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

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

June 6 - 7, 2016

James Bradbury, Senior Policy Advisor

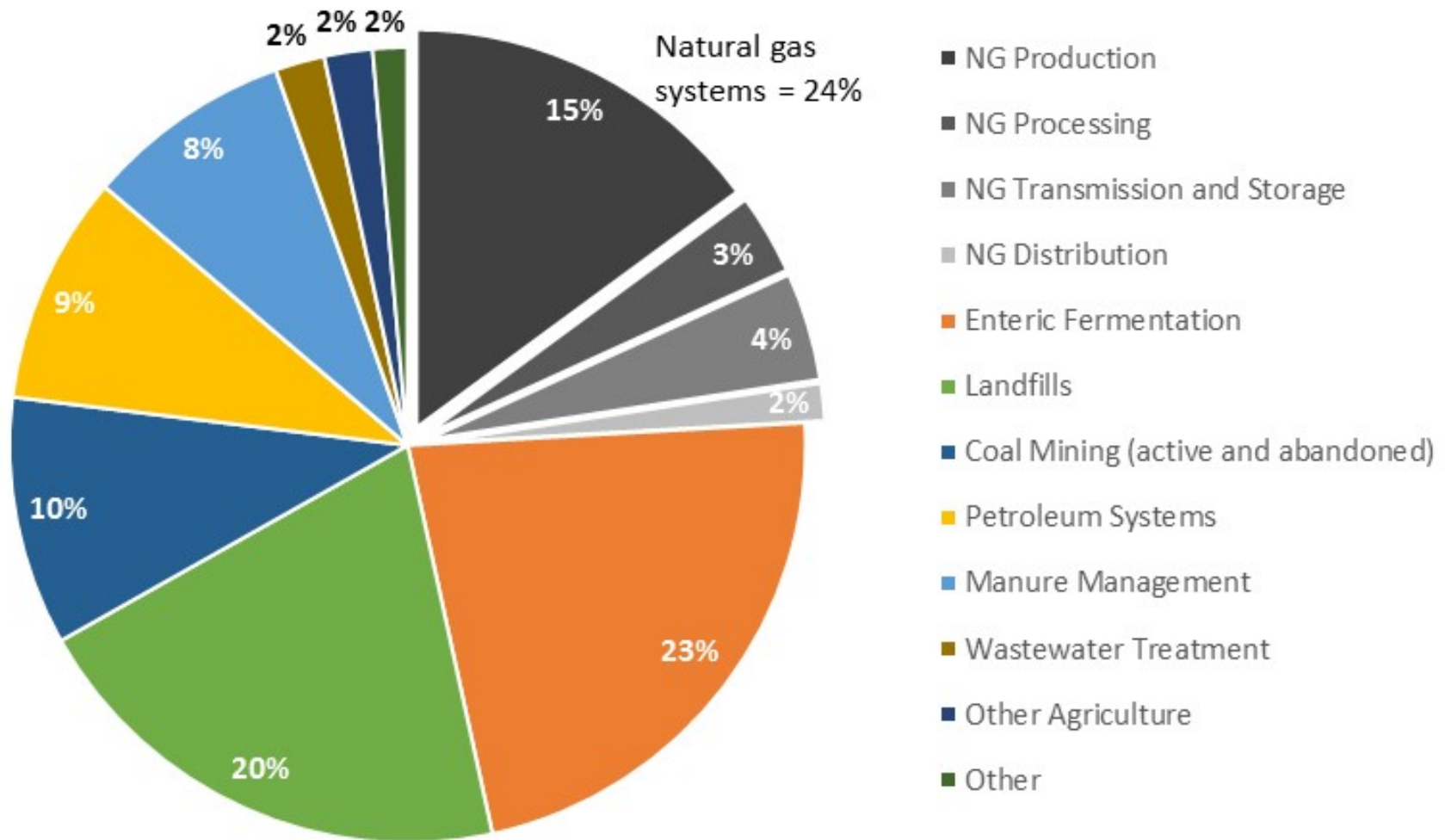
Office of Energy Policy and Systems Analysis

U.S. Department of Energy



THE LATEST ESTIMATES OF U.S. METHANE EMISSIONS

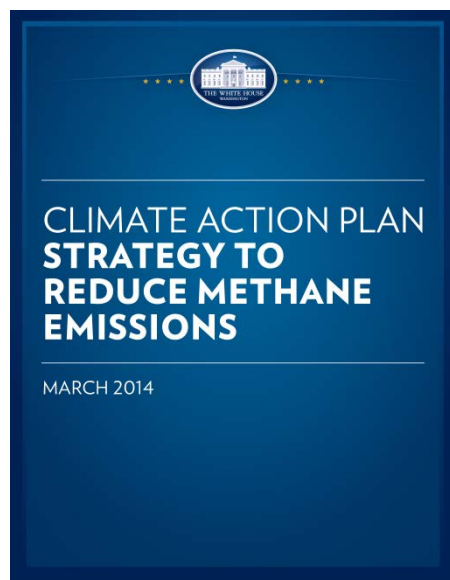
U.S. Anthropogenic Methane Emissions, 2014



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



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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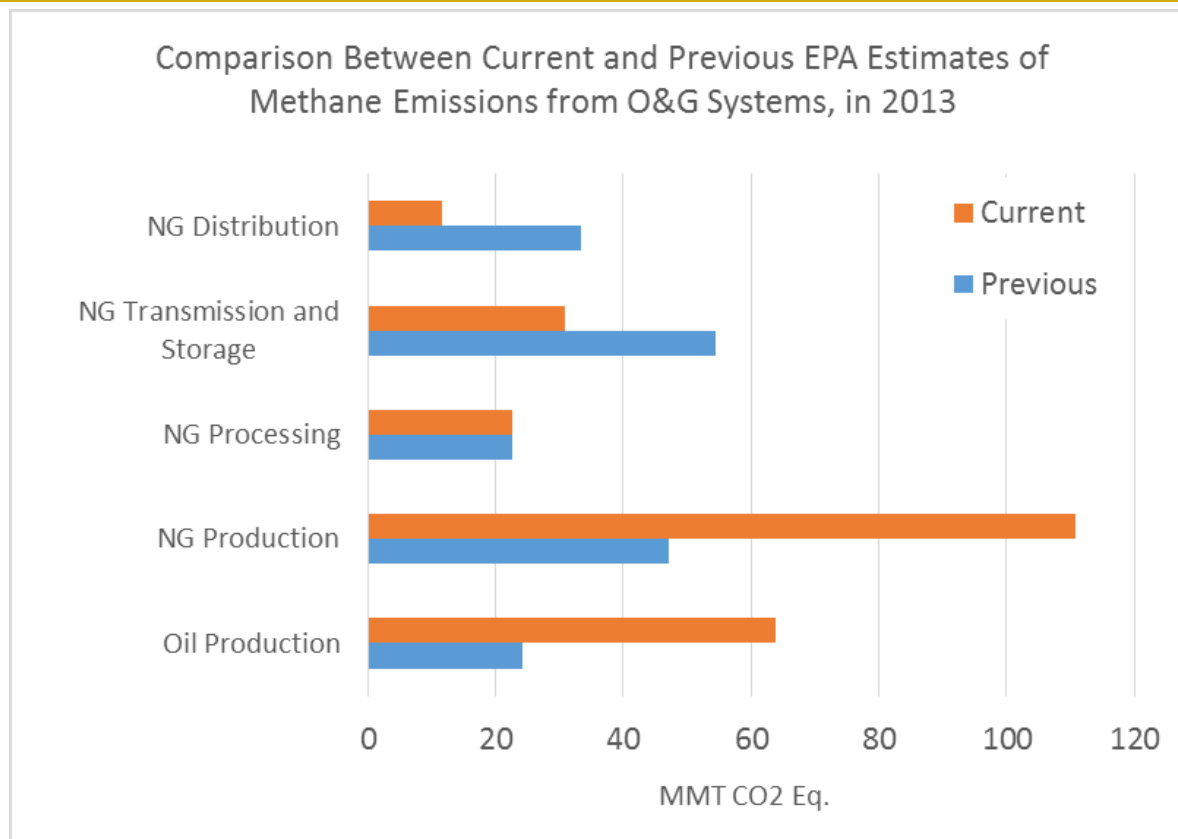
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<http://www.energy.gov/qer>

<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**

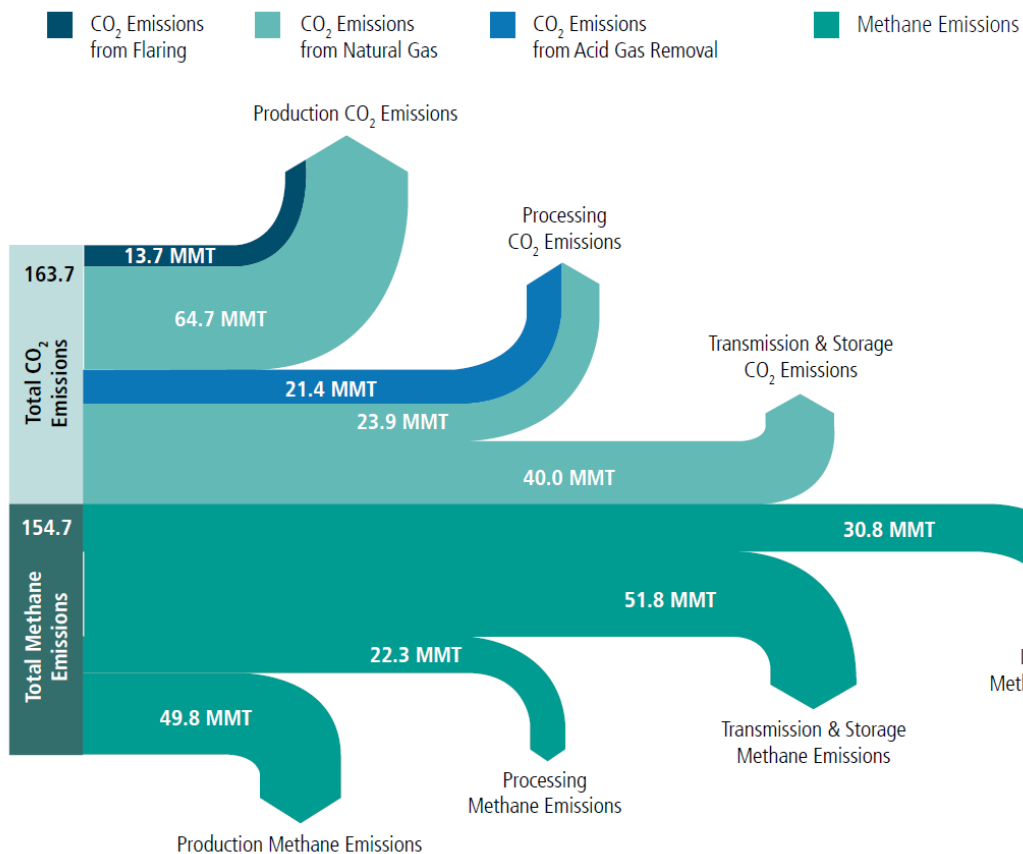
Participants:

- **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

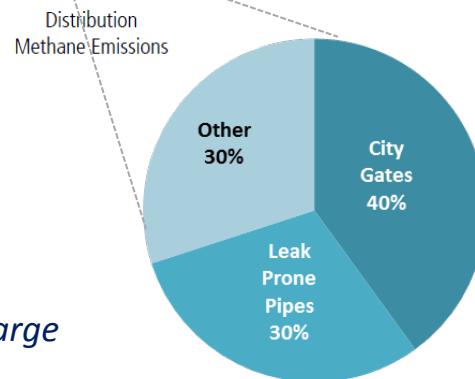


GHG EMISSIONS FROM NATURAL GAS INFRASTRUCTURE (NOT END USE)

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

RESOURCES

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