

---

# Arguments for Stricter Controls of Methane Emissions: How Valid Are They?

---

Ken Costello  
Principal Researcher  
National Regulatory Research Institute  
kcostello@nrri.org

NARUC Subcommittee on Gas

July 12, 2015

# Methane Emissions from the Top Seven Sources, 2013\*

Source	Amount of Methane Emissions (MMT CO <sub>2</sub> Eq.)	Percent of Total Methane Emissions
Enteric fermentation	164.5	25.9%
Natural gas systems	157.4	24.7
Landfills	114.6	18.0
Coal mining	64.6	10.2
Manure management	61.4	9.6
Petroleum systems	25.2	4.0
Wastewater treatment	15.0	2.4

\* Source: U.S. Environmental Protection Agency. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013*. April 2015.

# Methane Emissions from Different Natural Gas Functions since 1990 (MMT CO<sub>2</sub> Eq.)\*

Function	1990	2005	2009	2010	2011	2012	2013
Field production	59.5	75.5	62.0	56.5	51.3	49.7	47.0
Processing	21.3	16.4	19.2	17.9	21.3	22.3	22.7
Transmission and storage	58.6	49.1	52.7	51.6	53.9	51.8	54.4
Distribution	39.8	35.4	34.1	33.5	32.9	30.7	33.3
<b>Total</b>	<b>179.1</b>	<b>176.3</b>	<b>168.0</b>	<b>159.6</b>	<b>159.3</b>	<b>154.4</b>	<b>157.4</b>

\* Source: U.S. Environmental Protection Agency. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013*. April 2015.

# Methane Emissions by Natural Gas Function, 2013 (MMT CO<sub>2</sub> Eq.)

---

• Field production	47.0 (30%)
• Processing	22.7 (14%)
• Transmission and storage	54.4 (35%)
• Distribution	33.3 (21%)

---

(**Note:** Gas distribution contributes about 0.5% of U.S. GHG emissions, while the entire natural gas supply chain contributes about 2.4%)

\* Source: U.S. Environmental Protection Agency. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013*. April 2015.

# Relative Level of Methane Emissions from Gas Distribution, 2013\*

Source	Amount of Methane Emissions (MMT CO <sub>2</sub> Eq.)	Percent of Total
<b>Total U.S. GHG emissions</b>	6,673	-
<b>From fossil fuel combustion</b>	5,158	77%
• From electricity generation	2,040	31
• From vehicles	1,718	26
<b>From natural gas system (CH<sub>4</sub>)</b>	157	2
<b>From gas distribution (CH<sub>4</sub>)</b>	33	0.5

\* Source: U.S. Environmental Protection Agency. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013*. April 2015.

# Change in GHG Emissions by Source, 1990-2013 (MMT CO<sub>2</sub> Eq.)

Source	Percentage Change
Total CO <sub>2</sub>	7.4 <sup>0</sup> %
CO <sub>2</sub> from electricity generation	12
CO <sub>2</sub> from transportation	15
Total methane	-14.7
Methane from enteric fermentation	0
Methane from natural gas system	-12.3
Methane from gas distribution	-16.3

\* Source: U.S. Environmental Protection Agency. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013*. April 2015.

# Arguments for Stricter Controls of Methane Emissions: How Valid?

---

- Some companies have failed to achieve full potential of methane control technologies that are currently cost-effective.
- Voluntary actions have been deficient given the severity of the problem; in other contexts, voluntary actions have had limited success.
- Since EPA has proposed to control CO<sub>2</sub>, a natural next step is to control methane emissions, which would have relatively low costs.
- Gas utilities and state utility commissions should place a higher priority on methane emissions.

# Arguments for Stricter Controls of Methane Emissions: How Valid? – *continued*

---

- Society should demand that all companies further engage in controlling methane emissions, since the cost is insignificant and recent studies have shown that climate change is occurring more rapidly than previously expected.
- Additional efforts to reduce methane emissions by gas distributors are defensible from society's perspective.
- Substantial industry-wide, methane-emissions reductions to meet the Obama Administration's GHG targets demand that best practices become mandatory.



# Arguments for Stricter Controls of Methane Emissions: How Valid? – *continued*

---

- Further reductions in methane emissions across the entire natural gas supply chain would better ensure that switching to natural gas has a lesser effect on global warming than alternative fuels, such as coal for boiler use and diesel fuels for transportation.
- Gas companies can eliminate “unnecessary” leaks and venting in their systems quickly and at little costs.
- Market failure in the classic sense of firms not externalizing certain societal costs partly explains gas companies’ under-allocation of resources toward methane-emissions control. Another factor is companies’ not availing themselves of additional profits.

# The “Big Questions” for Policymakers

- Prioritizing actions for reducing GHG emissions
- Incentives for methane-emissions mitigation
- Appropriate actions under high uncertainty
- Special feature of methane emissions as a pollutant
- Merits of more stringent regulations
- Limits of voluntary actions

# Questions for State Public Utility Commissions

- Should gas utilities do more to mitigate methane emissions?
- What are the costs of reducing methane emissions?
- What incentives do gas utilities have to reduce methane emissions?
- What should state utility commissions take into account in considering the reduction of methane emissions by gas utilities?
- What positions have gas utilities taken on how, and how much, to control methane emissions?
- What priority or attention should gas utilities and state utility regulators place on methane emissions?
- What should be the objective of a methane-emissions reduction strategy
- What metric or benchmark should regulators apply to assess a utility's performance in controlling methane emissions?
- Given that methane emissions from the gas distribution system comprise an extremely small portion (0.5%) of the total GHG in the U.S., *would additional efforts to reduce methane emissions be defensible from a cost-benefit perspective?*