

The American Gas Association, founded in 1918, represents more than 200 local energy companies that deliver clean natural gas throughout the United States.

AGA represents 100% of the investor-owned gas utilities in the country.

There are more than 72 million residential, commercial and industrial natural gas customers in the U.S., of which 94 percent — over 68 million customers — receive their gas from AGA members.

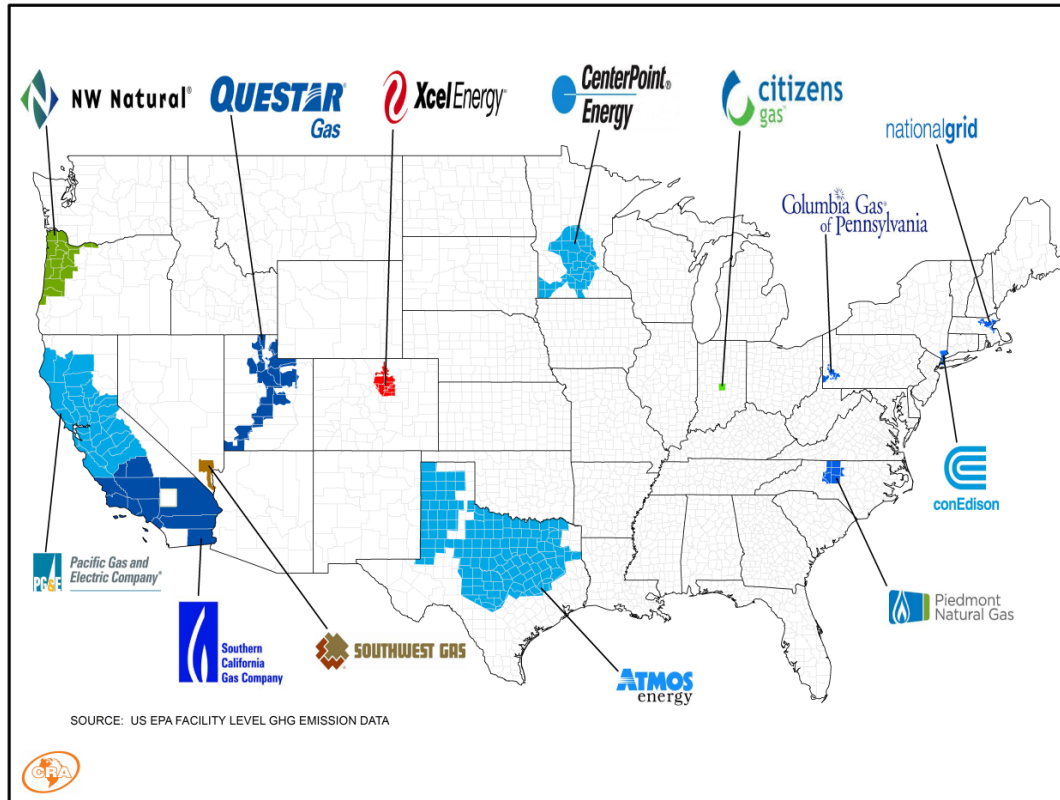


WSU Distribution Study: Vastly Improved Data for Emission Factors

- **Lamb, Washington State University (WSU) Multi-City Distribution Study (March 31, 2015)**
 - Sponsor-Participants: AGA and 13 AGA member companies
 - Wide geographic distribution
 - objective was to collect new measurements to update the Emission Factors for major source categories (distribution pipeline leaks and metering and regulating - M&R stations)
- **guided random sample selection process**
 - Focused on top 8 emitting categories from the current EPA methane inventory
- **For each Local Distribution Company (LDC):**
 - identified a city or region for measurements within the LDC service area
 - randomly selected leaks to measure from lists of LDC surveyed leaks
 - measured all (or as many as possible) of the M&R facilities within the region of interest

WSU Study

Participating AGA Members & Service Territories



Study partners

represent 19 percent of the distribution pipeline mileage and

deliver 16 percent of the gas to customers in the U.S. (2011).

Wide geographic coverage

Methodology for Measuring Distribution Pipeline Leaks



Lamb, Washington State University Multi-City Distribution Study (March 31, 2015):

- 1. Map surface area of a leak using a portable sniffer*
- 2. Use a flexible surface enclosure to capture the leak*
- 3. Measure emissions using a calibrated high-flow sampler*

Methodology for Measuring M&R Stations



- *Screen every component and device for emissions*
- *Measure component emissions with a high flow sampler*
- *Use a recording high flow system for vented devices*
- *Conduct daily calibration*
- *Perform tracer ratio tests at selected stations for QA*

WSU Study Far More Robust than 1992 GRI-EPA Study

- **Broader Field deployments**
 - Four eastern US gas distribution systems were sampled
 - Four central US gas distribution systems were sampled
 - Four western US gas distribution systems were sampled
 - Nine M&R facilities from the GRI/EPA study re-visited in the Northeast
- **Significantly More Measurements completed**
 - 230 underground pipeline measurements
 - 229 above ground and vaulted facilities measured
 - 57 tracer ratio measurements
- **More than double the data points compared to 1992 study**
- **Reflect current operations – not 20 years ago**

M&R Emission Factors

- WSU Emission Factors (EFs) were **significantly lower** than GRI/EPA 1992 estimates (**factor of 4 to 13** overall, with only one exception)
- Revisits to 1992 study sites showed that reductions in EFs can be **attributed to equipment upgrades**
- **Underground Vaulted facilities had much lower emissions compared to above ground sites – need updated EF for vaults**

AGA's Recommended Changes

- **Update Subpart W and Inventory EF's for Distribution Mains & Services using WSU data – especially:**
 - **PE Plastic Pipe** vs. vintage Plastic Pipe
 - **Cast Iron as Conduit for PE Plastic Pipe (Sleeved)**
 - **Renovated Cast Iron** – Flexible Plastic Liner or robot-repaired joints
 - **Unprotected Steel**
- **Allow Activity Factor based on # Leaks rather than Miles of Pipe**
- **Update Subpart W and Inventory EF's for M&R's based on WSU study and Subpart W Reporting**
- **Update Underground Vault M&R Emission Factor -- based on new data rather than current inflated default EF**

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