

# **Examples of Inventory Use USA Experience**

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## **Outline**



- IPCC Guidelines and the <u>Inventory of U.S. Greenhouse</u>
   <u>Gas Emissions and Sinks</u>
- Facility level <u>Greenhouse Gas Reporting Program</u>
- President Obama's <u>Climate Action Plan</u>
- The Clean Air Act

## The Inventory of U.S. GHG Emissions and Sinks

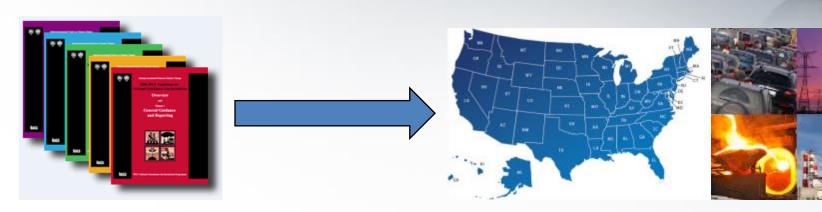
- U.S. Government annually submits a national U.S. GHG Inventory Report
  - Official U.S. Government GHG Inventory
  - Meets annual U.S. commitments under the UNFCCC
  - Impartial, policy-neutral (but policy relevant!)
- Interagency effort led by EPA
  - Data and input provided by DOE, USDA, DOT, DOD, USGS, the State Department
- Open for 30 day public review and comment period
  - Targeted "peer review" for technical audience
  - International peer review through the UNFCCC



GHG
Inventories help
track emission
trends, impact
of policies,
inform
projections, etc.
because "Can't
manage what
you don't
measure."

# IPCC Guidelines provide the foundation for the U.S. Inventory





2006 IPCC Guidelines

Inventory of U.S. Greenhouse Gas Emissions and Sinks

Aspects of the IPCC Guidelines that shape the U.S. Greenhouse Gas Inventory

- Tiers: different methodological options to suit country-specific circumstances
- Key Category Analysis: A system for prioritizing resources and improving the inventory
- Default emission factors for small source categories
- Methods for quantifying uncertainty
- Common definitions, units, and reporting tables to allow comparisons with other countries
- \*\*Standards for transparency and documentation, which build trust among countries

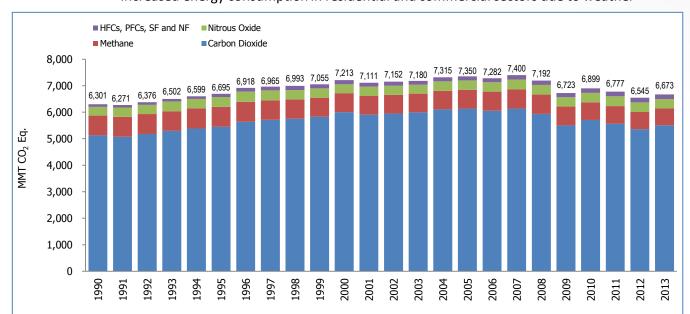
## What are the GHG emission trends?

### US GHG emissions

- Increased 2% from 2012 to 2013
- Increased 5.9% from 1990 to 2013
- 9.2% below 2005 levels

### CO<sub>2</sub> emissions from fossil fuel combustion dominate total emissions and trends

- The major contributor to the increase in overall GHG emissions was the increased combustion of fossil fuels in 2013, compared to 2012
- Increase in all sectors (electricity generation, transportation, industrial, residential and commercial)
  - Intensity for electricity generation due to increased coal use in 2013
  - Increased energy consumption in residential and commercial sectors due to weather

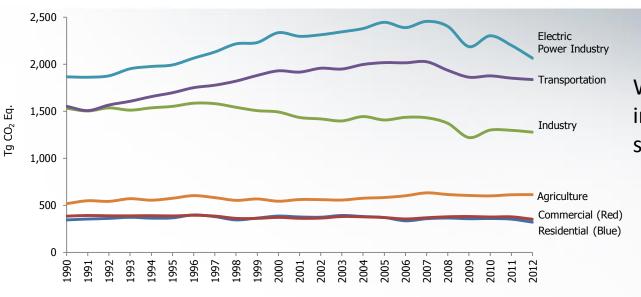


## Over the same period:

- ↑ GDP has grown by 75%
- ↑ U.S.
  Population
  has
  increased
  by 26%
- ↑ Energy consumption has increased by 15%

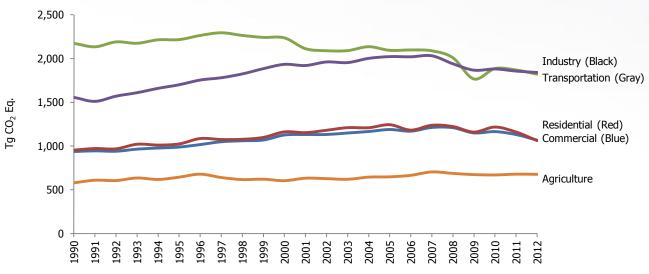
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# **2014 Inventory by Economic Sector**



With electric power industry as a separate sector

With electric power industry emissions allocated to other sectors by electricity use



# IPCC Guidelines informed the facility-level Greenhouse Gas Reporting Program (GHGRP)



2006 IPCC Guidelines

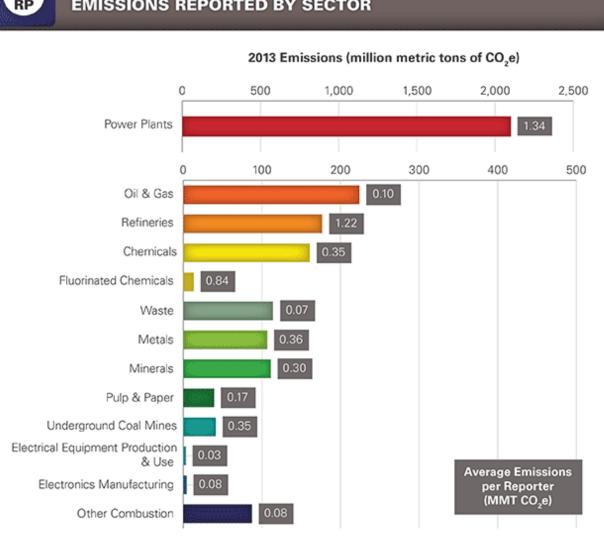
Greenhouse Gas Reporting Program (facility-level)

The IPCC Guidelines helped to shape the regulatory Greenhouse Gas Reporting Program (2009)

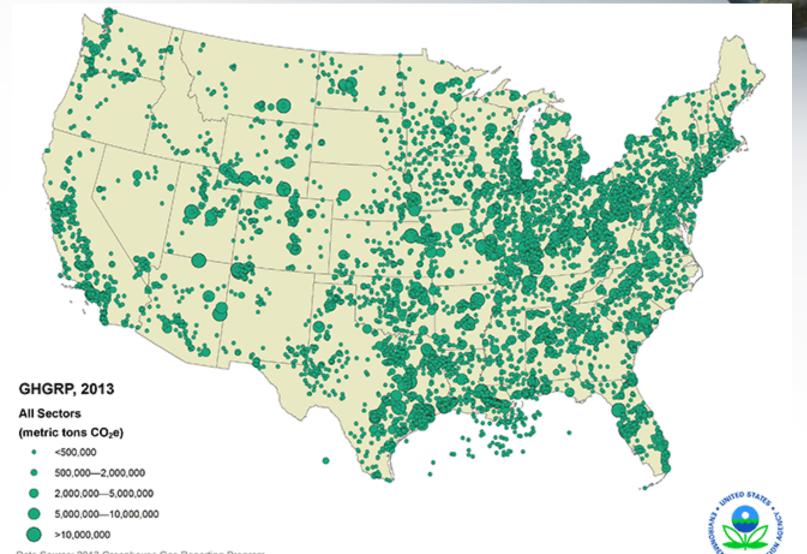
- Identification of advanced tier 2 and tier 3 methodologies
- Classification of anthropogenic sources
- Definitions, measurement units, classification of sources
- "EPA systematically reviewed the list of source categories developed from the U.S. GHG Inventory and the IPCC guidance to ensure the inclusion of those that emit the most significant amounts of GHG emissions while minimizing the number of reporters." \*

## **Data Reported to GHGRP**





# **Geographic Distribution of GHGRP Emissions**



# **EPA GHG Emissions Data Programs**

	U.S. GHG Inventory (UN Requirement)	GHG Reporting Program (Facility Reporting by Regulation)
Scale	<ul> <li>National</li> </ul>	• Facility
Coverage	<ul> <li>All U.S. anthropogenic emissions</li> <li>Energy</li> <li>Industrial Processes</li> <li>Agriculture and Land Use</li> <li>Waste</li> </ul>	<ul> <li>~55% US direct anthropogenic emissions</li> <li>~30% US indirect anthropogenic emissions (e.g., fuel &amp; chemical suppliers)</li> <li>Over 8,000 facilities</li> <li>Facilities &gt; 25,000 metric tons CO2 equivalent per year</li> <li>Excludes agriculture</li> </ul>
GHGs	<ul> <li>CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, Fluorinated</li> <li>GHGs</li> </ul>	• CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, Fluorinated GHGs
Methods	<ul> <li>IPCC higher "tier"</li> <li>Mix of measurement-based emission factors, models, and GHGRP data</li> </ul>	<ul> <li>Mix of continuous, periodic measurements, and sampling</li> <li>Engineering calculations &amp; emission factors</li> </ul>
Time series	• 1990 – present	• Annually, since 2010

# IPCC TFI provided technical information on using facility level data to improve national inventories



Task Specia on Mational Greenhause Con Insentarios (TRI)

#### El Tachnical Bullatin 1

### Use of Facility-Specific Data in National Greenhouse

"Signating material proposal for consideration by the interprenormal Period on Climate Change. This suggesting material has not been subject to be mail PCC review processors."

#### Introduction

The 2000 FDC Guidables for National Genericans Gashierating also manifolds for self-major selection from most source of emissions and services by stics. Within New New York and an Allandigate etc. Most select with a sealable, source of the company of the company of the company inventor program. The Guidables provide general principles in travertion programs. The Guidables provide general principles and containing principles and the Guidables provide general principles and developing of principles and the Guidables of the company of the developing of the CPC Guidables for Microsi Comertions. One application of the IPCC Guidables for Microsi Comertions. One provides producing grantees they may with to settly the Microsi Debut Allandia in Section 2000 and the provide leavesting in the glid caser objections, and to provide leavesting complian producing grantees they may with to settly the Microsi Bulletin stem cost also in set the to Guidables.

This Technical Builder is an extent from an agent meeting consearch by the PICOS Test Force on Network Generalization Commission (Fig. on this time in Wellington, New Zealand, Pa-PIZ-Alp 2011. This document has been reviewed by participation and the Bureau of the FIT, bowers if has not been asked to the bornal PICO reviewe and approach process and asked to the bornal PICO reviewe and approach process and the worken IPCO. Supporting failth and to repeated the consideration by the Intergovermental Pizel and Children Change.

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Users of plant or facility level data will need to consider this document in light of their specific situation. Such data will come in

#### taily general.

There are a number of key losses that have been identified and are discussed in the following chapters:

- Creating data is a screen qui
- Consistency was consistent
- Estimating uncertainties
- Control of Committee common and the c

illy level data is information related to emissions from an

Absorber dista Emissions can be measured directly (e.g. stack measurements) or indirectly (e.g. fluid carbon contents leading to CO<sub>2</sub> estimates). Measurements may be continuous (e.g. CEMS) or methods in safety to indirect intentific restriction factors.

Plant-Special: activity date may also be available. This is periodicity useful where plant can be stratified into different groups with known exhibition rates (e.g. presence of different mitigations options). Where the plant cannot be grouped in the way the data may still be useful to compare with national section

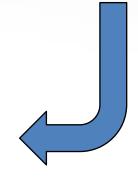
Emission factors for specific plant require plant-specific activity data to give plant-specific emissions. If plant specific emission factors are not accompanied by plant-specific activity data, it may be difficult to use such data to improve the inventors.

sing facility-level data would mean replacing an emission stimate for a category (the "sectional emission estimate") with the an of all the facility level data from all the facilities in the stegory, or by a combination of the sum of facility-level data and



**Greenhouse Gas Reporting Program** 





Inventory of US GHG Emissions and Sinks

## **GHG Emissions Data and U.S. Climate Policy**

## Inventory of US GHG Emissions and Sinks



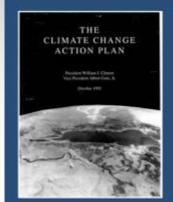


Greenhouse Gas Reporting Program





Identification of significant emission sources





- EPA Clean Power Plan
- Interagency Methane Strategy
- Energy Efficiency Standards
- Federal Facilities
- Land-Use Change and Forestry
- Department of Agriculture "10 Building Blocks"
- Etc.

## **GHG Emissions Data and US Regulations**



## Inventory of US GHG Emissions and Sinks







Identification of significant emission sources

# Clean Air Act

### **Automobiles:**

- Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act
- New and existing power plants
  - EPA Clean Power Plan proposal
- Aviation
  - Proposed Greenhouse Gas Endangerment and Cause or Contribute Findings Under CAA Section 231for Aircraft

## **Accessing EPA GHG Data**

- U.S. GHG Inventory (National-level data)
  - http://www.epa.gov/climatechange/ghgemissions/usinvent oryreport.html
- Facility-Level GHGRP Reporting Data
  - <a href="http://www.epa.gov/ghgreporting/">http://www.epa.gov/ghgreporting/</a>

### Greenhouse Gas Emissions Data

Information and data about greenhouse gas emissions are available at the global, national, facility, and individual levels.



Find out more about global greenhouse gas emissions and trends.

Learn More »



Review EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks report, which contains annual estimates of greenhouse gas emissions and removals associated with human activities, for each year since 1990.

Learn More »



Explore facility-level greenhouse gas data collected through EPA's Greenhouse Gas Reporting Program data. You can view emissions from individual facilities or from many facilities organized by sector or state.

Learn More »



Use EPA's Individual Greenhouse Gas Emissions Calculator to estimate your carbon footprint.

Learn More »