combustion emissions from facilities that produce pesticides, fertilizer, pharmaceuticals, and other organic and inorganic chemicals. A total of 457 facilities reported 2013 emissions under this sector. A small number of facilities in this sector collect CO_2 either for use in their other production processes, to transfer to other users, or to sequester or otherwise inject underground; this sector includes the CO_2 from those process emissions. For example, some of the process emissions reported for ammonia manufacturing plants includes CO_2 that is later consumed on site for urea production. This CO_2 is not released to the ambient air from the ammonia manufacturing process unit(s).

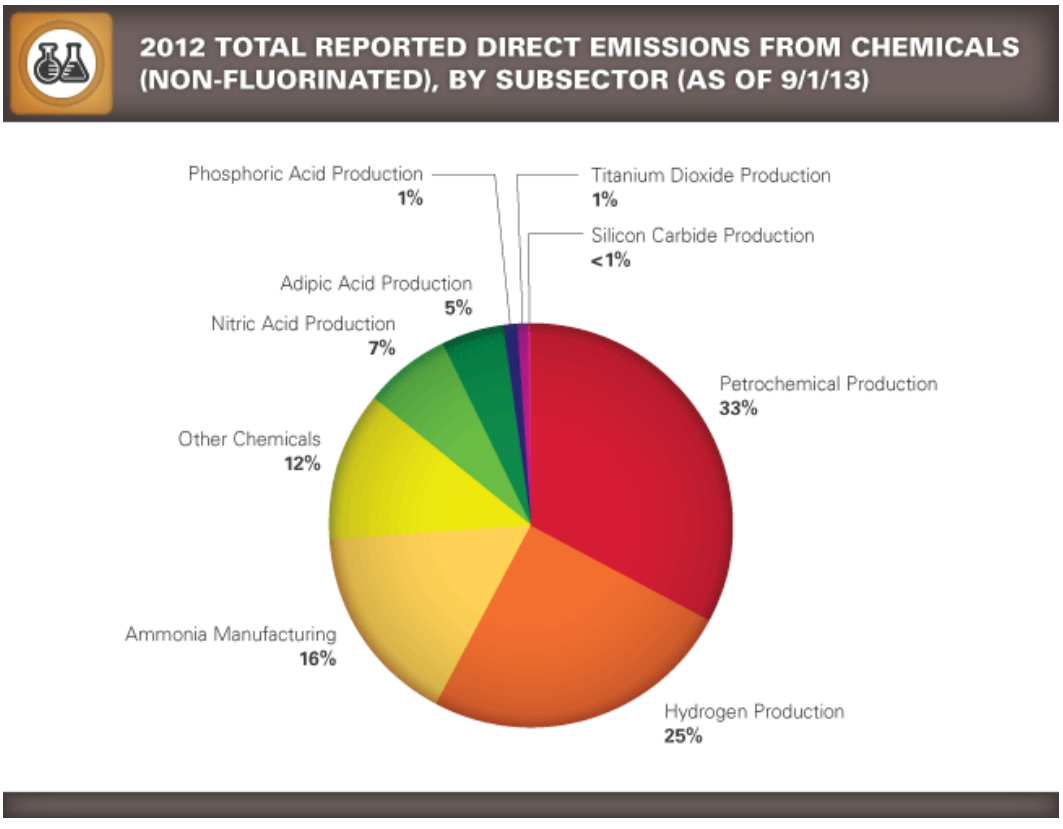
Chemicals (Non-Fluorinated) Subsectors — Greenhouse Gas Emissions Reported to the GHGRP

(all emission values presented in million metric tons CO_2e)

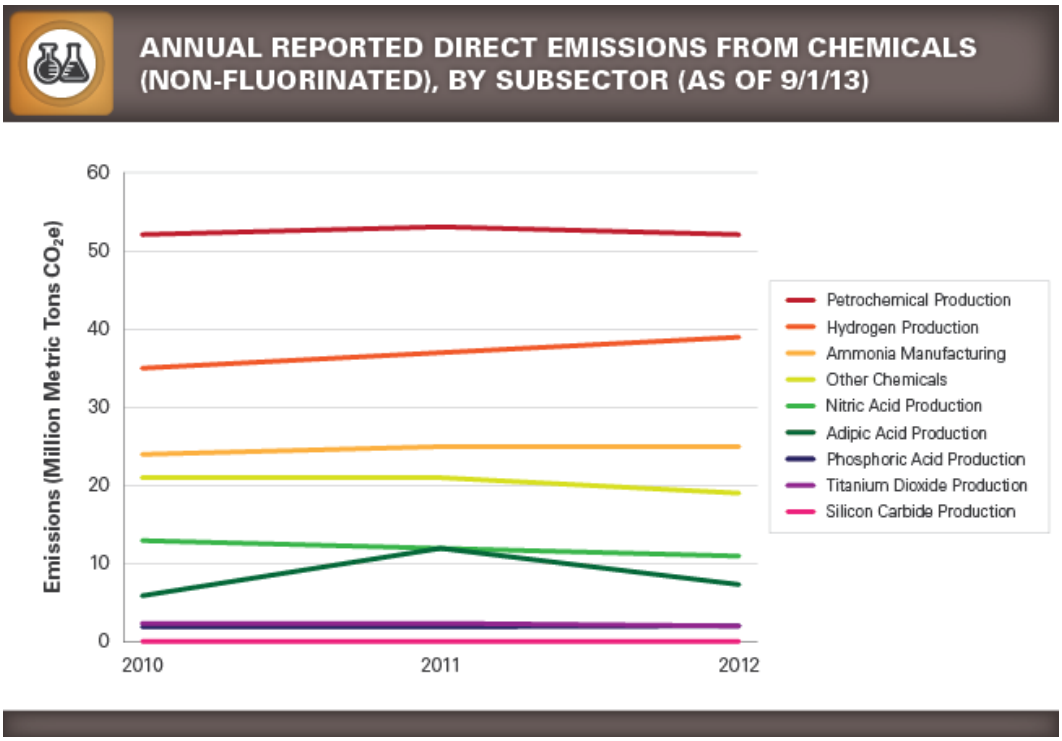
	2011	2012	2013
Number of facilities:	442	451	457
Total emissions (CO_2e):	163.5	158.5	161.1
Emissions by greenhouse gas (CO_2e)			
• Carbon dioxide (CO_2)	141.9	142.1	146.0
• Methane (CH_4)	0.4	0.2	0.2
• Nitrous oxide (N_2O)	21.2	16.2	14.9

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

Total Reported Direct Emissions from Chemicals (Non-fluorinated), by Subsector (as of 8/18/14).

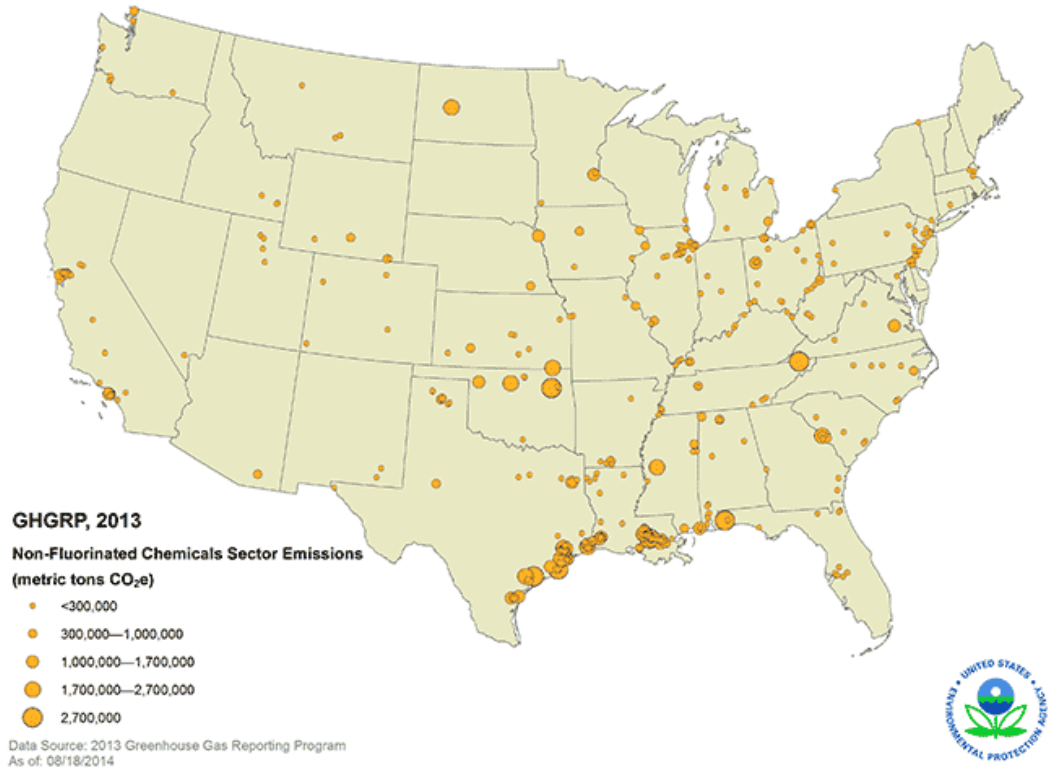


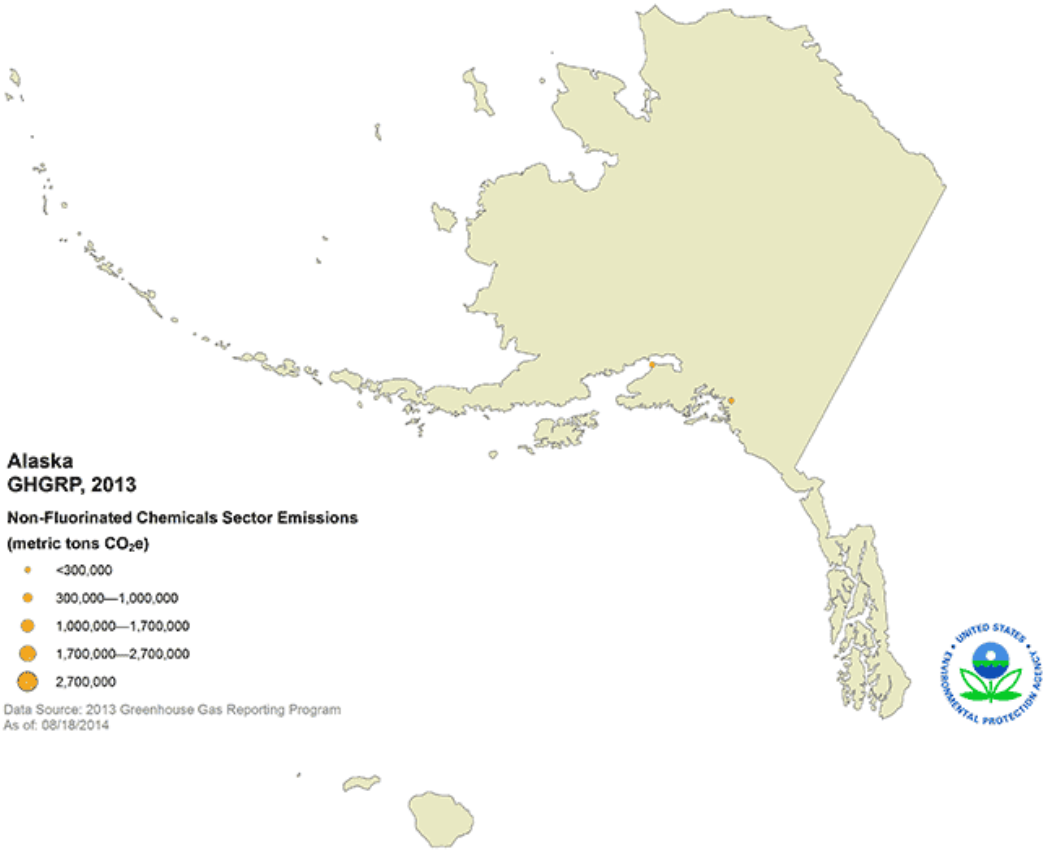
Trend of Annual Reported GHG Emissions for Chemicals (Non-fluorinated), by Subsector (as of 8/18/14).

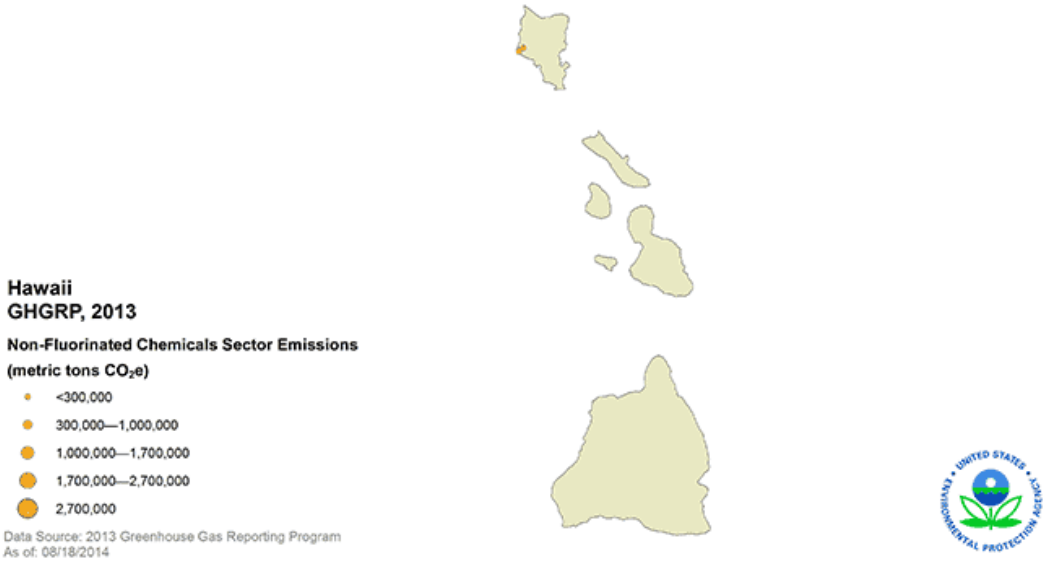


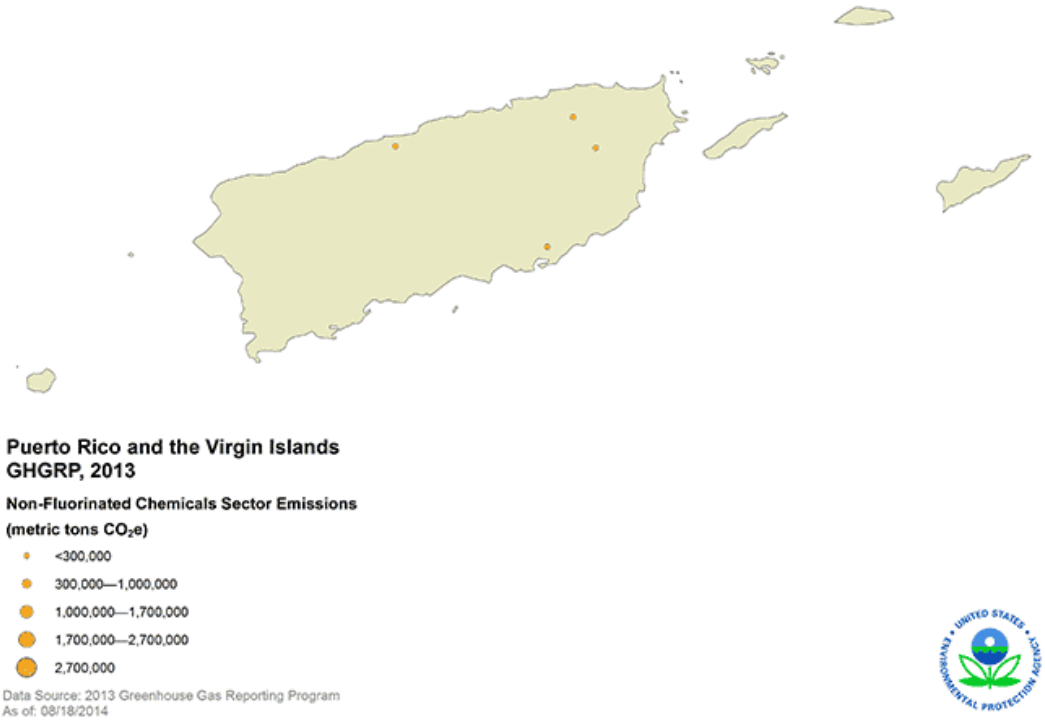
Location and emissions range for each reporting facility for Chemicals (Non-fluorinated) (as of 8/18/14).

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




Alaska
GHGRP, 2013
Non-Fluorinated Chemicals Sector Emissions
(metric tons CO_2e)
<300,000
300,000—1,000,000
1,000,000—1,700,000
1,700,000—2,700,000
2,700,000
Data Source: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014


Hawaii
GHGRP, 2013
Non-Fluorinated Chemicals Sector Emissions
(metric tons CO_2e)
<300,000
300,000—1,000,000
1,000,000—1,700,000
1,700,000—2,700,000
2,700,000
Data Source: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014



Chemicals (Fluorinated)

The fluorinated chemical subsector includes facilities that produce hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), other fluorinated GHGs such as fluorinated ethers, and chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), including chlorodifluoromethane (HCFC-22). The category 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

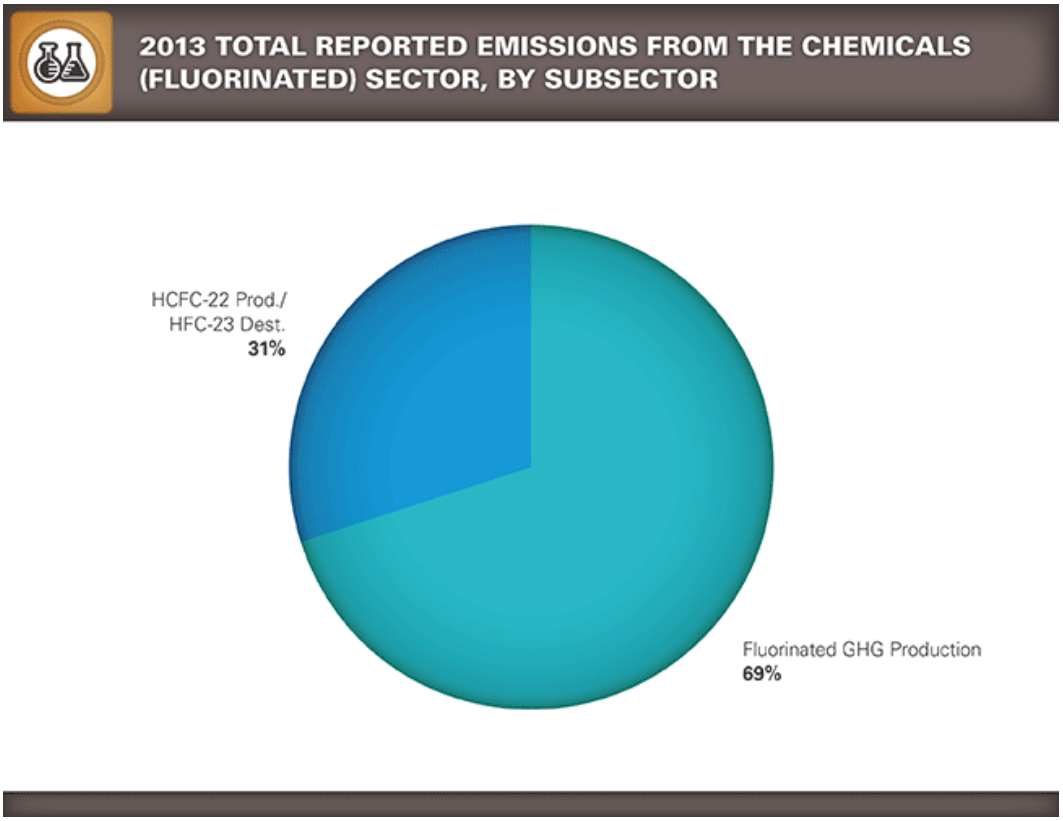
(all emission values presented in million metric tons CO_2e)

	2011	2012	2013
Number of facilities:	16	16	16
Total emissions (CO_2e):		14	12
• HCFC-22 Production/HFC-23 Destruction	15.7	12.4	13.5
• Destruction	8.8	5.5	4.1
• Other Fluorinated Gas Production	6.9	6.9	9.4
Emissions by greenhouse gas (CO_2e)			
• Carbon dioxide (CO_2)	0.9	0.7	0.8
• Methane (CH_4)	**	**	**
• Nitrous oxide (N_2O)	**	**	**
• Fluorinated GHGs	14.9	11.7	12.7

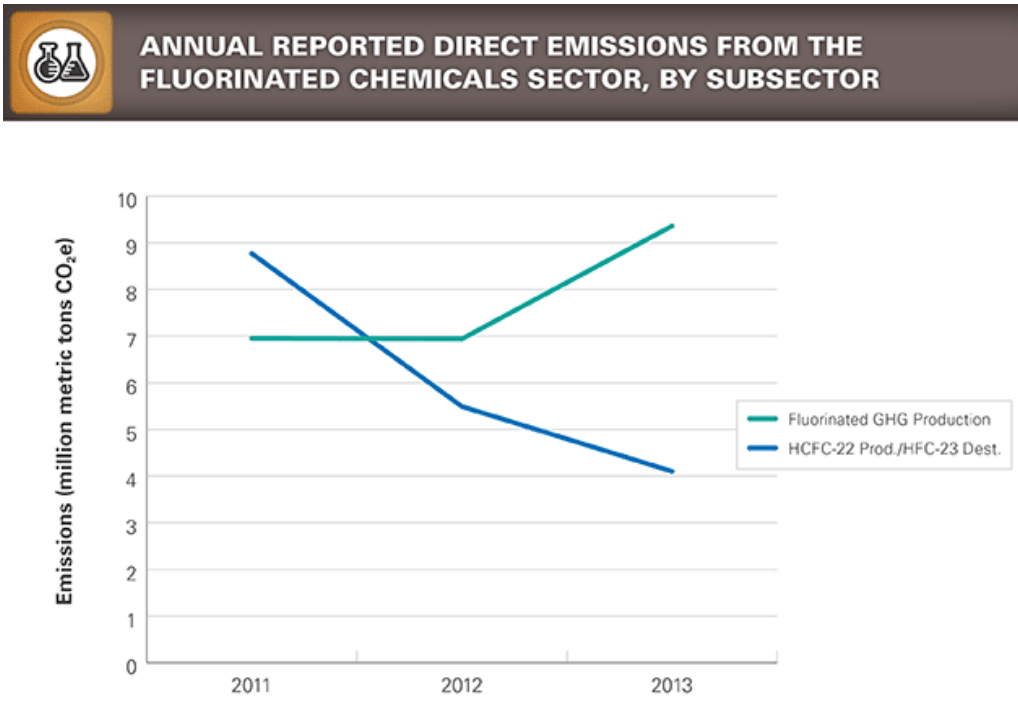
Totals may not equal sum of individual GHGs due to independent rounding.

** Total reported emissions are less than 0.05 million metric tons CO_2e.

Total Reported Direct Emissions from Fluorinated Chemicals, by Subsector (as of 8/18/14).



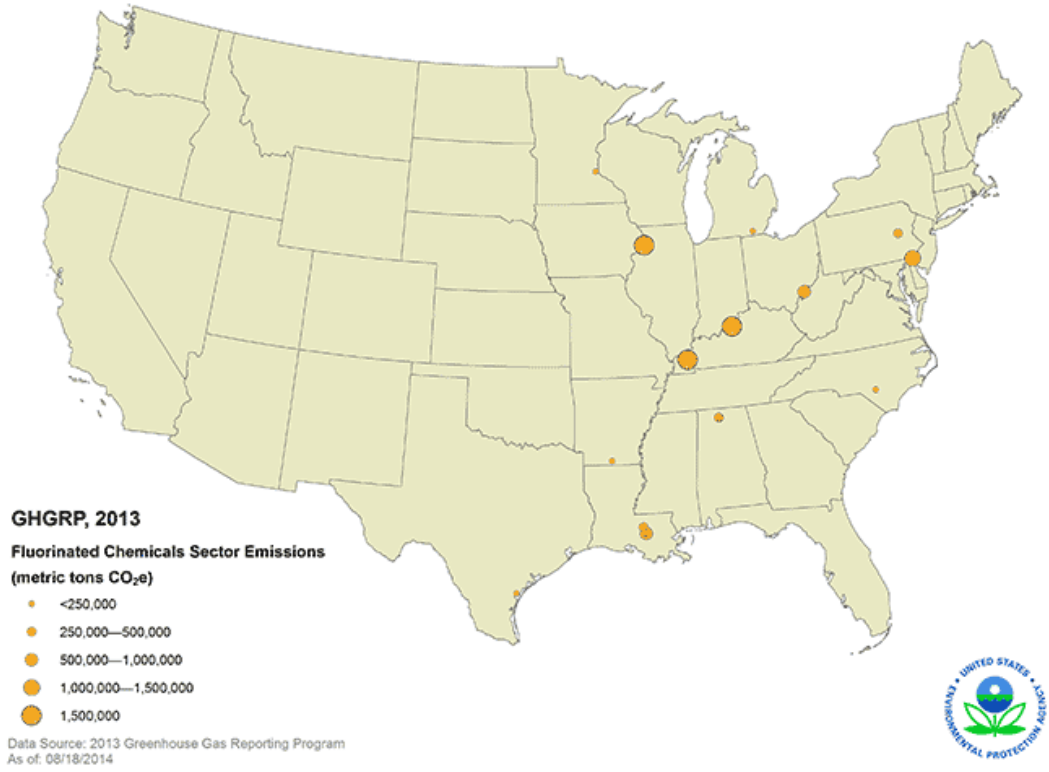
Trend of Annual Reported GHG Emissions for Fluorinated Chemicals, by Subsector (as of 8/18/14).



As noted above, the emission trend for fluorinated gas production is affected by the use of different GWPs in 2013 than in 2011 and 2012.

Location and emissions range for each reporting facility in Fluorinated Chemicals (as of 8/18/14).

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 2013: 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_2e 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_2e)

	2011	2012	2013
Number of facilities:	1,629	1,632	1,161
Total emissions (CO_2e):	115.4	118.5	114.0
Emissions by greenhouse gas (CO_2e)			
• Carbon dioxide (CO_2)	10.4	10.2	10.5
• Methane (CH_4)	104.7	107.9	103.1
• Nitrous oxide (N_2O)	0.4	0.4	0.4

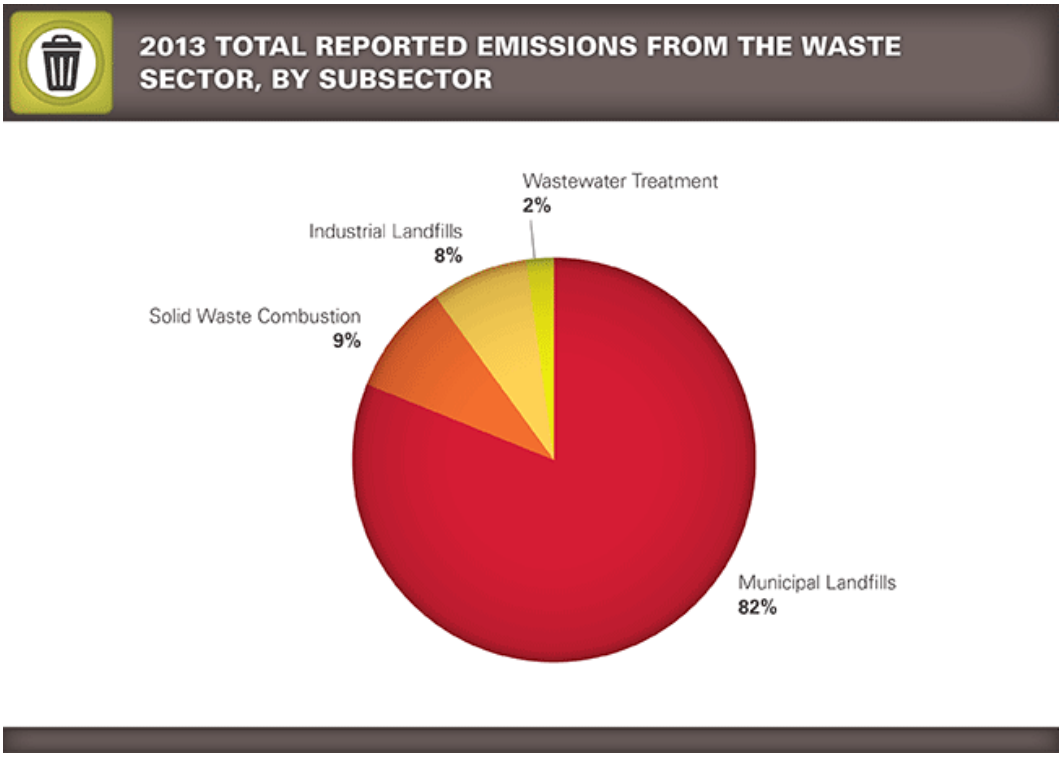
Totals may not equal sum of individual GHGs due to independent rounding.

CO_2 emissions from the combustion of biomass are NOT included in emissions totals provided above.

Number of reporters and 2013 emissions (CO_2e) per waste industry subsector

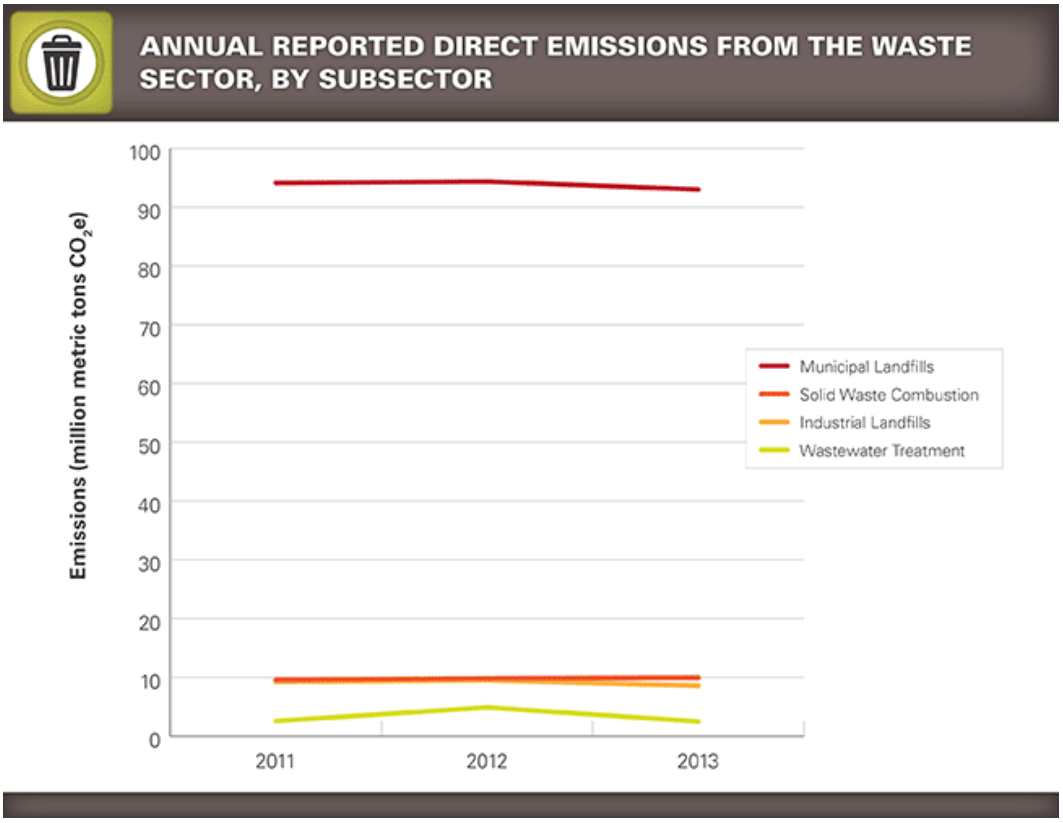
Industry Sector	2013 Number of Reporters	2013 Emissions (million metric tons CO_2e per year)
MSW Landfills	1,220	93.0
Industrial Wastewater Treatment	155	2.5
Industrial Waste Landfills	174	8.6
Solid Waste Combustion	68	10.0

Total Reported Direct Emissions from Waste, by Subsector (as of 8/18/14).



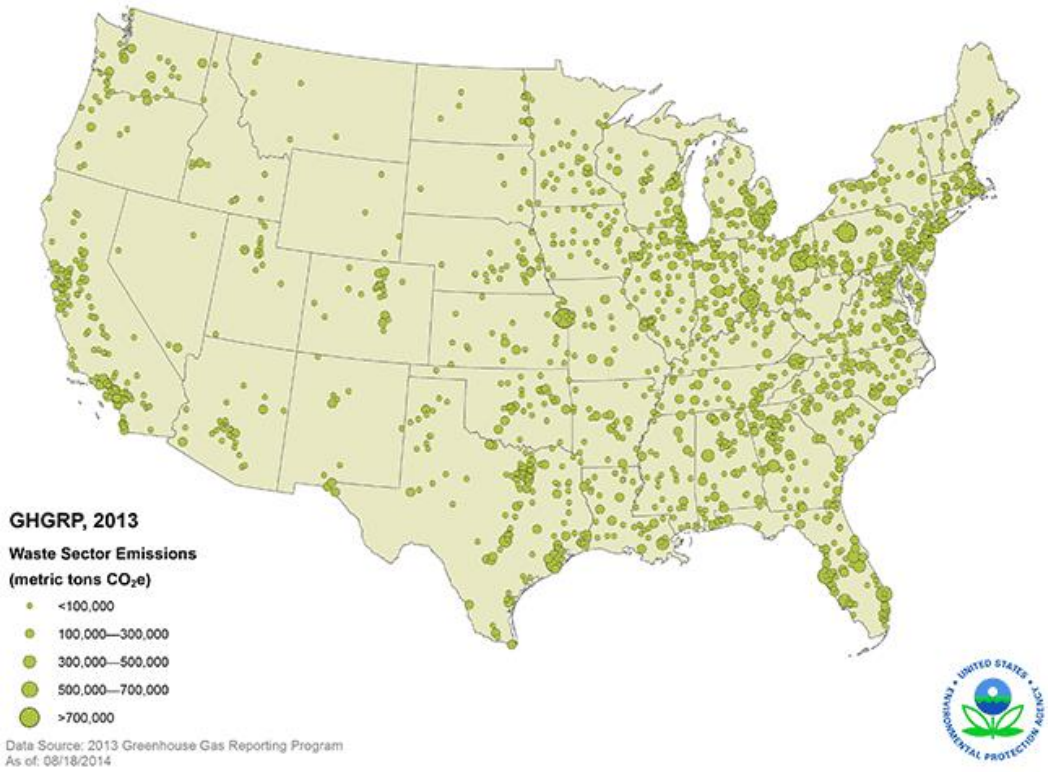
Sum of percentages may not equal 100% due to independent rounding.

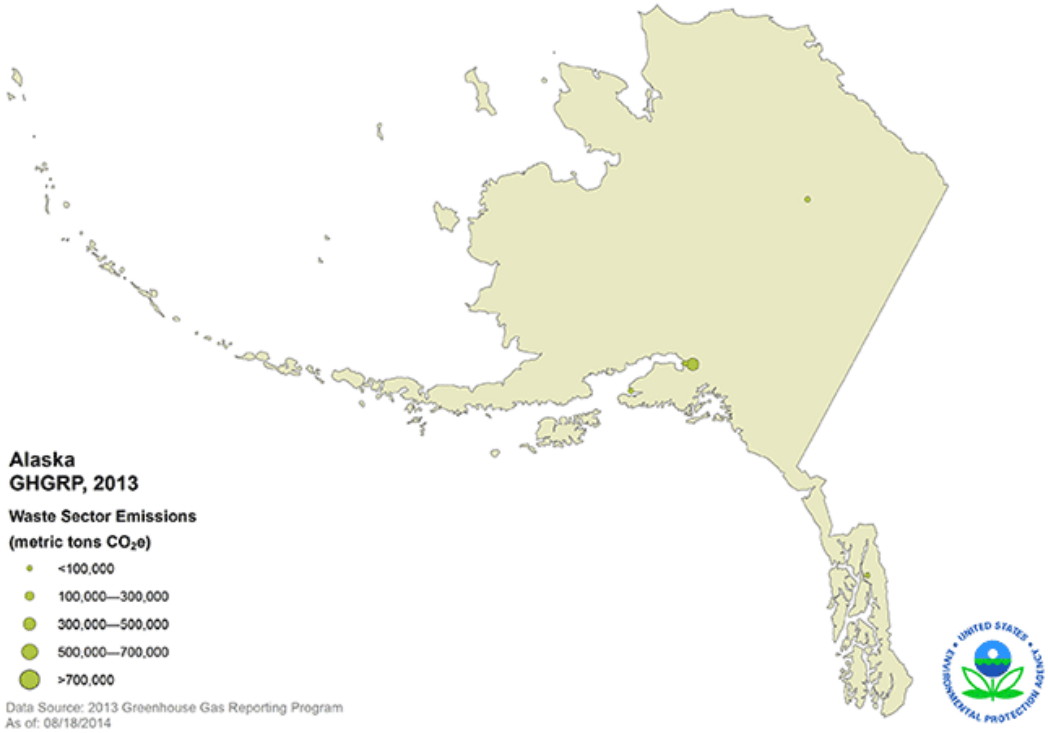
Trend of Annual Reported GHG Emissions for Waste, by Subsector (as of 8/18/14).

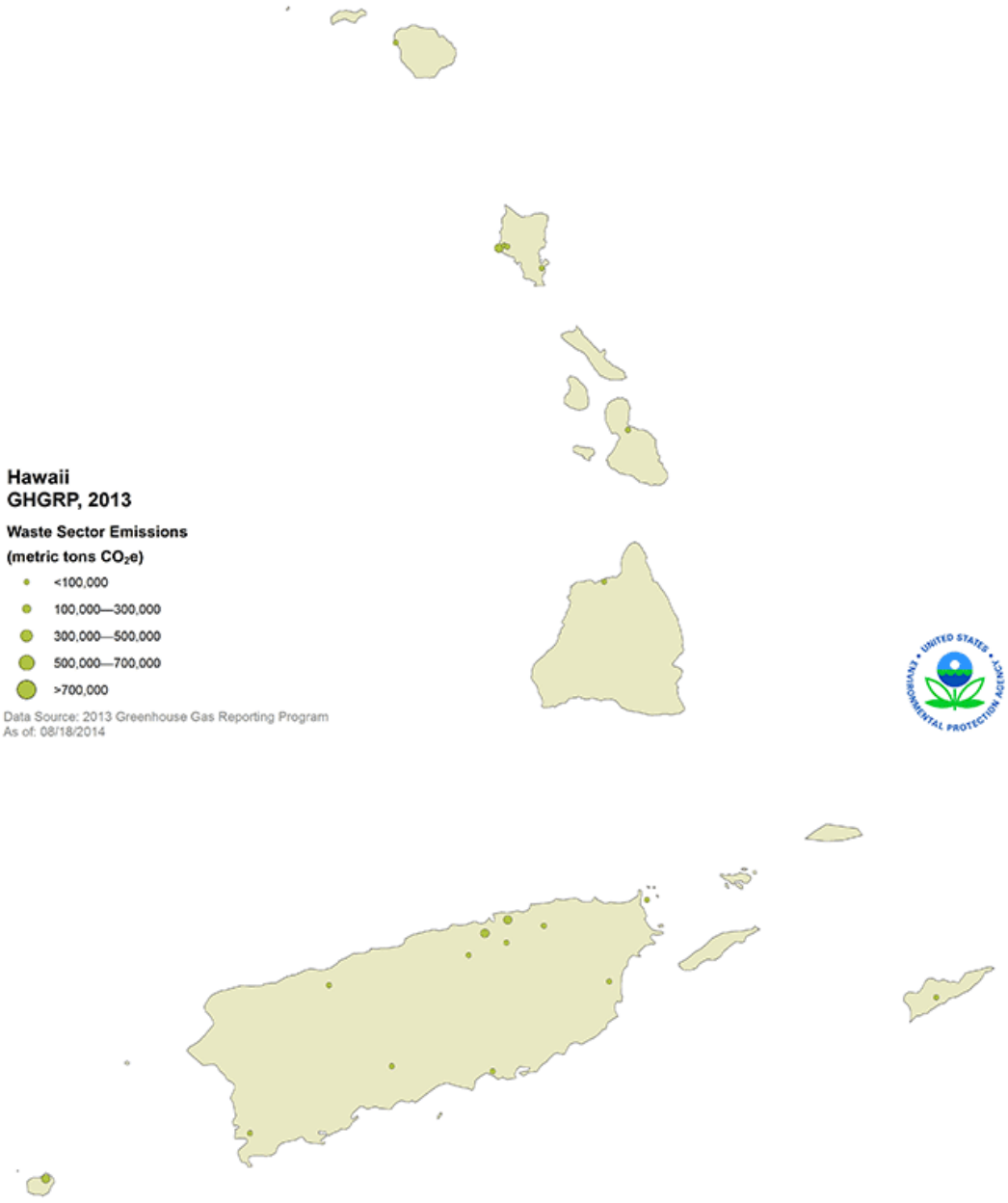


Location and emissions range for each reporting facility in the waste sector (as of 8/18/14).

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 2013: 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. Data for magnesium production were reported beginning in 2011 while data for all other metal production were reported beginning in 2010.

Metals Sector — Greenhouse Gas Emissions Reported to the GHGRP

(all emission values presented in million metric tons CO_2e)

	2011	2012	2013
Number of facilities:	298	298	296
Total emissions (CO_2e):	112.8	106.9	106.8
Emissions by greenhouse gas (CO_2e)			
• Carbon dioxide (CO_2)	108.8	102.6	102.7
• Methane (CH_4)	**	**	**
• Nitrous oxide (N_2O)	**	**	**
• Hydrofluorocarbons (HFCs)	**	**	0.1
• Perfluorocarbons (PFCs)	3.5	2.9	3.0
• Sulfur hexafluoride (SF_6)	1.5	1.3	1.0

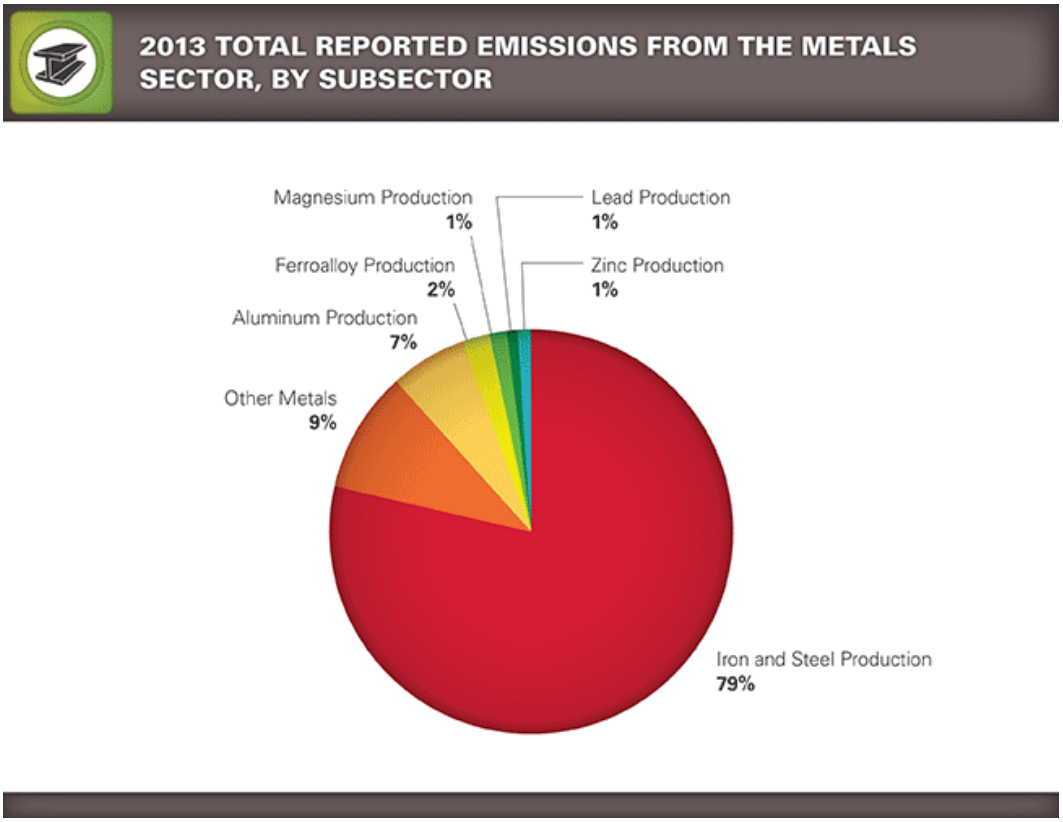
Totals may not equal sum of individual GHGs due to independent rounding.

** Total reported emissions are less than 0.05 million metric tons.CO_2 emissions from the combustion of biomass are NOT included in emissions totals provided above.

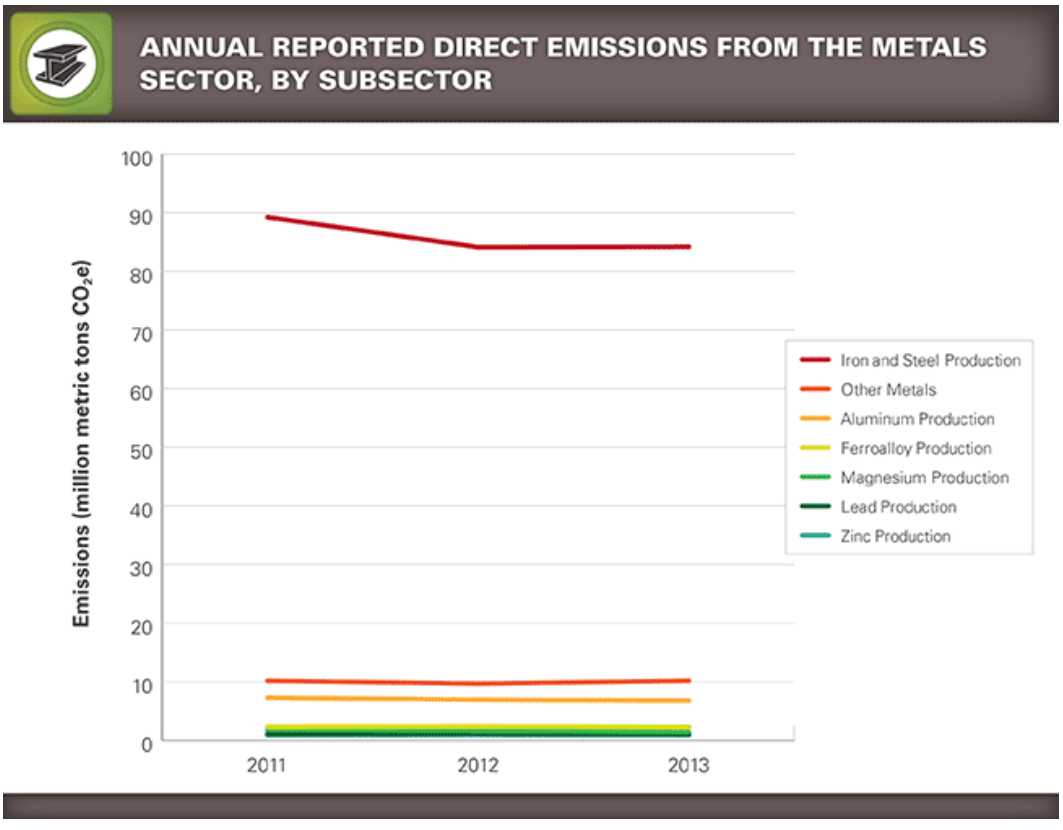
Number of reporters and 2013 emissions (CO_2e) per metals industry subsector

Industry Sector	2013 Number of Reporters	2013 Emissions (million metric tons CO_2e per year)
Aluminum Production	11	6.8
Ferroalloy Production	10	2.3
Iron and Steel Production	126	84.2
Lead Production	13	1.0
Magnesium Production	9	1.4
Zinc Production	6	0.9
Other Metals	122	10.1

Total Reported Direct Emissions from Metals, by Subsector (as of 8/18/14).

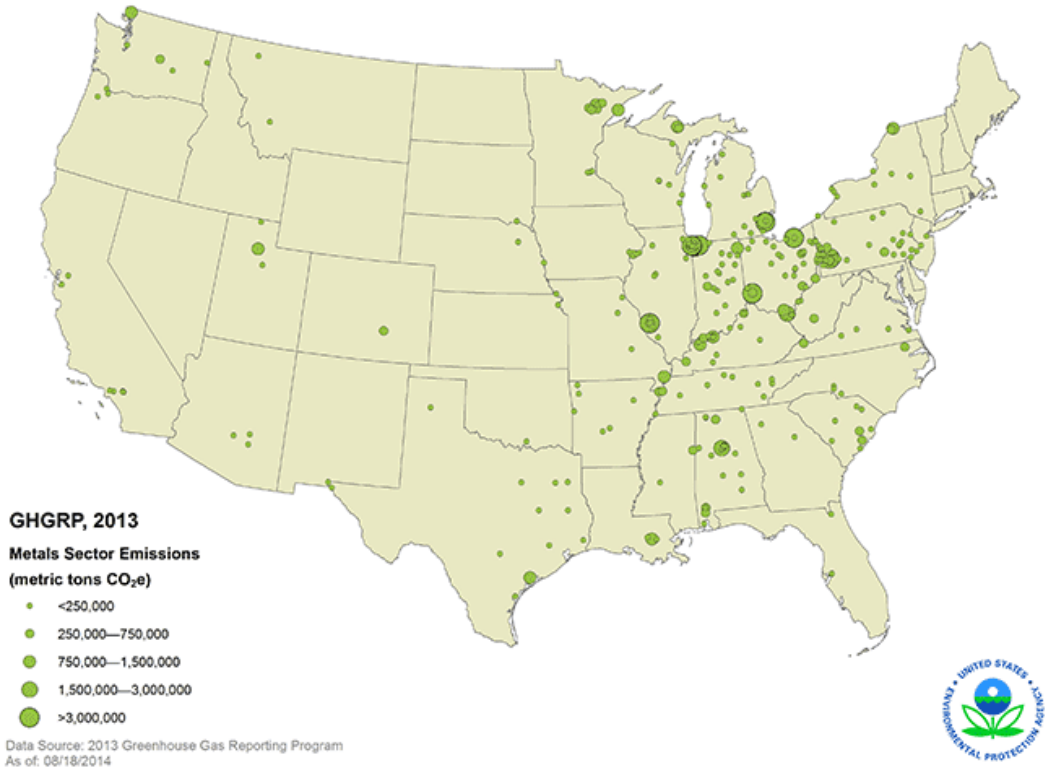


Trend of Annual Reported GHG Emissions for Metals, by Subsector (as of 8/18/14).



Location and emissions range for each reporting facility in the metals sector (as of 8/18/24).

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 2013: 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 (Nonmetallic Mineral Product Manufacturing). Facilities under this sector transform mined or quarried nonmetallic minerals —such as sand, gravel, stone, clay, and refractory materials — into products for intermediate or final consumption. Excluded from this sector are facilities that primarily beneficiate mined nonmetallic minerals. 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 CO2 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 CO2 emissions reported for those processes.

Minerals Sector — Greenhouse Gas Emissions Reported to the GHGRP

(all emission values presented in million metric tons CO_2e)

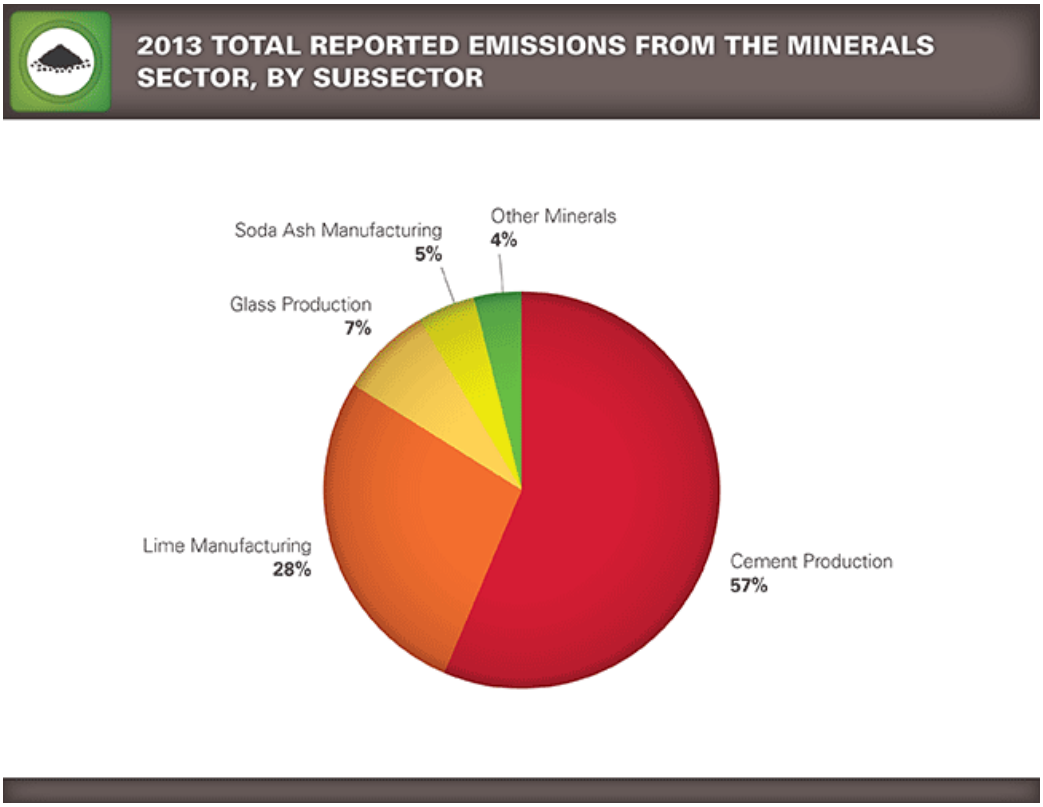
	2011	2012	2013
Number of facilities:	366	368	376
Total emissions (CO_2e):	103.2	107.5	111.3
Emissions by greenhouse gas (CO_2e)			
• Carbon dioxide (CO_2)	102.9	107.2	111.0
• Methane (CH_4)	0.1	0.1	0.1
• Nitrous oxide (N_2O)	0.2	0.2	0.2

CO_2 emissions from the combustion of biomass are NOT included in emissions totals provided above.

Number of reporters and 2013 emissions (CO_2e) per minerals industry subsector

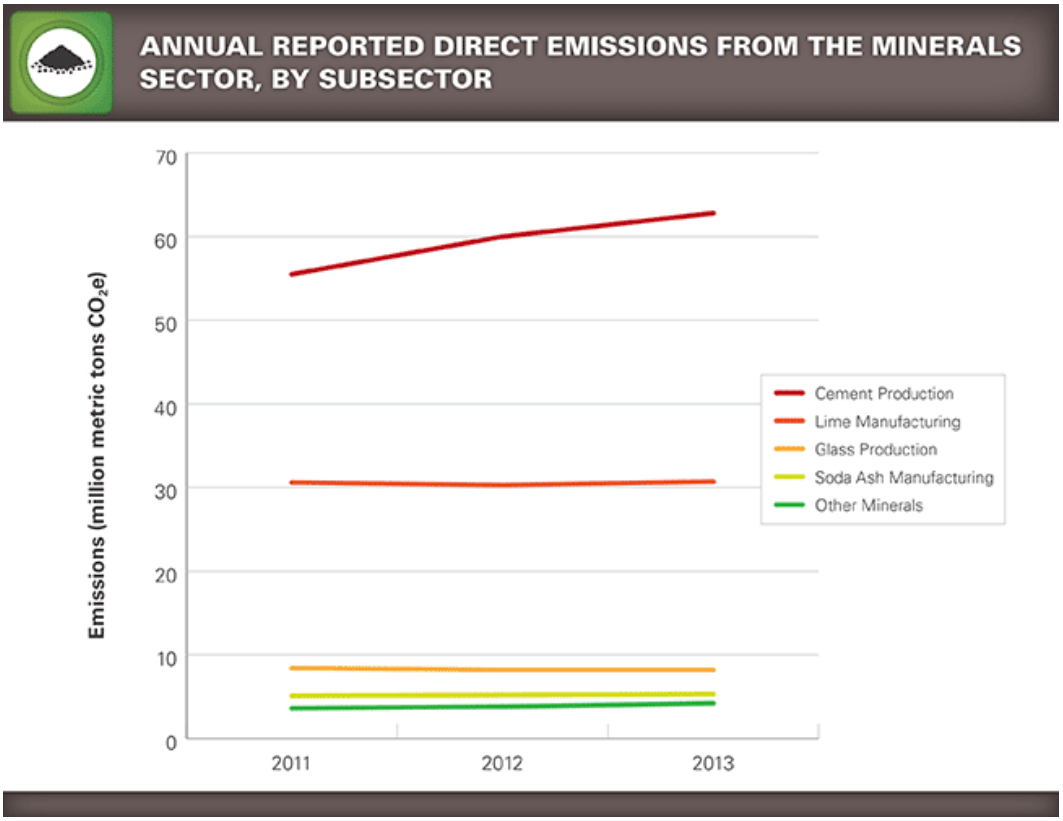
Industry Sector	2013 Number of Reporters	2013 Emissions (million metric tons CO_2e per year)
Cement Production	96	62.6
Lime Production	75	30.6
Glass Production	109	8.2
Soda Ash Manufacturing	4	5.3
Other Minerals	94	4.2

Total Reported Direct Emissions from Minerals, by Subsector (as of 8/18/14).



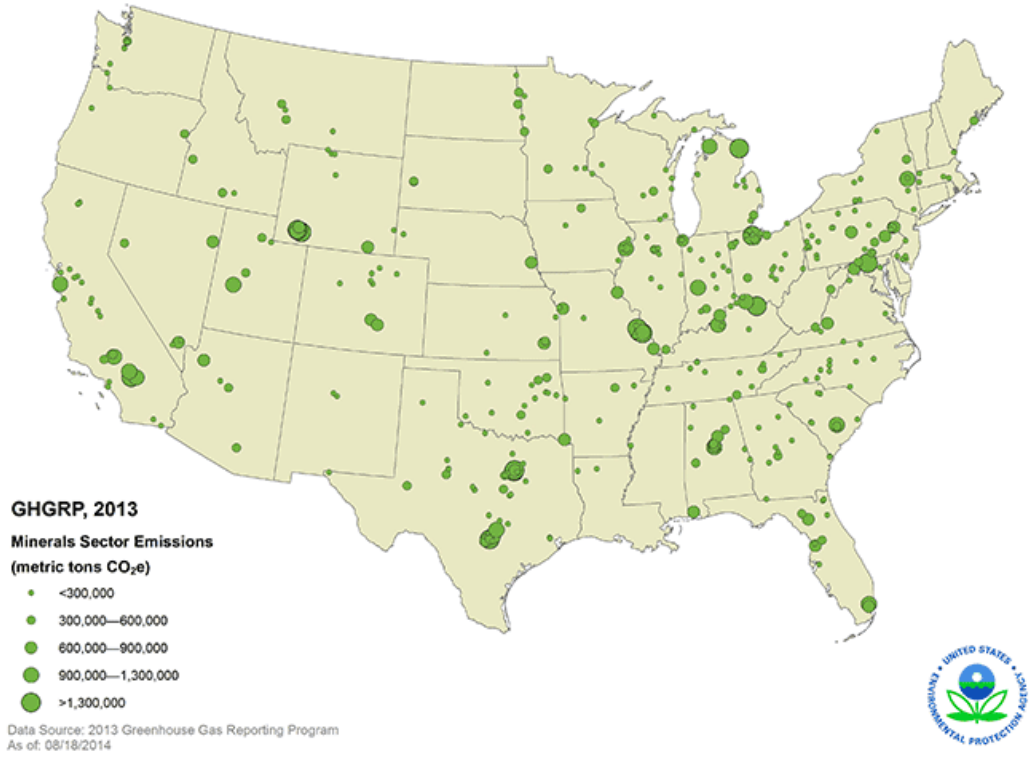
Sum of percentages may not equal 100% due to independent rounding.

Trend of Annual Reported GHG Emissions for Minerals, by Subsector (as of 8/18/14).



Location and emissions range for each reporting facility in the minerals ector (as of 8/18/14).

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 2013: 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 these facilities are included in the waste sector.

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

(all emission values presented in million metric tons CO_2e)

	2011	2012	2013
Number of facilities:	233	233	233
Total emissions (CO_2e):	44.2	42.5	39.1
Emissions by greenhouse gas (CO_2e)			
• Carbon dioxide (CO_2)	41.2	39.6	38.2
• Methane (CH_4)	1.1	1.1	0.2
• Nitrous oxide (N_2O)	1.9	1.9	0.7

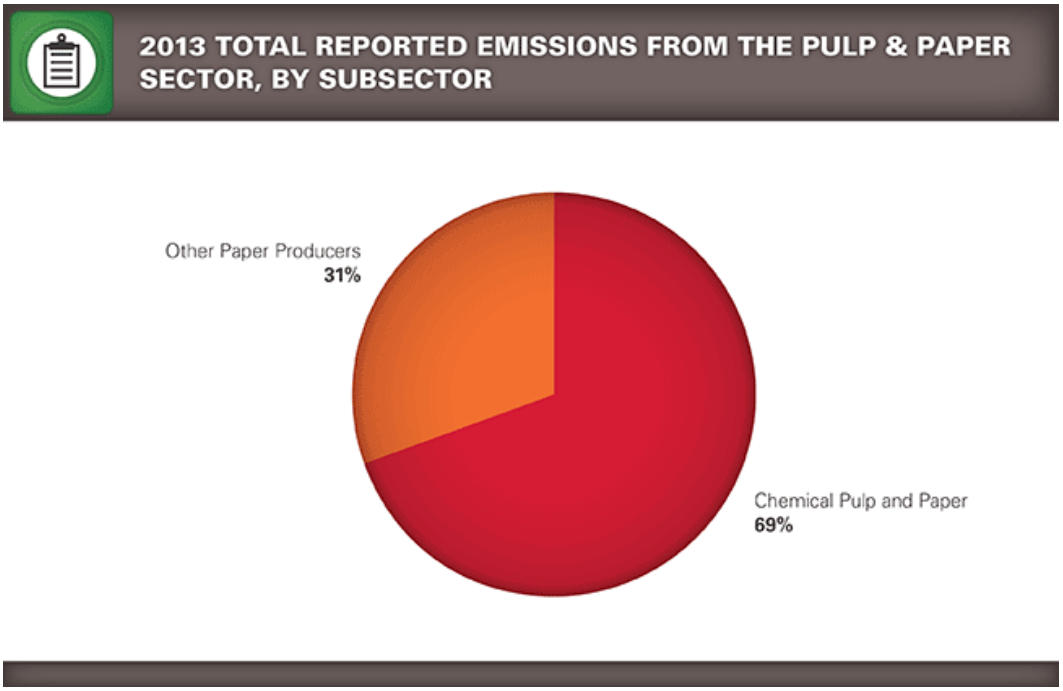
Totals may not equal sum of individual GHGs due to independent rounding.

CO_2 emissions from the combustion of biomass are NOT included in emissions totals provided above.

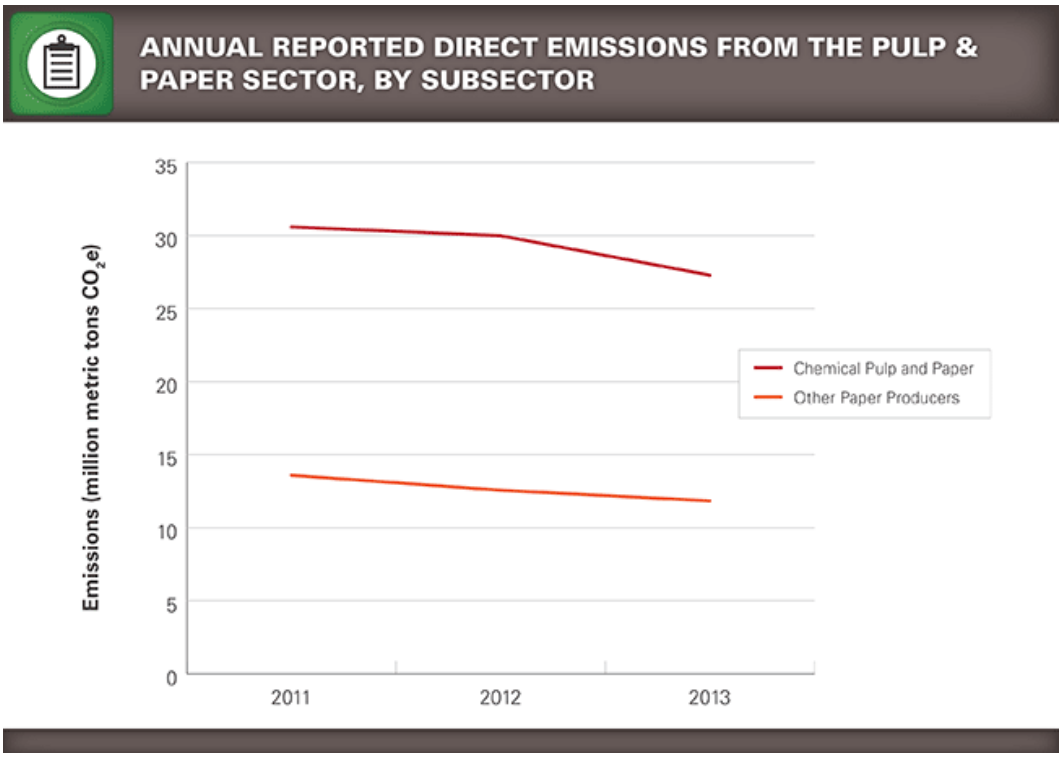
Number of reporters and 2013 emissions (CO_2e) per pulp and paper industry subsector

Industry Sector	2013 Number of Reporters	2013 Emissions (million metric tons CO_2e per year)
Pulp and Paper Production	110	27.3
Other Paper Products	123	11.8

Total Reported Direct Emissions from Pulp and Paper, by Subsector (as of 8/18/14).



Trend of Annual Reported GHG Emissions for Pulp and Paper, by Subsector (as of 8/18/14).

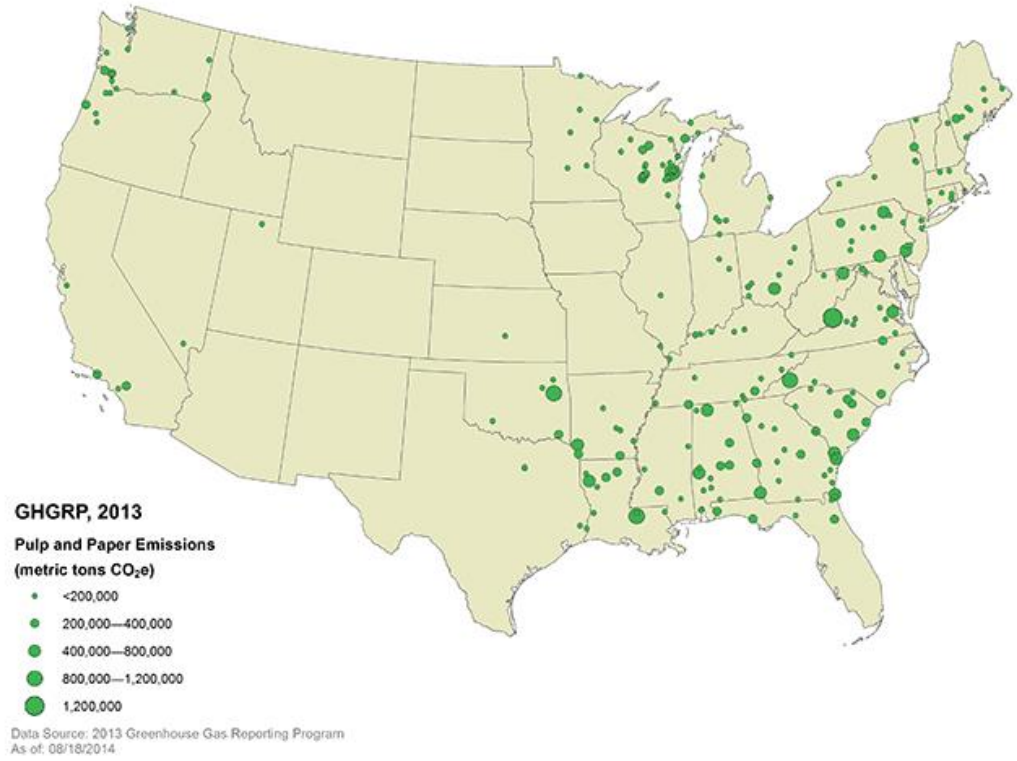


Overall, emissions from the pulp and paper sector declined by eight percent from 2012 to 2013. Most of the decline occurred in the chemical pulp and paper subsector, where emissions declined by nine percent. The emission trends observed between 2012 and 2013 appear to be declining, which could be attributed to changes in production levels and fuel use. However, the more pronounced decline in emissions from chemical pulp and paper facilities between 2012 and 2013 can in part be attributed to a change in the emission factors used to estimate methane and nitrous

oxide emissions from the combustion of spent pulping liquor and wood residuals. For reporting year 2013, EPA updated these emission factors based on review of emissions test data submitted to the EPA and other relevant literature.[5] These new emission factors used for reporting year 2013, but not for prior years, contributed to a decline in reported methane and nitrous oxide emissions from the pulp and paper industry. This decline in methane and nitrous oxide emissions resulted in an approximately five percent decline in total emissions from this sector. The rest of the observed decline is due to changes in production levels and fuel use in the industry.

Location and emissions range for each reporting facility in the pulp and paper sector (as of 8/18/14).

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

[5] Memorandum from K. Hanks and C. Gooden, RTI to M. Hannan, U.S. EPA. January 9, 2013. Kraft Pulping Liquor and Woody Biomass Methane (CH4) and Nitrous Oxide (N2O) Emission Factor Literature Review. EPA-HQ-OAR-2012-0934-0012.

GHGRP 2013: 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 emission values presented in million metric tons CO_2e)

	2011	2012	2013
Number of facilities:	1,366	1,387	1,399
Total emissions (CO_2e):	136.8	130.0	136.9
Emissions by greenhouse gas (CO_2e)			
• Carbon dioxide (CO_2)	91.1	88.4	88.0
• Methane (CH_4)	36.7	33.6	41.4
• Nitrous oxide (N_2O)	0.5	0.6	0.4
• Hydrofluorocarbons (HFCs)	0.2	0.2	0.2
• Perfluorocarbons (PFCs)	3.1	2.7	2.6
• Sulfur hexafluoride (SF_6)	4.6	3.8	3.9
• Nitrogen trifluoride (NF_3)	0.6	0.6	0.5

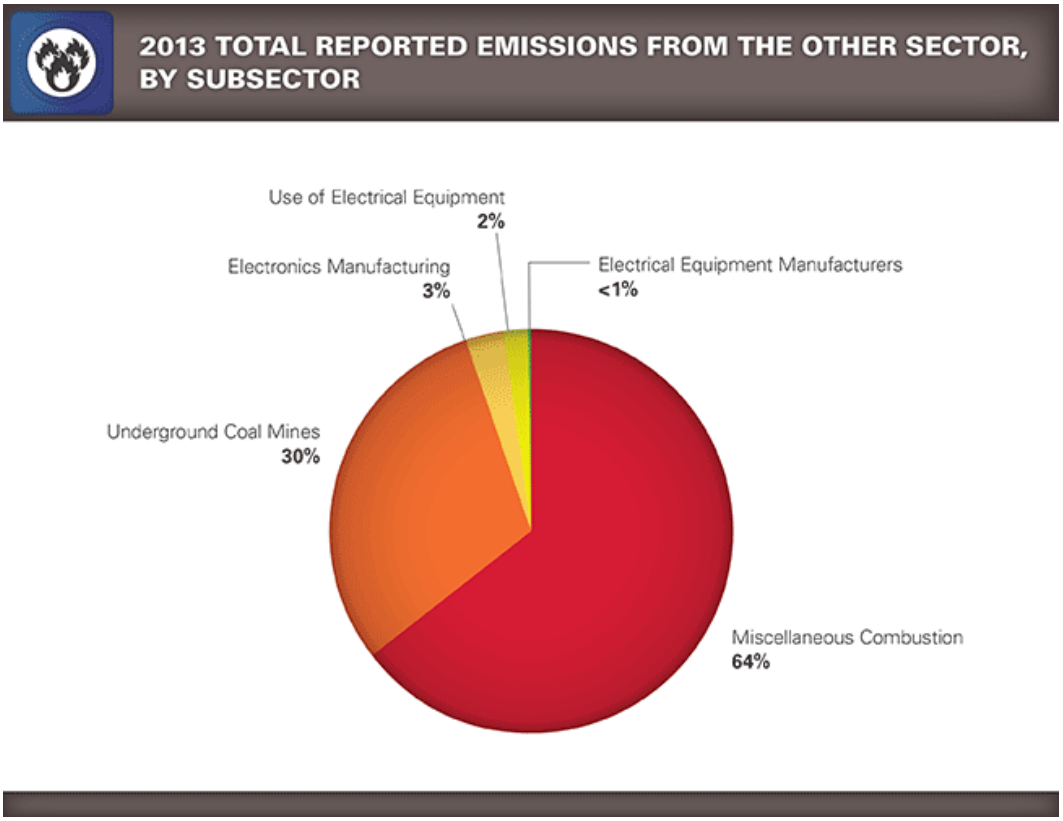
Totals may not equal sum of individual GHGs due to independent rounding.

CO_2 emissions from the combustion of biomass are NOT included in emissions totals provided above.

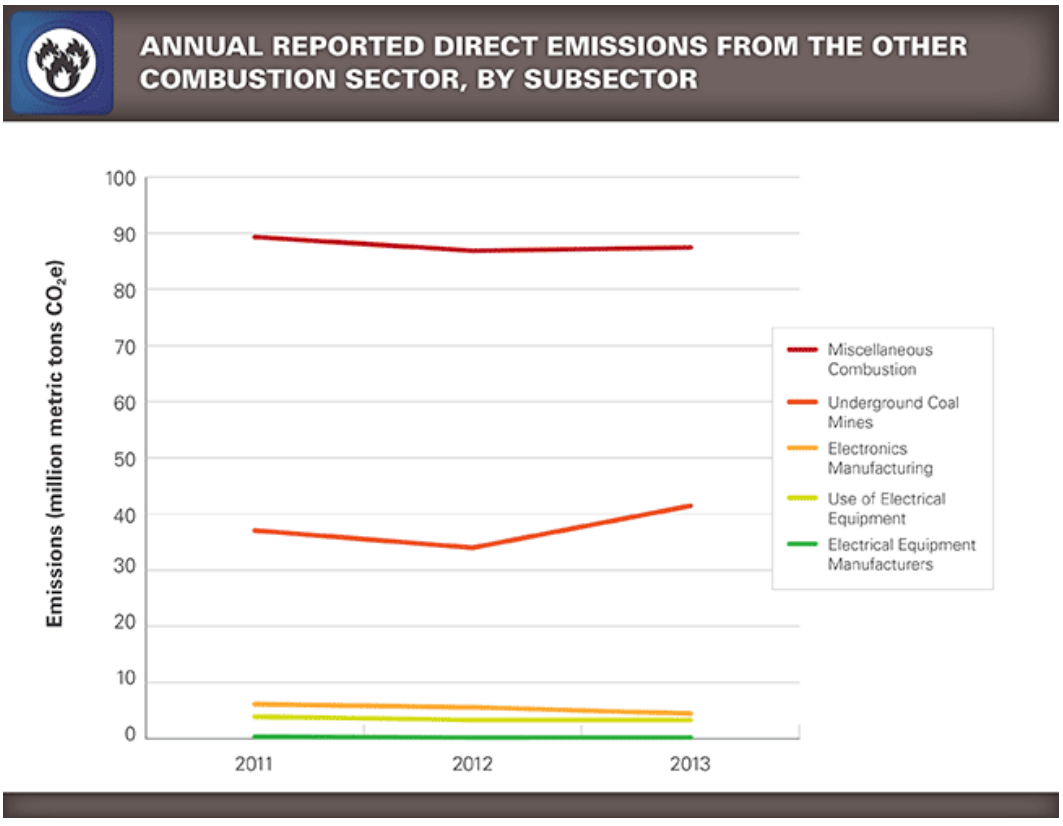
Number of reporters and 2012 emissions (CO_2e) per other industry subsector

Industry Sector	2013 Number of Reporters	2013 Emissions (million metric tons CO_2e per year)
Miscellaneous Combustion		
• Food Processing	322	30.8
• Ethanol Production	163	17.1
• Other Manufacturing	291	16.7
• Universities	112	9.2
• Military	43	2.5
• Other Combustion	170	11.1
• Underground Coal Mines	118	41.5
• Electronics Manufacturing	53	4.5
Production and Use of Electrical Equipment		
• Electrical Equipment Manufacturers	6	0.2
• Electrical Equipment Use	121	3.3

Total Reported Direct Emissions from Other, by Subsector (as of 8/18/14).

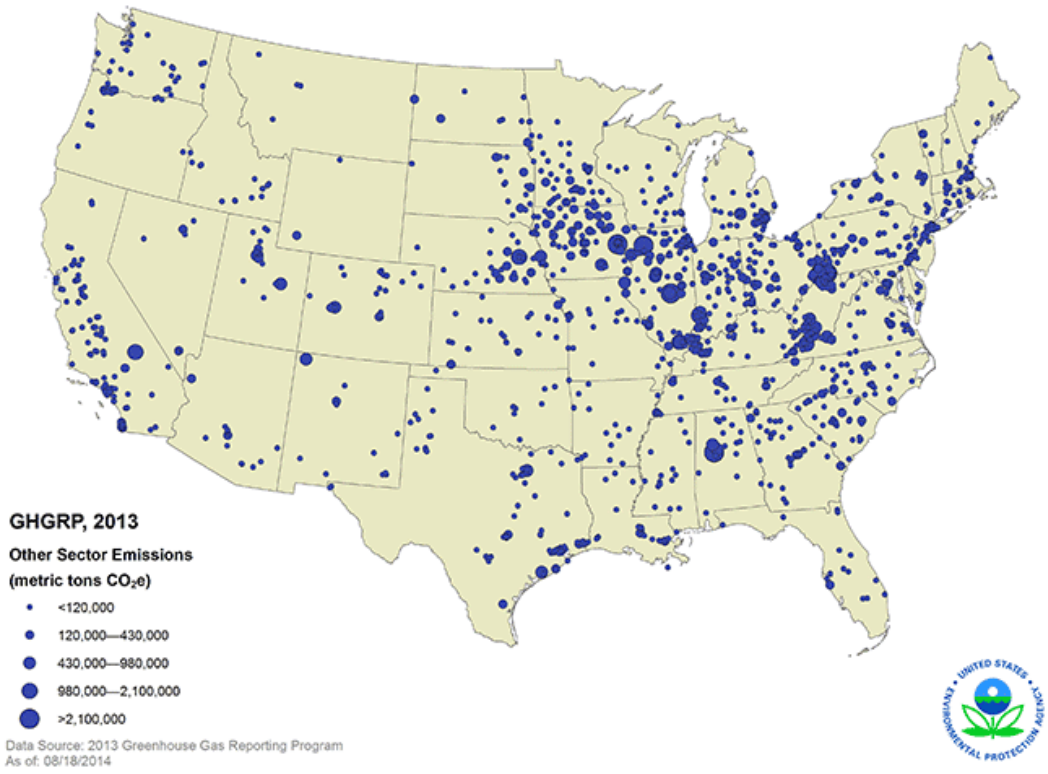


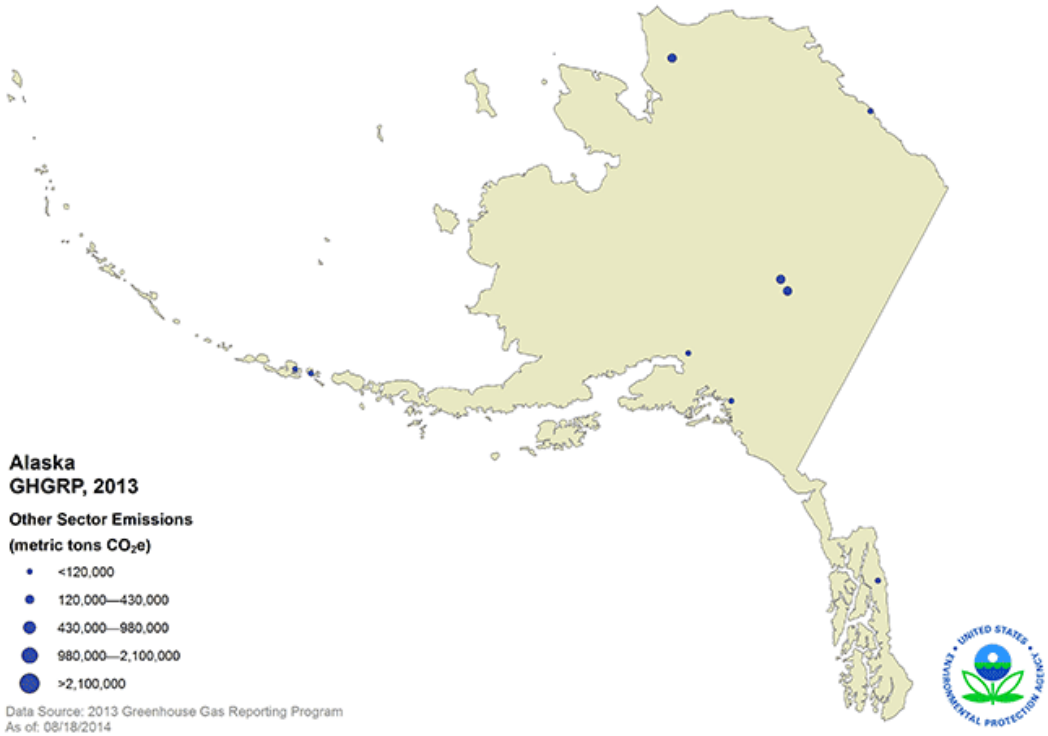
Trend of Annual Reported GHG Emissions for Other, by Subsector (as of 8/18/14).

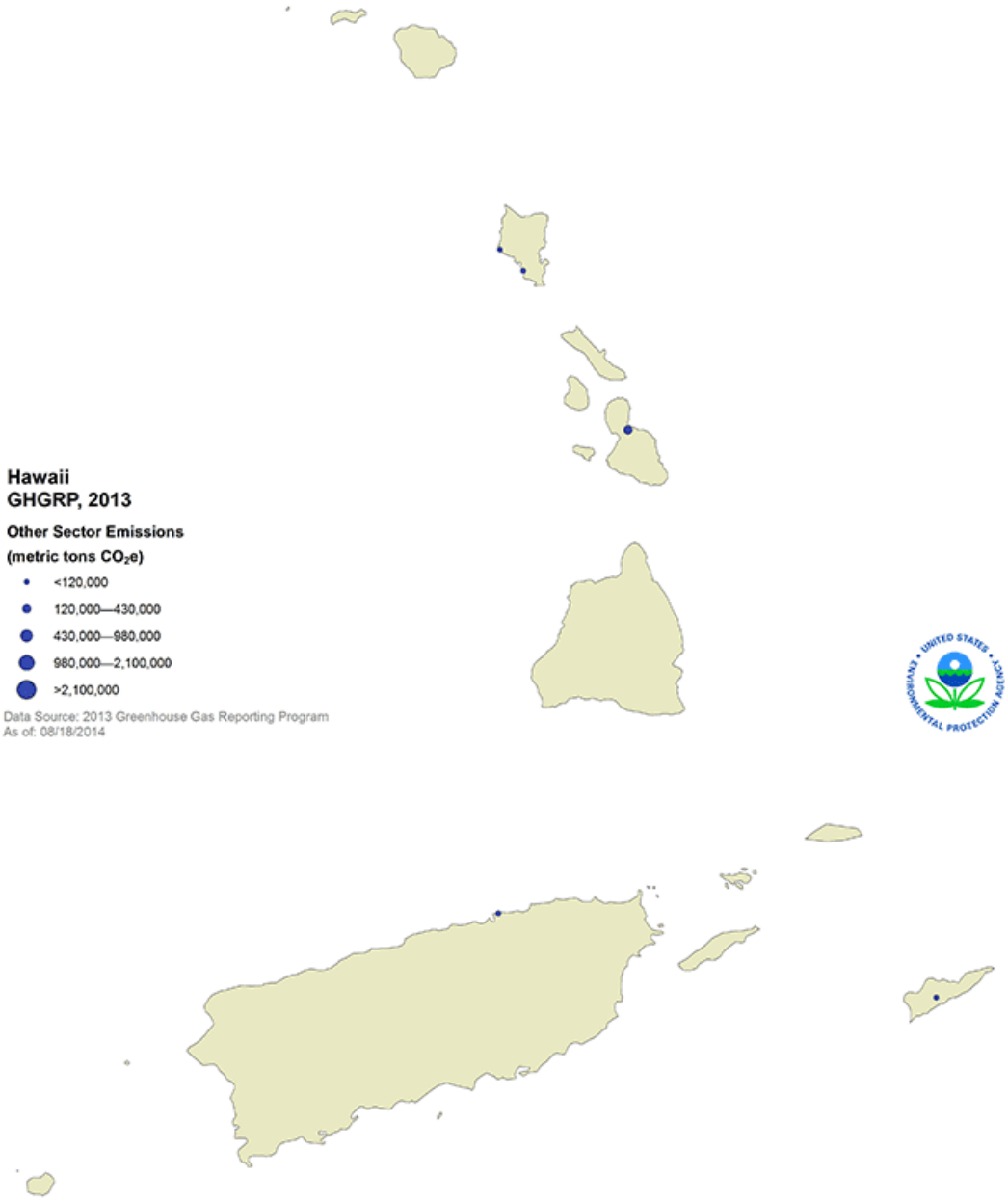


Location and emissions range for each reporting facility in the Other sector (as of 8/18/14).

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






Hawaii
GHGRP, 2013
Other Sector Emissions
(metric tons CO_2e)
<120,000
120,000—430,000
430,000—980,000
980,000—2,100,000
>2,100,000
Data Source: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014

Puerto Rico and the Virgin Islands
GHGRP, 2013
Other Sector Emissions
(metric tons CO_2e)
<120,000
120,000—430,000
430,000—980,000
980,000—2,100,000
>2,100,000
Data Source: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014

GHGRP 2013: 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 emission values presented in million metric tons CO_2e)

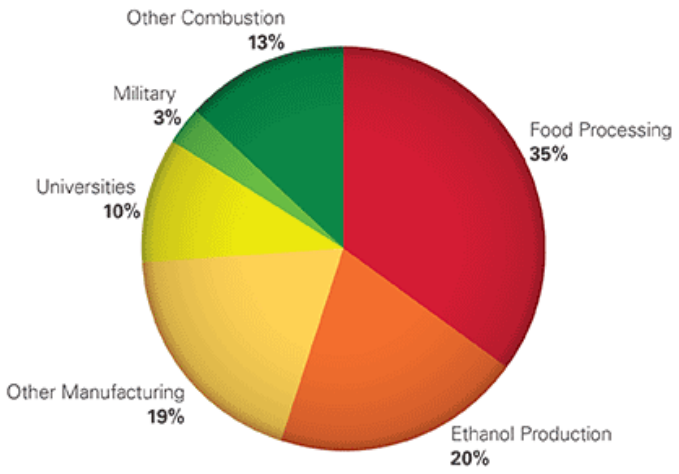
	2011	2012	2013
Number of facilities:			
• Food Processing	311	318	322
• Ethanol Production	163	165	163
• Other Manufacturing	283	287	291
• Universities	111	114	112
• Military	43	44	43
• Other Combustion	163	165	170
Total emissions (CO_2e):			
• Food Processing	31.0	30.7	30.8
• Ethanol Production	18.2	17.4	17.1
• Other Manufacturing	17.1	16.2	16.7
• Universities	9.4	9.0	9.2
• Military	2.7	2.6	2.5
• Other Combustion	11.0	11.1	11.1
Emissions by greenhouse gas (CO_2e) :			
Food Processing			
• Carbon dioxide (CO_2)	30.8	30.5	30.6
• Methane (CH_4)	0.1	0.1	0.1
• Nitrous oxide (N_2O)	0.1	0.1	0.1
Ethanol Production			
• Carbon dioxide (CO_2)	18.2	17.2	17.1
• Methane (CH_4)	**	**	**
• Nitrous oxide (N_2O)	**	0.2	**
Other Manufacturing			
• Carbon dioxide (CO_2)	17.0	16.1	16.6
• Methane (CH_4)	**	**	**
• Nitrous oxide (N_2O)	0.1	0.1	0.1
Universities			
• Carbon dioxide (CO_2)	9.4	8.9	9.2
• Methane (CH_4)	**	**	**
• Nitrous oxide (N_2O)	**	**	**

	2011	2012	2013
Military			
• Carbon dioxide (CO_2)	2.7	2.6	2.5
• Methane (CH_4)	**	**	**
• Nitrous oxide (N_2O)	**	**	**
Other Combustion			
• Carbon dioxide (CO_2)	10.9	11.1	11.1
• Methane (CH_4)	**	**	**
• Nitrous oxide (N_2O)	**	**	**

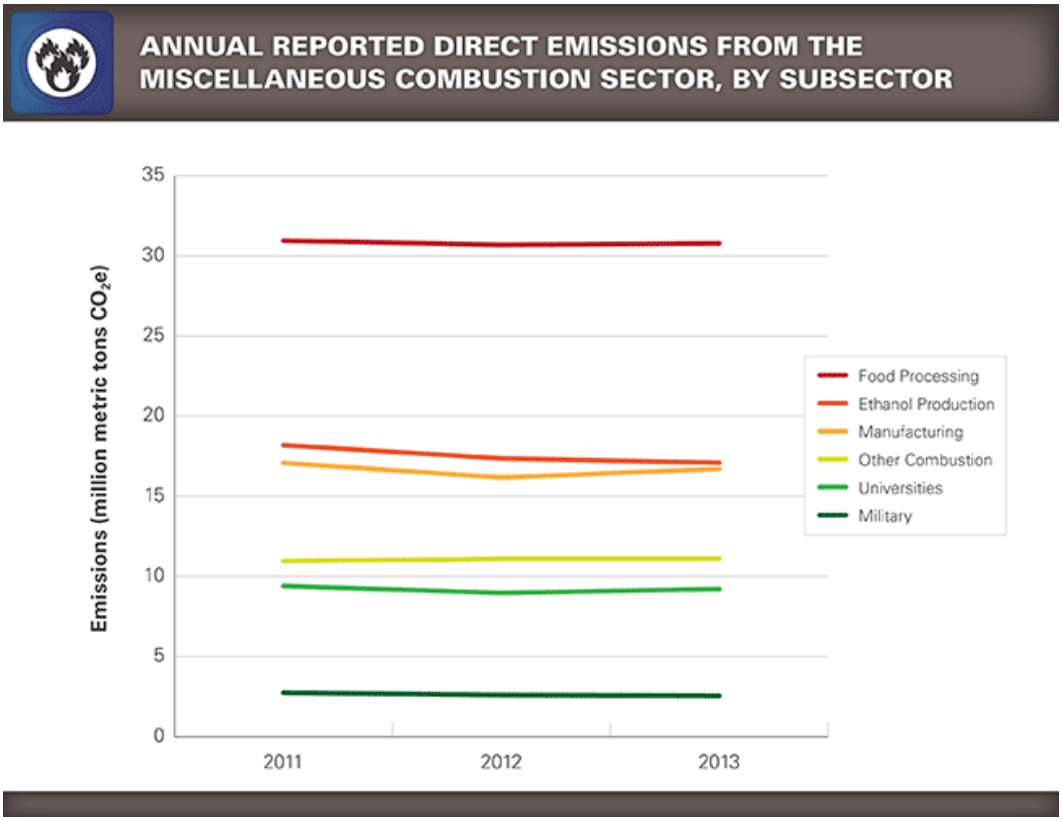
Totals may not equal sum of individual GHGs due to independent rounding.

** Total reported emissions are less than 0.05 million metric tons CO_2e.

Total Reported Direct Emissions from Miscellaneous Combustion, by Subsector (as of 8/18/14).

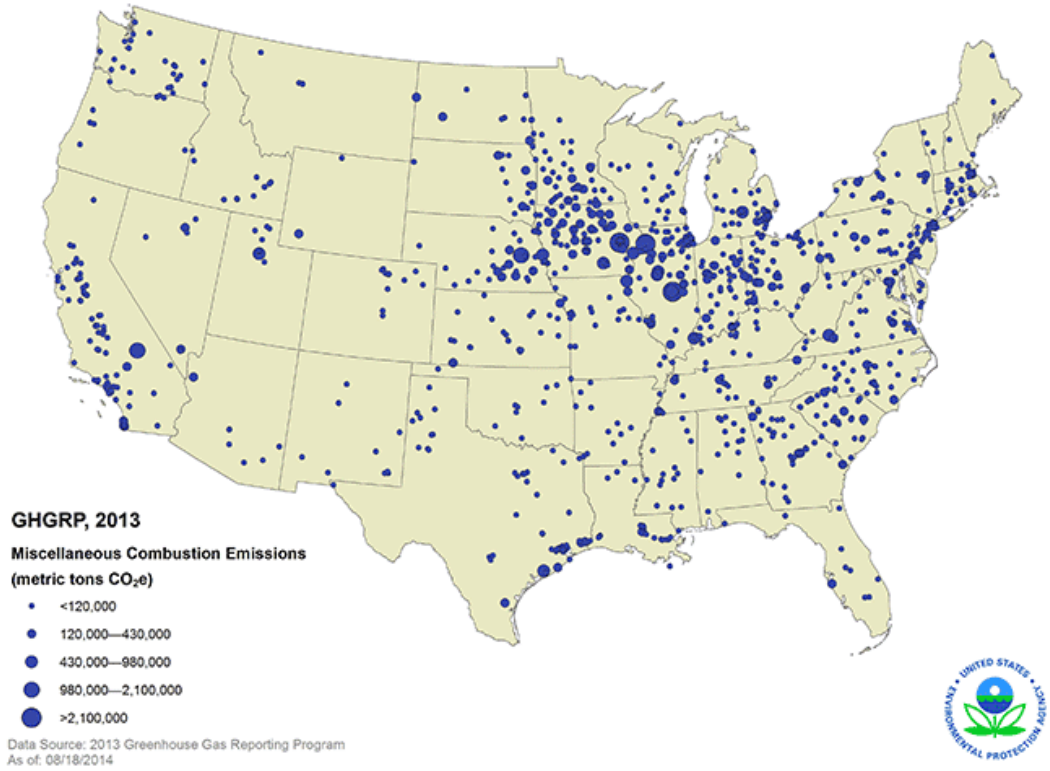


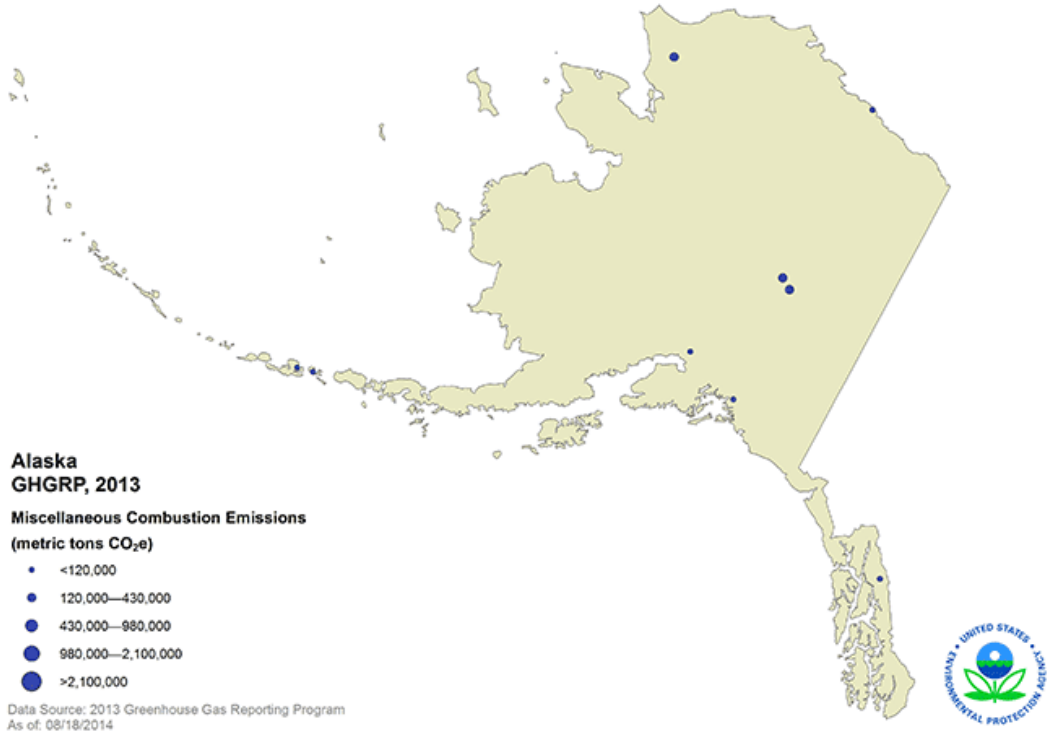
Trend of Annual Reported GHG Emissions from Miscellaneous Combustion, by Subsector (as of 8/18/14).

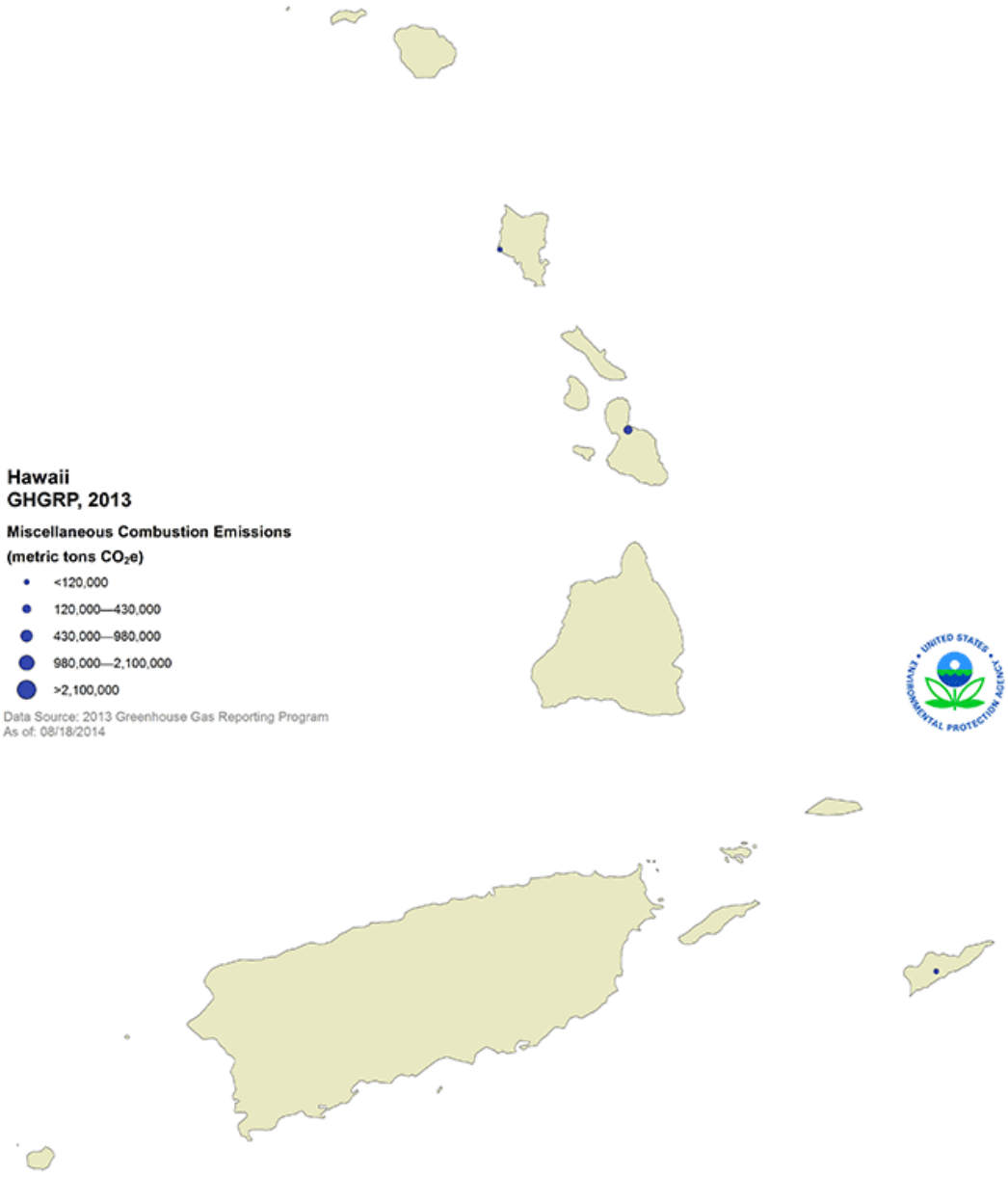


Location and emissions range for each reporting facility in the miscellaneous ombustion sector (as of 8/18/14).

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






Hawaii
GHGRP, 2013
Miscellaneous Combustion Emissions
(metric tons CO_2e)
<120,000
120,000—430,000
430,000—980,000
980,000—2,100,000
>2,100,000
Data Source: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014

Puerto Rico and the Virgin Islands
GHGRP, 2013
Miscellaneous Combustion Emissions
(metric tons CO_2e)
<120,000
120,000—430,000
430,000—980,000
980,000—2,100,000
>2,100,000
Data Source: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014

GHGRP 2013: 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 14,784 metric tons CO_2e) 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 emission values presented in million metric tons CO_2e)

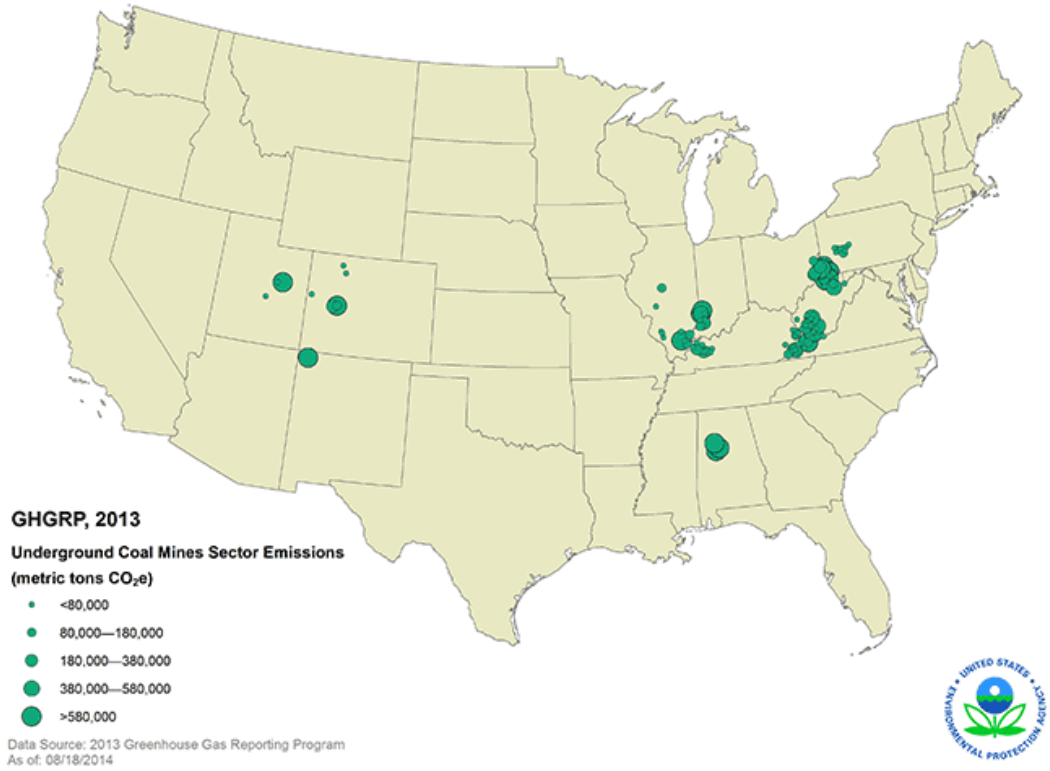
	2011	2012	2013
Number of facilities:	110	111	118
Total emissions (CO_2e):	37.1	34.0	41.5
Emissions by greenhouse gas (CO_2e)			
• Carbon dioxide (CO_2)	0.5	0.5	0.5
• Methane (CH_4)	36.6	33.5	41.3
• Nitrous oxide (N_2O)	**	**	**

** Total reported emissions are less than 0.05 million metric tons CO_2e.

CO_2 emissions from the combustion of biomass are NOT included in emissions totals provided above.

Location and emissions range for each reporting facility in the underground coal mines sector (as of 8/18/14).

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 2013: 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_2O, 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

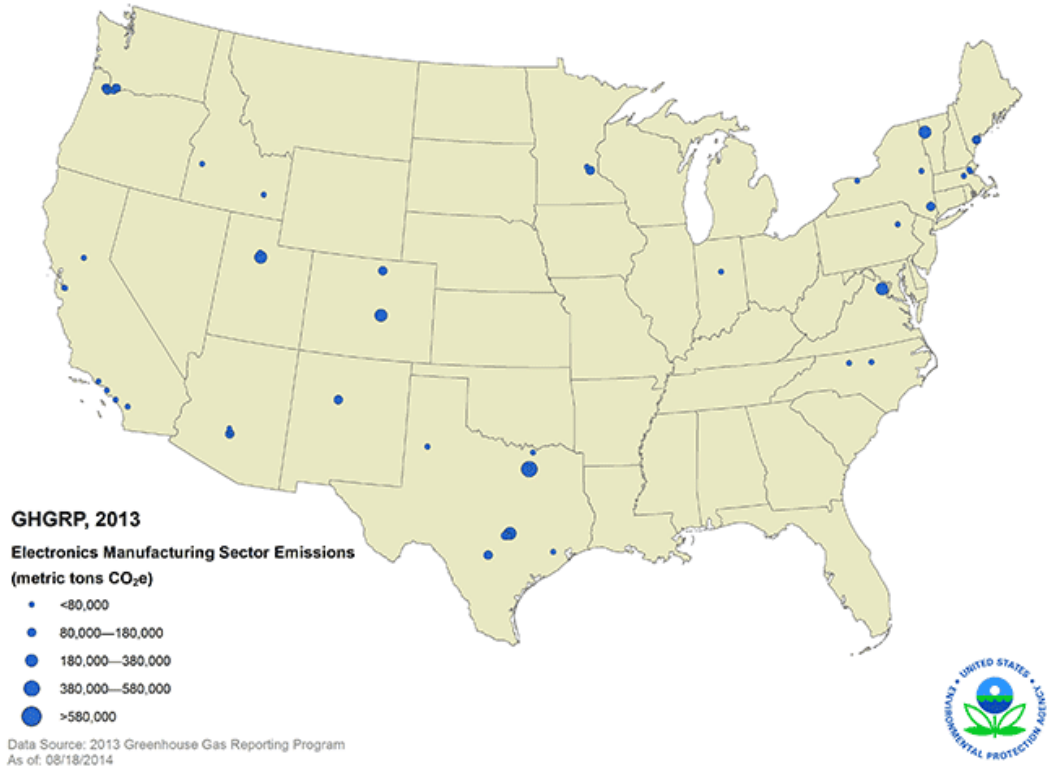
(all emission values presented in million metric tons CO_2e)

	2011	2012	2013
Number of facilities:	53	53	53
Total emissions (CO_2e):	6.1	5.6	4.5
Emissions by greenhouse gas (CO_2e)			
• Carbon dioxide (CO_2)	1.6	1.5	0.7
• Methane (CH_4)	**	**	**
• Nitrous oxide (N_2O)	0.2	0.2	0.2
• Hydrofluorocarbons (HFCs)	0.2	0.2	0.2
• Perfluorocarbons (PFCs)	3.1	2.7	2.6
• Sulfur hexafluoride (SF_6)	0.3	0.3	0.3
• Nitrogen trifluoride (NF_3)	0.6	0.6	0.5

Emissions of CO_2 and CH_4 are from stationary fuel combustion sources.

Location and emissions range for each reporting facility in the electronics manufacturing sector (as of 8/18/14).

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 2013: Electrical Equipment Production and Use

This source category is comprised of electrical transmission and distribution systems and facilities that manufacture or refurbish electrical equipment.

The electrical transmission and distribution equipment use subsector consists of all electric transmission and distribution equipment insulated with or containing sulfur hexafluoride (SF_6) 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_6 or PFCs; and gas containers such as pressurized cylinders, gas carts, electric power transformers, and other containers of SF_6 or PFCs.

The electrical equipment manufacturing or refurbishment subsector consists of electrical equipment manufacturers and refurbishers of closed-pressure equipment and sealed pressure equipment insulated with SF_6 or PFCs. This equipment includes gas insulated substations, circuit breakers and other switchgear, gas-insulated lines, or power transformers containing SF_6 or PFCs.

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

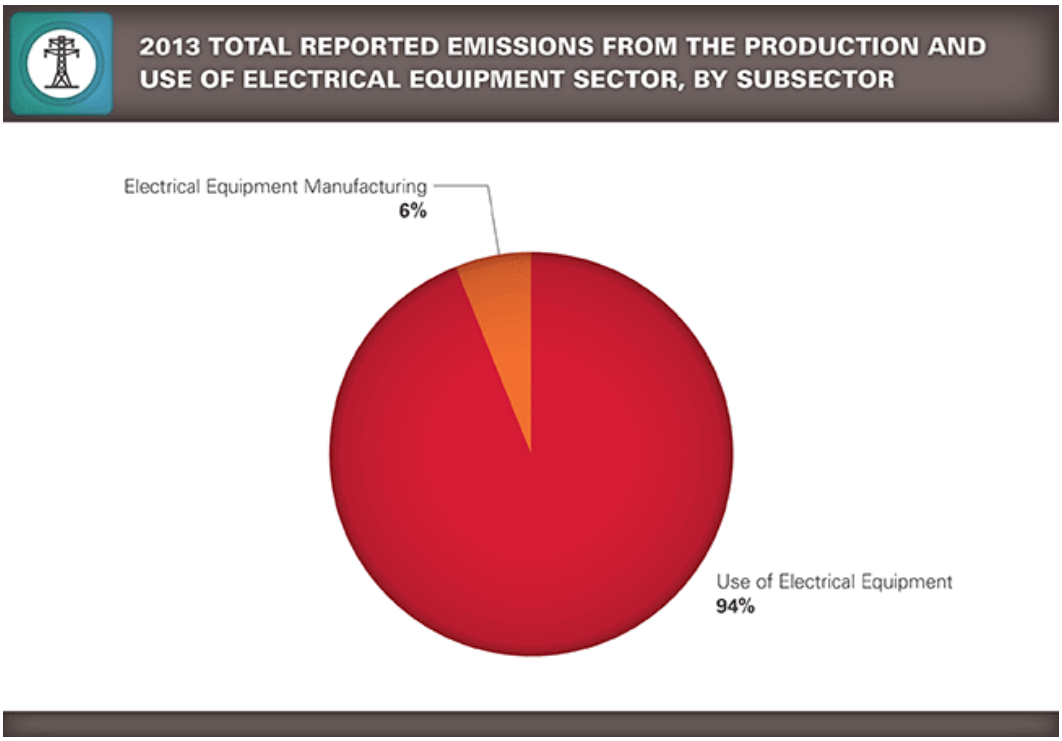
(all emission values presented in million metric tons CO_2e)

	2011	2012	2013
Number of facilities:			
• Electrical Transmission and Distribution Equipment Use	123	124	121
• Electrical Equipment Manufacturing	6	6	6
Total emissions (CO_2e):			
• Electrical Transmission and Distribution Equipment Use	3.9	3.3	3.3
• Electrical Equipment Manufacturing	0.3	0.2	0.2
Emissions by greenhouse gas (CO_2e)			
• Perfluorocarbons (PFCs)	**	**	**
• Sulfur hexafluoride (SF_6)	4.3	3.5	3.5

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

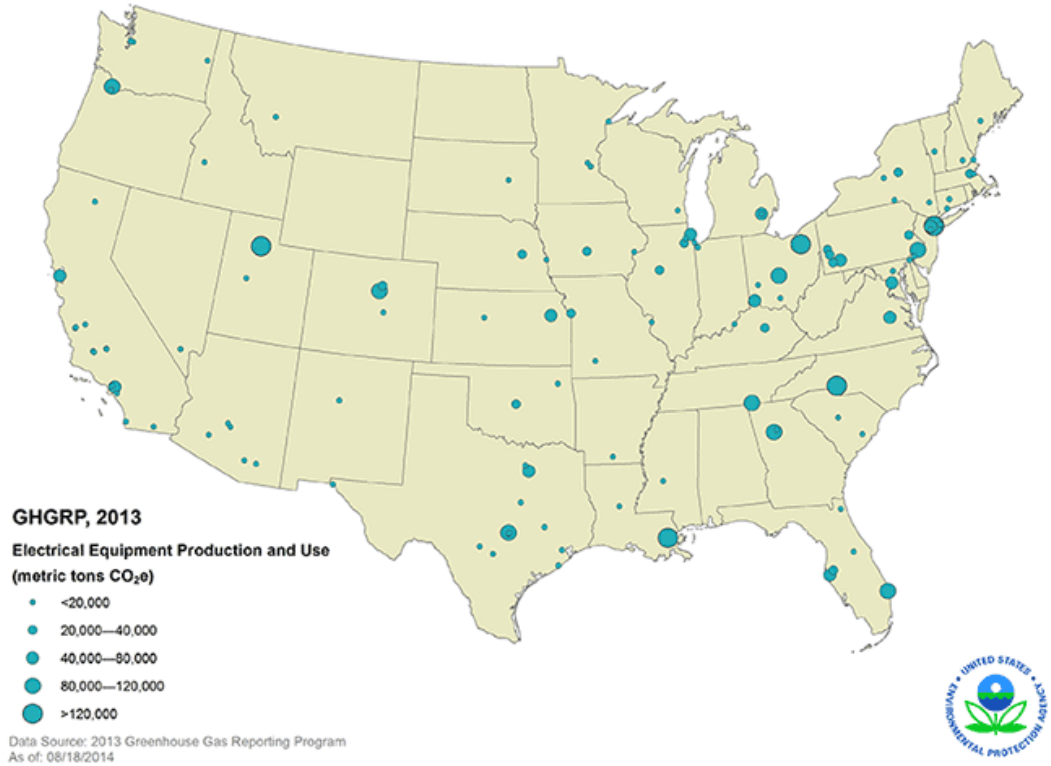
** Total reported emissions are less than 0.05 million metric tons CO_2e.

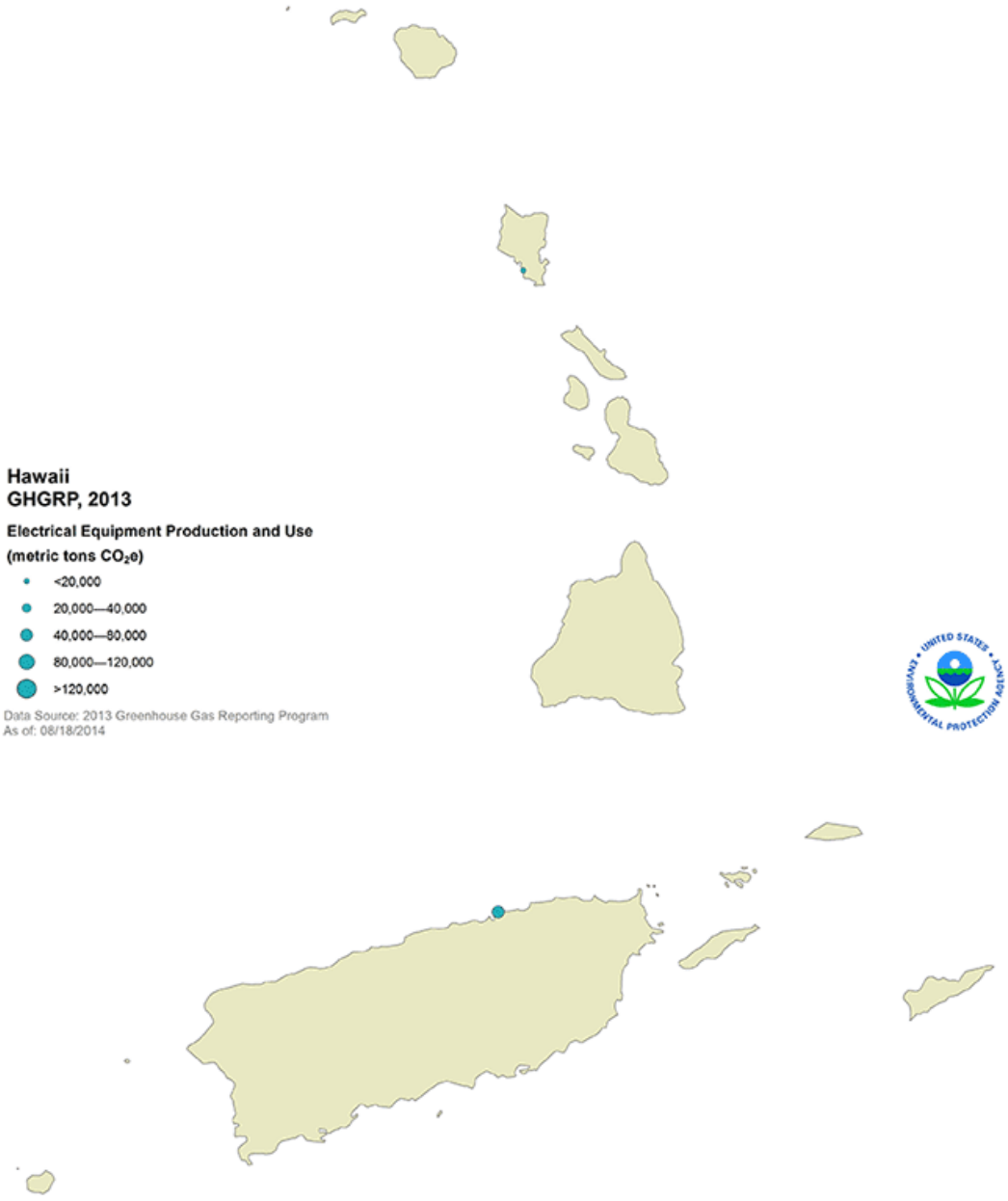
Total Reported Direct Emissions from Electrical Equipment Production and Use, by Subsector (as of 8/18/14).



Location and emissions range for each reporting facility in the electrical equipment production and use subsector (as of 8/18/14).

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




Hawaii
GHGRP, 2013
Electrical Equipment Production and Use
(metric tons CO_2e)
<20,000
20,000—40,000
40,000—80,000
80,000—120,000
>120,000
Data Source: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014

Puerto Rico and the Virgin Islands
GHGRP, 2013
Electrical Equipment Production and Use
(metric tons CO_2e)
<20,000
20,000—40,000
40,000—80,000
80,000—120,000
>120,000
Data Source: 2013 Greenhouse Gas Reporting Program
As of: 08/18/2014

GHGRP 2013: Supplier Highlights

For reporting year (RY) 2013, 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 2013, 965 suppliers submitted a GHG report. The majority of GHG emissions associated with the transportation, residential, and commercial sectors are accounted for by these suppliers.

Number of Suppliers that Reported (2013)

Industry Sector	Number of Reporters[6]
Suppliers of Coal-Based Liquid Fuels	1
Suppliers of Petroleum Products	232
Suppliers of Natural Gas and Natural Gas Liquids	
• *Natural Gas Distribution Companies*	379
• *Natural Gas Liquids Fractionators*	124
Suppliers of Industrial GHGs and Products Containing GHGs	
• *Industrial GHGs*	56
• *Imports and Exports of Equipment Pre-charged with Fluorinated GHGs or Containing Fluorinated GHGs in Closed-cell Foams*	47
Suppliers of Carbon Dioxide	143

[6] Totals sum to more than 965 because suppliers that fall into more than one sector are counted multiple times.

GHGRP 2013: 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_2 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. Go to the petroleum and natural gas systems section to learn more.

Natural Gas and Natural Gas Liquids Suppliers Sector — Carbon Dioxide Quantity Reported to the GHGRP (million metric tons CO_2)

	2011	2012	2013
Local Distribution Companies			
Number of reporters	383	382	379
CO_2 Quantity	715.3	707.6	770.8
Natural Gas Liquids Fractionators			
Number of reporters	112	117	124
CO_2 Quantity[7]	210.1	232.8	224.7

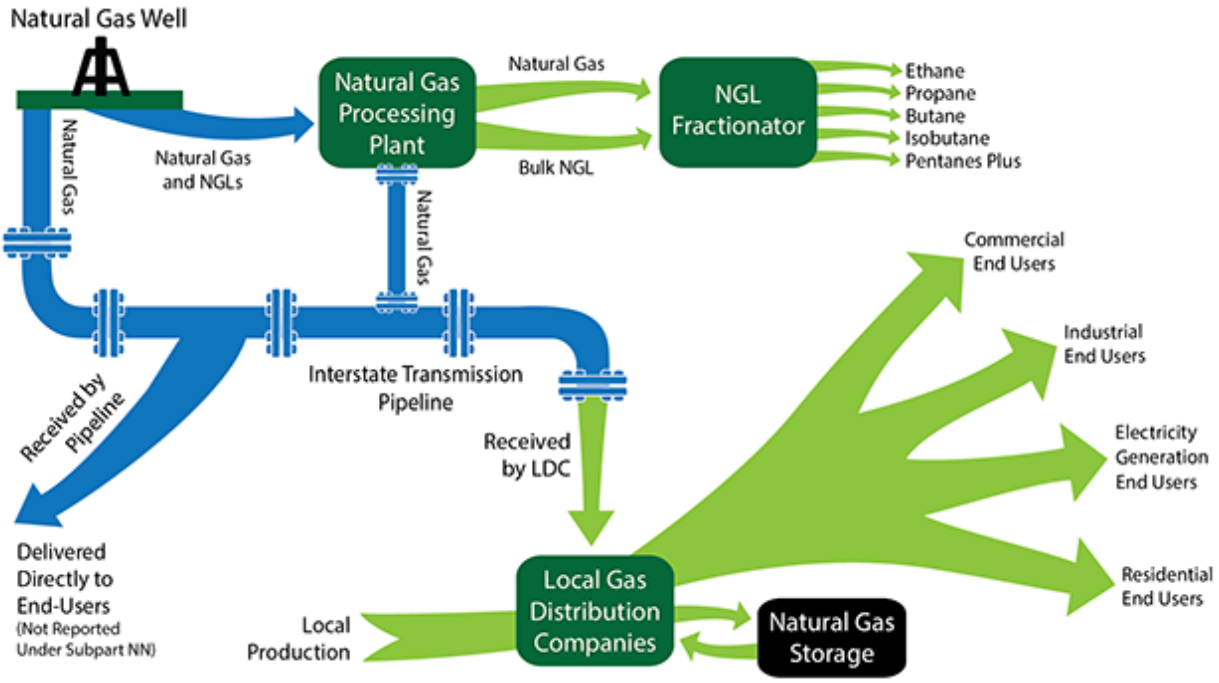
Natural Gas Deliveries Reported by LDCs (Mscf)

End-User	2010	2011	2012
Total Reported Deliveries	12,773,016,503	12,768,837,601	12,738,553,240
Residential Customers	4,681,611,446	4,631,261,922	4,078,702,157
Commercial Customers	2,929,714,709	3,033,644,755	2,792,796,677
Industrial Customers	3,382,614,478	3,245,078,743	3,450,910,172
Electricity Generating Facilities	1,779,075,869	1,858,852,181	2,416,144,234

Mscf means thousand standard cubic feet of gas.

[7] Excludes CO_2 reported by NGL Fractionators whose reported quantities are classified as confidential business information (CBI).

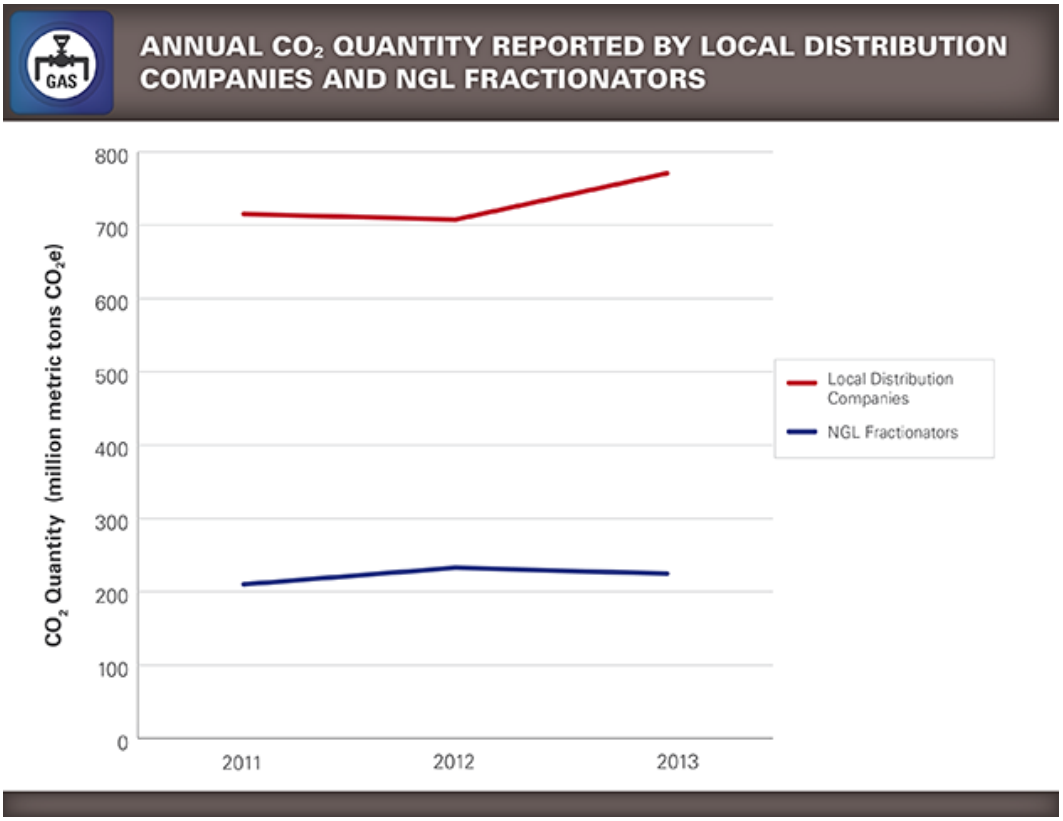
Graphic of the natural gas and NGL supply chain



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

Trend of Annual Reported CO_2 Quantity Associated with Natural Gas and NGL Supply.

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 CO2 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 CO2 value in 2013 than would have been reported if the factor had not been updated.


ANNUAL CO_2 QUANTITY REPORTED BY LOCAL DISTRIBUTION COMPANIES AND NGL FRACTIONATORS
GAS
CO_2 Quantity (million metric tons CO_2e)
800
700
600
500
400
300
200
100
0
2011
2012
2013
Local Distribution Companies
NGL Fractionators