FACT SHEET: REDUCING METHANE EMISSIONS

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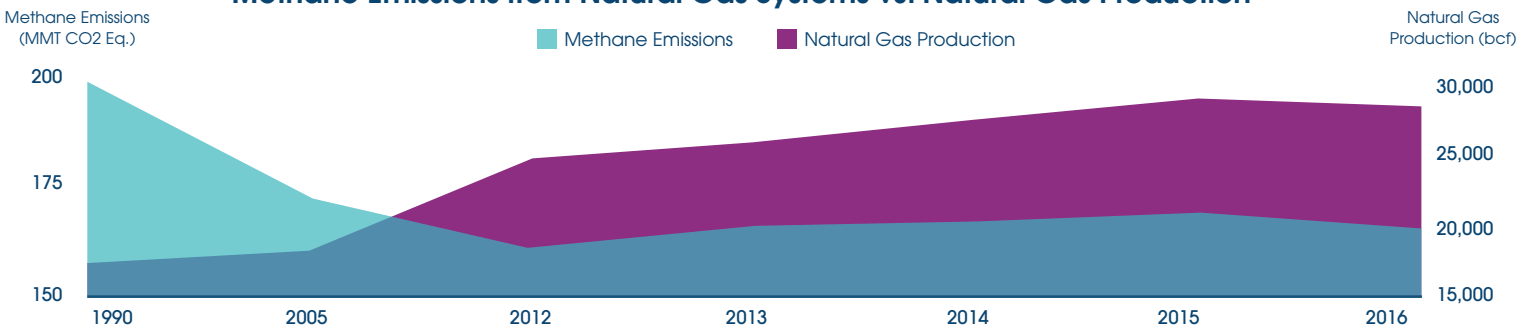
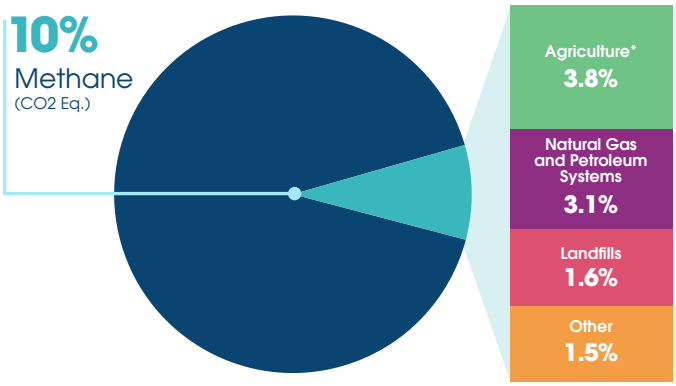
Methane Emissions from Natural Gas Systems vs. Natural Gas Production



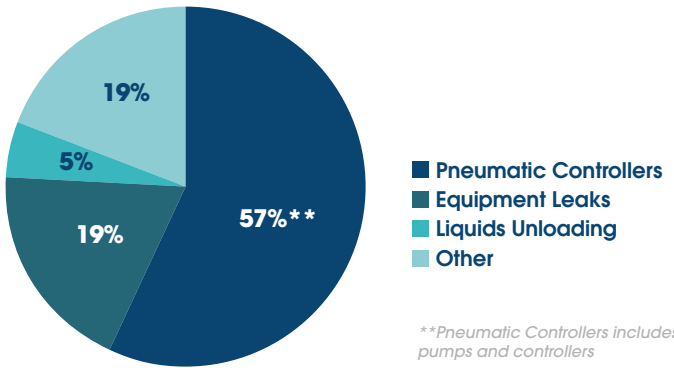
From 1990-2017, methane emissions from **natural gas systems have dropped 14%** during a period when **production has increased more than 50%**. This is effectively **a 43% reduction in the rate of emissions**, further demonstrating industry's continued progress in minimizing emissions as we maximize efficiency in getting energy to the consumer.

Total U.S. Greenhouse Gas Emissions by Sector[1]



*Includes enteric fermentation, manure management, rice cultivation and field burning of agricultural residues

Top Methane Emissions Reductions Opportunities in Industry Operations[2]



**Pneumatic Controllers includes pumps and controllers

Responsibly Developing Energy

- The United States is the world's gold standard when it comes to safe, responsible energy development.
- The U.S. energy revolution has delivered massive economic, environmental and geopolitical benefits and it is clear that the world is better off with the U.S. as the world's leading natural gas and oil producer.
- The industry is taking action to further reduce methane emissions from our operations, continuously developing new technologies and techniques as we innovate and address challenges—while providing affordable energy that's vital to Americans' lives, businesses and commerce, and to all of our futures.

Top Methane Emissions Reductions Opportunities

- **Pneumatic Controllers:** Process control devices powered or actuated by natural gas pressure.
- **Equipment Leaks:** Unintended emissions from flanges, seals, valves, connectors, etc.
- **Manual Liquid Unloading:** Temporarily diverting the flow of natural gas from the well to remove accumulated liquids. It is necessary to remove the liquids so the well can continue to produce.
- **Storage Vessels:** Emission from tanks storing crude oil or natural gas liquids.

[1] https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks
[2] https://www.epa.gov/ghgreporting

Voluntary Efforts to Reduce Methane Emissions

THE ENVIRONMENTAL PARTNERSHIP
An Initiative of the U.S. Natural Gas and Oil Industry

Environmental Partnership

- 55+ natural gas and oil companies
- Programs target the top three methane-reduction opportunities
- First annual report expected in Summer 2019

Oil and Natural Gas Climate Initiatives

- CEO-led initiative
- Membership represents almost 1/3 of global natural gas and oil production
- Committed $1 billion to startups that lower the carbon footprint of the new energy and industrial sectors.

OGCI
OIL AND GAS CLIMATE INITIATIVE

ONE
OUR NATION'S ENERGY
FUTURE

Our Nation's Energy (ONE) Future Coalition

- Members operate in 11 of 19 production basins.
- Goal of reducing methane intensity one percent or less by 2015 (performance-based)
- Achieved rate of .55 percent in 2017, surpassing the 2025 goal.

Methane Emissions Addressed by Federal Regulations

EPA's New Source Performance Standards (NSPS OOOO/OOOOa)

- 2012 rule regulated volatile organic compounds (VOCs) from common oil and natural gas production emission sources (storage vessels, compressors, hydraulically fractured natural gas wells, pneumatic controllers) that, as a co-benefit, also reduced methane emissions.
- 2016 rule was expanded to cover additional emissions sources (equipment leaks, hydraulically fractured oil wells, and pneumatic pumps) and directly regulated methane in addition to VOCs.
- Proposed 2018 amendments, if finalized, will continue to cost-effectively address all the emission sources regulated by the 2012 and 2016 rules.
- The EPA rules effectively address emissions from oil and natural gas sector.

EPA's Control Technique Guidelines (CTGs)

- CTGs are developed by the EPA and intended to provide guidance for states during development of their State Implementation Plans to meet the National Ambient Air Quality Standard for Ozone.
- Reduces VOCs, and methane as a co-benefit, from existing sources in nonattainment areas and states in the Ozone Transport Region.

2018 BLM Waste Prevention Rule

- Protects the public interest by establishing new requirements for drilling and production operations to prevent waste and conserve resources through well-defined criteria and approval processes.

Sources: https://www.eia.gov/dnav/ng/hist/n9070us2A.htm; https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2016; https://www.iea.org/publications/freepublications/publication/ngl2010_free.pdf; http://www.iea.org/publications/freepublications/publication/ngl2010_free.pdf