

# U.S. EPA Greenhouse Gas Reporting Program

Latin American and Caribbean Regional Workshop  
MRV of NAMAs as a Key Element of National MRV Systems

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- US GHG Reporting Program (GHGRP) Background
- Programmatic Requirements/Design Considerations
  - Coverage
  - Methodology
  - Data Collection/e-GGRT
  - Verification
  - Sensitive Business Information
- 2012 GHG Data Snapshot
- Lessons Learned
- Comparison of GHGRP to U.S. National Inventory



- Required by Congressional Appropriation Act (2008 budget)
- Data collected from the largest emitting industries *to provide accurate and timely GHG data to inform future policy*
- Reporting threshold is 25,000 metric tons of CO<sub>2</sub>e per year
- Rule covers 41 source categories for reporting, accounting for 85-90% of total U.S. GHG emissions
- Direct reporting to EPA electronically
- EPA verification of emissions data
- Monitoring began in 2010 for most emission sources with first reports submitted to EPA in September, 2011

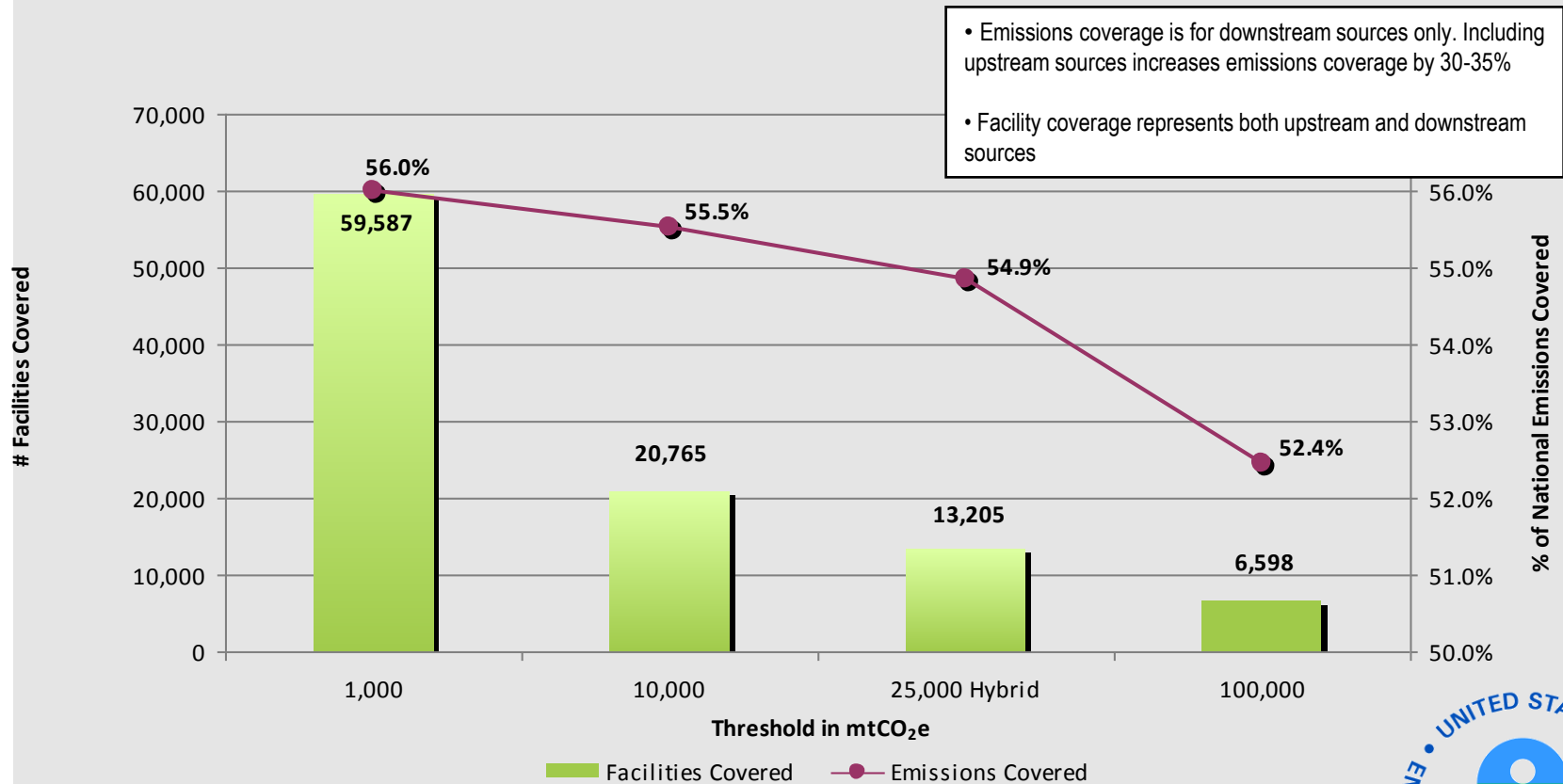
# U.S. GHGRP Coverage



Power	Refining & Petrochem.	Other Chemicals	Combustion	Waste	Metals	Minerals	Pulp & Paper	High GWP Gases
<ul style="list-style-type: none"> <li>-Electricity Generation</li> <li>- Electrical Equipment Mfg.</li> <li>- Use of Electrical Equip.</li> </ul>	<ul style="list-style-type: none"> <li>- Petroleum Refineries</li> <li>- Petrochem. Production</li> </ul>	<ul style="list-style-type: none"> <li>- Adipic Acid</li> <li>-Ammonia</li> <li>-Hydrogen Production</li> <li>- Nitric Acid</li> <li>- Titanium Dioxide</li> <li>- Phosphoric Acid</li> </ul>	<ul style="list-style-type: none"> <li>- Stationary Combustion</li> </ul>	<ul style="list-style-type: none"> <li>- Municipal Landfills</li> <li>- Industrial Waste Landfills</li> <li>- Waste Water Treatment</li> </ul>	<ul style="list-style-type: none"> <li>- Aluminum</li> <li>- Ferroalloy</li> <li>- Iron &amp; Steel</li> <li>- Lead</li> <li>- Zinc</li> <li>- Magnesium</li> <li>- Silicon Carbide</li> </ul>	<ul style="list-style-type: none"> <li>- Cement</li> <li>- Glass</li> <li>- Lime</li> <li>- Misc. Carbonate Use</li> <li>- Soda Ash Production</li> </ul>	<ul style="list-style-type: none"> <li>- Pulp &amp; Paper</li> </ul>	<ul style="list-style-type: none"> <li>- Fluorinated GHG Prod.</li> <li>- HCFC-22 Prod./HFC-23 Destruction</li> <li>- Electronics Mfg.</li> <li>- Pre-Charged Equip. Imp./Exp.</li> <li>- Suppliers of Industrial Gases</li> </ul>
Petroleum & Natural Gas Systems – Direct Emissions			Fuel Suppliers			Carbon Capture & Sequestration		Mining
<ul style="list-style-type: none"> <li>- Onshore Production</li> <li>- Offshore Production</li> <li>- Natural Gas Processing</li> <li>- Natural Gas Transmission/Compression</li> <li>- Natural Gas Distribution</li> <li>- Underground Natural Gas Storage</li> <li>- Liquefied Natural Gas Storage</li> <li>- Liquefied Natural Gas Import/Export</li> </ul>			<ul style="list-style-type: none"> <li>- Coal based Liquid Suppliers</li> <li>- Petroleum Product Suppliers</li> <li>-Natural Gas Distribution Companies</li> <li>-Natural Gas Liquids Suppliers</li> </ul>			<ul style="list-style-type: none"> <li>- Suppliers of CO2</li> <li>- Injection of CO2</li> <li>- Geologic Sequestration of CO2</li> </ul>		<ul style="list-style-type: none"> <li>- Underground Coal Mines</li> </ul>

# U.S. GHGRP Coverage – Threshold Analysis

## Downstream Facility and Emissions Coverage by Threshold



- What types of methodologies are available for calculating GHGs?
  - Direct measurement
  - Facility-specific calculation (i.e., calculations based on periodic sampling/testing at a facility)
  - Simplified methods using default factors
- What are the sources of methods currently in use?
  - EPA,
  - IPCC,
  - WRI/WBCSD ,
  - industry,
  - States (e.g., California)



- Tiered approach used in many sub parts (lower order to higher order)
- In addition to calculation methodologies:
  - Adherence to and reference of Standards (ASTM, ISO etc...)
  - Calibration requirements
  - Missing data procedures
  - Extensive recordkeeping requirements



# U.S. GHGRP Data Collection - Data Flow

## EPA GHG Data System

**Data Verification & Compliance Management**



**EPA EnviroFacts:**  
Serviceable, searchable and separately hosted copy of non-CBI dataset.  
Open Access to Public



**State-Specific Service**  
Oriented data flow using EnviroFacts API



**Downloadable Data Files, (non-CBI)**  
Open Access to Public

**Reporters**  
Approximately 8,000 Facilities and Suppliers

**e-GGRT**, interactive web-based, CROMERR compliant data reporting tool,

**e-GGRT Database Servers (Master Data Store)**

**e-GGRT Datamart**

**FLIGHT (ghgdata.epa.gov)**  
Open Access to public.



# U.S. GHGRP Data Collection - Data Entry

- Data is reported using web forms and spreadsheets.
- Web form data entry
  - User friendly
  - Significant development and testing effort
  - Direct parsing of entered data
- Spreadsheet Reporting form
  - Faster development and testing
  - Harder to parse data

**Subpart U - Miscellaneous Uses of Carbonate**  
**COMPLETE REQUIRED INFORMATION AND UPLOAD SPREADSHEET TO E-GGRT**

Version R.02  
 Today's date 2/15/2013

Facility Name: \_\_\_\_\_  
 GHGRP ID: \_\_\_\_\_  
 Reporting Period: \_\_\_\_\_  
 Comments: \_\_\_\_\_  
 Calculation Method (98.216(d)): \_\_\_\_\_

Instructions: Complete if your facility uses \_\_\_\_\_ to calculate

Carbonate Type	Calcination Fraction Measurement Method (98.216(e)(3))	Method
Limestone - (CaCO <sub>3</sub> )		
Magnesite - (MgCO <sub>3</sub> )		
Dolomite - (CaMg(CO <sub>3</sub> ) <sub>2</sub> )		
Siderite - (FeCO <sub>3</sub> )		
Ankerite - (Ca(Fe, Mg, Mn)(CO <sub>3</sub> ) <sub>2</sub> )		

**EQ. Q-1: CO<sub>2</sub> EMISSIONS CALCULATION**  
 Use equation Q-1 to calculate annual CO<sub>2</sub> mass emissions for this Taconite Indurating Furnace.

EQUATION Q-1 SUMMARY AND RESULT

$$CO_2 = \frac{44}{12} \times [ (F_s) \times (C_{sf}) + (F_g) \times (C_{gf}) \times \frac{MW}{MVC} \times 0.001 + (F_l) \times (C_{lf}) \times 0.001 + (F_o) \times (C_{of}) \times 0.001 ]$$

Annual CO<sub>2</sub> mass emissions (metric tons) \_\_\_\_\_ (metric tons)

INPUT: SOLID FUEL - FUEL

Annual mass or volume is based on one or more substitute monthly data values

Number of months that missing data procedures were followed, if applicable \_\_\_\_\_ (months)

**WEB**

**XLS**



# U.S. GHGRP Data Collection - Webforms

The screenshot shows the EPA e-GGRT webform interface for 'CHIU\_TEST\_Facility'. The main heading is 'Subpart NN: Suppliers of Natural Gas and Natural Gas Liquids (2011)'. The interface includes a navigation menu with 'HOME', 'FACILITY REGISTRATION', 'FACILITY MANAGEMENT', and 'DATA REPORTING'. A sidebar on the left contains 'e-GGRT Help' and 'Using e-GGRT for Subpart NN reporting'. The main content area is titled 'CO2 QUANTITIES CALCULATION' and explains that Equation NN-6 will calculate CO2 quantities for natural gas supplied to end-users receiving less than 460,000 mscf per year. It lists several equations: Equation Summary (NN-6), CO2: (NN-1) Potential CO2 Quantities associated with Natural Gas Received at the City Gate(s), CO2: (NN-3) Potential CO2 Quantities associated with Natural Gas delivered to Transmission Pipelines or Other LDCs, CO2: (NN-4) Potential CO2 Quantities associated with Natural Gas Received by End-users that Receive a Supply ≥ 460,000 Thousand scf per Year, and CO2: (NN-5) Potential CO2 Quantities associated with product received that bypassed the city gate(s). A 'SUMMARY' section shows the equation:  $CO_{2i} = 1 \times 10^9 * Fuel * HHV * EF$ . A table below the equation has columns for Year, Product, Fuel, HHV, EF, and Calculated Result. A callout box on the right shows a calculator icon and the text '(Eq. NN-1) Total CO2 quantities that would result from the complete combustion or oxidation of the annual supply of the natural gas received at the city gate(s)'. A warning icon and 'Eq. NN-1: View Validation' link are also present.

**Tab Navigation**

**Context-Sensitive Help**

**Rolling GHG Calculator**

**Interactive Tax software-like Interview workflow**

**Part 98 Rule Equations**

# U.S. GHGRP Data Collection - Webforms

Hello, Kong Chiu | My Profile | Logout

[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.

<b>COAL AND COKE</b> <a href="#">HIDE</a>	<b>PETROLEUM PRODUCTS</b> <a href="#">SHOW</a>
<input type="radio"/> Mixed (Industrial sector)	<b>OTHER FUELS - SOLID</b> <a href="#">SHOW</a>
<input type="radio"/> Mixed (Industrial coking)	<b>OTHER FUELS - GASEOUS</b> <a href="#">HIDE</a>
<input type="radio"/> Mixed (Commercial sector)	<input type="radio"/> Propane Gas
<input type="radio"/> Coke	<input type="radio"/> Blast Furnace Gas
<input type="radio"/> Mixed (Electric Power sector)	<input type="radio"/> Fuel Gas
<input type="radio"/> Subbituminous	<input type="radio"/> Coke Oven Gas
<input type="radio"/> Bituminous	<a href="#">SHOW</a>
<input type="radio"/> Anthracite	<b>BIOMASS FUELS - GASEOUS</b> <a href="#">SHOW</a>
<input type="radio"/> Lignite	<b>BIOMASS FUELS - LIQUID</b> <a href="#">SHOW</a>
<b>NATURAL GAS</b> <a href="#">HIDE</a>	<b>SOLID PARTIALLY BIOGENIC FUEL</b> <a href="#">SHOW</a>
<input type="radio"/> Natural Gas (Weighted U.S. Average)	
<a href="#">?</a> If a fuel is not found among those listed, you can add it to the other fuels and blends list below.	
<b>OTHER FUELS AND BLENDS</b> <a href="#">HIDE</a>	
No other fuels or blends present.	
<a href="#">+</a> <b>ADD an Other Fuel or Blend</b>	

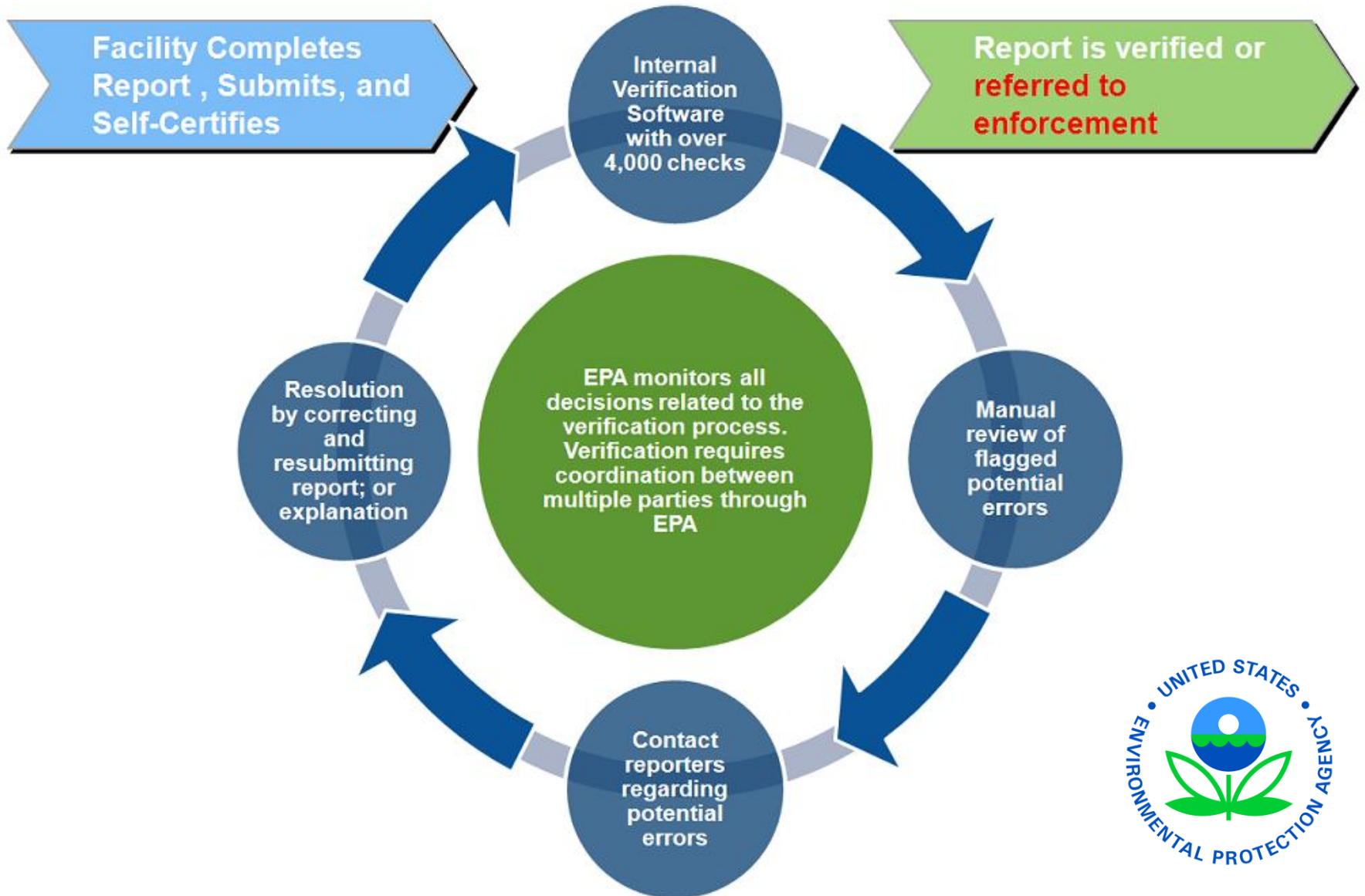
Easy to find and select multiple Fuels/types



Lists Expand and Contract



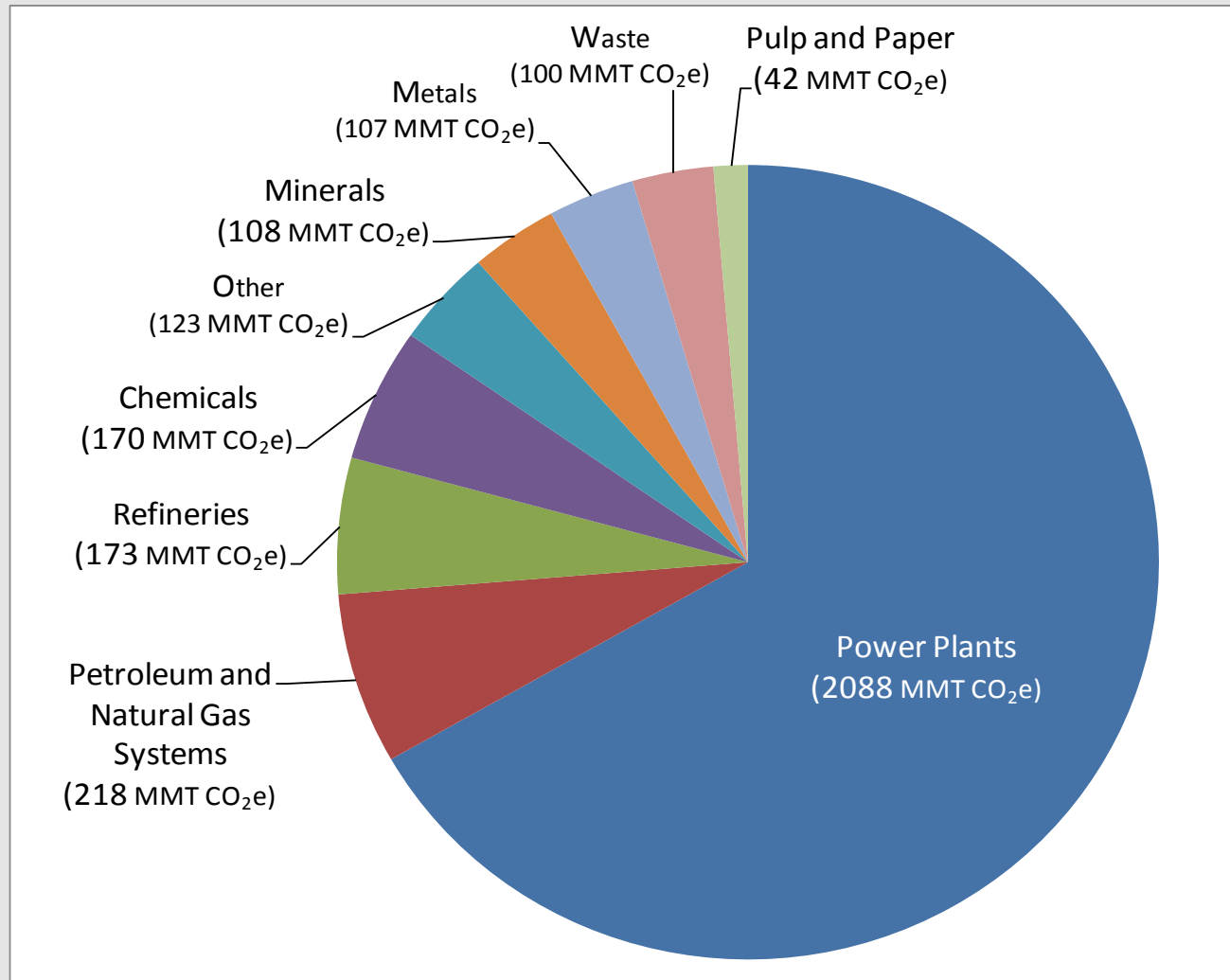
# U.S. GHGRP Data Verification



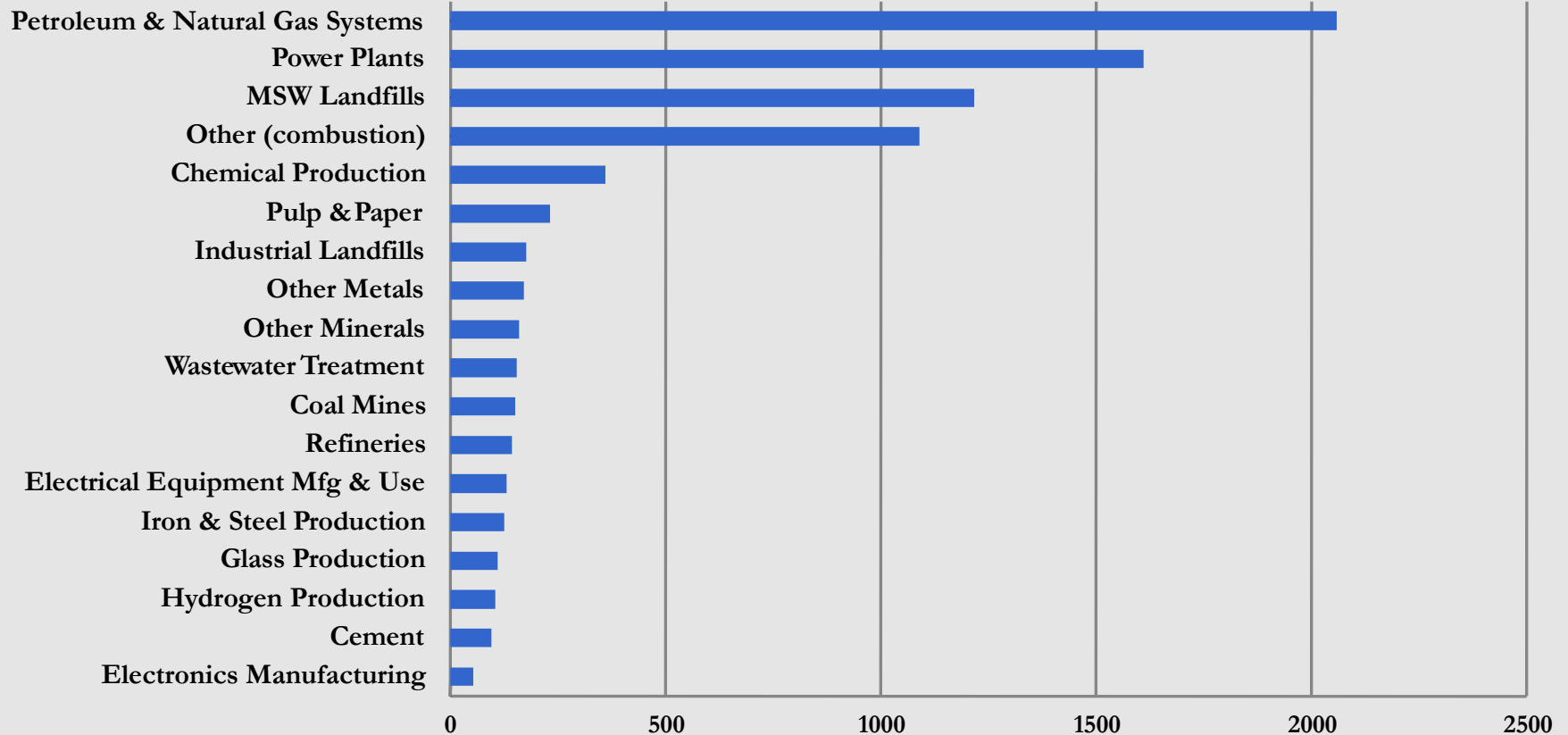
- EPA can collect and protect Confidential Business Information (CBI)
- EPA typically makes CBI determinations on a case-by-case basis (e.g., could information cause competitive harm?).
- For the GHGRP, EPA made CBI determinations on a broad category-basis to permit more timely release of data.
- One challenge has been that emissions data collected under the Clean Air Act cannot be considered CBI, including inputs to emissions equations.
- Publish only “publicly available” data.



# U.S. GHGRP - Reporting Year 2012 Data



# U.S. GHGRP - Reporting Year 2012 Data



- Many critical decisions will influence system design
  - Use of data
  - Coverage-upstream/downstream
  - Threshold
  - Verification
  - Electronic vs. paper reporting
  - Access to data
  - Treatment of sensitive business information
  - Compliance/enforcement structure
- Hard to anticipate ALL the issues up front; have made to make some changes





- Stakeholder engagement/outreach improves “buy-in” and data quality
- Tradeoff of coverage vs. cost
  - Decide how to structure program to maximize coverage/minimize cost (example: US: 10% of Facilities emit 76% of Emissions)
- High quality data begins with high quality submission
  - More up-front costs with electronic reporting but saves money in the long-run and improves data quality
    - Reduces “handling” time
    - Reduces human errors
    - Enables faster verification and analysis
    - Enables faster access to data

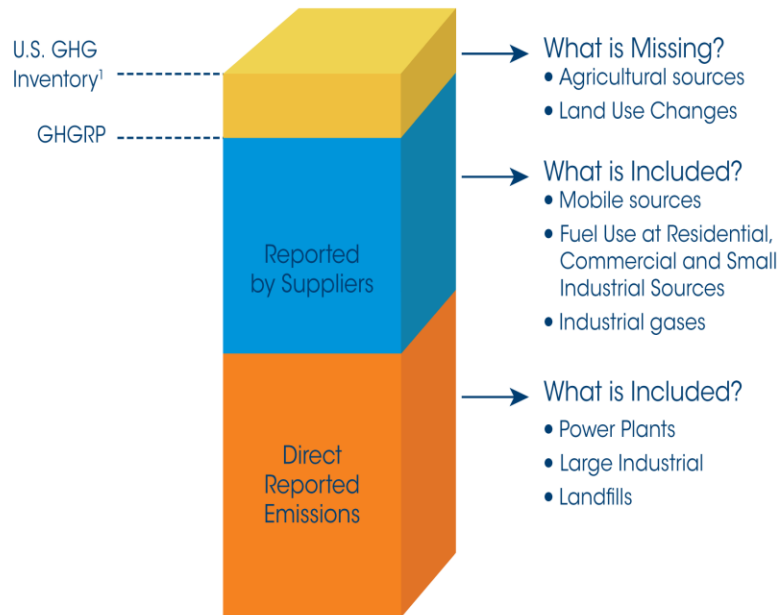


# Comparing U.S. GHG Inventory and GHG Reporting Program

- 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, and transport
  - 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

# Comparing U.S. GHG Inventory and GHG Reporting Program

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



<sup>1</sup> Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2011, April 2013.

Task	Inventory	Greenhouse Gas Reporting Program
Find total U.S. emissions	✓	
Review trend data for the past 20 years	✓	
Browse a map to find largest emitters in your area		✓
Compare facility emissions across an industrial sector		✓
Find total <u>reported</u> emissions by state		✓

## Direct Use

- Replace the entire estimate - e.g., categories where the GHGRP has complete coverage
  - *Note: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume I, Chapter 5 “Time Series Consistency”*

## Indirect Use for Calculations

- Develop a more accurate national emission factor based on plant measurements - Landfills, Wastewater Treatment (Industrial), Natural Gas Systems, Petroleum Systems
- Disaggregate national estimates to show more detail - Industrial sector fossil fuel combustion

## Indirect Use for QA/QC

- General QA/QC on a national estimate

Part 98 Info

- [www.epa.gov/ghgreporting](http://www.epa.gov/ghgreporting)

GHGRP and e-GGRT  
Help

- [www.ccdsupport.com](http://www.ccdsupport.com)

e-GGRT

- <https://ghgreporting.epa.gov>

Published Data  
(FLIGHT)

- [ghgdata.epa.gov](http://ghgdata.epa.gov)



# Thank You



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