



Overview of Inventory of U.S. Greenhouse Gas Emissions and Sinks

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Outline



- Context for UNFCCC reporting
- Schedule and process
- Methodological approach
- Results



- The Inventory is a basic commitment under the 1992 United Nations Framework Convention on Climate Change (UNFCCC)
 - *Article 4.1(a) – Commitments: All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, shall:*
 - *(a) Develop, periodically update, publish and make available to the Conference of the Parties, in accordance with Article 12, national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties;*

UNFCCC technical reporting requirements



Element	Requirement
Due date	April 15 each year
Time period	Annual estimates from 1990 to present (with two year lag)
Gases	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ , other fluorinated gases
Sectors	Energy, Industrial Processes, Agriculture, Land-use, Land-use Change and Forestry, Waste
Methodologies	Consistent with Intergovernmental Panel on Climate Change (IPCC) Guidelines
Units	Metric (gigatons)
Reporting format	Text document: <i>National Inventory Report</i> Data tables: <i>Common Reporting Format</i>

UNFCCC GHG Inventory Quality Principles



- **Transparency**
 - Assumptions and methodologies should be clearly explained to facilitate replication and assessment
- **Accuracy**
 - Estimates should be systematically neither over nor under true emissions or removals, as far as can be judged, and uncertainties should be reduced as far as practicable
- **Consistency**
 - The same methodologies are used for the base and all subsequent years, and consistent data sets are used to estimate emissions
- **Comparability**
 - Countries follow the IPCC methodological guidelines, and the UNFCCC reporting formats to allow comparisons.
- **Completeness**
 - The inventory should cover all sources, sinks, and gases, included in the IPCC Guidelines, and have full geographic coverage.

GHG Inventory Roles



- EPA:
 - Coordination of Interagency team
 - Generation of estimates for most sources
 - Compilation of document and coordination of review activities
- DOE/EIA
 - Underlying statistics for most Energy sector sources (e.g., combustion of fossil fuel)
- USDA/DOT/DOD and others
 - Provision of data for specific sources (e.g., aviation)
- State Department
 - Transmittal to UNFCCC

Inventory Schedule



Date	Milestone
May - September	<ul style="list-style-type: none">• Preliminary evaluation of methodological changes• Data collection
October – November	<ul style="list-style-type: none">• Compilation of first draft
December – January	<ul style="list-style-type: none">• <i>Expert review period</i>
January	<ul style="list-style-type: none">• Preparation of 2nd draft
February	<ul style="list-style-type: none">• <i>Federal Register publication of draft Inventory for 30 day public comment</i>
March	<ul style="list-style-type: none">• Internal deadline for preparation of final document.
April 15	<ul style="list-style-type: none">• Submission of Inventory to UNFCCC.
September	<ul style="list-style-type: none">• UNFCCC in-depth review of Inventory

Common U.S. GHG Inventory terms



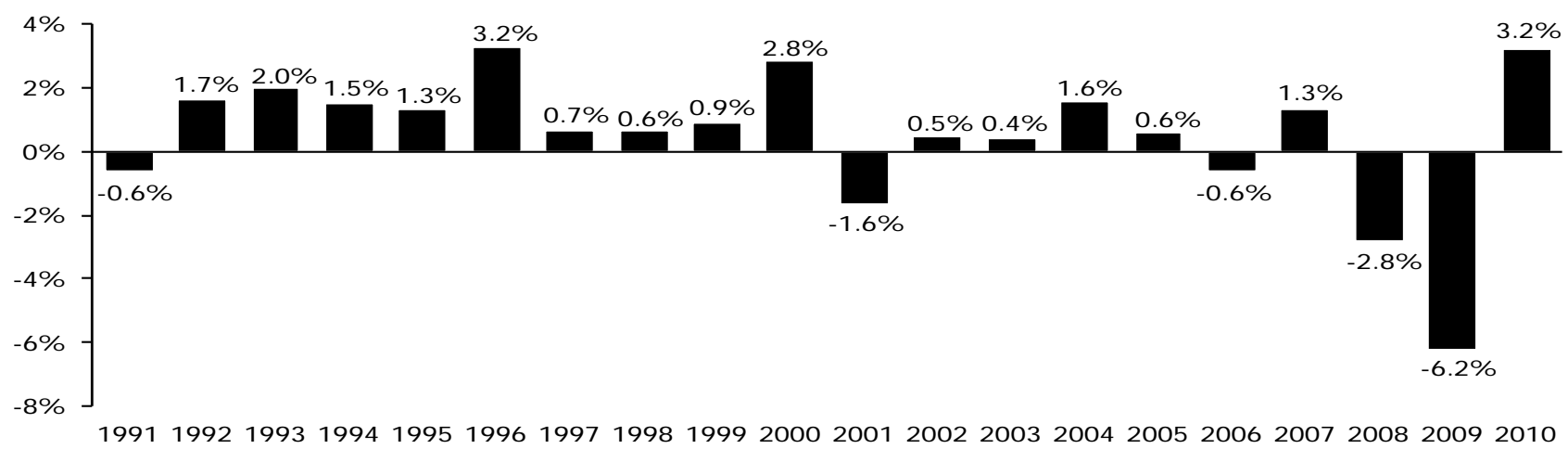
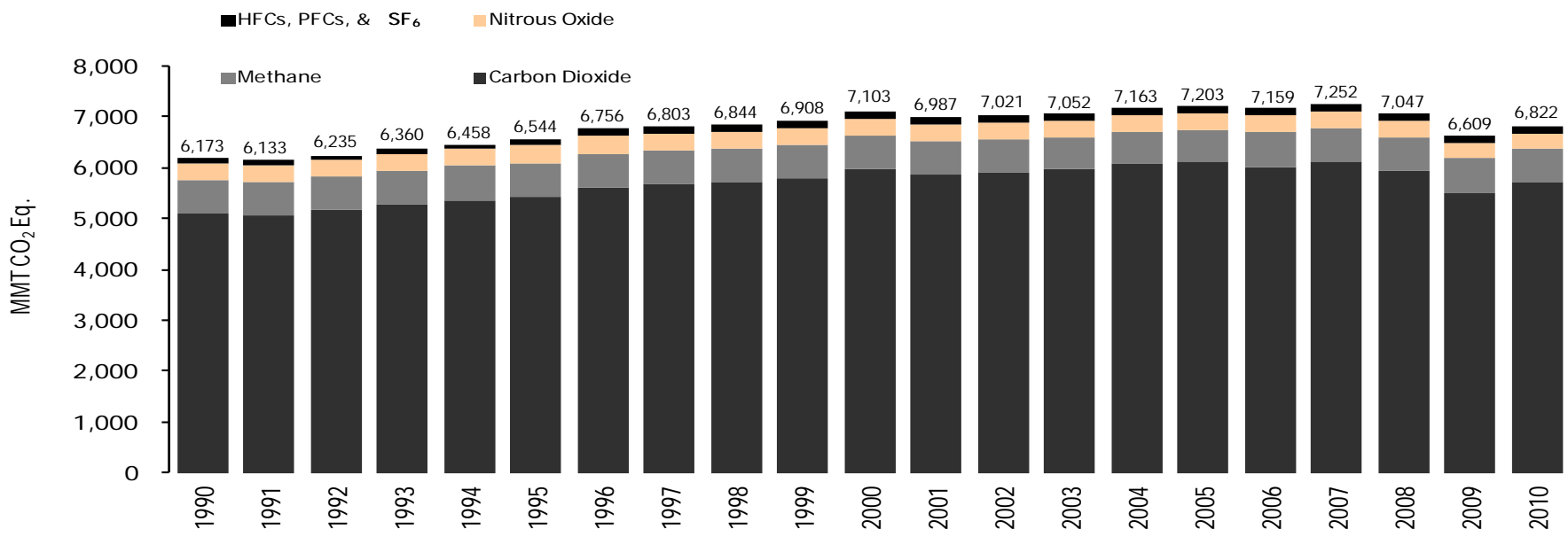
- “2012 Inventory”
 - References year U.S. GHG Inventory published and submitted to UNFCCC
 - *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010* finalized by EPA and submitted to UNFCCC in April 2012
- Emissions are provided in “MMT CO₂e”
 - MMT = million metric tons
 - Also referenced in the equivalent unit “Tg” (teragrams) per UNFCCC reporting requirements in U.S. GHG Inventory
 - CO₂e = carbon dioxide equivalent
 - Per UNFCCC reporting requirements all gases are aggregated using “global warming potential” (GWP) which compares ability of each greenhouse gas to trap heat in the atmosphere relative to carbon dioxide
 - GWP values from IPCC Second Assessment Report (1996)

Methodologies



- Three general IPCC approaches or “Tiers”
 - Tier 1 – National data and international default emission factors
 - Tier 2 – National/regional data and country-specific emission factors
 - Tier 3 – Facility-level data or country-specific modeling
- Selecting and updating methodologies for the US Inventory
 - Overall goal of continuous improvement in the Inventory
 - If better data become available, IPCC good practice obligates us to consider using it for the Inventory
 - Emphasis on improving estimates and devoting resources to large sources, or rapidly changing sources (“Key Sources”)
 - Annual reassessment of methodologies and refinements for each source category:
 - Must fit into Inventory preparation schedule
 - Must apply consistently to the entire time series (e.g., 1990-2011)
 - Generally easier to adopt significant changes if initiated earlier in the development schedule
 - EPA flags updated methodologies for expert, public and UNFCCC reviews

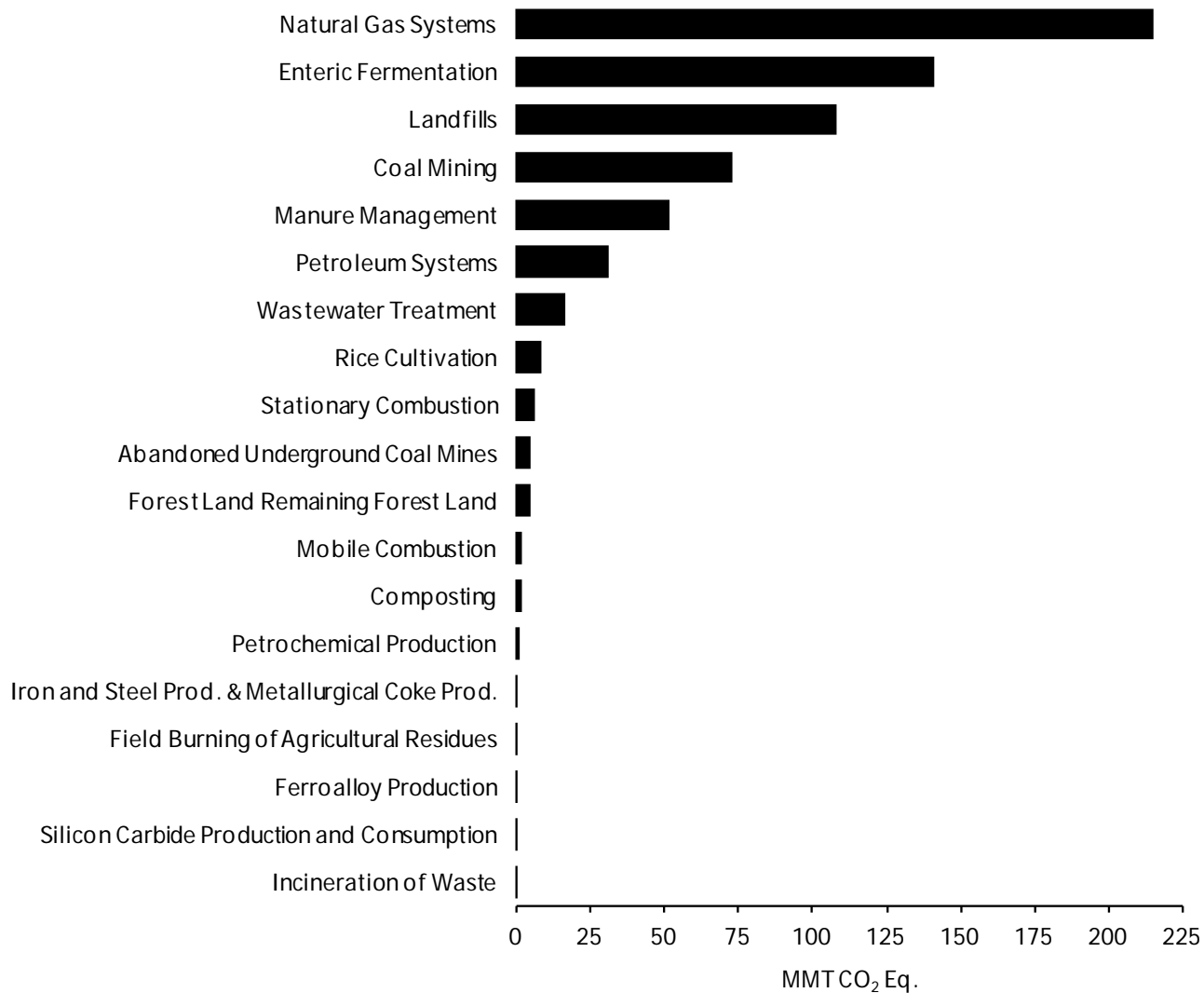
Results



Results – CH₄



2010 Sources of CH₄ Emissions



Thank you



- References

- Inventory of US Greenhouse Gas Emissions and Sinks
 - <http://epa.gov/climatechange/ghgemissions/usinventoryreport.html>
- UNFCCC Reporting Guidelines
 - https://unfccc.int/national_reports/annex_i_ghg_inventories/reporting_requirements/items/2759.php
- IPCC Guidelines
 - <http://www.ipcc-nggip.iges.or.jp/>



Extra slides

IPCC Guidelines



- The IPCC has developed the common international methodological framework for inventories used by all countries under UNFCCC:
 - Definition of “anthropogenic” and other concepts
 - Coverage: all anthropogenic emissions within national territory for which methodologies exist
 - Timing considerations: annual estimates, recalculations and time series
 - Standards for transparency in reporting
 - Coverage of GHGs
 - Delineation and definition of sectors and source categories
 - Methodological choice, QA/QC, data collection and uncertainty analysis
 - Approaches to reflect mitigation efforts
 - “...methods used are transparent with respect to mitigation which is important for assessing inventory quality.”
 - Definition of “Good Practice:”
 - “...inventories should contain neither over nor underestimates so far as can be judged, and the uncertainties in these estimates should be reduced as far as practicable.”
- IPCC Guidelines also provide the foundation for other efforts:
 - Part 98 methods, Climate Leaders, CARB, etc.