2011-2022 Greenhouse Gas Reporting Program Industrial Profile: Petroleum and Natural Gas Systems

Table of Contents

Introduction

All emissions presented here reflect the most recent information reported to EPA as of 8/18/2023. The reported emissions exclude biogenic carbon dioxide (CO_2). Greenhouse gas (GHG) data displayed here are in units of carbon dioxide equivalent (CO_2e) and reflect the global warming potential (GWP) values from Table A-1 of 40 CFR 98, which is generally based on the International Panel on Climate Change (IPCC) Assessment Report (AR4), with the addition of GWPs from the IPCC AR5 for fluorinated GHGs that did not have GWPs in the AR4. The AR4 GWP value for methane (CH_4) is 25 and AR4 GWP value for nitrous oxide (N_2O) is 298.

In Fall 2023, the U.S. Environmental Protection Agency (EPA) released 2022 greenhouse gas (GHG) data for Petroleum and Natural Gas Systems[1] collected under the Greenhouse Gas Reporting Program (GHGRP). The GHGRP, which was required by Congress in the Fiscal Year 2008 Consolidated Appropriations Act, requires facilities to report data from large emission sources across a range of industry sectors, as well as from suppliers of certain greenhouse gases and products that would emit GHGs if released or combusted.

The data show 2022 GHG emissions from 2,330 facilities conducting Petroleum and Natural Gas Systems activities, such as production, gathering and boosting, processing, transmission, and distribution. In total, these facilities accounted for GHG emissions of 316 million metric tons of carbon dioxide equivalent (CO_2e). In 2022, reported GHG emissions from Petroleum and Natural Gas Systems represented 11.7 percent of emissions reported to the GHGRP.

When reviewing these data and comparing them to other data sets or published literature, it is important to understand the GHGRP reporting requirements and the impacts of these requirements on the reported data. Facilities used 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 had a choice of calculation methods for an emission source.

Petroleum and Natural Gas Systems is one of the more complex source categories within the GHGRP because of the number of emission sources covered, technical complexity, variability in the calculation methods used for a particular emission source, and variability across facilities. It is expected that there can be differences in reported emissions from one facility to another. As described in more detail below, there is a reporting threshold, and the reporting requirements do not cover certain emission sources. Thus the data do not represent the entire universe of emissions from Petroleum and Natural Gas Systems. Starting with data reported for 2016, facilities reported emissions from select emission sources in gathering and boosting systems, blowdown emissions from natural gas transmission pipelines, and emissions from oil well completions and workovers with hydraulic fracturing. Facilities also began reporting well identification numbers for

[1] The implementing regulations of the Petroleum and Natural Gas Systems source category of the GHGRP are located at 40 CFR Part 98 Subpart W.

onshore production wells starting with data reported for 2016. While changes in the total number of reporting facilities can cause changes in total reported emissions from year-to-year, a number of factors, such as those detailed above, contribute to differences as well.

In addition, the reporting requirements were significantly revised in 2014, so some activity data reported starting in 2015 are not available for previous years. Furthermore, there were some deferred activity data reported for 2011-2013, as part of the reporting year 2014 submissions. All of these factors could impact cross-segment, cross-source, cross-facility, or cross-year comparisons. It is important to be aware of these limitations and differences when using this data, particularly when attempting to draw broad conclusions about emissions and activities from this sector.

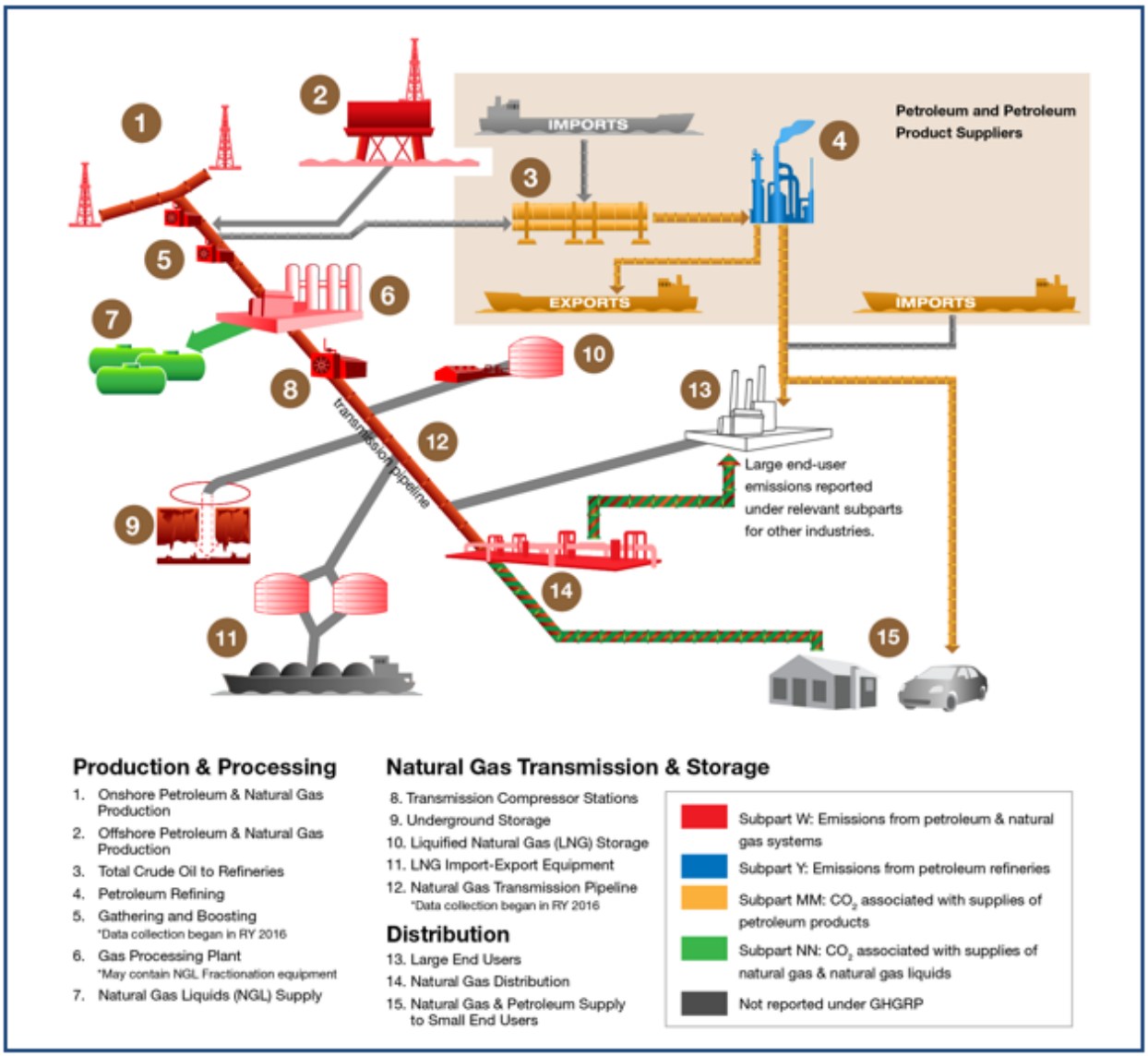
Petroleum and Natural Gas Systems in the GHG Reporting Program

The Petroleum and Natural Gas Systems source category of the GHGRP (Subpart W) requires reporting from the following 10 industry segments for 2022:

- Onshore Production – Production of petroleum and natural gas associated with onshore production wells and related equipment;
- Offshore Production – Production of petroleum and natural gas from offshore production platforms;
- Gathering and Boosting – Gathering pipelines and other equipment that collect petroleum/natural gas from onshore production gas or oil wells and then compress, dehydrate, sweeten, or transport the petroleum/natural gas;
- Natural Gas Processing – Processing of field-quality gas to produce pipeline-quality natural gas;
- Natural Gas Transmission Compression – Compressor stations used to transfer natural gas through transmission pipelines;
- Natural Gas Transmission Pipeline – A rate-regulated interstate or intrastate pipeline, or a pipeline that falls under the "Hinshaw Exemption" of the Natural Gas Act;
- Underground Natural Gas Storage – Facilities that store natural gas in underground formations;
- Liquefied Natural Gas (LNG) Import/Export – Liquefied Natural Gas import and export terminals;
- LNG Storage – Liquefied Natural Gas storage equipment; and
- Natural Gas Distribution – Distribution systems that deliver natural gas to customers.

Figure 1 below illustrates the segments of the Petroleum and Natural Gas Systems source category that were required to report under the GHGRP for 2022.

Figure 1: Petroleum and Natural Gas Operations Covered by the GHG Reporting Program



Other segments of the petroleum and natural gas industry are covered by the GHGRP but not included in the Petroleum and Natural Gas Systems (Subpart W) source category, such as Petroleum Refineries (Subpart Y), Petrochemical Production (Subpart X), Suppliers of Petroleum Products (Subpart MM), and Suppliers of Natural Gas and Natural Gas Liquids (Subpart NN).

As noted above, the GHGRP also includes reporting of stationary fuel combustion emissions from facilities that are associated with the petroleum and natural gas industry, but that do not report process emissions from any of the above source categories, such as certain facilities that have a North American Industry Classification System (NAICS) code

beginning with 211 (the general NAICS for oil and gas extraction).[2] These facilities are referred to as "Other Oil and Gas Combustion" in this document.

The GHGRP covers a subset of national emissions from Petroleum and Natural Gas Systems. A facility in the Petroleum and Natural Gas Systems source category is required to submit annual reports if total emissions are 25,000 metric tons carbon dioxide equivalent (CO_2e) or more.

The EPA has a multi-step data verification process, including automatic checks during data-entry, statistical analyses on completed reports, and staff review of the reported data.[3] Based on the results of the verification process, the EPA follows up with facilities to resolve mistakes that may have occurred during the reporting period.

The EPA has made available the optional use of best available monitoring methods (BAMM) for targeted circumstances where the EPA made recent changes to GHGRP monitoring requirements for Petroleum and Natural Gas Systems.[4] In certain previous reporting years, in order to provide facilities with time to adjust to the requirements of the GHGRP, the EPA made available the optional use of BAMM for unique or unusual circumstances. Where a facility used BAMM for any reporting year, it was required to follow emission calculations specified by the EPA but allowed to use alternative methods for determining inputs to calculate emissions. Examples of BAMM include monitoring methods used by the facility that do not meet the specifications of 40 CFR Part 98 Subpart W, supplier data, engineering calculations, and other company records. As of reporting year 2017, no facilities have been approved to use BAMM.

Reported GHG Emissions from Petroleum and Natural Gas Systems

The following section provides information on reported GHG emissions by industry segment, greenhouse gas, and combustion and process emissions for the 2022 reporting year.[5]

Reported Emissions by Industry Segment

The 2022 reporting year was the 12th year that GHG emissions from Petroleum and Natural Gas Systems activities were required to be collected. The EPA received reports

[2] For more information, go to https://ccdsupport.com/confluence/display/ghgp/Understanding+Facility+Types.

[3] For more information on verification, go to http://www.epa.gov/ghgreporting/ghgrp-methodology-and-verification.

[4] For more information on BAMM, go to http://www.epa.gov/ghgreporting/ghgrp-methodology-and-verification.

[5] "Reporting year" means the calendar year during which the GHG data are required to be collected for purposes of the annual GHG report. For example, reporting year 2022 was January 1, 2022 through December 31, 2022, and the annual reports for reporting year 2022 were required to be submitted to EPA by March 31, 2023.

from 2,330 facilities[6] with Petroleum and Natural Gas Systems activities, with total reported GHG emissions of 316 million metric tons (MMT) CO_2e.

Table 1 presents number of facilities and reported emissions in 2022 by industry segment. The largest industry segment in terms of reported GHG emissions was Onshore Production, with a total of 90 MMT CO_2e, followed by Gathering and Boosting, with reported emissions of 86 MMT CO_2e. Natural Gas Processing accounted for 59 MMT CO_2e. The next largest segment was Natural Gas Transmission Compression, with reported emissions of 35 MMT CO_2e. Reported emissions from LNG Import/Export totaled 17 MMT CO_2e. The remaining segments accounted for total reported emissions of approximately 29 MMT CO_2e.

Table 1: 2022 Reported Emissions by Industry Segment

Industry Segment	Number of Facilities	Reported Emissions (MMT CO_2e)
Onshore Production	459	90
Offshore Production	116	7
Gathering and Boosting	350	86
Natural Gas Processing	444	59
Natural Gas Transmission Compression	654	35
Natural Gas Transmission Pipeline	44	2
Underground Natural Gas Storage	51	1
LNG Import/Export	11	17
LNG Storage	5	<1
Natural Gas Distribution	161	12
Other Oil and Gas Combustion	58	8
Total	**2330**	**316**

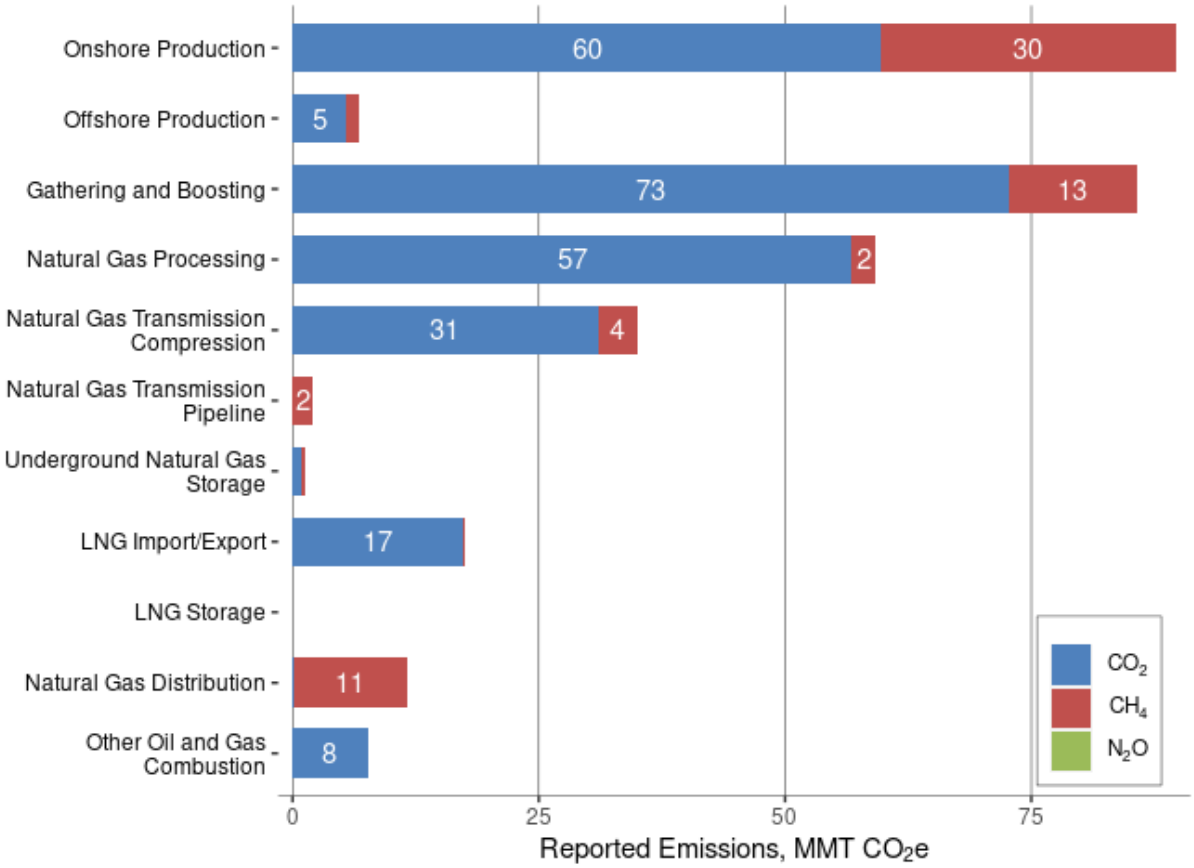
Note: Total number of facilities is smaller than the sum of facilities from each segment because some facilities reported under multiple segments.

[6] In general, a "facility" for purposes of the GHGRP means all co-located emission sources that are commonly owned or operated. However, the GHGRP has developed specialized facility definitions for onshore production, gathering and boosting, natural gas transmission pipeline, and natural gas distribution. For onshore production, the "facility" includes all emissions associated with wells owned or operated by a single company in a specific hydrocarbon producing basin (as defined by the geologic provinces published by the American Association of Petroleum Geologists). For 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 basin. For 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. For natural gas distribution, a "facility" is a local distribution company as regulated by a single state public utility commission.

Reported Emissions by Greenhouse Gas

Figure 2 presents reported emissions in 2022 by industry segment and greenhouse gas. For all segments combined, carbon dioxide (CO_2) emissions accounted for 252 MMT CO_2e of reported emissions and methane (CH_4) emissions accounted for 65 MMT CO_2e of reported emissions. Nitrous oxide (N_2O) emissions accounted for 0.2 MMT CO_2e of reported emissions.

Figure 2: 2022 Reported Emissions by Greenhouse Gas

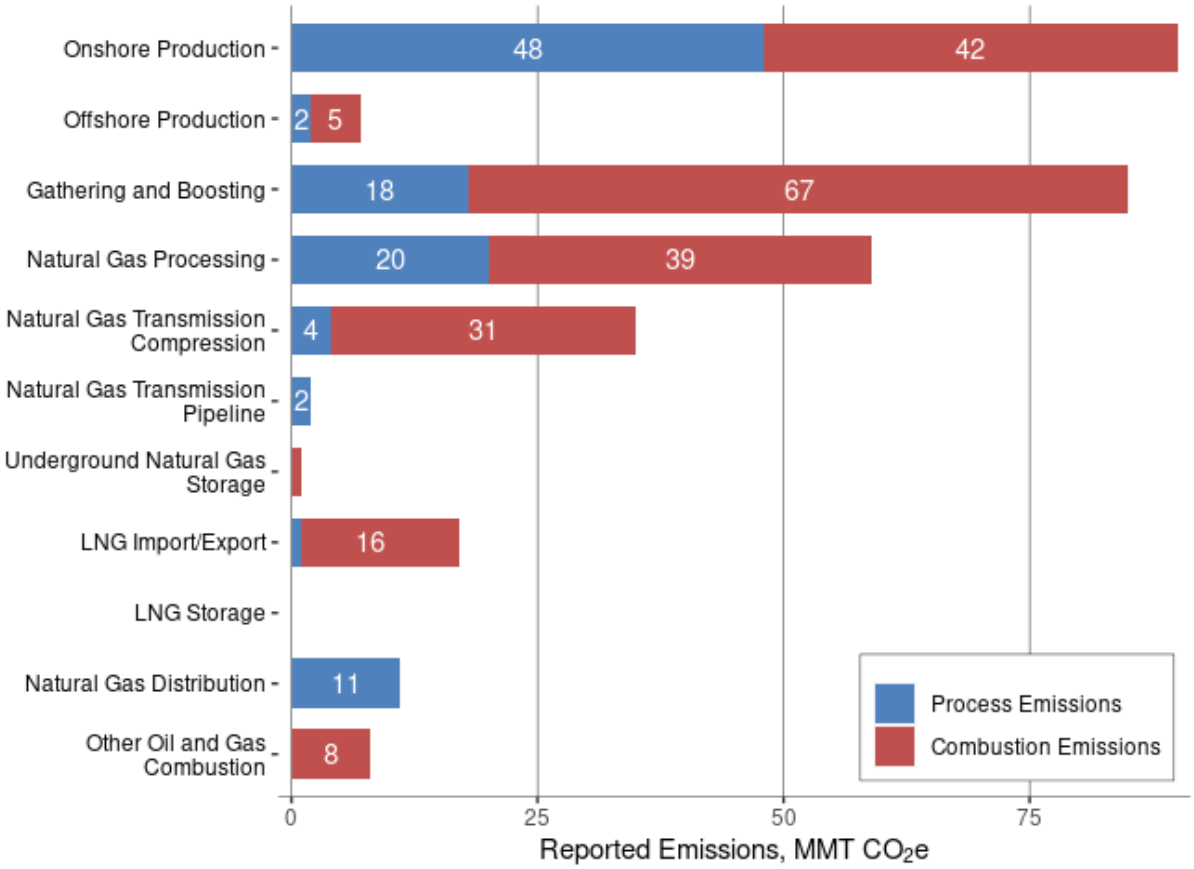


Note: Segment totals may not equal sum of individual GHGs due to independent rounding.

Reported Combustion and Process Emissions

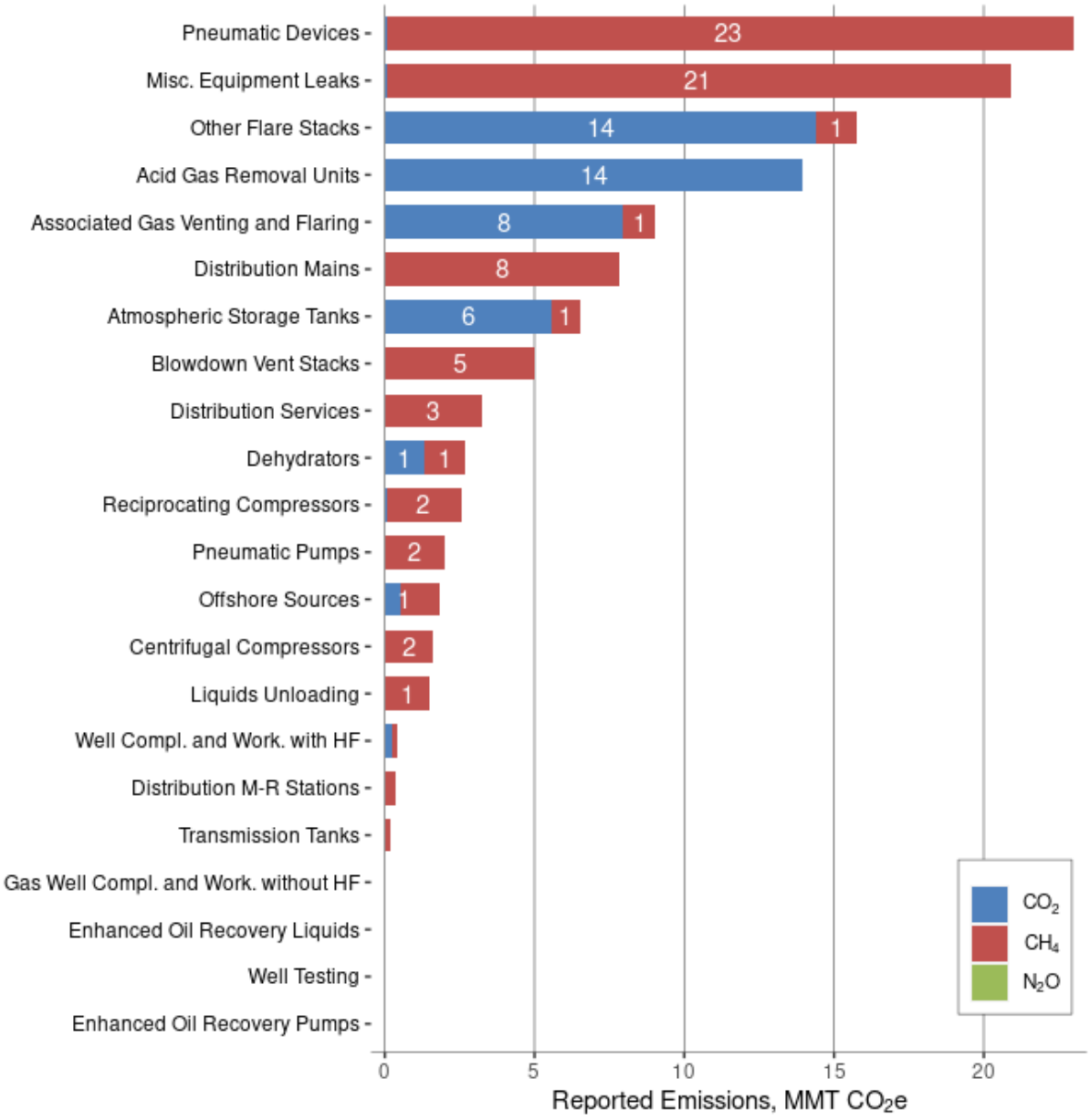
Each segment of Petroleum and Natural Gas Systems includes a combination of emission sources. Emissions may result from the combustion of fossil fuels (combustion emissions) or from process sources that result in the direct emission of GHGs (process emissions). Process emissions can include vented emissions, equipment leaks, and flaring. Reported combustion emissions in Petroleum and Natural Gas Systems totaled 210 MMT CO_2e and reported process emissions totaled 118 MMT CO_2e. Figures 3 and 4 present reported combustion and process emissions in 2022 by industry segment and emission source, respectively.

Figure 3: 2022 Reported Combustion and Process Emissions



Note: Segment totals may not equal sum of process and combustion emissions due to independent rounding.

Figure 4: 2022 Reported Process Emission Sources



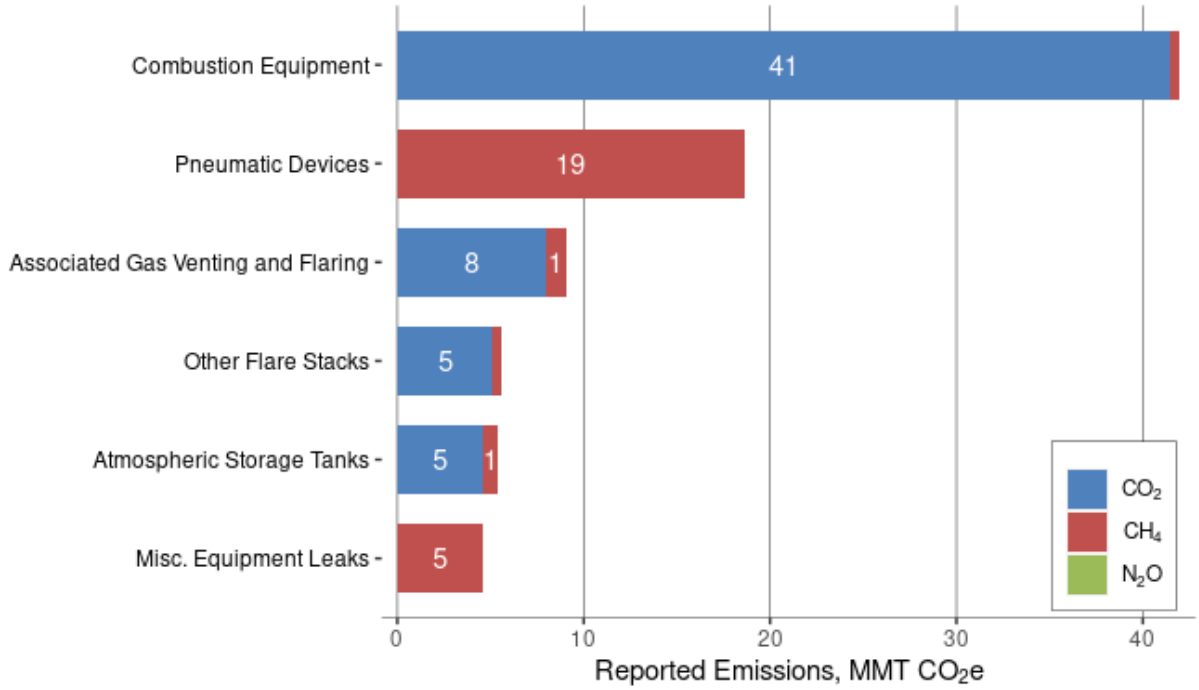
Reported GHG Emissions by Industry Segment and Source

The following section provides information on reported GHG emissions organized by industry segment. For each segment, the top reported emission sources are presented.

Onshore Production

The EPA received annual reports from 459 facilities in the onshore production segment and reported emissions totaled 89.7 MMT CO_2e. Methane emissions totaled 29.9 MMT CO_2e and carbon dioxide emissions totaled 59.8 MMT CO_2e. Combustion Equipment (42.0 MMT CO_2e) and Pneumatic Devices (18.7 MMT CO_2e) were the top reported emission sources, followed by Associated Gas Venting and Flaring (9.0 MMT CO_2e), Other Flare Stacks (5.6 MMT CO_2e), Atmospheric Storage Tanks (5.4 MMT CO_2e), and Misc. Equipment Leaks (4.6 MMT CO_2e). Onshore production emissions by greenhouse gas from the top reported emission sources are presented in Figure 5 for 2022.

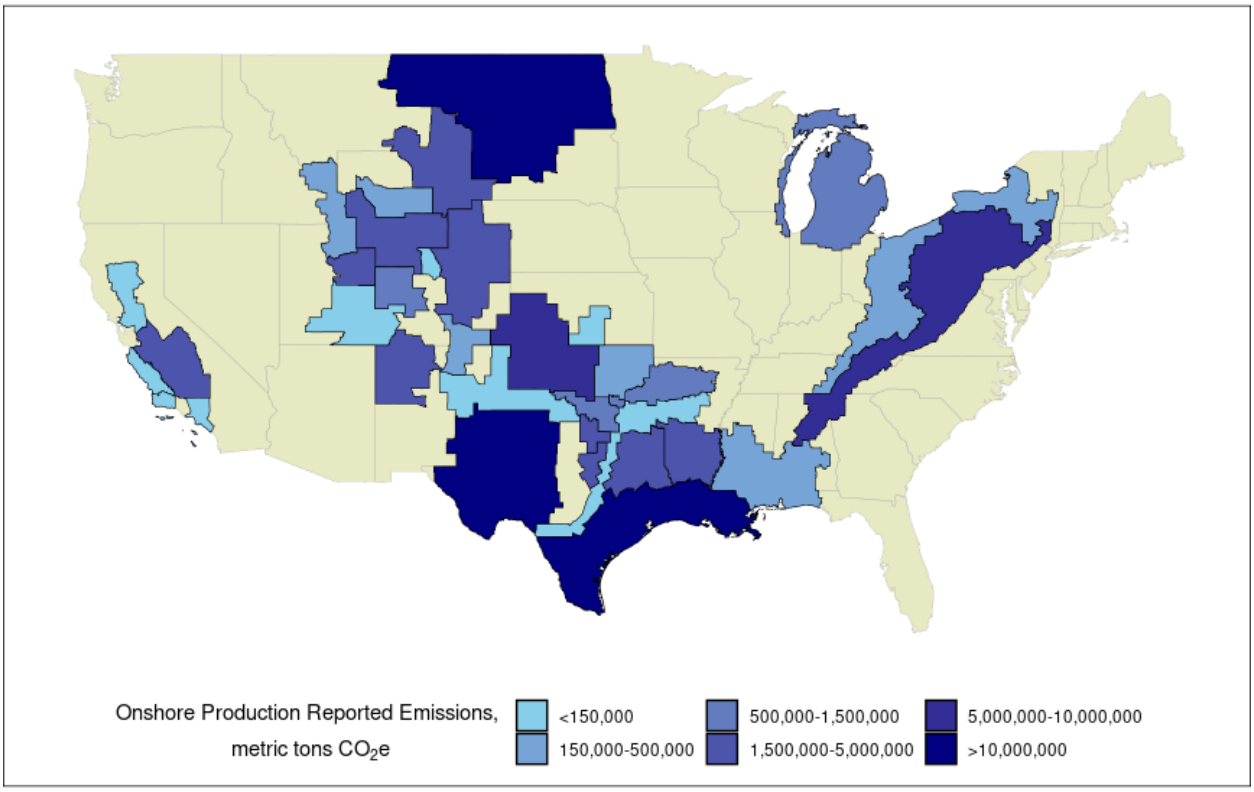
Figure 5: 2022 Onshore Production: Top Reported Emission Sources



Note: Segment totals may not equal sum of individual GHGs due to independent rounding.

Figure 6 shows 2022 onshore production reported emissions by basin.

Figure 6: 2022 Onshore Production Reported Emissions (CO_2e) by Basin

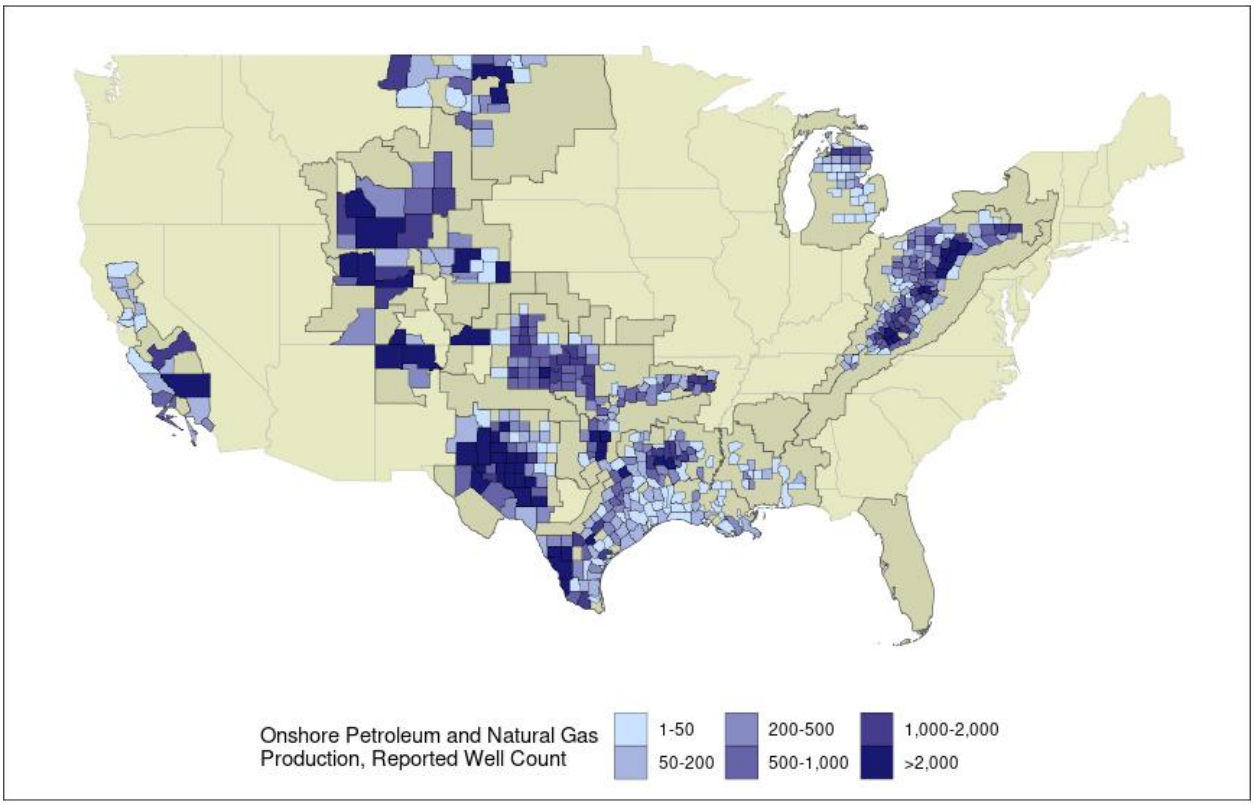


Basin refers to the geological provinces as published by the American Association of Petroleum Geologists (AAPG).

Starting with data reported for 2016, onshore production facilities reported well identification numbers and certain emission source types associated with wells. A well identification number is either the US Well Number (formerly referred to as the API Well Number, or API Number), or the unique well number assigned by its permitting authority if the well does not have a US Well Number.[7] Figure 7 shows 2022 well count by county for onshore production facilities.

[7] Professional Petroleum Data Management Association. The US Well Number Standard: An Identifier for Petroleum Industry Wells in the USA. Version 2013 rev 1, published June 19, 2014. Available at https://dl.ppdm.org/dl/1209.

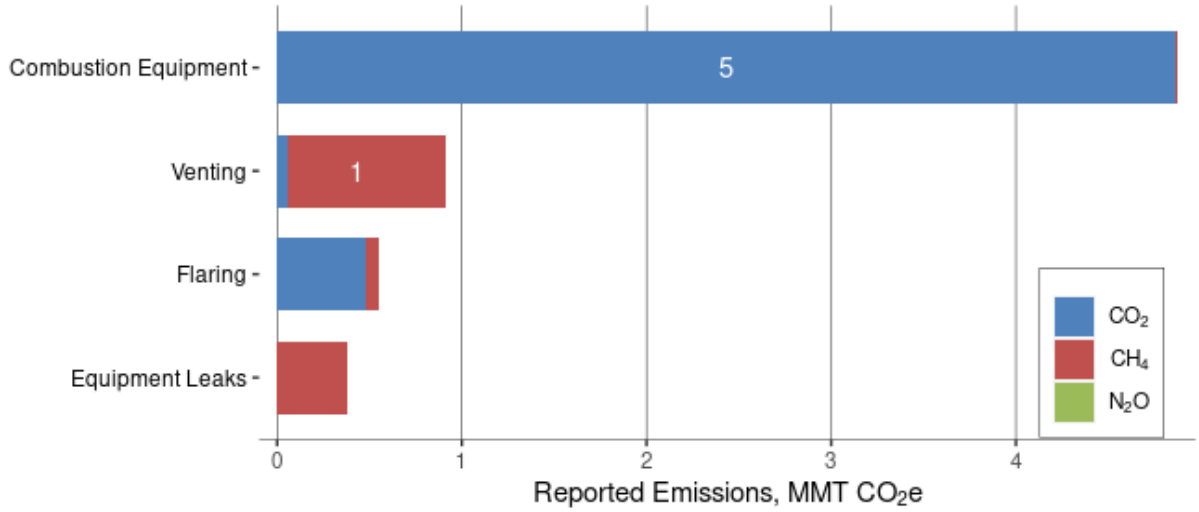
Figure 7: 2022 Onshore Production Reported Well Count by County



Offshore Production

The EPA received annual reports from 116 facilities in the offshore production segment that totaled 6.7 MMT CO_2e. For offshore production, facilities calculate process emissions using requirements that were established by the Bureau of Ocean Energy Management (BOEM). In addition, the GHGRP collects data on combustion emissions. While the full list of process emission sources is extensive, it can generally be categorized into vented emissions, flaring, and equipment leaks. The top reported source of emissions for offshore production was from Combustion Equipment (4.9 MMT CO_2e), followed by Venting (0.9 MMT CO_2e). See Figure 8 below for offshore production emissions for the top reported sources.

Figure 8: 2022 Offshore Production: Top Reported Emission Sources

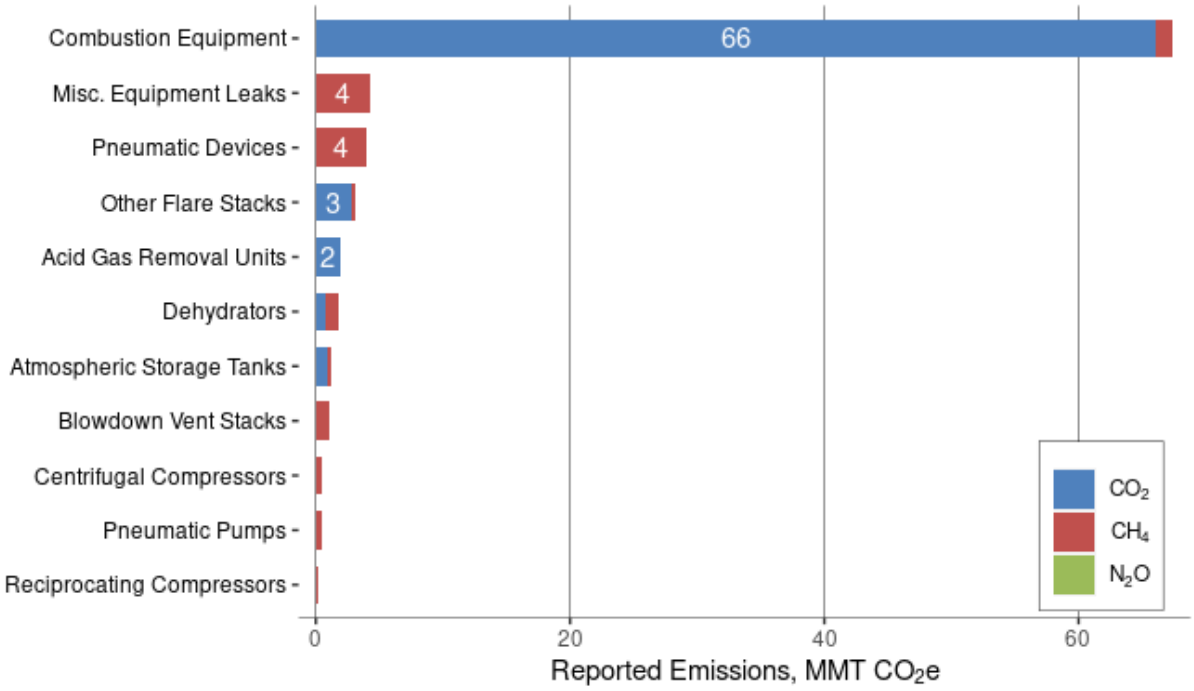


Note: Segment totals may not equal sum of individual GHGs due to independent rounding.

Gathering and Boosting

The gathering and boosting segment was first reported in 2016. In 2022, the EPA received annual reports from 350 facilities in the gathering and boosting segment and reported emissions totaled 85.8 MMT CO_2e. Methane emissions totaled 13.1 MMT CO_2e and carbon dioxide emissions totaled 72.6 MMT CO_2e. Combustion Equipment (67.4 MMT CO_2e) was the top reported emission source, followed by Misc. Equipment Leaks (4.2 MMT CO_2e), Pneumatic Devices (4.0 MMT CO_2e), and Other Flare Stacks (3.1 MMT CO_2e). See Figure 9 below for gathering and boosting emissions by greenhouse gas for the top reported emission sources in 2022.

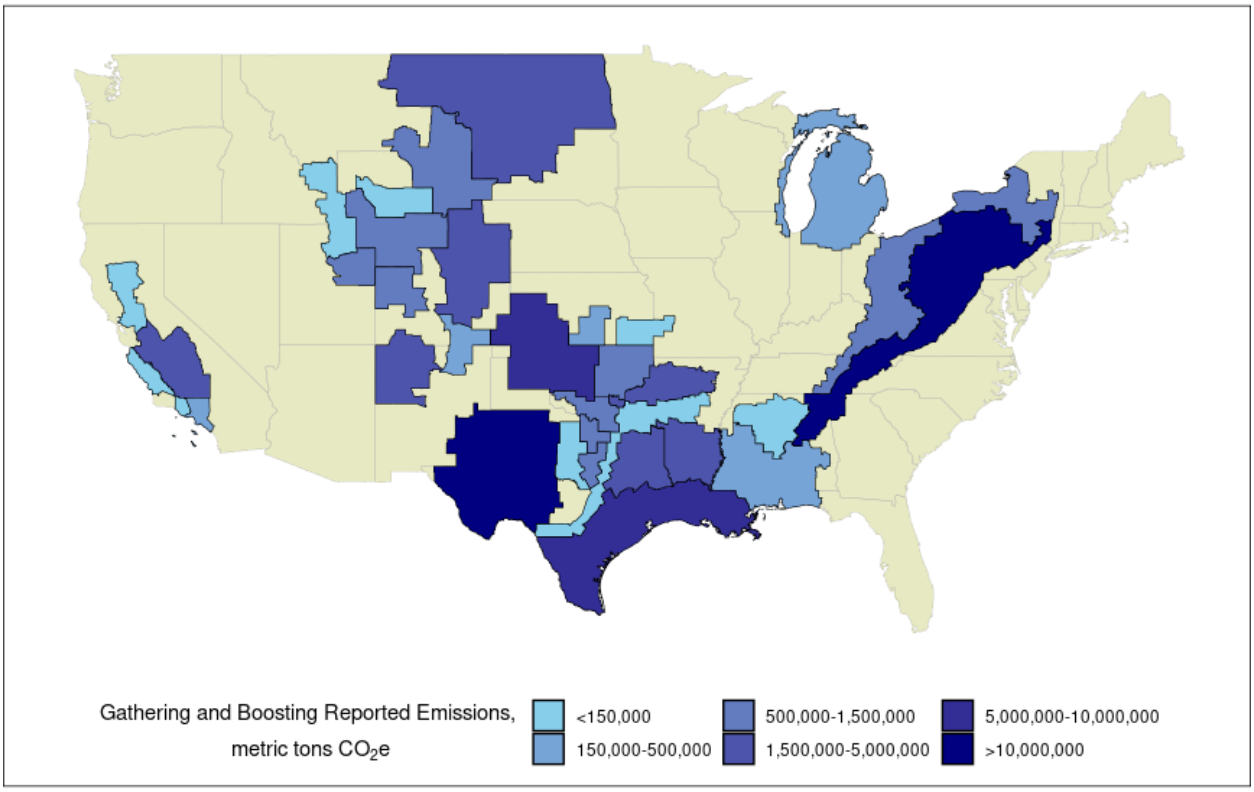
Figure 9: 2022 Gathering and Boosting: Top Reported Emission Sources



Note: Segment totals may not equal sum of individual GHGs due to independent rounding.

Figure 10 shows 2022 gathering and boosting reported emissions by basin.

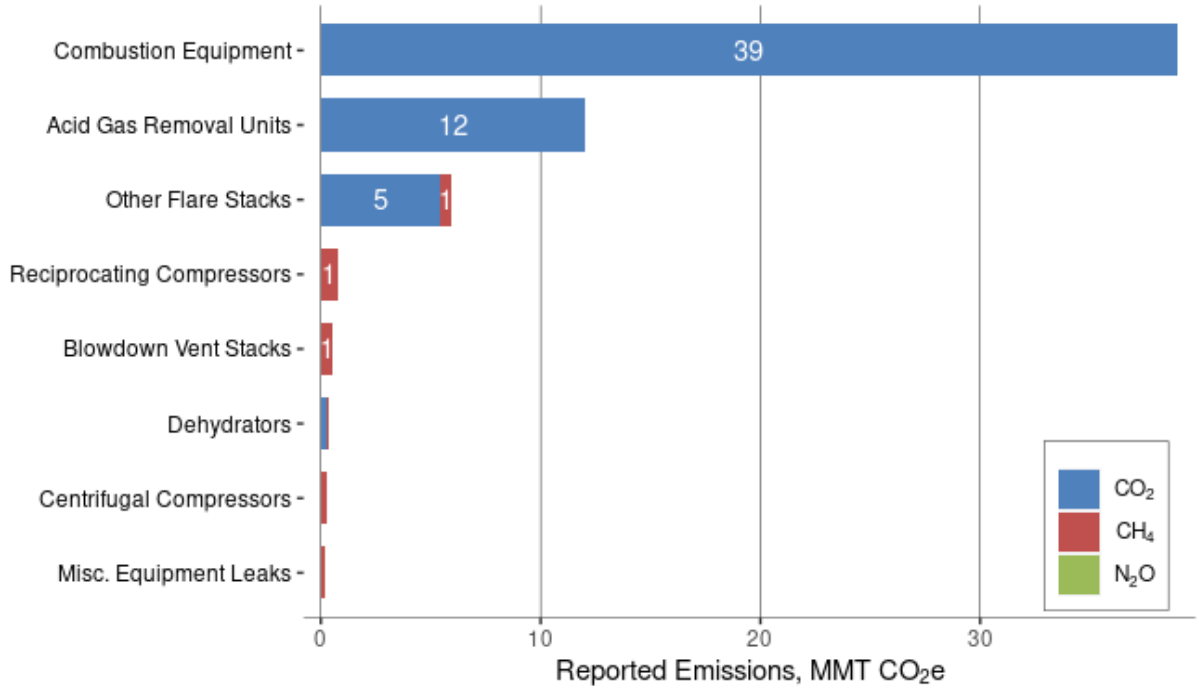
Figure 10: 2022 Gathering and Boosting Reported Emissions (CO_2e) by Basin



Natural Gas Processing

The EPA received annual reports from 444 facilities in the natural gas processing segment, and reported emissions totaled 59.2 MMT CO_2e. Methane emissions totaled 2.4 MMT CO_2e and carbon dioxide emissions totaled 56.7 MMT CO_2e. As presented in Figure 11, the top reported emission sources were Combustion Equipment (39.0 MMT CO_2e), Acid Gas Removal Units (12.0 MMT CO_2e), and Other Flare Stacks (5.9 MMT CO_2e).

Figure 11: 2022 Natural Gas Processing: Top Reported Emission Sources

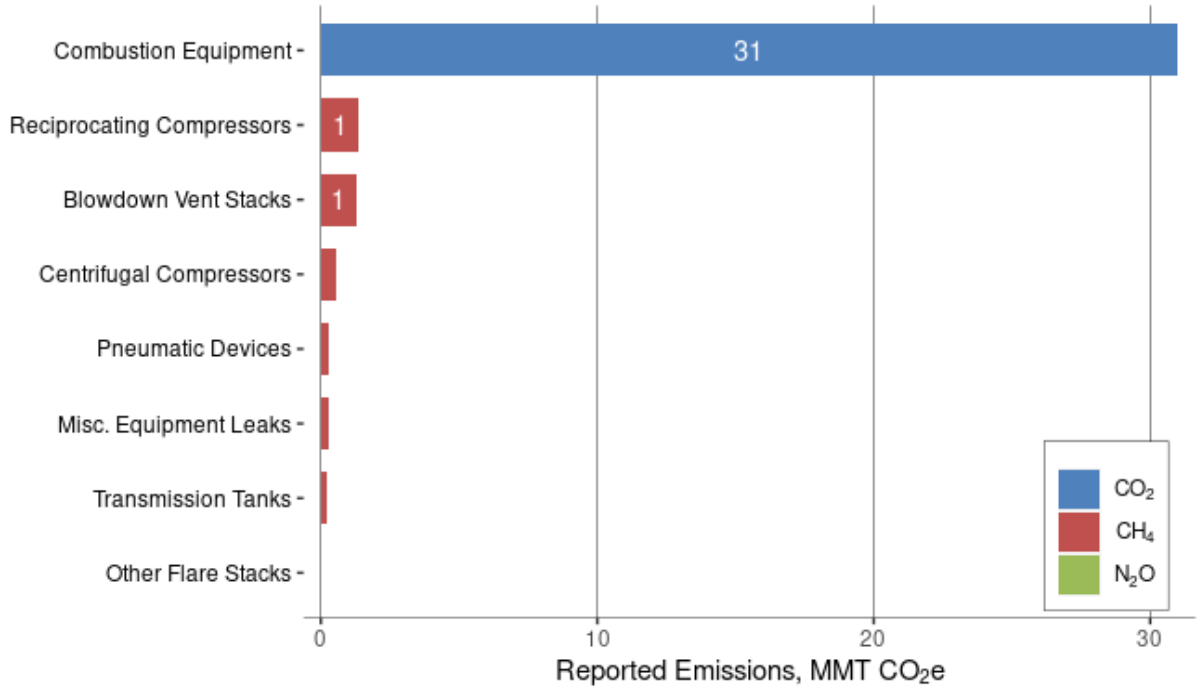


Note: Segment totals may not equal sum of individual GHGs due to independent rounding.

Natural Gas Transmission Compression

The EPA received annual reports from 654 facilities in the natural gas transmission compression segment, and reported emissions totaled 35.0 MMT CO_2e. Methane emissions totaled 3.9 MMT CO_2e and carbon dioxide emissions totaled 31.0 MMT CO_2. Combustion emissions (31 MMT CO_2e) were larger than process emissions. Aside from combustion equipment, the top reported emission sources were Reciprocating Compressors (1.3 MMT CO_2e) and Blowdown Vent Stacks (1.3 MMT CO_2e). See Figure 12 for natural gas transmission compression emissions by greenhouse gas for the top reported emission sources in 2022.

Figure 12: 2022 Natural Gas Transmission Compression: Top Reported Emission Sources



Note: Segment totals may not equal sum of individual GHGs due to independent rounding.

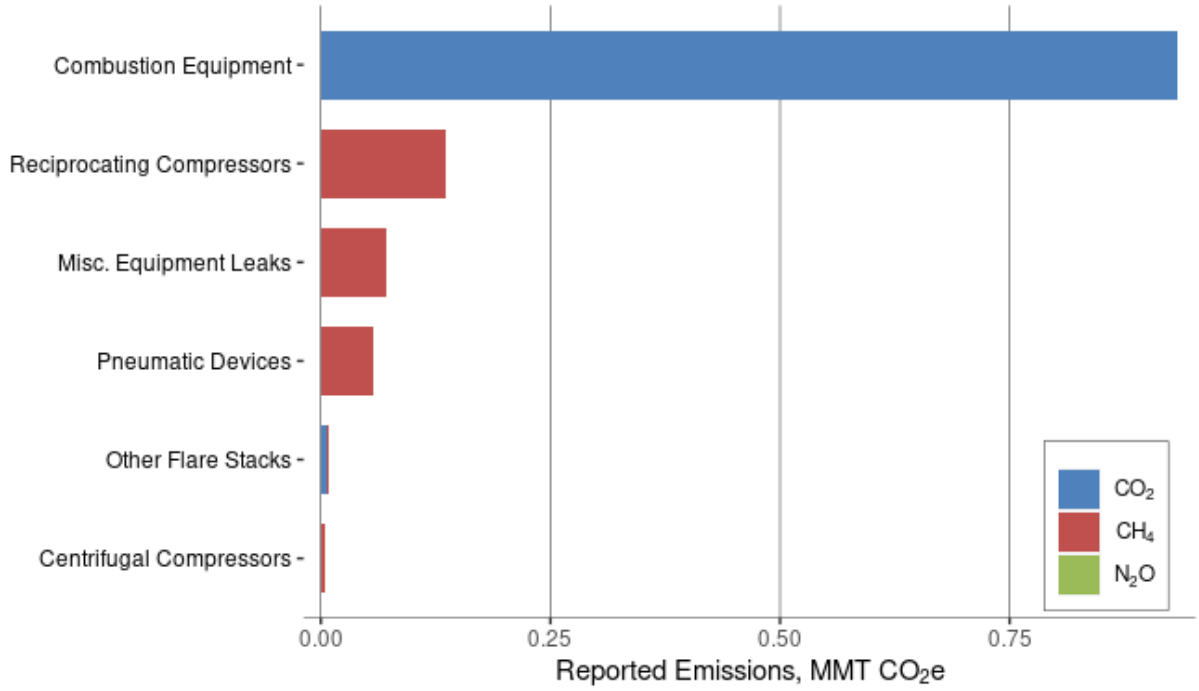
Natural Gas Transmission Pipeline

GHG emissions from the natural gas transmission pipeline segment were first reported in 2016. The segment contains one reported emission source, blowdown vent stacks. In 2022, the EPA received annual reports from 44 facilities in the natural gas transmission pipeline segment and reported emissions totaled 2.1 MMT CO_2e. Methane emissions totaled 2.1 MMT CO_2e and carbon dioxide emissions totaled 0.002 MMT CO_2.

Underground Natural Gas Storage

The EPA received annual reports from 51 facilities in the underground natural gas storage segment and reported emissions totaled 1.2 MMT CO_2e. Methane emissions totaled 0.3 MMT CO_2e and carbon dioxide emissions totaled 0.9 MMT CO_2e. As presented in Figure 13, Combustion Equipment (0.9 MMT CO_2e) was the top reported source of emissions for underground natural gas storage, followed by Reciprocating Compressors (0.1 MMT CO_2e).

Figure 13: 2022 Underground Natural Gas Storage: Top Reported Emission Sources



Note: Segment totals may not equal sum of individual GHGs due to independent rounding.

LNG Import/Export

The EPA received emission reports from 11 LNG import/export terminals and reported emissions totaled 17.4 MMT CO_2e. Methane emissions totaled 0.1 MMT CO_2e and carbon dioxide emissions totaled 17.3 MMT CO_2e. The top reported source of emissions was Combustion Equipment (16.3 MMT CO_2e).

LNG Storage

The EPA received emission reports from five LNG storage facilities. Total reported emissions from LNG storage were approximately 4,437 metric tons CO_2e.

Natural Gas Distribution

The EPA received annual reports from 161 facilities in the natural gas distribution segment, and reported emissions totaled 11.6 MMT CO_2e. Methane emissions totaled 11.4 MMT CO_2e and carbon dioxide emissions totaled 0.2 MMT CO_2e. Figure 14 presents natural gas distribution emissions by source.

Figure 14: 2022 Natural Gas Distribution: Top Reported Emission Sources

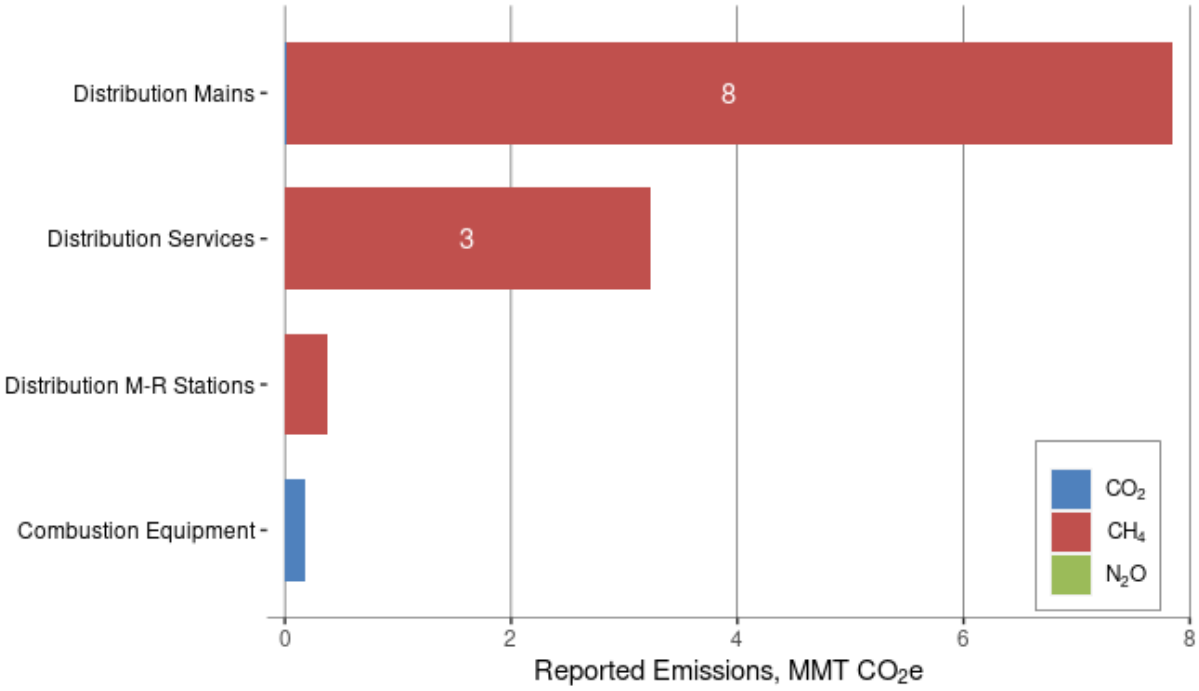
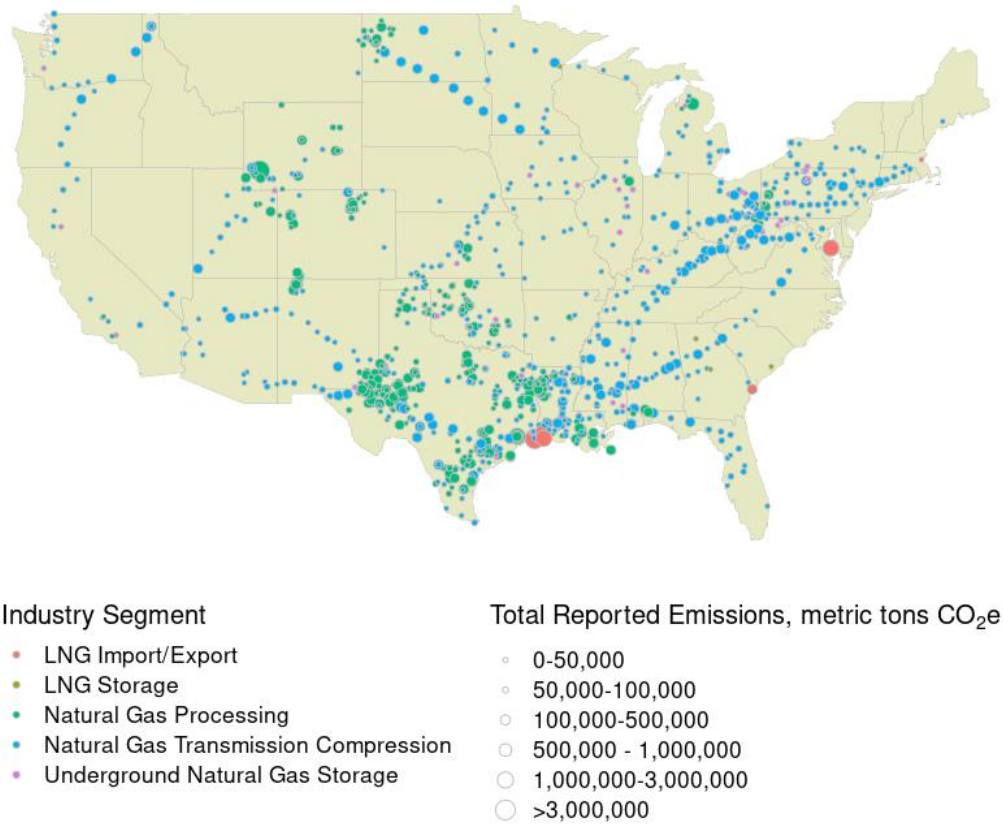


Figure 15 shows reported emissions (CO_2e) and facility locations for natural gas processing, natural gas transmission compression, underground natural gas storage, LNG storage, and LNG import/export facilities.

Figure 15: 2022 Facility Locations and Reported Emissions by Industry Sectors (CO_2e)



Changes from 2011 to 2022

The following section describes the reported data for the 2011 through 2022 reporting years for Petroleum and Natural Gas Systems.[8]

Changes in Number of Facilities

Annual reported facility counts from 2011 to 2022 are shown in Table 2.[9] It should also be noted that emissions can be variable in the Petroleum and Natural Gas Systems sector and

[8] The EPA received resubmissions of previously reported data from certain facilities and this section describes the 2011-2022 time series updated to include the resubmitted data.

[9] For 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 basin. Gathering and boosting includes certain stationary and portable fuel combustion equipment emissions that may have been published for Reporting Years 2011-2015 as Other Petroleum and Natural Gas Systems and reported using a facility definition referring to all co-located emission sources that are commonly owned or operated.

it is not unexpected that emissions for a facility may exceed 25,000 metric tons CO_2e in a given year. Once the reporting threshold is triggered, facilities must report to the GHGRP until emissions are below the threshold for a period of time specified in the regulations, or until all emission sources at a facility cease operation. As a result, the number of facilities reporting to the GHGRP may vary from year-to-year.

Changes in Reported Emissions

Annual reported emissions values from 2011 to 2022 by industry segment are shown in Table 3. Emission changes are the result of a number of factors, such as changes in the number of facilities, operational changes (e.g., increased flaring), calculation changes (e.g., reduced BAMM use), and changes in the reporting landscape, including the addition of industry segments and emission sources (e.g., oil well completions and workovers with hydraulic fracturing) in 2016. Total reported emissions increased 1.3 percent between 2021 and 2022 while the number of facilities decreased 3 percent.

Table 2: Number of Facilities by Industry Segment: 2011 to 2022

Industry Segment[1]	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Onshore Production[2]	459	507	509	570	538	519	506	513	496	479	475	459
Offshore Production	101	108	109	129	133	137	142	145	141	134	133	116
Gathering and Boosting[3]	N/A	N/A	N/A	N/A	N/A	308	332	344	365	364	369	350
Natural Gas Processing	374	403	438	480	467	449	452	455	460	464	452	444
Natural Gas Transmission Compression	421	458	487	522	522	529	534	576	624	644	653	654
Natural Gas Transmission Pipeline[3]	N/A	N/A	N/A	N/A	N/A	28	34	41	46	49	50	44
Underground Natural Gas Storage	49	52	51	54	53	53	48	49	50	52	49	51
LNG Import/Export	8	8	8	8	7	7	7	9	11	11	11	11
LNG Storage	6	5	5	5	7	5	6	5	5	5	5	5
Natural Gas Distribution	183	183	176	181	177	171	171	164	165	166	167	161
Other Oil and Gas Combustion[4]	338	388	419	489	542	70	59	64	55	56	56	58
Total	**1921**	**2096**	**2187**	**2419**	**2422**	**2253**	**2264**	**2336**	**2394**	**2399**	**2396**	**2330**

Notes:

1. *Total number of facilities is smaller than the sum of facilities from each segment because some facilities reported under multiple segments.*
2. *Beginning in Reporting Year 2016, Onshore Production facilities began reporting emissions from oil well completions and workovers with hydraulic fracturing.*
3. *This industry segment began reporting data for the first time in Reporting Year 2016.*
4. *Beginning in Reporting Year 2016, facilities that met the definition of Gathering and Boosting reported emissions for applicable sources. This includes certain stationary and portable fuel combustion equipment emissions that may have been published for Reporting Years 2011-2015 as Other Petroleum and Natural Gas Systems.*

Table 3: Reported Emissions by Industry Segment: 2011 to 2022 (in MMT CO_2e)

Industry Segment	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Onshore Production[1]	92	93	98	102	102	87	97	111	127	98	92	90
Offshore Production	6	7	6	7	7	7	7	8	7	7	6	7
Gathering and Boosting[2]	N/A	N/A	N/A	N/A	N/A	76	76	81	88	86	84	86
Natural Gas Processing	59	60	59	60	59	56	56	57	61	60	59	59
Natural Gas Transmission Compression	24	24	23	22	23	23	24	28	31	30	33	35
Natural Gas Transmission Pipeline[2]	N/A	N/A	N/A	N/A	N/A	3	3	3	3	3	3	2
Underground Natural Gas Storage	2	2	2	2	2	1	1	1	2	1	1	1
LNG Import/Export	1	1	<1	1	1	3	4	7	10	12	14	17
LNG Storage	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Natural Gas Distribution	16	15	15	15	15	14	13	13	13	12	12	12
Other Oil and Gas Combustion[3]	23	25	24	27	29	6	7	9	8	8	7	8
Total	**222**	**226**	**228**	**236**	**236**	**277**	**288**	**318**	**350**	**318**	**312**	**316**

Notes:

1. *Beginning in Reporting Year 2016, Onshore Production facilities began reporting emissions from oil well completions and workovers with hydraulic fracturing.*
2. *This industry segment began reporting data for the first time in Reporting Year 2016.*
3. *Beginning in Reporting Year 2016, facilities that met the definition of Gathering and Boosting reported emissions for applicable sources. This includes certain stationary and portable fuel combustion equipment emissions that may have been published for Reporting Years 2011-2015 as Other Petroleum and Natural Gas Systems.*

Additional Information

Access GHGRP data: https://www.epa.gov/ghgreporting/ghg-reporting-program-data-sets

Access additional information about Petroleum and Natural Gas Systems in the GHGRP, including reporting requirements and calculation methods: https://www.epa.gov/ghgreporting/subpart-w-petroleum-and-natural-gas-systems

Access the GHGRP Petroleum and Natural Gas Systems Data Highlights Page: https://www.epa.gov/ghgreporting/ghgrp-petroleum-and-natural-gas-systems

Access Facility Level Information on Greenhouse Gases Tool (FLIGHT): https://ghgdata.epa.gov/

Glossary

IPCC AR4 refers to the Fourth Assessment Report by the Intergovernmental Panel on Climate Change. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K. and Reisinger, A. (eds)]. IPCC, Geneva, Switzerland, 2007.* The AR4 values also can be found in the current version of Table A-1 in subpart A of 40 CFR part 98.

IPCC AR5 refers to the Fifth Assessment Report by the Intergovernmental Panel on Climate Change. *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.*