



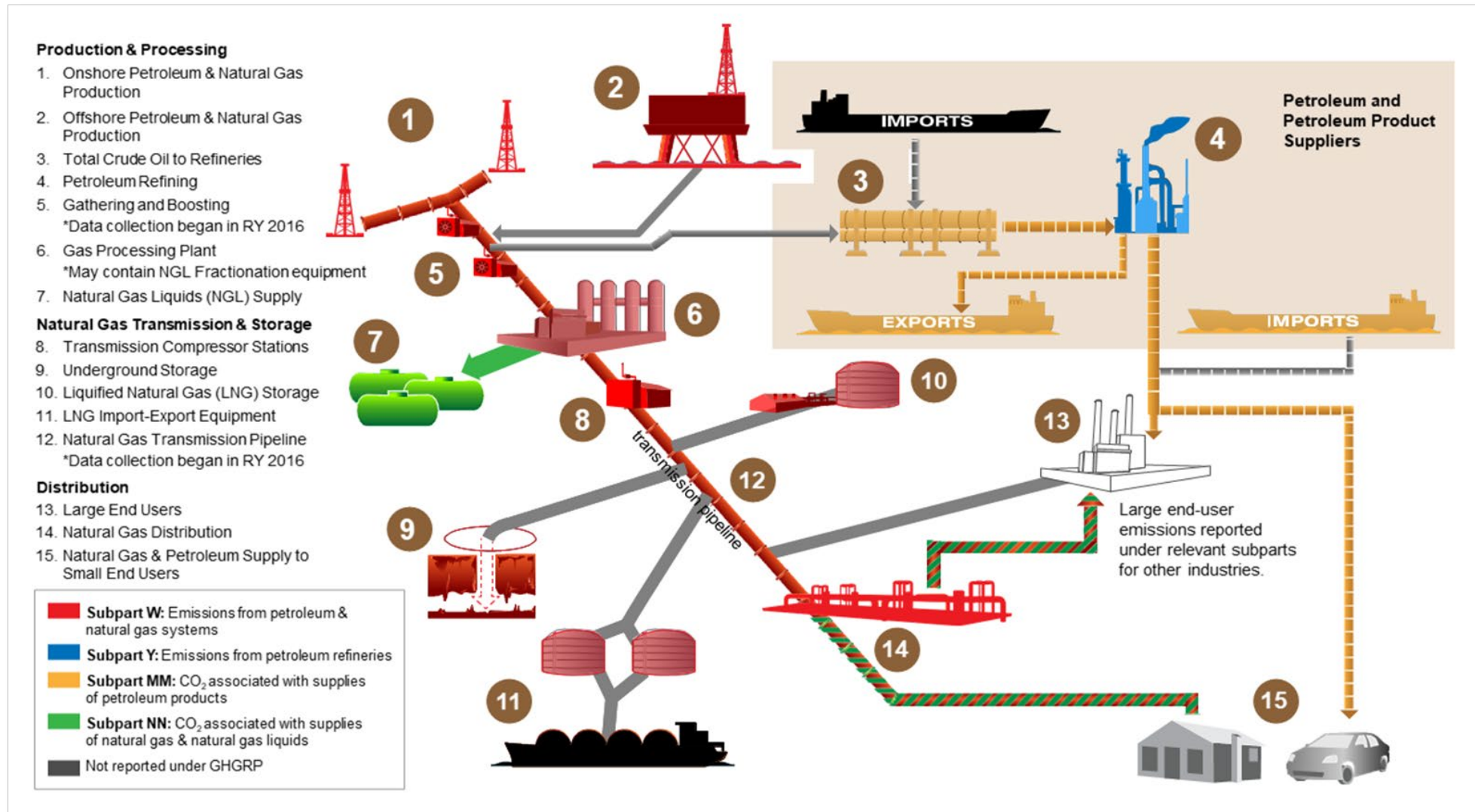
GREENHOUSE GAS REPORTING PROGRAM PETROLEUM AND NATURAL GAS SYSTEMS

U.S. Environmental Protection Agency
November 2022

Overview of the Greenhouse Gas Reporting Program (GHGRP)

- Launched in response to Fiscal Year 2008 Consolidated Appropriations Act and codified at 40 CFR Part 98
- 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
- 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 via EPA electronic GHG Reporting Tool (e-GGRT)
- EPA verification of GHG data

GHGRP and the Oil and Natural Gas Industry



Reporting Year 2022 Subpart W Reporting Materials

- Draft versions of the Reporting Year (RY) 2022 Subpart W reporting materials were made available for comments and suggestions (comment period is now closed)
 - Subpart W reporting form
 - Optional calculation workbook
 - XML schema
- There are no Subpart W reporting form or schema changes for RY2022
- A calculation correction was made on the '(f) Liquids Unloading' sheet in the Optional Calculation Workbook
- Please note that preview versions of the reporting form and schema are subject to review and correction and may change prior to final release. EPA is currently evaluating the comments that were received and will release final versions of the reporting materials following review of all the comments.

GHGRP June 2022 Proposed Amendments

- In June 2022, the EPA proposed amendments to the GHGRP to:
 - Improve the quality and consistency of the data collected under the rule
 - Streamline and improve implementation
 - Clarify or propose minor updates to certain provisions that have been the subject of questions from reporting entities
- The proposed amendments include:
 - Amendments to calculation and monitoring methods that reflect an improved understanding of emissions sources and end uses of GHGs.
 - Amendments that would require reporting of additional data to understand new emissions sources for specific sectors, improve the EPA's understanding of the sector-specific processes or other factors that influence GHG emission rates, improve verification of reported data, and complement or inform other EPA programs.
 - Amendments that would streamline requirements and improve implementation by providing flexibility, increasing efficiency, and clarifying certain provisions.

June 2022 Proposed Amendments for Subpart W

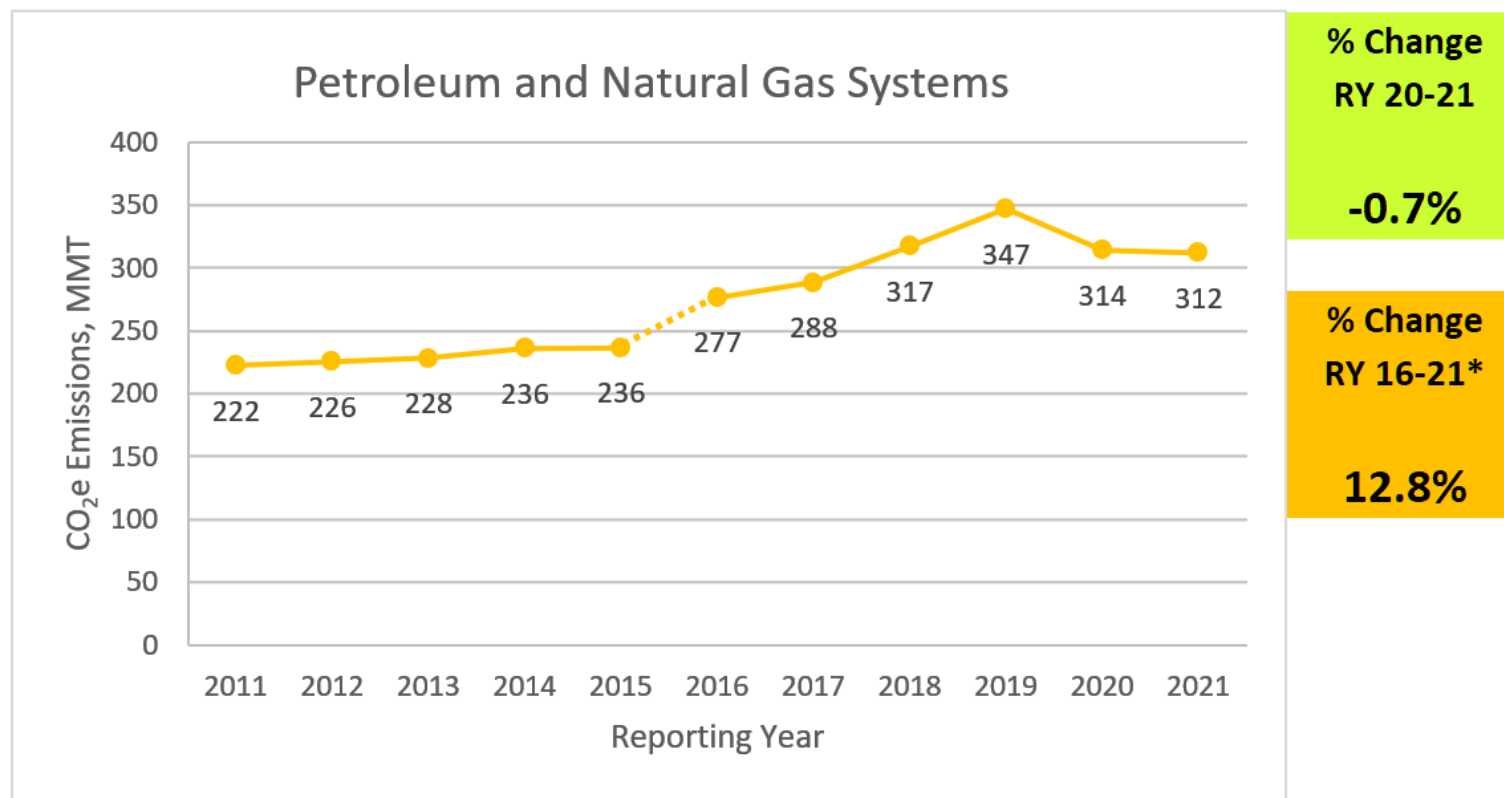
- Clarification of reporting requirements when facility ownership changes
- Revision of the definition of the Onshore Natural Gas Processing industry segment
- Addition of calculation methodologies and reporting requirements for a new emission source type, “other large release events”
- Substantive revisions to the calculation methodologies and/or reporting requirements for most emission source types in Subpart W
- Addition of emission factors for calculation combustion emissions that account for combustion slip
- Clarifications to the use of certain measurement methods
- Revisions to the facility-level reporting requirements for Onshore natural gas processing, Natural gas distribution, Onshore petroleum and natural gas gathering and boosting, and Onshore natural gas transmission pipeline
- Other minor technical corrections and typographical changes

Reporting Year 2021 Data Release

- Reporting Year 2021 data was released in October 2022
- In 2021, reported emissions from large industrial sources were approximately 4% higher than 2020
 - Reflects an increase in economic activity following the economic slowdown and decrease in emissions in 2020 due to the COVID-19 pandemic
- Power plants were the largest stationary source of GHG emissions reporting to GHGRP
 - Reported emissions increased by 6.3% between 2020 and 2021 but have decreased 28.5% since 2011
 - Overall reduction reflects long-term shifts in power sector fuel-stock from coal to natural gas
- Petroleum and natural gas systems were the second largest stationary source of GHG emissions
 - Reported emissions for 2021 were 0.7% lower than in 2020, but 12.8% higher than 2016
 - 2016 is the earliest year of comparable data, as new industry segments began reporting that year
- Reported emissions from other large sources in the industrial and waste sectors were up 1.8% from 2020, and down 7.7% since 2011
- With this year's data publication, GHGRP updated EPA's user-friendly online tool, the Facility Level Information on GreenHouse gases Tool (FLIGHT) by:
 - Releasing a new National Federal Lands mapping layer, to allow users to view GHGRP reporting facilities in proximity to National Federal Lands, or any land other than tribal lands that are controlled or owned by the United States
 - Updating the existing demographic mapping layer using census tract information

Petroleum And Natural Gas Systems: Overall Trend

- EPA received annual reports from 2,379 facilities conducting petroleum and natural gas systems activities
- Total reported GHG emissions were 312 million metric tons (MMT) CO₂ equivalent (CO₂e)

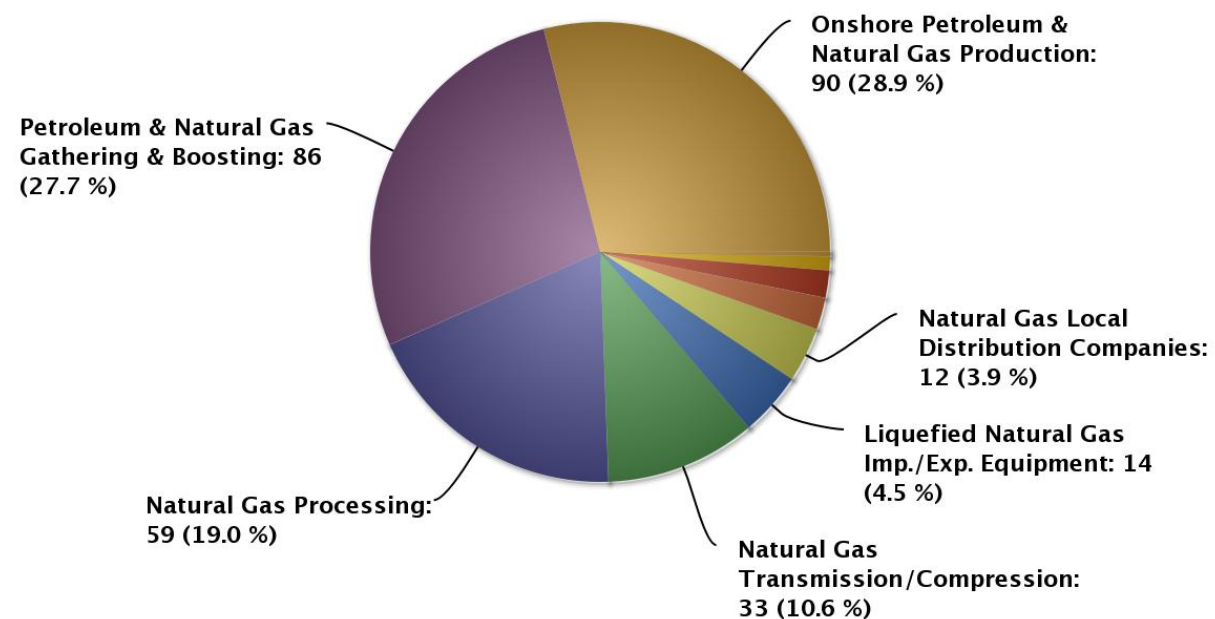


* Facilities in the Gathering and Boosting and Transmission Pipeline industry segments began in reporting year 2016.

Reported GHG Emissions by Industry Segment

Industry Segment	Facility Count	2021 CO ₂ e Emissions (MMT)
Offshore Production	132	6
Onshore Production	470	90
Gathering and Boosting	365	86
NG Processing	452	59
NG Transmission Compression	654	33
NG Transmission Pipeline	50	3
Underground NG Storage	49	1
LNG Storage	5	<1
LNG Import/Export	11	14
NG Distribution	165	12
Other Oil and Gas Combustion	56	7
Subpart W Total	2,379	312

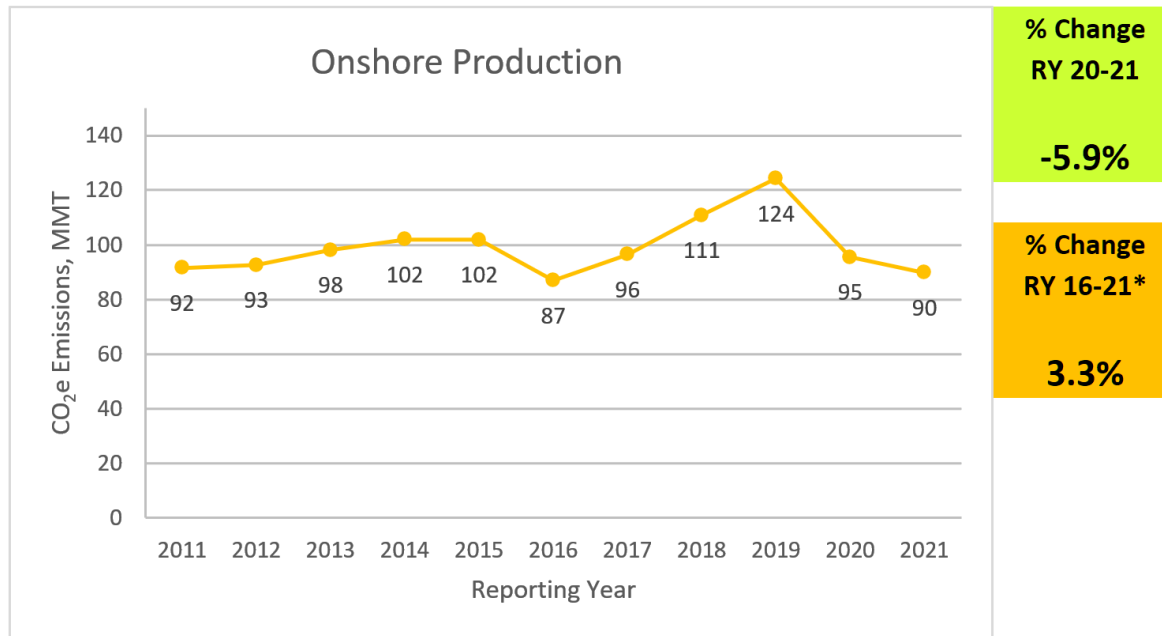
U.S. – Petroleum and Natural Gas Systems – Direct GHG Emissions of Selected Gases Reported by Sector in Million Metric Tons of CO₂e



Data reported to EPA as of 08/12/2022

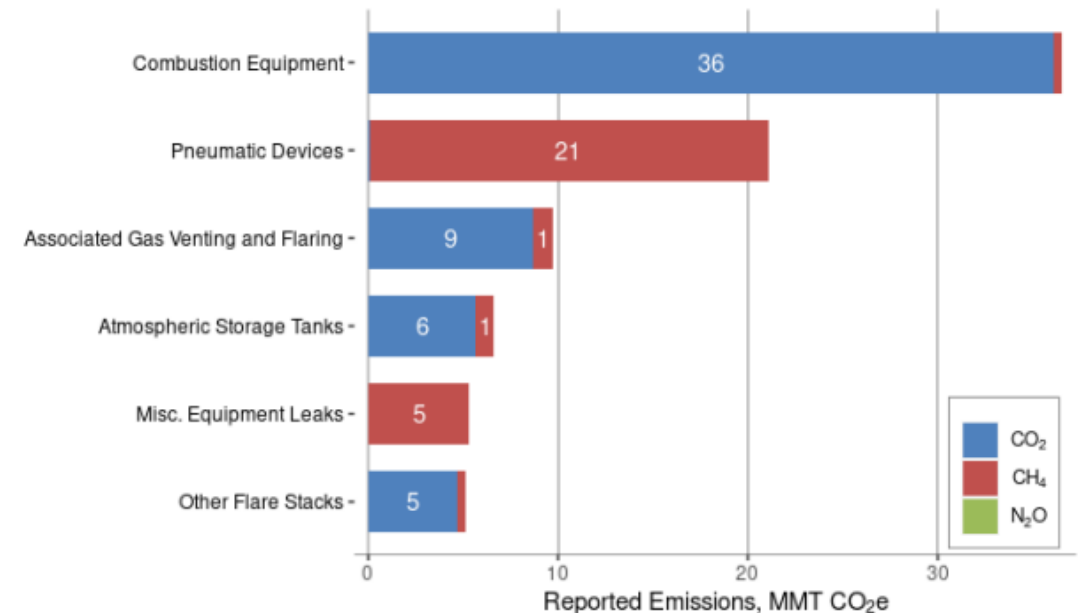
Onshore Production

- RY 2021 reported emissions from onshore production totaled 89.8 MMT CO₂e
- Methane emissions totaled 33.7 MMT CO₂e and carbon dioxide emissions totaled 56.0 MMT CO₂e
- The top reported emission sources were combustion equipment, pneumatic devices, associated gas venting and flaring, atmospheric storage tanks, miscellaneous equipment leaks, and other flare stacks.



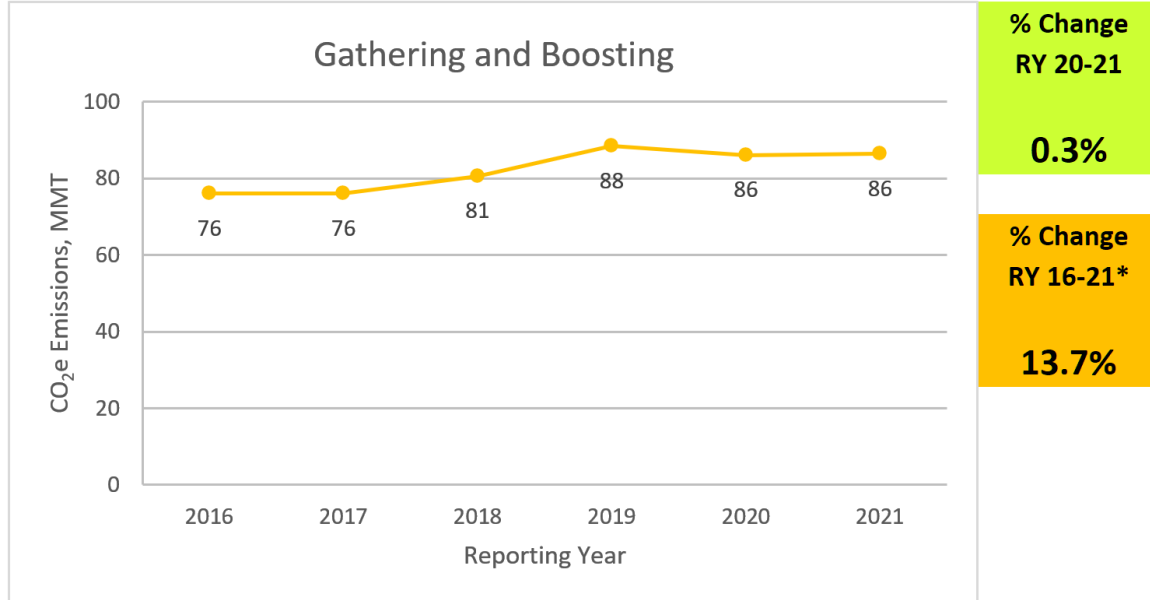
* 2016-2021 not comparable with 2011-2015 due to changes in coverage of the segment

2021 Onshore Production Top Reported Emission Sources



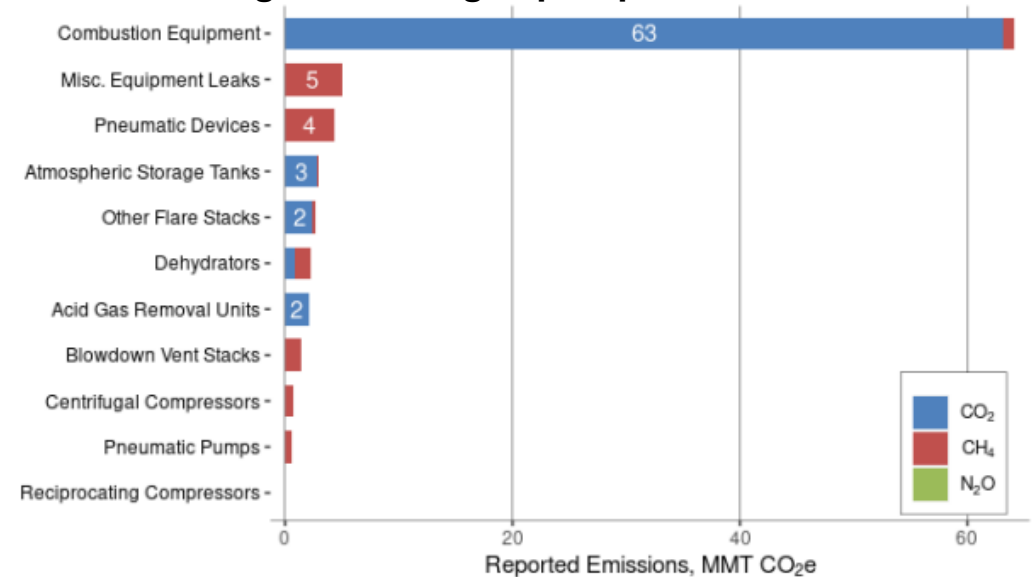
Gathering and Boosting

- The gathering and boosting segment was first reported in 2016
- RY 2021 reported emissions from gathering and boosting totaled 86.4 MMT CO₂e
- Methane emissions totaled 14.9 MMT CO₂e and carbon dioxide emissions totaled 71.5 MMT CO₂e
- The top reported emission sources were combustion equipment, miscellaneous equipment leaks, pneumatic devices and atmospheric storage tanks.



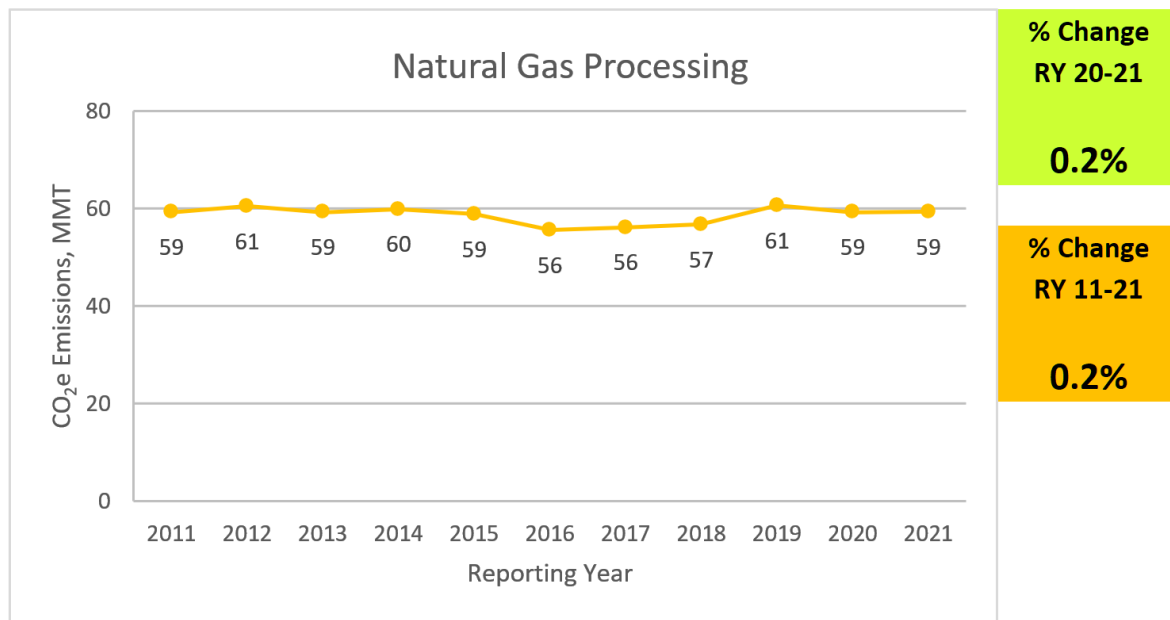
* Gathering and boosting segment was first reported in 2016.

2021 Gathering & Boosting Top Reported Emission Sources

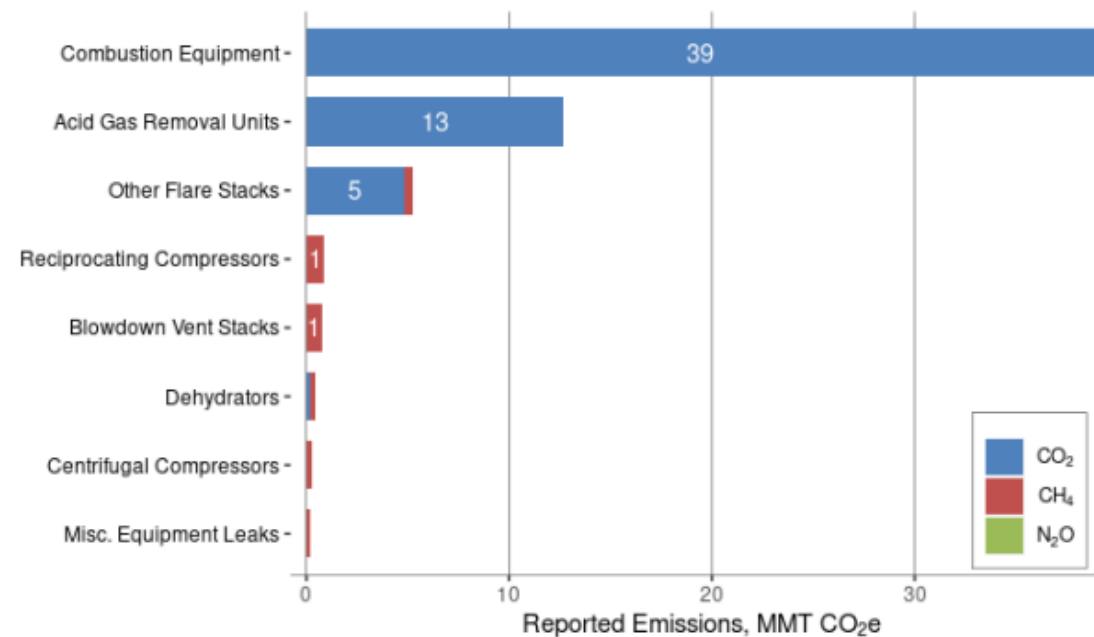


Natural Gas Processing

- RY 2021 reported emissions from natural gas processing totaled 59.4 MMT CO₂e
- Methane emissions totaled 2.8 MMT CO₂e and carbon dioxide emissions totaled 56.6 MMT CO₂e
- The top reported emission sources were combustion equipment, acid gas removal units and other flare stacks.

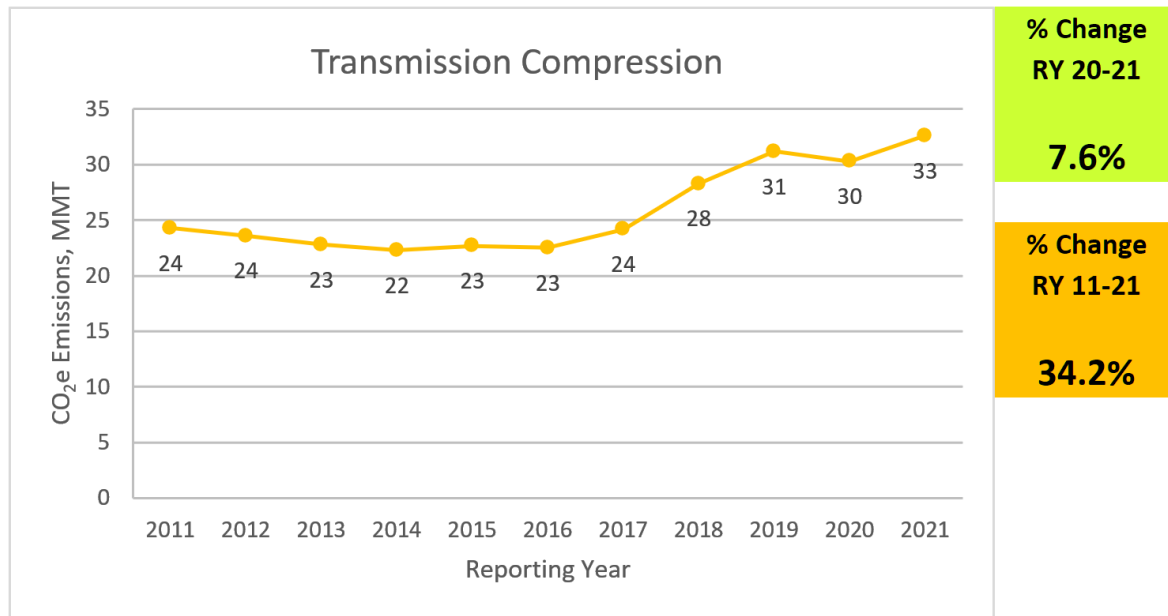


2021 Natural Gas Processing Top Reported Emission Sources

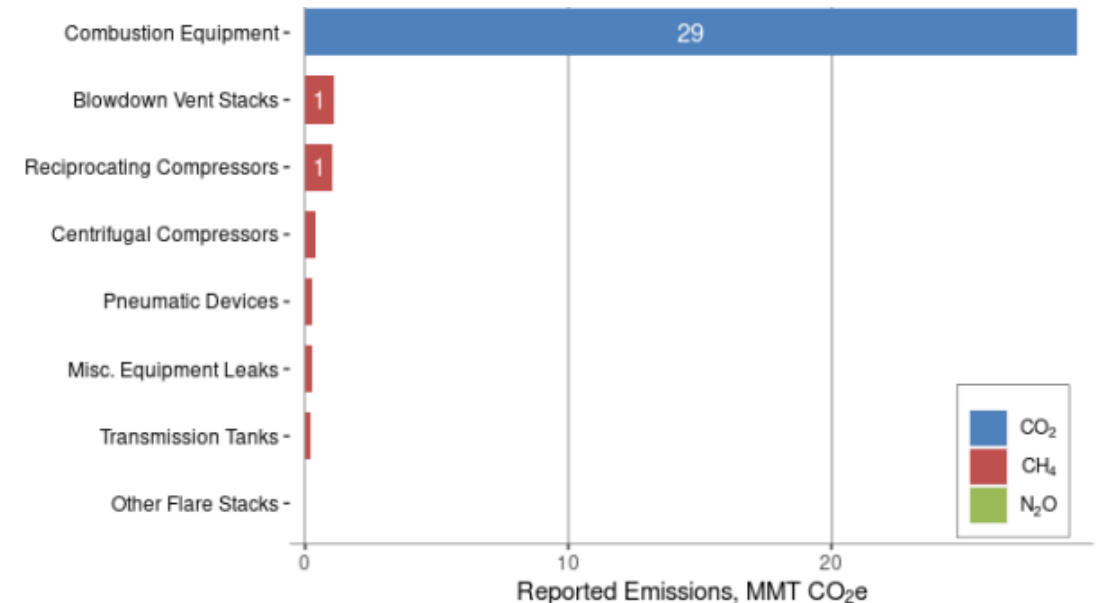


Natural Gas Transmission Compression

- RY 2021 reported emissions from natural gas transmission compression totaled 32.6 MMT CO₂e
- Methane emissions totaled 3.3 MMT CO₂e and carbon dioxide emissions totaled 29.4 MMT CO₂e
- The top reported emission sources were combustion equipment, blowdown vent stacks and reciprocating compressors.

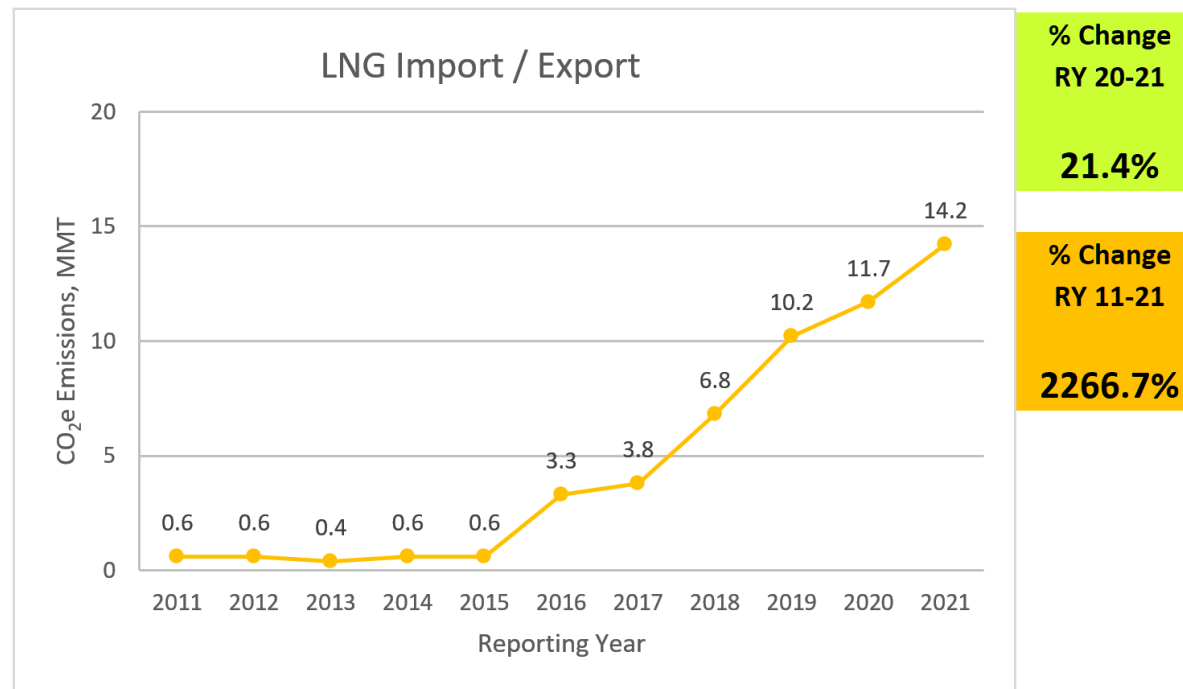


2021 Transmission Compression Top Reported Emission Sources



LNG Import/Export

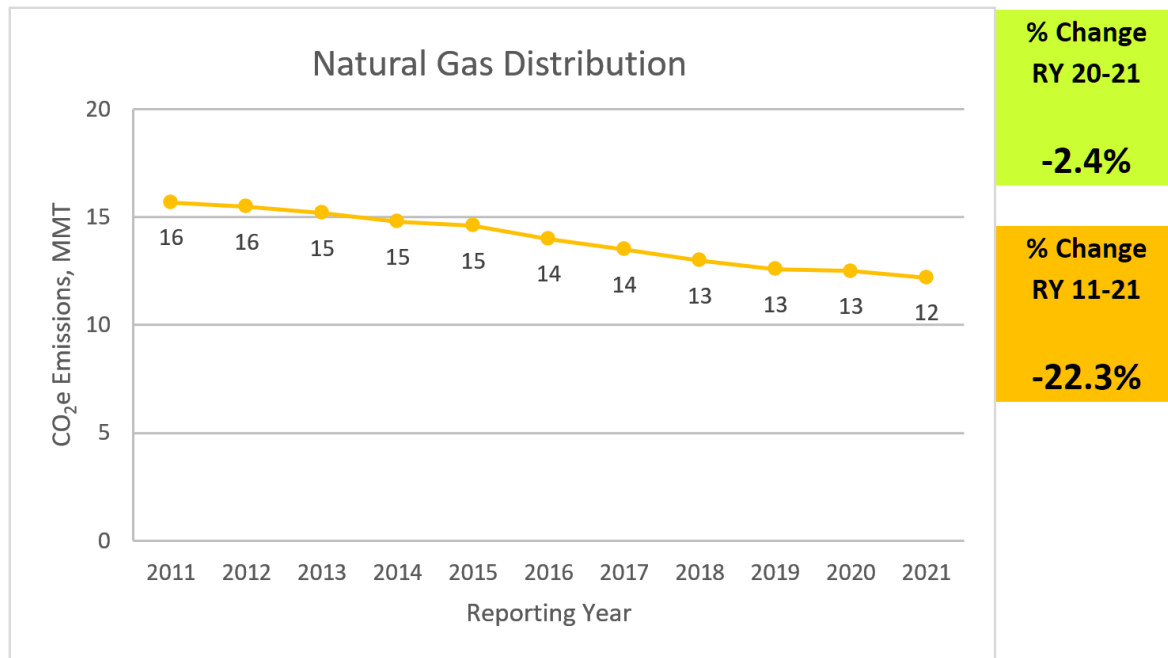
- RY 2021 reported emissions from LNG import/export totaled 14.2 MMT CO₂e
- Methane emissions totaled 0.07 MMT CO₂e and carbon dioxide emissions totaled 14.1 MMT CO₂e
- The top reported emission source was combustion (13.3 MMT CO₂e).



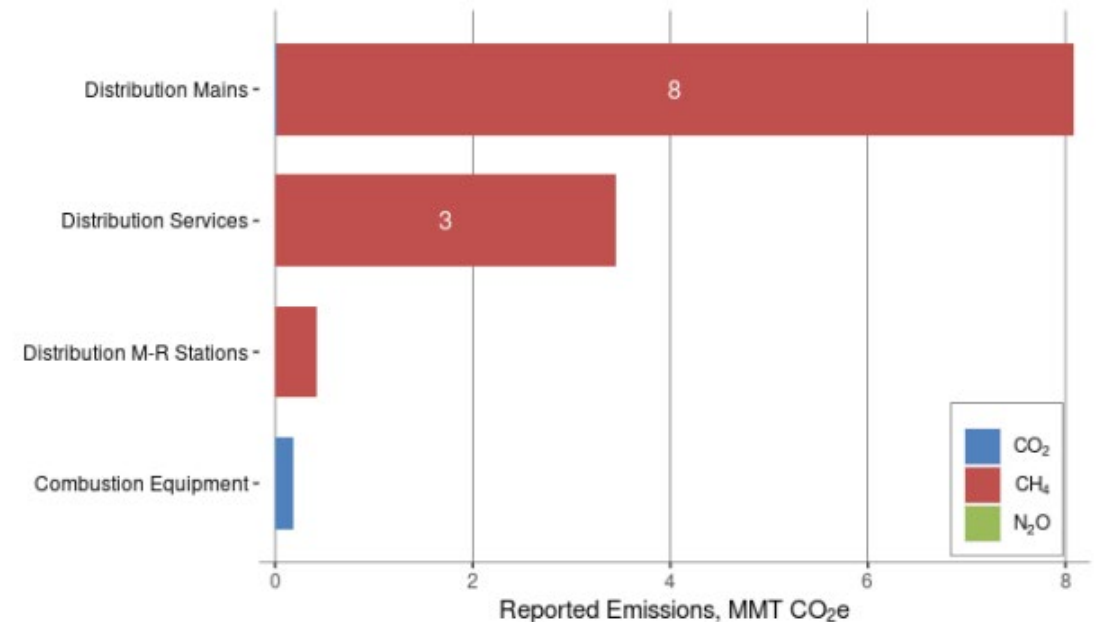
GHGRP data as of 8/12/2022

Natural Gas Distribution

- RY 2021 reported emissions from natural gas distribution totaled 12.1 MMT CO₂e
- Methane emissions totaled 11.9 MMT CO₂e and carbon dioxide emissions totaled 0.2 MMT CO₂e
- Distribution mains and distribution services accounted for the majority of reported emissions



2021 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 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
 - <https://ghgdata.epa.gov/ghgp/main.do>
 - Detailed publicly available data are provided in Envirofacts in a searchable, downloadable format
 - <https://enviro.epa.gov/query-builder/ghg>

Other GHGRP Resources

- GHGRP Website: <https://www.epa.gov/ghgreporting>
- GHGRP Subpart W Website: <https://www.epa.gov/ghgreporting/subpart-w-petroleum-and-natural-gas-systems>
- GHGRP Help Desk Email Address: GHGReporting@epa.gov