



Greenhouse Gas Reporting Program Petroleum and Natural Gas Systems

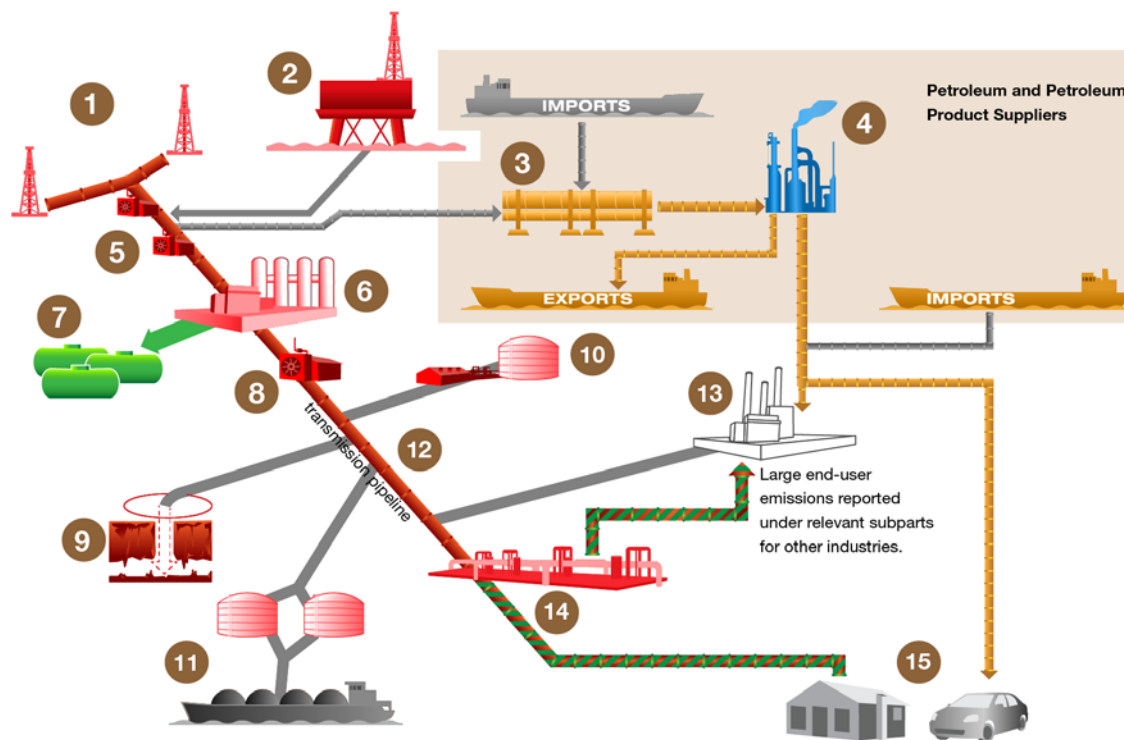
U.S. Environmental Protection Agency
November 2020

Overview of GHG Reporting Program



- Launched in response to FY 2008 Consolidated Appropriations Act
- Annual reporting of GHGs by 41 source categories
 - 33 types of direct emitters
 - 6 types of suppliers of fuel and industrial GHGs
 - Facilities that inject CO₂ underground for geologic sequestration, enhanced oil recovery, or any other purpose
- Most source categories began collecting data in 2010
 - An additional 12 source categories began collecting data in 2011
 - We now have 10 years of data for 29 source categories and 9 years of data for 12 source categories
- Facilities use uniform methods prescribed by the EPA to calculate GHG emissions, such as direct measurement, engineering calculations, or emission factors derived from direct measurement
 - In some cases, facilities have a choice of calculation methods for an emission source
- Direct reporting to EPA electronically
- EPA verification of GHG data

GHGRP and the Oil and Gas Industry



Production & Processing

1. Onshore Petroleum & Natural Gas Production
2. Offshore Petroleum & Natural Gas Production
3. Total Crude Oil to Refineries
4. Petroleum Refining
5. Gathering and Boosting
*Data collection began in RY 2016
6. Gas Processing Plant
*May contain NGL Fractionation equipment
7. Natural Gas Liquids (NGL) Supply

Natural Gas Transmission & Storage

8. Transmission Compressor Stations
9. Underground Storage
10. Liquefied Natural Gas (LNG) Storage
11. LNG Import-Export Equipment
12. Natural Gas Transmission Pipeline
*Data collection began in RY 2016

Distribution

13. Large End Users
14. Natural Gas Distribution
15. Natural Gas & Petroleum Supply to Small End Users

	Subpart W: Emissions from petroleum & natural gas systems
	Subpart Y: Emissions from petroleum refineries
	Subpart MM: CO ₂ associated with supplies of petroleum products
	Subpart NN: CO ₂ associated with supplies of natural gas & natural gas liquids
	Not reported under GHGRP

What is a Facility?



- In general, a “facility” for purposes of the GHGRP means all co-located emission sources that are commonly owned or operated
- However, certain industry segments within the Petroleum and Natural Gas Systems source category have unique “facility” definitions
 - Onshore production: the “facility” includes all emissions associated with wells owned or operated by a single company (the permit holder) in a specific hydrocarbon producing basin (as defined by the geologic provinces published by the American Association of Petroleum Geologists)
 - Natural gas distribution: the “facility” is a local distribution company as regulated by a single state public utility commission
 - Gathering and boosting: a “facility” means all gathering pipelines and other equipment located along those pipelines that are under common ownership or common control by a gathering and boosting system owner or operator and that are located in a single hydrocarbon
 - Natural gas transmission pipeline, a “facility” means the total U.S. mileage of natural gas transmission pipelines, owned and operated by an onshore natural gas transmission pipeline owner or operator
- The other industry segments in the Petroleum and Natural Gas Systems source category follow the general GHGRP definition of “facility”

Reporting Year 2020 Subpart W Preview Materials



- Draft versions of the RY2020 Subpart W reporting materials were made available for comments and suggestions
 - Subpart W reporting form
 - Optional calculation workbook
 - XML schema
- Changes to the Optional Calculation Workbook were limited to changes to improve usability. There are no Subpart W reporting form or schema changes this year.
- Please note that preview versions of the reporting form and schema are subject to review and correction and may change prior to final release.
- Access the preview materials here:

<https://ccdsupport.com/confluence/display/help/RY2020+Subpart+W+Preview+Materials>



Petroleum and Natural Gas Systems Data Summary

Reporting Year 2019 Data Release

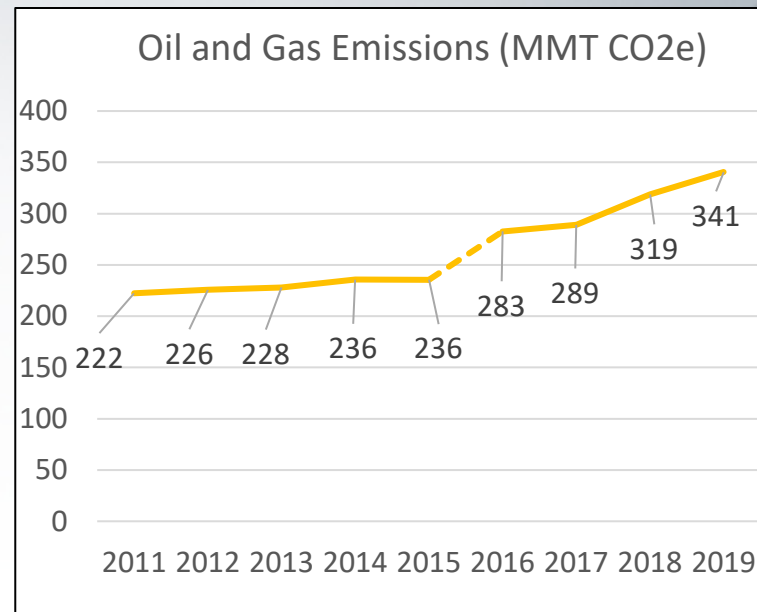


- Reporting Year 2019 data released in Nov. 2020
- Total reported direct emissions decreased by 4.7% compared to 2018
- There has been a long-term trend in a decrease in emissions since 2011. This longer-term decline in emissions is primarily driven by a reduction in emissions from power plants of nearly 25% from 2011 to 2019
- There is a 6.8% increase in emissions from oil and gas from 2018 to 2019, which is a largely a result of increased flaring emissions

Oil and Gas – Overall Trend



- EPA collected data from 2,350 facilities conducting oil and gas activities across the value chain, such as production, gathering and boosting, processing, transmission and distribution
- Total reported GHG emissions were 341 MMT CO₂e, an increase of 6.8% from 2018 to 2019



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6.8%

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N/A*

* Facilities in the Gathering and Boosting and Transmission Pipeline industry segments began reporting in 2016.

Reported GHG Emissions by Industry Segment



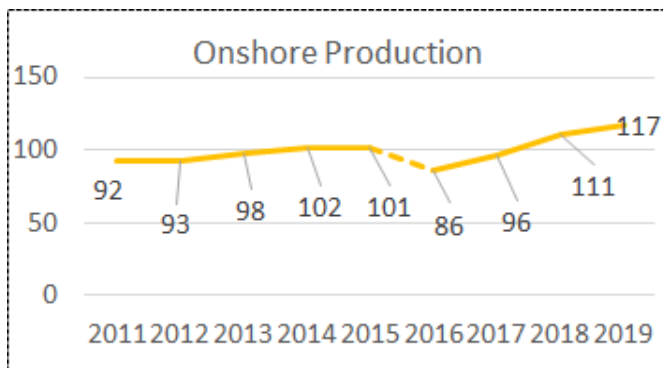
- EPA received annual reports from 2,350 facilities
- Reported emissions totaled 341 Million Metric Tons (MMT) CO₂e
- Largest segments in terms of reported GHG emissions were onshore production, gathering and boosting, and natural gas processing

Segment	Number of Facilities	2019 Reported Emissions (Million Metric Tons CO ₂ e)
Onshore Production	478	117
Offshore Production	141	7
Gathering and Boosting	354	92
Natural Gas Processing	454	58
Natural Gas Transmission Compression	619	31
Natural Gas Transmission Pipeline	43	3
Underground Natural Gas Storage	49	2
LNG Import/Export	11	10
LNG Storage	5	<1
Natural Gas Distribution	163	13
Other Oil and Gas Combustion	56	8
Total	2,350	341

Onshore Production



- Reported emissions in onshore production totaled 117.0 MMT CO₂e
- Methane emissions totaled 44.6 MMT CO₂e and carbon dioxide emissions totaled 72.3 MMT CO₂e
- Combustion equipment (36.2 MMT CO₂e) and pneumatic devices (25.5 MMT CO₂e) were the top reported emission sources in onshore production



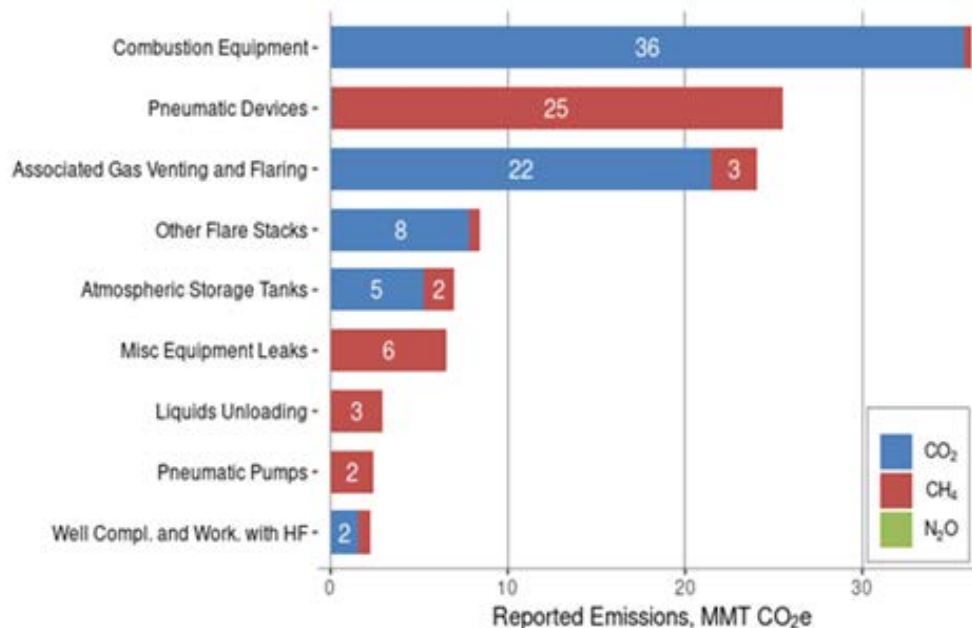
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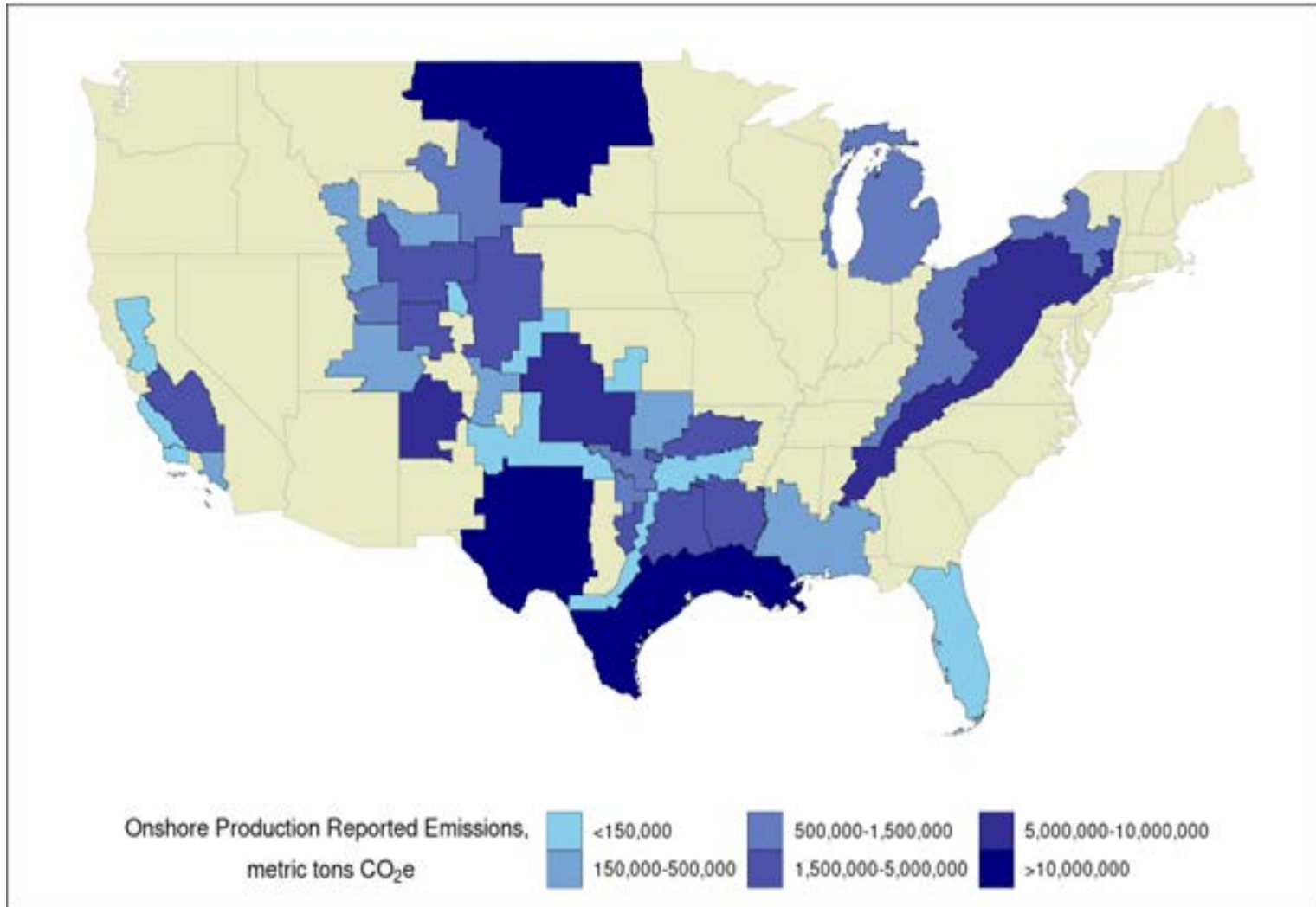
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2019 Onshore Production: Top Reported Emission Sources



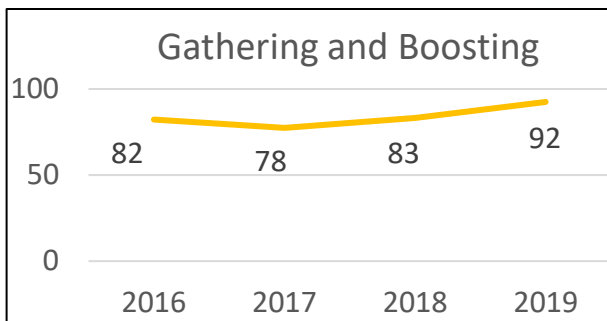
Onshore Production Basins



Gathering and Boosting



- The gathering and boosting segment was first reported in 2016
- Reported emissions from gathering and boosting totaled 92.5 MMT CO₂e
- Methane emissions totaled 22.6 MMT CO₂e and carbon dioxide emissions totaled 69.8 MMT CO₂e
- The top reported emission sources were combustion equipment (63.5 MMT CO₂e), atmospheric storage tanks (6.2 MMT CO₂e) and miscellaneous equipment leaks (5.2 MMT CO₂e)



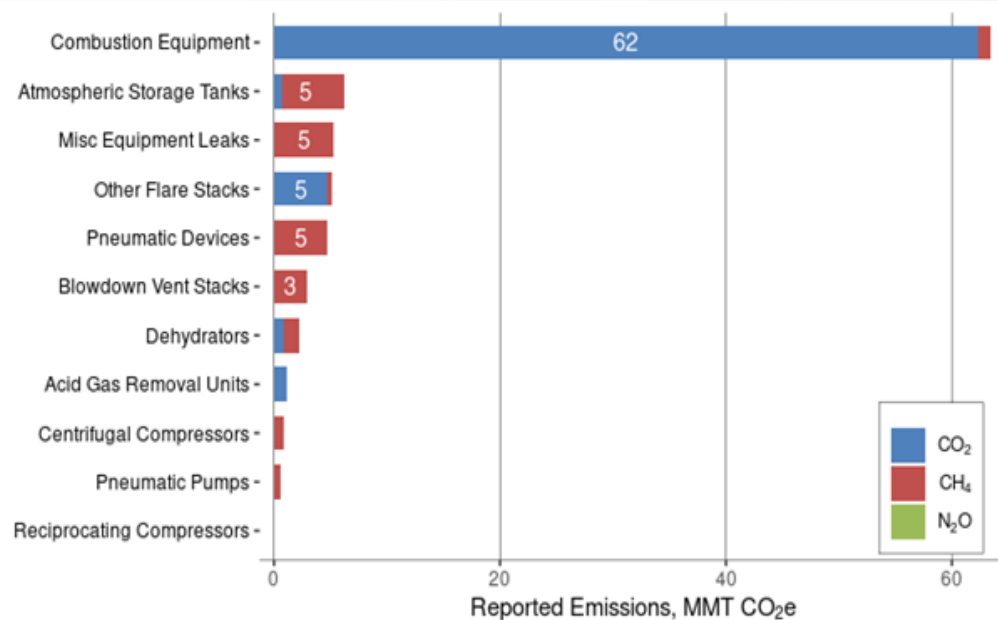
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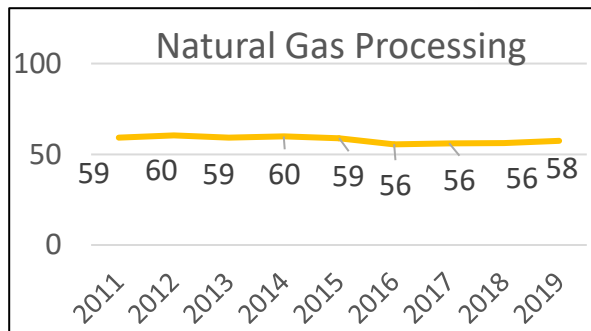
2019 Gathering and Boosting: Top Reported Emission Sources



Natural Gas Processing



- Reported emissions from natural gas processing totaled 57.5 MMT CO₂e
- Methane emissions totaled 2.7 MMT CO₂e and carbon dioxide emissions totaled 54.8 MMT CO₂e
- The top reported emission sources were combustion equipment (38.0 MMT CO₂e), acid gas removal units (11.2 MMT CO₂e), and other flare stacks (6.0 MMT CO₂e)



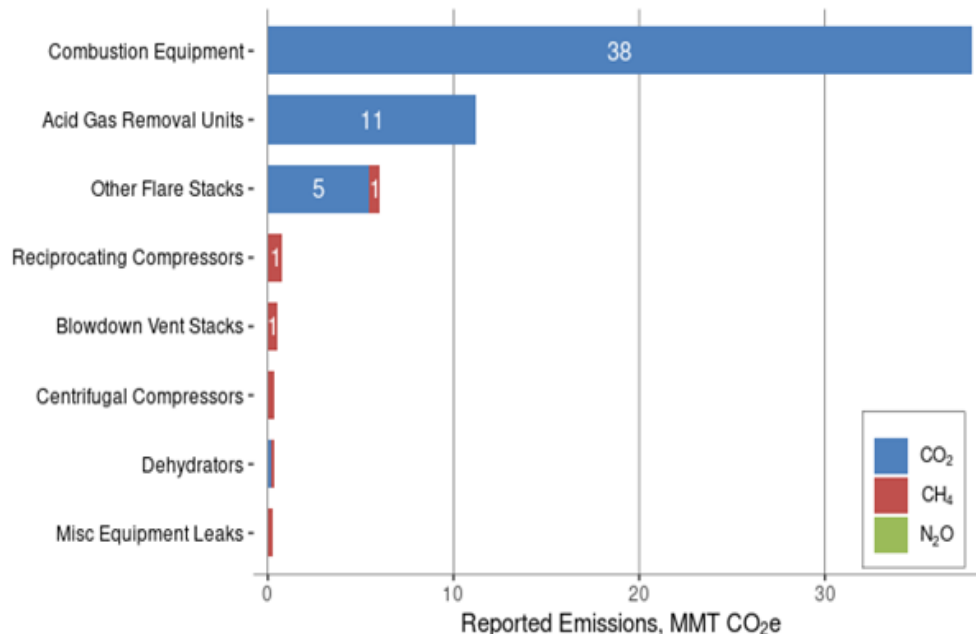
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2019 Natural Gas Processing: Top Reported Emission Sources

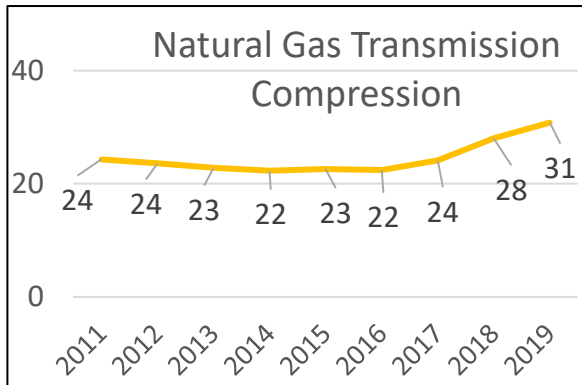


Natural Gas Transmission Compression



- Reported emissions from natural gas transmission compression totaled 30.8 MMT CO₂e
- Methane emissions totaled 4.1 MMT CO₂e and carbon dioxide emissions totaled 26.7 MMT CO₂e
- Top reported emission source was combustion equipment (26.7 MMT CO₂e)

2019 Natural Gas Transmission Compression: Top Reported Emission Sources

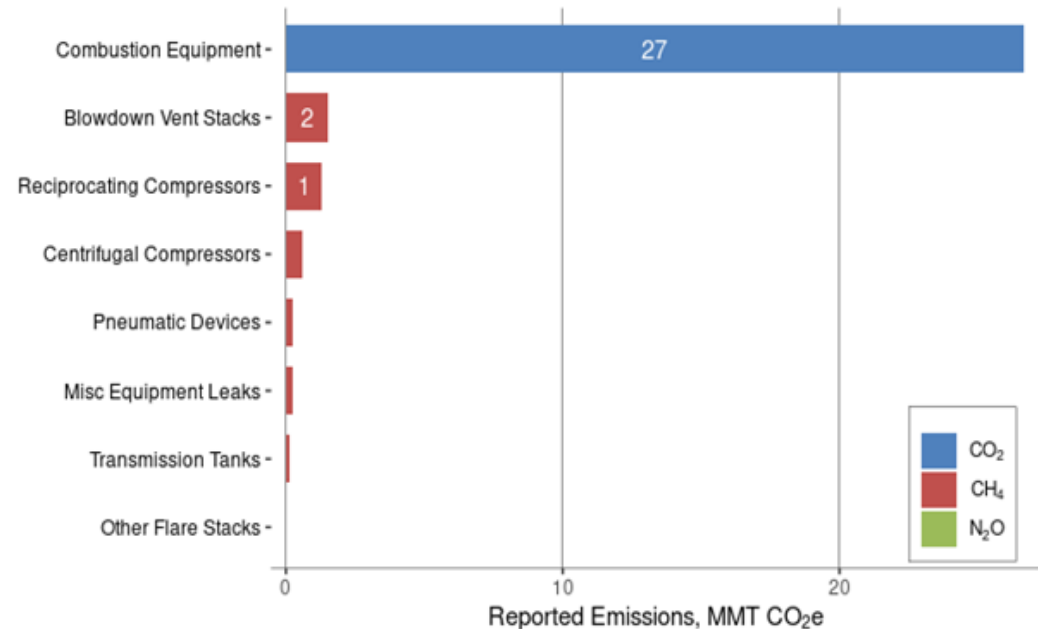


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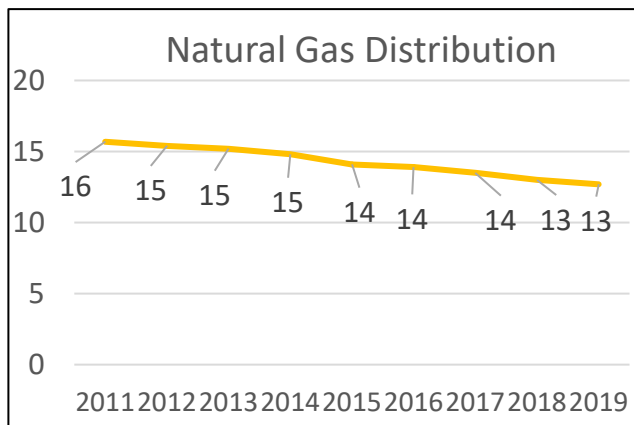
26.8%



Natural Gas Distribution



- Reported emissions from natural gas distribution totaled 12.7 MMT CO₂e
- Methane emissions totaled 12.5 MMT CO₂e and carbon dioxide emissions totaled 0.2 MMT CO₂e
- Distribution mains (8.6 MMT CO₂e) and distribution services (3.7 MMT CO₂e) accounted for the majority of reported emissions



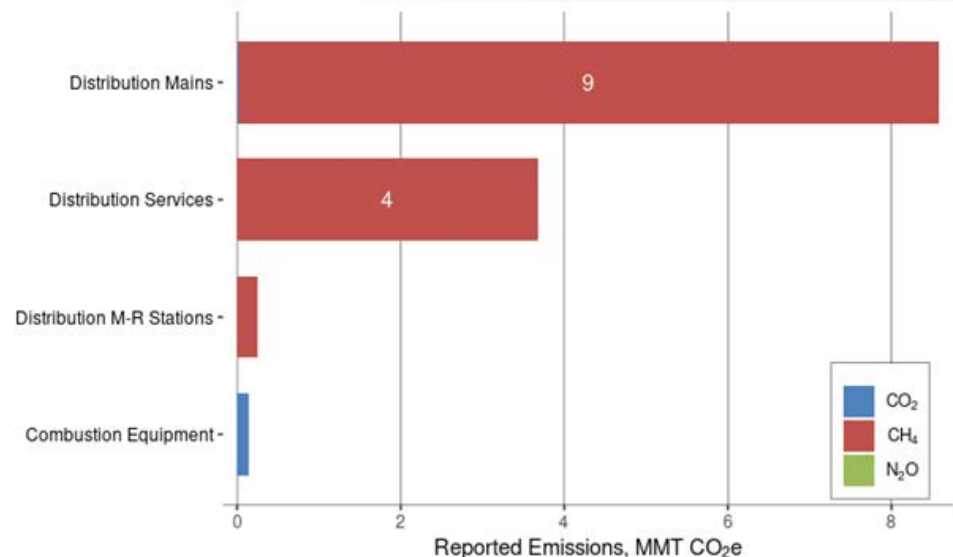
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2019 Natural Gas Distribution: Top Reported Emission Sources



How to Access GHGRP Data on Petroleum and Natural Gas Systems



- EPA has several data portals to access data collected by the GHGRP on Petroleum and Natural Gas Systems
- EPA's easy-to-use Facility Level Information on GreenHouse gas Tool (FLIGHT) allows users to view GHG data from Petroleum and Natural Gas Systems in a variety of ways
 - View GHG data reported by individual facilities
 - Aggregate reported emissions based on industry segment or geographic level
 - Search for facilities by name, location, corporate parent, or NAICS code
 - Visit FLIGHT: <http://ghgdata.epa.gov>
- Detailed non-CBI data is available on the Envirofacts
 - Access GHG data on Envirofacts: <http://www.epa.gov/enviro/facts/ghg/search.html>

Other GHGRP Resources



- GHGRP Subpart W website:
<http://www.epa.gov/ghgreporting/subpart-w-petroleum-and-natural-gas-systems>
- GHGRP Subpart W Industrial Profile:
<https://www.epa.gov/ghgreporting/ghgrp-petroleum-and-natural-gas-systems-sector-industrial-profile>
- GHGRP Help Desk: GHGReporting@epa.gov