



Petroleum and Natural Gas Systems in the Greenhouse Gas Reporting Program Transmission and Storage Segment

U.S. Environmental Protection Agency
Office of Atmospheric Programs, Climate Change Division

Description of Segments that Include Transmission and Storage Activity



- Subpart W of the GHGRP has several segments that span the general transmission and storage space:
 - Natural Gas Transmission Compressor Stations
 - Underground Natural Gas Storage
 - Liquefied Natural Gas (LNG) Storage
 - LNG Import-Export Equipment
- A “facility” for purposes of these segments means all co-located emission sources that are commonly owned or operated (i.e. individual compressor station).

Description of Segments that Include Transmission and Storage Activity



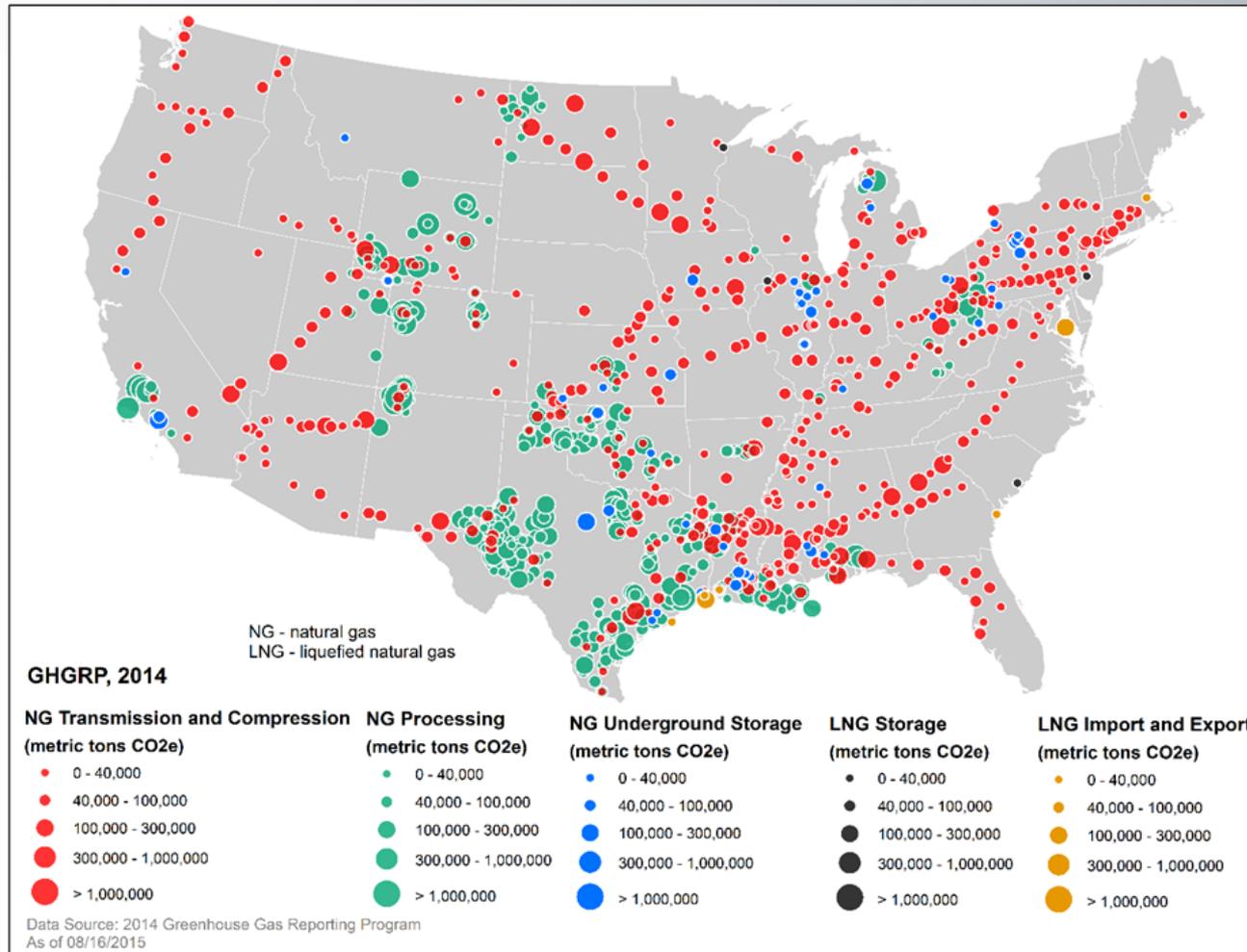
- Onshore natural gas transmission compression generally means a compressor station that assists in the transport of natural gas.
- Underground natural gas storage generally means a subsurface natural gas storage station and associated equipment.
- Liquefied natural gas (LNG) storage generally means onshore LNG storage vessels located above ground and associated equipment.
- LNG import-export equipment generally means all onshore or offshore equipment that receives imported or transports exported LNG.

Emission Sources



- Blowdown vent stacks
- Centrifugal compressors
- Combustion equipment (reported under subpart C)
- Equipment leaks
- Pneumatic devices
- Reciprocating compressors
- Transmission tanks

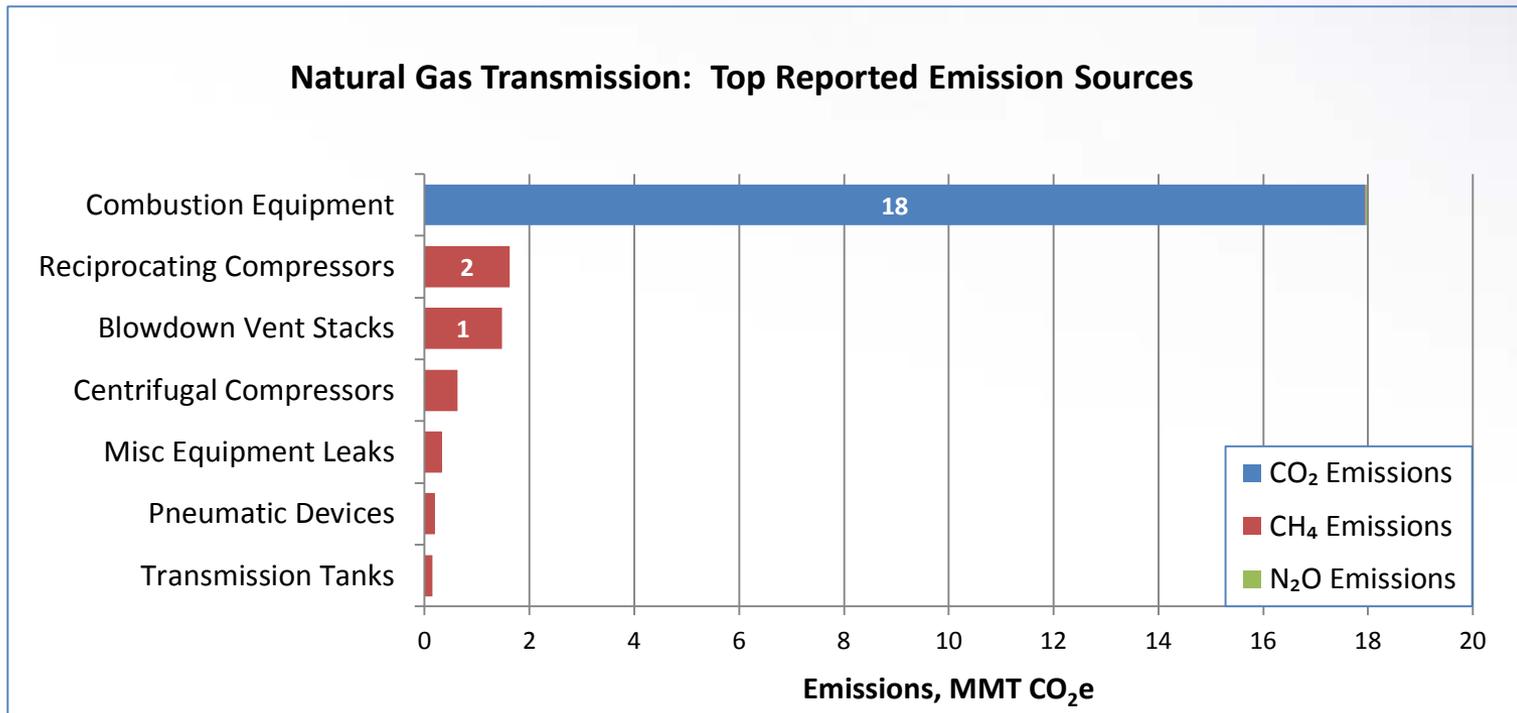
2014 GHGRP Emissions by Segment



2014 Natural Gas Transmission Emissions by Emission Source



- Reported emissions in natural gas transmission totaled 22.4 MMT CO₂e
- 521 facilities reported under this sector
- Methane emissions totaled 4.4 MMT CO₂e and carbon dioxide emissions totaled 18.0 MMT CO₂e

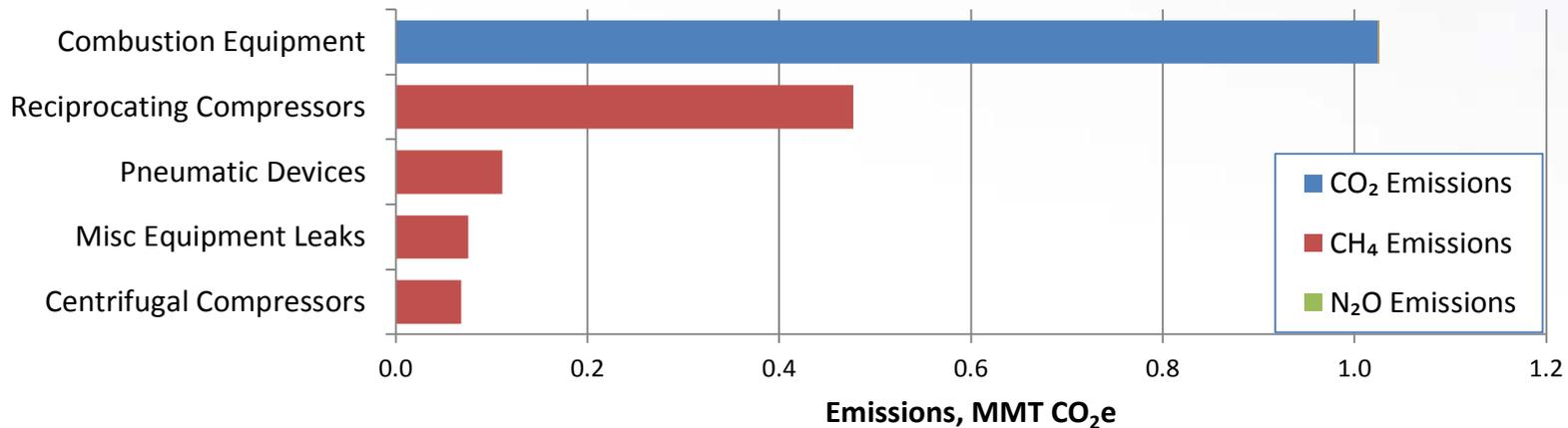


2014 Underground Natural Gas Storage Emissions



- Reported emissions from underground natural gas storage totaled 1.7 MMT CO₂e
- 53 facilities reported under this sector
- Methane emissions totaled 0.7 MMT CO₂e and carbon dioxide emissions totaled 1.0 MMT CO₂e

Underground Natural Gas Storage: Top Reported Emission Sources



Select Newly Reported Activity Data



- Count of pneumatic devices – low bleed, intermittent bleed, high bleed
- Dehydrator feed natural gas flow rate
- Dehydrator total operating time
- Volume of gas sent to each flare
- Total time a centrifugal / reciprocating compressor was in operating mode / shutdown mode
- Compressor reporter emission factor for wet seal oil degassing vents / blowdown vents / isolation valve vents

Reported Activity Counts: 2011-2014



Industry Segment	Source Type	2011 Count	2012 Count	2013 Count	2014 Count
Natural Gas Transmission	Reporting Facilities	421	457	487	520
	Pneumatic Devices	11,187	11,105	11,115	13,392
	Centrifugal Compressors	630	727	789	841
	Reciprocating Compressors	1,900	1,978	2,087	2,165
Underground Natural Gas Storage	Reporting Facilities	49	52	51	53
	Pneumatic Devices	2,894	2,958	2,985	3,635
	Centrifugal Compressors	36	40	36	36
	Reciprocating Compressors	301	338	341	351

Considerations for Future Reporting Years



- Select changes for the 2015 reporting year:
 - Volumetric emissions from manifolded compressors can be measured at the common vent stack instead of measuring at each compressor.
 - Vented compressor emissions routed to a flare will be reported in the flared emissions total rather than in the compressor emissions total.
 - Facilities have the option to directly measure blowdown emissions.
 - Modified list of “equipment or event types” for categorizing blowdowns.
- Select changes for the 2016 reporting year:
 - Reporting of natural gas transmission pipelines, was added to Subpart W on October 22, 2015 (80 FR 64262) with national-level “facility” definition.
 - Report transmission pipeline blowdowns between compressor stations.