U.S. FEDERAL STRATEGIES TO CUT METHANE EMISSIONS FROM NATURAL GAS SYSTEMS

Methane Emissions from California's Natural Gas System: Challenges and Solutions

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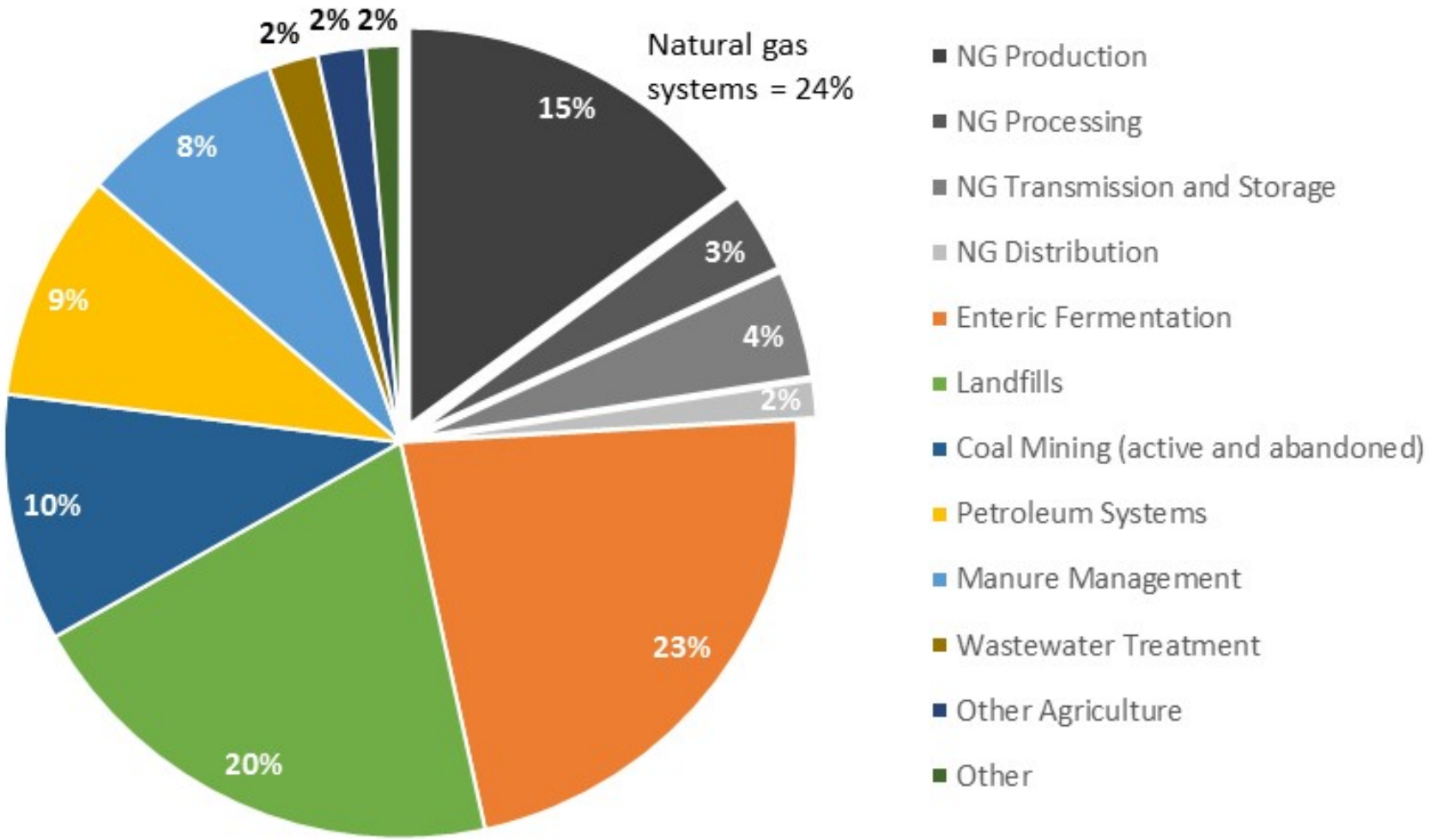
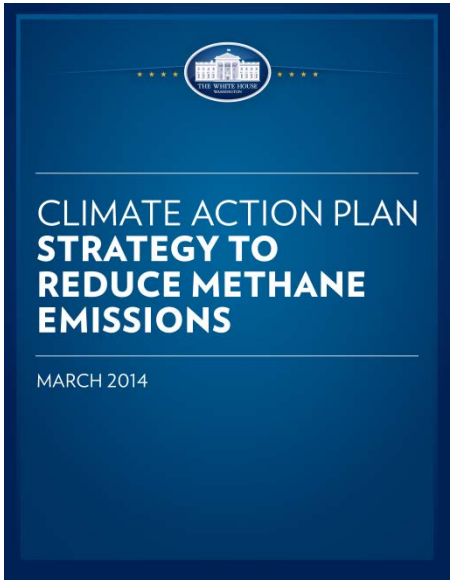
U.S. Department of Energy

The Latest Estimates of U.S. Methane Emissions



Source: EPA, 2016 (Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2014)

Interagency Strategy to Reduce Methane Emissions



"Curbing emissions of methane is critical to our overall effort to address global climate change. … To achieve additional progress, the Administration will":

- Develop a comprehensive Interagency Methane Strategy (*completed March 2014)*
- *Take a* collaborative approach with state governments and the private sector to cover all methane emitting sectors
- Meet a 2025 target for the O&G sector to reduce methane emissions by 40 to 45% below 2012 levels (*established January 2015*)
- The U.S. and Canada committed to taking coordinated domestic actions to reduce methane emissions from the O&G sector (March 2016)

Three Pillars

1) Assessing current emissions data and addressing data gaps	2) Identifying Technologies and Best Practices for Reducing Emissions	3) Identifying Existing Authorities and Incentive-based Opportunities for Reducing Emissions

Federal Authorities Related to Methane Emissions from NG Infrastructure

Transportation Service and Siting:

- Federal Energy Regulatory Commission (FERC) and State Public Utility Commissions (PUCs) oversee the regulation of natural gas pipeline siting and transportation service
- These regulators focus mostly on affordability, reliability and safety
- The traditional cost-of-service approach to setting rates for pipelines treats methane leaks as lost and unaccounted for gas.

Safety:

- Pipeline Hazardous Material and Safety Administration (PHMSA) focuses on the risk that gas pipeline leaks and ruptures pose to public safety
- Most states have put safety standards in place that go beyond minimum federal requirements

Air Pollution:

- Environmental Protection Agency (EPA) has authority to regulate air pollutants
- EPA currently regulates VOCs and HAPs and has recently finalized regulations for methane

Federal Permitting Requirements:

- Bureau of Land Management (BLM) has the authority to regulate oil and gas activities on federal and tribal land to limit waste

Research and Development:

- Department of Energy (DOE) focuses on research, development, demonstration and deployment activities; convening; and technical assistance

Adapted from: Paranhos et al., 2015. JISEA. NREL/TP-6A50-63416.

DOE's Natural Gas Modernization Initiative

- **ARPA-E** announced funding for 11 new projects developing low-cost methane sensing for the oil and gas sector (Dec., 2014).
  - Issued RFI on an independent field test site to support MONITOR
- **Office of Fossil Energy** has $12 million for programs on Methane Emissions Mitigation and Methane Emissions Quantification (FY 2016)
    - Funding Opportunity Announcement closes June 13th
- **FERC** issued a Policy Statement on cost recovery for midstream natural gas infrastructure upgrades (April, 2015). Policy now in effect (October, 2015)
- **DOE-NARUC partnership** for technical assistance was announced (Feb, 2016)
- **DOE launched the Natural Gas Modernization Clearinghouse** website
- **DOE is offering technical assistance** to support EPA's voluntary Methane Challenge Program (launched in March, 2016)
- **Quadrennial Energy Review made recommendations** to modernize natural gas infrastructure and reduce emissions
- **Stakeholder action is also key.** We continue to work with stakeholders who announced commitments to action at the Secretary of Energy Methane Roundtable Capstone event.

Other Agency Actions

Environmental Protection Agency (EPA)

- Finalized NSPS for O&G sector to cut emissions from new and modified sources.
- Issued draft Information Collection Request (ICR), to gather information on existing sources of methane emissions, abatement strategies and associated costs.
- The Methane Challenge Program provides incentives and opportunities for companies to make voluntary methane emission reductions.
- Issuing Control Techniques Guidelines (CTGs) for cost-effective technologies for controlling VOC emissions from covered oil and gas sources.

Bureau of Land Management (BLM) – DOI

- Proposed venting and flaring rule to reduce methane emissions and reduce waste from O&G facilities on public lands.

Pipeline and Hazardous Materials Safety Administration (PHMSA) – DOT

- Released an Advisory Bulletin for natural gas storage facility operators.
- Initiated regulatory actions to improve safety of NG storage facilities.
- Proposed a natural gas transmission pipeline safety rule.

Interagency Methane Measurement Working Group

- Meets periodically to enable coordination and collaboration

Interagency Task Force on Natural Gas Storage Safety

- **Structure of the Task Force**:
  - Co-Chaired by DOE and PHMSA
  - Includes technical support from EPA, DHS, DOI, FERC, and NOAA
  - Will also work closely with:
    - State of California, LA County and the City of LA

- **Activities**: Task Force will conduct studies and hold workshops with industry, state and local leaders, and other interested stakeholders
  - Support the development of best practices for ensuring:
    - well integrity
    - proper response plans
    - Public health and safe operations of storage facilities
  - Assess the potential vulnerabilities to energy reliability posed by the loss of use of storage facilities

- Results and findings will be published later this year (~4 months)

Methane Sensing Research – Policy Objectives

Three policy goals tied to methane emission sensing R&D strategies:

1. **Improving the GHG Inventory**: The U.S. GHG Inventory is published annually by EPA. This provides a foundational basis for policy; improvements help policymakers identify focus areas and set priorities.

2. **Enabling methane emissions abatement**: Methane measurement and leak detection is needed to support operational strategies for methane mitigation. Deploying these technologies helps the private sector identify cost-effective opportunities for investment in methane mitigation, through voluntary actions or to comply with regulations.

3. **Establishing emissions monitoring networks**: Expanding methane monitoring networks and improving inverse modeling tools can help companies and policymakers with enforcement and accountability, to help validate reported progress toward achieving targets, domestically and internationally.

QUESTIONS?

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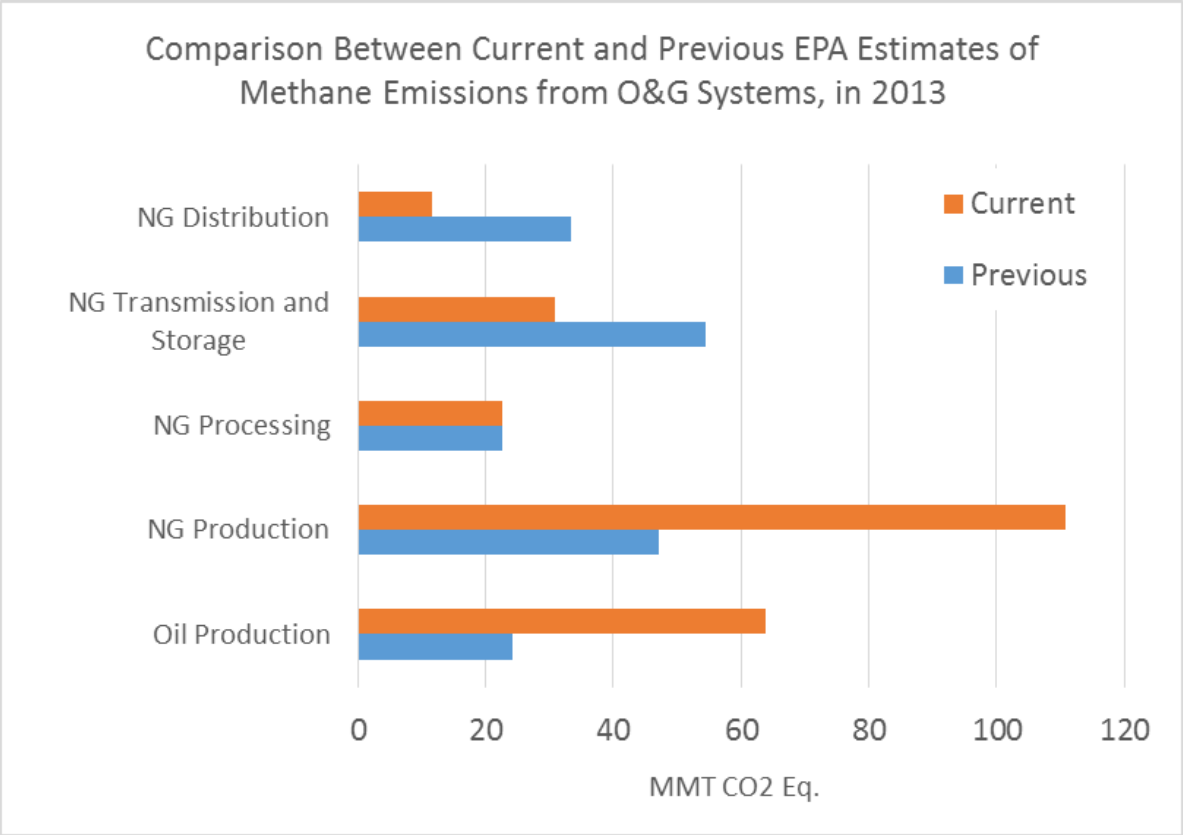
U.S. Department of Energy

http://www.energy.gov/qer

http://www.energy.gov/epsa/natural-gas-modernization-clearinghouse

EPA GHG Inventory Updates



Between the 2015 and 2016 inventory reports, estimates of methane emissions from the oil and gas sectors for 2013 changed significantly:
- For the NG sector: increased by 12%
- For the petroleum sector: increased by 157%
- For the two sectors combined: increased by 32%

Source: EPA, 2016 (Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2014)

Interagency Methane Measurement Working Group

Chaired by:

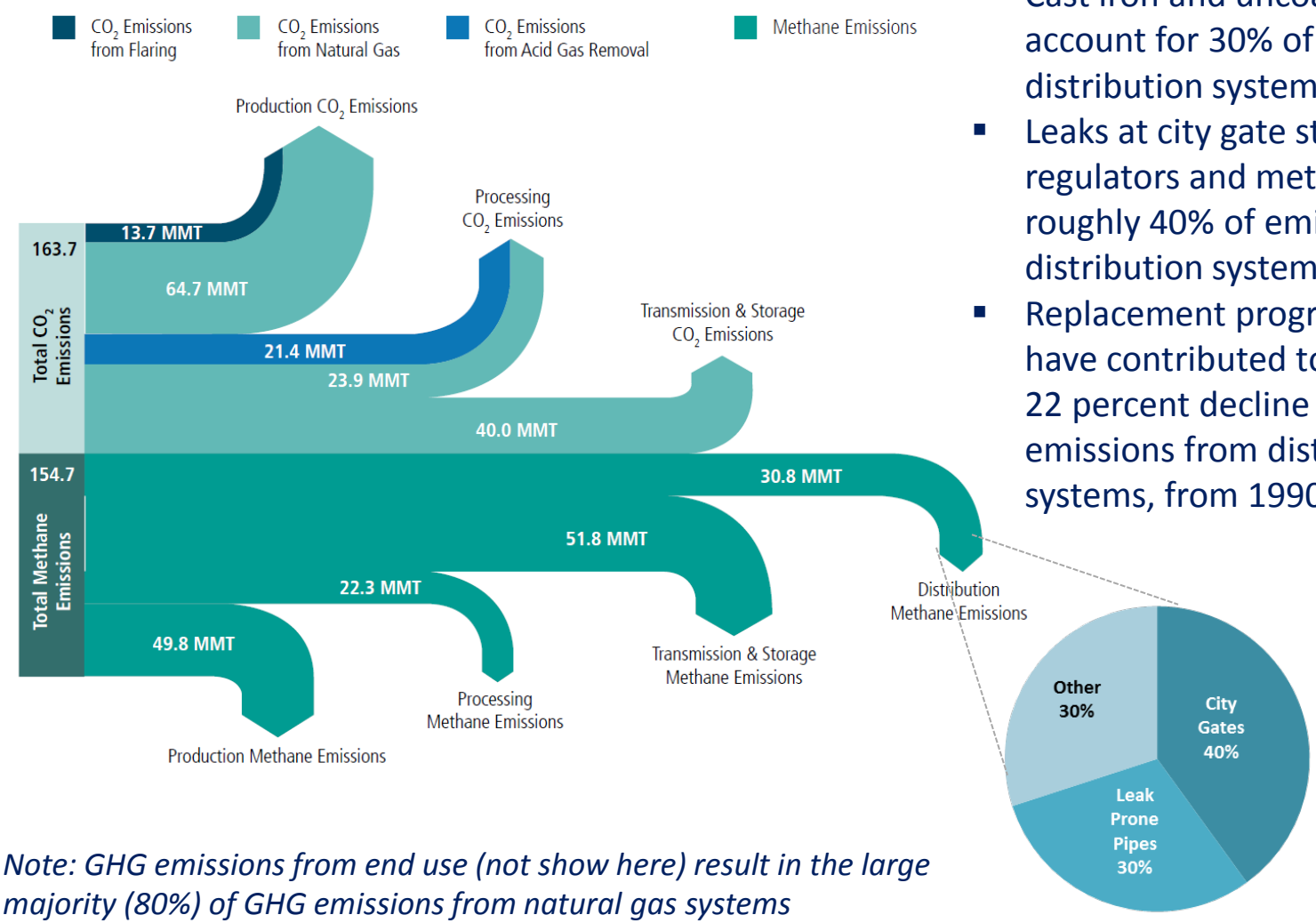
- **White House Office of Science and Technology Policy**

Participants:

- **Department of Agriculture**
- **Department of Commerce**/ National Institute of Standards and Technology/ National Oceanic and Atmospheric Administration
- **White House Council on Environmental Quality**
- **Environmental Protection Agency**
- **Department of Energy**/ Advanced Research Projects Agency – Energy/ National Energy Technology Laboratory/ National Renewable Energy Laboratory
- **Department of Interior**/ Bureau of Land Management/ Bureau of Safety and Environmental Enforcement/ United States Geological Survey
- **Department of Labor**
- **National Aeronautics and Space Administration**/ Jet Propulsion Laboratory
- **National Science Foundation**
- **Department of State**
- **Department of Transportation**/ Pipeline and Hazardous Materials Safety Administration

GHG Emissions from Natural Gas Infrastructure (not end use)

Distribution systems account for 20% of methane emissions from the natural gas sector.



- Cast iron and uncoated steel pipes account for 30% of emissions from distribution systems.
- Leaks at city gate stations (from regulators and meters) account for roughly 40% of emissions from distribution systems.
- Replacement programs to date have contributed to an estimated 22 percent decline in methane emissions from distribution systems, from 1990 to 2012.

Note: GHG emissions from end use (not show here) result in the large majority (80%) of GHG emissions from natural gas systems

Data sources: EPA, 2014; EIA, 2014 (see QER for details)

RESOURCES

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