Greenhouse Gas Inventory for Texas

Prepared for
Texas Commission on Environmental Quality
for the
Climate Pollution Reduction Grants Program
by

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Executive Summary

A comprehensive, state-level greenhouse gas (GHG) inventory has been developed to support planning for greenhouse gas emission management in Texas. Emissions are reported for calendar year 2022 for electric power generation, transportation, industry, agriculture, commercial, and residential sectors. Combined greenhouse gas sinks and emissions are reported for natural and working lands. Emissions were estimated separately for carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases (F-gases), which include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). Data necessary to estimate emissions were obtained primarily from the EPA Greenhouse Gas Reporting Program (GHGRP), the EPA Greenhouse Gas Inventory (GHGI), the EPA State-level Inventory Tool (SIT), and other public sources. Total state-wide emissions for carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), and other greenhouse gases are reported in Table ES-1. Emissions are reported in tons emitted per year of the greenhouse gas and are aggregated into a single statewide total using Global Warming Potentials, which convert the emissions of greenhouse gases other than carbon dioxide into the amount of carbon dioxide that would produce an equivalent amount of warming over a 100-year period (carbon dioxide equivalents, CO_2e). Greenhouse gas sinks are also reported as carbon dioxide equivalents. Detailed source characterizations are provided in the report and in Supporting Information that documents the calculations. The accuracy of these emission calculations (quality assurance) was assessed by mapping of emissions to evaluate the reasonableness of predicted spatial distributions of emissions and by comparing emission estimates to independent estimates based on alternative data sources.

While multiple emissions reporting systems generally led to similar statewide totals for greenhouse gas emissions, quality assurance analyses revealed different conventions in reporting for different emission reporting systems. For example, in reporting rail, aircraft and marine vessel emissions, some emission inventories report only those emissions that occur within the state, such as marine vessels in port and emissions that occur in railyards and on tracks within state boundaries. Other inventories are based on fuel usage within the state by the reporting sector and do not identify the locations where that fuel was combusted. These differences can lead to substantial differences in reported emissions in some categories and are documented in the report.

In addition, the sectors under which facilities report their emissions can differ among inventories. For example, some facilities that have combined heat and power generation (co-generation) integrated into industrial facilities may report emissions from the co-generation as emissions from the industrial facilities, while other facilities may report the co-generation emissions in the power sector. Again, these differences can lead to substantial differences in reported emissions in some categories and differences associated with large emission sources are documented in the report.

While precise definition of source categories can vary, the dominant emission source categories in Texas, accounting for 87% of total greenhouse gas emissions, expressed as million metric tons per year of CO2e (MMT CO_2e) are industrial sources (260 MMT CO_2e 36% of state total), electric

power generation (192 MMT CO_2e, 26%) and transportation sources (182 MMT CO_2e, 25% of state total).

Overall, total state-wide emissions of greenhouse gases are dominated by carbon dioxide (87% of statewide total emissions expressed as CO_2e). Methane and nitrous oxide emissions, when reported as carbon dioxide equivalents based on warming over a 100 year period, contribute 9% and 3% of total statewide emissions, respectively.

Some source categories have been identified as having larger emission uncertainties than other sectors. Generally, emissions of carbon dioxide, which can be estimated with a high degree of precision based on fuel usage, have less uncertainty than emissions of methane and nitrous oxide, which are typically based on statewide extrapolations based on measurements from small numbers of sources. For example, emissions of methane and nitrous oxide from all oil and gas facilities or all livestock in the state are estimated from measurements on limited numbers of sites or animals.

Source categories where additional emission inventory development would drive the greatest improvement in the accuracy of the statewide inventory are methane emissions from upstream and midstream oil and gas oil operations.[1] The base case emissions of methane for this sector, in this inventory are ~21 million metric tons of carbon dioxide equivalents. Measurement studies have provided evidence that emissions of methane in oil and gas production regions may be under-reported by 50% or more, driven largely by large unintended emission events. Large unintended emissions of methane have the potential to be large in this sector because of the large number (hundreds of thousands) of sites that operate unattended, and because if a malfunction occurs, maximum emission rates can be very large, unlike emissions from other large sources of methane such as livestock or manure management. Further, the potential for emission uncertainty varies significantly among production basins. In Texas, the Permian Basin has the greatest extent of these large unintended emitting sources, while the East Texas production regions have some of the smallest. There are no established guidelines for estimating emissions from these large unintended sources and as these methods develop, the accuracy of the Statewide emission inventory could be improved.

[1]Upstream and midstream excludes Natural Gas Local Distribution from Petroleum and Natural Gas Systems, end uses such as electricity generation, and other downstream processes such as Petrochemical Production and Petroleum Refining.

Table ES-1. State-wide emissions of greenhouse gases in metric tons per year by source sector.

Source Category	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	All other GHGs as MT CO_2e[7]	Total (all GHGs) as MT CO_2e
Electric power generation[1]	191,101,017	10,832	1,747		191,892,519
Transportation[2]	179,039,963	10,278	8,241		181,752,666
Industry[3]	229,534,262	911,569	5,718	6,318,175	260,345,680
Residential and Commercial[4]	31,949,823	690.9	597.4		32,145,115
Municipal and Industrial Wastewater[6]		77,200	2,450		2,660,000
Municipal and Industrial Landfills[6]		422,960			10,574,000
Agriculture[5]	268,000	1,146,000	66,000		48,590,000
Total emissions	**631,893,065**	**2,579,530**	**84,754**	**6,318,175**	**727,959,980**
Natural and working lands[6] (Greenhouse gas removal)	(46,700,000)				(46,700,000)
Net Total	**585,193,065**	**2,579,530**	**84,754**	**6,318,175**	**681,259,980**

[1]Based on EPA Greenhouse Gas Reporting Program, Energy Information Administration, continuous emission monitoring reports and other data

[2]Based on mobile source emission modeling (MOVES modeling) from the Emissions Modeling Platform and data on certain non-road sectors from the National Emission Inventory

[3]Based primarily on reporting to the EPA Greenhouse Gas Reporting Program and extrapolation to non-reporters

[4]Based on fuel consumption reported to the Energy Information Administration

[5]Based on procedures used in EPA Greenhouse Gas Inventory

[6]From EPA State Inventory Tool

[7] Other gases include HFCs, PFCs, SF6, NF3, Other Fully Fluorinated GHGs, HFEs, Very Short Lived Compounds, Other as reported to the US EPA GHGRP

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Acronyms

AAPG	American Association of Petroleum Geologists
AP-42	Compilation of Air Pollutant Emissions Factors from Stationary Sources
AR4, AR5	Assessment Reports (4 or 5) of the Intergovernmental Panel on Climate Change
ARP	Acid Rain Program
BBL	Barrels
BOE	Barrels of Oil Equivalent
CFR	Code of Federal Regulations
CAMD	Clean Air Markets Division (U.S. Environmental Protection Agency)
CH_4	Methane
CHP	Combined Heat and Power
CDL	Cropland Data Layer (U.S. Department of Agriculture)
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalents
CMV	Commercial Marine Vessels
CNG	Compressed Natural Gas
CPRG	Climate Pollution Reduction Grants (U.S. Environmental Protection Agency)
E85	Blend of fuel that contains 85% ethanol and 15% gasoline
EF	Emission Factor
eGRID	Emissions & Generation Resource Integrated Database
EGU	Electricity Generating Unit
EIA	Energy Information Administration
EMP	Emissions Modeling Platform (U.S. Environmental Protection Agency)
EPA	Environmental Protection Agency
FFC	Fossil Fuel Combustion
FHWA	Federal Highway Administration
F-gases	Fluorinated
GHG	Greenhouse Gas
GHGI	Greenhouse Gas Inventory (from the U.S. Environmental Protection Agency)
GHGI-TX	Inventory of U.S. Greenhouse Gas Emissions and Sinks by State for Texas

GHGRP	Greenhouse Gas Reporting Program (from the U.S Environmental Protection Agency)
GHGRPID	Identification number assigned to a facility reported to the EPA GHGRP
GWP	Global Warming Potential (from the Intergovernmental Program on Climate Change)
HFC	Hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent Power Producer
KG	Kilogram
LCD	Liquid Crystal Display
LDC	Local Distribution Company (natural gas distribution)
LED	Light-emitting Diode
LNG	Liquefied Natural Gas
LSO	Launch Site One
MCF	Thousand Cubic Feet
MEMS	Micro-electro-mechanical Systems
MMCF	Million Cubic Feet
MMT	Million metric tons (1,000,000,000 kg)
MOVES	Motor Vehicle Emissions Simulator (from U.S. Environmental Protection Agency)
MT	Metric ton (1000 kilograms)
MWH	Megawatt Hour
N_2O	Nitrous Oxide
NAICS	North American Industry Classification System (the standard used by Federal statistical agencies in classifying business)
NASS	National Agricultural Statistics Service
NEI	National Emission Inventory (of criteria air pollutants assembled by the U.S. Environmental Protection Agency
NEU	Non-energy Use
NF_3	Nitrogen Trifluoride
NLCD	National Land Cover Dataset
NPC	National Petroleum Council
OCS	Outer Continental Shelf

ORIS	A code assigned by the Energy Information Agency at the United States Department of Energy to power plants owned by electric utilities.
PFC	Perfluorocarbons
PHMSA	Pipeline and Hazardous Materials Safety Administration (U.S. Department of Transportation)
PV	Photovoltaic
RGGI	Regional Greenhouse Gas Initiative
RRC	Railroad Commission (Texas)
SCC	Source Class Codes
SCFH	Standard Cubic Feet per Hour
SEDS	EIA's State Energy Data System
SF_6	Sulfur Hexafluoride
SI	Supporting Information (for this report)
SIC	Standard Industrial Classification
SIT	State Inventory Tool (from the U.S. Environmental Protection Agency)
TCEQ	Texas Commission on Environmental Quality
TTI	Texas Transportation Institute
USDA	United States Department of Agriculture
VAM	Ventilation Air Methane
VMT	Vehicle Miles Travelled

Introduction

The Texas Commission on Environmental Quality (TCEQ) plans to submit a Comprehensive Roadmap to Reduce Emissions to the United States Environmental Protection Agency (EPA) as part of the Climate Pollution Reduction Grants (CPRG) program. This plan will include a comprehensive, state-level greenhouse gas (GHG) inventory. The University of Texas at Austin was contracted to develop the Texas GHG Inventory for the base year 2022. Emission sources are inventoried for the following economic sectors: electric power generation, transportation, industry, commercial, residential, agriculture and natural and working lands.

The GHGs reported in this inventory include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases (F-gases), which include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). Emissions are reported by pollutant and total GHG emissions. Greenhouse gas emissions are aggregated into total emissions across multiple pollutants using Global Warming Potentials to convert emissions of individual greenhouse gases, other than carbon dioxide, into the amount of carbon dioxide that would produce an equivalent amount of warming (Carbon dioxide equivalents, CO_2e) using AR4 100-year Global Warming Potentials (GWPs, **Table 1**; Greenhouse Gas Protocol 2024) from the Intergovernmental Panel on Climate Change (IPCC). Data are primarily obtained from the U.S. Environmental Protection Agency (EPA) Greenhouse Gas Reporting Program (GHGRP), the EPA State-level Inventory Tool (SIT), and other public sources.

Table 1. Global warming potentials (GWPs) of specific GHGs based on AR4 and AR5 100-yr GWPs (IPCC, 2023); GWPs indicate the ratio of the radiative forcing over a 100-year period of 1 metric ton of the GHG divided by 1 metric ton of CO_2; 20-yr GWPs indicate the ratio of the radiative forcing over a 20-year period of 1 metric ton of the GHG divided by 1 metric ton of CO_2. This inventory uses AR4 100-GWPs to be consistent with the EPA Greenhouse Gas Reporting Program; the other values are shown for comparison purposes.

Greenhouse Gas	AR4 100-yr GWP	AR4 20-yr GWP	AR5 100-yr GWP
Carbon Dioxide (CO2)	1	1	1
Methane (CH4)	25	72	28
Nitrous Oxide (N2O)	298	289	265
Sulfur Hexafluoride (SF6)	22,800	16,300	23,500
Nitrogen Trifluoride (NF3)	17,200	12,300	16,100
Hydrofluorocarbons (HFCs)	124 – 18,400	273 – 2,000	4 – 12,500
Perfluorocarbons (PFCs)	7,390 – 17,340+	5,210-13,200+	6,630 – 11,100+

Source: (Greenhouse Gas Protocol, 2025)

Emission inventories are valuable for characterizing and quantifying the sources of GHG emissions to facilitate the development of effective programs for managing emissions. Most inventories, including this Texas GHG Inventory, are based on bottom-up approaches that combine activity data (e.g., number of beef cattle) and emission factors (e.g., average emissions per head of beef cattle) to estimate emissions in an area such as a state or county.

One of the primary sources of data utilized in this GHG emission inventory is the EPA Greenhouse Gas Reporting Program (GHGRP). The EPA GHGRP is a mandatory reporting program that requires

U.S. facilities with annual GHG emissions ≥25,000 metric tons (MT) carbon dioxide equivalents (CO_2e) to report their annual emissions and associated data to EPA by March 15 of the following year (EPA 2024a). For each sector and emission source, GHGRP provides one or more methods that companies are required to use to estimate emissions; these methods mainly are bottom-up approaches such as emission factors and engineering equations. Most facilities report emissions at the site-level, however, in the Petroleum and Natural Gas Systems sector, onshore production, and gathering facilities report at the production basin-level and transmission pipeline facilities report at the system-level.

Additional sources of data for this inventory are the EPA Greenhouse Gas Inventory (GHGI) and the EPA State Inventory Tool (SIT). The EPA GHG Inventory is a comprehensive, national inventory that EPA publishes every April to fulfill the United States' reporting obligations under the United Nations Framework Convention on Climate Change (EPA 2024b). Each year, the GHG Inventory report estimates annual, nationwide emissions by GHG, sector, and source for the years 1990 to two years prior to the publication year. EPA also regularly releases a State-Inventory Tool (SIT) to facilitate the development of state-level GHG inventories that use similar sectors and methods to the EPA GHG Inventory (EPA 2024c). The spreadsheet-based tool estimates emissions using state-specific default data collected by federal agencies and other sources. The latest version of SIT, 2025.1, which includes 2022 data, was published by EPA in January 2025.

The general approach to be used in constructing emissions inventories was to assemble activity data and emission factors from the GHGRP. Because not all facilities report to the GHGRP, the activity data from the GHGRP is supplemented, when necessary, by the EPA GHGI, the SIT, and other relevant data sources. In cases where detailed data from the State of Texas or other government sources are available and potentially more accurate than the EPA GHGRP, GHGI and SIT sources, data from these sources is utilized. These data sources will be described in the sections of this report covering the sectors in which the data are used. The activity data, emission factors, and emission estimates will be compared, when possible, to independent measurements and emission estimates, based on data sources independent of those used in developing the inventories.

The emission calculations described in this report underwent three tiers of quality assurance. An initial check was performed to assure that activity data and emission factors were correctly downloaded from the original data sources. A second tier involved quality assurance personnel, not involved in the original calculations, reproducing emission calculations. A third tier of quality assurance involved mapping emissions to assess the reasonableness of predicted spatial distributions of emissions and comparing emission estimates to independent estimates based on alternative data sources, when possible. These quality assurance procedures were performed for each major source category, with more detailed assessments performed for source categories with the highest total emissions. The results are summarized in the report with more documentation in Supporting Information (SI).

The emission estimates provided in this report have uncertainties. Performing a detailed uncertainty analysis was beyond the scope of the development of this inventory. Potential sources of uncertainty are described in the report and Appendices. As a general reflection of uncertainty, the results presented in summary Tables in this report (Executive Summary and

Summary sections) will be limited to three or four significant figures, or to the nearest thousand tons. Data used in the emissions calculations are reported with more than four significant figures of precision (e.g., oil and gas well counts). This higher level of precision is retained in the report text and in spreadsheets used to perform the calculations that are summarized in this report. Spreadsheets are available as Supporting Information (SI).

Electric Power Generation

Methods

For this GHG Inventory, the electric power generation sector is defined as facilities that combust fuels such as coal, natural gas, biomass, or oil for the primary purpose of generating electricity. Only scope 1 (on-site) emissions are included in GHG estimates for this sector. Scope 2 (off-site) emissions from fuel production and transport are included in the industry sector that supplies the fuels (e.g., Petroleum and Natural Gas Systems). Nuclear, wind, solar, and hydroelectric facilities are assumed to have zero scope 1 GHG emissions.

For the electric power generation sector, county-level emissions of CO_2, CH_4, and N_2O are estimated by combining 2022 emissions data from the U.S. Environmental Protection Agency (EPA) and the U.S. Energy Information Administration (EIA). A detailed description of how the data were merged is provided in Appendix 1 and spreadsheets documenting the calculations are available as Supporting Information (SI).

Results

The inventory includes a total of 186 facilities with emissions of 191,892,519 MT CO_2e, where the top 20 emitting facilities are summarized in **Table 2**. Comparisons with the eGRID, EIA and GHGI state level inventories are described in Appendix 1 and in the SI. The 20 highest emitting power plants account for 110,805,919 MT (58%) of the sector's GHG emissions, shown in **Table 2**. The 20 highest emitting counties account for 72% of statewide electric power generation GHG emissions (**Table 3**). County-level emissions are mapped in **Figure 1.** Emissions by primary fuel type, as classified by EPA's eGRID2022 data (EPA, 2023), are provided in **Table 4**. Emissions for the 20 highest emitting counties are dominated by facilities that rely on coal as a fuel (61% of emissions come from coal-fired utilities), while statewide, the emissions mixture is more even, with a 48%:52% split between coal and gas as primary fuels.

Table 2. Top 20 CO_2e emitting Texas power plants.

Rank	GHGRP ID	Facility Name	County	Total GHG Emissions (MT CO_2e)
1	1007504	Martin Lake	Rusk	13,331,097
2	1007505	Oak Grove	Robertson	12,698,415
3	1006868	W A Parish	Fort Bend	12,436,815
4	1007153	Sam Seymour	Fayette	10,547,133
5	1005713	Limestone	Limestone	7,729,335
6	1007376	J K Spruce	Bexar	7,040,902
7	1000375	Welsh Power Plant	Titus	4,713,944
8	1001042	Harrington Station	Potter	4,686,398
9	1007324	Sandy Creek Energy Station	McLennan	4,242,043
10	1000825	Deer Park Energy Center	Harris	3,825,258
11	1006085	FORNEY POWER PLANT	Kaufman	3,654,071
12	1001176	H W Pirkey Power Plant	Harrison	3,345,879
13	1007323	Channelview Cogeneration Facility	Harris	3,091,136
14	1011554	Panda Temple Power Station	Bell	2,953,700
15	1001070	Twin Oaks	Robertson	2,870,694
16	1001148	SWEENY COGENERATION FACILITY	Brazoria	2,847,226
17	1001038	Coleto Creek	Goliad	2,830,305
18	1001043	Tolk Station	Lamb	2,741,275
19	1007303	Cottonwood Energy Project	Newton	2,662,576
20	1006040	Guadalupe Generating Station	Guadalupe	2,557,717

Table 3. Top 20 Texas counties ranked by 2022 EGU GHG emissions in the inventory.

Rank	County	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	CO_2e (MT)
1	Robertson	15,451,184	1,715	252	15,569,109
2	Rusk	14,787,846	1,557	227	14,894,547
3	Harris	14,814,041	327	41	14,834,433
4	Fort Bend	13,829,755	1,354	197	13,922,268
5	Fayette	10,509,256	1,211	178	10,592,517
6	Bexar	10,022,410	131	127	10,063,626
7	Limestone	7,669,241	874	128	7,729,335
8	Potter	5,123,391	58	80	5,148,607
9	Titus	4,676,754	541	79	4,713,944
10	Harrison	4,395,633	390	56	4,422,169
11	Guadalupe	4,283,830	79	8	4,288,208
12	McLennan	4,208,525	487	72	4,242,043
13	Chambers	3,718,112	69	7	3,721,914
14	Kaufman	3,650,340	68	7	3,654,071
15	Montgomery	3,468,496	64	7	3,472,043
16	Hidalgo	3,391,418	63	6	3,394,888
17	Hood	3,285,495	61	6	3,288,867
18	Wise	3,281,363	61	6	3,284,716
19	Orange	3,194,104	57	6	3,197,232
20	Wharton	3,067,782	57	6	3,070,918
	Other Counties	*54,272,042*	*1,609*	*251*	*54,387,066*
	TX Total	**191,101,017**	**10,832**	**1,747**	**191,892,519**

Table 4. Emissions by fuel type for the top 20 CO2e emitting Texas counties.

Rank	County	Emissions at facilities using coal (% of county total)	Emissions at facilities using natural gas (% of county total)
1	Robertson	100%	0%
2	Rusk	90%	10%
3	Harris	0%	100%
4	Fort Bend	89%	11%
5	Fayette	100%	0%
6	Bexar	70%	30%
7	Limestone	100%	0%
8	Potter	91%	9%
9	Titus	100%	0%
10	Harrison	76%	24%
11	Guadalupe	0%	100%
12	McLennan	100%	0%
13	Chambers	0%	100%
14	Kaufman	0%	100%
15	Montgomery	0%	100%
16	Hidalgo	0%	100%
17	Hood	0%	100%
18	Wise	0%	100%
19	Orange	0%	100%
20	Wharton	0%	100%
	Other Counties	15%	85%
	TX Total	**48%**	**52%**

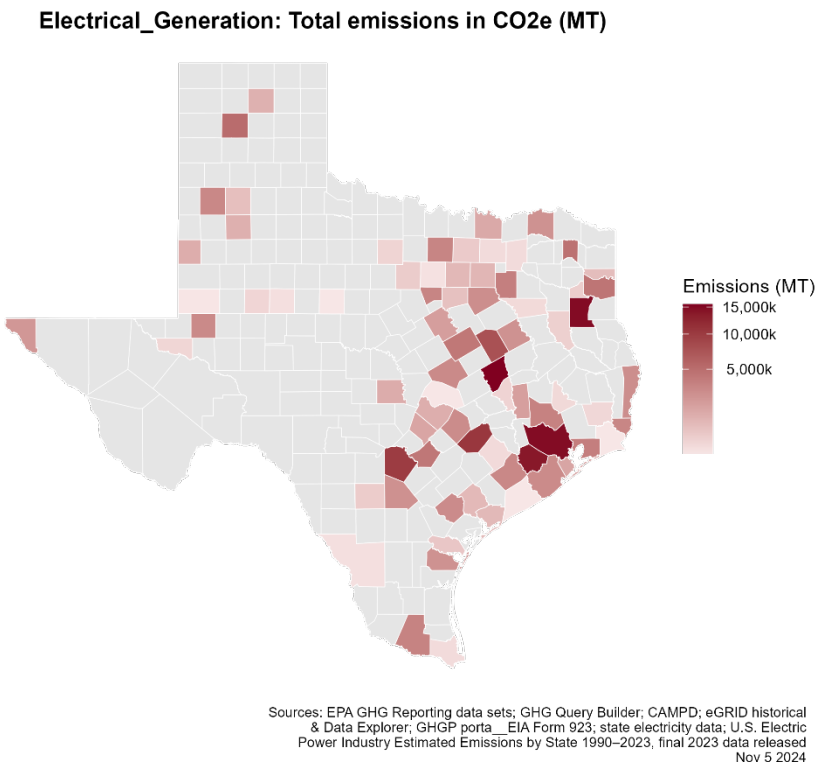


Figure 1. County-level CO2 emissions of power plants reported in the statewide inventory.

Transportation

The transportation sector is defined as on-road vehicles, aircraft, marine vessels, trains/locomotives, rockets that emit GHGs, construction equipment, agricultural equipment, lawn and garden equipment and other non-road mobile sources. For aircraft, only emissions associated with take-off and landing at Texas airports are included in this inventory; emissions during cruising are excluded from state emissions. Similarly, for locomotives and marine vessels, only emissions in railyards/on tracks in Texas and emissions by vessels in port or in Texas state waters are included. For on-road vehicles, aircraft, marine vessels, and trains/locomotives, the primary emissions estimate is based on data from EPA's 2022v1 Emissions Modeling Platform (EMP; EPA 2024e). The emissions estimated for these sectors using the EMP are compared with emissions estimated using the EPA State Inventory Tool (SIT). For other source sectors that are not estimated in the EMP, such as non-road construction equipment, agricultural equipment and lawn and garden equipment, emissions are estimated based on the National Emission Inventory (NEI). For rockets, emissions for 2022 were estimated to be negligible.

Methods

On-road Vehicles

For on-road mobile vehicles, county-level emissions of CO_2, CH_4, and N_2O were obtained from EPA's EMP (EPA 2024e) as the primary emission estimate. Emissions are summarized by fuel type, vehicle type, and road type. The EMP estimates emissions with the Motor Vehicle Emissions Simulator version 4 (MOVES4; EPA 2024f) model, following the methods and assumptions outlined in the EMP documentation. This information is available in Supporting Information (SI).

Because of the importance of on-road vehicle emissions in determining total GHG emissions in the State, several additional estimates were performed. The EPA State Inventory Tool was run for the State of Texas, using default input values for Texas. The SIT calculates emissions for highway vehicles based on vehicle miles traveled (VMT) for eight types of control technologies: three-way catalyst, early three-way catalyst, oxidation catalyst, non-catalyst, low-emission vehicle, advanced, moderate, and uncontrolled; and for seven classes of vehicles, using Federal Highway Administration (FHWA) vehicle classifications. Details of the calculation procedure used by the SIT, and the details of the SIT analyses, are available in the SI.

In addition to the EPA SIT, the results from the EPA EMP tool were compared to an analysis performed by the Texas Transportation Institute (TTI) for the TCEQ, projecting on-road emissions through 2060 using version 3 of the MOVES tool with detailed State of Texas VMT data (TTI, 2023).

Aircraft

For Aircraft, county-level emissions of CO_2 are obtained from EPA's EMP (EPA 2024e). Emissions are categorized by fuel type, and aircraft engine power cycle. The EMP estimates emissions with the methods and assumptions outlined in the EMP documentation, available in the SI. For comparison, the EPA SIT was run for the State of Texas, using default input values for Texas. Details of the calculation procedure used by the SIT are available in the SI.

Marine Vessels

For commercial marine vessels (CMV), county-level emissions of CO_2, are obtained from EPA's EMP (EPA 2024e). Emissions are categorized by ship class, ship movement, fuel type, and main and auxiliary engine power. The EMP estimates emissions for CMV via the methods and assumptions outlined in the EMP documentation, available in the SI. For comparison, the EPA SIT was run for the State of Texas, using default input values for Texas. Details of the calculation procedure used by the SIT are available in the SI.

Locomotives

For locomotives, county-level emissions of CO_2, CH_4, N_2O, and NH_3 are obtained from the EPA's EMP (EPA 2024e). Emissions of CO_2 and N_2O are categorized by operations from the following operators: National Railroad Passenger Corporation (Amtrak), Commuter lines, and Class 1, Class 2, and Class 3 operations. The EMP estimates emissions for locomotives following the methods and assumptions outlined in the EMP documentation, available in the SI. For comparison, the EPA SIT was run for the State of Texas, using default input values for Texas. Details of the calculation procedure used by the SIT are available in the SI.

Rockets

Of 82 rocket launches in the United States in 2022 identified through rocketlaunch.org, four were in Texas. All four launches were conducted by Blue Origin from Corn Ranch, also known as Launch Site One (LSO), which is located about 30 miles north of Van Horn, Texas. The launches were of the New Shepard rocket, named after Alan Shepard, the first American to travel into space. The rocket uses a liquid hydrogen/liquid oxygen fuel system and so the combustion of the rocket fuel leads to water as the primary combustion product.[2] Water is not considered an anthropogenic greenhouse gas, so emissions from rocket launches were assumed to be negligible. Emissions used in the production of hydrogen in Texas are assumed to be accounted for in Chemical sector reporting. Currently, Blue Origin is testing rocket engines using Liquefied Natural Gas (LNG) at its test stand facilities.[3] Carbon dioxide and methane emissions associated with these test firings are assumed to be negligible compared to other transportation sources, however, emissions from the fuels used for rocket firings should continue to be assessed in future state greenhouse gas inventories as launch frequency increases and rocket fuels evolve.

Other non-road vehicles

Non-road vehicles are listed as a separate source category in some emission inventories, such as the inventories in the National Emission Inventory (NEI) for criteria air pollutants. In these inventories of non-road emissions, source categories typically include aircraft, marine vessels, and locomotives, which were estimated in this work based on the EPA's Emissions Modeling Platform (EMP). The NEI also includes source categories that are not estimated separately in this work, including Agricultural Equipment, Commercial Equipment, Construction Equipment, Lawn

[2] https://www.blueorigin.com/new-shepard *Last accessed May 18, 2025.*

[3] https://fortune.com/2023/08/21/jeff-bezos-blue-origin-rocket-tests-texas-emitting-methane-see-from-space-iss/ *Last accessed May 18, 2025.*

and Garden equipment and others. Some of these emissions may be included in GHGI and GHGRP industrial and commercial categories, however, others may be missing. Emissions for non-road sectors that are reported through the 2022 National Emission Inventory (NEI), and not included in the aircraft, marine vessels, and locomotives sectors, documented separately in this work, are reported as a separate source category.

Results

On-road vehicles

Statewide emissions from on-road mobile vehicles in 2022 were estimated using the EPA EMP, and the EPA SIT with default input parameters for Texas. Estimates were also extracted from a report by the Texas Transportation Institute for the TCEQ (TTI, 2023). Results are shown in **Table 5**. Emission estimates differ by approximately 10 million tons/year of carbon dioxide emissions (about 6% of total on-road transportation emissions). The difference is due, in part, to the total estimated VMT. For example, the TTI estimate of annual VMT in 2022 for on-road vehicles is 301 billion miles per year, while the EPA SIT estimates 289 billion miles per year. Since the EPA EMP provides a central estimate, compared to the EPA SIT and the TTI analysis, and because it relies on MOVES version 4 simulations, it will be used as the central estimate in this inventory, however, it should be viewed as having an uncertainty of at least ±3-5% (~±5-8 million tons CO_2e) due to differences in VMT estimates, assumed vehicle types and age distributions, and assumed emission factors.

In the EPA EMP, gasoline and diesel vehicles accounted for two-thirds and one-third of CO_2 emissions, respectively; compressed natural gas (CNG) and ethanol (E85) vehicles accounted for less than 1%. Contributions from passenger trucks, passenger cars, combination unit long haul trucks, combination unit short haul trucks, single unit short haul trucks, and light commercial trucks are shown in **Table 6.** Motorcycles, intercity buses, transit buses, school buses, refuse trucks, motor homes, and single unit long haul trucks accounted for <1% each. Vehicle distributions and fuel type distributions are similar to the estimates from the EPA SIT.

By road type, about 60% of emissions were from urban roads with the remainder from rural and off-network roads. County-level emissions generally scale with population. The 5 highest emitting counties include the state's five largest metropolitan regions (Harris, Dallas, Tarrant, Bexar, Travis). The 20 counties with the highest on-road emissions are listed in **Table 7**. Emissions in all Texas counties are mapped in **Figure 2**.

Table 5. Total Greenhouse Gas emissions from on-road sources in Texas.

Estimation method	CO_2 (MT)	CH_4 (MT CO2e)	N_2O (MT CO2e)	CO_2e (MT)
EPA EMP MOVES 4 Estimate	155,791,891	148,071	2,152,820	158,092,782
EPA SIT (default settings for Texas)	149,479,539	64,450	591,758	150,135,747
TTI MOVES 3 estimate	160,759,854	Not reported	Not reported	

Table 6. On-road emissions by vehicle type.

Vehicle type	% of on-road emissions
Passenger Trucks	42.5%
Passenger Cars	20.7%
Combination long-haul trucks	15. 8%
Combination Short-haul Trucks	9.5%
Single Unit Short-haul Trucks	5.5%
Light Commercial Trucks	4.1%
Single Unit Long-haul Trucks	0.8%
Intercity Buses	0.4%
Motor Homes	0.3%
Motorcycles	0.2%
School Buses	0.1%
Transit Buses	0.1%
Refuse Trucks	0.1%

Table 7. Top 20 Texas counties ranked by 2022 GHG on-road emissions.

Sector Rank	County	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	Total emissions as CO_2e (MT CO_2e)
1	Harris	22,001,540	851.86	950.57	22,306,106
2	Dallas	12,128,329	484.13	422.54	12,266,348
3	Tarrant	8,689,545	342.88	313.46	8,791,529
4	Bexar	8,364,629	420.68	329.58	8,473,362
5	Travis	5,190,874	185.64	197.96	5,254,507
6	Collin	4,068,032	159.55	141.02	4,114,045
7	Hidalgo	3,416,457	130.29	134.18	3,459,699
8	Denton	3,281,589	129.25	121.49	3,321,024
9	El Paso	3,271,374	166.89	125.66	3,312,993
10	Fort Bend	2,754,991	127.79	131.14	2,797,265
11	Montgomery	2,763,084	110.03	92.14	2,793,291
12	Williamson	2,599,713	88.30	108.40	2,634,224
13	Bell	1,985,332	78.84	100.81	2,017,346
14	Mc Lennan	1,975,764	64.43	114.62	2,011,531
15	Cameron	1,727,819	63.80	63.50	1,748,337
16	Nueces	1,658,343	71.26	67.67	1,680,292
17	Hays	1,490,210	62.27	86.44	1,517,527
18	Ellis	1,480,364	44.81	70.12	1,502,379
19	Smith	1,475,096	55.75	75.54	1,499,001
20	Webb	1,416,542	60.48	81.54	1,442,353

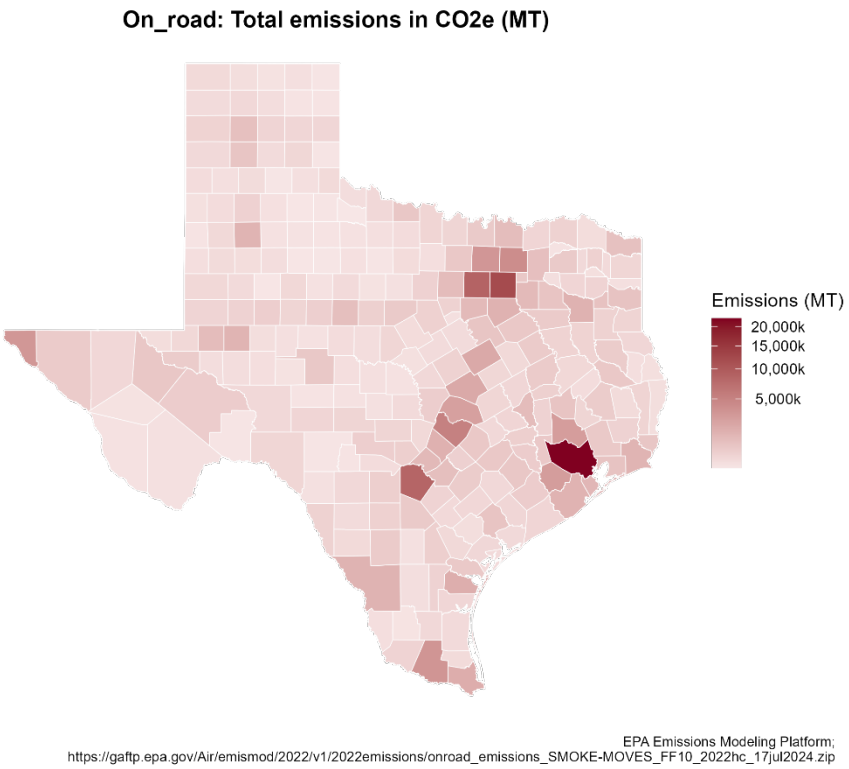


Figure 2. On-road mobile vehicle CO2e emissions.

Aircraft

Statewide emissions from aircraft/aviation sources in 2022 were estimated using the EPA EMP, and the EPA SIT with default input parameters for Texas. Results are shown in **Table 8**. Emission estimates differ substantially between the EMP results and the SIT since the EMP estimates emissions are based only on take-off and landing emission estimates, while the SIT bases estimates on total jet fuel usage within the State. The central emission estimate will utilize the EPA EMP calculations for carbon dioxide emissions, since emissions from aircraft in-flight are not under state regulatory control. The ratio of methane and nitrous oxide emissions to carbon dioxide emissions in the central estimate will be assumed to be equal to the ratio predicted by the SIT. The EMP listed nine source classes (SCC codes) for the aircraft sector, but no greenhouse gas emissions were estimated for the classes identified as Aircraft Auxiliary Power Units and Airport Ground Support Equipment. Based on emissions of NOx and other criteria air pollutants estimated for these sources, these source classes may contribute about 3% to total greenhouse gas emissions from the aircraft/airports sector. These data are described in detail in the SI. No adjustments were made to the EMP estimates.

Table 8. Total Greenhouse Gas emissions from aircraft/aviation sources in Texas.

Estimation method	CO_2 (MT)	CH_4 (MT CO2e)	N_2O (MT CO2e)	CO_2e (CO_{2e} MT)
EPA EMP	3,133,212	Assumed negligible	Assumed negligible	3,133,212
EPA SIT (default settings for Texas)	20,537,346	16,614	187,721	20,741,681
Estimate used in this inventory	3,133,212	2,535	28,639	3,164,386

The 5 counties with the highest aircraft emissions reported through EPA EMP are listed in **Table 9**. Emissions in all Texas counties are mapped in **Figure 3**.

Table 9. Counties with highest aircraft emissions, ranked by GHG emissions (as CO_2e).

Sector Rank	County	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	Total emissions as CO_{2e} (MT CO_{2e})
1	Tarrant	869,334	Assumed negligible	Assumed negligible	869,334
2	Harris	637,746	Assumed negligible	Assumed negligible	637,746
3	Travis	199,384	Assumed negligible	Assumed negligible	199,384
4	Dallas	183,068	Assumed negligible	Assumed negligible	183,068
5	Wichita	133,937	Assumed negligible	Assumed negligible	133,937
	State Total	**3,133,212**	**Assumed negligible**	**Assumed negligible**	**3,133,212**

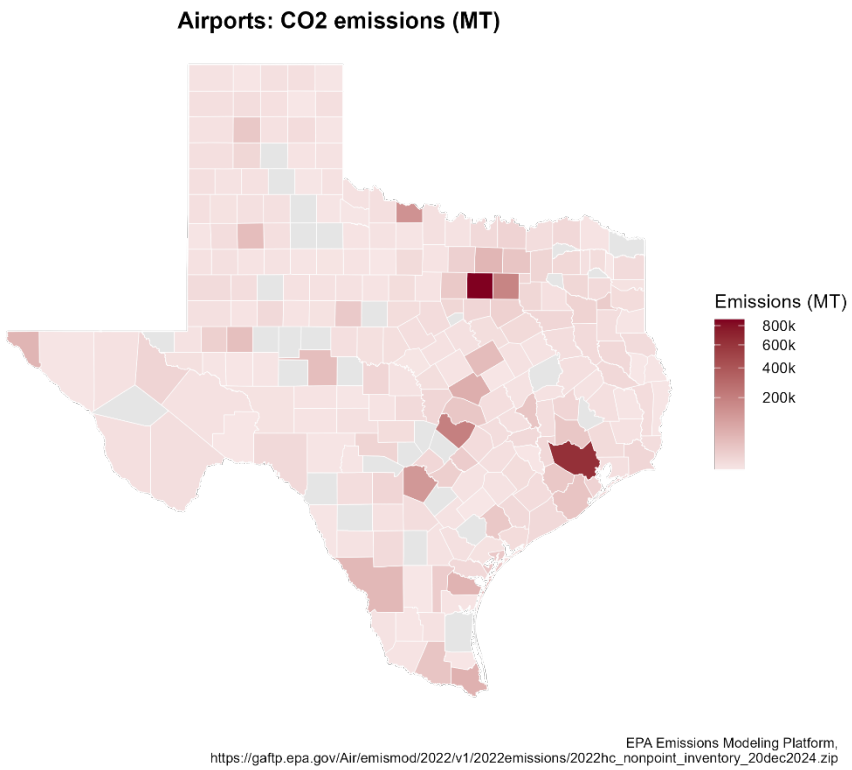


Figure 3. Airport/Aircraft CO2e emissions.

Marine Vessels

Statewide emissions from marine vessels in 2022 were estimated using the EPA EMP, and the EPA SIT with default input parameters for Texas. Results are shown in **Table 10**. Like other transportation estimates, the SIT marine vessel estimates are based on total fuel consumption while the EMP estimates are based on activity using ship tracking and estimated power consumption. Each ship tracking record was assigned a state and county if it was located within a region designated as part of the County (e.g., a port region). Emissions from ships underway in shipping lanes in federal waters were assigned a specific location code for federal waters. The central emission estimate will utilize the EPA EMP calculations for carbon dioxide emissions, since emissions from marine vessels not in state waters are not under state regulatory control. The ratio of methane and nitrous oxide emissions to carbon dioxide emissions in the central estimate will be assumed to be equal to the ratio predicted by the SIT.

Table 10. Total Greenhouse Gas emissions from marine vessels in Texas.

Estimation method	CO_2 (MT)	CH_4 (MT CO2e)	N_2O (MT CO2e)	CO_2e (MT CO_2e)
EPA EMP	2,278,154	Assumed negligible	Assumed negligible	2,278,154
EPA SIT (default settings for Texas)	18,626,201	124,384	132,667	18,883,252
Estimate used in this inventory	2,278,154	15,213	16,226	2,309,764

The 5 counties with the highest marine vessel emissions are listed in **Table 11**. Emissions in all Texas counties are mapped in **Figure 4**.

Table 11. Counties with highest marine vessel emissions, ranked by GHG emissions (as CO2e).

Sector Rank	County	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	Total emissions as CO_{2e} (MT CO_{2e})
1	Harris	778,650	Assumed negligible	Assumed negligible	778,650
2	Galveston	588,768	Assumed negligible	Assumed negligible	588,768
3	Jefferson	236,240	Assumed negligible	Assumed negligible	236,240
4	Nueces	234,772	Assumed negligible	Assumed negligible	234,772
5	Brazoria	148,031	Assumed negligible	Assumed negligible	148,031
	State Total	**2,278,154**	**Assumed negligible**	**Assumed negligible**	**2,278,154**

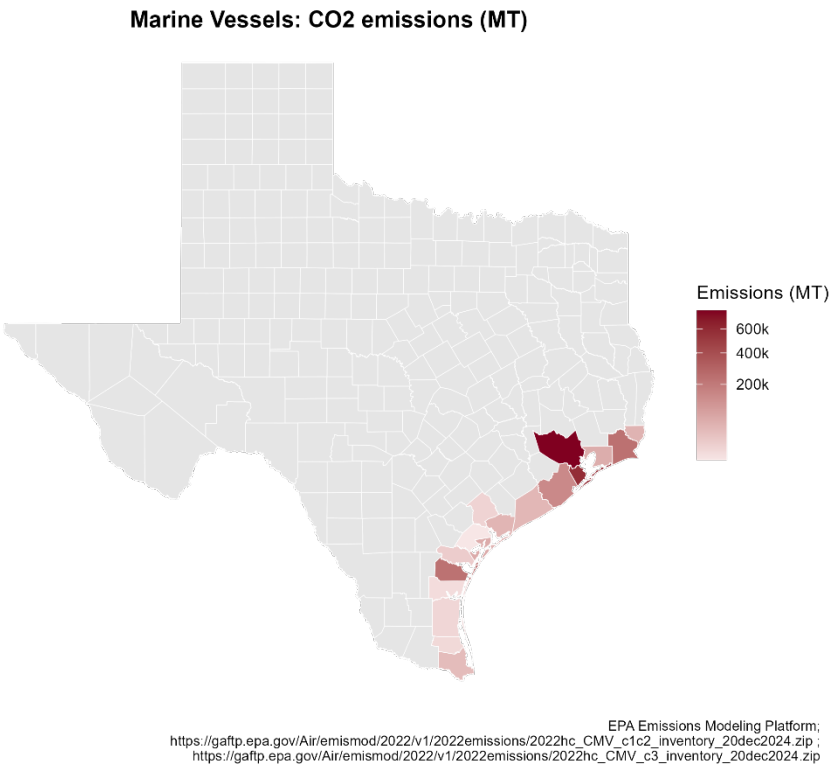


Figure 4. Marine vessel CO2e emissions.

Locomotives

Statewide emissions from trains/locomotives in 2022 were estimated using the EPA EMP, and the EPA SIT with default input parameters for Texas. Results are shown in **Table 12**. Estimates from the EMP are 20% lower than the SIT estimates. Like other transportation estimates, the SIT trains/locomotives estimates are based on total fuel usage in the State while the EMP estimates are based on estimated activity in railyards and tracks in the State. The central emission estimate will utilize the EPA EMP calculations for carbon dioxide emissions, for consistency with other transportation categories. The ratio of methane and nitrous oxide emissions to carbon dioxide emissions in the central estimate will be assumed to be equal to the ratio predicted by the SIT.

Table 12. Total Greenhouse Gas emissions from trains/locomotives in Texas.

Estimation method	**CO_2 (MT)**	**CH_4 (MT)**	**N_2O (MT)**	**Total emissions as CO_{2e} (MT CO_{2e})**
EPA EMP	2,963,993	234	75.925	2,992,459
EPA SIT (default settings for Texas)	3,705,837	8,089	30,853	3,744,779
Estimate used in this inventory	2,963,993	6,470	24,677	2,995,140

The 5 counties with the highest emissions are listed in **Table 13**. Emissions in all Texas counties are mapped in **Figure 5**.

Table 13. Counties with highest locomotive emissions, ranked by GHG emissions (as MT for individual species and MT CO_2e for total).

Sector Rank	County	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	Total emissions as CO_{2e} (MT CO_{2e})
1	Tarrant	91,985	7.25	2.36	92,868
2	Harris	83,797	6.60	2.15	84,602
3	Parmer	82,363	6.49	2.11	83,154
4	Carson	66,440	5.24	1.70	67,078
5	Randall	64,380	5.07	1.65	64,999
	State Total	**2,963,993**	**234**	**76**	**2,992,459**

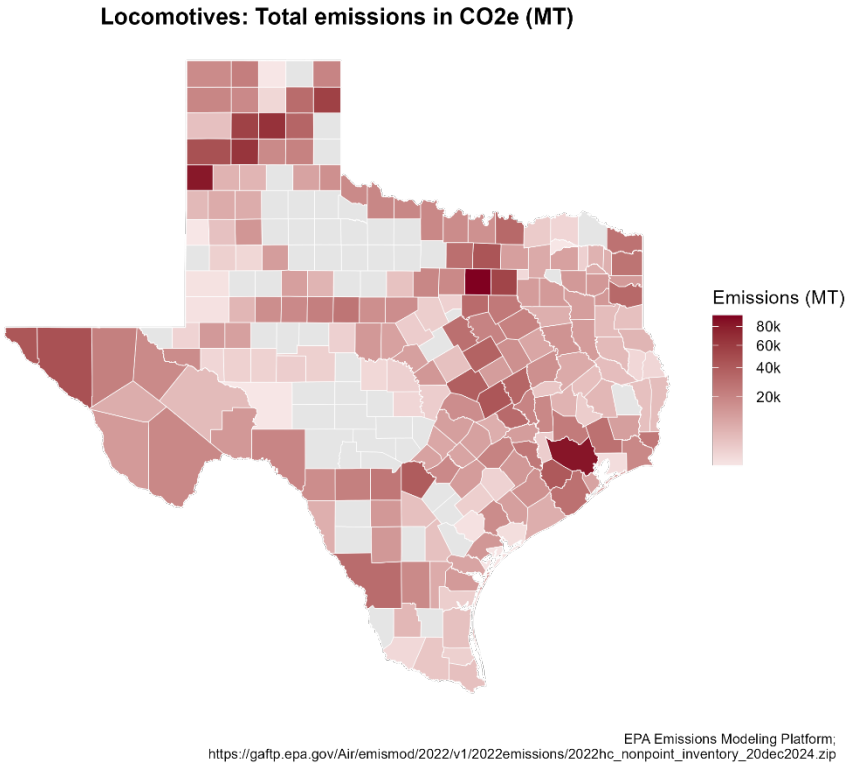


Figure 5. Train/Locomotive CO2e emissions.

Other non-road vehicles

Non-road vehicles are listed as a separate source category in some emission inventories, such as the inventories in the National Emission Inventory (NEI) for criteria air pollutants. In these inventories of non-road emissions, source categories typically include aircraft, marine vessels, and locomotives, which were estimated in this work based on the EPA's Emissions Modeling Platform (EMP). The NEI also includes source categories that are not estimated separately in this work, including Agricultural Equipment, Commercial Equipment, Construction Equipment, Industrial Equipment, Lawn and Garden equipment and others. While in principle, some of these emissions may be included in other GHGI and GHGRP categories, detailed review of these categories did not suggest any double counting. Emissions for non-road sectors that are reported through the 2022 National Emission Inventory (NEI), and not reported in the aircraft, marine vessels and locomotives categories are listed in Table 14. Total emissions in these potentially missing categories are approximately 15 million metric tons CO_2, and are dominated by construction equipment, commercial and agricultural equipment, other industrial equipment, and lawn and garden equipment.

Table 14. Non-road mobile source emissions, not included in EMP estimates in other categories, reported through the NEI.

Nonroad sector	CO_2 (MT)	CH_4 (MT)	N_2O[1] (MT)	Total Emissions (MT CO_2e)
Agricultural Equipment	1,151,411	86	53	1,169,482
Commercial Equipment	1,663,420	1,003	77	1,711,470
Construction and Mining Equipment	6,173,175	208	286	6,263,679
Industrial Equipment	2,774,825	442	129	2,824,224
Lawn and Garden Equipment	2,123,637	1,402	98	2,188,028
Logging Equipment	23,255	1	1	23,605
Pleasure Craft	683,724	488	32	705,367
Railway maintenance	21,592	1	1	21,927
Recreational Equipment	257,672	285	12	268,356
State Total	**14,872,713**	**3,916**	**690**	**15,176,138**

[1]Emissions for these categories were estimated based on the ratio of emissions N_2O to CO_2 emissions in the on-road sector

Summary of Transportation Emissions

Total emissions from the transportation sector, not including potentially missing categories, are 166,562,072 MT CO_2e and are summarized in **Table 15.** Including the missing emissions from the non-road category, the total is 181,732,664, assuming that the ratio of nitrous oxide emissions to carbon dioxide emissions in the estimate of missing emissions is equal to the ratios predicted in the sum of the emissions without missing emissions.

The 20 highest emitting counties account for 71% of statewide transportation GHG emissions (**Table 16**). County-level emissions are mapped in **Figure 6.**

Table 15. Transportation sector emissions.

Sub-sector	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	Total GHG emissions (MT CO_2e)	Percentage of State total for transportation sources[1]
On-road	155,791,891	5,923	7,224	158,092,782	95.0%
Aircraft[2]	3,133,212	119	145	3,179,486	1.9%
Marine Vessels[2]	2,278,154	87	106	2,311,800	1.4%
Locomotive	2,963,993	234	76	2,992,459	1.8%
Total (without additional non-road sources from NEI)	**164,167,250**	**6,362**	**7,551**	**166,576,527**	100%
Other potentially missing sources	14,872,713	3,916	690	15,176,138	
Total (with potentially missing sources)	**179,039,963**	**10,278**	**8,241**	**181,752,666**	

[1]Without additional non-road sources from NEI

[2]Emissions of CH_4 and N_2O for these categories were estimated based on the ratio of emissions of CH_4 or N_2O to CO_2 emissions in the on-road sector

Table 16. Top 20 Texas counties ranked by 2022 Transportation GHG emissions reported to the GHGRP (without additional non-road sources from NEI).

Rank	County	Total transportation sources (MT CO_2e)
1	Harris	23,807,104
2	Dallas	12,504,069
3	Tarrant	9,753,731
4	Bexar	8,631,782
5	Travis	5,464,688
6	Collin	4,145,355
7	Hidalgo	3,482,802
8	Denton	3,409,367
9	El Paso	3,402,238
10	Fort Bend	2,856,706
11	Montgomery	2,835,973
12	Williamson	2,669,686
13	Bell	2,116,592
14	Mc Lennan	2,081,297
15	Nueces	1,976,212
16	Galveston	1,865,250
17	Cameron	1,835,056
18	Jefferson	1,666,515
19	Brazoria	1,614,560
20	Ellis	1,536,048
	other counties	*68,841,577*
	TX Total	**166,496,608**

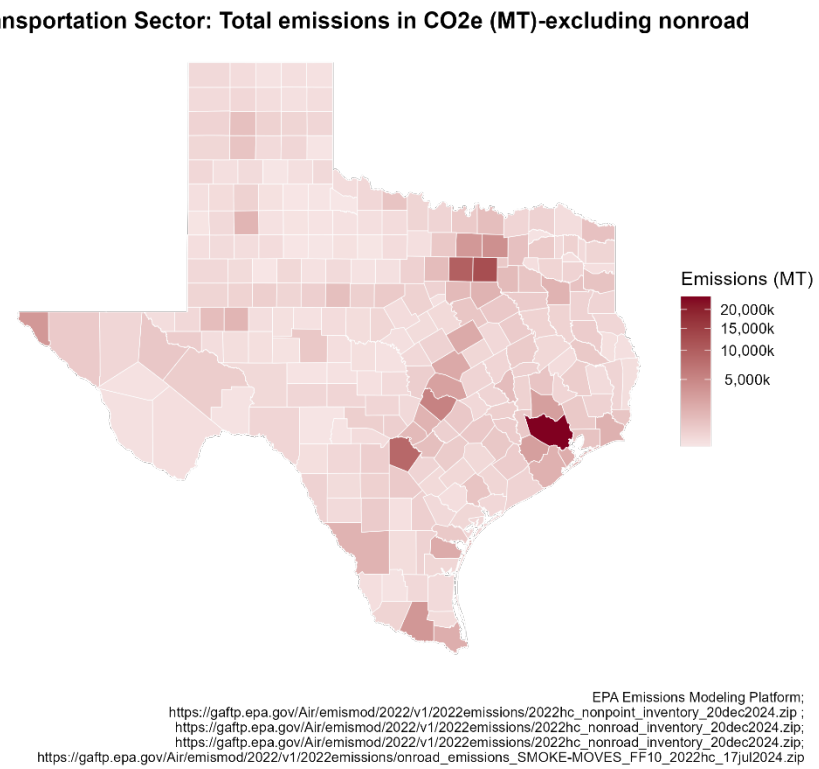


Figure 6. Total transportation sector CO_2e emissions (without additional non-road sources from NEI).

Industry

For this inventory, the industry category includes all industrial sectors reporting to the EPA GHGRP except power plants and waste management, which are separately reported. Emissions are reported to the GHGRP for 7 sectors and 47 sub-sectors. These sectors and sub-sectors are listed in Table 17. Not all sub-sectors include facilities in Texas. Sectors and sub-sectors are defined using the GHGRP definitions in the associated Subpart of the regulatory text in the Code of Federal Regulations.

Table 17. GHGRP sectors by primary and secondary categorization and their reporting GHGs. All sectors except Power Plants and Waste Management are included.

GHGRP Sector/Sub-Sector	40 CFR Part 98 Subpart	Reporting GHGs
Petroleum and Natural Gas Systems		CO_2, CH_4, N_2O
Offshore Petroleum & Natural Gas Production	W	
Onshore Petroleum & Natural Gas Production	W	
Onshore Petroleum & Natural Gas Gathering & Boosting	W	
Natural Gas Processing	W/C	
Natural Gas Transmission/Compression	W/C	
Onshore Natural Gas Transmission Pipelines	W	
Natural Gas Local Distribution Companies	W	
Underground Natural Gas Storage	W/C	
Liquefied Natural Gas Storage	W/C	
Liquefied Natural Gas Imp/Exp Equipment	W/C	
Refineries	Y	CO_2, CH_4, N_2O
Chemicals		CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, HFEs, NF_3, Other Fully Fluorinated GHGs, Very Short-lived Compounds
Adipic Acid Production	E	
Ammonia Manufacturing	G	
Fluorinated GHG Production	L	
HCFC-22 Production/HFC-23 Destruction	O	
Hydrogen Production	P	
Nitric Acid Production	V	
Petrochemical Production	X	
Phosphoric Acid Production	Z	
Silicon Carbide Production	BB	
Titanium Dioxide Production	EE	
Other Chemicals	C	

GHGRP Sector/Sub-Sector	40 CFR Part 98 Subpart	Reporting GHGs
Other		CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, HFEs, NF_3, Other Fully Fluorinated GHGs, Very Short-lived Compounds
Underground Coal Mines	FF	
Food Processing	C	
Ethanol Production	C	
Universities	C	
Manufacturing	C	
Military	C	
Use of Electrical Equipment	SS	
Electronics Manufacturing	I	
Electrical Equipment Manufacturers	I	
Other	C	
Minerals		CO_2, CH_4, N_2O
Cement Production	H	CO_2, CH_4, N_2O
Glass Production	N	
Lime Manufacturing	S	
Soda Ash Manufacturing	CC	
Other Minerals	C	
Metals		CO_2, CH_4, N_2O, HFCs, PFCs, SF_6
Aluminum Production	F	
Ferroalloy Production	K	
Iron & Steel Production	Q	
Lead Production	R	
Magnesium	T	
Zinc Production	GG	
Other Metals	C	
Pulp and Paper		CO_2, CH_4, N_2O
Pulp and Paper Manufacturers	AA	
Other Paper Producers	C	

Methods

For most sectors and sub-sectors, county-level or facility level emissions are estimated with a similar approach: 1) compile facility-level reported 2022 emissions data from the GHGRP and assign emissions to the appropriate counties, 2) estimate the fraction of statewide emissions or underlying activity data accounted for by reporting facilities, 3) spatially allocate remaining activity data among counties using best available information, 4) apply representative emission factors to estimate emissions from non-reporting facilities, and 5) combine emissions data from reporting and non-reporting facilities. For sub-sectors with missing statewide activity data or near comprehensive coverage of activity data by GHGRP facilities, the GHGRP reported emissions are

assumed to be the state total. Some sectors including Petroleum and Natural Gas Systems and Landfills are estimated with different approaches that are described in the Results sections. The waste and electricity generation sectors are reported in separate sections of this report.

To assess the completeness of the GHGRP reporting, facilities reporting to the GHGRP were compared, in most sectors, to facilities reporting emissions of criteria air pollutants to the TCEQ. Data from the GHGRP reporting, and the TCEQ reporting, available in the Appendices and SI, were compared. Strings of identifiers were used in each data set to identify facilities. For the GHGRP data the string included: facility name, address, city, county, latitude, longitude. For the TCEQ data the string included: site (corresponding to GHGRP facility name), location (corresponding to GHGRP address), near city (corresponding to GHGRP city), county, latitude, longitude. When possible, these strings were compared and a similarity index was created for each pair of GHGHRP/TCEQ facilities using the fuzzy matching algorithm;[4] similarity was scored from 0-100, where 0 means no matching and 100 means complete matching. Facilities were considered matched if the similarity score was >70 and the distance calculated between locations was <5 km. Only one-to-one matching was considered; if multiple facilities from one database match to one facility in the other, the facility with the closest distance and highest similarity score was chosen. For unmatched facilities from the previous step, any two facilities located within 1 km distance are considered a matched pair; if multiple matchings identified, the closest facility was chosen. All of the matching results were manually confirmed, and the results are provided as Appendices to this report. For some source sectors, the variety of facility names and SIC Codes made automated matching difficult. In these cases, facilities were matched manually without an automated system, based primarily on names and reported locations.

Results

Petroleum and Natural Gas Systems

Petroleum and Natural Gas Systems covers the upstream, midstream, and downstream oil and gas supply chain.[5,6,7] All sub-sectors report CO_2, CH_4, and N_2O emissions under Subpart W of GHGRP, some sub-sectors report the portion of CO_2, CH_4, and N_2O emissions associated with combustion under Subpart C as identified above in **Table 17**.

Emissions for the Petroleum and Natural Gas Systems inventory have some of the highest uncertainties in the State emission inventory, driven largely by uncertainty in methane emissions. At a national level, using the AR5 Global Warming potential for methane, the National Petroleum Council (NPC, 2024) estimated total emissions of methane from natural gas supply chains as ~150 million metric tons of carbon dioxide equivalents. A variety of measurement studies (Alvarez, 2018) have provided evidence that emissions of methane in oil and gas production regions may be under-reported by 50% or more, principally driven by large unintended emission events. Large

[4] rapidfuzz: https://rapidfuzz.github.io/RapidFuzz/ *Last accessed May 18, 2025.*
[5] Upstream: onshore and offshore oil and gas production, natural gas gathering and boosting
[6] Midstream: gas processing, transmission compression and pipelines, liquified natural gas facilities
[7] Downstream: underground gas storage, natural gas distribution

unintended methane emissions can be significant in this sector due to the vast number of unattended sites—numbering in the hundreds of thousands—and the potential for malfunctions to result in extremely high emission rates. This contrasts with other major methane sources, such as livestock or manure management, where maximum emissions are typically lower. Data collected in multiple production basins, as summarized in Alvarez, *et al.*, have demonstrated that the magnitude of the underestimates varies significantly between basins. In Texas, the Permian Basin has the greatest extent of large emitting sources, while the East Texas production regions have some of the smallest. There are no established guidelines for estimating emissions from these sources. This inventory uses reported emission estimates, based largely on the GHGRP. Estimated uncertainties are described in the Summary section of this report.

In this analysis, emissions from Onshore Production and Onshore Gathering and Boosting facilities were consolidated into a single category due to significant ambiguity in how these segments are defined and classified. Operators often apply inconsistent classifications to similar equipment. For example, some designate central tank battery facilities as Onshore Production, while others classify them under Onshore Gathering and Boosting. This inconsistency complicates the interpretation of emissions inventories. Additionally, both segments include facilities that emit below the 25,000 metric tons CO_2e/year threshold required for reporting under the Greenhouse Gas Reporting Program (GHGRP).

Emissions for both segments are reported at the basin level, and the 13 basins that contain Texas counties are listed in **Table 18**. To account for unreported emissions from sub-threshold facilities, basin-level emissions for the combined segments were scaled up based on total basin production, measured in energy terms (e.g., barrels of oil equivalent, or BOE), using data from Prism (Enverus, 2025). This scaling was applied relative to the production associated with GHGRP-reported Onshore Production facilities. No production was reported in the Kerr, Llano Uplift, and Bend Arch Basins in the GHGRP. Bend Arch includes emissions from two Gathering and Boosting facilities. However, Enverus reports minor production in all three basins. Kerr and Llano Uplift emissions were estimated using the emissions per energy unit derived for the Ouachita Folded Basin, which is geologically similar. An analogous approach was used to estimate emissions for the Bend Arch based on emissions per energy unit derived from the Strawn Basin.

Table 18. GHGRP reporting basins in Texas (EPA, n.d.-1).

Reporting basin number	Reporting basin name
220	Gulf Coast Basin (LA, TX)
260	East Texas Basin
345	Arkoma Basin
360	Anadarko Basin
400	Ouachita Folded Belt
405	Kerr Basin
410	Llano Uplift
415	Strawn Basin
420	Fort Worth Syncline
425	Bend Arch
430	Permian Basin

435	Palo Duro Basin
465	Orogrande Basin

Several basins span multiple states. Therefore, basin-level emissions had to be allocated to the Texas portion based on the share of energy production occurring within Texas counties relative to the entire basin.

The upstream (Onshore Production and Onshore Gathering and Boosting) contribute the majority of emissions across this sector (~67%). **Table 19** provides the emissions attributable to the 20 highest emitting counties from these segments and **Figure 7** provides a map of carbon dioxide equivalent emissions distributed across the state.

Table 19. On-shore production emissions for top 20 counties

Rank	County	CO_2 emissions (MT)	CH_4 emissions (MT)	N_2O emissions (MT)	Total emissions (MT CO_2e)
1	REEVES	5,226,984	34,254	16	6,088,048
2	MIDLAND	5,041,504	33,038	15	5,872,013
3	MARTIN	3,887,621	25,477	12	4,528,046
4	WEBB	3,048,750	43,627	8	4,141,743
5	KARNES	3,033,387	43,407	8	4,120,872
6	LOVING	3,429,942	22,477	10	3,994,972
7	HOWARD	2,649,531	17,363	8	3,086,000
8	UPTON	2,275,462	14,912	7	2,650,308
9	LA SALLE	1,670,780	23,908	4	2,269,764
10	DEWITT	1,545,292	22,113	4	2,099,286
11	TARRANT	1,053,507	37,006	3	1,979,539
12	PANOLA	1,035,562	33,717	3	1,879,422
13	CULBERSON	1,597,692	10,470	5	1,860,887
14	REAGAN	1,543,240	10,113	5	1,797,465
15	DIMMIT	1,238,767	17,726	3	1,682,871
16	GLASSCOCK	1,305,005	8,552	4	1,519,984
17	WISE	726,624	27,191	2	1,406,862
18	WARD	1,184,271	7,761	4	1,379,362
19	DENTON	620,669	23,226	1	1,201,715
20	ANDREWS	960,720	6,296	3	1,118,984
	Other Counties	*15,261,467*	*255,062*	*43*	*21,650,704*

Rank	County	CO_2 emissions (MT)	CH_4 emissions (MT)	N_2O emissions (MT)	Total emissions (MT CO_2e)
	Texas Total	**58,336,779**	**717,696**	**167**	**76,328,848**

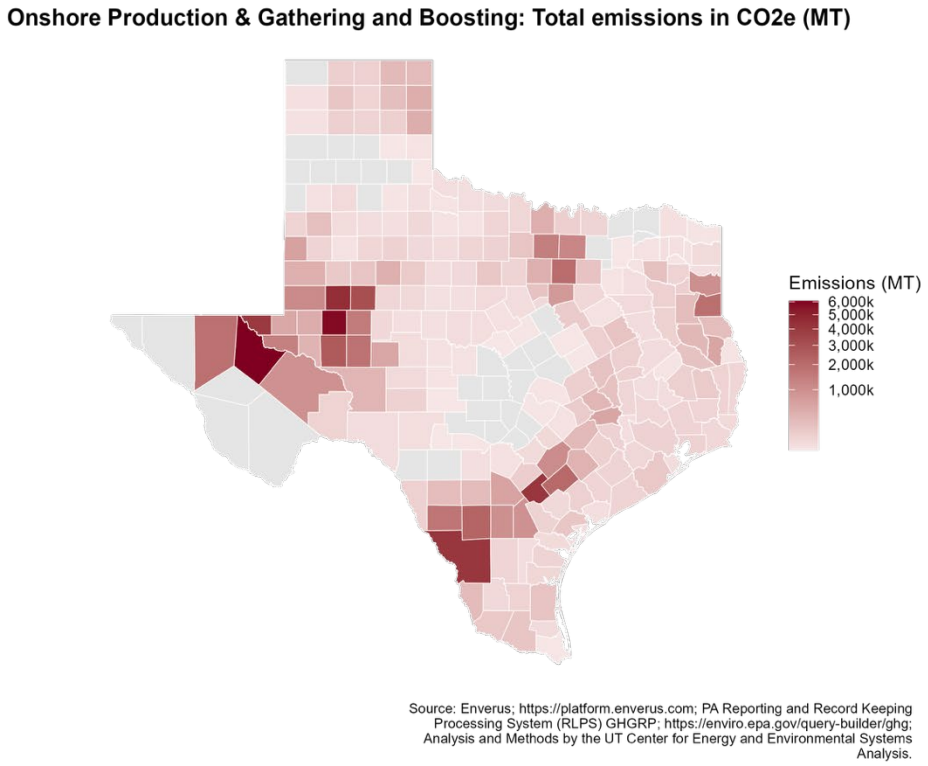


Figure 7. Total Petroleum and Natural Gas System CO_2e emissions.

Emissions from abandoned wells—both plugged and unplugged—are not included in the EPA's Greenhouse Gas Reporting Program (GHGRP); however, their emissions were incorporated into this analysis. These estimates were derived through the application of emission factors from EPA's 2022 Greenhouse Gas Inventory (GHGI) [8] to counts of oil and gas wells labeled as inactive in the Enverus database as of year-end 2021.

Similarly, emissions from offshore facilities were estimated. For facilities located within coastal state waters, production volumes reported to the Texas Railroad Commission (RRC) were used.

[8] U.S. Environmental Protection Agency (EPA). (2024). *Inventory of U.S. greenhouse gas emissions and sinks: 1990–2022* (EPA 430-R-24-003). Washington, DC. Retrieved from https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks

To capture activity within the remainder of the 25 nautical miles of the state's jurisdictional reach under the Outer Continental Shelf (OCS) Air Regulations,[9] supplemental production estimates from Enverus were used. Emissions were then calculated by applying 2022 GHGI emission factors for Gulf of Mexico State Waters on a production-volume basis, with facilities categorized as either oil or gas wells.

Gas processing emissions were estimated based on reported emissions under GHGRP Subparts C and W, where subpart C emissions are dominated by CO_2 emissions associated with combustion and CO_2 contributions from Subpart W arise largely due to flaring and acid gas removal.

Most inter- and intrastate transmission pipeline capacity is included in the GHGRP. To account for unreported pipeline segments, missing pipeline systems were identified based on EIA data (EIA, n.d.-1). Those pipeline blowdown emissions were scaled according to the most analogous systems within the inventory. Classification was based on system geometry—either complex/webbed or simple/straight configurations. This distinction was critical because GHGRP pipeline reporting only includes blowdown events, which can occur more frequently in complex systems due to the greater ease of isolating pipeline segments for maintenance without disrupting overall operations.

Similarly, the majority of transmission compression capacity is captured within the Greenhouse Gas Reporting Program (GHGRP). To estimate emissions from residual non-reporting sources, reported compressor stations were mapped to the pipeline systems they serve. To account for unreported emissions from sub-threshold facilities, eight additional compressor stations were modeled using emissions and throughput assumptions equivalent to half the capacity of the Valley Crossing Brownsville Station, reflecting the smaller scale of pipeline systems likely to fall under the GHGRP reporting threshold.

Only two LNG facilities were operating in Texas in 2022, and both were included in the GHGRP. The Freeport LNG facility had a material loss of containment event in 2022, so emissions were estimated and included based on documentation in the PHMSA investigation of the event (IFO Group, 2022).

Distribution facilities include minor upscaling factors to account for sources under the reporting threshold using activity data. Facilities representing approximately 65% of statewide Underground Gas Storage working gas capacity were not included in the inventory, so emissions were scaled up to reflect that discrepancy. Statewide emissions from petroleum and natural gas sources in 2022 are reported in **Table 20**. Additional details are provided in Appendix 2.

[9] OCS Air Regulations in Part 55 include provisions related to permitting, monitoring, reporting, fees, compliance, and enforcement. OCS sources locating within 25 nautical miles of a state seaward boundary, commonly known as "inner OCS sources", are required to comply with the air quality requirements of the corresponding onshore area (COA), which include New Source Review preconstruction permitting and/or Part 70 Title V operating permit program requirements and other state and local requirements that apply to OCS sources. https://www.epa.gov/caa-permitting/outer-continental-shelf-air-permits#:~:text=OCS%20sources%20locating%20beyond%2025,South%20Coast%20and%20Ventura%20County). *Last accessed 5/13/25*.

Table 20. Emissions from the petroleum and natural gas sector.

Petroleum and Natural Gas Sub-Sector Emissions	CO_2 emissions (MT)	CH_4 emissions (MT)	N_2O emissions (MT)	Total emissions (MT CO2e)
Offshore Petroleum & Natural Gas Production	5,386	604	-	20,497
Onshore Petroleum & Natural Gas Production Onshore Petroleum and Natural Gas Boosting and Gathering	58,336,779	717,696	167	76,328,848
Abandoned Wells	420	14,714	-	368,278
Natural Gas Processing	24,972,554	57,055	50	26,413,821
Natural Gas Transmission Compression	5,263,300	35,336	10	6,149,666
Onshore Natural Gas Transmission Pipelines	467	30,434	-	761,316
Natural Gas Local Distribution Companies	990	32,853	-	822,315
Underground Natural Gas Storage	205,914	1,725	0	249,069
Liquefied Natural Gas Storage	-	-	-	-
Liquefied Natural Gas Imp/Exp Equipment	3,149,622	1,121	6	3,179,424
Total Petroleum and Natural Gas Systems	**91,935,430**	**891,539**	**233**	**114,293,233**

Petroleum Refineries

Petroleum Refineries reporting through the GHGRP (Subpart Y) includes facilities that produce gasoline, gasoline blending stocks, naphtha, kerosene, distillate fuel oils, residual fuel oils, lubricants, or asphalt (bitumen) through distillation of petroleum or through redistillation, cracking, or reforming of unfinished petroleum derivatives. The emissions from the 32 facilities that reported through the GHGRP as refineries are listed in **Table 21**. Of the 32 distinct facilities identified, facilities numbered 1-27 were matched to facilities reporting to the TCEQ (Appendix 3). One facility reporting to the TCEQ as a refinery (Facility 28, Deer Park Chemical) is associated with the Deer Park Refinery (Facility 23) and is reported in this inventory as a chemical manufacturing facility, leaving row 28 empty in **Table 21**. Four facilities (Facilities 29-32) reported to the GHGRP as a refinery, but do not appear as separate units in the TCEQ inventory. These facilities are counted as refineries in this inventory, but they contribute less than 0.7% of the emissions from this sector. Total emissions from the sector are 53,861,129 MT CO_2e. Emissions in all Texas counties are mapped in **Figure 8**.

Data similar to the data presented in **Table 21**, together with comparisons to TCEQ emissions reporting, have been prepared for other Industrial source categories but are presented in Appendices. **Table 21** has been included here to illustrate the type of detail available in Appendices.

Table 21. Emissions by facility for sources reporting as Petroleum Refineries.

	GHGRP Facility	id_ghgrp	CO_2 (MT CO_2e)	CH_4 (MT CO_2e)	N_2O (MT CO_2e)	Total (MT CO_2e)	County
1	VALERO CORPUS CHRISTI REFINERY	1008110	2,391,571.1	12,148	7,582.61	2,411,302	NUECES
2	Marathon El Paso Refinery	1003564	783,395.9	5,058.25	2,332.148	790,786.3	EL PASO
3	HOUSTON REFINING	1004130	1,985,068.7	21,928.25	5,454.294	2,012,451	HARRIS
4	Galveston Bay Refinery	1005585	4,855,089.8	42,385.75	11,506.972	4,908,983	GALVESTON
5	PASADENA REFINING SYSTEM	1005903	311,757	3,835.5	1,149.088	316,741.6	HARRIS
6	VALERO REFINING HOUSTON REFINERY	1006062	1,517,198.9	2,730.75	5,024.876	1,524,955	HARRIS
7	Delek Refining, Ltd	1006444	527,360.6	1,856.25	1,616.352	530,833.2	SMITH
8	VALERO CORPUS CHRISTI REFINERY EAST PLANT	1006959	676,177.1	10,237.5	2,823.848	689,238.4	NUECES
9	BIG SPRING REFINERY	1006961	633,510.4	5,736.25	1,954.284	641,200.9	HOWARD
10	Exxonmobil Beaumont Refinery	1007959	3,369,537.8	10,899.75	9,830.126	3,390,268	Jefferson
11	CITGO CORPUS CHRISTI REFINERY EAST PLANT	1007965	964,051	1,645.75	2,744.878	968,441.6	NUECES
12	Buckeye Texas Processing LLC	1011920	100,172.7	930.75	303.364	101,406.8	NUECES
13	DIAMOND SHAMROCK REFINING VALERO	1008310	696,757.5	3,871	1,693.534	702,322	LIVE OAK
14	VALERO REFINING TEXAS CITY REFINERY	1008938	2,104,777.4	9,026	7,680.652		GALVESTON
15	Nixon Refinery	1010605	21,825.2	218.75	63.772	22,107.72	WILSON
16	PREMCOR REFINING GROUP INCORPORATED PORT ARTHUR REFINERY	1002657	2,047,739.3	18,060	5,973.112	2,071,772	JEFFERSON
17	TotalEnergies Petrochemicals & Refining USA, Inc. - Port Arthur Refinery	1005743	2,083,153.4	7,307.75	7,059.918	2,097,521	JEFFERSON
18	SWEENY REFINERY	1005992	1,879,948.2	8,041.5	4,103.162	1,892,093	BRAZORIA
19	BORGER REFINERY	1006301	1,088,521.4	9,798.25	2,743.09	1,101,063	HUTCHINSON
20	EXXONMOBIL Bt Site	1007542	12,492,524.8	35,167.5	32,705.5	12,560,398	HARRIS
21	FLINT HILLS RESOURCES CORPUS CHRISTI WEST PLANT	1009066	2,503,986.5	11,143.5	6,526.498	2,521,656	NUECES
22	FLINT HILLS RESOURCES CORPUS CHRISTI EAST PLANT	1009067	526,263.3	2,753.25	1,228.654	530,245.2	NUECES
23	Deer Park Refining Limited Partnership	1014559	3,175,946.6	13,708	6,848.338	3,196,503	HARRIS
24	CITGO CORPUS CHRISTI REFINERY - WEST PLANT	1002970	421,874	2,424.5	1,480.762	425,779.3	NUECES
25	Diamond Shamrock Refining Company, L.P.	1007936	1,256,482.6	3,307	3,725.894	1,263,515	MOORE
26	The San Antonio Refinery, LLC	1005803	81,363.7	1,488.75	299.49	83,151.94	BEXAR

	GHGRP Facility	id_ghgrp	CO_2 (MT CO_2e)	CH_4 (MT CO_2e)	N_2O (MT CO_2e)	Total (MT CO_2e)	County
27	MOTIVA ENTERPRISES LLC	1007458	5,161,638.4	32,724.5	19,597.076	5,213,960	JEFFERSON
28	Deer Park Chemical is reported as a chemical manufacturing facility in this inventory	-	-	-	-	-	-
29	GP Condensate Splitter	1011719	197,803.6	798.5	131.12	198,733.2	HARRIS
30	Corpus Christi Terminal Condensate Splitter	1012506	67,826.6	600.25	203.832	68,630.68	NUECES
31	Hartree Channelview Facility	1013186	33,772.9	961.5	24.436	34,758.84	HARRIS
32	Galveston Crude Processing Unit	1014593	65,116.5	200	41.124	65,357.62	
	State Total		**54,022,213**	**280,993.3**	**154,452.8**	**54,457,659**	

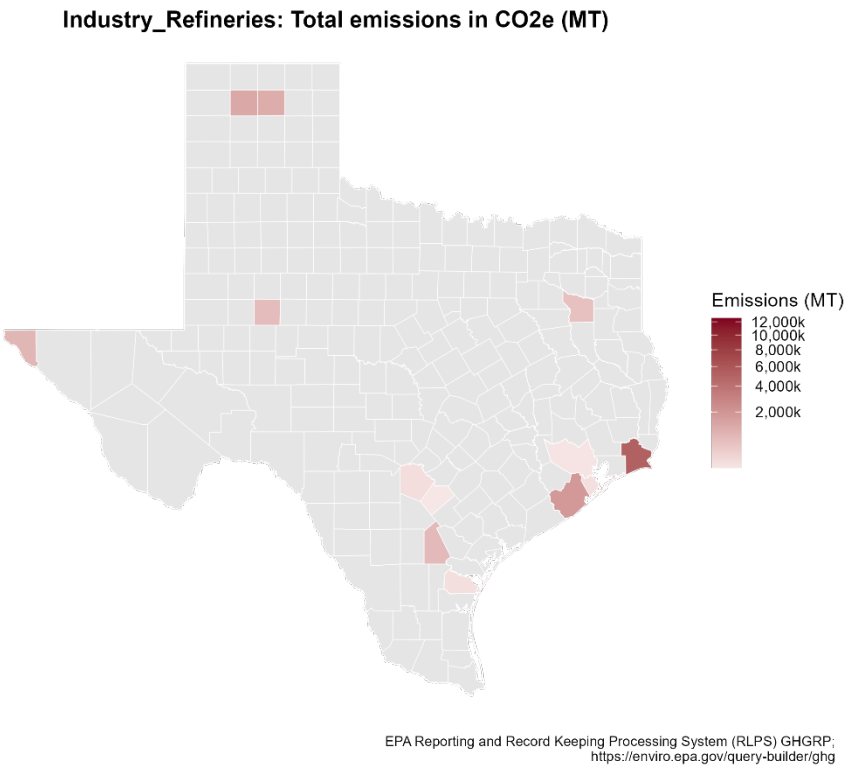


Figure 8. Refinery CO_2e emissions.

Chemicals

The Chemicals sector includes 11 GHGRP subsectors: Adipic Acid Production, Ammonia Manufacturing, Fluorinated GHG Production, HCFC-22 Production and HFC-23 Destruction, Hydrogen Production, Nitric Acid Production, Petrochemical Production, Phosphoric Acid Production, Silicon Carbon Production, Titanium Dioxide Production, and Other Chemicals.

Each subsector uses the GHGRP definition as summarized below.

- Adipic Acid Production (Subpart E) includes facilities that produce the precursor to nylon.
- Ammonia Manufacturing (Subpart G) includes facilities that produce the fertilizer and feedstock ammonia from fossil fuels on through the gasification of solid and liquid raw material.
- Fluorinated Gas Production (Subpart L) includes processes that produce a fluorinated gas from any raw material or feedstock chemical, except for processes that generate HFC-23 during the production of HCFC-22.
- HCFC-22 Production and HFC-23 Destruction (Subpart O) includes processes that produce HCFC-22 or destroy HFC-22.
- Hydrogen Production (Subpart P) includes facilities that produce hydrogen gas as a product.
- Nitric Acid Production (Subpart V) includes facilities that produce nitric acid through the catalytic oxidation of ammonia.
- Petrochemical Production (Subpart X) includes facilities that produce acrylonitrile, carbon black, ethylene, ethylene dichloride, ethylene oxide, or methanol, as either an intermediate in the on-site production of other chemicals or as an end product for sale or shipment off site.
- Phosphoric Acid Production (Subpart Z) includes facilities that produce phosphoric acid with a wet-process phosphoric acid process line.
- Silicon Carbide Production (Subpart BB) includes processes that produces silicon carbide for abrasive purposes.
- Titanium Dioxide Production (Subpart EE) includes facilities that use the chloride process to produce titanium dioxide.
- Other Chemicals include facilities that have a North American Industry Classification Systems (NAICS) code for the industrial sector but do not meet the definition of the other industrial facility categories in the GHGRP. These facilities report their general stationary combustion emissions (Subpart C).

Statewide emissions for Texas from the Chemicals sector in 2022 are listed in **Table 22**. Four subsectors (HFC-22 production/HFC destruction; Phosphoric Acid Production; Silicon Carbide production, and Titanium Dioxide production) did not report emissions in Texas. For Adipic Acid Production, Ammonia Manufacturing, Fluorinated GHG production, and Nitric Acid Production, only one facility reported to the GHGRP in Texas. Except for the Fluorinated GHG Facility, the facilities reported to both the GHGRP and the TCEQ. Lists of these facilities are given in Appendix 4. For the other sectors (Hydrogen Production, Petrochemical Production and Other Chemical Production), multiple facilities reported emissions, and these facilities are listed in Appendix 4. Emissions in Texas counties are mapped in **Figure 9**.

When comparing with GHGRP emissions to TCEQ reporting, differences in source categories become apparent. For example, hydrogen production is often associated with petroleum refining. A refinery may generate its own hydrogen, or have an industrial partner that manufactures and sells hydrogen on site. This type of difference in ownership will influence whether the emissions associated with hydrogen production are reported separately or integrated into refinery reporting. In general, GHGRP reporting was used to generate emissions, to avoid double counting of emissions. Potential uncertainties are identified, by subsector, in Appendix 4.

Table 22. Chemical sector greenhouse gas emissions (MT or MT CO_2e) reported through the GHGRP.

Subsector (number of facilities reporting to GHGRP)	**CO_2 (MT)**	**CH_4 (MT CO_2e)**	**N_2O (MT CO_2e)**	**Other (MT CO_2e)**	**HFC (MT CO_2e)**	***Total GHG* (MT CO_2e)**
Adipic Acid Production (1)	630,071	297	1,098,362	0	0	1,728,730
Ammonia Manufacturing (1)	1,026,152	235	280	0	0	1,026,667
Fluorinated GHG Production (1)	11,359	5	6	406	55,772	67,554
Hydrogen Production (22)	11,362,153	494	754	0	0	11,363,400
Nitric Acid Production (1)	0	0	115,955	0	0	115,955
Other Chemicals (44)	7,460,883	5,795	38,813	0	0	7,505,491
Petrochemical Production (38)	38,904,607	195,138	104,186	0	0	39,203,932
State Total	**59,395,225**	**201,965**	**1,358,357**	**406**	**55,772**	**61,011,731**

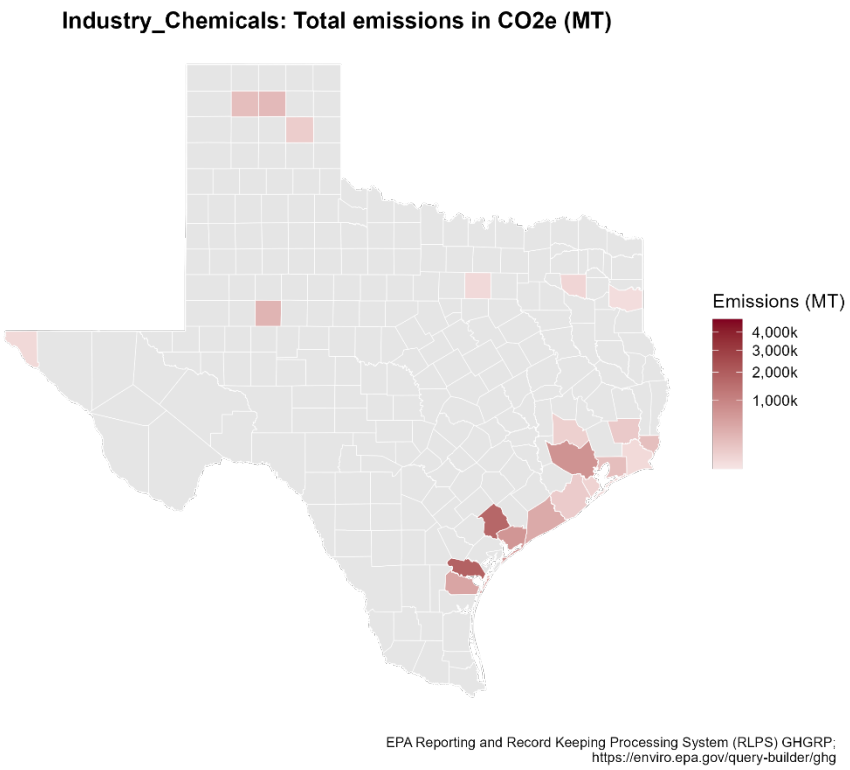


Figure 9. Chemicals CO_2e emissions.

Minerals

The Minerals sector includes 5 GHGRP subsectors: Cement Production, Glass Production, Lime Manufacturing, Soda Ash Manufacturing (no facilities reporting in Texas), and Other Minerals.

Each subsector uses the GHGRP definition as summarized below.

- Cement Production (Subpart H) includes Portland cement manufacturing facilities including alkali bypasses, and includes kilns and in-line kiln/raw mills that burn hazardous waste.
- Glass Manufacturing (Subpart N) includes facilities that use continuous glass melting furnaces to manufacture flat glass, container glass, pressed and blown glass, or glass wool).
- Lime Manufacturing (Subpart S) includes facilities that manufacture a lime product by calcination of limestone, dolomite, shells or other calcareous materials.
- Soda Ash Manufacturing (Subpart CC) includes facilities producing soda ash by calcining trona, calcining sodium sesquicarbonate, or using a liquid alkaline feedstock process that directly produces CO_2 (no facilities in Texas)
- Other Minerals include facilities that have NAICS code for the minerals sector but do not meet the definition of the other mineral facility categories in the GHGRP. These facilities report their general stationary combustion emissions (Subpart C).

Reported GHGRP emissions for the Minerals sector are summarized in **Table 23.** Soda Ash manufacturing did not report emissions in Texas. Relatively small numbers of cement, glass and lime account for most of the emissions. The counties in which the emissions occur are mapped in **Figure 10**. Individual facility emissions and the facility categories used in this inventory were identified through a combination of GHGRP reporting and TCEQ reporting as described in Appendix 5.

Table 23. Minerals sector greenhouse gas emissions reported through the GHGRP.

Subsector (number of facilities reporting to GHGRP)	CO_2 (MT)	CH_4 (MT CO_2e)	N_2O (MT CO_2e)	Total GHG (MT CO_2e)
Cement Production	12,118,740	8,666	13,433	12,140,839
Glass Production	660,747	247	295	661,289
Lime Manufacturing	2,055,429	632	1,193	2,057,253
Other Minerals	761,436	529	742	762,706
Total	**15,596,352**	**10,073**	**15,662**	**15,622,087**

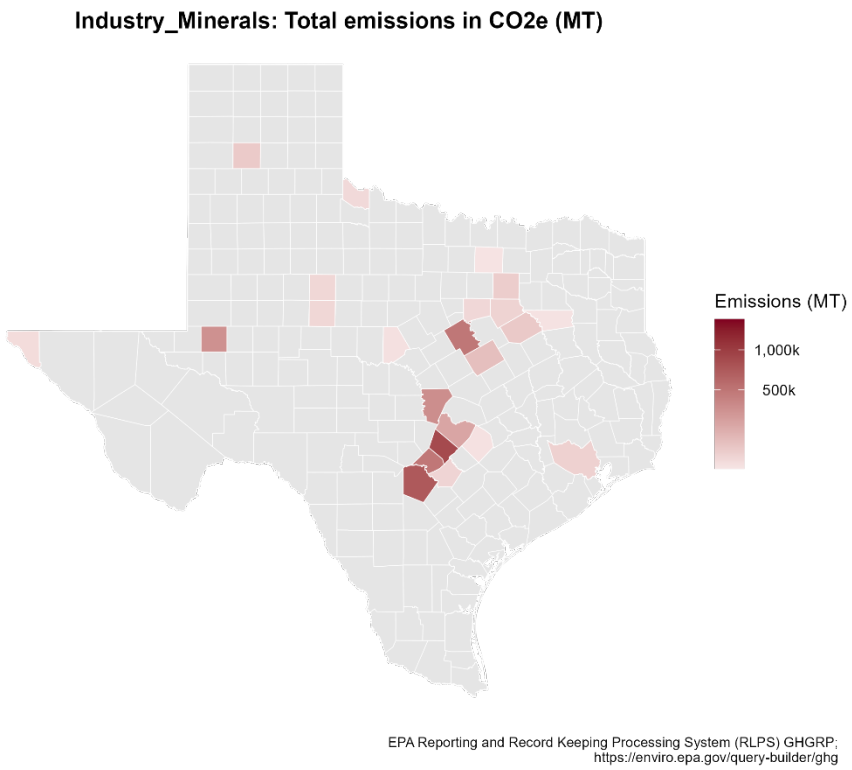


Figure 10. Minerals CO_2e emissions.

Metals

The Metals sector includes 7 GHGRP subsectors: Aluminum Production, Ferroalloy Production, Iron & Steel Production, Lead Production, Magnesium Production, Zinc Production, and Other Metals.

Each subsector uses the GHGRP definition as described below.

- Aluminum Production (Subpart F) are facilities that manufacture primary aluminum using the Hall-Héroult manufacturing process.
- Ferroalloy Production (Subpart K) are facilities that use pyrometallurgical techniques to produce any of the following metals: ferrochromium, ferromanganese, ferromolybdenum, ferronickel, ferrosilicon, ferrotitanium, ferrotungsten, ferrovanadium, silicomanganese, or silicon metal.
- Iron and Steel Production (Subpart Q) are facilities with any of the following processes: taconite iron ore processing, integrated iron and steel manufacturing, coke making not collocated with an integrated iron and steel manufacturing process, direct reduction furnaces not collocated with an integrated iron and steel manufacturing process, and electric arc furnace (EAF) steelmaking not collocated with an integrated iron and steel manufacturing process.
- Lead Production (Subpart R) includes primary lead smelters and secondary lead smelters. A primary lead smelter is a facility engaged in the production of lead metal from lead sulfide ore concentrates through the use of pyrometallurgical techniques. A secondary lead smelter is a facility at which lead-bearing scrap materials (including but not limited to, lead-acid batteries) are recycled by smelting into elemental lead or lead alloys.
- Magnesium Production and Processing (Subpart T) includes any process in which magnesium metal is produced through smelting (including electrolytic smelting), refining, or remelting operations and any process in which molten magnesium is used in alloying, casting, drawing, extruding, forming, or rolling operations.
- Zinc Production (Subpart GG) includes zinc smelters and secondary zinc recycling facilities.
- Other Metals are facilities that have a North American Industry Classification Systems (NAICS) code for the metals sector but do not meet the definition of the other metal facility categories in the GHGRP. These facilities report their general stationary combustion emissions (Subpart C).

Statewide emissions for Texas from the metals sector in 2022 are listed in **Table 24** and are mapped in **Figure 11**. Five sectors (primary Aluminum Production, Ferro-alloy Production, Lead Production; Magnesium Production, and Zinc Production) did not report emissions in Texas, leaving the sub-categories of iron and steel facilities and other facilities. Individual facility emissions and the facility categories used in this inventory were identified through a combination of GHGRP reporting and TCEQ reporting as described in Appendix 6.

Table 24. Metals sector greenhouse gas emissions.

	CO_2 (MT)	CH_4 (MT CO_2e)	N_2O (MT CO_2e)	Total GHG (MT CO_2e)
Iron and Steel Production	1,894,024	318	382	1,894,723
Other Metals	379,387	227	305	379,919
Total Metals	**2,273,411**	**545**	**687**	**2,274,643**

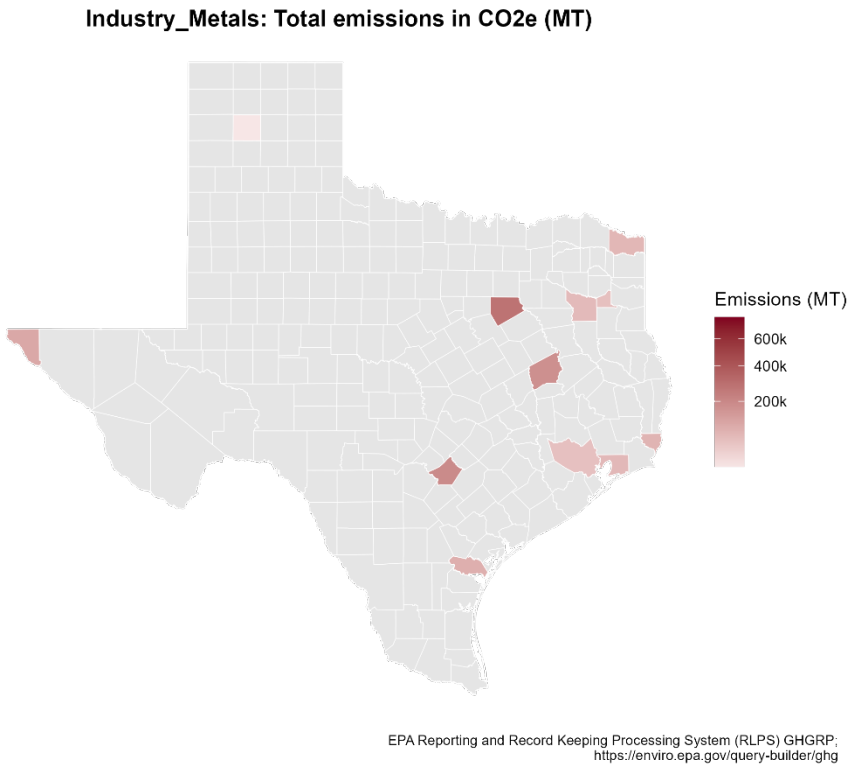


Figure 11. Metals CO_2e emissions.

Pulp and Paper and Other

Pulp and Paper includes 2 GHGRP subsectors: Pulp and Paper Manufacturers and Other Paper Producers.

Each subsector uses the GHGRP definition as described below.

- Pulp and Paper Manufacturing (Subpart AA) includes facilities that produce market pulp (i.e., stand-alone pulp facilities), manufacture pulp and paper (i.e., integrated facilities), produce paper products from purchased pulp, produce secondary fiber from recycled paper, convert paper into paperboard products (e.g., containers), or operate coating and laminating processes.
- Other Paper Producers are facilities that have a North American Industry Classification Systems (NAICS) code for the pulp and paper sector but do not meet the definition of Pulp and Paper Manufacturing. These facilities report their general stationary combustion emissions (Subpart C).

The "Other" industrial sector is a group of 9 miscellaneous GHGRP subsectors that do not clearly fit in the specific industrial sectors: Underground Coal Mines, Food Processing, Ethanol Production, Universities, Manufacturing, Military, Electronics Manufacturing, Electrical Equipment Manufacturers, and Other. Each subsector uses the GHGRP definition as described below.

Underground Coal Mines

Underground Coal Mines (Subpart FF) consists of active underground coal mines, and any underground mines under development that have operational pre-mining degasification systems. An underground coal mine is a mine at which coal is produced by tunneling into the earth to the coalbed, which is then mined with underground mining equipment such as cutting machines and continuous, longwall, and shortwall mining machines, and transported to the surface.

This source category includes the following:

- Each ventilation system shaft or vent hole, including both those points where mine ventilation air is emitted and those where it is sold, used onsite, or otherwise destroyed (including by ventilation air methane (VAM) oxidizers).
- Each degasification system well or gob gas vent hole, including degasification systems deployed before, during, or after mining operations are conducted in a mine area. This includes both those wells and vent holes where coal bed gas is emitted, and those where the gas is sold, used onsite, or otherwise destroyed (including by flaring).

This source category does not include abandoned or closed mines, surface coal mines, or post-coal mining activities (e.g., storage or transportation of coal).

Electronics Manufacturing

Electronics Manufacturing (Subpart I) includes production processes that use fluorinated GHGs or N2O. Facilities that may use these processes include, but are not limited to, facilities that manufacture micro-electro-mechanical systems (MEMS), liquid crystal displays (LCDs), photovoltaic cells (PV), and semiconductors (including light-emitting diodes (LEDs)).

Electrical Equipment Manufacturing

Electrical Equipment Manufacturing (Subpart SS) or refurbishment category consists of processes that manufacture or refurbish gas-insulated substations, circuit breakers, other switchgear, gas-insulated lines, or power transformers (including gas-containing components of such equipment) containing fluorinated GHGs, including but not limited to sulfur-hexafluoride (SF6) and perfluorocarbons (PFCs). The processes include equipment testing, installation, manufacturing, decommissioning and disposal, refurbishing, and storage in gas cylinders and other containers.

Other

Food Processing, Ethanol Production, Universities, Manufacturing, Military, and Other are not defined in GHGRP but are classified by NAICS code and report their general stationary combustion emissions (Subpart C).

Reported GHGRP emissions for the Pulp and Paper and Other sectors are summarized in **Table 25.** The counties in which the emissions occur are mapped in **Figure 12.**

Table 25. Pulp and paper and other sectors greenhouse gas emissions.

	CO_2 (MT)	**CH_4 (MT CO_2e)**	**N_2O (MT CO_2e)**	**Other GHG (MT CO_2e)**	**Total GHG (MT CO_2e)**
Pulp and paper	994,590	4,532	18,651	4,137,336	5,155,108
Ethanol	328,027	155	184		328,366
Food Processing	487,622	269	360		488,250
Manufacturing	3,356,937	1,632	4,184		3,362,753
Military	114,940	71	162		115,173
University	212,282	101	122		212,505
Electronics Manufacturing	156,157	77	81,441	1,965,196	2,202,871
Use of Electrical Equipment	0	0	0	159,459	159,459
Other	661,077	330	435		661,842
State Total	**6,311,632**	**7,165**	**105,540**	**6,261,991**	**12,686,327**

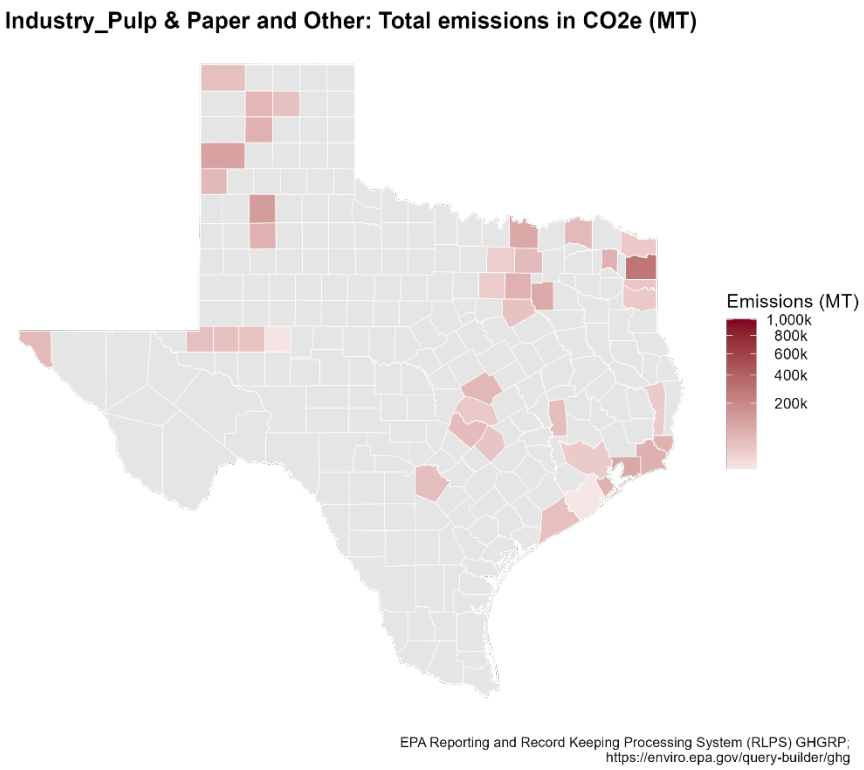


Figure 12. Pulp and Paper and Other CO_2e emissions.

Summary of Industrial Emissions

Table 26 provides a summary of total industrial emissions. Emissions total 260,345,680 MT CO2e. Upstream and Midstream Petroleum and Natural Gas Systems, Refineries, and Chemical Manufacturing are the largest subsectors.

Table 26. GHGRP sectors by primary and secondary categorization and their reporting GHGs. All sectors except Power Plants and waste management are included.

GHGRP Sector/Sub-Sector	Sector/Sub-sector GHG emissions (MT CO_2e)
Chemicals	**61,011,731**
Adipic Acid Production	1,140,479
Ammonia Manufacturing	1,026,667
Fluorinated GHG Production	67,554
Hydrogen Production	11,363,400
Nitric Acid Production	704,206
Other Chemicals	7,505,491
Petrochemical Production	39,203,932
Metals	**2,274,643**
Iron and Steel Production	1,894,723
Other Metals	379,919
Minerals	**15,622,087**
Cement Production	12,140,839
Glass Production	661,289
Lime Manufacturing	2,057,253
Other Minerals	762,706
Other	**7,531,219**
Electronics Manufacturing	2,202,871
Ethanol Production	328,366
Food Processing	488,250
Manufacturing	3,362,753
Military	115,173
Other	661,842
Universities	212,505
Use of Electrical Equipment	159,459
Pulp and Paper	**5,155,108**
Other Paper Producers	140,138
Pulp and Paper	5,014,969
Petroleum Refineries	54,457,659
Petroleum and Natural Gas Systems	**114,293,233**
Offshore Petroleum & Natural Gas Production	20,497

GHGRP Sector/Sub-Sector	Sector/Sub-sector GHG emissions (MT CO_2e)
Onshore Petroleum & Natural Gas Production Onshore Petroleum and Natural Gas Boosting and Gathering	76,328,848
Abandoned Wells	368,278
Natural Gas Processing	26,413,821
Natural Gas Transmission Compression	6,149,666
Onshore Natural Gas Transmission Pipelines	761,316
Natural Gas Local Distribution Companies	822,315
Underground Natural Gas Storage	249,069
Liquefied Natural Gas Storage	-
Liquefied Natural Gas Imp/Exp Equipment	3,179,424
Total	**260,345,680**

Commercial

The Commercial sector is defined as combustion of natural gas or other fossil fuels within commercial buildings for heating or other purposes. Only direct emissions from fossil fuel combustion are included within this sector; indirect emissions from electricity consumption are accounted for in the Electric Power Generation Sector.

Methods

Statewide emissions from commercial sources are estimated by applying EPA emission factors for external fossil fuel combustion, shown in **Table 27** (EPA, 1995); to EIA-reported statewide fuel consumption by fuel type, shown in **Table 28** (EIA, n.d.-2). The EPA SIT does not include a separate module for Commercial fuel combustion, and so no direct comparisons with the SIT are possible.

Results

Emissions from the Commercial sector are reported in **Table 29**. Natural gas and petroleum (fuel oil #2) accounted for 64% and 32% of commercial GHG emissions, respectively. Emissions were disaggregated among counties proportional to population and are mapped in **Figure 13**. Details of the calculations are reported in SI.

Residential

The Residential sector is defined as combustion of natural gas or other fossil fuels within residential buildings for heating or other purposes. Only direct emissions from fossil fuel combustion are included within this sector; indirect emissions from electricity consumption are accounted for in the Electric Power Generation Sector.

Methods

Statewide emissions are estimated by applying EPA emission factors (**Table 27**; EPA AP-42) for external fossil fuel combustion to EIA-reported statewide fuel consumption by fuel type (**Table 28**). The EPA SIT does not include a separate module for Commercial fuel combustion, and so no direct comparisons with the SIT are possible.

Results

Emissions from the Residential sector are reported in **Table 29**. Natural gas, petroleum (fuel oil #2), and propane accounted for 78%, 13%, and 9% of residential GHG emissions, respectively.

Emissions were disaggregated among counties proportional to population and are mapped in **Figure 13**. Details of the calculations are reported in SI.

Table 27. Commercial and residential emission factors used in this inventory. All EFs are derived from the referenced tables in AP-42, Fifth Edition, Stationary Combustion Sources.

	CO_2	CH_4	N_2O	AP-42 Tables
Natural Gas (MT / Mcf)	54.43	0.001043	0.000998	1.4-2
Residential Fuel Oil (MT / 1000 bbls)	424.8	0.03391	0.000953	1.3-3; 1.3-8; 1.3-12
Commercial Fuel Oil (MT / 1000 bbls)	424.8	0.00411	0.00495	1.3-3; 1.3-8; 1.3-12
Propane (MT / 1000 gallons)	5.44	0.0000907	0.000408	1.5-1

Table 28. EIA reported Statewide fuel use in residential and commercial sectors.

	Natural gas (thousands of Mcf)	Fuel oil (1000s of bbl)	Propane (1000s of gallons)
Residential	232,766,000	5,032	257,902
Commercial	196,883,000	11,821	

Table 29. Top 5 counties for commercial and residential emissions.

	County	CO_2 emissions (MT)	CH_4 emissions (MT)	N_2O emissions (MT)	Total emissions (MT CO2e)
1	Harris	5,113,538	110.6	95.6	5,144,794
2	Dallas	2,785,868	60.2	52.19	2,802,897
3	Tarrant	2,286,247	49.4	42.8	2,300,221
4	Bexar	2,179,186	47.1	40.8	2,192,506
5	Travis	1,406,504	30.4	26.3	1,415,101
	State Total	**31,949,823**	**690.9**	**597.4**	**32,145,115**

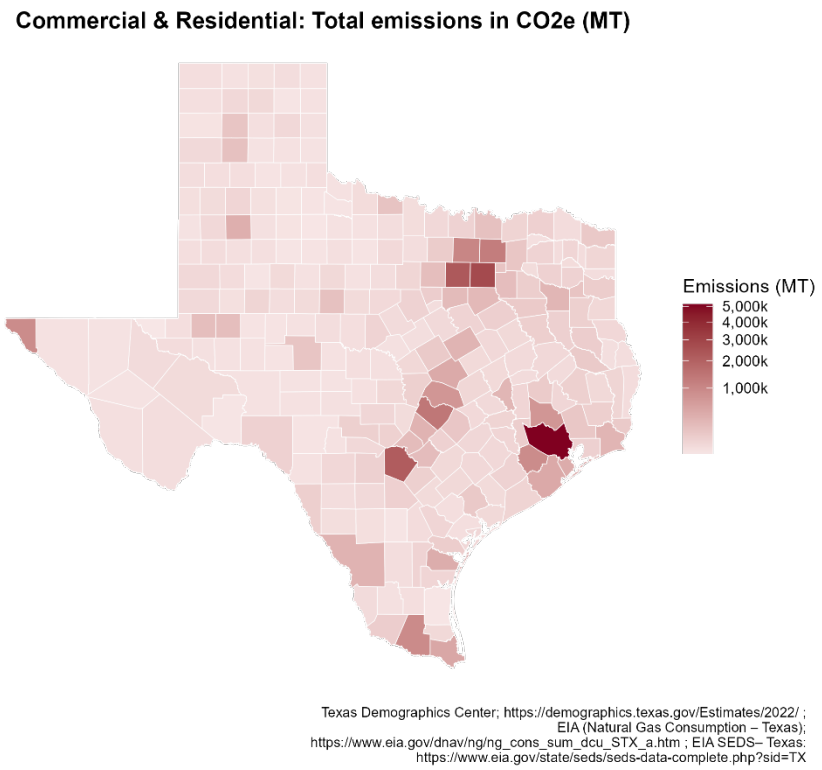


Figure 13. Commercial and Residential CO_2e emissions.

Municipal and Industrial Landfills and Wastewater

Methods

Municipal wastewater emissions were estimated using the EPA SIT. These estimates are based on population and default average emission factors. Municipal landfills were estimated using the SIT with default factors for Texas, and reports to the GHGRP through Subpart HH.

Results

Emissions from municipal wastewater operations, estimated using the SIT, are reported in **Table 30**. The details of the calculations are available in SI.

Table 30. Wastewater emissions estimated using the State Inventory Tool.

	CH_4 (MT CO_2e)	**N_2O (MT CO_2e)**	**Total CO2e (MT CO_2e)**
Municipal	1,830,000	730,000	2,560,000
Industrial	100,000	-	100,000
Total	**1,930,000**	**730,000**	**2,660,000**

Estimated emissions for Municipal and Industrial Landfills from the SIT are reported in **Table 31**. The SIT, using default assumptions for Texas, estimates potential methane emissions from landfills as 26.8 million metric tons CO_2e in 2022, with 6.2 million tons CO_2e flared, 8.9 million tons CO_2e used in waste to energy facilities and 1.2 million tons CO_2e otherwise oxidized. These combustion sources consume 451,000 MT of carbon, leading to approximately 1.65 million tons of CO_2. It is assumed that biomass generates the bulk of the methane and therefore these carbon dioxide emissions are not included in the inventory since they originate from biomass. The SIT calculates a fraction of the carbon dioxide that is due to plastics and other anthropogenic material, but this total, reported in **Table 31**, is assumed to be negligible. For the SIT, industrial landfills contribute approximately 7% of the potential methane emissions and are assumed to contribute approximately the same amount to the net emissions, leading to an estimate of 9.882 million metric tons of CO_2e attributable to municipal landfills (**Table 31**).

Municipal landfills reported 9.98 million metric tons of CO_2e. Because statewide totals from the GHGRP and the SIT are within ~1% of each other for municipal landfills, and because the assumptions associated with the SIT are well documented, the SIT will be used as the central estimate for this inventory.

Table 31. Industrial and Municipal Landfills (with combustion).

	CO_2 emissions ($MMT\ CO_2$)	**CH_4 emissions ($MMT\ CO_2e$)**	**N_2O emissions ($MMT\ CO_2e$)**	**Total emissions (MMT CO2e)**
EPA SIT Municipal and Industrial Landfills	Assumed negligible	10.574 (0.42296 MMT CH_4)	~0.0003	10.574
EPA SIT Estimated Municipal Landfill emissions[1]				9.882
EPA GHGRP Subpart HH, Municipal Landfills				9.97883

[1]Assumes net emissions from industrial and municipal landfills, after accounting for flaring and waste to energy combustion, has the same ratio as potential emissions from industrial and municipal landfills

Agriculture

Emissions from agriculture are grouped into livestock and cropland categories. Livestock are defined as cattle, bison, horses, mules, goat, sheep, swine, chickens, turkey raised for animal products or other human uses, and emissions of greenhouse gases come from enteric fermentation (for ruminant animals) and manure management. Methane is the dominant greenhouse gas emitted by livestock. Agricultural croplands are defined as any land or water system in which a plant is cultivated for profit and or consumption. The cropland categories included in this inventory are defined by crop type, comprised of annual and perennial crops, mixed system crops, fallow lands, and orchards. Emissions for this category exclude natural biogenic emissions and only manmade biogenic emissions are included. Nitrous oxide is the dominant greenhouse gas emitted by cropland.

Methods

Livestock emissions are based on animal counts and emission factors. County-level animal populations were obtained from the United States Department of Agriculture 2022 Census of Agriculture. Cattle, chicken, and pig population counts are provided in categories that distinguish animal type (beef/dairy; broiler/layer), age, and feed (pasture/on feed). To estimate emissions from enteric fermentation (CH_4) and manure management (CH_4, N_2O), animal counts were multiplied by Texas-specific emission factors from the EPA GHG Inventory, shown in SI (EPA 2024a; Tables A-144, A-148, A-170, A-172). Carbon dioxide emissions were excluded from the inventory to be consistent with the EPA GHG Inventory. Emissions were also calculated using the EPA SIT, using the same methods, with default data for Texas.

Emissions from livestock are dominated by methane emissions due to enteric fermentation. Emissions from livestock are calculated using animal counts and emission factors, however, county level distributions of cattle are not reported publicly in all counties for all cattle types (e.g., steers vs. beef cattle), therefore assumptions must be made regarding distributions of cattle and other animal types. To maintain consistency with national estimates and transparency in State estimates of net emissions in the category, the EPA SIT was used to estimate emissions in this source category, using default parameters for Texas.

Emissions from croplands are dominated by emissions of N_2O. Calculating the net emissions requires tracking of crop usage, fertilizer use by crop, and the conversion of nitrogen to N_2O by microbial populations that can vary by crop and other parameters (Geisseler 2016). To maintain consistency with national estimates and transparency in State estimates of net emissions in the category, the EPA SIT was also used to estimate emissions in this source category, using default parameters for Texas.

Results

Total Agricultural emissions, estimated by the EPA SIT using default parameters for Texas, are reported in **Table 32**. Details of the calculations are reported in the SI. Three source categories emit 97% of the total emissions for the sector. Ranked by total emissions (as CO_2e), these sources are CH_4 emissions from enteric fermentation (51% of total), N_2O emissions from agricultural soils (35% of total), and N_2O and CH_4 emissions from manure management (11% of total).

Table 32. Total Agricultural emissions.

	CO_2 (MMT)	**CH_4 (MMT)**	**N_2O (MMT)**	**CO_2e (MMT CO_2e)**
Enteric Fermentation		0.992		24.8
Manure Management		0.104	0.009	5.3
Ag Soils			0.057	17.0
Rice Cultivation		0.049		1.2
Liming	0.085			0.1
Urea Fertilization	0.184			0.2
Agricultural Residue Burning		0.001		0.0
Total	**0.3**	**1.1**	**0.1**	**48.6**

Emissions from livestock were also estimated using animal counts downloaded directly from the USDA census and emission factors from the GHGI. The emissions calculated in this way are reported in **Table 33** and totaled 0.886 MMT CH_4 and 0.08 MMT N_2O with 91% of CH_4 emissions from enteric fermentation. Cattle account for ~95% of livestock methane emissions, however, county level distributions of cattle are not reported publicly in all counties for all cattle types (e.g., steers vs. beef cattle), therefore the approximate county level distributions of total cattle are used as a surrogate for the total enteric emissions. The 20 counties with the highest cattle head counts are listed in **Table 34**. County level head counts in all Texas counties are mapped in **Figure 14**.

Table 33. Livestock emissions estimated from USDA livestock counts and GHGI emission factors.

	CH_4 Emissions (MT)	N_2O Emissions (MT)	Total Emissions (MT)
Cattle	908,409	7,209	24,858,398
Hogs	20,634	112	549,266
Goats	6,882	24	179,083
Sheep	5,765	77	167,132
Horses	5,245	30	140,072
Mules & Asses	638	4	17,137
American Bison	683	-	17,067
Chickens	6,915	626	359,418
Turkeys	44	5	2,657
Livestock Total	**955,216**	**8,087**	**26,290,230**

Table 34. Total Cattle head counts for top 20 counties.

Rank	County	Total cattle count (Head)	Percentage of State Head Count (%)
1	DEAF SMITH	700,069	5.65%
2	CASTRO	582,951	4.70%
3	HARTLEY	420,346	3.39%
4	DALLAM	383,651	3.09%
5	PARMER	362,742	2.93%
6	HANSFORD	285,421	2.30%
7	SHERMAN	255,969	2.06%
8	RANDALL	231,146	1.86%
9	SWISHER	196,293	1.58%
10	MOORE	185,142	1.49%
11	ERATH	171,459	1.38%
12	LAMB	156,623	1.26%
13	GONZALES	143,254	1.16%
14	FALLS	129,740	1.05%
15	BAILEY	128,705	1.04%
16	HALE	121,898	0.98%
17	COMANCHE	117,228	0.95%
18	GRAY	116,562	0.94%
19	HOPKINS	110,911	0.89%
20	WILSON	110,390	0.89%
	Texas Total	**12,397,925**	

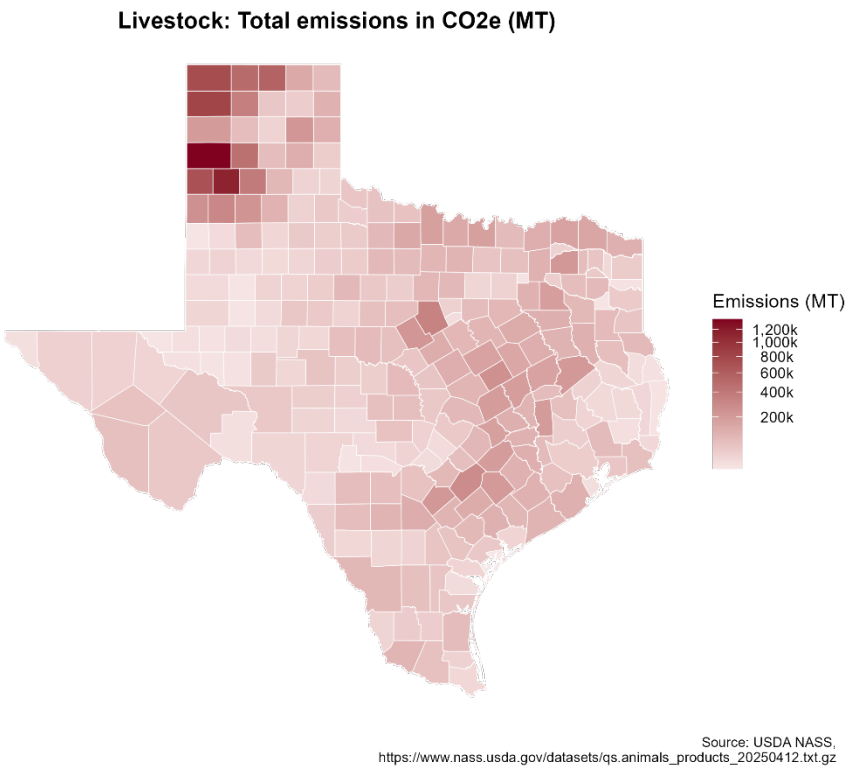


Figure 14. Livestock CO_2e emissions.

Cropland emission estimates in the SIT are dominated by N_2O released from application of fertilizer and livestock waste onto agricultural lands. These estimates are driven by fertilizing practices, livestock management and total land use. **Table 35** lists the acreage in various types of land uses important to this source category, drawn from the National Land Cover Dataset (NLCD, for grassland), and the NASS (other crop types). The largest contributor to the sector's N_2O emissions, based on SIT estimates, are emissions associated with livestock on grass/pasture lands. While the uncertainty from this source is large on a relative basis, the total emissions, estimated by the SIT, are 16.99 MMT CO_2e. Total emissions and the associated uncertainty are therefore relatively small compared to other source categories in Texas.

Table 35. Acreage by land cover types.

Land cover	Acreage in Texas
Crops (all types)	20,084,448
hay	2,500,793
fallow	1,036,629
grass/pasture	33,625,183

Natural and Working Lands (Land Use, Land Use Change and Forestry)

Methods

Emission sources and greenhouse gas sinks from natural and working lands were estimated using the EPA SIT module for Land Use, Land Use Change and Forestry. Emission sources and sinks accounted for in the tool include forest carbon flux and agricultural soil carbon flux. These include carbon emitted from or sequestered in above ground biomass, below ground biomass, dead wood, litter, mineral and organic soils, drained organic soils, and wood products. Emission estimation methods in the SIT follow the procedures used in the GHGI. Three Land Use databases are used to track changes. The databases are the U.S. Department of Agriculture's National Resources Inventory (U.S. Department of Agriculture, Natural Resources Conservation Service, n.d.), the U.S. Forest Service Forest Inventory and Analysis (U.S. Forest Service, n.d.), and the National Land Cover Dataset (Multi-Resolution Land Characteristics Consortium, n.d.). Calculating the net emissions requires tracking of the land use changes and modeling of the carbon cycling on managed lands. Developing definitions for land use types and developing input data complete enough for modeling of carbon cycling requires a large number of assumptions. To maintain consistency and transparency in State estimates of net emissions in the category with national estimates, default parameters for Texas were used. The U.S. EPA estimates that uncertainties in the estimated emissions in the major source categories in this sector, using default estimates are on the order of 10% for forest ecosystem carbon pools and 25% for harvested wood products (U.S. Environmental Protection Agency, 2024g).

Results

The overall GHG estimate for this category is a net sink (withdrawal from the atmosphere) of 46.70 million metric tons of CO_2e (emissions of -46.70 million metric tons). This estimate is the sum of the forest carbon flux estimate of 54.68 million metric tons of CO_2e and the agricultural soil carbon flux of +7.98 million metric tons of CO_2e. The forest carbon flux is dominated by increases in aboveground biomass on managed lands and wood products. Details of the default settings used in the tool for Texas, the SIT module, and a detailed description of the calculation methodology are available in the SI.

Comparison with US EPA State Level GHGI

Data for EPA's state-level Greenhouse Gas Inventory for Texas (GHGI TX) were extracted from the EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks by State via the Greenhouse Gas Inventory Data Explorer. The emissions reported in the GHGI are compared to the emissions reported in this inventory in Table 36. Caution is warranted in interpreting these comparisons due to methodological and categorical differences between this inventory and the EPA's GHGI. Specifically, the GHGI employs distinct estimation methods and organizes emissions sources according to IPCC categories, which differ from the economic sector-based structure used here and in EPA's Greenhouse Gas Reporting Program (GHGRP). The most important discrepancies are explored in the discussion that follows. An excerpt from EPA's State GHG Emissions and Removals webpage is provided in Figure 15 to contextualize some of these variations.

Table 36. Direct comparison of this inventory with 2022 GHGI state level data from EPA.

	This Inventory All GHGs as MT CO2e	EPA GHGI - State All GHGs as MT CO2e	Relative Difference
Electric power generation	**191,892,519**	**189,353,986**	**1%**
Transportation	**181,752,666**	**211,591,399**	**-16%**
Industry	**260,345,680**	**334,292,960**	**-28%**
Residential and Commercial	**32,145,115**	**52,200,561**	**-62%**
Municipal and Industrial Wastewater*	**2,660,000**	**-**	**N/A**
Municipal and Industrial Landfills*	**10,574,000**	**-**	**N/A**
Agriculture	**48,590,000**	**63,703,766**	**-31%**
Total emissions	**727,959,980**	**851,142,673**	**-17%**

***Industrial waste landfills are included in EPA's Industry sector.**

> The ***Inventory of U.S. Greenhouse Gas Emissions and Sinks by State*** should not be viewed as official state data. The EPA recognizes that there will be differences between the EPA's state-level estimates and some inventory estimates developed independently by individual state governments. Inventories compiled by states may differ for several reasons and differences do not necessarily mean that one set of estimates is more accurate, or "correct." In some cases, the EPA may be using different methodologies, activity data, and emission factors, or may have access to the latest facility-level information through the Greenhouse Gas Reporting Program (GHGRP). In other cases, because of state laws and regulations, states may have adopted accounting decisions that differ from those adopted under the UN transparency system and IPCC to ensure comparability in national reporting (e.g., use of different category definitions and emission scopes consistent with state laws and regulations). Users of state GHG data should take care to review and understand differences in accounting approaches to ensure that any comparisons of estimates are equivalent or an apples-to-apples comparison of estimates. Inventories compiled for specific purposes (i.e., state laws) can produce different but complementary results.

Figure 15. Excerpt from EPA's State GHG Emissions and Removals website discussion discrepancies between other inventories and its state level estimates.[10]

[10] https://www.epa.gov/ghgemissions/state-ghg-emissions-and-removals *Last accessed June 3, 2025.*

This inventory structures emissions by economic sectors, while the GHGI follows IPCC-based categories. Although EPA does present state-level data using economic sector groupings, the underlying definitions and boundaries of sectors and subsectors are not fully aligned, reducing the direct comparability of results.

One of the most significant sources of discrepancy is the treatment of fossil fuel combustion (FFC). In the GHGI, industrial FFC is presented as an aggregated block derived from national fuel consumption data, primarily EIA's State Energy Data System (SEDS), and allocated to states using proxies such as fuel sales or economic output. These emissions are not disaggregated into industrial subsectors such as refining, hydrogen production, or petrochemical manufacturing, limiting traceability to specific economic activities. This can lead to overstatements of state-level industrial emissions, particularly when emissions already captured in bottom-up data (e.g., via GHGRP) are effectively counted again under the FFC category.

Further, the GHGI assumes 100% combustion of all fuels not explicitly reported as non-energy use (NEU). This introduces additional error for Texas, where large volumes of fuels serve as chemical feedstocks rather than being combusted. For example, hydrogen production via steam methane reforming consumes natural gas both as a fuel and feedstock. If the non-combusted portion is not clearly subtracted as NEU or counted as process CO_2, the GHGI overestimates emissions. Similarly, ethane used in steam cracking to produce olefins may be mischaracterized as fully combusted, though much of the carbon is embedded in intermediate or final products.

Industrial operations using cogeneration or CHP systems introduce further complexity. These systems may export or internally redistribute energy, improving efficiency but complicating fuel attribution. The GHGI's national proxy-based allocation methods do not account for such configurations. In contrast, this inventory applies GHGRP facility-level data, scaled by production and operational metrics, allowing emissions to be properly assigned to individual sectors, including hydrogen production and petrochemicals—both typically underrepresented or obscured in the GHGI.

EPA's methodology combines two approaches to derive state-level estimates: one based on geographically specific data (e.g., state-level fuel use), and another that downscales national totals using proxies such as population or gross domestic product. A hybrid is often used to ensure time-series continuity. The Texas State inventory in this report, by comparison, relies more directly on operator-reported and spatially resolved data, resulting in more accurate estimates—especially for sectors that dominate Texas's emissions profile.

Additional differences stem from EPA's exclusion of offshore sources that fall under state air permitting jurisdiction but lie beyond state waters, and its lack of a discrete hydrogen production category—both of which are included in this inventory. Conversely, this inventory may omit minor categories covered in the GHGI, such as surface coal mining emissions. Texas coal production is exclusively surface mining (not covered under GHGRP Subpart FF), and these emissions are minimal. In 2022, GHGI TX estimated coal mining emissions at under 200,000 metric tons CO_2e, representing just 0.08% of this inventory's total and 0.06% of the GHGI TX total.

Differences also arise in accounting for fuel use in the transportation in sectors such as rail, shipping and aircraft. This inventory only includes emissions that occur within the state, such as

emissions from shipping in Texas ports and state waters, while total fuel consumption would account for all shipping fuels acquired in Texas.

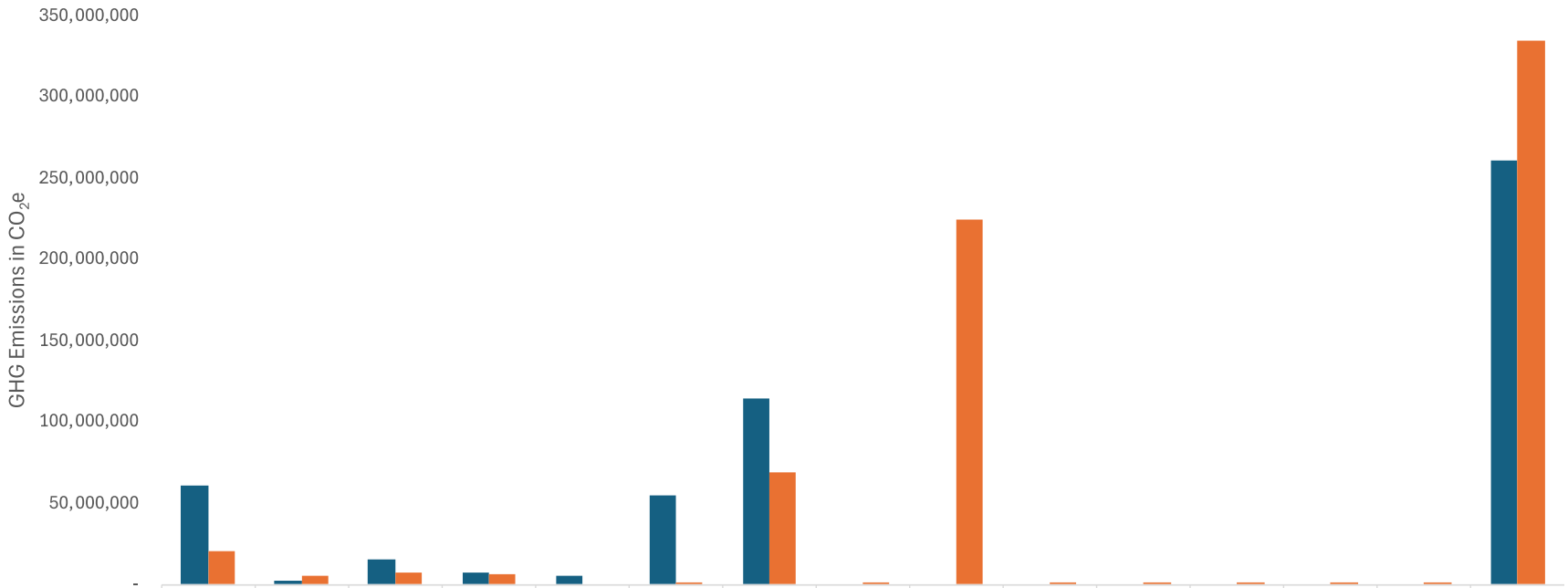
Differences in global warming potential (GWP) assumptions—GHGI uses AR5 values, this inventory uses AR4—explain only about 1% of the total discrepancy, as CO_2 accounts for roughly 87% of statewide CO_2e emissions in this inventory.

The largest discrepancy in absolute terms is found in the industrial sector, prompting a more detailed comparison in Table 37 and Figure 16, which illustrate how differences in methodology and source categorization influence emissions estimates and their comparability across inventories.

Table 37. Comparison of included sub-sectors and GHGI best match categories between this inventory, divided by GHGRP Sub-sectors, and the GHGI TX.

GHGRP Sector	GHGRP Sub-sectors	GHGI Best Match
Chemicals	Adipic and Nitric Acid Production Ammonia Manufacturing Fluorinated GHG Production Hydrogen Production Petrochemical Production Other Chemicals	Includes other chemicals of caprolactam, glyoxal and glyoxylic acid production, ceramics, other process uses of carbonates, soda ash consumption Excludes hydrogen production
Metals	Iron and Steel Production Other Metals	Other metals includes flux stone
Minerals	Cement Production Glass Production Lime Manufacturing Other Minerals	Other minerals includes silicon carbide consumption
Other	Electronics Manufacturing Ethanol Production Food Processing Manufacturing Military Other Universities Use of Electrical Equipment	Includes semiconductors manufacturing, carbon dioxide consumption, SF6 and PECs from other product use in military applications, SF6 and PFCs from other product use, and urea consumption Excludes ethanol production, manufacturing, and universities
Pulp and Paper	Other Paper Producers Pulp and Paper	Included in FFC emissions category but not isolated separately

GHGRP Sector	GHGRP Sub-sectors	GHGI Best Match
Refineries	Petroleum Refineries	Includes crude oil refining and crude oil transportation
Petroleum and Natural Gas Systems	Offshore Petroleum & Natural Gas Production Onshore Petroleum and Natural Gas Boosting and Gathering Abandoned Wells Natural Gas Processing Natural Gas Transmission Compression Onshore Natural Gas Transmission Pipelines Natural Gas Local Distribution Companies Underground Natural Gas Storage Liquefied Natural Gas Storage Liquefied Natural Gas Imp/Exp Equipment	Includes post-meter emissions from natural gas distribution Excludes offshore production and processes beyond state waters, and LNG facilities
	Not Included as Industrial Categories in GHGRP	Other Categories
	Not included	Surface Mining & Post Mining
	Included at facility/sector level by sector rather than a lumped allocation	Fossil Fuel Non-energy use and combustion (less ag stationary and mobile non-highway farm equipment)
	Not included as a category	N2O from Product Uses
	Included in different category in this Inventory (Landfills)	Industrial Landfills
	Included in different category in this Inventory (EGU)	Other Process Uses of Carbonates (FGD)
	Included in different category in this Inventory (Transportation)	Mobile Non-Highway Combustion
	Included in different category in this Inventory (Transportation)	Mobile Non-Highway Other



	Chemicals	Metals	Minerals	Other	Pulp and Paper	Refineries	Petroleum and Natural Gas Systems	Surface Mining	FF-NEU & FFC	N2O Product Uses	Industrial Landfills	EGU Source	Transportation Source	Transportation Source	Total
GHGRP	61,011,731.	2,274,643.0	15,622,087.	7,531,219.0	5,155,108.0	54,457,659.	114,293,233	-	-	-	-	-	-	-	260,345,680
GHGI Texas	20,442,966	4,776,028	6,937,147	5,902,887	-	1,284,130	68,945,685	197,500	223,959,496	334,302	834,728	256,451	126,206	295,377	334,292,904

Figure 16. Comparison of GHG emissions across the industrial sector between this inventory and the US EPA GHGI for Texas.

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APPENDICES

Appendix 1: Power Plant Inventory

The first step in developing the inventory involved identifying the set of facilities in Texas relevant to the energy generating unit (EGU) category. To compile this list, several data sources were reviewed, including datasets maintained by the Environmental Protection Agency (EPA) and the Energy Information Administration (EIA).

The initial facility list was created using EPA's ORIS crosswalk,[11] which maps Greenhouse Gas Reporting Program (GHGRP) Facility IDs to ORIS codes, unique identifiers assigned by EIA or EPA's Clean Air Markets Division. ORIS codes link EPA facility data with datasets from programs like the Acid Rain Program (ARP), Regional Greenhouse Gas Initiative (RGGI), and EIA. Facilities included in these datasets are primarily classified as power plants according to the GHGRP.

It is important to note that the EPA's ORIS crosswalk is current only through reporting year 2020. Since then, some facilities have ceased operations while new facilities have also begun operations. Furthermore, facilities not mandated to report to EPA programs are excluded from this crosswalk, representing a limitation in the comprehensiveness of the facility inventory.

The ORIS crosswalk was filtered down to only those GHGRP reporting EGUs in the state of Texas. EGUs from the ORIS crosswalk were then evaluated against the relevant EGUs identified in the Emissions by Unit and Fuel Type spreadsheet provided by EPA,[12] which is a spreadsheet that contains data at the unit-level and fuel-level for facilities in the Pulp and Paper Manufacturing (Subpart AA), Electricity Generation (Subpart D), and General Stationary Fuel Combustion (Subpart C) source categories.

The following scenarios were evaluated, and the summary results are presented in Table A1-1.

1) ORIS crosswalk year 2020 reporting indicated no submission for RY20 (23 facilities); two of those facilities had reported emissions in the 2022 GHGRP and were thus retained in the Power Plants list.
2) ORIS crosswalk year 2020 reporting indicated no reporting under GHGRP Subpart D (23 facilities); 10 of those facilities were included in the 2022 GHGRP and listed with a primary NAICS code in the Power Generation industry and were thus retained in the Power Plants list.

[11] Huetteman, J., Tafoya, J., Johnson, T., and Schreifels, J. (2021). EPA-EIA Power Sector Data Crosswalk. Accessible at www.epa.gov/airmarkets/power-sector-data-crosswalk.

[12] Emissions by Unit and Fuel Type: Facilities report emissions from many process types defined by the Greenhouse Gas Reporting Program (GHGRP). Reporting requirements for each process type are contained in different subparts of the regulation (40 CFR 98). This file contains more detailed data on emissions from fuel combustion than you can find in the GHGRP's Facility Level Information on Greenhouse gases Tool (FLIGHT). For the purposes of this file, fuel combustion emissions are defined as those reported under Pulp and Paper Manufacturing (Subpart AA), Electricity Generation (Subpart D), and General Stationary Fuel Combustion (Subpart C), except that Subpart C emissions do not include emissions from the use of sorbent.

3) ORIS crosswalk year 2020 reporting indicated reporting under GHGRP Subpart D but were either not reported in the 2022 GHGRP (4 facilities) or had primary NAICS codes listed with a primary NAICS code in Manufacturing (4 facilities) and were thus removed from the Power Plants list.

Table A1-1. Results of facilities in the ORIS crosswalk evaluated against GHGRP. Colors are retained for traceability in the spreadsheets.

GHGRP Facility ID	Facility Name	Status in ORIS Crosswalk	Status in 2022 GHGRP	Disposition
1000281	AES Deepwater, Inc.	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1000948	Valley (TXU)	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1000953	C E Newman	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1005625	North Texas	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1007598	Tradinghouse	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1008008	AES Western Power, LLC	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1011578	WOODVILLE RENEWABLE POWER PROJECT	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1000172	Nacogdoches Power LLC	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1000499	Sandow Station	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1000503	Clear Lake Cogeneration	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1000932	Sam Bertron	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1000938	Moore County Station	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1000952	Bryan	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1000994	Spencer	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1001034	Monticello	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1001039	J T Deely	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1001234	New Gulf Power Facility	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1006857	Signal Hill Generating LLC	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1007500	Big Brown	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List

GHGRP Facility ID	Facility Name	Status in ORIS Crosswalk	Status in 2022 GHGRP	Disposition
1010578	Riverview	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1011203	T2 Pettus Cogen	Listed as no reporting as of 2020 in ORIS Crosswalk	No GHGRP reporting in 2022	Remove from Power Plants List
1007501	Decordova	Listed as no reporting as of 2020 in ORIS Crosswalk	GHGRP reporting in 2022	Keep in Power Plants List
1007784	Morgan Creek	Listed as no reporting as of 2020 in ORIS Crosswalk	GHGRP reporting in 2022	Keep in Power Plants List
1006652	Antelope Station	No Subpart D reporting per ORIS Crosswalk as of 2020	Primary NAICS Code in Power Generation	Keep in Power Plants List
1000540	Copper Station	No Subpart D reporting per ORIS Crosswalk as of 2021	Primary NAICS Code in Power Generation	Keep in Power Plants List
1013173	Denton Energy Center	No Subpart D reporting per ORIS Crosswalk as of 2022	Primary NAICS Code in Power Generation	Keep in Power Plants List
1005671	Greens Bayou	No Subpart D reporting per ORIS Crosswalk as of 2023	Primary NAICS Code in Power Generation	Keep in Power Plants List
1003645	HAL C WEAVER POWER PLANT	No Subpart D reporting per ORIS Crosswalk as of 2024	Primary NAICS Code in Power Generation	Keep in Power Plants List
1006602	LUBBOCK POWER & LIGHT BRANDON STATION	No Subpart D reporting per ORIS Crosswalk as of 2025	Primary NAICS Code in Power Generation	Keep in Power Plants List
1004104	PEARSALL POWER PLANT	No Subpart D reporting per ORIS Crosswalk as of 2026	Primary NAICS Code in Power Generation	Keep in Power Plants List
1007155	Permian Basin	No Subpart D reporting per ORIS Crosswalk as of 2027	Primary NAICS Code in Power Generation	Keep in Power Plants List
1009496	Pet Coke/Coal Fired Energy Generating Facility	No Subpart D reporting per ORIS Crosswalk as of 2028	Primary NAICS Code in Power Generation	Keep in Power Plants List
1012373	Red Gate Power Plant	No Subpart D reporting per ORIS Crosswalk as of 2029	Primary NAICS Code in Power Generation	Keep in Power Plants List
1000053	TEXAS MEDICAL CENTER CENTRAL HEATING AND COOLING SERVICES CORPORATION	No Subpart D reporting per ORIS Crosswalk as of 2030	Primary NAICS Code in Steam and Air-Conditioning Supply	Remove from Power Plants List
1003780	AIR LIQUIDE - PORT NECHES ASU COGENERATION PLANT	No Subpart D reporting per ORIS Crosswalk as of 2031	Primary NAICS Code in Manufacturing	Remove from Power Plants List
1000346	Bayou Cogeneration Plant	No Subpart D reporting per ORIS Crosswalk as of 2032	Primary NAICS Code in Manufacturing	Remove from Power Plants List
1005834	DFW RECYCLING AND DISPOSAL FACILITY	No Subpart D reporting per ORIS Crosswalk as of 2033	Primary NAICS Code in Waste	Remove from Power Plants List

GHGRP Facility ID	Facility Name	Status in ORIS Crosswalk	Status in 2022 GHGRP	Disposition
1007542	EXXONMOBIL Bt Site	No Subpart D reporting per ORIS Crosswalk as of 2034	Primary NAICS Code in Manufacturing	Remove from Power Plants List
1007542	EXXONMOBIL Bt Site	No Subpart D reporting per ORIS Crosswalk as of 2035	Primary NAICS Code in Manufacturing	Remove from Power Plants List
1001781	INV Nylon Chemicals Americas Victoria Site	No Subpart D reporting per ORIS Crosswalk as of 2036	Primary NAICS Code in Manufacturing	Remove from Power Plants List
1007893	MESQUITE CREEK LANDFILL	No Subpart D reporting per ORIS Crosswalk as of 2037	Primary NAICS Code in Waste	Remove from Power Plants List
1003781	Orange Carbon Black Plant	No Subpart D reporting per ORIS Crosswalk as of 2038	Primary NAICS Code in Manufacturing	Remove from Power Plants List
1006359	SEADRIFT COKE L.P.	No Subpart D reporting per ORIS Crosswalk as of 2039	Primary NAICS Code in Manufacturing	Remove from Power Plants List
1007894	WASTE MANAGEMENT OF TEXAS AUSTIN COMMUNITY RECYCLING & DISPOSAL FACILITY	No Subpart D reporting per ORIS Crosswalk as of 2040	Primary NAICS Code in Waste	Remove from Power Plants List
1007852	WASTE MANAGEMENT SKYLINE LANDFILL	No Subpart D reporting per ORIS Crosswalk as of 2041	Primary NAICS Code in Waste	Remove from Power Plants List
1007840	Westside Recycling and Disposal Facility	No Subpart D reporting per ORIS Crosswalk as of 2042	Primary NAICS Code in Waste	Remove from Power Plants List
1003160	Air Products La Porte Facility	Subpart D reporting per ORIS Crosswalk as of 2020	Primary NAICS Code in Manufacturing	Remove from Power Plants List
1007438	Eastman Chemical - Texas Operations	Subpart D reporting per ORIS Crosswalk as of 2020	Primary NAICS Code in Manufacturing	Remove from Power Plants List
1007959	Exxonmobil Beaumont Refinery	Subpart D reporting per ORIS Crosswalk as of 2020	Primary NAICS Code in Manufacturing	Remove from Power Plants List
1005585	Galveston Bay Refinery	Subpart D reporting per ORIS Crosswalk as of 2020	Primary NAICS Code in Manufacturing	Remove from Power Plants List
1001032	Gibbons Creek Steam Electric Station	Subpart D reporting per ORIS Crosswalk as of 2020	Last GHGRP report in 2018	Remove from Power Plants List
1000935	Lone Star Power Plant	Subpart D reporting per ORIS Crosswalk as of 2020	Last GHGRP report in 2019	Remove from Power Plants List
1001426	Oklaunion Power Station	Subpart D reporting per ORIS Crosswalk as of 2020	Last GHGRP report in 2020	Remove from Power Plants List
1007365	Sabine Cogeneration Facility	Subpart D reporting per ORIS Crosswalk as of 2020	Last GHGRP report in 2020	Remove from Power Plants List

The remaining facilities were then compared to the UNIT_DATA tab from the Emissions by Unit and Fuel Type spreadsheet,[12] which was filtered for reporting in Texas, reporting year 2022, and by NAICS Codes beginning with "2211" (Electric Power Generation, Transmission and

Distribution).[13] Seven additional facilities were identified that began reporting after the ORIS Crosswalk reporting year cut-off. Those facilities are listed in Table A1-2.

Table A1-2. Power plant facilities that began reporting after reporting year 2020 into the GHGRP. Colors are retained for traceability in the spreadsheets.

GHGRP Facility ID	Facility Name	Comments	Disposition
1014274	LaPorte Generating Station	Began reporting in 2021 after ORIS date	Adding to Power Plants List
1014329	Victoria Port II Power LLC	Began reporting in 2021 after ORIS date	Adding to Power Plants List
1014345	SJRR Power LLC	Began reporting in 2022 after ORIS date	Adding to Power Plants List
1014433	HO Clarke Generating, LLC	Began reporting in 2021 after ORIS date	Adding to Power Plants List
1014434	Topaz Generating, LLC	Began reporting in 2021 after ORIS date	Adding to Power Plants List
1014658	Braes Bayou Generating, LLC	Began reporting in 2022 after ORIS date	Adding to Power Plants List
1014659	Mark One Generating, LLC	Began reporting in 2022 after ORIS date	Adding to Power Plants List
1006016	FREEPORT LNG IMPORT TERMINAL	Zero emissions in 2022 and suspect not functioning as LNG Import	Not adding to Power Plants List; Removing from UNIT_DATA Filtered and Pivot to facilitate comparison of totals in QA/QC
1013179	Corpus Christi Liquefaction	LNG Facility	Not adding to Power Plants List; Removing from UNIT_DATA, Filtered, and Pivot to facilitate comparison of totals in QA/QC

To identify potentially missing facilities that may not have been included in GHGRP reporting, the eGRID2022 Plant level data (PLNT22)[14] were filtered for Texas, Electric Utilities and IPPs, Biomass/Coal/Gas/Oil/OtherF (but excluded MWH as primary fuel) and compared to facilities in the Power Plants list from GHGRP and ORIS crosswalk review (above).

The Emissions & Generation Resource Integrated Database (eGRID) compiles detailed, plant-specific data on emissions, generation, and resource mix, including greenhouse gases and pollutants like CO_2, NO_x, SO_2, CH_4, N_2O, and mercury. eGRID annually publishes information on

[13] Electric Power Generation, Transmission and Distribution: This industry group comprises establishments primarily engaged in generating, transmitting, and/or distributing electric power. Establishments in this industry group may perform one or more of the following activities: (1) operate generation facilities that produce electric energy; (2) operate transmission systems that convey the electricity from the generation facility to the distribution system; and (3) operate distribution systems that convey electric power received from the generation facility or the transmission system to the final consumer.

[14] https://www.epa.gov/egrid/historical-egrid-data

net electricity generation, emission quantities and rates, heat input, and generation capacity, aggregated at various levels, including specific seasonal reporting for ozone-related emissions. An excerpt regarding data sources is extracted from the eGRID Technical Guide for eGRID2022.[15]

2.4 eGRID Data Sources

eGRID is developed using the following key data sources:

- CAMD's Power Sector Emissions Data (EPA/CAMD): this includes data reported to EPA by electric generating units to comply with the regulations in 40 CFR Part 75 and 40 CFR Part 63. Data include annual emissions of CO2, Nox, SO2, and Hg; ozone season emissions of Nox; and annual and ozone season generation and heat input. The data are available at https://www.epa.gov/airmarkets/power-sector-emission-data. CAMD's Power Sector Emissions Data used in eGRID2022 was queried on January 16, 2024.
- EIA-860: this includes data reported to EIA on electric generators. Data include nameplate capacity, prime mover, primary fuel type, and indications of whether the generator is a combined-heat-and-power unit (EIA,2023a). The EIA-860 data used in eGRID2022 was released on Septeber 19, 2023 and downloaded on October 18, 2923. Generators from Puerto Rico were included in the EIA-860 monthly reports. The EIA-860 monthly data used in eGRID2022 was released in February 2023 and downloaded on October 18, 2023 (EIA, 2023b).
- EIA-923: this includes data reported to EIA on fuel consumption and generation. Data include monthly generation and heat input at the unit or generator level for a subset of units and generators, and at the prime mover level for all plants. As discussed in more detail below, eGRID2022 uses unit- or generator-level data where available, and prime mover-level data for all other units and generators (EIA,2023c). The EIA-923 data used in eGRID2022 was released on September 28, 2023 and downloaded on October 18, 2023.

Figure A-1. Data source information excerpted from the eGRID Technical Guide for eGRID2022.[15]

This analysis identified 69 facilities, which were further reviewed for applicability. The results of that review are summarized in Table A1-3, where facilities that were not included in the Power Plants list are struck through with a reason given in the subsequent column. A detailed review of the list of facilities resulted in the exclusion of 12 facilities for reasons noted in Table A1-3.

[15] https://www.epa.gov/system/files/documents/2024-01/egrid2022_technical_guide.pdf Last accessed March 29, 2025.

Table A1-3. Facilities that appear in eGRID but not in GHGRP. Colors are retained for traceability in the spreadsheets.

Facility Name	Notes
Ameresco Dallas LLC	
Austin Gas Recovery	
Bakke	
Bryan (TX)	
BUC00040	
~~Carbon Capture Plant~~	<-- Not including this one because it is part of a carbon capture plant (Industrial)
Citrus City	
Clara	
Covel Gardens Gas Recovery	
Cutten	
DFW Gas Recovery	
E. Porte Ct.	
~~Eastman Cogeneration Facility~~	<-- Not including this one because it part of a manufacturing facility
Farmers Branch Renewable Energy Facility	
Frankel	
FTBLID2	
GCWA	
Goldsmith	
HEB_CPS00085	
HEB_CPSSADC	
HEB00020	
HEB00028	
HEB00038	
HEB00048	
HEB00054	
HEB00057	
HEB00063	
HEB00069	
HEB00070	
HEB00092	
HEB00095	
HEB00099	
HEB00109	
HEB00110	
HEB00182	
HEB00292	
HEB00591	
HEB00594	
HEBCCBakery	
HEBHoustonDistributionCenter	
HEBSnackPlant	
~~J T Deely~~	<-- Not including because no emissions reported (valid reasons to discontinue reporting per EPA GHGRP)
Mckeever	

Facility Name	Notes
~~Mesquite Creek LFGTE Project~~	<-- Not including because categorized as waste sector by GHGRP
N. Mary Francis	
~~Nacogdoches Generating Facility~~	<-- Not including because discontinued reporting for valid reasons per EPA GHGRP
~~NASA Johnson Space Center CHP~~	<-- Not including this one, part of NASA
Nelson Gardens Landfill Gas to Energy	
~~NET Power La Porte Station~~	<-- Not including because reported 0 emissions to EPA in GHGRP
OTHERCitizensHospital	
~~Oyster Creek Unit VIII~~	<-- Not including this one because it part of a manufacturing facility (Dow complex)
Praxair	
RavenChem	
~~Rentech Nitrogen Pasadena Cogeneration~~	<-- Not including this one because it part of a manufacturing facility
Ridge Rd	
Robert Mueller Energy Center	
Santa Rosa	
Security	
~~Signal Hill Generating LLC~~	<-- Not including because discontinued reporting for valid reasons per EPA GHGRP
Sky Global Power One	<-- Lots of information that suggests this is a real facility on the internet but not findable under any variation of name in GHGRP, but will keep
Southwick	
~~Spencer~~	<-- Not including because discontinued reporting for valid reasons per EPA GHGRP
Stonegate	
Tumbleweed	
Vaquero	
Villa Cavasos	
Westover	
Westside Landfill Gas Recovery	
~~Woodville Renewable Power Project~~	<-- Not including because no longer reporting

All of those facilities identified for inclusion were reported with a nameplate capacity less than 25 MW according to the Plant level data, which generally explains the exclusion from GHGRP. Nameplate capacity is taken from the Plant level data for all facilities and included in the Power Plant list for reference.

Of particular note, Sky Global Power One in Rock Island, TX[16] appears to be a valid facility based upon publicly available information on the internet, but could not be located in the GHGRP although it is listed in the eGRID Plant level data as having 51 MWH nameplate capacity in 2022. In a search of TCEQ documents, a pending Title V Standard Operating Permit renewal action

[16] https://skyglobalpartners.com/ Last accessed March 28, 2025.

was identified.[17,18] A review of the application indicated that the facility is an electricity generating unit with a primary NAICS code of 221112.[19] It was thus included in the Power Plant list.

Frontera Generation Energy appears in the GHGRP[20] under primary NAICS code 221112, but does not appear to be connected to the ERCOT grid in 2022, but currently configured to export electricity to Mexico.[21,22] The facility has flexibility and could be reconfigured to serve ERCOT. Because the facility is not reported in eGRID or the EIA-923 data for 2022, it is assumed to have operated (emitted) in Texas, but exported all power to Mexico. Accordingly, the facility was retained in the Power Plant list.

Finally, while HEB is a large grocery store chain and would otherwise have been eliminated from this list under the assumption that the associated emissions were derived from its commercial activities, it was retained because those facilities are part of Texas Microgrid, LLC, which operate power generating facilities that provide dedicated power to commercial and industrial customers in instances of power outages.

The EIA form 923 was reviewed for errantly excluded plants and none were identified.

In total 186 unique electricity generating units (Power Plants) were identified for inclusion from reporting year 2022.

Emissions Analysis

For facilities reported into the GHGRP, emissions data were taken from the UNIT_DATA tab, which are reported as unit emissions in metric tons for carbon dioxide (CO_2, non-biogenic), methane (CH_4), nitrous oxide (N_2O), and biogenic carbon dioxide (CO_2). Those emissions data are presented in units of metric tons of carbon dioxide equivalent using GWP's from IPCC's AR4.

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[17] https://www.tceq.texas.gov/assets/public/permitting/air/reports/applications/titlev-pending-permits.html Last accessed March 28, 2025.

[18] https://www.tceq.texas.gov/assets/public/permitting/air/reports/applications/37673-ac.pdf Last accessed March 28, 2025.

[19] Sky Global Power One, LLC (Sky Global) operates the Rock Island SGP1 electrical generating plant in Rock Island, Colorado County, Texas. Primary activities at Sky Global include the manufacturing of steel and plastic drums, including surface coating operations. Sky Global has been assigned Texas Commission on Environmental Quality (TCEQ) Customer Reference Number (CN) 604637678. Sky Global has been assigned TCEQ Regulated Entity Reference Number (RN) 107585721. Facilities at the site are operated under Site Operating Permit (SOP) O3799. The purpose of this application is to renew the SOP. In addition, a Permit-by-Rule (PBR) claim from 2024 is being incorporated into the SOP.

[20] https://ghgdata.epa.gov/ghgp/service/facilityDetail/2022?id=1001311&ds=E&et=&popup=true Last accessed March 28, 2025.

[21] https://www.ercot.com/files/docs/2014/10/29/fronterafactsheet_final.pdf Last accessed March 28, 2025.

[22] https://www.fisterraenergy.com/track-record/in-operation/#:~:text=Frontera%20is%20a%20540%20MW,a%20dedicated%20overhead%20transmission%20line. Last accessed March 28, 2025.

The AR4 uses 100 year GWPs for methane of 25 and nitrous oxide of 298. Therefore, those factors were used to convert to unit emissions to metric tons of the respective pollutants.

For facilities not reported in the GHGRP, unadjusted emissions were estimated using eGRID Plant level data, which provide annual CO_2,23 CH_4, and N_2O emissions in short tons, converted here into metric tons. Adjusted emissions represent fuel emissions specifically associated with electricity generation, accounting for two scenarios: (1) units burning biomass (such as landfill biogas, methane biogas, or digester gas), and (2) Combined Heat and Power (CHP) facilities. Adjustments for biomass combustion involve subtracting biomass-derived CO_2 emissions from the overall unadjusted totals, while CH_4 and N_2O adjustments are applied only to landfill gas. Additionally, emissions adjustments for landfill gas assume baseline emissions of NO_x, SO_2, CH_4, and N_2O would have occurred due to gas flaring, which are deducted using EPA flare emission factors. Since eGRID emissions data reflect only electricity generation, emissions linked to useful thermal output from CHP facilities are excluded via an electric allocation factor. The final adjusted emissions thus omit heat-related emissions. However, unadjusted emissions were selected for inventory completeness, particularly for facilities categorized under NAICS code "2211" (Electric Power Generation, Transmission, and Distribution), because biomass-derived electricity emissions and emissions attributable to heat generation are not otherwise captured elsewhere and contribute to total Texas GHG emissions.

Use of the unadjusted emissions data relative to the adjusted data results in a difference of total sector CO2e of 9,583,382 metric tons of CO2e, or 5.0% more than the adjusted data.

[23] According to the eGRID technical documentation, most CO2 emissions reported in eGRID2022 are monitored data from CAMD's Power Sector Emissions Data. For units that report to EIA but not to CAMD's Power Sector Emissions Data, or for units from CAMD's Power Sector Emissions Data where there are gaps in CO2 emissions data, the CO2 emissions are estimated based on heat input and an emission factor. See the eGRID guidance regarding emissions factors, which are principally default CO2 emission factors from the EPA Mandatory Reporting of Greenhouse Gases Final Rule (EPA, 2009, Table C-1). EPA, 2009: U.S. Environmental Protection Agency, Final Mandatory Reporting of Greenhouse Gases Rule (Table C-1, Default CO2 Emission Factors and High Heat Values for Various Types of Fuel and Table C-2, Default CH4 and N2O Emission Factors for Various Types of Fuel), Washington, D.C., October 30, 2009. https://www.epa.gov/sites/production/files/2015-06/documents/ghg-mrr-finalrule.pdf

The emissions for CH4 and N2O are calculated using heat input data and emission factors from the EPA or the IPCC. The emission factors are primarily from the EPA Mandatory Reporting of Greenhouse Gases Final Rule (EPA, 2009, Table C-1). For fuel types that are included in eGRID2022 but not in Table C-1 of the EPA Mandatory Reporting of Greenhouse Gases Final Rule, additional emission factors are used from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories and the EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015 (IPCC, 2007a; EPA, 2017).

Several fuel types do not have direct reported emission factors, so emission factors from similar fuel types are used:

- The emission factor for natural gas is used to estimate emissions from process gas and other gas;
- The emission factor for anthracite, bituminous, and lignite coal are used to estimate emissions from refined coal and waste coal; and
- The emission factor for other biomass liquids is used to estimate emissions from sludge waste and liquid wood waste

Emissions reported in eGRID represent emissions from fuel utilized only for electricity generation. For certain plants, there are two possible cases for which we adjust the emission estimates: (1) if the plant is a CHP facility; and (2) if one or more units at the plant burn biomass, including biogas (such as landfill, methane, and digester gas). The Plant file reports both adjusted and unadjusted emissions, while the Unit file reports only unadjusted emissions. Due to these adjustments, the adjusted emissions reported in eGRID may be different from emissions reported in other EPA sources.

Figure A-2. Excerpt of EPA description the emissions data in the Plant level data in its Technical Guide for eGRID2022 documentation.[24]

Total carbon dioxide equivalent emissions (CO2e) were calculated for all sources using AR4 values as used in the GHGRP.

Counties and primary fuel type were assigned to each facility based on the eGRID Plant level data for all facilities except the Frontera Generation Facility, which is not available in the eGRID Plant level data. The primary fuel was manually assigned as “gas” and the county as “Hidalgo”. Primary fuel type was assigned as either gas, oil, biomass, or coal. The eGRID primary fuel designation of a plant is determined solely by the fuel that has the maximum heat input at the Unit level. For plants that do not consume any combustible fuel, the primary “fuel” is determined by the nameplate capacity of the units at the plant. The fuel from the unit with the highest nameplate capacity is used as the primary fuel. Fuel code descriptions and associated fuel category are shown in Table A1-4.

[24] https://www.epa.gov/system/files/documents/2024-01/egrid2022_technical_guide.pdf Last accessed March 28, 2025.

Table A1-4. Table 3-3 Fuel-based Emission Rates – Primary Fuel Category, excerpted from section 3.1.3.3 Technical Guide for eGRID2022.

Fuel Code	Description	Fuel Category
BIT	Bituminous coal	Coal
LIG	Lignite coal	Coal
SUB	Subbituminous coal	Coal
RC	Refined coal	Coal
WC	Waste coal	Coal
SGC	Coal-derived synthetic gas	Coal
COG	Coke oven gas	Coal
NG	Natural gas	Gas
BU	Butane gas	Gas
DFO	Distillate fuel oil	Oil
JF	Jet fuel	Oil
KER	Kerosene	Oil
PC	Petroleum coke	Oil
RG	Refinery gas	Oil
RFO	Residual fuel oil	Oil
WO	Waste oil	Oil
BFG	Blast furnace gas	Other fossil
OG	Other gas	Other fossil
TDF	Tire-derived fuel	Other fossil

The facility level data was copied to a Counties tab to enable additional data analysis by county and Report Tables are derived from data in the Counties tab. County level emissions were calculated through combining emissions from facilities within the same county. Each facility was also aggregated by fuel type and county.

Comparison to Other Sources

Table A1-5. Comparison of this inventory with other sources from eia and EPA.

Data Source	Emissions Reported at State Level from Data Source	Emissions in this Inventory	% Difference Relative	Notes
eia[25]	187,756,641 MT CO_2	191,101,017 MT CO_2	1.8%	EIA data including CO2 emissions, in metric tons, for Electric Utliity, IPP NAICS-22 Non-Cogen and IPP NAICS-22 COGEN, where the exclusion of Frontera from eia data accounts for nearly 40% of the difference. If accounting for the emissions associated with Frontera energy, the difference would be reduced to 1.1%. Of note, the Total Electric Power Industry sum of all sources (which includes Commercial and Industrial electricity generation, otherwise excluded from this inventory) is 213,620,917 MT CO_2, which is within 0.01% of the eGRID reported total

[25] https://www.eia.gov/electricity/data.php#elecenv Last accessed 4/1/25.

Data Source	Emissions Reported at State Level from Data Source	Emissions in this Inventory	% Difference Relative	Notes
eGRID[Error! Bookmark not defined.,26] Texas	213,589,517 MT CO_2	191,101,017 MT CO_2	11.8%	eGRID state level report including all fossil fuels (coal, oil, natural gas, blast furnace gas, and tire-derived fuel) and biomass, such as wood, agricultural byproducts, municipal solid waste, and landfill gas, but excludes facilities in commercial and industrial sources. This inventory: 36,000,182 MT CO2 emissions among facilities that were removed from GHGRP reporters due to a primary NAICS code (see Table A1-1); Accounting for differences in methods, the total CO2 estimated by the unadjusted eGRID inventory for just the facilities in this inventory (and adding Frontera as estimated by GHGRP, since excluded from eGRID) 190,553,406 MT CO2 eGRID + Frontera = 190,553,406 MT CO2 GHGRP excluded facilities = 36,000,182 MT CO2 Methodology Differences = 191,101,017 MT CO2 - 190,553,406 MT CO2 = 547,611 MT CO2 eGRID (213,589,517 MT CO2) – GHGRP excluded facilities (36,000,182 MT CO2) + Methodology Differences (547,611 MT CO2) = 177,041,724 MT CO2, which is within 7.4% of estimate for this inventory
eGRID[Error! Bookmark not defined.] Texas	27,249,859 lbs CH_4 (12,361 MT CH_4)	10,832 MT CH_4	14.1%	eGRID + Frontera = 12,058 MT CH4 GHGRP excluded facilities = 1,621 MT CH4 Methodology Differences = -1,226 MT CH4 eGRID (12,361 MT CH_4) - GHGRP excluded facilities (1,621 MT CH4) + Methodology Differences (-1,226 MT CH4) = 9,514 MT CH4 (12.2% difference)

[26] Egrid totals from the Plant level and State level aggregated emissions adjusted emissions (among other quantities) are reported to match in total accounting for minor differences due to rounding, according to the eGRID technical guidance document.

Data Source	Emissions Reported at State Level from Data Source	Emissions in this Inventory	% Difference Relative	Notes
eGRID[Error! Bookmark not defined.] Texas	3,778,520 lbs N2O (1,714 MT N_2O)	1,747 MT N_2O	1.9%	eGRID + Frontera = 1,670 MT N2O GHGRP excluded facilities = 297 MT N2O Methodology Differences = 77 MT N2O eGRID (1,670 MT N_2O) - GHGRP excluded facilities (297 MT N2O) + Methodology Differences (77 MT N_2O) = 1,450 MT N_2O (17.0% difference)
eGRID[Error! Bookmark not defined.] Texas	214,479,065 MT CO_2e	191,892,519 MT CO_2e	11.8%	eGRID + Frontera = 191,352,475 MT CO2e GHGRP excluded facilities = 36,129,073 MT CO2e Methodology Differences = 540,044 MT CO2e eGRID (214,479,065 MT CO2e) - GHGRP excluded facilities (36,129,073 MT CO2e) + Methodology Differences (540,044 MT CO2e) = 178,890,036 MT CO2e (6.8% difference)
GHGI TX[27]	198 Million Metric Tons CO_2e	191,892,519 MT CO_2e	3.2%	GHGI includes facilities that were not included in this inventory due to a primary NAICS code outside of the sector (GHGRP excluded facilities = 36,129,073 MT CO2e) but does not include other facilities identified as non reporters (estimated by eGRID = 242,755 MT CO2e) which provides an adjustment down to 162,113,682 MT CO2e (15.5% difference)

[27]Data Extracted from EPA's FLIGHT Tool (http://ghgdata.epa.gov/ghgp); Search Parameters: year=2022; state=TX; GHGs=ALL; data type=Point Sources; emissionsType=FC;

Appendix 2: Petroleum and Natural Gas Systems

Upstream

To improve consistency and clarity in emissions estimation, sources from the **Onshore Petroleum and Natural Gas Production**[28] (Onshore Production) and **Onshore Gathering and Boosting**[29] (Gathering and Boosting) segments have been combined. This decision was made because operators often interpret the definitions of these segments differently. For example, some operators classify facilities such as central tank batteries as production assets, while others include them under boosting and gathering operations. Due to this variability, significant overlap exists in the types of assets included in each category, making it difficult to separately interpret and extrapolate emissions data. Details on the estimation methodology for the combined Onshore Production & Gathering and Boosting segments are provided below.

Onshore production and gathering and boosting facilities are reported by basin, where every county is assigned to a basin.[30] Basins that include counties in Texas are shown in Table A2-1 based on the list provided in EPA's Sub-Basin selection list.[31]

[28] 40 CFR 98.230(a)(2)

[29] 40 CFR 98.230(a)(9)

[30] Basin means geologic provinces as defined by the American Association of Petroleum Geologists (AAPG) Geologic Note: AAPG--CSD Geologic Provinces Code Map: AAPG Bulletin, Prepared by Richard F. Meyer, Laure G. Wallace, and Fred J. Wagner, Jr., Volume 75, Number 10 (October 1991) "(incorporated by reference, see 98.7) and the Alaska Geological Province Boundary Map, Compiled by the American Association of Petroleum Geologists Committee on Statistics of Drilling in Cooperation with the USGS, 1978 (incorporated by reference, see 98.7).

[31] https://ccdsupport.com/confluence/display/help/Subpart+W+Basin+and+County+Combinations

Table A2-1. GHGRP reporting basins in Texas.

Reporting basin number	Reporting basin name
220	Gulf Coast Basin (LA, TX)
260	East Texas Basin
345	Arkoma Basin
360	Anadarko Basin
400	Ouachita Folded Belt
405	Kerr Basin
410	Llano Uplift
415	Strawn Basin
420	Fort Worth Syncline
425	Bend Arch
430	Permian Basin
435	Palo Duro Basin
465	Orogrande Basin

Emissions data were downloaded for the 2022 reporting year from the Greenhouse Gas Reporting Program via the GHG Query Builder.[32] Emissions from production and gathering and boosting facilities were combined by basin. Both onshore production and gathering and boosting segments are required to report all emissions to subpart W, including combustion emissions.[33] However, in one instance, a production asset appears to have errantly reported a process heater to subpart C, instead of subpart W, but those emissions have been aggregated into the emissions associated the asset.[34] Total emissions for facilities reported into the GHGRP are presented in Table A2-2 by basin.

[32] https://enviro.epa.gov/query-builder/ghg
[33] https://www.epa.gov/ghgreporting/subpart-w-information-sheet
[34] https://ghgdata.epa.gov/ghgp/service/html/2022?id=1008526&et=undefined

Table A2-2. Basin-level emissions in the GHGRP for 2022 for basins with counties in Texas.

Basin	Facility Counts	CO_2 Emissions (MT)	CH4 Emissions (MT)	N_2O Emissions (MT)	Total GHG (MT CO_2e)
220 - Gulf Coast Basin (LA, TX)	91	14,160,434.43	202,631.48	36.25	19,237,022.61
260 - East Texas Basin	37	2,493,768.30	81,194.74	7.57	4,525,892.96
350 - South Oklahoma Folded Belt	14	1,239,252.32	21,133.88	2.81	1,768,436.51
360 - Anadarko Basin	59	9,590,297.00	194,465.14	22.07	14,458,502.43
400 - Ouachita Folded Belt	5	43,569.60	2,499.49	0.43	106,185.59
405 - Kerr Basin	0	-	-	-	-
410 - Llano Uplift	0	-	-	-	-
415 - Strawn Basin	17	1,534,107.40	53,887.43	4.34	2,882,586.47
420 - Fort Worth Syncline	20	1,680,267.51	62,876.32	3.67	3,253,268.37
425 - Bend Arch	2	46,681.32	771.68	0.09	65,998.82
430 - Permian Basin	154	43,944,976.09	287,984.48	133.01	51,184,225.66
435 - Palo Duro Basin	1	953.40	26.36	0.00	1,613.00
465 - Orogrande Basin	0	-	-	-	-
TOTAL	**400**	**74,734,307.38**	**907,471.01**	**210.23**	**97,483,732.42**

To estimate onshore oil and gas emissions attributable to Texas, two key adjustments were made to the U.S. EPA Greenhouse Gas Reporting Program (GHGRP) data:

1. Adjustment for Underreporting Due to Emissions Thresholds

The GHGRP only includes facilities emitting 25,000 metric tons of CO_2e or more per year. This results in underreporting for certain segments, particularly onshore production and gathering and boosting, which include many smaller facilities below the reporting threshold.

To correct for this, basin-level GHGRP production (Table A2-3) was compared against basin-level Enverus production (Table A2-4) for all basins relevant to Texas on an energy production (e.g., barrels of oil equivalence, BOE) basis. A scale-up factor was derived as the ratio of Enverus to GHGRP production for each basin. This factor was applied to GHGRP emissions to estimate total basin-level emissions, accounting for unreported facilities. The inverse of the scale-up factor (expressed as a percentage) indicates the coverage of basin production within GHGRP.

Results of this analysis, including scale-up factors and GHGRP coverage percentages, are presented in Table A2-5.

Table A2-3. Basin level production data for 2022 from GHGRP.

Basin	Gas To Sales (MCF)	Liquids Production (Bbls)	Production Total (BOE)
220 - Gulf Coast Basin (LA, TX)	2,225,648,910.01	372,774,152.92	780,275,123.78
260 - East Texas Basin	1,831,105,398.88	6,799,347.71	313,971,265.23
350 - South Oklahoma Folded Belt	310,785,705.25	18,195,884.37	72,000,158.97
360 - Anadarko Basin	1,887,957,661.97	96,611,612.33	423,880,347.38
400 - Ouachita Folded Belt	8,206,516.38	-	1,412,960.39
405 - Kerr Basin	-	-	-
410 - Llano Uplift	-	-	-
415 - Strawn Basin	397,189,478.13	52,122.77	76,167,906.74
420 - Fort Worth Syncline	342,122,574.84	1,164,644.73	61,616,574.41
425 - Bend Arch[1]	-	-	-
430 - Permian Basin	6,719,574,751.32	1,805,412,295.71	2,973,306,857.03
435 - Palo Duro Basin	733,205.89	3,979.73	129,067.30
465 - Orogrande Basin	-	-	-
Grand Total	**13,723,324,203**	**2,301,014,040**	**4,702,760,261**

[1] No Production Data (only two Boosting and Gathering Facilities Reported)

Table A2-4. GHGRP Basin level production data for 2022 from Enverus.

Basin	Gas Production (MCF)	Liquids Production (Bbls)	Production Total (BOE)
220 - Gulf Coast Basin (LA, TX)	2,957,019,786	461,446,398	954,310,553
260 - East Texas Basin	2,069,845,611	17,525,531	362,518,121
350 - South Oklahoma Folded Belt	370,926,708	29,167,607	90,992,750
360 - Anadarko Basin	2,674,178,725	115,353,611	561,110,318
400 - Ouachita Folded Belt	85,267,619	5,684,801	19,898,225
405 - Kerr Basin	-	1,550	1,550
410 - Llano Uplift	-	33,076	33,076
415 - Strawn Basin	464,848,275	66,734	77,548,306
420 - Fort Worth Syncline	387,927,834	2,940,603	67,604,971
425 - Bend Arch	20,320,786	4,469,215	7,859,209
430 - Permian Basin	7,553,130,276	1,976,990,973	3,235,899,803
435 - Palo Duro Basin	3,033,826	3,215,086	3,721,170
465 - Orogrande Basin	11,804,652	511,820	2,479,669
Grand Total	**16,598,304,098**	**2,617,407,005**	**5,383,977,721**

Table A2-5. Comparison of production volumes reported to GHGRP and Enverus for 2022.

Basins	Scale Factor from GHGRP to Enverus	% of Basin in GHGRP relative to Enverus
220 - Gulf Coast Basin (LA, TX)	1.22	81.8%
260 - East Texas Basin	1.15	86.6%
350 - South Oklahoma Folded Belt	1.26	79.1%
360 - Anadarko Basin	1.32	75.5%
400 - Ouachita Folded Belt	14.08	7.1%
405 - Kerr Basin	No production or emissions reported to GHGRP	--
410 - Llano Uplift	No production or emissions reported to GHGRP	--
415 - Strawn Basin	1.02	98.2%
420 - Fort Worth Syncline	1.10	91.1%
425 - Bend Arch	No production reported to GHGRP	--
430 - Permian Basin	1.09	91.9%
435 - Palo Duro Basin	28.83	3.5%
465 - Orogrande Basin	No production or emissions reported to GHGRP	--

Special Cases: Basins Without GHGRP Reporting

Four basins—Kerr, Llano Uplift, Bend Arch, and Orogrande—have no production reported in GHGRP for 2022. However, Enverus data shows minor production in each. Only Bend Arch includes emissions in GHGRP (from two gathering and boosting facilities). For Orogrande, all production occurs in Oklahoma counties, so no Texas emissions were estimated. For Kerr, Llano Uplift, and Bend Arch, emissions were estimated using emissions factors derived from geologically similar basins:

Kerr and Llano Uplift: Used emissions factor from the Ouachita Folded Belt Basin.

Bend Arch: Used emissions factor from the Strawn Basin.

The basin emission factors were created by pollutant as the total basin level emissions for each pollutant (metric tons of CO_2, CH_4, or N_2O) divided by the total production on an energy basis for the basin. The factors for Ouachita Folded Belt and Strawn Basins are given in Table A2-6 and basin level emissions scaled up to account for non-reporters are summarized in Table A2-7.

Table A2-6. Basin level emission factors for use in basins with no reported production based emissions.

Basin	MT CO_2/BOE	MT CH_4/BOE	MT N_2O/BOE
Ouachita Folded Belt	0.031	0.0018	0.00000031

Strawn Basin	0.020	0.00069	0.000000056

Table A2-7. Basin level emissions scaled up to account for facilities below the GHGRP reporting threshold.

Basin	CO_2 Emissions (MT)	CH4 Emissions (MT)	N_2O Emissions (MT)	Total GHG (MT CO_2e)
220 - Gulf Coast Basin (LA, TX)	17,318,829.74	247,827.15	44.33	23,527,718.78
260 - East Texas Basin	2,879,359.67	93,749.23	8.74	5,225,695.45
350 - South Oklahoma Folded Belt	1,566,149.00	26,708.69	3.55	2,234,924.25
360 - Anadarko Basin	12,695,126.43	257,422.64	29.22	19,139,398.53
400 - Ouachita Folded Belt	613,575.38	35,199.44	6.08	1,495,374.32
405 - Kerr Basin	47.80	2.74	0.00	116.48
410 - Llano Uplift	1,019.92	58.51	0.01	2,485.70
415 - Strawn Basin	1,561,910.20	54,864.04	4.42	2,934,827.90
420 - Fort Worth Syncline	1,843,569.48	68,987.15	4.02	3,569,447.28
425 - Bend Arch	186,838.35	6,991.57	0.41	361,749.13
430 - Permian Basin	47,826,055.74	313,418.35	144.76	55,704,652.66
435 - Palo Duro Basin	27,487.70	759.99	0.06	46,504.67
465 - Orogrande Basin	-	-	-	-
Grand Total	**86,519,969.40**	**1,105,989.51**	**245.60**	**114,242,895.15**

2. Disaggregation of Emissions to Identify Texas Portion

Since many geological basins span multiple states, it is necessary to disaggregate basin-level emissions to estimate the portion attributable to Texas. Enverus production data was extracted at the county level for all Texas counties within each basin for 2022. The basin-wide emissions (GHGRP emissions from onshore production and gathering and boosting after scale up in step 1) were then scaled down using the ratio of Texas county production to total basin production as reported in Enverus. This allocation process and the resulting estimates for Texas are summarized in Table A2-8.

Table A2-8. Basin level emissions scaled up to account for facilities below the GHGRP reporting threshold.

Basin	CO_2 Emissions (MT)	CH4 Emissions (MT)	N_2O Emissions (MT)	Total GHG (MT CO_2e)
220 - Gulf Coast Basin (LA, TX)	16,451,165.91	235,411.15	42.11	22,348,993.03
260 - East Texas Basin	2,879,359.67	93,749.23	8.74	5,225,695.45
350 - South Oklahoma Folded Belt	74,461.43	1,269.85	0.17	106,257.87
360 - Anadarko Basin	1,328,597.54	26,940.35	3.06	2,003,017.30
400 - Ouachita Folded Belt	118,257.93	6,784.19	1.17	288,212.14
405 - Kerr Basin	47.80	2.74	0.00	116.48
410 - Llano Uplift	1,019.92	58.51	0.01	2,485.70
415 - Strawn Basin	1,561,910.20	54,864.04	4.42	2,934,827.90
420 - Fort Worth Syncline	1,843,569.48	68,987.15	4.02	3,569,447.28
425 - Bend Arch	186,838.35	6,991.57	0.41	361,749.13
430 - Permian Basin	33,866,149.01	221,934.93	102.51	39,445,068.98
435 - Palo Duro Basin	25,402.18	702.33	0.05	42,976.32
465 - Orogrande Basin	-	-	-	-
Grand Total	**58,336,779.42**	**717,696.04**	**166.67**	**76,328,847.57**

Emissions were estimated for **abandoned wells** (both plugged and unplugged) through the application of 2022 emission factors from the EPA GHGI. Counts of abandoned wells across Texas were extracted from Enverus using the following filtering criteria.

- Gas wells = CBM, GAS, OIL & GAS
- Oil wells = OIL
- Unplugged = SHUT-IN, TA, INACTIVE
- Plugged = P & A
- Last production date from 12-1-1935 (beginning of data) to 12-31-2021 (ceased production before 2022)

There were 288,849 plugged wells and 105,974 unplugged wells identified, each of which were disaggregated into either gas or oil wells. The emission factors in Table A2-9, from the EPA GHG Inventory Annex Methodology for Estimating CH_4 and CO_2 Emissions from Abandoned Oil and Gas Wells,[35] were applied to each of the four categories to estimate total emissions from this category and are summarized in Table A2-10.

[35] https://www.epa.gov/system/files/documents/2024-02/2024_ghgi_abandoned_wells_annex_tables.xlsx

Table A2-9. EPA GHGI emission factors for abandoned wells for 2022.

Emission Factor	kg CH4 / yr / well	kg CO2 / yr / well
Abandoned Oil Wells – Plugged	0.3	0.01
Abandoned Oil Wells – Unplugged	133.0	2.7
Abandoned Gas Wells – Plugged	0.5	0.02
Abandoned Gas Wells – Unplugged	148.2	6.5

Table A2-10. Emission estimates for abandoned wells, both plugged and unplugged, in Texas for 2022.

Well Types	Well Count	CO_2 (MT)	CH_4 (MT)	CO_2e (MT)
Plugged Oil Wells	219,824	1	63	1,573
Unplugged Oil Wells	71,540	193	9,512	237,986
Plugged Gas Wells	69,025	2	37	939
Unplugged Gas Wells	34,434	224	5,102	127,780
Total	**394,823**	**420**	**14,714**	**368,278**

Offshore production in the United States is reported in state waters for Alabama, Alaska, California, Louisiana, and Texas within the GHGRP. Facilities operated in state waters offshore are individually reported, rather than aggregated by operator within a geological basin. Many offshore wells do not exceed the GHGRP reporting threshold. Eight offshore facilities were reported as operating in Texas within the GHGRP; however none of the coordinate locations reported for the facilities were within state waters or within the state delegated federal air permitting OCS boundaries, which extends 25 miles offshore.

Emission estimates were, instead, developed based on emission factors reported in the 2022 US EPA GHGI, which were applied to the production data for oil and gas wells.

Total production from offshore facilities in 2022 was derived from a combination of two data sources. The RRC publishes monthly and annual production volumes for facilities operating in state waters. The boundary of state waters delineates state jurisdiction over resource production, which is administered by the RRC, and extends to 9 nautical miles offshore, as shown in the red, state seaward boundary line in Figure A2-1.[36,37]

[36] The State Seaward Boundary is the limit of the state's jurisdiction under the Submerged Lands Act of 1953. The Act grants jurisdiction to states out to 3 nautical miles (although it is 9 nautical miles for Texas and the Gulf coast of Florida, and for Puerto Rico). The distance is measured from the Submerged Lands Act baseline. https://www.ncei.noaa.gov/maps/gulf-data-atlas/atlas.htm?plate=Marine%20Jurisdictions#:~:text=The%20State%20Seaward%20Boundary%20is,the%20Submerged%20Lands%20Act%20baseline. Last accessed 4/29/25

[37] https://www.ncei.noaa.gov/maps/gulf-data-atlas/atlas.htm?plate=Marine%20Jurisdictions#:~:text=The%20State%20Seaward%20Boundary%20is,the%20Submerged%20Lands%20Act%20baseline Last accessed 5/13/25.

Air permitting authority is delegated to TCEQ by the EPA beyond the state waters boundary. The extended delegation includes a portion of the Outer Continental Shelf (OCS), referred to as the "inner OCS," which extends to 25 nautical miles beyond the coast. An approximate mapping in Enverus was used to identify facilities and associated production in the inner OCS (exclusive of state waters) and is shown in Figure A2-2.

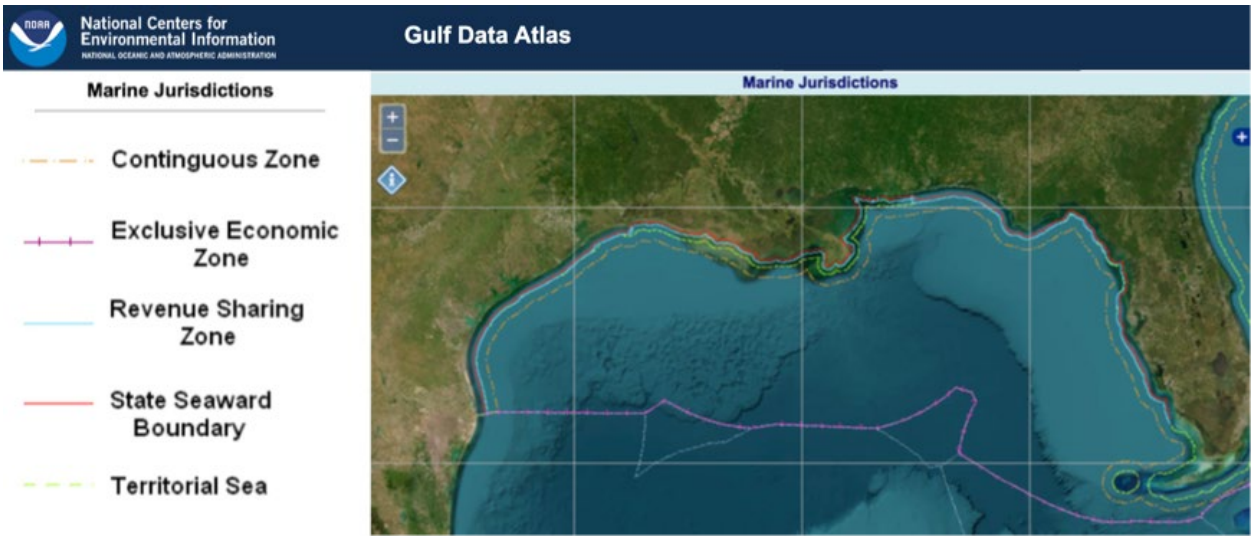

Figure A2-1. Illustration of marine jurisdictions mapped by the National Centers for Environmental Information in the National Oceanic and Atmospheric Administration.[38]

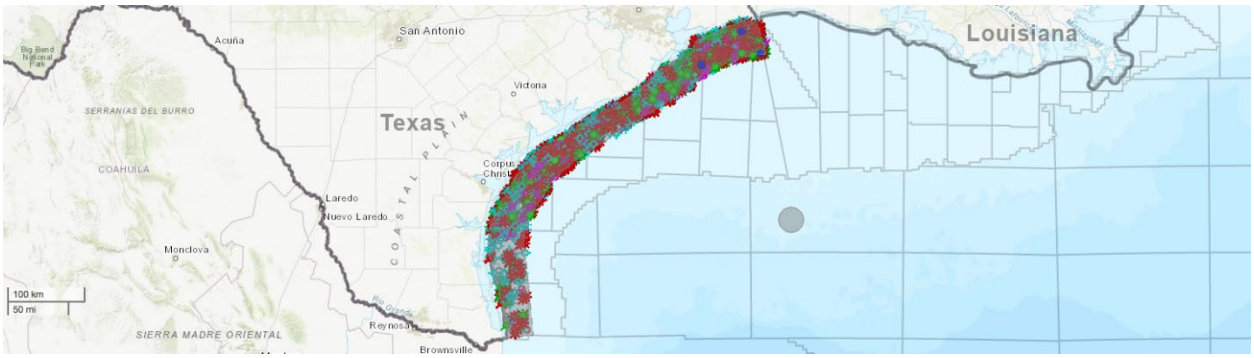

Figure A2-2. Approximate region of production in the inner OCS used to identify relevant facilities and production under state air permitting jurisdiction beyond state waters.

[38] Stein D. Marine Jurisdictions In Gulf of Mexico Data Atlas [Internet]. Stennis Space Center (MS): National Centers for Environmental Information; 2011. [1 screen]. Available from: https://gulfatlas.noaa.gov/.

The number of wells and production from both the RRC reports and Enverus filtered for 2022 is shown in Table A2-11, where wells were designated by the relevant source as either a gas well or an oil well. Emission factors from the GHGI are tabulated in Table A2-12 and applied to the aggregated production data to produce the emissions estimates summarized in Table A2-13.

Table A2-11. Offshore oil and gas wells and 2022 production data under Texas state jurisdiction.

	Total # Wells	Gas (Mcf)	Oil (bbl)	BOE (calc'd)
RRC Report Gas Wells	11	2,081,515	70,876	417,795
RRC Report Oil Wells	6	52,978	54,617	63,447
Enverus Gas Wells	96	206,933	3,311,200	758,800
Enverus Oil Wells	110	695,867	6,788,946	1,827,358
Total Gas Wells	107	2,288,448	3,382,076	1,176,595
Total Oil Wells	116	748,845	6,843,563	1,890,805
Total Wells (Gas + Oil)	223	3,037,293	10,225,639	3,067,400

Table A2-12. Production based emission factors for offshore oil and gas wells from the 2022 US EPA GHGI.

Offshore Well and Factor Type[1,2]	Unit	Emission Factor
Oil Wells: Offshore GOM State Waters Vent/Leak	kgCH_4/mbbl	18.9
Oil Wells: GOM State Waters - Flaring	kgCH_4/mbbl	0.0
Oil Wells: Offshore GOM State Waters Vent/Leak	kgCO_2/mbbl	4.2
Oil Wells: GOM State Waters - Flaring	kgCO_2/mbbl	780.7
Gas Wells: GOM State Waters Vent/Leak	kgCO2/MMcf	6.2
Gas Wells: GOM State Waters Flaring	kgCO2/MMcf	0.2
Gas Wells: GOM State Waters Vent/Leak	kgCH4/MMcf	207.6
Gas Wells: GOM State Waters Flaring	kgCH4/MMcf	0

[1] Oil Wells have 2020 Factors at latest (2022 ghgi petroleum systems annex35 tables)
[2] Wells have 2022 Factors at latest (2024 ghgi natural gas systems annex 36 tables)

Table A2-13. Well counts, total production and estimated emissions for offshore oil and gas production facilities under TX state authority.

	Wells	Production (McF - Gas, Bbl - Oil)	CH4 Emissions (MT)	CO2 Emissions (MT)	CO2e (MT)
Gas Wells	107	2,288,448	475	15	11,891.62
Oil Wells	116	6,843,563	129	5,371	8,604.93
Totals	**--**	**--**	**604**	**5,386**	**20,497**

Midstream

Two hundred and one facilities report emissions to the GHGRP in the **Gas Processing** subsector. These facilities and their emissions reported are listed in **Table A2-14.** Emissions are the sum of reporting under Subpart W and Subpart C of the GHGRP. Subpart C reporting is dominated by CO_2 emissions from fuel usage, while the CO_2 reported through Subpart W is almost exclusively due to flaring and acid gas removal. The GHGRP will be used as the base case reporting for this inventory.

The completeness of this reporting was assessed by examining reporting of data on gas plants to the RRC. As a first step, the number gas processing facilities was tabulated and compared to the GHGRP. The number of facilities reporting to the RRC totaled 395, with 305 plants presumed to be active plants in 2022 based on a first reporting date before 2023, a last reporting date after 2022, and any closure reports after 2022. This suggests that there may be an under-reporting of facilities in the GHGRP. These may be due to multiple causes, including facilities being below the reporting threshold for the GHGRP.

To assess magnitudes of potential under-reporting of emissions in the GHGRP for gas processing, throughput data from the RCC was combined with a throughput normalized emission factor for methane, developed based on measurements at 16 gas processing plants in the United States by Mitchell, et al. (Mitchell, 2015). The RRC reports a total of 769 billion cubic feet of gas throughput in various types of gas processing plants in December 2022 (Texas Railroad Commission, 2022). Multiplying this by the throughput normalized median emission rate for methane at gas processing facilities (0.079% of throughput) and assuming that the gas is 80% by volume methane and normalizing to an annual rate, leads to an estimate of 5.7 billion cubic feet of methane emissions, equivalent to ~110,000 metric tons of methane. The GHGRP reported emissions (**Table A2-14**) are 57,000 metric tons of methane (1.4 million tons CO_2e).

There could be multiple reasons for this discrepancy. The average national facility level emission factor could be inaccurate. Mitchell et al. (2015) report a median emission factor of 0.079%, but a range of 0.012% to 0.62% (a maximum to minimum ratio of 50). The facilities may report in other GHGRP sectors. For example, more than half of the gas processing throughput is to facilities that the RRC labels as Gasoline Plants, and some of these facilities may report, and be counted in this inventory through the refining sector (see Table A3-1, which lists two Condensate Splitters in the refinery inventory). Because the causes of these discrepancies cannot be fully resolved, the GHGRP is used as the base case reporting for this inventory, but the uncertainty in the emission estimate is at least 5-10% based on potential under-reporting of methane emissions and may be much larger.

Table A2-14. Gas Processing facilities reporting to the GHGRP and included in this inventory

Facility ID	Facility Name	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	Notes
1001132	BLOCK 31 GAS PLANT	85,097.10	671.81	0.15	
1001638	Midkiff Gas Plant	189,867.08	368.19	0.28	
1001806	SEMINOLE GAS PROCESSING PLANT	453,403.00	27.46	0.79	
1002029	WILCOX GAS PLANT	140,768.30	57.87	0.20	
1002066	GIDDINGS GAS PLANT	137,123.40	119.74	0.17	
1002169	Brookeland Gas Plant	84,861.70	72.79	0.07	
1002195	Sneed Booster Station	24,735.90	12.81	0.05	
1002256	MARKHAM GAS PROCESSING PLANT	97,719.00	287.44	0.16	
1002298	Bethel Gas Treating Facility	46,802.70	160.71	0.07	
1002325	BENEDUM GAS PLANT	454,741.00	1,934.91	0.84	
1002326	EAST VEALMOOR GAS PLANT	146,456.80	467.31	0.27	
1002334	Jameson Gas Plant	136,579.10	405.15	0.27	
1002378	SOUTHWEST OZONA GAS PLANT	43,655.30	77.86	0.08	
1002422	OZONA GAS PLANT	67,773.70	104.38	0.11	
1002451	Mallet CO2 Recovery Plant	66,240.70	19.94	0.10	
1002454	SALT CREEK FIELD GAS PLANT	83,829.10	14.23	0.11	
1002521	King Ranch Gas Plant	249,047.20	985.32	0.47	
1002528	FAIN GAS PLANT	77,813.60	213.27	0.13	
1002623	Copano Energy Houston Central Plant, TX	368,325.60	309.47	0.59	
1002625	SLAUGHTER GASOLINE PLANT	65,296.20	48.10	0.12	
1002629	WASSON CO2 REMOVAL PLANT	138,153.60	16.28	0.25	
1002630	WILLARD CO2 SEPARATION PLANT	38,479.60	12.04	0.05	
1002668	PEGASUS GAS PLANT	54,660.10	28.81	0.08	
1002676	Hawkins Gas Plant	96,949.80	124.90	0.12	
1002678	SACROC CO2 TREATMENT	454,103.10	137.69	0.76	

Facility ID	Facility Name	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	Notes
1002680	SNYDER GAS PLANT	59,799.40	7.57	0.11	
1002868	NORTH CROSS COMP STATION 4	32,835.20	107.67	0.06	
1002952	HOBART PLANT	41,626.10	31.09	0.37	
1003082	AVINGER GAS PLANT	33,808.20	180.39	0.09	
1003083	JACKALOPE TREATER	45,231.20	8.13	0.03	
1003097	TRINIDAD GAS PROCESSING PLANT	31,105.20	523.40	0.05	
1003127	GODLEY PLANT	67,490.90	2,945.02	0.12	
1003128	Terrell Gas Plant	49,124.60	2,051.63	0.07	
1003129	AKER PLANT	38,595.60	11.18	0.07	
1003170	Silver Creek Processing Plant	70,112.70	17.73	0.11	
1003220	Hemphill Gas Plant	24,135.60	46.74	0.05	
1003221	Sunray Gas Plant	71,348.20	74.15	0.12	
1003316	HIDETOWN PLANT	0.10	6.57	-	
1003317	WEATHERFORD PLANT	50,495.90	110.48	0.10	
1003318	ZYBACH CRYOGENIC PLANT	23,567.80	73.12	0.04	
1003346	Sterling Gas Plant	39,529.01	179.25	0.07	
1003347	Mertzon Gas Plant	30,809.16	91.85	0.06	
1003441	WORSHAM STEED GAS STORAGE, LLC	39,852.20	97.23	0.08	
1003530	POINT COMFORT GAS PLANT	-	0.90	-	
1003764	Chico Gas Plant	182,643.66	62.41	0.23	
1003767	Sand Hills Gas Plant	127,370.26	898.60	0.24	
1004087	Armstrong Gas Plant	32,350.90	1,521.66	0.06	Edited this one manually because there is reporting from multiple segments into both subpart W, so disaggregated from detailed report for only gas processing emissions
1004137	BKV Midstream - Cotton Cove	30,803.20	267.42	0.06	https://ghgdata.epa.gov/ghgp/service/html/2022?id=1004087&et=undefined

Facility ID	Facility Name	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	Notes
1004144	XTO - New Teague Plant	48,994.90	174.19	0.03	
1004248	Gomez Gas Plant	28,010.70	33.45	0.04	
1004269	Spearman Gas Processing Plant	34,305.00	308.40	0.06	
1004301	Century Gas Plant	5,974.20	158.61	0.01	
1004382	Carthage	81,496.70	257.27	0.15	
1004389	Javelina	83,209.50	34.51	0.07	
1004614	Mont Belvieu Fractionator	1,017,121.51	25.76	1.89	
1004619	Shilling Gas Plant	185,869.70	247.51	0.18	
1004666	San Martin Gas Plant	36,076.30	1,411.66	0.07	
1004704	Thompsonville Gas Plant	90,305.60	23.54	0.17	
1004970	JAY BUSINESS UNIT-St. Regis Gas Treating Facility-BASIN 210	141,827.90	381.23	0.33	
1005002	SHOUP GAS PROCESSING AND FRACTIONATION PLANT	176,752.60	1,461.86	0.33	
1005045	MBI NGLP Mont Belvieu Plant	225,715.90	7.27	0.43	
1005084	Sonora Gas Plant	15,690.60	140.04	0.03	
1005181	Keystone Gas Plant	67,888.40	1,265.78	0.11	
1005215	Mivida Treater Plant	94,814.50	1,839.91	0.17	
1005391	XTO - Farrar Plant	34,643.30	2.07	0.03	
1005431	KRIPPLE KREEK GAS PLANT	119,384.30	166.18	0.11	
1005691	Waha Gas Plant	71,423.20	80.02	0.13	
1005739	SHERHAN GAS PLANT	46,916.50	66.97	0.08	
1005818	COWTOWN GAS PROCESSING PLANT	94,616.20	122.68	0.17	
1005858	DENVER UNIT CO 2 RECOVERY PLANT	107,684.90	2,837.23	0.15	
1005887	ALLIANCE COMPRESSOR STATION	46,822.10	86.64	0.02	
1006087	Longview Gas Plant	73,717.70	457.81	0.14	
1006225	Tilden Gas Plant	90,383.00	60.64	0.11	

Facility ID	Facility Name	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	Notes
1006255	LAGRANGE PLANT	150,611.50	671.51	0.18	
1006321	HENDERSON GAS PLANT	79,071.90	496.46	0.09	
1006342	INDIAN SPRINGS GAS PLANT	55,355.20	177.91	0.06	
1006373	BRIDGEPORT GAS PROCESSING PLANT	487,496.50	127.47	0.58	
1006386	Mont Belvieu Complex	2,537,966.30	244.55	5.20	
1006392	JEB Gas Plant	229,682.61	414.36	0.19	
1006407	EAST TEXAS GAS PLANT	128,218.70	185.77	0.21	
1006709	GORDON GAS PROCESSING PLANT	11,749.10	173.51	0.02	
1006795	LONGVIEW GAS PLANT	52,643.90	278.38	0.09	
1006799	Rock Creek Gas Plant	138,385.70	111.99	0.26	
1006800	GOLDSMITH GAS PLANT	278,514.70	51.25	0.46	
1007104	Coyanosa Gas Plant	12,701.10	5.37	0.01	
1007399	Waskom Gas Processing Plant	39,300.00	116.59	0.07	
1007496	ALLISON GAS PLANT	30,972.30	45.92	0.06	
1007537	Halley Plant / Compressor Station	56,043.70	143.86	0.11	
1007714	Chapel Hill Gas Plan	9,492.50	133.62	0.02	
1007779	Tippett Gas Plant	28,566.00	38.09	0.05	
1008217	Roberts Ranch Gas Plant	42,352.80	60.73	0.06	
1008412	Dilley Treating Facility	38,210.60	5.18	0.07	
1008595	TGG SHELBY ASSETS, LLC - SHELBY #3 FACILITY	75,224.60	13.07	0.03	
1008677	Area 51 CGP Facility	60,538.80	94.10	0.09	
1008680	Area 71 CGP Facility	30,647.70	43.21	0.04	
1008681	Area 72 CGP Facility	67,591.10	123.83	0.11	
1009054	Dollarhide Gas Plant	81,518.80	83.54	0.10	
1009093	Yoakum Cryogenic Plant	690,132.20	142.32	0.75	
1009520	Hobbs Fractionation Facility	45,731.70	5.45	0.09	

Facility ID	Facility Name	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	Notes
1010118	Eagle-1 Gas Plant	90,420.30	100.59	0.13	
1010120	Brasada Gas Plant	64,000.80	192.07	0.06	
1010223	Goliad Gas Plant	139,348.90	31.43	0.17	
1010251	Carthage East Gas Plant	4,921.40	11.18	0.01	
1010312	PANOLA COUNTY GAS PLANT	64.70	225.23	-	
1010313	PANOLA II GAS PLANT	55,265.50	187.94	0.07	
1010351	Rawhide Gas Plant	61,858.90	95.37	0.11	
1010353	APPLEBY TREATER	33,259.50	206.28	0.02	
1010358	Tenaha Plant	38,900.20	295.38	0.06	
1010475	AJAX PLANT	35,231.70	48.70	0.07	
1010592	Zider	13,028.80	3.75	0.01	
1010598	Shelby	100,112.40	12.32	0.07	
1010634	Deadwood Cryo Plant	42,538.80	27.57	0.08	
1010691	Red Bluff Processing Plant	76,610.90	457.18	0.13	
1010714	EOG Resources, Inc- Milton Hub	33,984.30	11.82	0.06	
1010732	CHISHOLM PLANT	44,141.10	11.59	0.07	
1010735	LAS TIENDAS PLANT	99,222.20	568.04	0.10	
1010746	EOG Resources, Inc- T.R. Marshall Hub	40,317.10	10.93	0.08	
1010750	Cliffside Crude Helium Enrichment Unit	5,731.70	1,042.04	0.00	
1010768	Ramsey Gas Plant	259,573.70	625.67	0.42	
1010780	Driver/Johnson Gas Plant	155,039.66	884.83	0.19	
1010917	OHL NGLP Mont Belvieu NGL Fractionation and Storage Complex	341,106.90	7.79	0.64	
1010999	Mills Ranch Compressor Station	23,321.70	222.15	0.04	
1011000	Wheeler Gas Plant	16,143.60	84.14	0.03	
1011011	Jackson County Gas Plant	278,029.80	92.22	0.22	

Facility ID	Facility Name	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	Notes
1011012	Kenedy Gas Plant	145,748.30	872.16	0.23	
1011018	Mont Belvieu Fractionators	257,314.50	114.15	0.59	
1011129	Silver Oak Gas Plant	83,456.89	370.63	0.13	
1011210	EOG Resources, Inc. Shiner Hub	32,635.70	14.55	0.06	
1011285	Ridge Amine Plant	23,511.90	15.91	0.02	
1011311	Bones Springs Plant	25,226.40	36.40	0.05	
1011365	Rebel Gas Plant	145,041.10	340.55	0.25	
1011510	High Plains/Hopson Gas Plant	109,141.47	412.08	0.15	
1011558	Pembrook Gas Plant	237,315.36	391.12	0.32	
1011670	Silver Plant	72,334.30	69.25	0.12	
1011722	MidMar East Gas Plant	40,867.20	162.23	0.07	
1011745	EOG Resources, Inc. Smiley Hub	35,240.10	13.59	0.07	
1011870	Reveille Gas Plant	49,501.40	522.22	0.09	
1011930	Pecos Gas Processing Plant	127,639.00	361.72	0.24	
1011931	James Lake Gas Plant	82,812.30	98.25	0.12	
1011949	KDB Central Treating Facility Plant	58,644.90	519.29	0.06	
1011988	EOG Resources, Inc. Lyssy Hub	25,160.80	16.28	0.05	
1011989	EOG Resources, Inc. Titan Hub	52,060.60	18.83	0.10	
1012062	BECKVILLE GAS PROCESSING PLANT	80,561.20	258.23	0.06	
1012131	Lone Star NGL Fracs 4 & 5	187,216.70	88.81	0.42	
1012161	Hidalgo Cryogenic Gas Plant	85,826.30	151.36	0.16	
1012435	Robstown Fractionator	48,169.10	1.12	0.09	
1012465	Buffalo Gas Plant	87,556.08	549.50	0.14	
1012469	Phillips 66 Old Ocean NGL Fractionation Plant	350,322.90	120.03	11.34	
1012519	Delaware Basin Gas Plant	37,508.20	106.43	0.07	
1012675	East Toyah Gas Processing Plant	123,148.20	151.40	0.23	

Facility ID	Facility Name	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	Notes
1012781	Lobo Processing Plant	300,352.10	854.35	0.04	
1012788	Bearkat Cryogenic Plant	37,490.30	25.03	0.05	
1012809	Riptide Gas Plant	108,622.70	159.47	0.09	
1012815	Alamo Gas Plant	102,480.10	52.96	0.10	
1012845	Loving Gas Plant	11,202.76	36.52	0.02	
1012846	Raptor Gas Plant	211.29	23.24	0.00	
1012901	Panther Gas Plant	162,398.20	617.02	0.21	
1012906	Arrowhead Gas Plant	104,021.00	1,318.66	0.17	
1012983	Brazos Midstream - Comanche Plant	129,969.20	88.58	0.19	
1012986	Area 71B CGP Facility	46,916.20	52.04	0.07	
1013052	Newberry Gas Plant	193,203.50	568.41	0.30	
1013079	Pecos Bend Gas Processing Plant	161,824.70	232.02	0.30	
1013183	Wildcat Gas Plant	59,798.45	304.34	0.11	
1013185	Oahu Gas Plant	30,564.66	52.37	0.03	
1013266	Caymus Plant	102,028.70	44.96	0.18	
1013350	Delaware Basin Gas Processing Plant	23,337.90	164.22	0.04	
1013396	Nacogdoches Amine and Dehydration Plant	166,815.60	294.17	0.15	
1013400	Orla Gas Plant	555,054.60	306.37	0.73	
1013511	Falcon Gas Plant	30,129.95	18.80	0.04	
1013544	Diamond Cryo	225,753.20	131.03	0.28	
1013558	Mentone Gas Plant	69,707.90	288.79	0.10	
1013609	Campo Viejo Gas Processing Plant	188,146.10	16.09	0.22	
1013662	Taylor Gas Plant	198,888.60	475.11	0.27	
1013701	30-30 Gas Plant	40,742.70	6.22	0.05	
1013724	SCM Pecos Gas Processing Plant	238,232.30	318.06	0.27	
1013727	Lone Star Frac 6 & 8	504,502.80	302.95	0.80	

Facility ID	Facility Name	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	Notes
1013753	Freeport LNG Pretreatment Facility	235,934.60	108.61	0.43	
1013786	Peregrine Gas Plant	37,970.25	39.34	0.07	
1013787	Gateway/Heim Gas Plant	163,417.72	1,158.30	0.16	
1013788	Sale Ranch Gas Plant	226,435.50	1,171.21	0.46	
1013789	Martin County Gas Plant	322,519.00	1,462.73	0.68	
1013814	Tornado Gas Plant	112,717.70	121.24	0.14	
1013867	St. Lawrence Gas Plant	167,985.50	505.75	0.29	
1013882	BTT EPIC Frac	116,078.60	3.44	0.22	
1013901	Horseshoe Treater	237,710.30	520.27	0.17	
1013903	Battle Horse Plant	111,262.10	65.88	0.12	
1013904	Big Lake Cryo Plant	39,175.60	17.55	0.07	
1013924	Bulldog Gas Plant (Panola III)	134,523.20	144.36	0.08	
1013929	Lone Star NGL Frac VII	147,110.80	2.76	0.27	
1013932	Mentone Gas Plant	199,026.60	112.42	0.13	
1013973	Trident Gas Plant	125,319.40	127.13	0.20	
1014107	Preakness Gas Plant	65,823.20	85.31	0.13	
1014335	Cardinal Delaware Basin - Pecos Gas Plant	38,622.60	72.95	0.07	
1014362	WHITE WING GAS PROCESSING PLANT	17,656.40	47.89	0.03	
1014368	County Line Processing Plant	111,356.70	532.53	0.21	
1014485	Legacy Gas Plant	32,183.48	34.77	0.05	
1014680	Anton CO2 Re-Injection Facility	16,825.30	61.17	0.01	
1014705	Tuco Gas Plant	51,332.90	77.12	0.05	
1014707	OMAHA CDP	75,733.80	182.29	0.07	
1014725	Angelina Gas Plant	101,205.50	99.60	0.07	
1014729	Tiger Plant	129,570.20	45.42	0.23	
1003219	GRAPELAND PLANT	88,517.80	1.67	0.17	Only report into subpart C

Facility ID	Facility Name	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	Notes
1007459	DINN TREATER	0.20	-	-	Only report into subpart C
1007430	NGPL Station 388 Storage, Longview, TX	2,433.84	555.30	0.00	Edited this one manually because there is reporting from multiple segments into both subpart W, so disaggregated from detailed report for only gas processing emissions
1003452	KMTP Station 581	12,091.15	81.74	0.02	Edited this one manually because there is reporting from multiple segments into both subpart W, so disaggregated from detailed report for only gas processing emissions
	Totals	**24,972,554**	**57,055**	**50**	

Most **inter- and intrastate transmission pipeline** capacity is included in the GHGRP. To account for unreported pipeline segments, missing pipeline systems were identified based on EIA data. Those pipeline blowdown emissions were scaled according to the most analogous systems within the inventory. Classification was based on system geometry—either complex/webbed or simple/straight configurations. This distinction was critical because GHGRP pipeline reporting only includes blowdown events, which can occur more frequently in complex systems due to the greater ease of isolating pipeline segments for maintenance without disrupting overall operations.

Similarly, the majority of **transmission compression** capacity is captured within the Greenhouse Gas Reporting Program (GHGRP). To estimate emissions from residual non-reporting sources, reported compressor stations were mapped to the pipeline systems they serve. For pipeline systems lacking reported compressor stations, subject matter experts with midstream infrastructure experience assessed the likelihood of missing stations based on engineering judgment. As a result, eight additional compressor stations were modeled using emissions and throughput assumptions equivalent to half the capacity of the Valley Crossing Brownsville Station, reflecting the smaller scale of the associated pipeline systems.

There were no **LNG import** or separate **LNG storage** facilities operating in Texas in 2022. According to FERC records on **LNG export facilities**, two facilities were operating in 2022.[39] Since both facilities were reported to the GHGRP, those emissions values have been included. The Freeport LNG facility had a material loss of containment event in 2022, so emissions were estimated and included based on documentation in the PHMSA investigation of the event.[40]

Table A2-15. Total annual emissions for LNG facilities in Texas in 2022.

GHGRP ID	Facility Name	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)
1006016	FREEPORT LNG IMPORT TERMINAL	91,426	444	0	102,585
1013179	Corpus Christi Liquefaction	3,058,189	675	6	3,076,773
PHMSA report	Freeport explosion	6.60625	2.40	0	67
	Total	**3,149,622**	**1,121**	**6**	**3,179,424**

Four facilities reported emissions spanning multiple segments, including four of the six **Underground Gas Storage Facilities**. As a result, total facility emissions reported under Subparts C and W included contributions from multiple operational segments. To maintain segment-level accuracy, emissions attributable to each segment were allocated to the appropriate segment rather than retained in the aggregated facility total.

While Subpart W data are reported with segment-level detail, in three of the four cases, the operator reported aggregated combustion emissions under Subpart C as a single "Other

[39] https://www.ferc.gov/media/us-lng-export-terminals-existing-approved-not-yet-built-and-proposed
[40] https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2022-11/IFO-Group-RCFA-Report-final-redacted.pdf

Combustion Source." In these instances, combustion emissions were apportioned to individual segments based on each segment's relative share of total Subpart W emissions on a CO_2e basis. This approach ensured consistent alignment between combustion and process-related emissions across segments.

Downstream

Six **Underground Gas Storage** facilities were reported to GHGRP of 36 total facilities in EIA data. Missing source emissions were imputed based on a ratio of the working gas capacity (Mcf) which is reported both in EIA data as well as in the GHGRP

Emissions from the **natural gas distribution sector** were estimated using service territory shapefiles for Local Distribution Companies (LDCs), cross-referenced with customer delivery data from EIA Form 176 and statewide consumption figures from EIA's Texas dataset. The analysis confirmed alignment between derived customer demand and reported EIA state-level consumption. Four LDCs covered and verified under the GHGRP accounted for approximately 83% of the total delivered volumes, indicating that the majority of distribution system emissions are captured within the reporting program. Methane emissions were assumed to correlate proportionally with LDC-delivered volumes, and estimates were derived using GHGRP methane reporting.

Appendix 3: Refinery Inventory

Table A3-1 compares the facilities that reported through the GHGRP as refineries with the facilities identified as refineries in TCEQ inventories. Of the 32 distinct facilities identified, 27 were matched. One facility reporting to the TCEQ as a refinery (Facility 28, Deer Park Chemical) is associated with the Deer Park Refinery (Facility 23) and is reported in this inventory as a chemical manufacturing facility. Four facilities (Facilities 29-32) reported to the GHGRP as a refinery, but do not appear as separate units in the TCEQ inventory. For example, the Galveston Bay Refinery and the Galveston Crude Processing Unit (GHGRP facilities 1005585 and 1014593) may be consolidated in the Galveston Bay Refinery reporting to the TCEQ ((GB0004L). The emissions from these facilities will be attributed to the refinery sector in this inventory but they contribute less than 0.7% of the emissions from this sector.

Table A3-1. Matching of refinery facilities reporting through the GHGRP and the TCEQ

	GHGRP Facility	id_ghgrp	TCEQ Facility	id_tceq
1	VALERO CORPUS CHRISTI REFINERY	1008110	CORPUS CHRISTI WEST PLANT	NE0112G
2	Marathon El Paso Refinery	1003564	MARATHON EL PASO REFINERY	EE0015H
3	HOUSTON REFINING	1004130	HOUSTON REFINING	HG0048L
4	Galveston Bay Refinery	1005585	GALVESTON BAY REFINERY	GB0004L
5	PASADENA REFINING SYSTEM	1005903	PASADENA REFINING SYSTEM	HG0175D
6	VALERO REFINING HOUSTON REFINERY	1006062	HOUSTON REFINERY	HG0130C
7	Delek Refining, Ltd	1006444	DELEK TYLER REFINERY	SK0022A
8	VALERO CORPUS CHRISTI REFINERY EAST PLANT	1006959	CORPUS CHRISTI REFINING EAST	NE0043A
9	BIG SPRING REFINERY	1006961	BIG SPRING REFINERY	HT0011Q
10	Exxonmobil Beaumont Refinery	1007959	BEAUMONT REFINERY	JE0067I
11	CITGO CORPUS CHRISTI REFINERY EAST PLANT	1007965	EAST PLANT REFINERY	NE0027V
12	Buckeye Texas Processing LLC	1011920	CORPUS CHRISTI FACILITY	NEA029C
13	DIAMOND SHAMROCK REFINING VALERO	1008310	VALERO THREE RIVERS REFINERY	LK0009T
14	VALERO REFINING TEXAS CITY REFINERY	1008938	TEXAS CITY REFINERY	GB0073P
15	Nixon Refinery	1010605	NIXON REFINERY	WLA003C
16	PREMCOR REFINING GROUP INCORPORATED PORT ARTHUR REFINERY	1002657	VALERO PORT ARTHUR REFINERY	JE0042B
17	TotalEnergies Petrochemicals & Refining USA, Inc. - Port Arthur Refinery	1005743	PORT ARTHUR REFINERY	JE0005H
18	SWEENY REFINERY	1005992	SWEENY REFINERY PETROCHEM	BL0042G
19	BORGER REFINERY	1006301	BORGER REFINERY	HW0018P
20	EXXONMOBIL Bt Site	1007542	BAYTOWN REFINERY	HG0232Q
21	FLINT HILLS RESOURCES CORPUS CHRISTI WEST PLANT	1009066	WEST REFINERY	NE0122D
22	FLINT HILLS RESOURCES CORPUS CHRISTI EAST PLANT	1009067	EAST REFINERY	NE0120H
23	Deer Park Refining Limited Partnership	1014559	DEER PARK OIL REFINERY	HGA226S
24	CITGO CORPUS CHRISTI REFINERY - WEST PLANT	1002970	WEST PLANT FACILITY	NE0192F
25	Diamond Shamrock Refining Company, L.P.	1007936	VALERO MCKEE REFINERY	MR0008T
26	The San Antonio Refinery, LLC	1005803	PETROLEUM REFINERY	BG0103P
27	MOTIVA ENTERPRISES LLC	1007458	PORT ARTHUR REFINERY	JE0095D
28			DEER PARK CHEMICALS	HG0659W
29	GP Condensate Splitter	1011719		
30	Corpus Christi Terminal Condensate Splitter	1012506		
31	Hartree Channelview Facility	1013186		
32	Galveston Crude Processing Unit	1014593		

Appendix 4: Chemicals Manufacturing

Sectors with one facility reporting to the GHGRP

Four sub-sectors (Apdipic Acid Production, Ammonia Production, Fluorinated Chemicals Production, and Nitric Acid Production) had only one facility reporting emissions in Texas. Those emissions are listed in **Table A4-1**. The Adipic Acid facility reported both Adipic Acid and Nitric Acid production, but is listed in the Adipic Acid source category.

Hydrogen Production

Hydrogen production is often, but not exclusively, associated with petroleum refining. Some refineries generate their own hydrogen. Others have an industrial partner that manufactures and sells hydrogen on site. Similarly, some plants producing a variety of industrial gases, including hydrogen. Some refining facilities may report hydrogen production separately, such as the Borger refinery, which reports to the GHGRP both as a refinery and under hydrogen production. Other facilities may integrate their hydrogen production emissions with other reporting, rather than reporting hydrogen production emissions separately, such as the Clear Lake Plant (GHGRP facility 1006867), which reports zero emissions for hydrogen production. These types of differences in reporting influence whether the emissions associated with hydrogen production are included in the hydrogen production sub-sector or another reporting category. **Tables A4-2 and A4-3** report the facilities that are categorized as Hydrogen production in the GHGRP and in this inventory.

Petrochemical Manufacturing

Emissions reported through the GHGRP as Petrochemical Manufacturing are a complex mix of facility types. Some facilities report through this single sub-sector. Others, particularly but not exclusively integrated refining and petrochemical manufacturing, report in multiple categories for separate parts of their facilities in different sub-categories. To minimize the potential for double counting of emissions, only the emissions reported to the GHGRP as Petrochemical Facility emissions are included in this category. **Tables A4-4 and A4-5** report the facilities that are categorized as Petrochemical manufacturing in the GHGRP and in this inventory.

Other Chemical Manufacturing

Emissions reported through the GHGRP as Other chemical manufacturing are a complex mix of facility types. Some facilities report through this single sub-sector. Others, particularly but not exclusively industrial gas manufacturing, report in multiple categories for separate parts of their facilities in different sub-categories. To minimize the potential for double counting of emissions, only the emissions reported to the GHGRP as Other chemical manufacturing emissions are

included in this category. **Tables A4-6 and A4-7** report the facilities that are categorized as Other chemical manufacturing in the GHGRP and in this inventory.

Table A4-1. Apdipic Acid Production, Ammonia Production, Fluorinated Chemicals Production, and Nitric Acid Production emissions reported in Texas (one facility in each category)

Subsector (number of facilities reporting to GHGRP)	**CO_2 (MT)**	**CH_4 (MT CO_2e)**	**N_2O (MT CO_2e)**	**Otherl (MT CO_2e)**	**HFC (MT CO_2e)**	***Total GHG* (MT CO_2e)**	**County**
Adipic Acid Production and Nitric Acid (1)	630,071.3	297.25	1,098,362	0	0	1,728,731	VICTORIA
Ammonia Manufacturing (1)	1,026,152	235	280	0	0	1,026,667	HUTCHISON
Fluorinated GHG Production (1)*	11,359	5	6	406	55,772	67,554	SAN PATRICIO
Nitric Acid Production (1)	0	0	115,955	0	0	115,955	CHAMBERS

*No matching facility found in TCEQ dataset

Table A4-2. Comparison of Hydrogen manufacturing facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under SIC Code 2813 (Industrial gases)

TCEQ Identifier	Names in TCEQ Inventory	SIC[1]	GHGRP Identifier	Name in GHGRP Inventory	County
NE0412O	AIR LIQUIDE LARGE INDUSTRIES US LP HYDROGEN PLANT INDUST GAS	2813	1003724	AIR LIQUIDE - CORPUS CHRISTI SMR	NUECES
BL0626U	AIR LIQUIDE LARGE INDUSTRIES US LP FREEPORT HYCO PLANT	2813	1003730	AIR LIQUIDE - FREEPORT HYCO PLANT	BRAZORIA
HH0253U	AIR LIQUIDE AMERICA LP LONGVIEW POX ASU PLT	2813	1003910	AIR LIQUIDE AMERICA CORP	HARRISON
HG0071Q	AIR LIQUIDE AMERICA CORPORATION BAYPORT COMPL	2813	1006711	Air Liquide Large Industries US - SMR	HARRIS
CIA031E	AIR PRODUCTS LLC BAYTOWN 3 FACILITY	2813	1013205	Air Products Baytown 3 Facility	CHAMBERS
			1004442	Air Products LLC - Corpus Christi	NUECES
HG0011L	AIR PRODUCTS LLC PASADENA FACILITY	2813	1006943	Air Products LLC - Pasadena SMR	HARRIS
JE0824J	AIR PRODUCTS LLC PORT ARTHUR FACILITY	2813	1006402	Air Products Port Arthur Facility	JEFFERSON
			1006301	BORGER REFINERY	HUTCHINSON
HG1169O	LINDE INC CLEAR LAKE PLANT	2813	1006867	CLEAR LAKE PLANT	HARRIS
			1007936	Diamond Shamrock Refining Company, L.P.	MOORE
GB0325L	LINDE INC TEXAS CITY HYDROGEN PLANT	2813	1006562	LINDE TEXAS CITY	GALVESTON
HGA120P	AIR LIQUIDE LARGE INDUSTRIES US LP LA PORTE SMR	2813	1010702	La Porte Steam Methane Reformer	HARRIS
			1013977	Linde Clear Lake HyCO Plant	HARRIS
JEA025Y	LINDE INC PORT ARTHUR PLANT	2813	1011080	Linde Facility 0379	JEFFERSON
JEA003C	LINDE INC PRAXAIR PORT ARTHUR HYDROGEN FACILITY	2813	1002023	Linde Facility 0497	JEFFERSON
GBA005E	LINDE INC TEXAS CITY HYDROGEN COMPLEX	2813	1000043	Linde Inc Texas City Hydrogen Complex	GALVESTON
BLA070S	LINDE INC SWEENY HYDROGEN PRODUCTION PLANT	2813	1014343	Linde- Sweeny Hydrogen Plant	BRAZORIA
			1003564	Marathon El Paso Refinery	EL PASO
			1011834	Olin Blue Cube, Freeport, TX	BRAZORIA
			1008110	VALERO CORPUS CHRISTI REFINERY	NUECES
			1006959	VALERO CORPUS CHRISTI REFINERY EAST PLANT	NUECES

[1]Air separation and certain other types of gas production facilities reporting to the TCEQ through SIC 2813 are not included in this sub-sector comparison

Table A4-3. Hydrogen Production facilities included in this inventory

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1003724	AIR LIQUIDE - CORPUS CHRISTI SMR	317,571.4			317,571.4	NUECES
1003730	AIR LIQUIDE - FREEPORT HYCO PLANT	197,147			197,147	BRAZORIA
1003910	AIR LIQUIDE AMERICA CORP	484,975.4			484,975.4	HARRISON
1006711	Air Liquide Large Industries US – SMR	483,850			483,850	HARRIS
1013205	Air Products Baytown 3 Facility	924,549.2			924,549.2	CHAMBERS
1004442	Air Products LLC - Corpus Christi	172,959.4			172,959.4	NUECES
1006943	Air Products LLC - Pasadena SMR	421,374.5			421,374.5	HARRIS
1006402	Air Products Port Arthur Facility	2,255,676.6	457.25	709.538	2,256,843	JEFFERSON
1006301	BORGER REFINERY	621,613.7			621,613.7	HUTCHINSON
1006867	CLEAR LAKE PLANT[1]	0			0	HARRIS
1007936	Diamond Shamrock Refining Company, L.P.	13,640.1			13,640.1	MOORE
1006562	LINDE TEXAS CITY	1,407,460.7			1,407,461	GALVESTON
1010702	La Porte Steam Methane Reformer	594,160.8			594,160.8	HARRIS
1013977	Linde Clear Lake HyCO Plant	689,219.8			689,219.8	HARRIS
1011080	Linde Facility 0379	1,076,405.7	29	34.568	1,076,469	JEFFERSON
1002023	Linde Facility 0497	687,539.8			687,539.8	JEFFERSON
1000043	Linde Inc Texas City Hydrogen Complex	257,490.7	8	9.536	257,508.2	GALVESTON
1014343	Linde- Sweeny Hydrogen Plant				0	BRAZORIA
1003564	Marathon El Paso Refinery	17,892.5			17,892.5	EL PASO
1011834	Olin Blue Cube, Freeport, TX[1]	1.2			1.2	BRAZORIA
1008110	VALERO CORPUS CHRISTI REFINERY	411,299.1			411,299.1	NUECES
1006959	VALERO CORPUS CHRISTI REFINERY EAST PLANT	327,324.9			327,324.9	NUECES
	State Total	**11,362,152.5**	**494.25**	**753.642**	**11363400**	

[1]Facility also listed under Petrochemicals; emissions from hydrogen production assumed integrated into Petrochemical reporting

Table A4-4. Comparison of Petrochemical manufacturing facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under multiple SIC Codes

TCEQ Identifier	Names in TCEQ Inventory	SIC	GHGRP Identifier	Name in GHGRP Inventory	County
BL0038U	ASCEND PERFORMANCE MATERIALS OPERATIONS LLC CHOCOLATE BAYOU PLANT	2869	1002190	ASCEND PERFORMANCE MATERIALS CHOCOLATE BAYOU FACILITY	BRAZORIA
JE0843F	BASF TOTAL PETROCHEMICALS LLC NAFTA REGION OLEFINS COMPLEX	2869	1006543	BASF TOTALEnergies PETROCHEMICALS LLC	JEFFERSON
JEA039L	BAYPORT POLYMERS LLC ETHANE CRACKER	2869	1014234	Bayport Polymers LLC Ethane Cracker	JEFFERSON
HT0027B	TOKAI CARBON CB LTD BIG SPRING BLACK PLANT	2895	1000604	Big Spring Carbon Black Plant	HOWARD
HW0017R	TOKAI CARBON CB LTD BORGER BLACK PLT	2895	1000605	Borger Carbon Black Plant	HUTCHINSON
HW0008S	ORION ENGINEERED CARBONS LLC BORGER CARBON BLACK PLANT	2895	1003533	Borger Carbon Black Plant	HUTCHINSON
HG0033B	EQUISTAR CHEMICALS LP CHANNELVIEW COMPLEX	2869	1002859	CHANNELVIEW COMPLEX	HARRIS
BL0758C	CHEVRON PHILLIPS CHEMICAL COMPANY LP SWEENY OLD OCEAN FACILITIES	2869	1006967	CHEVRON PHILLIPS - SWEENY COMPLEX	BRAZORIA
JE0508W	CHEVRON PHILLIPS CHEMICAL COMPANY LP PORT ARTHUR PLANT	2869	1002146	CHEVRON PHILLIPS CHEMICAL COMPANY, LP PORT ARTHUR PLANT	JEFFERSON
HG0126Q	CELANESE LTD CLEAR LAKE PLANT	2869	1006867	CLEAR LAKE PLANT	HARRIS
MR0003G	CONTINENTAL CARBON COMPANY SUNRAY PLANT	2895	1004071	CONTINENTAL CARBON Sunray Plant	MOORE
HG0310V	CHEVRON PHILLIPS CHEMICAL COMPANY LP CEDAR BAYOU PLANT	2869	1003991	Chevron Phillips Chemical Company LP Cedar Bayou Plant	HARRIS
BL0082R	THE DOW CHEMICAL COMPANY TEXAS OPERATIONS FREEPORT	2869	1002040	DOW TEXAS OPERATIONS FREEPORT	BRAZORIA
HG0770G	EQUISTAR CHEMICALS LP LA PORTE COMPLEX	2869	1002758	EQUISTAR CHEMICALS LAPORTE COMPLEX	HARRIS
HG1996R	EQUISTAR CHEMICALS LP BAYPORT EO PLANT	2869	1006656	EQUISTAR CHEMICALS LIMITED PARTNERSHIP BAYPORT PLANT	HARRIS
NE0051B	EQUISTAR CHEMICALS LP CORPUS CHRISTI PLANT	2869	1004880	EQUISTAR CORPUS CHRISTI PLANT	NUECES
HG0229F	EXXON MOBIL CORPORATION BAYTOWN CHEMICAL PLANT	2869	1007542	EXXONMOBIL Bt Site	HARRIS
HH0042M	EASTMAN CHEMICAL COMPANY TEXAS OPERATIONS	2869	1007438	Eastman Chemical - Texas Operations	Harrison
JE0062S	EXXONMOBIL OIL CORPORATION BEAUMONT CHEMICAL PLANT	2869	1007959	Exxonmobil Beaumont Refinery	Jefferson

TCEQ Identifier	Names in TCEQ Inventory	SIC	GHGRP Identifier	Name in GHGRP Inventory	County
CB0038Q	FORMOSA PLASTICS CORPORATION TEXAS POINT COMFORT PLANT	2821	1006691	FORMOSA POINT COMFORT PLANT	CALHOUN
CB0034B	INEOS NITRILES USA LLC GREEN LAKE PLANT	2869	1003899	GREEN LAKE PLANT	CALHOUN
SDA013M	GULF COAST GROWTH VENTURES LLC	2869	1014210	Gulf Coast Growth Ventures LLC	SAN PATRICIO
BL0002S	INEOS USA LLC CHOCOLATE BAYOU PLANT	2869	1004368	INEOS CHOCOLATE BAYOU PLANT	BRAZORIA
JE0052V	INDORAMA VENTURES OXIDES LLC PORT NECHES OPERATIONS	2869	1007909	Indorama Ventures Oxides LLC	JEFFERSON
BL0378Q	FREEPORT POWER LIMITED OYSTER CREEK COGENERATION UNIT 8	2869	1013816	MEGlobal Oyster Creek	BRAZORIA
JE0135Q	MOTIVA ENTERPRISES LLC PORT ARTHUR CHEMICALS	2869	1006891	Motiva Port Arthur Chemicals	JEFFERSON
JEA035H	NATGASOLINE LLC BEAUMONT GAS TO GASOLINE PLANT	2869	1013382	Natgasoline LLC	JEFFERSON
SD0092F	OCCIDENTAL CHEMICAL CORPORATION INGLESIDE PLANT	2869	1001705	OCCIDENTAL CHEMICAL CORPORATION INGLESIDE PLANT	SAN PATRICIO
JE0343H	OCI BEAUMONT LLC PLANT	2869	1010636	OCI Beaumont LLC	JEFFERSON
HG1939G	OXY VINYLS L P DEER PARK VCM PLANT	2869	1001711	OXY VINYLS LP - Deer Park VCM Facility	HARRIS
HG0193B	OXY VINYLS LP LA PORTE VCM PLANT	2869	1001713	OXY VINYLS LP - LA PORTE VCM PLANT	HARRIS
BLA044R	BLUE CUBE OPERATIONS LLC FREEPORT	2869	1011834	Olin Blue Cube, Freeport, TX	BRAZORIA
OC0020R	ORION ENGINEERED CARBONS LLC ORANGE CARBON BLACK PLANT	2895	1003781	Orange Carbon Black Plant	ORANGE
GH0047T	CABOT CORPORATION PAMPA DEVELOPMENT & MANUFACTURING CENTER	2895	1003134	PAMPA PLANT	GRAY
			1011907	Proman USA (Pampa) LLC	GRAY
OC0007J	THE DOW CHEMICAL COMPANY SABINE RIVER OPERATIONS	2869	1003382	SABINE RIVER OPERATIONS	ORANGE
HG0659W	SHELL CHEMICAL LP DEER PARK CHEMICALS1	2911	1007002	Shell Deer Park Chemical	HARRIS
CB0028T	UNION CARBIDE CORPORATION SEADRIFT PLANT	2869	1002967	UCC SEADRIFT OPERATIONS	CALHOUN

[1]Transferred from refining sector, see Appendix 3

Table A4-5. Petrochemical facilities included in this inventory

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1002190	ASCEND PERFORMANCE MATERIALS CHOCOLATE BAYOU FACILITY	531,417.8	123.25	149.914	531,691	BRAZORIA
1006543	BASF TOTALEnergies PETROCHEMICALS LLC	1,795,155.4	10392	11,551.97	1,817,099	JEFFERSON
1014234	Bayport Polymers LLC Ethane Cracker	791,787.1	59,773.75	1,425.334	852,986.2	JEFFERSON
1000604	Big Spring Carbon Black Plant	258,380	4.5	5.364	258,389.9	HOWARD
1000605	Borger Carbon Black Plant	258,380	22.25	26.522	258,428.8	HUTCHINSON
1003533	Borger Carbon Black Plant	204,725.9	25.5	30.396	204,781.8	HUTCHINSON
1002859	CHANNELVIEW COMPLEX	1,948,843.4	4,988.25	6,033.308	1,959,865	HARRIS
1006967	CHEVRON PHILLIPS - SWEENY COMPLEX	1,097,240.6	5,904.5	5,733.52	1,108,879	BRAZORIA
1002146	CHEVRON PHILLIPS CHEMICAL COMPANY, LP PORT ARTHUR PLANT	866,934.4	3,737.25	1,748.366	872,420	JEFFERSON
1006867	CLEAR LAKE PLANT	781,891.5	262	312.304	782,465.8	HARRIS
1004071	CONTINENTAL CARBON Sunray Plant	165,239	8.5	10.132	165,257.6	MOORE
1003991	Chevron Phillips Chemical Company LP Cedar Bayou Plant	2,063,457.5	14,996.25	8,652.132	2,087,106	HARRIS
1002040	DOW TEXAS OPERATIONS FREEPORT	4,382,001.9	3,285.25	2,855.436	4,388,143	BRAZORIA
1002758	EQUISTAR CHEMICALS LAPORTE COMPLEX	1,209,867	3,856.25	4,101.97	1,217,825	HARRIS
1006656	EQUISTAR CHEMICALS LIMITED PARTNERSHIP BAYPORT PLANT	26,916	7.5	8.94	26,932.44	HARRIS
1004880	EQUISTAR CORPUS CHRISTI PLANT	1140,241.2	8,526.75	4,749.822	1,153,518	NUECES
1007542	EXXONMOBIL Bt Site	47,261.6	4,128.5	140.954	51,531.05	HARRIS
1007438	Eastman Chemical - Texas Operations	887,603.8	9,418.25	2,540.152	899,562.2	Harrison
1007959	Exxonmobil Beaumont Refinery	56,603.8	4,271.25	168.668	61,043.72	Jefferson
1006691	FORMOSA POINT COMFORT PLANT	4,760,579.3	13,547.25	21,086.182	4,795,213	CALHOUN
1003899	GREEN LAKE PLANT	285,767.2	66	106.982	285,940.2	CALHOUN
1014210	Gulf Coast Growth Ventures LLC	1,580,435.2	6,028.75	7,601.086	1,594,065	SAN PATRICIO
1004368	INEOS CHOCOLATE BAYOU PLANT	2,481,771.9	8,935.5	6,970.518	2,497,678	BRAZORIA
1007909	Indorama Ventures Oxides LLC	1,403,716.9	4,764.5	4,113.592	1,412,595	JEFFERSON
1013816	MEGlobal Oyster Creek	197,203.6	40	47.68	197,291.3	BRAZORIA

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1006891	Motiva Port Arthur Chemicals	793,904.6	5,619.25	4,658.634	804,182.5	JEFFERSON
1013382	Natgasoline LLC	676,940.8	187	222.904	677,350.7	JEFFERSON
1001705	OCCIDENTAL CHEMICAL CORPORATION INGLESIDE PLANT	1,874,412.8	1,658.25	2,669.484	1,878,741	SAN PATRICIO
1010636	OCI Beaumont LLC	464,175.5	163.5	194.892	464,533.9	JEFFERSON
1001711	OXY VINYLS LP - Deer Park VCM Facility	91,394.6	37	44.104	91,475.7	HARRIS
1001713	OXY VINYLS LP - LA PORTE VCM PLANT	1,271,592.8	584.5	696.724	1,272,874	HARRIS
1011834	Olin Blue Cube, Freeport, TX	1,836,713.8	861.5	1,043	1,838,618	BRAZORIA
1003781	Orange Carbon Black Plant	188,919.1	5.75	6.854	188,931.7	ORANGE
1003134	PAMPA PLANT	135,831.9	10.25	12.218	135,854.4	GRAY
1011907	Proman USA (Pampa) LLC	63,633	20.5	24.436	63,677.94	GRAY
1003382	SABINE RIVER OPERATIONS	795,536.4	11,789.75	1,435.466	808,761.6	ORANGE
1007002	Shell Deer Park Chemical	823,641	6,865.25	2,741.6	833,247.9	HARRIS
1002967	UCC SEADRIFT OPERATIONS	664,488.9	222	264.624	664,975.5	CALHOUN
	State Total	**38,904,607.2**	**195,138.3**	**104,186.2**	**39,203,932**	

Table A4-6. Comparison of Other chemical manufacturing facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under multiple SIC Codes

TCEQ Identifier	Names in TCEQ Inventory	SIC	GHGRP Identifier	Name in GHGRP Inventory	County
JE0351I	AIR LIQUIDE LARGE INDUSTRIES US LP PORT NECHES ASU COGEN PLANT	2813	1003780	AIR LIQUIDE - PORT NECHES ASU COGENERATION PLANT	JEFFERSON
HX1546N	AIR PRODUCTS LLC BAYTOWN II PLANT	2813	1002430	AIR PRODUCTS BAYTOWN PLANT	HARRIS
HG0225N	ALBEMARLE CORPORATION CORP	2869	1003402	ALBEMARLE CORPORATION HOUSTON PLANT	HARRIS
HX1772C	AMERICAN ACRYL LP PASADENA	2869	1004732	AMERICAN ACRYL PASADENA	HARRIS
JE0074L	ARKEMA INC BEAUMONT PLANT	2869	1006644	ARKEMA BEAUMONT PLANT	JEFFERSON
HGA005E	ARKEMA INC CLEAR LAKE	2869	1006797	ARKEMA INC CLEAR LAKE	HARRIS
HG0010N	AIR PRODUCTS LLC LA PORTE FACILITY	2813	1003160	Air Products La Porte Facility	HARRIS
TA0009B	ALCON VISION LLC FORT WORTH	2834	1003448	Alcon Vision, LLC	TARRANT
JE0113D	BASF CORPORATION BEAUMONT AGRO PLANT	2879	1005850	BASF BEAUMONT AGRO PLANT	JEFFERSON
HG1249P	BASF CORPORATION PASADENA PLANT	2869	1002613	BASF CORP - PASADENA PLANT	HARRIS
BL0021O	BASF CORPORATION FREEPORT SITE	2869	1001934	BASF FREEPORT SITE	BRAZORIA
			1000346	Bayou Cogeneration Plant	Harris
HG0199M	DIXIE CHEMICAL COMPANY INC BAYPORT FACILITY	2869	1005947	Dixie Chemical Company	HARRIS
HG0696Q	ECO SERVICES OPERATIONS CORP BAYTOWN PLANT	2819	1000044	Eco-Services BAYTOWN PLANT	HARRIS
HG0697O	ECO SERVICES OPERATIONS CORP HOUSTON PLANT	2819	1000042	Eco-Services HOUSTON PLANT	HARRIS
HG0288M	GOODYEAR TIRE & RUBBER COMPANY BAYPORT CHEMICAL PLANT	2869	1002991	GOODYEAR TIRE & RUBBER CO BAYPORT CHEMICAL PLANT	HARRIS
MQ0012Q	HUNTSMAN PETROCHEMICAL LLC CONROE FACILITY	2869	1002993	HUNTSMAN PETROCHEMICAL LLC	MONTGOMERY
GB0060B	EASTMAN CHEMICAL COMPANY TEXAS CITY OPERATONS	2869	1004957	INEOS Acetyls Chemicals Texas City Inc	GALVESTON
HG0276T	INEOS AMERICAS LLC PASADENA PLANT	2865	1003186	INEOS Americas, LLC	HARRIS
GBA007G	INEOS STYROLUTION AMERICA LLC TEXAS CITY PLANT	2869	1003429	INEOS NOVA LLC Texas City Site	GALVESTON
GB0001R	INEOS US CHEMICALS COMPANY TEXAS CITY CHEMICAL PLANT	2869	1010447	INEOS US Chemicals Company	GALVESTON

TCEQ Identifier	Names in TCEQ Inventory	SIC	GHGRP Identifier	Name in GHGRP Inventory	County
HG0035U	INV PROPYLENE LLC HOUSTON CHEMICAL	2869	1006275	INV Propylene, LLC	HARRIS
OCA002B	INV NYLON CHEMICALS AMERICAS LLC ORANGE SITE	2869	1002212	INVISTA ORANGE SITE	ORANGE
GB0028U	ISP TECHNOLOGIES INC TEXAS CITY	2869	1000022	ISP TECHNOLOGIES TEXAS CITY PLANT	GALVESTON
BLA042P	INDORAMA VENTURES OXIDES LLC LAB CHOCOLATE BAYOU PLANT	2819	1010589	Indorama Ventures Oxides LLC	BRAZORIA
HGA010J	ALBEMARLE CORPORATION BAYPORT PLANT	2819	1003570	Ketjen Bayport Plant	HARRIS
CIA004D	LANXESS CORPORATION CORP BAYTOWN	2869	1004234	LANXESS CORPORATION	CHAMBERS
HG0537O	LYONDELL CHEMICAL COMPANY BAYPORT CHOATE PLANT	2869	1001905	LCC BAYPORT LYONDELL	HARRIS
HG0460B	LUBRIZOL CORPORATION BAYPORT PLANT	2869	1000619	LUBRIZOL BAYPORT PLANT	HARRIS
HG0459J	LUBRIZOL CORPORATION DEER PARK PLANT	2869	1000620	LUBRIZOL DEER PARK PLANT	HARRIS
			1007562	LYONDELL CHEMICAL CHANNELVIEW	HARRIS
WO0057U	LINDE INC HAWKINS NITROGEN FACILITY	2813	1004798	Linde Air Separation Facility	WOOD
HG0319D	MONUMENT CHEMICAL HOUSTON LLC	2869	1004018	MONUMENT CHEMICAL HOUSTON, LLC	HARRIS
JE0318G	MONUMENT CHEMICAL PORT ARTHUR LLC KMTEX	2869	1005523	Monument Chemical Port Arthur, LLC (previously known as KMTEX)	JEFFERSON
HG3626Q	NIPPON CHEMICAL TEXAS INC NCTIUS	2869	1005675	NIPPON CHEMICAL TEXAS INC	HARRIS
HH0019H	NORIT AMERICAS INC MARSHALL PLANT	2819	1005127	NORIT AMERICAS INC	HARRISON
MH0009H	CELANESE LTD BAY CITY PLANT	2869	1006890	OQ CORP BAY CITY PLANT	MATAGORDA
			1009064	Pasadena Plant	HARRIS
HG0632T	ROHM AND HAAS TEXAS INCORPORATED DEER PARK PLANT	2869	1002076	ROHM AND HAAS TEXAS DEER PARK PLANT	HARRIS
BL0048R	SI GROUP INC TX OPERATIONS	2865	1001870	SI GROUP INC TX OPERATIONS	BRAZORIA
HG0486G	SASOL CHEMICALS USA LLC GREENS BAYOU PLANT	2869	1007074	Sasol Chemicals (USA) LLC	HARRIS
NE0022I	TICONA POLYMERS INC BISHOP FACILITY	2869	1007868	TICONA POLYMERS INCORPORATED	NUECES
HG0562P	TPC GROUP LLC HOUSTON PLANT	2869	1005198	TPC GROUP LLC	HARRIS
HF0017K	TRECORA HYDROCARBONS LLC SILSBEE	2869	1004829	TRECORA HYDROCARBONS LLC	HARDIN

Table A4-7. Other Chemical manufacturing facilities included in this inventory

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1003780	AIR LIQUIDE - PORT NECHES ASU COGENERATION PLANT	3,051.6	1.5	1.788	3,054.888	JEFFERSON
1002430	AIR PRODUCTS BAYTOWN PLANT	59,897.9	28.25	33.674	59,959.82	HARRIS
1003402	ALBEMARLE CORPORATION HOUSTON PLANT	44,914.9	22	27.118	44,964.02	HARRIS
1004732	AMERICAN ACRYL PASADENA	73,132.3	34.5	41.124	73,207.92	HARRIS
1006644	ARKEMA BEAUMONT PLANT	54,128	25.5	30.396	54,183.9	JEFFERSON
1006797	ARKEMA INC CLEAR LAKE	89,439.1	42	50.064	89,531.16	HARRIS
1003160	Air Products La Porte Facility	47,313.9	7.25	8.642	47,329.79	HARRIS
1003448	Alcon Vision, LLC	17,581.4	8.25	9.834	17,599.48	TARRANT
1005850	BASF BEAUMONT AGRO PLANT	67,272.4	31.75	37.846	67,342	JEFFERSON
1002613	BASF CORP - PASADENA PLANT	38,560.7	18.25	21.754	38,600.7	HARRIS
1001934	BASF FREEPORT SITE	626,952.4	279.75	333.462	627,565.6	BRAZORIA
1000346	Bayou Cogeneration Plant	1,940,464.6	2,515	5,860.468	1,948,840	Harris
1005947	Dixie Chemical Company	49,583.2	23.25	27,714	77,320.45	HARRIS
1000044	Eco-Services BAYTOWN PLANT	25,123.6	11.75	14.006	25,149.36	HARRIS
1000042	Eco-Services HOUSTON PLANT	26,707.8	12.5	14.9	26,735.2	HARRIS
1002991	GOODYEAR TIRE & RUBBER CO BAYPORT CHEMICAL PLANT	42,142.4	28.75	50.66	42,221.81	HARRIS
1002993	HUNTSMAN PETROCHEMICAL LLC	50,622.4	23.75	28.31	50,674.46	MONTGOMERY
1004957	INEOS Acetyls Chemicals Texas City Inc	40,523.5	22.25	35.462	40,581.21	GALVESTON
1003186	INEOS Americas, LLC	55,476.4	26.25	31.29	55,533.94	HARRIS
1003429	INEOS NOVA LLC Texas City Site	74,288.2	151.5	361.176	74,800.88	GALVESTON
1010447	INEOS US Chemicals Company	125,520	121.5	262.538	125,904	GALVESTON
1006275	INV Propylene, LLC	623,378	692.25	1,495.066	625,565.3	HARRIS
1002212	INVISTA ORANGE SITE	157,766	74.5	88.804	157,929.3	ORANGE
1000022	ISP TECHNOLOGIES TEXAS CITY PLANT	37,536.7	17.5	20.86	37,575.06	GALVESTON
1010589	Indorama Ventures Oxides LLC	42,960.5	20.25	24.138	43,004.89	BRAZORIA
1003570	Ketjen Bayport Plant	108,930.2	51.25	61.686	109,043.1	HARRIS

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1004234	LANXESS CORPORATION	165,384.1	38.25	45.594	165,467.9	CHAMBERS
1001905	LCC BAYPORT LYONDELL	82,731.8	49	77.182	82,857.98	HARRIS
1000619	LUBRIZOL BAYPORT PLANT	23,234.6	11	13.112	23,258.71	HARRIS
1000620	LUBRIZOL DEER PARK PLANT	105,032	49.5	59.004	105,140.5	HARRIS
1007562	LYONDELL CHEMICAL CHANNELVIEW	270,682.4	208.75	407.664	271,298.8	HARRIS
1004798	Linde Air Separation Facility	28,770.9	13.75	16.39	28,801.04	WOOD
1004018	MONUMENT CHEMICAL HOUSTON, LLC	69,340.8	32.75	39.038	69,412.59	HARRIS
1005523	Monument Chemical Port Arthur, LLC (previously known as KMTEX)	15,969.7	7.5	8.94	15,986.14	JEFFERSON
1005675	NIPPON CHEMICAL TEXAS INC	44,112.9	20.75	24.734	44,158.38	HARRIS
1005127	NORIT AMERICAS INC	8,125.4	6	8.642	8,140.042	HARRISON
1006890	OQ CORP BAY CITY PLANT	377,270.2	279	514.05	378,063.3	MATAGORDA
1009064	Pasadena Plant	60,420.7	28.5	33.972	60,483.17	HARRIS
1002076	ROHM AND HAAS TEXAS DEER PARK PLANT	315,048.9	135.75	161.814	315,346.5	HARRIS
1001870	SI GROUP INC TX OPERATIONS	72,714.6	34.25	40.826	72,789.68	BRAZORIA
1007074	Sasol Chemicals (USA) LLC	46,283.8	21.75	25.926	46,331.48	HARRIS
1007868	TICONA POLYMERS INCORPORATED	437,537.7	183.25	219.626	437,940.6	NUECES
1005198	TPC GROUP LLC	730,151.7	344	410.048	730,905.7	HARRIS
1004829	TRECORA HYDROCARBONS LLC	84,802.3	40	47.68	84,889.98	HARDIN
	State Total	**7,460,883**	**5,795**	**38,813.31**	**7,505,491**	

Appendix 5: Minerals Inventory

Cement

Table A5-1 compares the 11 facilities that reported through the GHGRP as Minerals Production with the facilities identified as "Cement-hydraulic" in TCEQ inventories (Standard Industrial Classification (SIC) Code 3241). All facilities match, although slightly different facility names may be used in the reports. GHGRP emission reports are used and **Table A5A5-2** lists the emissions of the facilities included in this inventory under the category of Cement.

Glass

Table A5-3 compares the facilities that reported through the GHGRP as Glass with the facilities identified with a variety of SIC Codes. These codes are 3211 (Flat Glass), 3221 (Glass Containers) and 3296 (Mineral Wool). Of the 8 facilities reporting under the Glass sector for the GHGRP, 2 reported as SIC 3211 facilities to the TCEQ, 2 reported as SIC 3221 facilities to the TCEQ, and 3 reported as SIC 3296 facilities to the TCEQ (total of 7 facilities). The final facility reporting in the Glass sector to the GHGRP (3M – Brownwood) is a fiberglass facility and reported to the TCEQ under SIC 3081 (Unsupported plastic film and sheet). Since there are many fiberglass facilities throughout the State, that report under different sectors, this facility (3M Brownwood, 29,490 MT CO_2e) will be eliminated from the Glass sector in this inventory.

Two facilities (American Rockwool and Quietflex), not reporting through the GHGRP in the Glass sector are SIC 3296 (Mineral Wool) facilities, however these facilities could not be identified by name or location in GHGRP reporting and they are therefore considered negligible.

GHGRP emission reports are used and Table A5-4 lists the emissions of the facilities included in this inventory under the category of Glass.

Lime

Table A5-5 compares the 5 facilities that reported through the GHGRP as Lime with the facilities identified as "Lime" in TCEQ inventories (Standard Industrial Classification (SIC) Code 3274). All facilities match, although slightly different facility names may be used in the reports. GHGRP emission reports are used and Table A5-6 lists the emissions of the facilities included in this inventory under the category of Lime.

Other Minerals

Table A5-7 compares the 15 facilities that reported through the GHGRP as "Other Minerals" with the facilities that reported to the TCEQ using SIC Codes 3251 (Brick and Structural Clay tile), 3261 (Plumbing fixtures), 3272 (Concrete Products NEC), 3275 (Gypsum Products), 3295 (Minerals ground or treated) and 5032 (Brick, Stone related materials). Two of the 15 facilities reporting

through the GHGRP could not be identified by name or location in TCEQ inventories (Gold Bond-ROT Plant; Potters Industries Brownwood), however, they are retained in the inventory for Minerals reported in this work since no comparable facilities were available to assess whether the emissions were negligible.

Three of the 15 facilities reporting to the GHGRP were Brick facilities (SIC 3251). An additional 7 facilities reporting to the TCEQ under this SIC Code were added, including other locations for the company that reported on three facilities to the GHGRP. Greenhouse gas emissions for the facilities not reporting the GHGRP were assumed to have the same ratio of greenhouse Gas emissions to NOx emissions as the reporting facilities in this SIC Code.

One of the 15 facilities reporting to the GHGRP was in the Concrete Products, Except Block and Bricksector (SIC 3272). An additional 2 facilities reporting to the TCEQ under this SIC Code were added. Greenhouse gas emissions for the facilities were assumed to be negligible.

A summary of emissions from Other Minerals is reported in Table A5-8.

Table A5-1. Comparison of Cement production facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under SIC Code 3241 (Cement-hydraulic).

TCEQ Identifier	Names in TCEQ Inventory	GHGRP Identifier	Name in GHGRP Inventory	County
MB0123F	Lehigh White Cement Co.	1002049	Lehigh Cement Co. LLC/Waco	MCCLENNAN
ED0099J	Holcim	1002055	Holcim	ELLIS
HK0014M	Texas Lehigh Cement	1002102	Texas Lehigh Cement	HAYS
ED0034O	Ash Grove Cement Co.	1002421	Ash Grove Cement Co.	ELLIS
BG0045E	Capitol Aggregates	1004270	Capitol Cement Co.	BEXAR
ND0014S	Lone Star Industries	1006110	Lone Star Industries/Buzzi Unichem	NOLAN
EB0121R	GCC Permian, LLC	1006363	GCC Permian, LLC	ECTOR
BG0259G	Alamo Cement Company	1007208	Alamo San Antonio Cement	BEXAR
CS0018B	Martin Marietta South Texas Cement	1007621	Martin Marietta South Texas Cement	COMAL
CS0022K	CEMEX Construction Materials South LLC	1007663	CEMEX Construction Materials South LLC	COMAL
ED0066B	Martin Marietta North Texas Cement	1007792	Martin Marietta North Texas Cement	ELLIS

Table A5-2. Cement Emissions reported in this inventory.

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1002049	Lehigh Cement Co. LLC/Waco	3,312,277	0.25	0.298	3,312,278	MCCLENNAN
1002055	Holcim	1,239,062.8	968.75	1,481.06	1,241,513	ELLIS
1002102	Texas Lehigh Cement	872,944.6	781.5	1,359.476	875,086	HAYS
1002421	Ash Grove Cement Co.	694,587.1	620.25	941.978	696,149	ELLIS
1004270	Capitol Cement Co.	496,775.4	898.768	524.25	498,198	BEXAR
1006110	Lone Star Industries/Buzzi Unichem	689,729.8	120	161.814	690,012	NOLAN
1006363	GCC Permian, LLC	321,866.1	56.25	67.05	321,989	ECTOR
1007208	Alamo San Antonio Cement	735,484.6	736	1,271.268	737,492	BEXAR
1007621	Martin Marietta South Texas Cement	1,166,738	891.75	1,397.62	1,169,027	COMAL
1007663	CEMEX Construction Materials South LLC	1,098,149	1,147.25	2,372.08	1,101,668	COMAL
1007792	Martin Marietta North Texas Cement	1,491,125.3	2,444.75	3,856.12	1,497,426	ELLIS
	State Total	**12,118,740**	**8,666**	**13,433**	**12,140,839**	

Table A5-3. Comparison of Glass facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under multiple SIC Codes.

TCEQ Identifier	Names in TCEQ Inventory	SCC	GHGRP Identifier	Name in GHGRP Inventory	County
NB0014R	Guardian Industries – Corsicana	3211	1002770	Guardian Industries - Corsicana	NAVARRO
BQ0009S	3M Company – Brownwood	3081	1003188	3M Brownwood[1]	BROWN
HG0028R	Ardagh Glass Packaging	3221	1003258	Ardagh Glass Packaging	HARRIS
RB0010D	Owens Corning Amarillo	3296	1003520	Owens Corning Amarillo	RANDALL
ED0051O	Johns Manville	3296	1003968	Johns Manville	JOHNSON
WH0040R	Vitro Flat Glass LLC	3211	1006397	Vitro Flat Glass LLC	WITCHITA
MB0095I	Owens Brockway Glass Container	3221	1007499	Owens Brockway Glass Container	MCLENNAN
ED0051O	Owens Corning Insulating Systems	3296	1002019	Owens Corning Insulating Systems	ELLIS
BF0107S	American Rockwool[2]	3296			BELL
HG5265M	Quietflex MFG[2]	3296			HARRIS

[1]Removed from this inventory sector for consistency with other Fiberglass facility reporting
[2]Neglected in the total emissions due to lack of data

Table A5-4. Glass emissions reported this inventory.

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1002770	Guardian Industries - Corsicana	115,395.2	40.5	48.276	115,484	NAVARRO
1003258	Ardagh Glass Packaging	62,396.7	19.75	23.542	62,439.99	HARRIS
1003520	Owens Corning Amarillo	73,918.4	32	38.144	73,988.54	RANDALL
1003968	Johns Manville	43,688.4	20	23.84	43,732.24	JOHNSON
1006397	Vitro Flat Glass LLC	204,808.4	73.25	87.91	204,969.6	WITCHITA
1007499	Owens Brockway Glass Container	108,698.7	37.5	44.7	108,780.9	MCLENNAN
1002019	Owens Corning Insulating Systems	51,841.2	23.75	28.31	51,893.26	ELLIS
	STATE TOTAL	**660,747**	**246.75**	**294.722**	**661,288.5**	

Table A5-5. Comparison of Lime facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under SIC Code 3274 (Lime).

TCEQ Identifier	Names in TCEQ Inventory	SCC	GHGRP Identifier	Name in GHGRP Inventory	County
TH0010I	Austin White Lime Company	3274	1007346	Austin White Lime Company	TRAVIS
JH0045I	Texas Lime Company	3274	1002395	Texas Lime Company	JOHNSON
BJ0001T	Lhoist North America/Clifton Falls	3274	1002403	Lhoist North America/Clifton Falls	BOSQUE
BS0020I	Lhoist North America/Marble Falls	3274	1002405	Lhoist North America/Marble Falls	BURNET
CS0020O	Lhoist North America/New Braunfels	3274	1002432	Lhoist North America/New Braunfels	COMAL

Table A5-6. Lime emissions reported this inventory.

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1007346	Austin White Lime Company	210,709.9	32.25	38.442	210,780.6	TRAVIS
1002395	Texas Lime Company	521,908	331.75	633.25	522,873	JOHNSON
1002403	Lhoist North America/Clifton Falls	492,944.3	134.5	281.312	493,360.1	BOSQUE
1002405	Lhoist North America/Marble Falls	339,506.6	29	34.568	339,570.2	BURNET
1002432	Lhoist North America/New Braunfels	490,360.5	104	205.024	490,669.5	COMAL
	STATE TOTAL	**2,055,429**	**631.5**	**1,192.596**	**2,057,253**	

Table A5-7. Comparison of Other Minerals facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under multiple SIC Codes (3275 Gypsum Products) (3251 Brick and Structural Clay tile) (5032 Brick, Stone related materials) (3295 Minerals ground or treated) (3261 Plumbing fixtures) (3272 Concrete Products NEC).

TCEQ Identifier	Names in TCEQ Inventory	SCC	GHGRP Identifier	Name in GHGRP Inventory	County
			1000403	Gold Bond-ROT Plant	FISHER
HG0762F	U S Gypsum	3275	1002303	US Gypsum Galena Park	HARRIS
GL0034M	Georgia Pacific McQueeney Wallboard	3275	1002392	Georgia Pacific Gypsum - McQueeney	GUADALUPE
EE14710	Dal-Tile	5032	1002961	Dal Tile International	EL PASO
NB0037F	Arcosa LWS Streetman	3295	1003482	Streetman Plant	NAVARRO
BQ0005D	KOHLER	3261	1004588	Kohler Co. Brownwood	BROWN
HE0006D	Acme Wallboard	3275	1005046	Acme Gypsum	HARDEMAN
DB3872H	Binford Supply	5032	1005106	Dal Tile Sunnyvale	DALLAS
BC0059O	Acme Brick Elgin	3251	1005601	Acme Brick Co. Elgin	BASTROP
			1006019	Potters Industries Brownwood	BROWN
ND0028H	United States Gypsum Sweetwater	3275	1006965	United States Gypsum Sweetwater	NOLAN
ND0009L	Georgia Pacific Gypsum Sweetwater	3275	1007697	G P Gypsum Sweetwater Wallboard	NOLAN
JH0263T	James Hardie	3272	1008992	James Hardie Building Products	JOHNSON
DF0001B	Acme Brick Denton	3251	1011325	Acme Brick Denton	DENTON
HM0016J	Acme Brick Texas Clay	3251	1012051	Acme Brick Texas Clay	HENDERSON
AH0039F	Acme Brick Sealy	3251			AUSTIN
PC0001E	Acme Brick Bennett	3251			PARKER
BC0018F	Meridian Brick Elgin	3251			BASTROP
HM0003S	Meridian Brick Athens	3251			DENTON
PA0029E	Meridian Brick Mineral Wells	3251			PALO PINTO
PC0026L	Meridian Brick Mineral Wells - East	3251			PARKER
RL0010N	Meridian Brick Henderson	3251			RUSK
JHA126V	Permabase Building Products	3272			JOHNSON
DB0374D	Fritz Industries	3272			DALLAS

Table A5-8. Other Minerals emissions reported this inventory.

GHGRP/TCEQ Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1000403	Gold Bond-ROT Plant	43,180.5	20.25	24.138	43,224.89	FISHER
1002303	US Gypsum Galena Park	56,134.8	26.5	31.588	56,192.89	HARRIS
1002392	Georgia Pacific Gypsum-McQueeney	48,476.1	22.75	27.118	48,525.97	GUADALUPE
1002961	Dal Tile International	33,014.3	15.5	18.476	33,048.28	EL PASO
1003482	Streetman Plant	75,534.1	206.25	357.302	76,097.65	NAVARRO
1004588	Kohler Co. Brownwood	16,971.2	8	9.536	16,988.74	BROWN
1005046	Acme Gypsum	37,925.1	17.75	21.158	37,964.01	HARDEMAN
1005106	Dal Tile Sunnyvale	66,457.6	31.25	37.25	66,526.1	DALLAS
1005601	Acme Brick Co. Elgin	24,436.3	11.5	13.708	24,461.51	BASTROP
1006019	Potters Industries Brownwood	25,737.9	12.25	14.602	25,764.75	BROWN
1006965	United States Gypsum Sweetwater	78,301.7	37	44.104	78,382.8	NOLAN
1007697	G P Gypsum Sweetwater Wallboard	42,527.7	20	23.84	42,571.54	NOLAN
1008992	James Hardie Building Products	42,260.7	20	23.84	42,304.54	JOHNSON
1011325	Acme Brick Denton	20,847.9	9.75	11.622	20,869.27	DENTON
1012051	Acme Brick Texas Clay	22,366.2	10.5	12.516	22,389.22	HENDERSON
AH0039F	Acme Brick Sealy[1]	11,707.2256	5.494787	6.549648	11,719.27	AUSTIN
PC0001E	Acme Brick Bennett[1]	20,904.9476	9.811739	11.69535	20,926.45	PARKER
BC0018F	Meridian Brick Elgin[1]	28,838.5752	13.53539	16.13384	28,868.24	BASTROP
HM0003S	Meridian Brick Athens[1]	7,747.8588	3.636458	4.334567	7,755.83	DENTON
PA0029E	Meridian Brick Mineral Wells[1]	15,951.3386	7.486762	8.924032	15,967.75	PALO PINTO
PC0026L	Meridian Brick Mineral Wells – East[1]	7,446.323	3.494932	4.165871	7,453.984	PARKER
RL0010N	Meridian Brick Henderson[1]	34,667.139	16.27102	19.39465	34,702.8	RUSK
JHA126V	Permabase Building Products[2]					JOHNSON
DB0374D	Fritz Industries[2]					DALLAS
	STATE TOTAL	**761,435.5**	**528.981088**	**741.996**	**762706.5**	

[1]Estimates based on emissions from other brick facilities; emissions were estimated as 1354 kg CO2 per kg NOx, 0.6355 kg CH_4 per kg NOx and 0.75 kg N_2O per kg NOx

[2]No basis for estimation; not included in inventory

Appendix 6: Metals Inventory

Iron and Steel

Table A6-1 compares the facilities that reported through the GHGRP as Metals – Iron and Steel Production with the facilities identified as Blast Furnaces and Steel Mills in TCEQ inventories (Standard Industrial Classification (SIC) Code 3312).

All facilities reporting through the TCEQ as Blast Furnaces and Steel Mills (SIC Code 3312) also report the GHGRP in Iron and Steel Production, however three additional facilities (JSW Steel, W. Silver and TPCO America) all report to the TCEQ as Blast Furnaces and Steel Mills, but do not report to the GHGRP. JSW Steel reports to the GHGRP in the "Other Metals" category but will be added back to this inventory in Iron and Steel Production. In the TCEQ inventory the remaining two facilities (W. Silver and TPCO America) collectively account >1% of the reported NOx emissions for SIC Code 3312, so it is possible that these two facilities are below the GHGRP reporting threshold. Because of their assumed small contributions greenhouse gas emissions, based on low NOx emissions, they will we neglected in this statewide greenhouse inventory.

Table A6-2 lists the emissions of the facilities included in this inventory under the category of Iron and Steel Production.

Other Metals

Table A6-3 compares the facilities that reported through the GHGRP as Metals – Other Metals with the facilities identified with a variety of SIC Codes beginning with the two-digit 33 code. These codes are 3321 (Gray and ductile iron foundries), 3341 (Secondary non-ferrous metals), 3331 (Primary Copper), and 3334 (Primary Aluminum). In addition, one facility (Wyman Gordon Forgings) is listed in the GHGRP inventory, but in the TCEQ inventory is listed under SIC Code 3462 (Iron and steel forgings).

Of the 7 facilities reporting through the GHGRP, 5 were identified in the TCEQ inventory. The JSW Steel facility reports to the TCEQ as a Blast Furnace and Steel Mill and is found in the Iron and Steel Production Metals sub-category in the GHGRP. The remaining facility in the GHGRP reporting (Tenaris Bay City) could not be found in the TCEQ inventory either by name or location (latitude/longitude).

In the TCEQ inventory the remaining two facilities (Alcoa, Gladieux Metals Recycling, and Conecsus, LLC) each account >1% of the reported NOx emissions among the other reporting facilities in this category. Because of their assumed small contributions greenhouse gas emissions, based on low NOx emissions, they will we neglected in this statewide greenhouse inventory.

Table A6-4 lists the emissions of the facilities included in this inventory under the category of Other Metals.

Table A6-1. Comparison of Iron and Steel production facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under SIC Code 3312 (Blast furnaces and Steel Mills)

TCEQ Identifier	Names in TCEQ Inventory	GHGRP Identifier	Name in GHGRP Inventory	County
ED0011D	CHAPARRAL STEEL MIDLOTHIAN PLANT	1005344	CHAPARRAL STEEL MIDLOTHIAN LP	ELLIS
EE0011P	VINTON STEEL LLC	1003580	VINTON STEEL LLC	EL PASO
GL0028H	STRUCTURAL METALS INC	1004259	STRUCTURAL METALS INC	GUADALUPE
LG0006S	NUCOR STEEL-TEXAS	1005832	NUCOR STEEL	LEON
OC0011S	OPTIMUS STEEL LLC	1007348	OPTIMUS STEEL LLC	ORANGE
SDA012L	ARCELORMITTAL TEXAS HBI	1012625	ARCELORMITTAL TEXAS HBI LLC	SAN PATRICIO
SDA019Q	STEEL DYNAMICS SOUTHWEST, LLC	1014686	STEEL DYNAMICS SOUTHWEST LLC	SAN PATRICIO
GJA005E	NUCOR STEEL LONGVIEW	1012352	NUCOR STEEL LONGVIEW	GREGG
CI0170H	JSW STEEL USA INC[1]			CHAMBERS
EE0091O	W SILVER INC[2]			EL PASO
SDA010J	TPCO AMERICA CORPORATION[2]			SAN PATRICIO

[1]Listed in "Other Metals" GHGRP sector; [2]Estimated at less than 1% of inventory – neglected in the total emissions

Table A6-2. Facilities included in this inventory as Iron and Steel Production

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1005344	CHAPARRAL STEEL MIDLOTHIAN PLANT	279,333.30	83.75	99.83	279,516.88	ELLIS
1003580	VINTON STEEL LLC	46,830.10	14.75	17.58	46,862.43	EL PASO
1004259	STRUCTURAL METALS INC	193,727.10	27.25	32.48	193,786.83	GUADALUPE
1005832	NUCOR STEEL-TEXAS	176890.7	42.25	53.044	176,985.99	LEON
1007348	OPTIMUS STEEL LLC	81,652.90	25.00	29.80	81,707.70	ORANGE
1012625	ARCELORMITTAL TEXAS HBI	788,379.10	16.75	19.97	788,415.82	SAN PATRICIO
1014686	STEEL DYNAMICS SOUTHWEST, LLC	196,084.8	47.25	56.322	196,188.37	SAN PATRICIO
1012352	NUCOR STEEL LONGVIEW	58,569.90	26.75	31.89	58,628.54	GREGG
1014023	JSW STEEL USA INC[1]	72,555.80	34.25	40.83	72,630.88	CHAMBERS
	State Total	**1,894,023.70**	**318.00**	**381.75**	**1,894,723.45**	

[1]Listed in "Other Metals" GHGRP sector but included in "Iron and Steel Production" in this inventory

Table A6-3. Comparison of Other Metals production facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under multiple SIC Codes.

TCEQ Identifier	Names in TCEQ Inventory		SCC	GHGRP Identifier	Name in GHGRP Inventory	County
BK0051Q	TCI TEXARKANA INC		3341	1012374	TCI Texarkana	BOWIE
				1013497	Tenaris Bay City	SAN PATRICIO
				1014023	JSW Steel[1]	CHAMBERS
SK0041T	Tyler Pipe		3321	1001662	Tyler Pipe	SMITH
EE0067L	Phelps Dodge Refining		3331	1002197	Phelps Dodge Refining	EL PASO
PG0005V	ASARCO LLC		3331	1002494	Asarco LLC Amarillo Copper	POTTER
HG0114A	WYMAN GORDON FORGINGS		3462	1004972	Wyman Gordon Fittings	HARRIS
CB0003M	ALCOA WORLD ALUMINA LLC[2]		3334			CALHOUN
BL0029V	GLADIEUX METALS RECYCLING LLC[2]		3341			BRAZORIA
KB0104U	CONECSUS LLC[2]		3341			KAUFMAN

[1]Listed in "Other Metals" GHGRP sector but included in "Iron and Steel Production" in this inventory

[2]Estimated at less than 1% of inventory – neglected in the total emissions

Table A6-4. Facilities included in this inventory as Other Metals.

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1012374	TCI Texarkana	74,771.20	35.25	42.02	74,848.47	BOWIE
1013497	Tenaris Bay City	91,635.40	43.00	51.26	91,729.66	SAN PATRICIO
1001662	Tyler Pipe	35,709.10	64.50	112.35	68,704.70	SMITH
1002197	Phelps Dodge Refining	108,766.50	51.25	61.09	108,878.84	EL PASO
1002494	Asarco LLC Amarillo Copper	10,885.20	5.25	6.26	10,896.71	POTTER
1004972	Wyman Gordon Fittings	57,619.90	27.25	32.48	57,679.63	HARRIS
	STATE TOTAL	**379,387.30**	**226.50**	**305.46**	**412,738.01**	

Appendix 7:Pulp and Paper and Other Industrial Inventory

Pulp and Paper

Table A7-1 compares the facilities that reported through the GHGRP as Pulp and Paper with the facilities identified as Paper Mills and Paperboard Mills in TCEQ inventories (Standard Industrial Classification (SIC) Codes 2621 and 2631, respectively).

The TCEQ also lists facilities in under SIC codes 2671 (Paper Coated and Laminated Packaging) and 2679 (Converted Paper Products NEC). These facilities collectively account <1% of the reported NOx emissions for Sthe facilities in this sector, so it is possible that these two facilities are below the GHGRP reporting threshold. Because of their assumed small contributions greenhouse gas emissions, based on low NOx emissions, they will be neglected in this statewide greenhouse inventory. Table A7-2 lists the emissions of the facilities included in this inventory under the category of Pulp and Paper.

Other - Electronics

The GHGRP contains ten facility reports in the Electronics Manufacturing sector, all of which also report emissions to the TCEQ and report under SIC Code 3674 (Semiconductor and related devices). The TCEQ reports contain three additional facilities in SIC 3674, which are not included in GHGRP reports. If these three facilities have emissions that scale with their NOx emissions reported to the TCEQ, their contribution to the emissions from this sector will be negligible. The GHGRP reports are used in this inventory. Tables A7-3 and A7-4 report these facilities and the GHGRP reports are used for in this inventory.

Other – Ethanol

The GHGRP contains three facility reports in the Ethanol sector, two of which come from a facility with a common name. The two distinct names for facilities in this sector also report emissions to the TCEQ. Tables A7-5 and A7-6 report these facilities and the GHGRP reports are used for in this inventory.

Other – Food

The GHGRP contains twelve facility reports in the Food sector, eight of which also report emissions to the TCEQ and report under multiple SIC Codes. Tables A7-7 and A7-8 report these facilities and the GHGRP reports are used for in this inventory.

Other – Manufacturing

The GHGRP contains thirty-five facility reports in the Manufacturing sector, thirty three of which also report emissions to the TCEQ and report under multiple SIC Codes. Tables A7-9 and A7-10 report these facilities and the GHGRP reports are used for in this inventory.

Other - Military

Only four Military facilities report through the GHGRP. Three additional facilities report emissions to the TCEQ under SIC 9711 (National Security). These facilities and their emissions are reported in Tables A7-11 and A7-12. The NOx emissions for the facilities reporting to the TCEQ but not the GHGRP, in some cases exceed the NOx emissions from facilities that report to the GHGRP. Only those emissions included in the GHGRP will be included in this inventory, however, this may result in the emissions being biased low. The overall emissions from this sector are small and this bias will have a small impact on state-wide emissions.

Other - Universities

Only four University facilities report through the GHGRP. Two additional facilities report emissions to the TCEQ under SIC 8221 (Colleges and Universities NEC). These facilities and their emissions are reported in Tables A7-13 and A7-14. The NOx emissions for the facilities reporting to the TCEQ but not the GHGRP suggest that these facilities may be below the GHGRP reporting threshold. To avoid potential double counting of emissions in this sector with the Commercial category, only those emissions included in the GHGRP will be included in this inventory, however, this may result in the emissions being biased low. The overall emissions from this sector are small and this bias will have a small impact on state-wide emissions.

Other – Use of electrical equipment

Facilities in this sector report only SF6 emissions. There are no equivalent TCEQ emission reports that overlap with the SF6 emission reports. GHGRP reporting (Tables A7-15 and A7-16) is used for this sector.

Other - Other

This subsector is a highly heterogenous set of facilities that do not fit well in other sectors.

GHGRP reporting (Tables A7-17 and A7-18**)** is used for this sector.

Table A7-1. Comparison of Pulp and Paper facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under multiple SIC Codes

TCEQ Identifier	Names in TCEQ Inventory	SIC	GHGRP Identifier	Name in GHGRP Inventory	County
JC0003K	WESTROCK TEXAS LP	2631	1002305	Westrock Texas, LP	JASPER
KB0156B	SMURFIT KAPPA NORTH AMERICA LLC	2631	1003953	Smurfit Kappa Orange County LLC	KAUFMAN
DB0179D	WESTROCK CONVERTING COMPANY	2621	1004024	Westrock (Dallas Mill)	DALLAS
OC0019C	INTERNATIONAL PAPER COMPANY	2621	1005909	International Paper (Orange Mill)	ORANGE
CG0010G	GRAPHIC PACKAGING INTERNATIONAL LLC	2621	1006668	Graphic Packaging International Texarkana	CASS
HGA026Z	STARPAK LLC[1]	2671			HARRIS
RJA003C	SPR PACKAGING LLC[1]	2671			ROCKWALL
TA0282E	PRINTPACK INC[1]	2671			TARRANT
DB0787U	SOLO CUP OPERATING CORP[1]	2679			DALLAS

[1]Estimated at less than 1% of inventory – neglected in the total emissions

Table A7-2. Pulp and paper Facilities included in this inventory.

	GHGRP ID	Facility Name	Biogenic CO_2 (MT)	CO_2 (MT)	CH_4 (MT CO2e)	N_2O (MT CO2e)	Reported Subparts
Pulp and Paper	1002305	Westrock Texas, L.P. (Waste, Pulp and Paper)	1,526,816	360,691	1,708	7,267	AA,C
Pulp and Paper	1005909	International Paper - Orange Mill (Waste, Pulp and Paper)	1,050,826	237,283	1,145	4,351	AA,C
Pulp and Paper	1006668	Graphic Packaging International - Texarkana Mill (Waste, Pulp and Paper)	1,537,074	279,522	1,580	6,709	AA,C
		Subtotal	*4,114,716*	*877,495*	*4,433*	*18,326*	
Other Paper Producers	1003953	Smurfit Kappa Orange County LLC (Pulp and Paper, but only reporting under subpart C… Pulp and Paper reports under both)	22,620	84,393	83	306	C
Other Paper Producers	1004024	Westrock (Dallas Mill) (Pulp and Paper, but only reporting under subpart C)	0	32,702	16	18	C
		Subtotal	*22,620*	*117,095*	*99*	*325*	
		TOTAL	**4,137,336**	**994,590**	**4,532**	**18,651**	**5,155,108**

Table A7-3. Comparison of Other Industrial Electronics facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under SIC Code 3674 (Semiconductor and Related Devices)

TCEQ Identifier	Names in TCEQ Inventory	SIC	GHGRP Identifier	Name in GHGRP Inventory	County
DB0820B	TEXAS INSTRUMENTS INC North	3674	1003945	Texas instruments North Campus	DALLAS
CPA006F	TEXAS INSTRUMENTS INC Richardson	3674	1008059	Texas Instruments Richardson	COLLIN
			1009738	X-Fab Texas	LUBBOCK
TH0602A	SAMSUNG AUSTIN SEMICONDUCTOR LLC	3674	1009872	Samsung Austin Semiconductor	TRAVIS
BG0406R	TJ TEXAS INC	3674	1010005	Tower Semiconductor	BEXAR
TH0065G	NXP USA INC Ed Bluestein	3674	1010066	NXP Semiconductor – EB Site	TRAVIS
TH0172E	NXP USA INC Oak Hill	3674	1010067	NXP Semiconductor – OH Site	TRAVIS
			1010134	TEXAS INSTRUMENTS - SHERMAN	
			1010141	Cypress Semiconductor	TRAVIS
CP0279E	QORVO TEXAS LLC	3674	1011813	Qorvo Texas LLC	COLLIN
DB1328D	HONEYWELL INTERNATIONAL INC[1]	3674			DALLAS
DB4751N	RAYTHEON COMPANY[1]	3674			DALLAS
DB4999V	DRS NETWORK & IMAGING SYSTEMS LLC[1]	3674			DALLAS

[1]Estimated at less than 1% of inventory – neglected in the total emissions

Table A7-4. Electronics Manufacturing facilities included in this inventory

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	Other emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1003945	Texas instruments North Campus	46,144.3	21.5	14,976.586	55,2961.6	614,104	DALLAS
1008059	Texas Instruments Richardson	10,458	4.75	15,367.562	181,434.3	207,264.6	COLLIN
1009738	X-Fab Texas	4,262	2	75.096	62,683.58	67,022.68	LUBBOCK
1009872	Samsung Austin Semiconductor	57,557.5	27.25	32,675.7	719,308.3	809,568.8	TRAVIS
1010005	Tower Semiconductor	5,375.9	6	3,280.384	29,013.93859	37,676.22	BEXAR
1010066	NXP Semiconductor – EB Site	8,022.9	3.75	1,362.158	97,235.00012	106,623.8	TRAVIS
1010067	NXP Semiconductor – OH Site	11,471	5.5	811.752	131,499.8749	143,788.1	TRAVIS
1010134	TEXAS INSTRUMENTS – SHERMAN	5,675	2.75	503.62	84,349.62394	90,530.99	
1010141	Cypress Semiconductor	106.9	0	10,152.86	71,740.55	82,000.31	TRAVIS
1011813	Qorvo Texas LLC	7,083.6	3.5	2,235	34,969.62	44,291.72	COLLIN
	State Total	**156,157.1**	**77**	**81,440.72**	**1,965,196**	**2,202,871**	

Table A7-5. Comparison of Ethanol facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under multiple SIC Codes

TCEQ Identifier	Names in TCEQ Inventory	SIC	GHGRP Identifier	Name in GHGRP Inventory	County
			1000352	Hereford Ethanol Partners LP	DEAF SMITH
HA0179P	PLAINVIEW BIOENERGY LLC BIOENERY	5153	1007819	PLAINVIEW BIOENERY LLC	HALE
DDA003C	WE HEREFORD LLC	2869	1004799	WE HEREFORD LLC	DEAF SMITH

[1]Estimated at less than 1% of inventory – neglected in the total emissions

Table A7-6. Facilities included in this inventory

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1000352	Hereford Ethanol Partners LP	92,464.4	43.5	51.852	92,559.75	DEAF SMITH
1007819	PLAINVIEW BIOENERY LLC	127,780.46	60.25	71.818	127,912.5	HALE
1004799	WE HEREFORD LLC	107,782.2	50.75	60.494	107,893.4	DEAF SMITH
	State Total	**328,027.1**	**154.5**	**184.164**	**328,365.7**	

Table A7-7. Comparison of Food Processing facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under multiple SIC Codes.

TCEQ Identifier	Names in TCEQ Inventory	SIC	GHGRP Identifier	Name in GHGRP Inventory	County
HG0030H	ANHEUSER-BUSCH INC ANHEUSER BUSCH HOUSTON BREWERY	2082	1003224	ANHEUSER-BUSCH HOUSTON BREWERY	HARRIS
HA0106T	AZTECA MILLING LP PLAINVIEW CORN PLANT	2041	1014603	Azteca Milling – Plainview	HALE
PD0019U	CARGILL MEAT SOLUTIONS CORPORATION FRIONA PLANT	2011	1010356	Cargill Meat Solutions	PARMER
			1013363	Darling Ingredients Inc.	BASTROP
DB0372H	FRITO LAY INC	2099	1014397	Frito Lay Inc	DALLAS
			1011783	Hilmar Cheese Company Dalhart	DALLAM
TA0235N	MOLSON COORS USA LLC FORT WORTH BREWERY	2082	1001267	Molson Coors - Fort Worth Brewery	TARRANT
LA0183P	SILGAN CAN COMPANY PARIS PLANT	3411	1006617	PARIS PLANT	LAMAR
			1006356	PILGRIM'S CORPORATION MOUNT PLEASANT COMPLEX	TITUS
LN0066U	PYCO INDUSTRIES INC IND AVENUE A FACILITY	2074	1005207	PYCO INDUSTRIES AVENUE A FACILITY	LUBBOCK
			1007824	SWIFT & CO	MOORE
PG0024R	TYSON FRESH MEATS INC	2011	1001680	TYSON FRESH MEATS	POTTER

Table A7-8. Food processing facilities included in this inventory.

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1003224	ANHEUSER-BUSCH HOUSTON BREWERY	41,041.3	25.25	37.25	41,103.8	HARRIS
1014603	Azteca Milling - Plainview	41,375.4	19.5	23.244	41,418.14	HALE
1010356	Cargill Meat Solutions	48,019	24.5	31.29	48,074.79	PARMER
1013363	Darling Ingredients Inc.	27,127.6	12.75	15.198	27,155.55	BASTROP
1014397	Frito Lay Inc	25,513.3	12	14.304	25,539.6	DALLAS
1011783	Hilmar Cheese Company Dalhart	35,240.1	23	30.396	35,293.5	DALLAM
1001267	Molson Coors - Fort Worth Brewery	17,711.9	16	27.714	17,755.61	TARRANT
1006617	PARIS PLANT	46,012.2	21.75	25.926	46,059.88	LAMAR
1006356	PILGRIM'S CORPORATION MOUNT PLEASANT COMPLEX	64,352	30.25	36.058	64,418.31	TITUS
1005207	PYCO INDUSTRIES AVENUE A FACILITY	28,581.8	13.5	16.092	28,611.39	LUBBOCK
1007824	SWIFT & CO	51,843.6	32.25	47.382	51,923.23	MOORE
1001680	TYSON FRESH MEATS	60,803.8	37.75	55.13	60,896.68	POTTER
	State Total	**487,622**	**268.5**	**359.984**	**48,8250.5**	

Table A7-9. Comparison of Other Manufacturing facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under multiple SIC Codes.

TCEQ Identifier	Names in TCEQ Inventory	SIC	GHGRP Identifier	Name in GHGRP Inventory	County
OC0004P	ARLANXEO USA LLC ORANGE PLANT	2822	1013817	ARLANXEO Orange Site	ORANGE
JE0164J	VEOLIA WTS USA INC BEAUMONT PLANT	2899	1006416	BEAUMONT POLYETHYLENE PLANT	JEFFERSON
HG0825G	BRASKEM AMERICA INC LA PORTE PLANT	2821	1007574	BRASKEM AMERICA INC - LAPORTE SITE	HARRIS
HG0323M	EQUISTAR CHEMICALS LP BAYPORT POLYMERS	2821	1001630	Bayport Polymers LLC - HDPE Plant	HARRIS
CI0016S	COVESTRO LLC INDUSTRIAL PARK BAYTOWN	2869	1004621	Covestro LLC	CHAMBERS
ED0168P	DARTCO OF TEXAS LLC WAXAHACHIE	3089	1000184	DARTCO OF TEXAS WAXAHACHIE SITE	ELLIS
DB1494I	SOLAR TURBINES INC DESOTO OVERHAUL FACILITY	3511	1013247	Dallas Overhaul Center	DALLAS
			1001911	ELLWOOD TEXAS FORGE NAVASOTA	GRIMES
MH0040N	EQUISTAR CHEMICALS LP MATAGORDA PLANT	2821	1006120	EQUISTAR CHEMICALS LP MATAGOR DA FACILITY	MATAGORDA
CI0009P	EXXONMOBIL CHEMICAL COMPANY MONT BELVIEU PLASTICS PLANT	2821	1006274	EXXONMOBIL CHEMICAL MONT BELVIEU PLASTICS PLANT	CHAMBERS
HX2270B	ELLWOOD TEXAS FORGE LP	3462	1010648	Ellwood Texas Forge Houston	HARRIS
TA0157I	GENERAL MOTORS LLC ARLINGTON ASSEMBLY PLANT	3711	1006371	GMC TRUCK GROUP ARLINGTON ASSEMBLY PLANT	TARRANT
JE0039N	GOODYEAR TIRE & RUBBER COMPANY BEAUMONT CHEMICAL PLANT	2822	1002965	GOODYEAR BEAUMONT CHEMICAL PLANT	JEFFERSON
HG3307M	INEOS STYROLUTION AMERICA LLC BAYPORT PLANT	2865	1003451	INEOS NOVA LLC BAYPORT SITE	HARRIS
HG0665E	INEOS USA LLC POLYETHYLENE PLANT	2821	1006264	INEOS POLYETHYLENE	HARRIS
HX2897U	INEOS USA LLC POLYPROPYLENE PLANT	2821	1004227	INEOS POLYPROPYLENE	HARRIS
HG1065E	KANEKA NORTH AMERICA LLC PASADENA SITE	2821	1005095	KANEKA North America LLC	HARRIS
HG3757A	LCY ELASTOMERS LP BAYTOWN FACILITY	2822	1007137	LCY ELASTOMERS	HARRIS
OC0010U	LION ELASTOMERS ORANGE LLC PLANT	2822	1006856	LION ELASTOMERS ORANGE PLANT	ORANGE
JE0017A	LION ELASTOMERS LLC PORT NECHES SYNTHETIC RUBBER PLANT	2822	1005623	Lion Elastomers	JEFFERSON
JC0058I	LOUISIANA-PACIFIC CORPORATION JASPER OSB MILL	2493	1012527	Louisiana Pacific Corporation Jasper OSB Mill	JASPER
ME0019O	NORBORD TEXAS JEFFERSON INC OSB	2493	1014637	Norbord Texas Jefferson Inc.	MARION

TCEQ Identifier	Names in TCEQ Inventory	SIC	GHGRP Identifier	Name in GHGRP Inventory	County
NA0017W	NORBORD TEXAS NACOGDOCHES INC	2493	1014657	Norbord Texas Nacogdoches, Inc.	NACOGDOCHES
HG0192D	OXY VINYLS LP DEER PARK PVC CAUSTIC PLANT	2812	1001712	OXY VINYLS LP - Deer Park PVC	HARRIS
HG1451S	OXY VINYLS LP PASADENA PVC PLANT	2821	1001710	Oxy Vinyls, LP- Pasadena Facility	HARRIS
BL0051F	SHINTECH INCORPORATED FREEPORT PLANT	2821	1006453	SHINTECH INCORPORATED	BRAZORIA
			1011974	SOLVAY Specialty Polymers USA – LLC	HUTCHINSON
HX2763T	SEKISUI SPECIALTY CHEMICALS AMERICA LLC PASADENA PLANT	2821	1003007	Sekisui Specialty Chemicals America, LLC – Pasadena	HARRIS
BGA002B	TOYOTA MOTOR MANUFACTURING TEXAS INC VEHICLE ASSEMBLY PLANT	3711	1003585	TOYOTA MOTOR MANUFACTURING TEXAS INC	BEXAR
HG0036S	TOTALENERGIES PETROCHEMICALS & REFINING USA INC LA PORTE POLYPROPYLENE	2821	1003944	Total Petrochemicals & Refining USA, Inc.	HARRIS
TA0156K	LOCKHEED MARTIN CORPORATION US AIR FORCE PLANT 4	3721	1002866	U.S. AIR FORCE PLANT 4 LOCKHEED MARTIN AERONAUTICS CO	TARRANT
			1004324	Vallourec Star Sheldon Rd	HARRIS
BF0110G	WILSONART LLC TEMPLE NORTH LAMINATE FACILITY	3089	1002633	WILSONART LLC-TEMPLE NORTH	BELL
ACA006F	WEST FRASER WOOD PRODUCTS ANGELINA	2421	1014398	West Fraser Angelina	ANGELINA
HHA004D	WESTLAKE LONGVIEW CORPORATION	2821	1011708	Westlake Longview Corp.	HARRISON

Table A7-10. Facilities included in this inventory.

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1013817	ARLANXEO Orange Site	209,931.2	99	118.008	210,148.2	ORANGE
1006416	BEAUMONT POLYETHYLENE PLANT	75,686	48.75	83.44	75,818.19	JEFFERSON
1007574	BRASKEM AMERICA INC - LAPORTE SITE	38,190.2	20.25	28.906	38,239.36	HARRIS
1001630	Bayport Polymers LLC - HDPE Plant	44,213.5	20.75	24.734	44,258.98	HARRIS
1004621	Covestro LLC	52,033.8	24.5	29.204	52,087.5	CHAMBERS
1000184	DARTCO OF TEXAS WAXAHACHIE SITE	32,441.2	15.25	18.178	32,474.63	ELLIS
1013247	Dallas Overhaul Center	28,208.9	14.5	19.37	28,242.77	DALLAS
1001911	ELLWOOD TEXAS FORGE NAVASOTA	37,684.5	17.75	21.158	37,723.41	GRIMES
1006120	EQUISTAR CHEMICALS LP MATAGOR DA FACILITY	34,952.7	16.5	19.668	34,988.87	MATAGORDA
1006274	EXXONMOBIL CHEMICAL MONT BELVIEU PLASTICS PLANT	89,953.5	42.5	50.66	90,046.66	CHAMBERS
1010648	Ellwood Texas Forge Houston	12,623.5	6	7.152	12,636.65	HARRIS
1006371	GMC TRUCK GROUP ARLINGTON ASSEMBLY PLANT	57,199.9	26.75	31.886	57,258.54	TARRANT
1002965	GOODYEAR BEAUMONT CHEMICAL PLANT	466,771.7	219.75	261.942	467,253.4	JEFFERSON
1003451	INEOS NOVA LLC BAYPORT SITE	216,458.8	102	121.584	216,682.4	HARRIS
1006264	INEOS POLYETHYLENE	132,167.8	104.75	200.852	132,473.4	HARRIS
1004227	INEOS POLYPROPYLENE	11,446.2	6	8.046	11,460.25	HARRIS
1005095	KANEKA North America LLC	55,247.8	26	30.992	55,304.79	HARRIS
1007137	LCY ELASTOMERS	44,888.8	21.25	25.33	44,935.38	HARRIS
1006856	LION ELASTOMERS ORANGE PLANT	60,979.4	28.75	34.27	61,042.42	ORANGE
1005623	Lion Elastomers	66,435.3	31.25	37.25	66,503.8	JEFFERSON
1012527	Louisiana Pacific Corporation Jasper OSB Mill	17,513.4	209	1,206.9	18,929.3	JASPER
1014637	Norbord Texas Jefferson Inc.	25,433.5	96	507.792	26,037.29	MARION
1014657	Norbord Texas Nacogdoches, Inc.	28,620.8	96	507.792	29,224.59	NACOGDOCHES
1001712	OXY VINYLS LP - Deer Park PVC	42,404.7	20	23.84	42,448.54	HARRIS

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1001710	Oxy Vinyls, LP- Pasadena Facility	107,267.1	50.5	60.196	107,377.8	HARRIS
1006453	SHINTECH INCORPORATED	132,555.3	62.5	74.5	132,692.3	BRAZORIA
1011974	SOLVAY Specialty Polymers USA - LLC	30,979.8	14.5	17.284	31,011.58	HUTCHINSON
1003007	Sekisui Specialty Chemicals America, LLC – Pasadena	23,142.1	11	13.112	23,166.21	HARRIS
1003585	TOYOTA MOTOR MANUFACTURING TEXAS INC	1,003,585	15.5	18.476	1,003,619	BEXAR
1003944	Total Petrochemicals & Refining USA, Inc.	50,031.8	23.5	28.012	50,083.31	HARRIS
1002866	U.S. AIR FORCE PLANT 4 LOCKHEED MARTIN AERONAUTICS CO	23,861.3	11.25	13.41	23,885.96	TARRANT
1004324	Vallourec Star Sheldon Rd	23,596.2	11	13.112	23,620.31	HARRIS
1002633	WILSONART LLC-TEMPLE NORTH	50,947.3	24	28.60	50,999.9	BELL
1014398	West Fraser Angelina	7,503.3	84.5	486.336	8,074.136	ANGELINA
1011708	Westlake Longview Corp.	21,980.6	10.25	12.218	22,003.07	HARRISON
	State Total	3,356,937	1,631.75	4,184.21	3,362,753	

Table A7-11. Comparison of Military facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under SIC Code 9711.

TCEQ Identifier	Names in TCEQ Inventory	SIC	GHGRP Identifier	Name in GHGRP Inventory	County
BK0025R	US DEPT OF THE ARMY RED RIVER DEPOT	9711	1004286	RED RIVER ARMY DEPOT	BOWIE
BG0075S	US DEPT OF AIR FORCE JBSA LACKLAND	9711	1002785	U.S. AIR FORCE LACKLAND AFB TX	BEXAR
			1010745	U.S. Air Force JBSA Fort Sam Houston	BEXAR
EE0024G	US DEPT OF THE ARMY FT BLISS INSTALLATION	9711	1003631	US ARMY FORT BLISS	EL PASO
BF0129I	US DEPT OF THE ARMY FORT CAVAZOS	9711			BELL
NE0054S	US DEPT OF THE ARMY CORPUS CHRISTI ARMY DEPOT	9711			NUECES
TA0079D	US DEPARTMENT OF THE NAVY NAVAL AIR STATION JOINT RESERVE BASE	9711			TARRANT

Table A7-12. Facilities included in this inventory.

GHGRP/TCEQ Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1004286	RED RIVER ARMY DEPOT	21,767.9	26.3	108.5	21,902.6	BOWIE
1002785	U.S. AIR FORCE LACKLAND AFB TX	18,003.2	8.5	10.1	18,021.8	BEXAR
1010745	U.S. Air Force JBSA Fort Sam Houston	28,547.5	13.5	16.1	28,577.1	BEXAR
1003631	US ARMY FORT BLISS	46,621.4	22.3	27.7	46,671.4	EL PASO
	State Total	**114,940.0**	**70.5**	**162.4**	**115,172.9**	

Table A7-13. Comparison of University facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under multiple SIC Codes.

TCEQ Identifier	Names in TCEQ Inventory	SIC	GHGRP Identifier	Name in GHGRP Inventory	County
HG1149U	RICE UNIVERSITY	5541	1004671	RICE UNIVERSITY	HARRIS
LN0103Q	TEXAS TECH UNIVERSITY CENTRAL PLANT 1	4961	1004040	TEXAS TECH UNIVERSITY	LUBBOCK
DB2459D	UNIVERSITY OF TEXAS SOUTHWESTERN MEDICAL CENTER DALLAS	8221	1000842	The University of Texas Southwestern Medical Center at Dallas	DALLAS
GB0081Q	UNIVERSITY OF TEXAS MEDICAL BRANCH AT GALVESTON UTMB	8221	1009993	University of Texas Medical Branch at Galveston	GALVESTON
HG7572J	BAYLOR COLLEGE OF MEDICINE[1]	8221			
BG0579I	UTSA CENTRAL ENERGY PLANT WIN SAM INC[1]	8221			

[1]Estimated NOx emission suggest that facility is below GHGRP reporting threshold

Table A7-14. University Facilities included in this inventory.

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1004671	RICE UNIVERSITY	19,520.7	9.25	11.026	19,540.98	HARRIS
1004040	TEXAS TECH UNIVERSITY	64,837.7	30.5	36.356	64,904.56	LUBBOCK
1000842	The University of Texas Southwestern Medical Center at Dallas	65,690.3	31.75	39.634	65,761.68	DALLAS
1009993	University of Texas Medical Branch at Galveston	62,233.5	29.5	35.164	62,298.16	GALVESTON
	State Total	212,282.2	101	122.18	212,505.4	

Table A7-15. Comparison of Use of Electrical Equipment facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under multiple SIC Codes.

TCEQ Identifier	Names in TCEQ Inventory	SIC	GHGRP Identifier	Name in GHGRP Inventory	County
			1013207	Bearkat Substation	GLASSCOCK
			1014588	Bernoulli Substation	GLASSCOCK
			1008343	CenterPoint Energy Houston Electric, LLC substations	HARRIS
			1013208	Cottonwood Substation	DICKENS
			1002040	DOW TEXAS OPERATIONS FREEPORT	BRAZORIA
			1013209	Faraday Substation	BORDEN
			1005585	Galveston Bay Refinery	GALVESTON
			1013210	Grelton Substation	MARTIN
			1009894	LCRA Transmission Services	TRAVIS
			1013211	Long Draw Substation	BORDEN
			1014587	Mhos Substation	SCURRY
			1008107	Oncor Electric Delivery	DALLAS
HNA026Z	SOUTH TEXAS ELECTRIC COOPERATIVE INC RED GATE POWER PLANT	4911	1012373	Red Gate Power Plant	HIDALGO
			1013191	Sand Bluff Substation	GLASSCOCK
			1009439	Texas New Mexico Power	DENTON
			1009917	Transmission and Distribution	EL PASO

Table A7-16. Use of Electrical Equipment facilities included in this inventory.

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	Other GHG emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1013207	Bearkat Substation	0	0	0	0	0	GLASSCOCK
1014588	Bernoulli Substation	0	0	0	0	0	GLASSCOCK
1008343	CenterPoint Energy Houston Electric, LLC substations	0	0	0	23,070.3852	23,070.3852	HARRIS
1013208	Cottonwood Substation	0	0	0	0	0	DICKENS
1002040	DOW TEXAS OPERATIONS FREEPORT	0	0	0	201.666	201.666	BRAZORIA
1013209	Faraday Substation	0	0	0	0	0	BORDEN
1005585	Galveston Bay Refinery	0	0	0	4,573.3836	4,573.3836	GALVESTON
1013210	Grelton Substation	0	0	0	0	0	MARTIN
1009894	LCRA Transmission Services	0	0	0	42,867.1692	42,867.1692	TRAVIS
1013211	Long Draw Substation	0	0	0	0	0	BORDEN
1014587	Mhos Substation	0	0	0	0	0	SCURRY
1008107	Oncor Electric Delivery	0	0	0	26,931.4284	26,931.4284	DALLAS
1012373	Red Gate Power Plant	0	0	0	0	0	HIDALGO
1013191	Sand Bluff Substation	0	0	0	455.0424	455.0424	GLASSCOCK
1009439	Texas New Mexico Power	0	0	0	14,664.0936	14,664.0936	DENTON
1009917	Transmission and Distribution	0	0	0	46,695.7452	46,695.7452	EL PASO
	State Total	**0**	**0**	**0**	**159,458.9**	**159,458.9**	

Table A7-17. Comparison of other facilities reported through the GHGRP with facilities reporting emissions to the TCEQ under multiple SIC Codes.

TCEQ Identifier	Names in TCEQ Inventory	SIC	GHGRP Identifier	Name in GHGRP Inventory	County
			1014281	Atlas Sand Kermit	ECTOR
			1014278	Atlas Sand Monahans	ECTOR
JE0111H	PHILLIPS 66 PIPELINE LLC BEAUMONT TERMINAL	4226	1013597	Beaumont Terminal	JEFFERSON
			1011817	Bostco Terminal	HARRIS
HG0633R	CLEAN HARBORS DEER PARK LLC	4953	1014028	Clean Harbors Deer Park, LLC.	HARRIS
WK0148O	SEMINOLE PIPELINE COMPANY LLC COUPLAND PUMP STATION	4619	1013729	Coupland Pump Station	WILLIAMSON
			1014627	Covia Crane Facility	MIDLAND
			1014638	Covia Kermit Facility	ECTOR
HG0542V	KM LIQUIDS TERMINALS LLC GALENA PARK TERMINAL	4226	1008185	Galena Park Terminal	HARRIS
HX2726C	CITY OF HOUSTON-HOUSTON AIRPORT SYSTEM BUSH IAH	4581	1012957	George Bush Intercontinental Airport	HARRIS
HG0345C	HFOTCO LLC HOUSTON FUEL OIL TERMINAL	4226	1006163	HFOTCO LLC	HARRIS
			1013616	Hi-Crush Inc. - Kermit Plant North	WINKLER
			1013274	Hi-Crush Permian Sands LLC Kermit Plant	ECTOR
HG0531D	ENTERPRISE PRODUCTS OPERATING LLC HOUSTON TERMINAL	4226	1013399	Houston Terminal	HARRIS
HG0029P	LBC HOUSTON LP BAYPORT TERMINAL	4226	1013625	LBC Houston LP	HARRIS
HG1601A	NATIONAL AERONAUTICS AND SPACE ADMINISTRATION NASA LBJ CENTER	9661	1012978	NASA - Lyndon B. Johnson Space Center	HARRIS
HX2687K	METHODIST HOSPITAL THE	8062	1008929	The Methodist Hospital	HARRIS
HG0629I	VOPAK TERMINAL DEER PARK INC	4226	1014177	Vopak Terminal Deer Park	HARRIS
HG0657D	SHELL CHEMICAL LP TECHNOLOGY CENTER HOUSTON	2869	1004492	WESTHOLLOW TECHNOLOGY CENTER	HARRIS

Table A7-18. Other facilities included in this inventory.

GHGRP Identifier	Names	CO_2 emissions (MT)	CH_4 emissions (MT CO_2e)	N_2O emissions (MT CO_2e)	CO_2e emissions (MT CO_2e)	County
1014281	Atlas Sand Kermit	58,802.8	27.75	33.078	58,863.63	ECTOR
1014278	Atlas Sand Monahans	62,034.5	29.25	34.866	62,098.62	ECTOR
1013597	Beaumont Terminal	13,974.4	8.75	15.496	13,998.65	JEFFERSON
1011817	Bostco Terminal	40,087.3	19	22.648	40,128.95	HARRIS
1014028	Clean Harbors Deer Park, LLC.	30,391	15.75	22.35	30,429.1	HARRIS
1013729	Coupland Pump Station	21,150.2	10	11.92	21,172.12	WILLIAMSON
1014627	Covia Crane Facility	28,621.4	13.5	16.092	28,650.99	MIDLAND
1014638	Covia Kermit Facility	28,331.3	13.25	15.794	28,360.34	ECTOR
1008185	Galena Park Terminal	32,808.1	15.5	18.476	32,842.08	HARRIS
1012957	George Bush Intercontinental Airport	26,040.6	12.25	14.602	26,067.45	HARRIS
1006163	HFOTCO LLC	51,065.8	24	28.608	51,118.41	HARRIS
1013616	Hi-Crush Inc. - Kermit Plant North	34,618.7	16.25	19.37	34,654.32	WINKLER
1013274	Hi-Crush Permian Sands LLC Kermit Plant	31,390.6	14.75	17.582	31,422.93	ECTOR
1013399	Houston Terminal	51,502.2	39	79.566	51,620.77	HARRIS
1013625	LBC Houston LP	18,844.8	9	10.728	18,864.53	HARRIS
1012978	NASA - Lyndon B. Johnson Space Center	62,351.3	29.25	35.164	62,415.71	HARRIS
1008929	The Methodist Hospital	38,568.2	18.25	21.754	38,608.2	HARRIS
1014177	Vopak Terminal Deer Park	6094.8	3	3.576	6,101.376	HARRIS
1004492	WESTHOLLOW TECHNOLOGY CENTER	24,398.8	11.5	13.708	24,424.01	HARRIS
	State Total	**661,076.8**	**330**	**435.378**	**661,842.2**	