Natural Gas and New Federal Rules

Implications On Natural Gas Markets

Richard Meyer, Manager Policy Analysis
The American Gas Association (AGA), founded in 1918, represents more than 200 local natural gas utilities that deliver natural gas to 177 million Americans nationwide. In addition, AGA’s broader membership includes natural gas pipelines, Canadian local distribution companies, natural gas gatherers, marketers and storage companies and more than 350 associate members who provide critical products and services to the natural gas industry.
Intended Nationally Determined Contributions

Washington DC energy policy targeting greenhouse gas emissions

Source: White House GHG target submission to UN Framework Convention on Climate Change
Domestic Laws, Regulations, and Measures to Reduce Greenhouse Gas Emissions

Completed
- Appliance and equipment standards
- Light-duty vehicle fuel economy standards
- Approved alternatives to hydro-fluorocarbons

Underway
- CO2 regulations on new and existing power plants
- Methane regulations for oil and gas sector and landfills.
- Heavy-duty vehicle fuel economy standards
- Continuation of HFC reduction
- Appliance and equipment standards, building codes

Enforced Under
- EISA, EPACT
- Clean Air Act
But First:

Natural Gas Systems Contribution to Greenhouse Gas Emissions
Methane accounts for one-tenth of annual greenhouse gas emissions

US GREENHOUSE GAS EMISSIONS

- Carbon Dioxide: 82%
- Methane: 9%
- Nitrous Oxide: 6%
- Other GHGs: 3%

Source: *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2012*, Environmental Protection Agency
Natural gas systems represent a small share of annual GHGs


- All Greenhouse Gases: 6,673 Million Metric Tons CO2-equivalent
- Field Production: 0.7%
- Processing: 0.3%
- Transmission & Storage: 0.8%
- Distribution: 0.5%
- Natural Gas Systems Methane: 2.4%

Source: Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2013, Environmental Protection Agency
Technological advances, industry best practices, and system modernization... 

*add up to a declining emissions trend*

**Natural Gas Systems**

*Methane Emissions*  
(Million Metric Tons of Carbon Dioxide Equivalent)

EPA Estimates of Natural Gas System Methane Emissions Show a Continued Decline  
Source: *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2012*, Environmental Protection Agency
System Modernization Has Been a Decades Long Process and Will Continue

Cast Iron and Unprotected Steel Pipeline (Miles)

Source: Department of Transportation
As a Result, Emissions Have Declined Even as the System Grows

Source: AGA Analysis based on Department of Transportation data and EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2012

*Excludes Reductions from Voluntary Programs
Natural Gas Used Directly In Homes and Businesses Reduces Greenhouse Gas Emissions

Space Heating System Carbon Dioxide Emissions
(Ton CO2 per 100 MW Useful Energy Consumption)

Source: MIT Future of Natural Gas
Appliance efficiencies Energy STAR compliant.
Back to Federal Policy & Natural Gas
Federal Actions on Methane

- EPA New Source Performance Standards for volatile organic compound (VOCs) – “Green Well Completions.”

- January 2015 – Announced goal: Cut methane from oil and gas sector by 40 to 45 percent from 2012 levels by 2025.

- EPA will initiate rulemaking to set standards for methane and VOC emissions for new oil and gas production, and processing and transmission.
EPA’s Proposed Clean Power Plan: 
Goal Setting for Each State

EPA Has Set Goals for Each State Based on Reductions Achievable with Four “Building Blocks”

1. Power Plant Heat Rate Improvements
2. Shift Dispatch to Cleaner Affected Units (Natural Gas Combined Cycle Turbines)
3. Increased Use of Renewable and Nuclear Plants
4. Increased Use of End-use Energy Efficiency

Pleasants Power Plant, Belmont, WV
Flexible Compliance Options

- **Direct use of natural gas** to improve residential efficiency and reduce carbon emissions

![Graph showing residential energy consumption](chart.png)

*Electric system losses* account for half the energy consumed in the US residential sector.

Source: EIA, AGA Calculations
Flexible Compliance Options

• Combined Heat and Power in industrial and commercial applications

CHP Technical Potential by State

DOE Proposes Gas Furnace Standard

Mandates 92% Efficient Gas Furnaces

From the rule

• Costs of equipment & installation
  • $6-12 billion
  • 60% Consumers see zero or negative benefits

• Unintentional fuel switching, leading to increases in energy and emissions.

• CO2 savings only 0.2% from baseline
AGA’s Comments on Residential Furnace Propose Rule

• AGA and its members actively promote energy efficiency

• AGA supports energy conservation standards

• Opposes outcomes that drive uneconomic inefficient fuel switching

• Opposes standards that harm consumers

• Finds flaws in DOE’s analysis
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How much does this reinforce existing trends?

Coal retirements are accelerating and gas is filling the gap

Operational capacity by coal type (GW)

Source: Bloomberg New Energy Finance
How much does this reinforce existing trends?

Renewable build and energy efficiency continues

Cumulative Renewable Capacity (GW)

- Solar
- Wind
- Other

Source: Bloomberg New Energy Finance

Change in US Annual Retail Sales of Electricity (%)
(Index 2007=0)

Energy Information Administration
New data on gas distribution systems

Emissions up to 70% lower than current estimates

Methane Emissions from Natural Gas Utility Systems

- **EPA (2011)**
- **New Data (2015)**

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Source: Lamb et. al., Environment Science and Technology, March 2015
New data on gas production largely confirms EPA’s estimates

Some estimates lower, some higher.

National Emissions Estimates for the Production Sector
(PNAS - Allen, et. al.)

- Completion flowbacks
- Chemical Pumps
- Pneumatic Controllers
- Equipment Leaks
- Subtotal, National

EPA GHG Inventory
Allen et. al.
Natural gas reduces greenhouse gases
unconventional (shale) gas similar to conventional gas, both better than coal

*Proceedings of the National Academy of Sciences*

“Harmonization of initial estimates of shale gas life cycle greenhouse gas emissions for electric power generation”
Heath, et.al
Lower lifecycle greenhouse gas emissions from natural gas means LNG exports can displace coal, lower overall emissions.