

U.S. Natural Gas Emissions

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Mobile Sources Technical Review Subcommittee
Clean Air Act Advisory Committee

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Outline

- **Overview: Natural Gas Industry and Methane Emissions Sources**
- **Key Data/Resources**
 - US Greenhouse Gas Emissions Inventory
 - Greenhouse Gas Reporting Program (Subpart W)
- **Mitigating Methane Emissions**
 - EPA's Natural Gas STAR Program
 - New Source Performance Standards (NSPS) for VOCs for the oil and gas sector

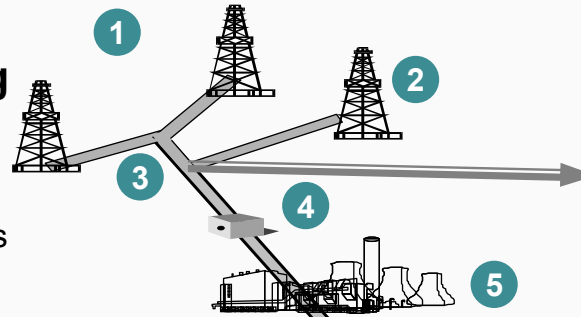
The Natural Gas Industry



Natural gas systems encompass wells, gas gathering and processing facilities, storage, and transmission and distribution pipelines.

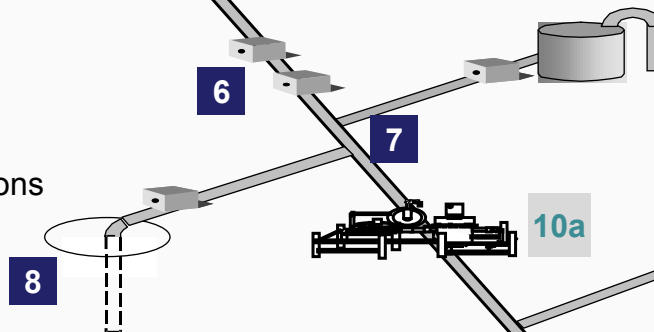
Production & Processing

1. Drilling and Well Completion
2. Producing Wells
3. Gathering Lines
4. Gathering and Boosting Stations
5. Gas Processing Plant



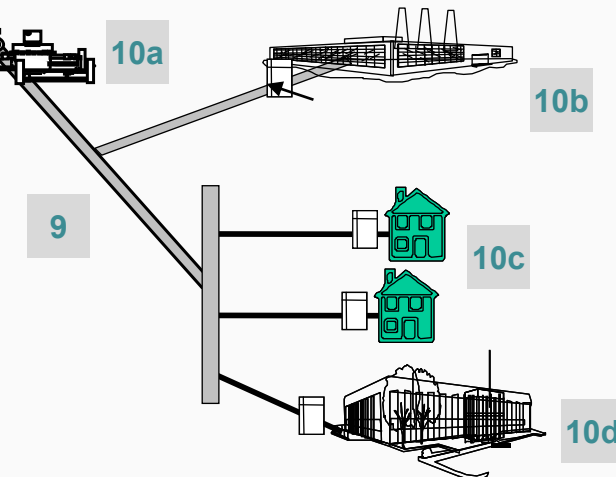
Natural Gas Transmission & Storage

6. Transmission Compressor Stations
7. Transmission Pipeline
8. Underground Storage



Distribution

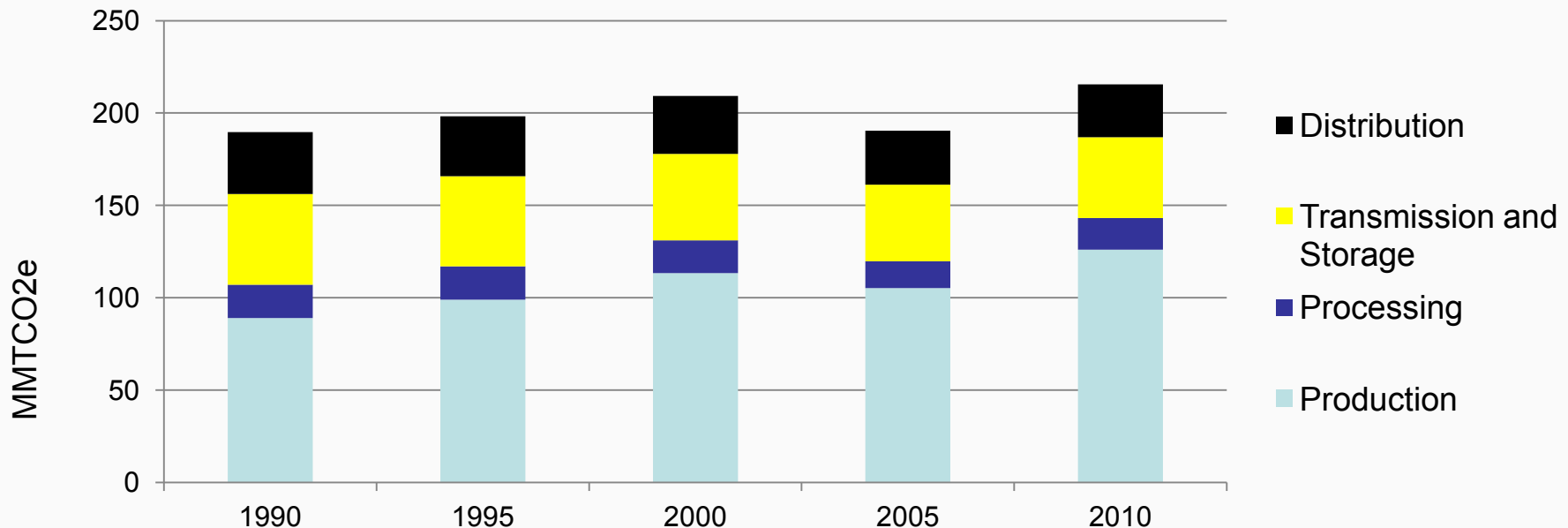
9. Distribution Mains
10. Regulators and Meters for:
 - a. City Gate
 - b. Large Volume Customers
 - c. Residential Customers
 - d. Commercial Customer



2010 Natural Gas Systems Methane Emissions



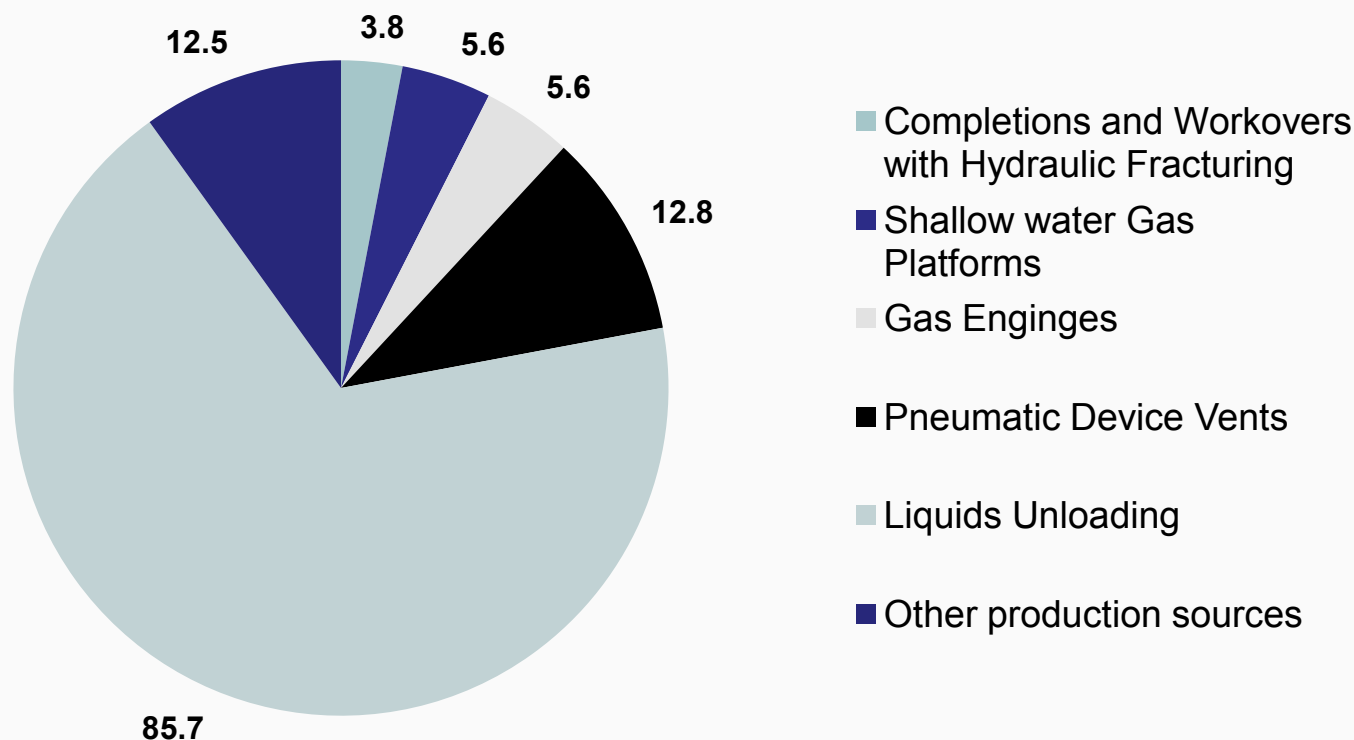
- In 2010, U.S. natural gas systems methane emissions = 215 MMTCO₂e, including all sectors of the natural gas industry:
 - Production, processing, transmission and storage, and distribution
 - 32% of total U.S. CH₄ emissions; 3% of total U.S. GHG emissions
- Direct end use emissions from the transportation sector for all fuels is presented separately in the inventory (and represents about 27% of total GHG emissions in 2010)



Natural Gas Production Emissions



2010 Methane Emissions from Natural Gas Production (MMTCO₂e)



U.S. Environmental Protection Agency

Source: EPA. *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990 – 2010*. April, 2012. Available on the web at: epa.gov/climatechange/emissions/usinventoryreport.html.

U.S. GHG Emissions Inventory Process



- The U.S. Government annually submits to the UNFCCC a national U.S. GHG Inventory Report
- EPA held a Stakeholder workshop for the Natural Gas Systems GHG Inventory in September 2012
 - Included stakeholder presentations on new data and information
- The Inventory is being updated based on information from this workshop, new studies, comments on previous Inventories, and other stakeholder information
 - Considering a number of potential improvements to the natural gas systems inventory for 2013
- Expert and Public Review (December 2012 – February 2013)
- Final Inventory to be published April 2013
- Continual evaluation of new data for updates
 - **GHG Reporting Program (GHGRP)**
 - New studies

Subpart W, Greenhouse Gas Reporting Program

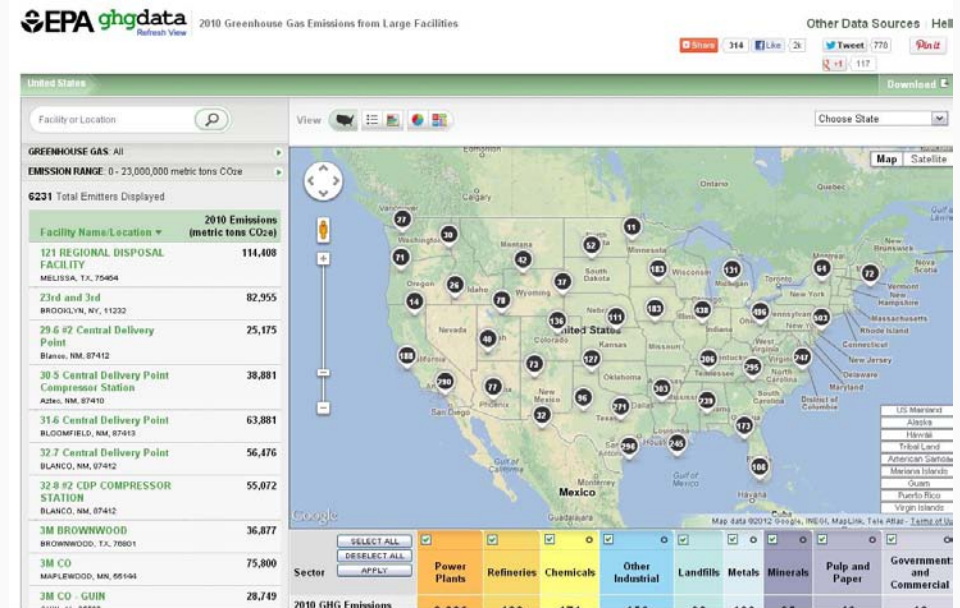


- GHGRP - 40 CFR Part 98 requires annual reporting of GHG emissions and other relevant information from certain source categories in the United States
 - Better understand relative emissions of specific industries, and of individual facilities within those industries
 - Better understand factors that influence GHG emission rates and actions facilities could take to reduce emissions
- Subpart W requires reporting by oil and gas facilities that emit GHGs $\geq 25,000$ metric tons carbon dioxide equivalent (CO₂e) per year
 - September 28, 2012 was the deadline for first Subpart W annual reports (2011 data)
- Industry segments covered:
 - Onshore petroleum and natural gas production
 - Offshore petroleum and natural gas production
 - Onshore natural gas processing facilities
 - Onshore natural gas transmission compression
 - Underground natural gas storage
 - Liquefied natural gas (LNG) storage
 - LNG import and export equipment
 - Natural gas distribution

GHGRP Data Publication



- 2010 data published Jan 2012
- 2011 data to be published in early 2013
- Data publication website allows stakeholders and the public to access the key data elements quickly and easily and to sort data by location, sector, and by GHG
 - <http://ghgdata.epa.gov/>



Mitigating Methane Emissions



Natural Gas STAR Program:

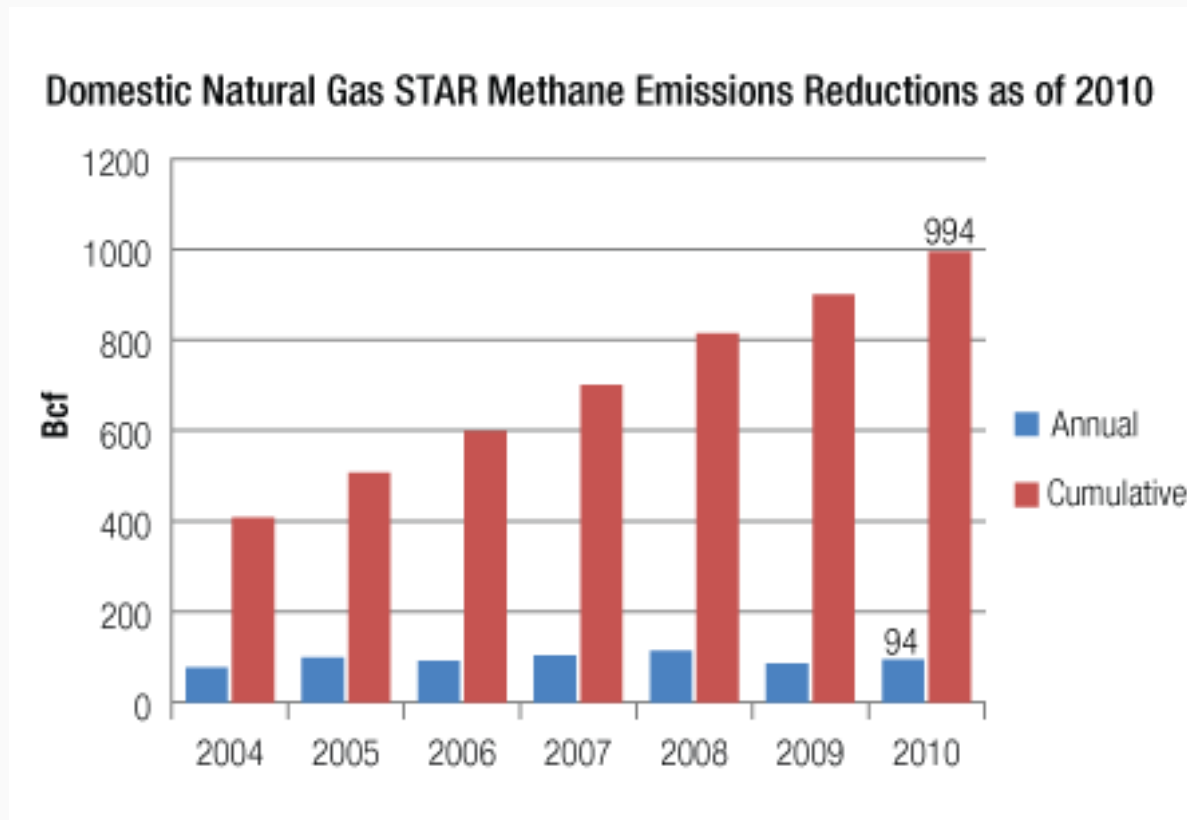
- Established in 1993, the Natural Gas STAR Program is a flexible, voluntary partnership that encourages oil and natural gas companies—both in the U.S. and internationally—to adopt proven, cost-effective technologies and practices that improve operational efficiency and reduce methane emissions.
 - Over 130 domestic and 14 international partner companies
- Provides resources to advance cost-effective oil & gas sector methane emission reductions including:
 - General technology transfer, training, and capacity building
 - Workshops and conferences
 - Technical documents and research outlining over 60 mitigation options, including analyses of economic, environmental and operational benefits
 - Individual assistance to help companies identify and assess project opportunities



Natural Gas STAR Program Accomplishments



- Natural Gas STAR partners reported emission reductions of over 90 Bcf in 2010
 - Since 1990, cumulative savings of over 990 BCF of natural gas
 - Equivalent to emissions reductions of 401 MMTCO₂e (109 MMTCE)
 - Valued at \$3.9 Billion





EPA's NSPS and NESHAP for Oil and Gas

- On April 17, 2012, EPA issued New Source Performance Standards (NSPS) for VOCs for the oil and gas sector.
 - Reduces emissions of smog-forming VOCs, air toxics, and methane (co-benefit)
- Relies on available, affordable technology already in use
 - Achieves a 95% VOC reduction from all hydraulically fractured gas wells, both new wells and existing wells that are fractured or refractured to get more gas out of a well.
 - The rule also has requirements for compressors, storage vessels, pneumatic controllers, and equipment leaks at processing plants
- From these actions, EPA estimates that annual VOC emissions will be reduced by 190,000 to 290,000 tons with methane reductions of 1.0 to 1.7 million tons per year (about 19 to 33 million tonnes of CO₂ equivalent).



Thank You!

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www.epa.gov/gasstar
<http://www.epa.gov/ghgreporting/index.html>
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