## **2010 GHGRP DATA HIGHLIGHTS**

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## **GHGRP 2010: Reported Data**

For reporting year 2010, over 6,200 facilities in nine industry sectors reported 3.2 billion tons carbon dioxide equivalent ( $CO_2e$ ) of direct emissions. The facilities reported direct emissions of carbon dioxide, methane, nitrous oxide, and fluorinated gases. In 2011, 12 additional source categories began monitoring GHG data and will report GHG data in 2012.

All values and graphics presented here were last updated on April 6, 2012. To review the most recent 2010 data reported by each facility, download summary GHG data, explore FLIGHT, or download facility-specific data through Envirofacts.

EPA prepares the annual Inventory of U.S. Greenhouse

Gas Emissions and Sinks (Inventory) report to track total national emissions of greenhouse gases. The Inventory presents national estimates of GHG emissions starting in 1990 and for each subsequent year. The GHGRP represents a subset of the national estimates and covered roughly 80 percent of total U.S. GHG emissions in 2010. The GHGRP's coverage will increase to 85-90% of total U.S. GHG emissions in 2012. More information.

## 2010 Data Highlights Reported to GHGRP

All 2011 data presented here reflects data reported to the GHGRP as of 4/6/12.

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

- 2010 Reporting: Location of direct-emitting facilities
- Most of the 2010 reported greenhouse gas emissions were from combustion
- About 5% of facilities emitted 60% of 2010 reported emissions.
- Power plants accounted for about 73% of 2010 reported emissions.
- Approximately 800 suppliers reported more than 3 billion metric tons CO<sub>2</sub>e.

Select an industry sector in the table below to view a profile of sector emissions in another section of this document.

<u>Archived GHGRP data is available for download from all reporting years</u>. All 2011 data presented here reflects data reported to the GHGRP as of January 16, 2013.

**Table 1: GHGRP Sector Classifications** 

Industry Sector	Number of Reporters	Emissions (million metric tons CO <sub>2</sub> e)
Power Plants	1,562	2,326
<b>Government and Commercial</b>	172	14
Universities	108	9.5
Military	38	3
Commercial	3	0.2

Industry Sector	Number of Reporters	Emissions (million metric tons CO <sub>2</sub> e)
Hospitals	15	0.6
Other Government	8	0.4
Refineries	145	183
<u>Chemicals</u>	548	172
Adipic Acid Production	2	5.9
Ammonia Manufacturing	22	25.2
HCFC-22 Prod./HFC-23 Dest.	5	6.9
Hydrogen Production	101	32.5
Nitric Acid Production	36	12.7
Petrochemical Production	63	50.1
Phosphoric Acid Production	10	1.9
Silicon Carbide Production	1	0.1
Soda Ash Manufacturing	4	5.1
Titanium Dioxide Production	7	2.5
Other Chemicals	321	29.1
<u>Waste</u>	1,202	107
<u>Metals</u>	269	100
Aluminum Production	9	4.8
Ferroalloy Production	10	2.3
Iron and Steel Production	123	82.8
Lead Production	12	0.9
Zinc Production	6	0.8
Other Metals	109	8.5
<u>Minerals</u>	352	95
Cement Production	97	54.1
Glass Production	108	8.1
Lime Manufacturing	70	29.1
Other Minerals	77	3.4
Pulp and Paper	228	47

Industry Sector	Number of Reporters	Emissions (million metric tons CO <sub>2</sub> e)
Pulp and Paper Manufacturing	110	32.9
Other Paper Producers	118	13.7
Other Industrial	1,782	156
Oil and Natural Gas	973	78.9
Food Processing	277	31.4
Ethanol Production	158	17.4
Manufacturing	169	8.1
Other Industrial	205	20

Note: Biogenic emissions are NOT included in the total emissions.

## **Suppliers: 2010 Reporting**

For calendar year 2010, approximately 800 suppliers reported more than 3 billion metric tons  $\text{CO}_2\text{e}$ .

Suppliers are those entities that supply products into the economy which if combusted, released or oxidized emit greenhouse gases into the atmosphere. These fuels and industrial gases are not emitted from the supplier facility but instead distributed throughout the country and used. The majority of GHG emissions associated with the transportation, residential and commercial sectors are accounted for by these suppliers.

Reported emissions may or may not be totally emitted in the future. However, the data from suppliers provide important information on the structure and flow of greenhouse gas products through the economy. In addition, reporting fossil fuel and industrial gas suppliers can account for greenhouse gas emissions by many low-emitting sources that are not required to report emissions under the GHGRP. Emissions reported by suppliers can be accessed through the <u>suppliers section</u> of FLIGHT.

#### How You Can Obtain the GHGRP Data

Use <u>FLIGHT</u> to view maps of facility locations, obtain summary data for individual facilities, create customized searches, and display search results graphically.

All non-CBI GHG data submitted to the GHGRP is now available on <u>Envirofacts</u> in a format that allows users to easily search, sort, and download data.

#### **GHGRP 2010: Power Plants**

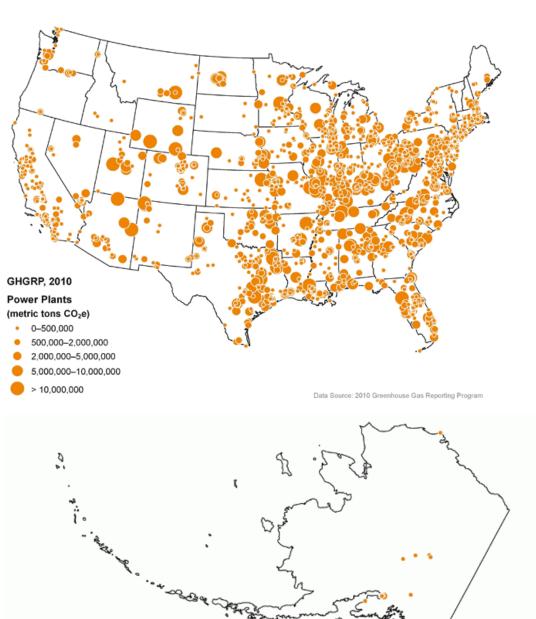
The power plant sector consists of facilities that produce electricity by combusting fossil fuels and/or biomass (Subpart C). This sector includes power plants operated by electric utility companies and combustion units in the industrial, commercial, and institutional sector that generate electricity for their own use or to sell to other facilities or to an electric utility company. The emissions from this sector are solely from stationary fuel combustion sources such as boilers, simple and combined-cycle combustion turbines, engines, and incinerators. Approximately 42% of power plants measure emissions using continuous emissions monitoring equipment. The remaining facilities use engineering calculations based on measured data.

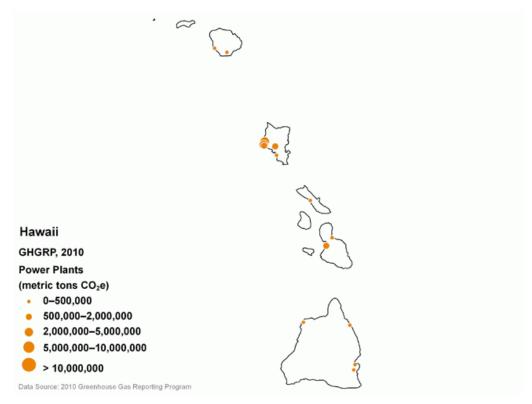
# Power Plant Sector 2010 Greenhouse Gas Emissions Reported to the GHGRP

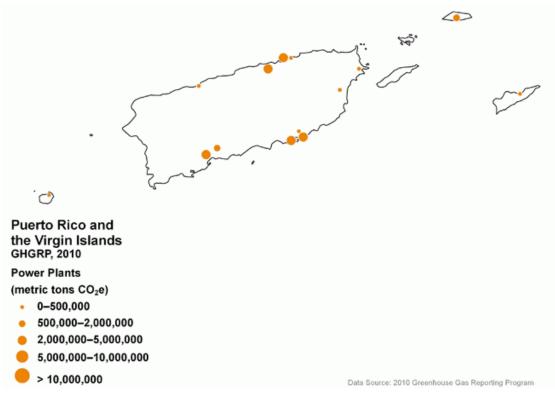
- Number of facilities: 1,562
- **Total emissions (CO<sub>2</sub>e):** 2,326 million metric tons
- Emissions by category (CO<sub>2</sub>e):
  - Combustion: 2,326 million metric tons
  - o <u>Process</u>: Not applicable

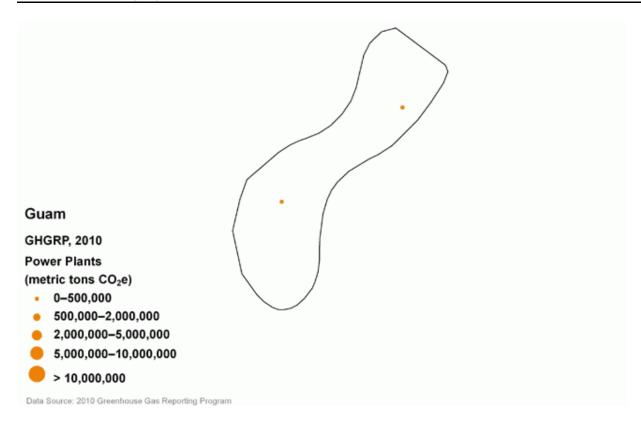
 $CO_2$  emissions from the combustion of biomass are NOT included in emissions totals provided above.

Location and emissions range for each reporting facility in the power plant sector (as of 4/6/12).









#### **GHGRP 2010: Refineries**

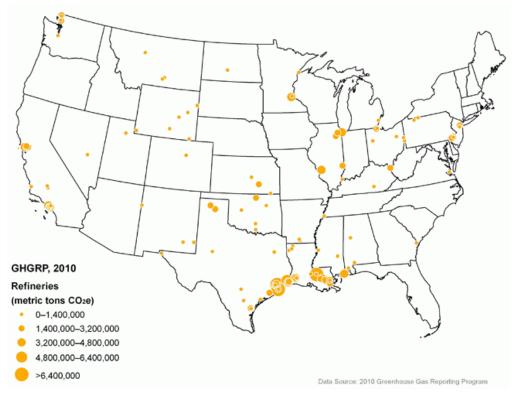
The refinery sector consists of 145 facilities that produce gasoline, gasoline blending stocks, naphtha, kerosene, distillate fuel oils, residual fuel oils, lubricants, or asphalt (bitumen) by the distillation of petroleum or the redistillation, cracking, or reforming of unfinished petroleum derivatives. GHG process emissions from this sector include emissions from venting, flares, and fugitive leaks from equipment (e.g., valves, flanges, pumps). Besides the emissions from petroleum refining processes, the sector includes combustion emissions from stationary combustion units and flares located at these facilities. Approximately 12% of refineries use continuous emissions monitoring equipment to measure GHG emissions from some of their emission sources. Excluded from this sector are the emissions from industrial production processes not related to petroleum refining that take place at some refineries. For example, process emissions from hydrogen production or petrochemical production are included in the chemical manufacturing sector.

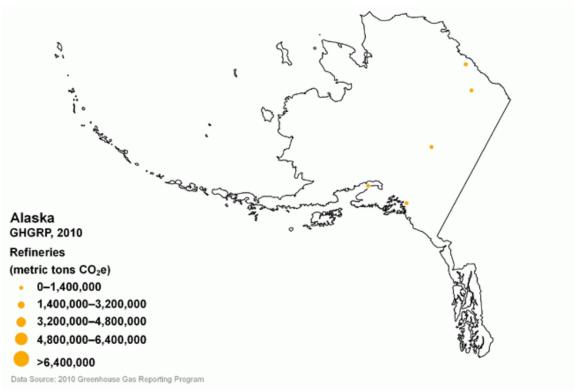
# Refineries Sector 2010 Greenhouse Gas Emissions Reported to the GHGRP

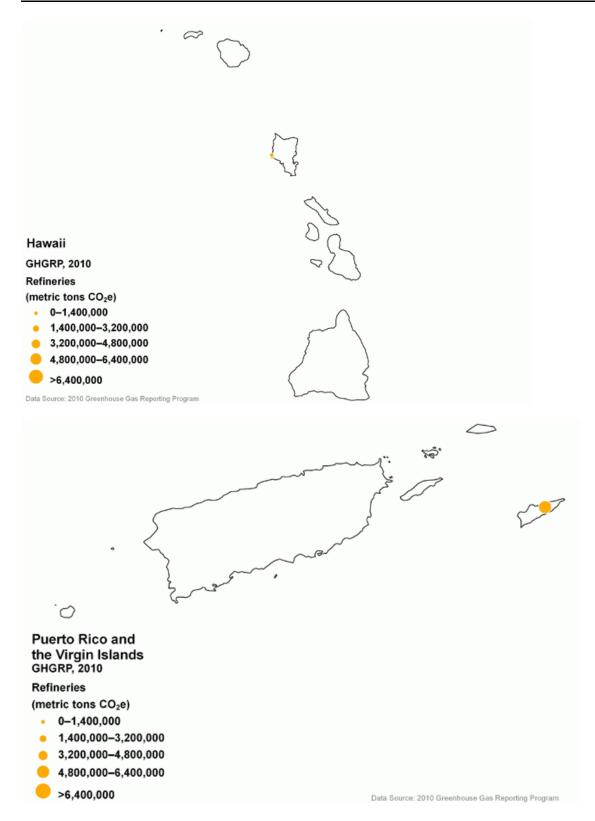
- Number of facilities: 145
- **Total emissions (CO<sub>2</sub>e):** 182.7 million metric tons
- Emissions by category (CO<sub>2</sub>e):
  - o **Combustion**: 127.1 million metric tons
  - Process: 55.6 million metric tons

 ${\rm CO_2}$  emissions from the combustion of biomass are NOT included in emissions totals provided above.

#### Location and emissions range for each reporting facility in the refinery sector (as of 4/6/12).







U.S. Greenhouse Gas Inventory Report 1990-2010

#### **GHGRP 2010: Chemicals**

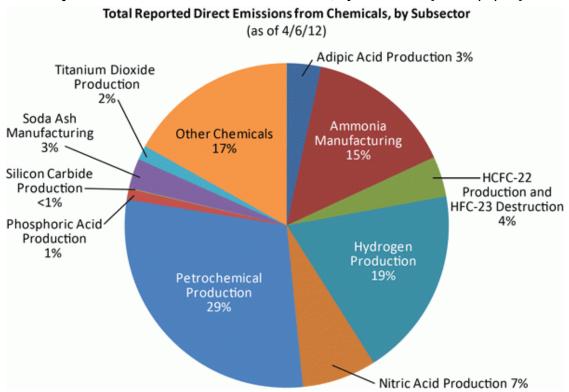
The chemical manufacturing sector consists of facilities that produce adipic acid, ammonia, HCFC-22 (and HFC-23 destruction), hydrogen (both merchant and non-merchant plants), nitric acid, petrochemicals (i.e., acrylonitrile, carbon black, ethylene, ethylene dichloride, ethylene oxide, methanol), phosphoric 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 plastics, rubber products, and other organic and inorganic chemicals. A total of 548 facilities reported under this sector. Approximately 3% of facilities in this sector measure emissions using continuous emissions monitoring equipment. The majority of facilities calculate GHG emissions using mass balance, site-specific emission factors developed by the reporting facility, or default emission factors. A small number of facilities in this sector (less than 5%) collect CO2 either for use in their other production processes, to transfer to other users, or to sequester or otherwise inject underground. Process emissions reported under this sector includes CO2 that is later consumed on-site or sent off site. For example, some of the process emissions reported for ammonia manufacturing plants includes CO2 that is later consumed on-site for urea production. This CO2 is not released to the ambient air from the ammonia manufacturing process unit(s).

# Chemical Manufacturing Sector 2010 Greenhouse Gas Emissions Reported to the GHGRP

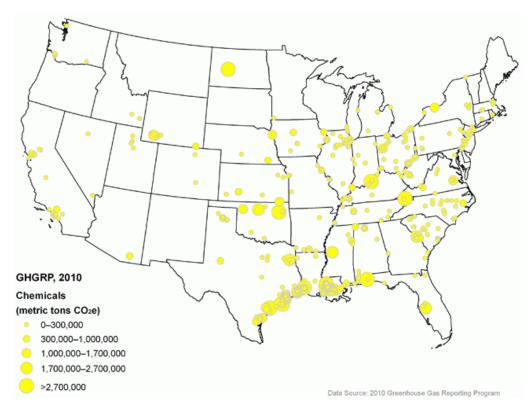
- Number of facilities: 548
- **Total emissions (CO<sub>2</sub>e):** 171.9 million metric tons
- Emissions by category (CO<sub>2</sub>e):
  - o **Combustion**: 90.3 million metric tons
  - o **Process**: 81.6 million metric tons

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

#### Total Reported Direct Emissions from Chemicals, by Subsector (as of 4/6/12).



## Location and emissions range for each reporting facility in the chemical manufacturing sector (as of 4/6/12).



#### **GHGRP 2010: Waste**

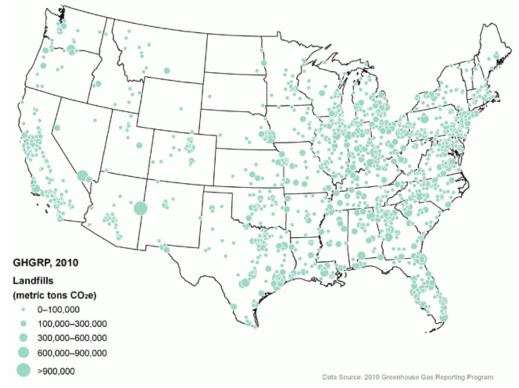
This sector includes only municipal solid waste (MSW) landfills that accepted waste on or after January 1, 1980 and generated methane (CH $_4$ ) in amounts equivalent to 25,000 metric tons of carbon dioxide equivalent (CO $_2$ e) or more per year. Landfills generate methane from the anaerobic degradation of organic wastes that are deposited. The gas can be collected and used as an energy source. An MSW landfill comprises the landfill, landfill gas collection systems, and landfill gas destruction devices (including flares). Of the 1,202 landfills that reported under this sector for reporting year 2010, 865 collected the CH $_4$  generated. 540 MSW landfills burned the collected CH $_4$  on site, while 33 transferred the collected CH $_4$  to offsite facilities for burning, and 292 landfills had a mix of on-site and off-site burning. This sector does not include industrial waste, industrial, hazardous waste, or construction and demolition landfills. This sector has been expanded for reporting year 2011 to include data on industrial waste landfills.

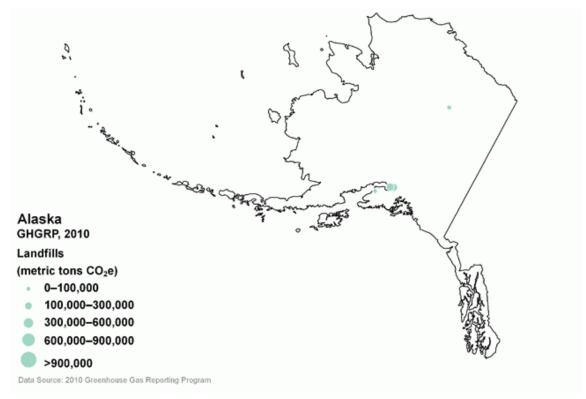
## Landfills Sector 2010 Greenhouse Gas Emissions Reported to the GHGRP

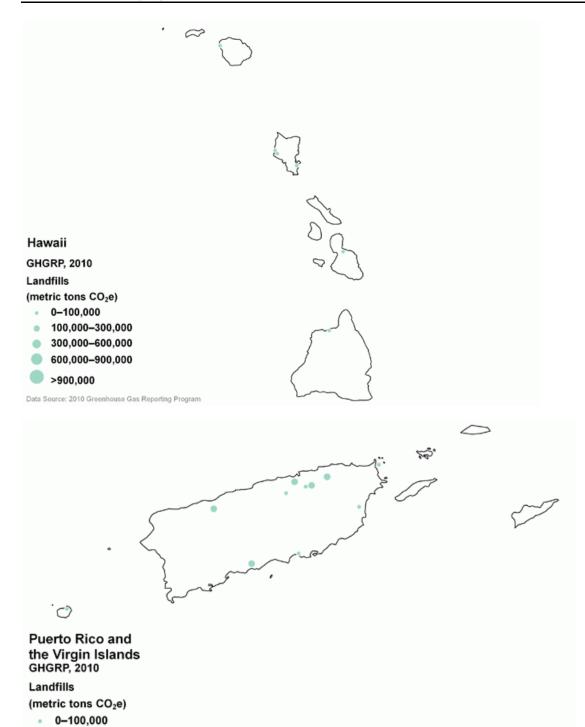
- Number of facilities: 1,202
- **Total emissions (CO<sub>2</sub>e):** 107.4 million metric tons
- Emissions by category (CO<sub>2</sub>e):
  - o <u>Combustion</u>: 1.1 million metric tons
  - o **Process**: 106.3 million metric tons

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

#### Location and emissions range for each reporting facility in the waste sector (as of 4/6/12).







100,000-300,000 300,000-600,000 600,000-900,000

>900,000

• <u>U.S. Greenhouse Gas Inventory Report 1990-2010</u>

Data Source: 2010 Greenhouse Gas Reporting Program

#### **GHGRP 2010: Metals**

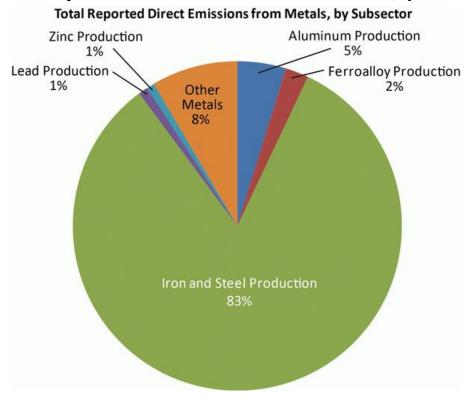
The metals sector consists of 269 metal production facilities that smelt and/or refine ferrous and nonferrous metals from ore, pig or scrap, using electrometal lurgical and other methods, including primary aluminum, ferroalloy, iron and steel, lead, zinc, and any other metal production facility operating under NAICS codes beginning with 331. Primary aluminum, ferroalloy, iron and steel, lead, and zinc facilities report GHG emissions from metal smelting and/or refining activities, as well as stationary fuel combustion sources. All other metal production facilities report only the GHG emissions from stationary fuel combustion sources. Approximately 4% of facilities in this sector measure emissions using continuous emissions monitoring equipment. The majority of facilities use engineering calculations based on measured data.

## Metals Sector 2010 Greenhouse Gas Emissions Reported to the GHGRP

- Number of facilities: 269
- **Total emissions (CO<sub>2</sub>e):** 99.8 million metric tons
- Emissions by category (CO<sub>2</sub>e):
  - o **Combustion**: 64.8 million metric tons
  - Process: 35.0 million metric tons

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

#### Total Reported Direct Emissions from Metals Production, by Subsector (as of 4/6/12).



#### Location and emissions range for each reporting facility in the metals sector (as of 4/6/12).

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**

#### **GHGRP 2010: Minerals**

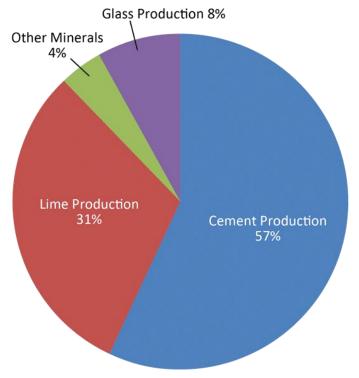
The minerals sector consists of cement production, glass manufacturing, lime production, and any other mineral production facility operating under NAICS codes beginning with 327 (Nonmetallic Mineral Product Manufacturing). Facilities under this sector transform mined or quarried nonmetallic minerals, 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 manufacturing facilities with emissions above 25,000 metric tons  $CO_2e$  per year, and all cement and lime facilities report both process emissions from the calcination of carbonate-based raw materials and GHG emissions from stationary combustion sources. All other facilities report only the GHG emissions from stationary combustion sources. Approximately 13% of the 352 facilities reporting under this sector measure emissions using continuous emissions monitoring equipment. The remaining facilities use engineering calculations based on measured data. A small number of facilities in this sector collect  $CO_2$  either for use in their other production processes (e.g., sugar refining), to transfer to other users, or to sequester or otherwise inject underground. Process emissions reported under this sector include any  $CO_2$  that is later consumed on site or transferred off site.

#### Minerals Sector 2010 Greenhouse Gas Emissions Reported to the GHGRP

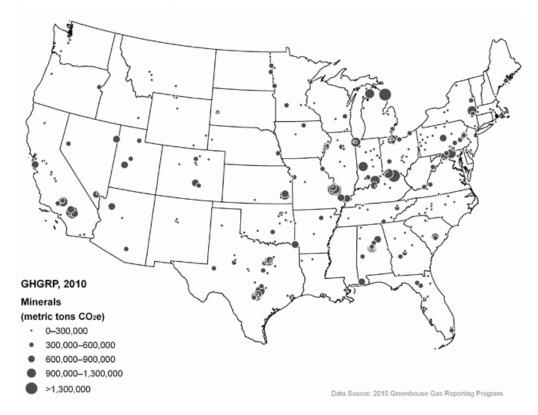
- Number of facilities: 352
- **Total emissions (CO<sub>2</sub>e):** 94.7 million metric tons
- Emissions by category (CO<sub>2</sub>e):
  - Combustion: 34.1 million metric tons
  - o **Process**: 60.6 million metric tons

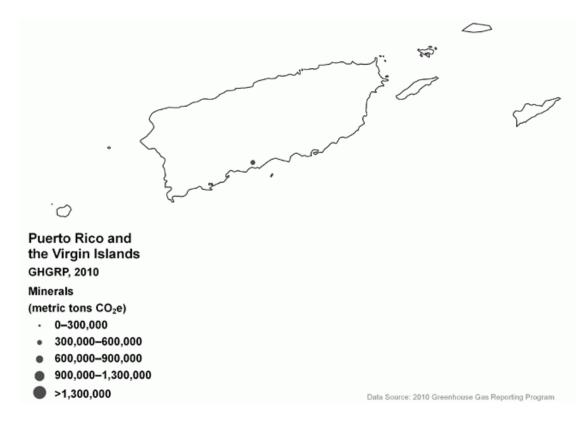
 $CO_2$  emissions from the combustion of biomass are NOT included in emissions totals provided above.

# Total Reported Direct Emissions from Minerals, by Subsector (as of 4/6/12). Total Reported Direct Emissions from Minerals, by Subsector



## Location and emissions range for each reporting facility in the minerals sector (as of 4/6/12).





• U.S. Greenhouse Gas Inventory Report 1990-2010

## **GHGRP 2010: Pulp and Paper**

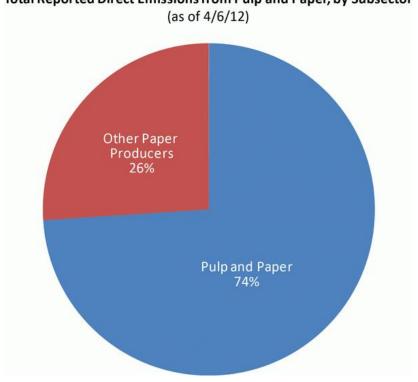
The pulp and paper sector consists of facilities that produce market pulp or that manufacture pulp and paper. Facilities that have pulping processes report the GHG emissions from chemical recovery units, lime kilns, and stationary fuel combustion units. Besides the emissions from the pulp production 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 newspapers, books, labels, business cards, stationery, business forms), and perform support activities (such as data imaging, platemaking services, and bookbinding). A total of 228 facilities reported under this sector. Facilities in this sector use mass balance or emission factors to calculate GHG emissions.

# Pulp and Paper Sector 2010 Greenhouse Gas Emissions Reported to the GHGRP

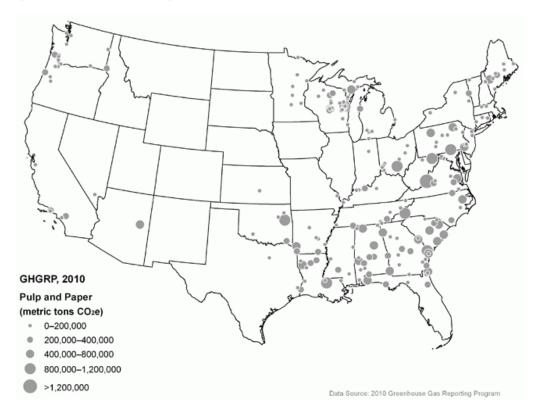
- Number of facilities: 228
- **Total emissions (CO<sub>2</sub>e):** 46.6 million metric tons
- Emissions by category (CO<sub>2</sub>e):
  - o <u>Combustion</u>: 39.1 million metric tons
  - o **Process**: 7.5 million metric tons

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

Total Reported Direct Emissions from Pulp and Paper, by Subsector (as of 4/6/12). Total Reported Direct Emissions from Pulp and Paper, by Subsector



Location and emissions range for each reporting facility in the pulp and paper sector (as of 4/6/12).



#### GHGRP 2010: Government and Commercial

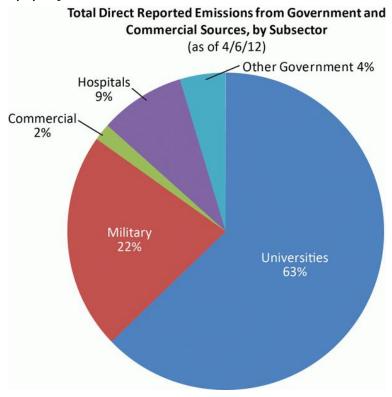
The government and commercial sector consists of 172 facilities that emit more than 25,000 tons of  $CO_{2}e$  per year from stationary combustion sources. The sector includes government owned facilities (excluding municipal waste landfills); schools (including colleges, universities, and technical and trade schools); military installations; hospitals; airports; and a small number of commercially owned facilities. Less than 1% of the facilities in this sector measure emissions using continuous emissions monitoring equipment. The majority of facilities use engineering calculations based on measured data.

# Government and Commercial Sector 2010 Greenhouse Gas Emissions Reported to the GHGRP

- Number of facilities: 172
- Total emissions (CO<sub>2</sub>e): 13.7 million metric tons
- Emissions by category (CO<sub>2</sub>e):
  - o **Combustion**: 13.7 million metric tons
  - o **Process**: Not applicable

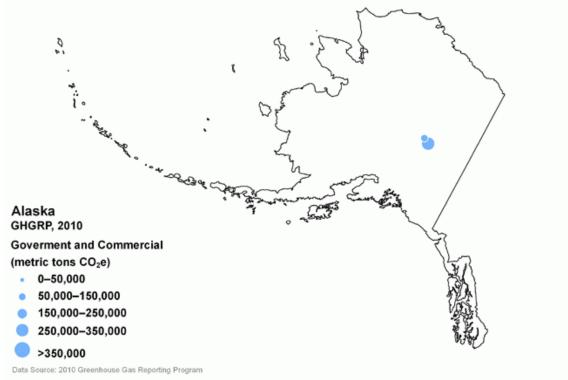
 $CO_2$  emissions from the combustion of biomass are NOT included in emissions totals provided above.

Total Reported Direct Emissions from Government and Commercial, by Subsector (as of 4/6/12).



## Location and emissions range for each reporting facility in the government and commercial sector (as of 4/6/12).





#### **GHGRP 2010: Other Sectors**

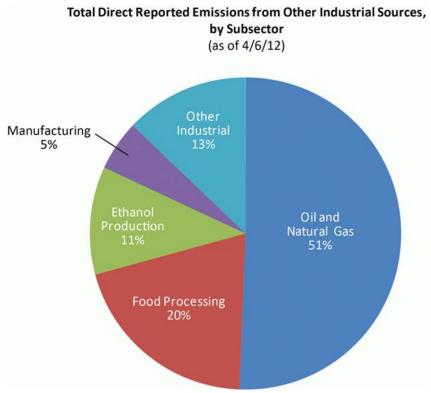
The other industrial sector consists of facilities that engage in oil and natural gas production, ethanol production, food processing, and other industrial and manufacturing processes not covered under other industry sectors (i.e., textile mills, apparel manufacturing, leather and allied product manufacturing, wood product manufacturing, fabricated metal product manufacturing, machinery manufacturing, computer and electronic product manufacturing, electrical equipment, appliance and component manufacturing, transportation equipment manufacturing, furniture manufacturing, and other miscellaneous manufacturing). The emissions from this sector are solely from stationary fuel combustion sources such as boilers and combustion turbines that are located at these facilities. A total of 1,782 facilities reported under this industrial sector. The facilities in this sector used mass balance and emission factors to calculate their GHG emissions.

# Other Industrial Sector 2010 Greenhouse Gas Emissions Reported to the GHGRP

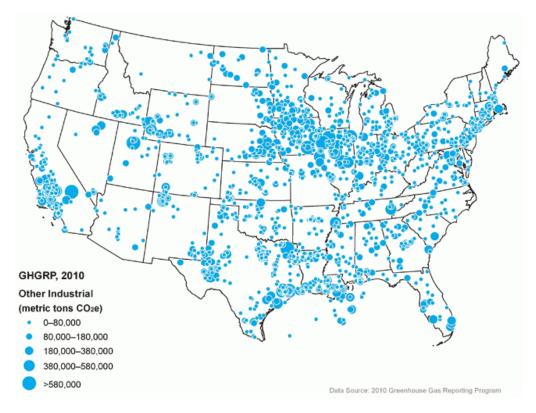
- Number of facilities: 1,782
- **Total emissions (CO<sub>2</sub>e):** 155.9 million metric tons
- Emissions by category (CO<sub>2</sub>e):
  - o <u>Combustion</u>: 155.9 million metric tons
  - o **Process**: Not applicable

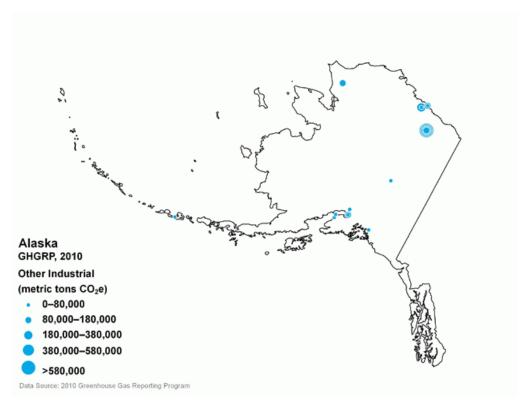
 $CO_2$  emissions from the combustion of biomass are NOT included in emissions totals provided above.

Total Reported Direct Emissions from Other Industrial, by Subsector (as of 4/6/12).



## Location and emissions range for each reporting facility in the other industrial sector (as of 4/6/12).







## **Glossary**

**Combustion sources:** Combustion sources are produced from the combustion of fuel to provide process heat for industrial, commercial, or industrial uses, whether the combustion is internal or external to the manufacturing process equipment. Examples are boilers, stationary internal combustion engines, process heaters, kilns, combustion turbines, and waste incinerators.

**Process emission sources:** Process emissions are vented, evaporative, or fugitive emission from industrial manufacturing processes and from decomposition processes at landfills and wastewater treatment systems.