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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U.S. GHGRP Overview

- 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
U.S. GHGRP Overview

- 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 CO2e 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

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<td>- Nitric Acid</td>
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<td>- Lead</td>
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<td>- Pre-Charged Equip. Imp./Exp.</td>
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<td>- Titanium Dioxide</td>
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<td>- Zinc</td>
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<td>- Suppliers of Industrial Gases</td>
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<td></td>
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<td>- Phosphoric Acid</td>
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<td>- Silicon Carbide</td>
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### Petroleum & Natural Gas Systems – Direct Emissions

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<tr>
<td>- Onshore Production</td>
<td>- Coal based Liquid Suppliers</td>
<td>- Suppliers of CO2</td>
<td>- Underground Coal Mines</td>
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<tr>
<td>- Offshore Production</td>
<td>- Petroleum Product Suppliers</td>
<td>- Injection of CO2</td>
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<td>- Natural Gas Processing</td>
<td>- Natural Gas Distribution Companies</td>
<td>- Geologic Sequestration of CO2</td>
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<tr>
<td>- Natural Gas Transmission/Compression</td>
<td>- Natural Gas Liquids Suppliers</td>
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<td>- Natural Gas Distribution</td>
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<td>- Underground Natural Gas Storage</td>
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<td>- Liquefied Natural Gas Storage</td>
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<td>- Liquefied Natural Gas Import/Export</td>
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• Emissions coverage is for downstream sources only. Including upstream sources increases emissions coverage by 30-35%.
• Facility coverage represents both upstream and downstream sources.
U.S. GHGRP Methodologies

• 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

- e-GGRT, interactive web-based, CROMERR compliant data reporting tool,
- e-GGRT Database Servers (Master Data Store)

Data Verification & Compliance Management

Reporters
Approximately 8,000 Facilities and Suppliers

iVP

iVP

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

FLIGHT (ghgdata.epa.gov)
Open Access to Public

EPA GHG Data System
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 NN: Suppliers of Natural Gas and Natural Gas Liquids (2011)

CH4U_TEST_Facility

CO2 QUANTITIES CALCULATION

Equation NN-6 will calculate CO2 quantities associated with the combustion or oxidation of natural gas supplied to end-users that receive less than 460,000 mscf per year. CO2 that would result from natural gas re-delivered to transmission pipelines or other 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 CO2 associated with the natural gas received at the city gate(s) and from local production. For additional information about the CO2 quantities calculations, please use the e-GGRT Help link(s) provided.

Equation Summary (NN-6)

- CO2: (NN-1) Potential CO2 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
- 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
- CO2: (NN-5) Potential CO2 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

$$CO_2 = 1 \times 10^9 \times \text{Fuel} \times \text{HHV} \times \text{EF}$$
Easy to find and select multiple Fuels/types

Lists Expand and Contract
U.S. GHGRP Data Verification

Facility Completes Report, Submits, and Self-Certifies

Internal Verification Software with over 4,000 checks

Report is verified or referred to enforcement

EPA monitors all decisions related to the verification process. Verification requires coordination between multiple parties through EPA

Resolution by correcting and resubmitting report; or explanation

Contact reporters regarding potential errors

Manual review of flagged potential errors
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

- **Power Plants**: 2088 MMT CO₂e
- **Petroleum and Natural Gas Systems**: 218 MMT CO₂e
- **Refineries**: 173 MMT CO₂e
- **Chemicals**: 170 MMT CO₂e
- **Metals**: 107 MMT CO₂e
- **Minerals**: 108 MMT CO₂e
- **Waste**: 100 MMT CO₂e
- **Other**: 123 MMT CO₂e
- **Pulp and Paper**: 42 MMT CO₂e
- **Waste**: 100 MMT CO₂e
- **Pulp and Paper**: 42 MMT CO₂e

**TOTAL**: 676 MMT CO₂e
U.S. GHGRP - Reporting Year 2012 Data

- Petroleum & Natural Gas Systems
- Power Plants
- MSW Landfills
- Other (combustion)
- Chemical Production
- Pulp & Paper
- Industrial Landfills
- Other Metals
- Other Minerals
- Wastewater Treatment
- Coal Mines
- Refineries
- Electrical Equipment Mfg & Use
- Iron & Steel Production
- Glass Production
- Hydrogen Production
- Cement
- Electronics Manufacturing

0 500 1000 1500 2000 2500
• 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
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

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<tr>
<th>Task</th>
<th>Inventory</th>
<th>Greenhouse Gas Reporting Program</th>
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<tbody>
<tr>
<td>Find total U.S. emissions</td>
<td></td>
<td>✅</td>
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<tr>
<td>Review trend data for the past 20 years</td>
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<tr>
<td>Browse a map to find largest emitters in your area</td>
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<tr>
<td>Compare facility emissions across an industrial sector</td>
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<td>✅</td>
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<tr>
<td>Find total reported emissions by state</td>
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GHGRP Covers the Majority of U.S. GHG Emissions

- **U.S. GHG Inventory**: What is Missing?
  - Agricultural sources
  - Land Use Changes

- **GHGRP**: What is Included?
  - Mobile sources
  - Fuel Use at Residential, Commercial and Small Industrial Sources
  - Industrial gases
  - Power Plants
  - Large Industrial
  - Landfills

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Applying GHGRP Data to National Inventory

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
Additional Information

- 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](http://https://ghgreporting.epa.gov)
- Published Data (FLIGHT): [ghgdata.epa.gov](http://ghgdata.epa.gov)
Thank You

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