

# US EPA Mandatory GHG Reporting Program Overview

## 美国环境保护署温室气体报告规则概述

US-China Workshop: MRV  
*June 4<sup>th</sup> 2012, Washington, DC*

**Kong Chiu**

U.S. Environmental Protection Agency



# Overview: U.S. EPA Mandatory GHG Reporting Rule



*Goal of is to collect accurate and timely data on GHG information to inform future policy decisions.*

- Monitoring began in 2010 for most emission sources with first reports submitted to EPA in September, 2011.
- An additional 12 source categories began collecting data in 2011 (reporting in 2012).
- Rule covers 41 source categories for reporting, accounting for 85-90% of total U.S. GHG emissions.
- Reporting only, no control or use requirements.



# GHGRP vs. U.S. GHG Inventory

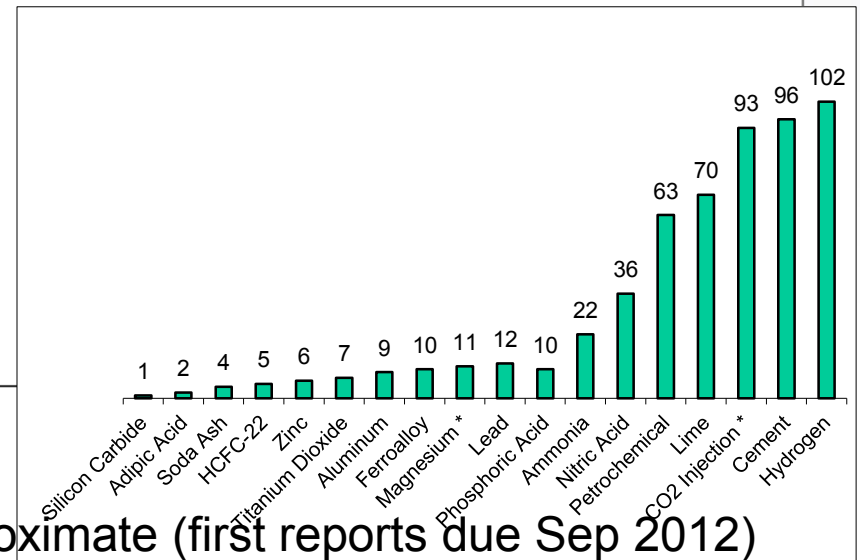
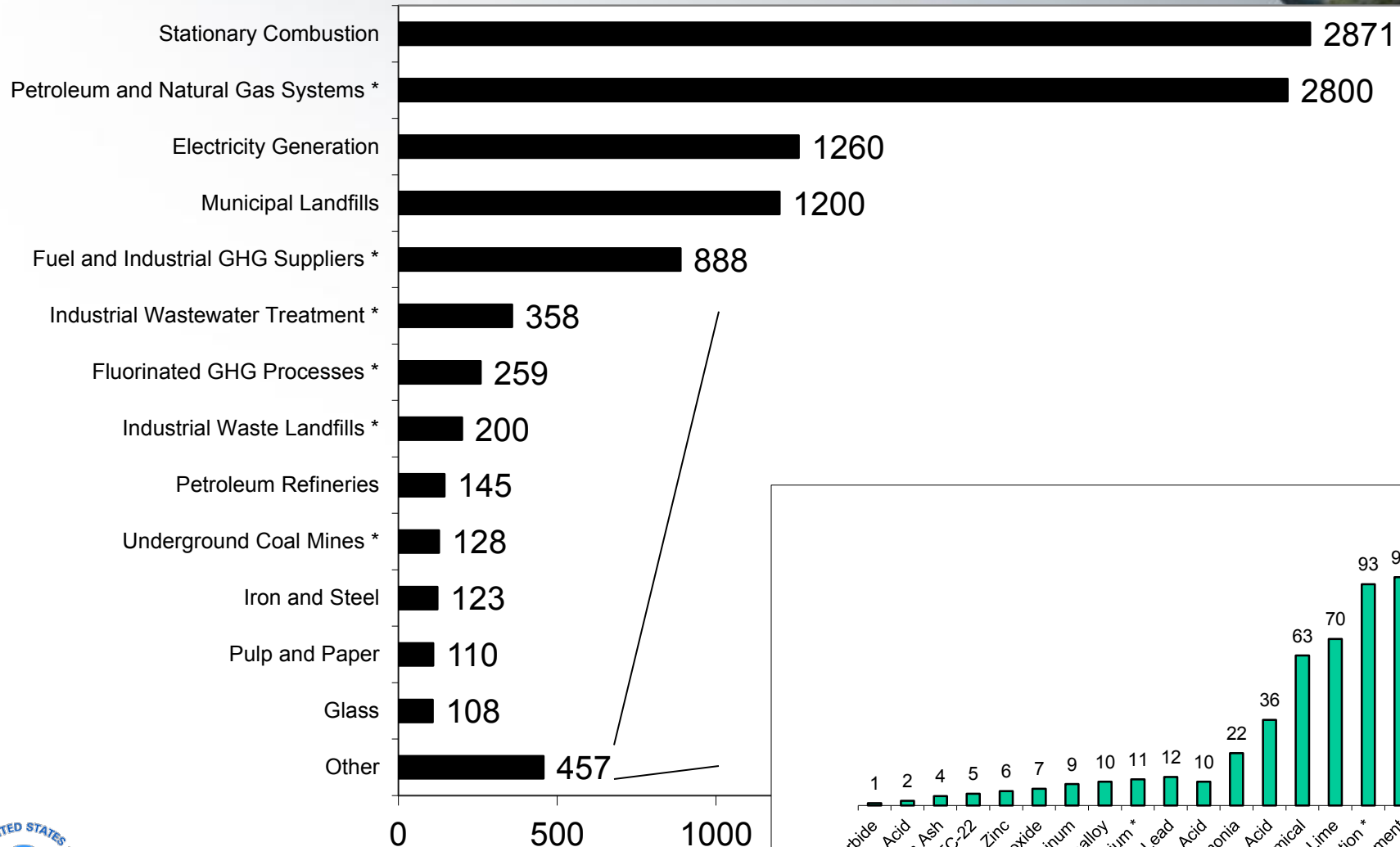


- The U.S. GHG Inventory is a comprehensive top-down assessment of national GHG emissions and removals which presents emissions across multiple years starting in 1990.
  - U.S. GHG emissions calculated using internationally-accepted methods and nationally appropriate statistics
  - Emissions estimates not provided at the geographic or facility level
  - Includes small industrial emitters, residential and commercial sectors
  - Includes agriculture and land-use/forestry sectors
- When compared in aggregate, some of the summary emissions totals for specific industries appear different in the Inventory and GHGRP.
  - Different Source Category Definitions
  - Reporting Threshold
  - Lack of Disaggregated Data to Represent Certain Industries
  - Use of Continuous Emissions Monitoring Technologies
  - Differences in use of Default International Factors from Facility-Specific Methods

# Approximately 10,000 U.S. Facilities & Suppliers Covered



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\* Approximate (first reports due Sep 2012)



# Reporting Applicability



## All-In Category:

Any source category listed under Table A-3 of rule, including:

- Adipic Acid, Aluminum, Cement, Lime, EGUs (Part 75), Petroleum Refineries etc...

## Threshold Category:

Any facility that emits 25,000 metric tons CO<sub>2</sub>e or more per year from:

- All applicable source categories (Table A-4) at single facility (i.e. Ferroalloy production, Glass production, Iron & Steel etc...)
- Stationary fuel combustion units
- Miscellaneous use of carbonates

## Suppliers:

Any supplier listed under A-5, including: Petroleum products, Coal-Based Liquids, Industrial GHGs







## Table A-3: All-in Source Categories

### Applies in 2010

Electricity Generation if report CO<sub>2</sub>  
year-round through Part 75

Adipic Acid Production

Aluminum Production

Ammonia Manufacturing

Cement Production

HCFC-22 Production/  
HFC-23 Destruction Processes

Lime Manufacturing

Nitric Acid Production

Petrochemical Production

Petroleum Refineries

Phosphoric Acid Production

Manure Management Systems\*

Silicon Carbide Production

Soda Ash Production

Titanium Dioxide Production

Municipal Solid Waste Landfills that  
generate CH<sub>4</sub> ≥ 25,000 metric tons CO<sub>2</sub>e per  
year

### Applies in 2011

Carbon Dioxide Injection

Electrical Equipment Use

Electrical Equipment Manufacturing

Geologic Sequestration

Underground Coal Mines that liberate 36.5  
million actual cubic feet CH<sub>4</sub> per year



## Table A-4: Threshold Source Categories\*

### Applies in 2010

Ferroalloy Production  
Glass Production  
Hydrogen Production  
Iron and Steel Production  
Lead Production  
Pulp and Paper Manufacturing  
Zinc Production

### Applies in 2011

Electronics Production  
Fluorinated GHG Production  
Industrial Wastewater  
Treatment  
Industrial Waste Landfills  
Magnesium Production  
Petroleum and Natural Gas  
Systems

*\* >25,000 metric tons CO<sub>2</sub>e per year from all source categories, combustion units, and miscellaneous use of carbonates.*



# Key Elements of the GHG Reporting Rule



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- Annual reporting of GHG by:
  - 41 source categories, which includes:
    - 33 types of direct emitters
    - 6 types of suppliers of fuel and industrial GHG
  - Facilities that inject CO<sub>2</sub> underground for geologic sequestration, enhanced oil recovery, or any other purpose.
- Direct reporting to EPA electronically
- EPA verification of emissions data





# What GHGs Are Reported?



- CO<sub>2</sub>
- CH<sub>4</sub> (methane)
- N<sub>2</sub>O (nitrous oxide)
- Fluorinated GHGs
  - HFCs (hydrofluorocarbons)
  - PFCs (perfluorocarbons)
  - SF<sub>6</sub> (sulfur hexafluoride)
  - Other fluorinated gases (except CFC and HCFC and gases <1 mm Hg @25° C)




# What Is Not Reported?



- Indirect emissions (e.g., electricity use)
- Mobile source emissions (e.g., fleet emissions, off-road equipment)
- Emission offsets

# Applicability Tool Screenshot




United States Environmental Protection Agency

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EPA Proposes Schedule to Address GHG Emissions from Refineries & Power Plants

EPA / NHTSA Medium and Heavy Duty Vehicle Regulations to Reduce GHGs & Improve Fuel Efficiency

Final GHG Tailoring Rule

EPA and NHTSA National Program to Cut GHG and Improve Fuel Economy for Cars and Trucks

Endangerment Findings

GHG Reporting Program

Waste Energy Recovery Registry

California GHG Waiver Request

Renewable Fuel Standard 2 (RFS)

Geologic Sequestration of Carbon Dioxide

Advance Notice of Proposed Rulemaking

You are here: EPA Home » Climate Change » Regulatory Initiatives » Final Mandatory Reporting of Greenhouse Gases Rule » Applicability Tool

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## Applicability Tool

► Is the Mandatory Greenhouse Gas Reporting Rule applicable to your FACILITY?

This tool is designed to help you assess whether your facility would be required to report greenhouse gas (GHG) emissions as required by EPA's Mandatory GHG Reporting Rule. Applicability depends on the source categories located at the facility and, for some source categories, the emission level or production capacity.

This tool is **not** intended for **Suppliers** of fossil fuels or industrial GHGs and **Engine Manufacturers**. However, guidance for Suppliers and Engine Manufacturers is available at the following links:

- Mobile Sources Information Sheet (PDF) (2 pp., 53 K)
- Suppliers of Carbon Dioxide Information Sheet (PDF) (2 pp., 53 K)
- Suppliers of Coal-based Liquid Fuels Information Sheet (PDF) (3 pp., 45 K)
- Suppliers of Industrial Greenhouse Gases Information Sheet (Including Bulk Importers and Bulk Exporters of Fluorinated GHGs and N<sub>2</sub>O)(PDF) (4 pp., 69 K)
  - Download calculation utility (XLS) (50 K, About XLS)
- Importers and Exporters of Fluorinated Greenhouse Gases Contained in Pre-charged Equipment or Closed-cell Foams (PDF) (2 pp., 37 K)
- Suppliers of Natural Gas Information Sheet (PDF) (3 pp., 61 K)
- Suppliers of Petroleum Products Information Sheet (PDF) (4 pp., 62 K)

You will need Adobe Reader to view some of the files on this page. See [EPA's PDF page](#) to learn more.

[Run the Applicability Tool >>](#)

**Required browser settings for using this tool:** JavaScript and cookies *must* be enabled in your browser. [More >](#)

# Methodologies



- Methodologies developed from extensive review of existing GHG programs
- Tiering approach used in many sub parts (lower order to higher order)
- Example: Stationary Combustion employs 4 Tier Approach
- In addition to calculation methodologies, the GHG Rule Requires:
  - Adherence to and reference of Standards (ASTM, ISO etc...)
  - Calibration requirements
  - Missing data procedures
  - Extensive recordkeeping requirements



# Methodologies (Stationary Combustion)

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Tier	Method	Usage
1	Fuel / Mass Bal	Company Records for Fuel Use (e.g. tank drop measurements, billing records etc...) and default HHV & CO2 emission factor
2	Fuel / Mass Bal	Company Records for Fuel Use and HHV (high heating value of fuel) plus default CO2 emission factor. HHV minimum sampling frequency of weekly, monthly, quarterly, biannual depending on fuel type.
3	Fuel / Mass Bal	Company Records* for Fuel Use and Carbon Content Carbon content has minimum fuel sampling frequency depending on fuel type.
4	Direct Measurement	Monitor CO2 emissions with CEMS (Continuous Emissions Monitoring System) Install CO2 and volumetric flow rate monitor

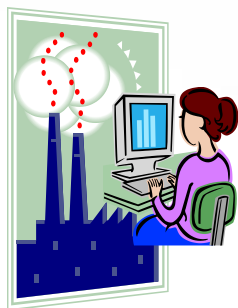


# Collecting, Verifying, Publishing GHG Data

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- Electronic Reporting Only



**Reporter (Facility  
or Supplier)**



**Web Form or  
Bulk XML Upload**



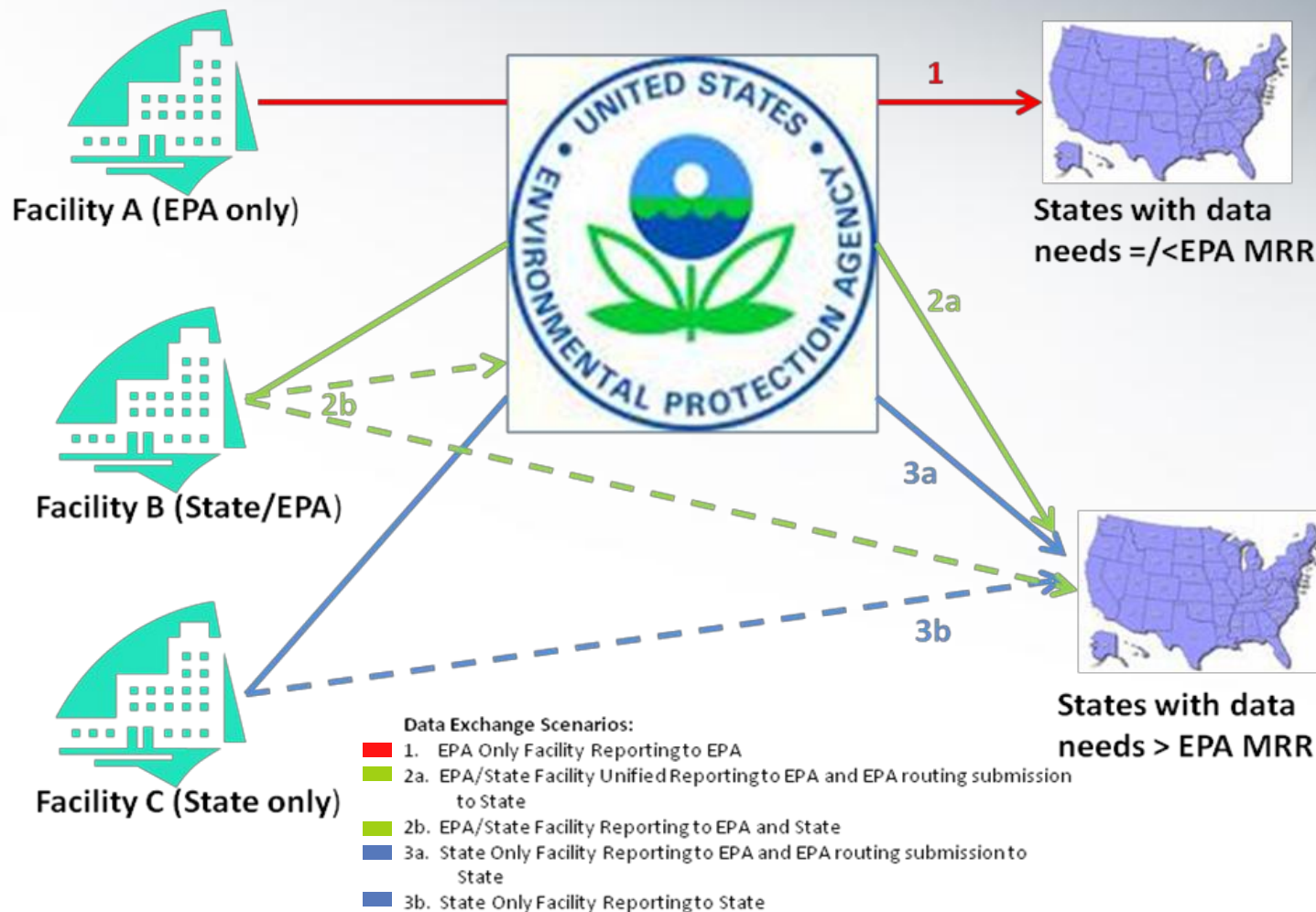
**EPA Web & Oracle  
DB Servers**



**EPA Verifies &  
Publishes GHG Data**

# Coordinating with States (GHG Data Collection & Exchange)

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# Data Collection: e-GGRT



- EPA's **e**lectronic **G**reenhouse **G**as **R**eporting **T**ool (e-GGRT)
- Web-based application for facilities/suppliers to report directly to EPA
- For Reporting Year 2010, includes 29 individual sub-part modules, each with self-guided web forms
- Additional 12 Source Category modules available in mid-2012
- Also includes option for direct data upload via XML
- Annual Reports are electronically submitted and CROMERR Compliant
- Publicly accessible “beta” version available June 4<sup>th</sup>, 2012 at: [sandbox.ccdsupport.com](http://sandbox.ccdsupport.com)



# Electronic Reporting Tool



**EPA** United States Environmental Protection Agency

**e-GGRT** Electronic Greenhouse Gas Reporting Tool

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**CHIU\_TEST\_Facility**  
**Subpart PP: Suppliers of Carbon Dioxide (2011)**  
**Subpart Overview**

**SELECT SUPPLIER CLASSIFICATION**  
As a supplier of carbon dioxide (CO<sub>2</sub>), please select below the classification that describes your facility. This will enable e-GGRT to tailor the subpart screens to properly include those reporting requirements germane to your facility. \* denotes a required field

**SUPPLIER TYPE**

Please select the classification that describes your facility \*

<input type="radio"/> Capture Facility	A facility with production process units that capture a CO <sub>2</sub> stream for purposes of supplying CO <sub>2</sub> for commercial applications or that capture and maintain custody of a CO <sub>2</sub> stream in order to sequester or otherwise inject it underground. Capture refers to the initial separation and removal of CO <sub>2</sub> from a manufacturing process or any other process.
<input type="radio"/> Extract Facility	A facility with CO <sub>2</sub> production wells that extract or produce a CO <sub>2</sub> stream for purposes of supplying CO <sub>2</sub> for commercial applications or that extract and maintain custody of a CO <sub>2</sub> stream in order to sequester or otherwise inject it underground.
<input type="radio"/> Importers or Exporters	Importers or exporters of bulk CO <sub>2</sub> .

CANCEL NEXT →

Interactive  
Tax software-like  
Interview  
workflow



# Reporting Tool, continued



Tab Navigation

Context-Sensitive  
Help

Rolling  
“tax refund”  
style  
GHG Calculator

Real-time  
Data Quality  
Feedback

Part 98 Rule  
Equations

**EPA** United States Environmental Protection Agency

**e-GGRT** Electronic Greenhouse Gas Reporting Tool

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**CHIU\_TEST\_Facility**

**Subpart NN: Suppliers of Natural Gas and Natural Gas Liquids (2011)**

Subpart Overview » Natural Gas » Eq. NN-6 » Eq. NN-1

**CO<sub>2</sub> QUANTITIES CALCULATION**

Equation NN-6 will calculate CO<sub>2</sub> quantities associated with the combustion or oxidation of natural gas supplied to end-users that receive less than 460,000 thousand standard cubic feet (mscf) per year. This is done by subtracting the total LDCs, natural gas delivered to end-users that receive a supply greater than or equal to 460,000 mscf per year and the net natural gas that is liquefied and/or stored and not used for deliveries by the LDC within the reported year from the total CO<sub>2</sub> associated with the natural gas received at the city gate(s) and from local production. For additional information about the CO<sub>2</sub> quantities calculations, please use the...

**(Eq. NN-1)** Total CO<sub>2</sub> quantities that would result from the complete combustion or oxidation of the annual supply of the natural gas received at the city gate(s).

**Eq. NN-1: View Validation**

**Equation Summary (NN-6)**

- CO<sub>2</sub>i: (NN-1) Potential CO<sub>2</sub> Quantities associated with Natural Gas Received at the City Gate(s)**
  - Fuel:** Annual Volume of Natural Gas Received at the City Gate(s)
  - HHV and EF:** Higher Heating Value and Emission Factor
- CO<sub>2</sub>j: (NN-3) Potential CO<sub>2</sub> Quantities associated with Natural Gas delivered to Transmission Pipelines or Other LDCs**
- CO<sub>2</sub>k: (NN-4) Potential CO<sub>2</sub> Quantities associated with Natural Gas Received by End-users that Receive a Supply ≥ 460,000 Thousand scf per Year**
- CO<sub>2</sub>l: (NN-5) Potential CO<sub>2</sub> Quantities associated with product received that bypassed the city gate(s) such as natural gas received from local production and the Net Natural Gas that is Liquefied and/or Stored/Removed from storage by the LDC within the Reported Year**

**SUMMARY**

**Equation NN-1**  $CO_{2i} = 1 \times 10^{-3} * Fuel * HHV * EF$

Hover over an element in the equation above to reveal a definition of that element.

Year	Product	Fuel	HHV	EF	Calculated Result
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# Fuel Selection Screenshot



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Electronic Greenhouse Gas Reporting Tool  
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e-GGRT Help  
 Using e-GGRT for Subpart D reporting

## Chiu Industries (2010)

### Subpart D: Electricity Generation

[Subpart D Overview](#) » [Add a Fuel](#)

#### ADD A FUEL

Use this page to select a fuel combusted in this electricity-generating unit. Repeat this process for each fuel consumed by this electricity-generating unit over the course of the reporting year. If the fuel you wish to add is not on the list, click "ADD an Other Fuel or Blend" to add a new fuel type. For additional information about reporting fuel information, please use the e-GGRT Help link(s) provided.

#### COAL AND COKE

HIDE

- ☐ Mixed (Industrial sector)
- ☐ Mixed (Industrial coking)
- ☐ Mixed (Commercial sector)
- ☐ Coke
- ☐ Mixed (Electric Power sector)
- ☐ Subbituminous
- ☐ Bituminous
- ☐ Anthracite
- ☐ Lignite

#### NATURAL GAS

HIDE

- ☐ Natural Gas (Weighted U.S. Average)

If a fuel is not found among those listed, you can add it to the other fuels and blends list below.

#### OTHER FUELS AND BLENDS

HIDE

No other fuels or blends present.

[+ ADD an Other Fuel or Blend](#)

#### PETROLEUM PRODUCTS

SHOW

#### OTHER FUELS - SOLID

SHOW

#### OTHER FUELS - GASEOUS

HIDE

- ☐ Propane Gas
- ☐ Blast Furnace Gas
- ☐ Fuel Gas
- ☐ Coke Oven Gas

#### BIOMASS FUELS - SOLID

SHOW

#### BIOMASS FUELS - GASEOUS

SHOW

#### BIOMASS FUELS - LIQUID

SHOW

#### SOLID PARTIALLY BIOGENIC FUEL

SHOW

CANCEL

SAVE



# State Coordination: CARB



# Data Verification



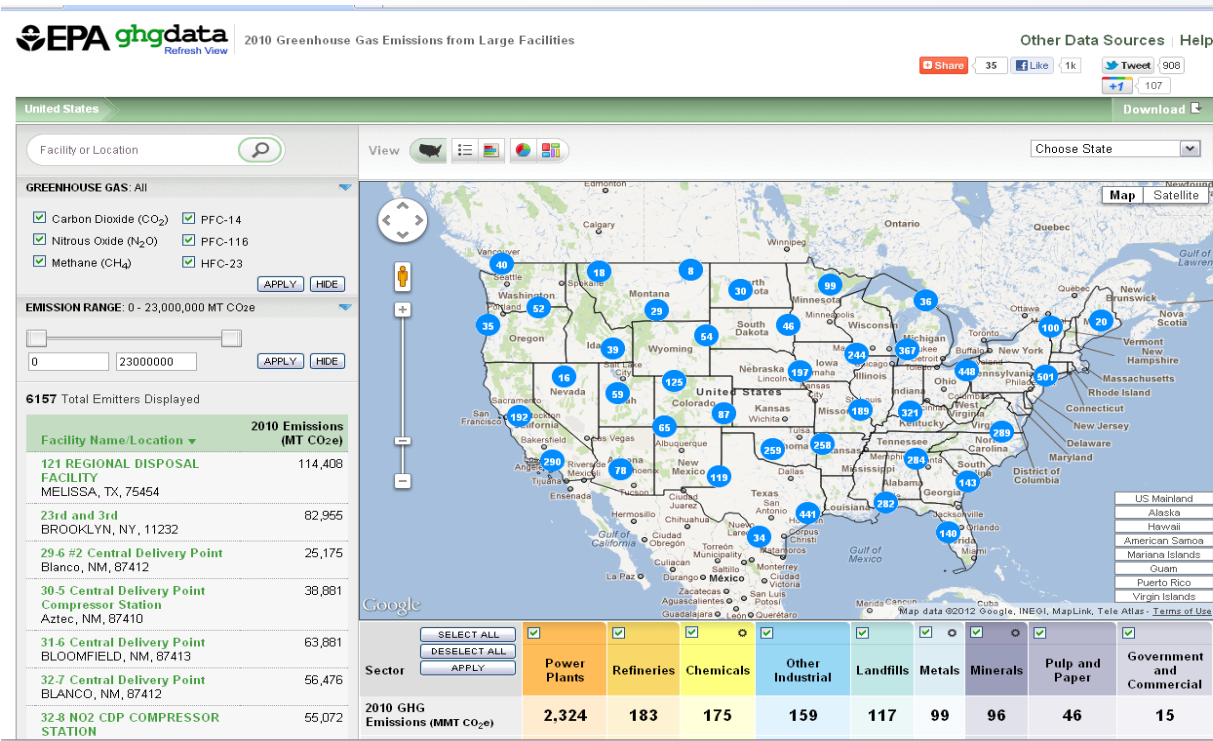
- Reporter Self-Certifies
- Electronic Verification
  - Pre-submittal warning for reporters entering data outside reasonable ranges or missing data
  - Post-submittal verification through logic checks, use of outside data sets, and statistical analyses across facilities
- Staff review and direct follow-up
  - Staff review electronic verification results
  - Phone/email follow-up
  - Targeted site visits as necessary



# Data Publication



- <http://GHGdata.epa.gov/ghgp/main.do>
- Data publication tool allows stakeholders and the public to access the key data elements quickly and easily and to sort data by location, sector, and by gas.
- 2010 data published in January 2012.



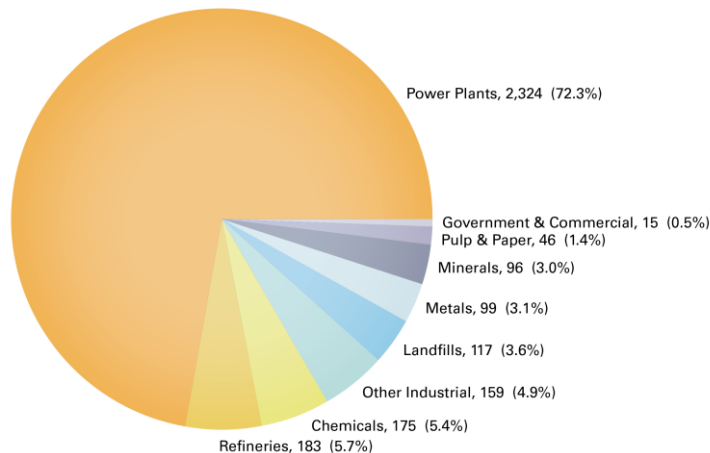
# Goals of GHG Data Publication



- Increase understanding of the sources of GHG emissions in the U.S. among the public
- Voluntary management (TRI)
- Improve quality of reported data
- Support regional, state, and local programs
- Provide a tool for schools, students, researchers and journalists
- Information displayed in a simple, transparent manner
  - Allows public to use data in creative ways

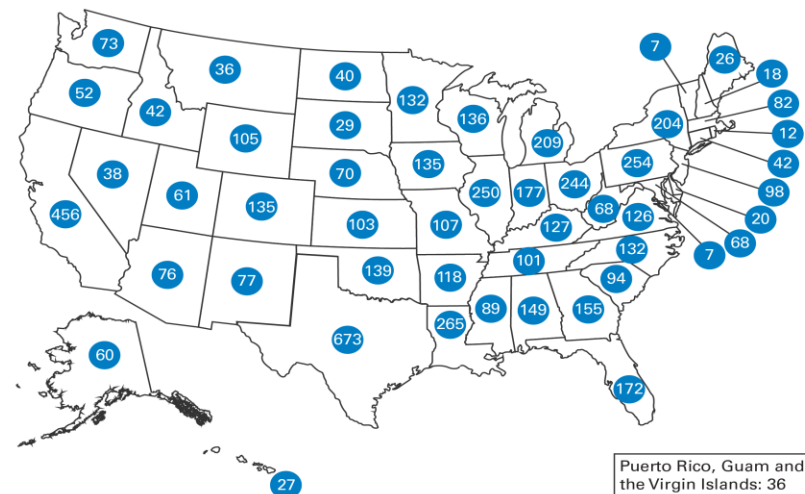


## Breakdown of Reported GHG Emissions (MMT CO<sub>2</sub>e) by Industry Type - 2010



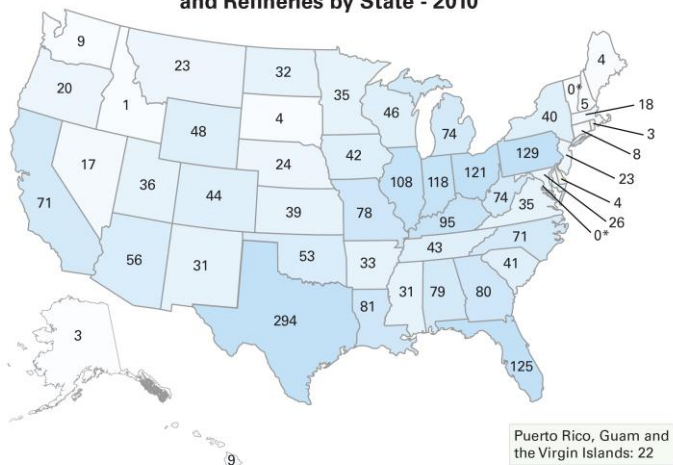
This figure shows total reported GHG emissions by industry type reported to the Greenhouse Gas Reporting Program (GHGRP) in 2010. Note this figure does not represent total U.S. emissions, and percentages only imply the percent of total emissions reported by facilities in the GHGRP. The GHGRP covers the vast majority of U.S. emissions from the electric power and industrial sectors. The transportation, residential, commercial, and agriculture sectors emit a significant amount of GHGs, the majority of these emissions are not included here.

## Number of Facilities Reporting GHG Emissions by State - 2010



This figure shows the number of facilities in each state that reported GHG emissions in 2010. The Greenhouse Gas Reporting Program generally covers those facilities that emit more than 25,000 metric tons of carbon dioxide equivalent per year. Entities only reporting GHG quantities associated with products supplied are not included in this graphic.

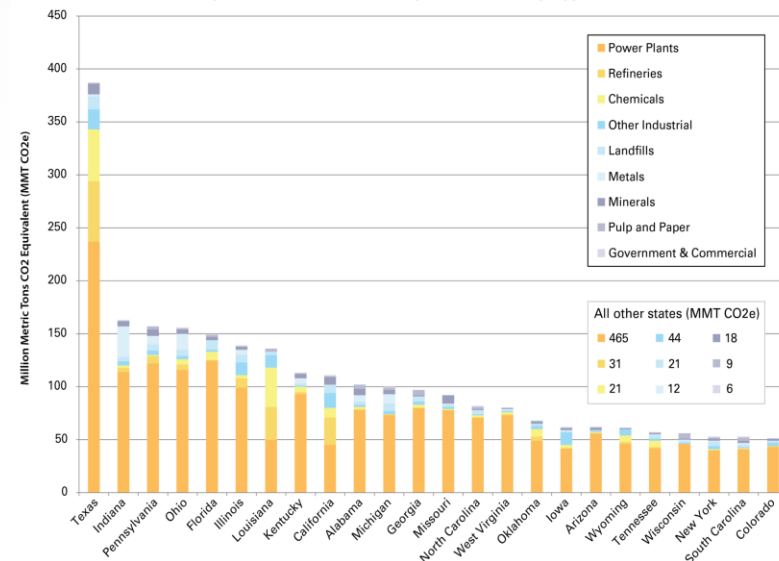
## Total Reported GHG Emissions (MMT CO<sub>2</sub>e) by Power Plants and Refineries by State - 2010



\*These states have less than 0.5 MMT CO<sub>2</sub>e emissions from power plants and refineries.

This figure shows total GHG emissions reported by power plants and refineries in each state in 2010 in million metric tons of carbon dioxide equivalent (CO<sub>2</sub>e). All U.S. refineries are required to report. All power plants who emit above 25,000 metric tons of CO<sub>2</sub>e and select smaller power plants are required to report.

## Reported GHG Emissions by State/Industry Type - 2010



This figure shows GHG emission totals by state and industry type reported by facilities covered by the Greenhouse Gas Reporting Program in 2010. The GHGRP covers the vast majority of U.S. emissions from the electric power and industrial sectors. The transportation, residential, commercial and agriculture sectors emit a significant amount of GHGs, the majority of these emissions are not included in these state totals.

# 2010 GHG Data Quick Summary

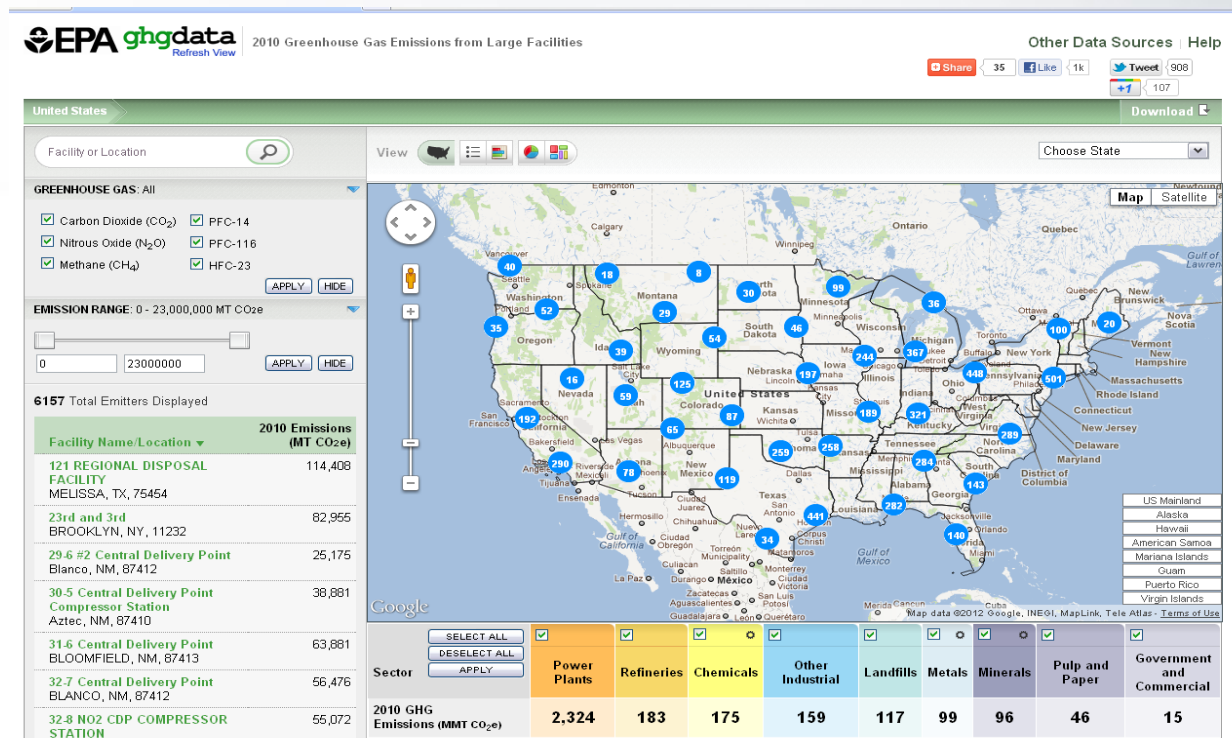


- Reports from over 6,700 entities
- Power plants are largest stationary source of direct emissions- 2,324 MMTCO<sub>2</sub>e
- Refineries are second at 183 MMTCO<sub>2</sub>e
- 100 facilities reported over 7 MMTCO<sub>2</sub>e including 96 power plants, 2 iron and steel mills, 2 refineries
- 2010 data accounts for roughly 80 percent of total U.S. emissions.
  - This percentage reflects both upstream suppliers and direct emitters.
  - Among the data not covered are GHG emissions from smaller sources, and from agricultural and land-use activities.

# GHG Data Publication: Demo



- Time-permitting





# Additional Information

- [www.epa.gov/climatechange/emissions/ghgrulemaking.html](http://www.epa.gov/climatechange/emissions/ghgrulemaking.html)
  - Preamble and rule
  - Technical background documents on source categories
  - Response to comment documents
  - Link to rulemaking docket
  - Technical assistance materials (e.g., Information Sheets, Monitoring Checklists, FAQs, optional forms)
  - Data reporting system information (e-GGRT)
  - On-line applicability tool