Analysis of the Gas Companies' June 13, 2025, Natural Gas Leak and Emission Reports

CALIFORNIA PUBLIC UTILITIES COMMISSION AND CALIFORNIA AIR RESOURCES BOARD JOINT STAFF REPORT

December 22, 2025

SB 1371 (Leno) Natural Gas: Leakage Abatement | *R.15-01-008, D.17-06-015, D.19-08-020*

California Public Utilities Commission

Table of Contents

Tables & Figures

Executive Summary

This is the eleventh annual report (2025 Joint Report) compiled jointly by the California Public Utilities Commission (CPUC or the Commission) and the California Air Resources Board (CARB) in compliance with Senate Bill (SB) 1371 (Leno, 2014) on natural gas (NG) emissions, as ordered by the CPUC decision approving the Natural Gas Leak Abatement Program (NGLA Program) (D.17-06-015).

According to the gas companies' self-reported data, significant progress has been made toward the NGLA Program's statewide emission reduction goal of 40 percent below the 2015 baseline by 2030. As the end of 2024, the combined emission reduction for all reporting gas companies is 41 percent, exceeding the 2030 goal several years ahead of schedule. This achievement has been made possible by the collaboration among affected parties and by the continued support of the Commission in approving funding in rates to implement best practices (BPs) to reduce methane emissions.

The 2025 Joint Report compiles and analyzes the 2024 NG emissions estimates from sources of fugitive leaks and vented emissions in the NG transmission and distribution system in California, as reported by California NG utilities and independent storage providers (ISPs) (collectively "gas companies" or "respondents").[1] This report also presents and discusses NG emissions estimates by system category, source classification, and company.[2]

Respondents filed their 2024 NG emission estimates and related information by June 13, 2025, pursuant to the data request issued by CPUC-Safety Policy Division (SPD) Staff on March 27, 2025. The data request included reporting templates and associated guidelines for gas companies.

SPD and CARB Staff (Staff) used the respondents' filings, including their responses to Staff follow-up questions and comments on the initial report filings, to prepare the 2025 Joint Report. Staff adjusted the 2023 NG emission estimates in this report, as initially reported in the 2024 Joint Report, to reflect data corrected by the respondents.

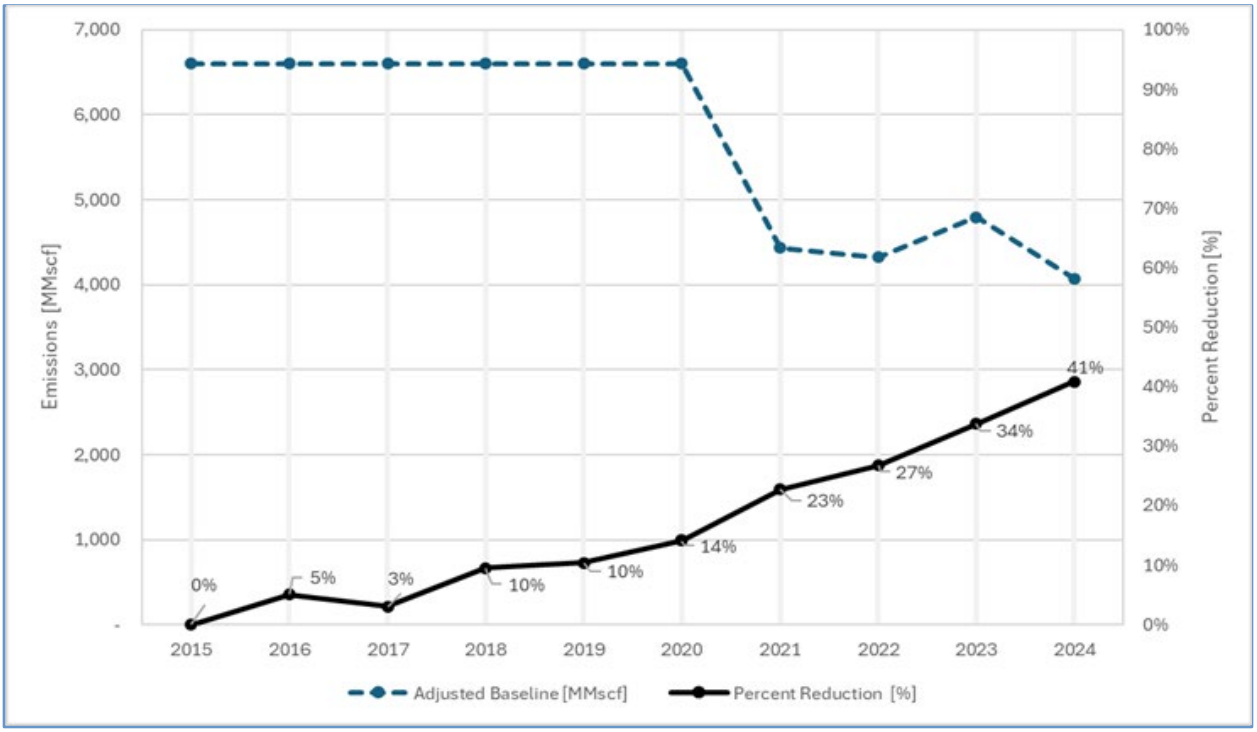
Gas companies have developed improved methods to estimate emissions for several system categories as compared to those used since the inception of the NGLA Program. Before gas companies can incorporate the improved methods into their annual reporting, they must receive approval from SPD, after consultation with CARB. Gas companies have also been developing adjustments to the 2015 Baseline to account for improved methodologies, updated emission factors (EFs), and other adjustments needed to enable a direct comparison of the 2015 Baseline with current-year emissions estimates. Gas companies must present proposed adjustments to the 2015 Baseline for SPD review and approval. Developing and approving improved emissions estimation methods and adjustments to the 2015 Baseline is an ongoing process.

[1] For the purposes of this report, "emissions" include both fugitive leaks and vented emissions of NG, unless otherwise noted.

[2] The term "system category" is used to describe the grouping of NG emissions based on where the emissions occur in the NG transmission and distribution system. The Joint Report groups emissions into seven distinct system categories (see Table 2 for the list of system categories). The term "source classification" refers to the grouping of NG emissions by emission type, including the way the emission occurs or the method by which emissions are estimated (see Table 3 for the list of source classifications).

In 2025, SPD approved adjustments to the following gas companies' emissions estimation methodologies and 2015 Baseline emissions: Southern California Gas Company (SoCalGas) and San Diego Gas & Electric Company (SDG&E) on October 3, 2025, and Pacific Gas and Electric Company (PG&E) on October 8, 2025. These three adjustments contribute to a sizeable reduction in estimated and baseline emissions compared with previously reported results in the following categories: Transmission Metering and Regulating Stations (SoCalGas and PG&E) and Distribution Metering and Regulation Stations (SDG&E). The three Baseline adjustment approval letters are included in Appendix A.

Graph ES-1: Adjusted Baseline and Percentage Reduction of Emissions



Source: Gas companies' self-reported data 2015-2024.

The 2015 Baseline has evolved over time in response to methodological changes, as have the 2015-2024 reported emission reductions relative to each year's approved baseline (Graph ES-1). In 2024, gas companies reported a cumulative emissions reduction of approximately 41 percent from the baseline, which amounts to about 1,665 millions of standard cubic feet (MMscf) of natural gas (NG) not being emitted into the atmosphere from their NG transmission and distribution systems. The baseline has been adjusted in the last four years, from 6,601 MMScf in 2020 to 4,072 MMscf in 2024 to incorporate improvements in measurement methods. These adjustments have reduced the initial baseline by about 40 percent, primarily due to a switch to leaker-based methodology, emission factor (EF) updates, and various emissions corrections. These baseline adjustments have had an impact on the emission reductions to date because for the same emission reduction, a smaller baseline results in a higher relative percentage change for the emission reductions achieved.

If the most recent measurement methods and corresponding baseline changes had not been approved, the emission reductions for 2024 would have been 36 percent rather than 41 percent.

Based on the latest reported data, the majority of emissions about 1,800 MMscf, or 75 percent of the total are from two main sources: Distribution Mains and Services pipelines, and Customer Meters.

SPD's approval of new emission estimation methods and adjustments to 2015 Baseline emissions allows Staff to more accurately evaluate progress towards overall methane emissions reduction targets for the NGLA Program and to estimate the System-wide Leak Rate more accurately, as required by SB 1371. The new emissions estimation methods also assist SPD, CARB, and the gas companies in estimating forecasted emissions reductions of proposed measures more accurately and more effectively, to evaluate the absolute and relative cost-effectiveness of proposed measures in future compliance plans.

Reporting Year (RY) 2024 represents the fourth year that SPD has approved baseline adjustments in the NGLA Program. Last year, SPD and CARB implemented process improvements regarding the submittal of baseline adjustment requests. Staff continually seek ways to improve data standards and guidelines to ensure accurate, verifiable data are used for the submission of baseline adjustments.

As recommended in Resolution G-3595,[3] (the CPUC resolution of SoCalGas' NGLA 2022 spending proposal in Advice Letter 5950-G-B) SPD "should request that CARB work with SPD to identify options for verifying emission reduction estimates by sources independent of the utilities. A verification program would require implementation by CPUC with support from CARB and would depend on available resources." SPD has requested and received verification suggestions from CARB and will continue working collaboratively on possible options that depend on available resources. At the same time, there is an existing CPUC Safety Enforcement Division compliance enforcement process of auditing utility operating practices and records, including leak survey practices, which increases confidence in the reported leak data.

Interested parties should use the information in this report to help determine general emission trends over time and identify where potential emission reductions can be achieved to contribute to meeting the State's overall goal of reducing methane emissions by 40 percent from 2013 levels by 2030,[4,5] while maintaining the safe, reliable, and affordable operation of the regulated NG storage and delivery systems, as stated in SB 1371.

Key Findings

As the end of 2024, the combined emission reduction for all reporting gas companies is 41 percent, exceeding the 2030 goal several years ahead of schedule. Total statewide estimated NG emissions from sources of fugitive leaks and vented emissions in the transmission and distribution system were 2,407

[3] CPUC Final Resolution G-3595, Finding: #19, pg. 22. https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M512/K907/512907380.PDF

[4] This goal was established by SB 1383 (Lara, 2016).

[5] CPUC Decision D.17-06-015. https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M190/K740/190740714.PDF, specified that the 2015 baseline emissions estimates will provide the starting point to measure future NG emissions reductions for the NGLA Program.

million standard cubic feet (MMscf), which is 55 MMscf or approximately 2 percent lower than the 2023 adjusted emissions (2,461 MMscf), and 41 percent (1,665 MMscf) below the adjusted 2015 Baseline emissions estimate (4,072 MMscf) (see Table 1).

In five of the seven reported system categories, NG emissions decreased from 2023 to 2024. Reported data indicates that the Customer Meters show the largest overall Year-Over-Year (YOY) emissions decrease (47 MMscf decrease). The emissions from the Underground Storage category decreased by 18 MMscf and Transmission Pipeline emissions decreased by 12 MMscf. For categories showing emission increases, emissions from the Distribution Mains and Services category showed the largest volume increase of 32 MMscf (4 percent) (see Table 2).

A detailed analysis of NG emissions estimates from individual system categories is provided later in this report.

The total statewide 2024 reported NG emissions of 2,407 MMscf equate to 1.078 million metric tonnes of carbon dioxide equivalents (MMT CO2e) using the Intergovernmental Panel on Climate Change (IPCC), Fourth Assessment Report (AR4), 100-year methane Global Warming Potential (GWP) or 3.103 MMT CO2e, using the 20-year methane GWP.

Table 1: Total Statewide Natural Gas Emissions Reported Under SB 1371

Total Emissions	2015 Baseline*	2023**	2024	2015 Baseline to 2024 Change		2023 - 2024 YOY Change	
				MMscf, MMT CO2e	% Change	MMscf, MMT CO2e	% Change
Volume of NG (MMscf)	4,072	2,461	2,407	(1,665)	(41%)	(55)***	(2%)
Mass Equivalent, 100-Yr GWP, AR 4 (MMT CO2e)	1.823	1.102	1.078	(0.746)	(41%)	(0.025)	(2%)
Mass Equivalent, 20-Yr GWP, AR 4 (MMT CO2e)	5.251	3.174	3.103	(2.148)	(41%)	(0.071)	(2%)

* All baseline and method approvals are provided in Appendix A.
** The 2023 total has been modified from the 2024 Joint Report, which is described in the section, "2023 Data Adjustments and Corrections".
***The 2023 to 2024 YOY Change is noted as 55 MMscf due to the rounding of the figure of 54,813 Mscf.

Subsequent sections of this report analyze the total NG emissions for 2024 by examining individual system categories and source classifications. Table 2 shows total estimated NG emissions and emissions trends grouped by system category, and Table 3 shows total estimated NG emissions and emissions trends grouped by source classification.

Natural Gas Emissions by System Category

As indicated in Table 2, there was a 2 percent reduction in the total from 2023 to 2024 YOY NG emissions.

Table 2: Total Natural Gas Emissions by System Category

System Category	2015 Baseline		2023		2024		2015 Baseline to 2024 Change		2023 – 2024 YOY Change	
	MMscf	% Total	MMscf	% Total	MMscf	% Total	MMscf	% Change	MMscf	% Change
Transmission Pipeline	589	14%	115	5%	103	4%	(486)	(83%)	(12)	(10%)
Transmission M&R Station	135	3%	80	3%	78	3%	(57)	(42%)	(2)	(3%)
Transmission Compressor Station	187	5%	114	5%	108	4%	(79)	(42%)	(6)	(5%)
Distribution Mains & Services	1,472	36%	886	36%	918	38%	(554)	(38%)	32	4%
Distribution Metering & Regulating Stations	204	5%	186	8%	186	8%	(18)	(9%)	0	NA
Customer Meters	1,133	28%	930	38%	883	37%	(250)	(22%)	(47)	(5%)
Underground Storage	353	9%	149	6%	131	5%	(222)	(63%)	(18)	(12%)
Total	**4,072**	**100%**	**2,461**	**100%**	**2,407**	**100%**	**(1,665)**	**(41%)**	**(55)**	**(2%)**

Notes to Table 2:
The 2015 Baseline is noted as 4,072 MMscf, which is rounded from 4,072,101 Mscf.
The 2023 Total is noted as 2,461 MMscf, which is rounded from 2,461,384 Mscf.
The 2024 Total is noted as 2,407 MMscf, which is rounded from 2,406,571 Mscf.

The first system category, Transmission Pipelines, accounts for approximately 4 percent of the total 2024 emissions but showed a 10 percent YOY decrease of 12 MMscf from 2023. This category shows an 83 percent decrease against its 2015 Baseline. See more details in Summary of Gas Company– Estimated Natural Gas Emissions.

Transmission Meter and Regulation (M&R) Stations' 3 percent proportional share of the total 2024 emissions remained the same as the 2023 emissions. The YOY emissions decreased 2 MMscf or 3 percent from a total of 80 MMscf in 2023 to 78 MMscf in 2024 and shows a 42 percent decrease from its 2015 Baseline.

Transmission Compressor Stations' share of the 2024 total emissions decreased to 108 MMscf, which accounts for 4 percent of total emissions. Transmission Compressor Station emissions decreased 6 MMscf or 5 percent YOY and shows a 42 percent decrease against its 2015 Baseline. Within this category, the Component Fugitive Leaks subcategory is described in the section of this report titled Impacts of CARB's Oil and Gas Methane Regulation.

Distribution Mains and Services pipeline emissions increased by 32 MMscf or 4 percent from 886 MMscf in 2023 to 918 MMscf in 2024. This category shows a 38 percent decrease against its 2015 Baseline and makes up 38 percent of total 2024 emissions.

Distribution Metering and Regulating (M&R) Stations emissions stayed constant at 186 MMscf in 2023 and 2024. This category shows a 9 percent decrease against its baseline and makes up 8 percent of total 2024 emissions.

Customer Meters emissions decreased by 47 MMscf or 5 percent YOY from 930 MMscf in 2023 to 883 MMscf in 2024. This category shows a 22 percent decrease against its baseline, making up 37 percent of total 2024 emissions. The 2023 and 2024 emissions use a Population-Based approach by four utilities (Alpine, SDG&E, Southwest Gas, and West Coast Gas) and a Leaker-Based approach by two utilities (PG&E and SoCalGas).

Underground Storage emissions decreased by 18 MMscf or 12 percent YOY from 149 MMscf in 2023 to 131 MMscf in 2024. This category shows a 63 percent decrease against its baseline, making up 5 percent of total 2024 emissions. Within this category, the Component Fugitive Leaks subcategory and Storage Leaks & Emissions subcategory are described in the section of this report titled, Impacts of CARB's Oil and Gas Methane Regulation.

Lastly, a single unusually large leak resulting in 138 MMscf of emissions occurred in 2024. SoCalGas reported that this leak occurred due to a mudslide that damaged a transmission pipeline.

For more sub-category details see Table 9: Natural Gas Emissions by System Category, Emission Source, and Source Classification.

Natural Gas Emissions by Source Classification

NG emissions can be grouped into the six main source classifications: Population-Based Emissions, Graded Pipeline Leaks, Leaker-Based Emissions, Blowdowns, Vented Emissions, and Damages. An additional source classification, Other Leaks, is used for emission sources that do not fit one of the six main source classifications. Table 3 shows the YOY changes by source classification.[6]

[6] See Table 9: Natural Gas Emissions by System Category, Emission Source, and Source Classification, in the body of the report.

Table 3: Total Natural Gas Emissions by Source Classification

Source Classification	2015 Baseline		2023		2024		2015 Baseline to 2024 Change		2023 - 2024 YOY Change	
	MMscf	% Total	MMscf	% Total	MMscf	% Total	MMscf	% Change	MMscf	% Change
Population-Based Emissions	365	9%	376	15%	369	15%	4	1%	(7)	(2%)
Graded Pipeline Leaks	1,236	30%	771	31%	783	33%	(453)	(37%)	12	2%
Leaker Based Emissions	1,038	25%	794	32%	747	31%	(291)	(28%)	(47)	(6%)
Blowdown	603	15%	149	6%	125	5%	(478)	(79%)	(24)	(16%)
Vented	364	9%	180	7%	142	6%	(222)	(61%)	(38)	(21%)
Damages	318	8%	146	6%	191	8%	(127)	(40%)	45	31%
Other Leaks	147	4%	46	2%	50	2%	(97)	(66%)	4	8%
Total Sector Emissions	**4,072**	**100%**	**2,461**	**100%**	**2,407**	**100%**	**(1,665)**	**(41%)**	**(55)**	**(2%)**

Notes to Table 3: The2015 Baseline is noted as 4,072 MMscf, which is rounded from 4,072,101 Mscf.
The 2023 Total is noted as 2,461 MMscf, which is rounded from 2,461,384 Mscf.
The 2024 Total is noted as 2,407 MMscf, which is rounded from 2,406,571 Mscf.

YOY emission changes by source classification are summarized as follows:

- The Population-Based Emissions classification currently makes up 15 percent of the 2024 total emissions, although it had been a larger proportion before leaker-based methods had been developed and approved by SPD. This classification increased 4 MMscf or 1 percent from its 2015 Baseline and shows a 2 percent decrease YOY. The four emission sources that are part of this category are provided in Table 6, Population-Based Natural Gas Emissions.
- Graded Pipeline Leaks Emissions makes up the largest source of system emissions at 33 percent or 783 MMscf increasing 2 percent or 12 MMscf from 771 MMscf reported in 2023. This category shows a 37 percent or 453 MMscf decrease from its 2015 Baseline.
- Leaker-Based Emissions decreased from 794 MMscf in 2023 to 747 MMscf in 2024, by 6 percent or 47 MMscf and makes up the second largest source of system emissions at 31 percent. This classification decreased 291 MMscf or 28 percent from its 2015 Baseline.
- Blowdowns decreased by 24 MMscf or 16 percent YOY from 149 MMscf in 2023 to 125 MMscf in 2024. This category has emissions that are cyclical and vary with annual operating conditions. Nonetheless, the 2024 data show a 79 percent decrease from its 2015 Baseline. For a more detailed analysis, see Table 7, Blowdown Natural Gas Emissions.

- Vented Emissions decreased from 180 MMscf in 2023 to 142 MMscf in 2024, a 21 percent decrease. The category shows a 61 percent decrease from its 2015 Baseline. For a more detailed analysis, see Table 8, Vented Natural Gas Emissions.
- Emissions from Damages increased 45 MMscf or 31 percent YOY from 146 MMscf in 2023 to 191 MMscf in 2024 but shows a 40 percent decrease from its 2015 Baseline.
- Other Leaks increased 4 MMscf or 8 percent from 46 MMscf in 2023 to 50 MMscf in 2024. This classification shows a 66 percent decrease from its 2015 Baseline.

Introduction and Background

SB 1371 (Leno, 2014) requiring reporting and mitigation of emissions from CPUC-regulated gas pipeline facilities was enacted in 2014.[7] The statute requires gas corporations to file a report summarizing utility leak management practices, a list of new NG leaks by grade, a list of open leaks that are being monitored or are scheduled to be repaired, and a best estimate of gas loss due to leaks. In accordance with SB 1371, the CPUC and CARB jointly prepared this Natural Gas Leak Abatement (NGLA) annual report (2025 Joint Report), which analyzes and accounts for NG from leaks and vented emissions from NG transmission, distribution, and storage in California.[8]

SB 1371 also requires the adoption of rules and procedures to minimize NG leakage from Commission-regulated NG pipeline facilities consistent with Section 192.703(c) of Subpart M of Title 49 of the Code of Federal Regulation, the Commission's General Order (GO) 112-F, and the State's goal of reducing GHG emissions.

In January 2015, the Commission opened an Order Instituting Rulemaking (R.) 15-01-008 to implement the provisions of SB 1371.

On June 15, 2017, the Commission in decision (D.)17-06-015 approved the NGLA Program consistent with SB 1371. This decision established Best Practices (BPs) and reporting requirements for the NGLA Program to be developed by the CPUC in consultation with CARB.[9] The decision implements the following to support the State's goal of reducing 2015 Baseline NG emissions 40 percent by 2030:

1. Annual reporting for tracking NG emissions,
2. Twenty-six mandatory BPs for minimizing NG emissions pertaining to policies and procedures, recordkeeping, training, experienced trained personnel, leak detection, leak repair, and leak prevention,
3. Biennial Compliance Plan (CP) incorporated into the respondents' annual Gas Safety Plans, beginning in March 2018, and
4. Cost recovery process to facilitate Commission review and approval of incremental expenditures to implement BPs, Pilot Programs and Research & Development.

In D.17-06-015, the Commission affirms that the 2015 Baseline emissions estimates will provide the starting point to measure future NG emissions reductions.[10]

[7] Leno, Chapter 525, Statutes of 2014.

[8] Unless specified as a fugitive leak or vented emission, for the purposes of this report "emissions" include both fugitive leaks, and vented emissions of NG.

[9] Leno, 2014; Pub. Util. Code §§ 975, 977, 978.

[10] https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M190/K740/190740714.PDF, Findings of Fact #13, Pg. 145.

To culminate the second phase of R.15-01-008, on August 15, 2019, the Commission approved D.19-08-020 establishing additional policies and mechanisms for the NGLA Program pursuant to SB 1371 and SB 1383 (Lara, 2016).[11] This decision requires:[12]

- Utility Proposed Cost-Effectiveness Methodology and two Cost-Benefit Analyses for evaluating proposed methane reduction measures and the Biennial Methane Leaks Compliance Plans (Compliance Plans).
- Adopting a restriction on rate recovery beginning in 2025, for emissions greater than 20 percent below the 2015 Baseline levels for Pacific Gas and Electric Company (PG&E) and Southern California Gas Company (SoCalGas) to ensure they achieve their intended emissions reductions.[13]
- Two workshops to refine the scope and detail of the Compliance Plans and Tier 3 Advice Letters pertaining to cost-effectiveness, cost-benefit analysis, and other elements as directed in D.17-06-015.
- Developing a process that gas companies can rely on, before submittal of the next Compliance Plans in March 2020, to adjust Emission Factors (EFs) used for annual reports to account for methane reduction measures in consultation with CARB.
- Extending the timeframe from 2020 to 2021 for the CPUC's Safety and Enforcement Division[14] and Energy Division Staff to complete a written program evaluation of the NGLA Program after Commission approval of the second set of Compliance Plans in late 2020. In June 2021, the due date for this program evaluation was further extended to December 2022.
- The Commission directed the NGLA Program to continue evaluating the Best Practices Biennial Compliance Plans, most recently submitted by gas companies in March 2024.
- SPD completed the NGLA Program evaluation December 29, 2022. The evaluation resulted in the following recommendations, which have yet to be adopted; most will require a rulemaking proceeding to establish:[15]
    - Adopt cost-effectiveness threshold guidance for future reduction proposals.
    - Allow utilities to continue reducing emissions under current policy framework without imposing a hard target.
    - Verify emission measurement data with selective audits by mid-2024.
    - Adopt cost-accounting modifications in resolutions or rate case proceedings related to NGLA funding.

---

[11] Lara, Chapter 395, Statutes of 2016.

[12] D.19-08-020: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M311/K449/311449621.PDF

[13] D.20-05-038, Order Correcting Error in D.19-08-020, states at pg. 1 that: "For SoCalGas, any necessary reductions in rate recovery for methane emissions for 2025 and beyond as directed in this Decision should be identified in its Annual Regulatory Account Balance Update for rates effective January 1, 2027."

[14] Since the Decision was issued, the SED RASA Staff who have responsibility for preparation of the NGLA Program evaluation have moved to the Safety Policy Division (SPD).

[15] Staff Evaluation of the Natural Gas Leak Abatement Program, CALI FORNIA PUBLIC UT I L I T I ES COMMI SSION SAFETY POLICY DIVISION REPORT, December 29, 2022; Pg. 3: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/safety-policy-division/reports/ngla-staff-evaluation-report.pdf

All directives of D.17-06-015 remain in effect unless they are superseded by directives and/or guidance provided by this decision. Lastly, in D.19-08-020 the Commission closed R.15-01-008.

In addition, SB 32 (Pavley, 2016), which sets a 40 percent GHG reduction target from 1990 levels by 2030, was passed and signed into law in 2016.[16] SB 605 (Lara, 2014)[17] directed CARB to develop plans to reduce statewide emissions of short lived climate pollutants, which it did in the Short-Lived Climate Pollutant Reduction Strategy.[18] SB 1383 (Lara, 2016) required CARB to implement the Short-Lived Climate Pollutant Reduction Strategy and specified certain emissions reduction goals.[19]

Purpose of the Annual Natural Gas Leak Abatement Report

This report summarizes the individual company reports of NG emissions from the storage and delivery systems in aggregate, by company, system category, source classification, and leak grade. This information helps determine where emission reductions can be achieved while maintaining safe and reliable operation of commission-regulated NG pipelines and other facilities. The metrics used to compile this report provide operators, the Commission, and the public with information about the type, number, and severity of NG emissions and the leaked quantity of NG emitted to the atmosphere over time.

This report provides a summary of the 2024 emissions submitted to CPUC by the gas companies on June 13, 2025.

1. Updated reporting templates were issued to the NGLA Program service list on March 27, 2025, with the following changes:

- General Update
    - Timetable for 2025
        - Deadline for requests for baseline adjustments, methodology changes, including new emission factors: April 30, 2025.
        - Any requests must also be included in the Supplemental Questionnaire to be submitted on June 13, 2025.
        - Agency Review Meetings: April 30 through July 31, 2025.
        - Final Decision: August 29, 2025.
- Appendix 3 – Transmission Compressor Station
    - The "Compressor and Component Fugitive Leaks" worksheet includes the note "The number of days leaking may be more than 365 days due to including the estimation function of the leak occurring at half the number of days between the prior survey date and the discovery date."
    - The "Component Vented Emissions" worksheet replaces the header "ID" with "Quantity."

[16] Pavley, Chapter 249, Statutes of 2016.

[17] Lara, Chapter 523, Statutes of 2014.

[18] CARB, 2017: https://ww2.arb.ca.gov/resources/documents/slcp-strategy-final.

[19] Lara, Chapter 395, Statute of 2016.

  - The "Compressor Vented Emissions" worksheet includes the note "Enter either the initials of the facility to be included in the "ID" column or the name be provided along with the zip code in the "Geographic Location."
- Appendix 4 – Distribution Mains and Services
  - The "Unknown Leaks" worksheet includes the note "Please show the calculation for determining the total emissions. If additional worksheets are necessary, please include those to show intermediate calculations, such as the formula for the Risk-Based Survey Method."
  - The "Summary" worksheet includes the note "The designated fields highlighted yellow are optional."
- Appendix 6 – Meter Set Assembly (MSA) Systems
  - The "Meter Leaks, Leak Count, Leaker" worksheet includes the note "Please show the calculation for determining the total emissions. If additional worksheets are necessary, please include those to show intermediate calculations, such as the formula for Emissions from Leaks Detected from Survey."
- Appendix 7 – Underground Storage
  - The "Compressor and Component Fugitive Leaks" worksheet includes the note "The number of days leaking may be more than 365 days due to including the estimation function of the leak occurring at half the number of days between the prior survey date and the discovery date."
  - The "Component Vented Emissions" worksheet replaces the header "ID" with "Quantity."
  - The "Compressor Vented Emissions" worksheet includes the note "Enter either the initials of the facility to be included in the "ID" column or the name be provided along with the zip code in the "Geographic Location."
- Appendix 8 – Summary
  - For the "Leak Rate Data" worksheet, Staff have revised the name of the header "Total Annual Volume of Gas Used by the Gas Department" to "Total Annual Volume of Gas Used." Similarly, other headers that end with the phrase "by the Gas Department" have been revised to remove the phrase.

This report includes general discussions of operational practice changes, new leak and emission detection methods, and mitigation programs. Lastly, Staff included information on improvements in the data capture resulting from gas company efforts (e.g., verification of asset inventory, integrating system databases, etc.), changes to methodology for estimating emissions (e.g., calculating emissions for all blowdowns not just those above a specific threshold), and corrections to the classification of data or errors in the data that may provide greater accuracy in reporting.

Basis for the Annual Natural Gas Leak Abatement Report

On March 27, 2025, Staff issued a data request to CPUC jurisdictional NG utilities and independent storage providers (ISPs) in California to collect the information required by Article 3, Section 975 (c) and (e)(6), using templates jointly developed by CPUC and CARB Staff (See Appendix C for detailed wording).

The data were tabulated into the following seven systems categories (which included subgroupings by type):

1. Transmission Pipelines (leaks, damages, blowdowns, components, and odorizers),

2. Transmission M&R stations (station leaks and emissions, and blowdowns),
3. Compressor stations (compressor leaks and emissions, blowdowns, components leak and emissions, and storage tanks),
4. Distribution Mains and Services (M&S) (leaks, damages, and blowdowns),
5. Distribution M&R stations (station leaks and emissions, and blowdowns),
6. Customer Meters (leaks, and venting), and
7. Underground Storage Facilities (leaks, compressors leaks and emissions, blowdowns, and component leaks and emissions).

The respondents provided contextual information and explanations for their data to help Staff understand the composition of the emissions, emission sources, and related calculations underlying the emission estimates. The respondents summarized the data and provided information on system-wide leaks.

Staff analyzed the data and requested supplementary information needed for clarification. The "Lessons Learned" section of this report identifies insights Staff acquired about potential improvements to the process and opportunities to enhance future data requests.

Basis for Updating Emissions Methodologies and Adjusting the 2015 Baseline Values

Since the NGLA reporting process began, Staff and respondents identified opportunities for improving reporting methodology, emission factors, and record keeping. Had some of these improved emissions data been known or used at the time of the 2015 reporting year they would have had a material impact on the level of 2015 Baseline emissions in the Joint Report.

While the June 2017 Commission D.17-06-015 does not order a process for updating the 2015 Baseline, it does order that:

> "The Natural Gas Leak Abatement Program Annual Reporting Framework contained in Section 5.2 … of this decision is adopted consistent with the process detailed below: The Commission's Safety and Enforcement Division (SED)[20], in consultation with the Air Resources Board [C](ARB), shall direct the annual report process…"[21]

This order is interpreted to include the consideration and evaluation of any changes to 2015 Baseline emissions based on new methods of emissions accounting, better record keeping and information, and updated EFs used for estimating emissions.

D.19-08-020 modifies the approach to updating EFs by allowing gas companies to propose EF changes that more accurately account for the emissions from their Compliance Plan emissions mitigation programs. In

[20] Since the Decision was issued, the SED Staff who have responsibility for directing the annual report process have moved to the Safety Policy Division (SPD) and maintained this responsibility.

[21] D.17-06-015, Pg. 157.

addition, changes to the 2015 Baseline EFs may be warranted based on the supporting data and evidence used to develop the EFs for the emission mitigation programs included in their Compliance Plans.

The discussion within D.17-06-015 further clarifies the roles and responsibilities for managing the emissions reporting processes.

> "…[T]he development of EFs and an official Baseline to manage this initiative in the long term is still in flux. Therefore, while, [C]ARB is ultimately responsible for the development of EFs in collaboration with stakeholders, both [C]ARB and CPUC should continue to collaborate to ensure that updates to EFs are completed in a timely fashion consistent with the Commission's annual reporting process. Following this year's example, if changes are required to the annual reporting template, [C]ARB and CPUC Staff will conduct a workshop to discuss EFs and ongoing changes to the reporting template. This workshop should take place during the first quarter of each year before SED[22] issues the annual data request at the end of the first quarter."[23]

On June 6, 2022, the SPD approved new estimation methods for the 2020 and 2021 emission data. The SPD approved Leaker-Based methodologies developed by PG&E and SoCalGas to replace Population-Based methodologies for estimation of NG emissions from Distribution M&R Stations and Customer Meters systems categories. Population-Based emissions estimates are calculated based on the number of units within a system category (e.g., number of Distribution M&R stations) multiplied by an EF. Therefore, Population-Based emissions stay constant from year to year unless a change is made to the number of units or to the EFs. Population-Based emission estimates generally cannot capture emissions changes associated with the gas companies' emissions mitigation practices. On the other hand, Leaker-Based emissions estimates are calculated by using surveyed or estimated number of leaks. They are more effective in capturing emissions changes associated with gas companies' mitigation practices. Accurately estimating emissions reduction is critical to measuring progress toward the targeted goal and evaluating the mitigation process's cost-effectiveness.

On October 26, 2022, SPD approved adjustments to the 2015 Baseline emissions for PG&E and SoCalGas to account for methodological changes, EF updates, and other adjustments that are needed to allow for a direct comparison of 2015 Baseline emissions with current-year emissions estimates. Letters from SPD to PG&E and SoCalGas approving the adjustments to 2015 Baseline emissions are included in the 2022 Joint Report.[24]

On July 19, 2023, SPD approved two adjustments to the 2015 Baseline emissions for PG&E. For the first adjustment, PG&E has made several improvements in the accounting of component vented emissions on Transmission Pipelines since the original reporting of this category. This 2015 Baseline adjustment for this category aligns the baseline to match the improvement in reporting via the GIS system of the pressure relief valves (Calendar Year (CY) 2019) emissions and to account for the addition of automated valve emissions

[22] Since Decision D.17-06-015 was issued, the SED RASA Staff who had responsibility for issuing the annual data request have moved to the Safety Policy Division (SPD) and maintained this responsibility.

[23] Ibid, Pg. 39.

[24] Analysis of the Gas Companies' June 15, 2022, Natural Gas Leak and Emissions Report (2022 Joint Report), Appendix A.

(CY 2020/2021). For the second adjustment to Distribution Mains and Services, PG&E collected pipeline leak data in 2014-2020 that aligns with Washington State University (WSU) study data and finds that the WSU study best characterizes leaks on the PG&E system overall, compared to the initial set of EFs used to establish a baseline and measure performance. Staff met with PG&E several times to evaluate the methodologies, and reached a final approval of the WSU Adjusted methodology as proposed by PG&E. The letter from SPD to PG&E approving the adjustments to 2015 Baseline emissions is included in Appendix A of the 2023 Joint Report.[25]

On August 21, 2023, SPD approved a single adjustment to the 2015 Baseline emissions for West Coast Gas (WCG). In the utility's original 2015 Baseline data for Customer Meters (Appendix 6) – Meter Leaks, West Coast Gas reported a value of 2.8 Mscf based on an estimation of the number of leaks for the year 2015. This, however, was contrary to the Population-Based methodology established as the standard by participating parties. Following the submittal of 2022 emissions data on June 15, 2023, Staff identified and resolved the discrepancy between West Coast Gas's original 2015 Baseline emissions value (of 2.8 Mscf) and the 194.177 Mscf value that West Coast Gas was now providing as the 2015 Baseline in its annual data submittals. The letter from SPD to WCGC approving the adjustments to 2015 Baseline emissions is included in Appendix A of the 2023 Joint Report.[26]

On September 23, 2024, SPD approved adjustments to the 2015 Baseline emissions for SoCalGas Appendices 3, 4, 6, and 7, as well as an adjustment to the EF used to calculate emissions from non-hazardous leaks in meter set assemblies (Appendix 6). The letter from the SPD to SoCalGas approving the adjustments to the 2015 Baseline and the EF is included in Appendix A of the 2024 Joint Report.[27]

On September 26, 2024, SPD approved adjustments to the 2015 Baseline emissions for LGS for Underground Storage (Appendix 7). LGS originally reported a Compressor Vented Emissions baseline of 99 Mscf based on an estimated utility specific EF for the pressurized operating state of each of its four compressors, however subsequent measurements taken in subsequent years yielded significantly higher results. Working with a third-party contractor, LGS updated the EF to reflect these measurements, also updating the 2015 Baseline value to 2,383 Mscf. Additionally, LGS corrected an error where the 2015 Baseline of 1,144 Mscf for Compressor and Component Fugitive Leaks had been mistakenly reported in the Component Vented Emissions category. The letter from SPD to LGS approving the adjustments to the 2015 Baseline is included in Appendix A of the 2024 Joint Report.[28]

On October 22, 2024, SPD approved an adjustment to the 2015 Baseline emissions for SDG&E Transmission Compressor Stations (Appendix 3). Per changes to the CARB Oil and Gas Regulation (COGR) in 2020, SDG&E began including leaks with concentration measures of less than 10,000 ppm in the Component Fugitive Leaks category. SDG&E updated its 2015 Baseline value of 2,919 Mscf by adding emissions from leaks with concentration measures of less than 10,000 ppm recorded in 2020 (the first year SDG&E began reporting said data), resulting in a new 2015 Baseline value of 3,512 Mscf. The letter from

[25] Analysis of the Gas Companies' June 15, 2023, Natural Gas Leak and Emissions Report (2023 Joint Report), Appendix A.

[26] Ibid

[27] Analysis of the Gas Companies' June 14, 2024, Natural Gas Leak and Emissions Report (2024 Joint Report), Appendix A.

[28] Ibid

the SPD to SDG&E approving the adjustments to the 2015 Baseline is included in Appendix A of the 2024 Joint Report.[29]

On October 3, 2025, SPD approved a change to the SoCalGas Transmission Metering and Regulating Stations (Appendix 2) reporting methodology from a population-based to a leaker-based approach using recently updated U.S. EPA Emission Factors.[30] SPD also approved an adjustment to the 2015 Baseline was, which was obtained by applying the new leaker-based methodology to data recorded in 2017 (the earliest year SoCalGas had applicable data). The letter from the CPUC/SPD to SoCalGas approving the leaker-based methodology and corresponding adjustment to the 2015 Baseline is included in Appendix A of the 2025 Joint Report.

On October 3, 2025, SPD approved a change to the SDG&E Distribution Metering and Regulating Stations (Appendix 5) reporting methodology from a population-based to a leaker-based approach using recently updated U.S. EPA Emission Factors.[31] SPD also approved an adjustment to the 2015 Baseline, which was obtained by applying the new leaker-based methodology to data recorded in 2019 (the earliest year SDG&E had applicable data). The letter from SPD to SDG&E approving the leaker-based methodology and corresponding adjustment to the 2015 Baseline is included in Appendix A of the 2025 Joint Report.

On October 8, 2025, SPD approved a change to the PG&E Transmission Metering and Regulating Stations (Appendix 2) reporting methodology from a population-based to a leaker-based approach using recently updated U.S. EPA Emission Factors.[32] SPD also approved an adjustment to the 2015 Baseline, which was obtained by applying the new leaker-based methodology to data recorded in 2022 (the earliest year PG&E had applicable data). The letter from SPD to PG&E approving the leaker-based methodology and corresponding adjustment to the 2015 Baseline is included in Appendix A of the 2025 Joint Report.

SPD's approval of new emission estimation methods and adjustments to 2015 Baseline emissions allows the CPUC and CARB to more accurately estimate the System-wide Leak Rate, as required by SB 1371, and to evaluate progress towards goals of the NGLA Program and the State to reduce methane emissions (i.e., a 20 percent reduction in methane emissions for PG&E and SoCalGas by 2025 relative to 2015 for the NGLA Program, and a 40 percent reduction in methane emissions by 2030 relative to 2015 across all sectors state-wide). These approvals will also assist CPUC and the gas companies in estimating forecasted emissions reductions of proposed measures more accurately and effectively evaluate the absolute and relative cost-effectiveness of proposed measures in future Compliance Plans.

[29] Ibid

[30] EFs are based on U.S. EPA updates to Tables W-1 and W-4, Subpart W, Part 98 published on May 14, 2024

[31] EFs are based on U.S. EPA updates to Tables W-1 and W-6, Subpart W, Part 98 published on May 14, 2024

[32] EFs are based on U.S. EPA updates to Tables W-1 and W-4, Subpart W, Part 98 published on May 14, 2024

Findings and Discussion

Natural Gas Leaks and Emissions

As described in the Executive Summary, the 2024 reported NG emissions totaled approximately 2,407 MMscf, which equates to 1.078 MMTCO2e using the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) 100- year methane Global Warming Potential (GWP) factor of 25, or 3.103 MMTCO2e using the 20-year methane GWP factor of 72 (see Table 1). This is about 2 percent YOY decrease from the 2023 estimated NG emissions of 2,461 MMscf.

System-wide Leak Rate

The System-wide Leak Rate is an important metric that shows the relative NG emissions to throughput from all respondents. SB 1371 requires annual reporting of the System-wide Leak Rate for the transmission and distribution system.[33,34]

The 2024 System-wide Leak Rate was 0.13 percent and has increased from the previous year's 2023 System-wide Leak Rate of 0.12 percent. The System-wide Leak Rate is calculated by dividing the Total Emissions by the Total Throughput, as shown in Table 4. Accordingly, the change in percentage in System-wide Leak Rate from 2023 to 2024, can be attributed to the decrease in Total Throughput from 2,062,987 MMscf in 2023 to 1,823,863 MMscf in 2024, and a decrease in Total Emissions from 2,461 MMscf in 2023 to 2,407 MMscf in 2024.

System-wide Leak Rates for the intermediate years (i.e., 2016 to 2022) are not shown because updated emission estimation methodologies have not been applied to emissions for these years.

[33] For the purposes of SB 1371, the definitions of "leak" and "gas loss" and the formula for calculating a "System-wide Leak Rate" were defined in a different manner than elsewhere. For the purposes of calculating the System-wide Leak Rate, a "leak" was defined as any breach, whether intentional or unintentional, whether hazardous or non-hazardous, of the pressure boundary of the gas system that allows NG to leak into the atmosphere. Any vented or fugitive emission to the atmosphere is considered a "leak." See Appendix B.

[34] Refer to Appendix C for Public Utilities Code Section 975(e)(6), Article 3.

Table 4: System-wide Throughput, Emissions, and Leak Rate - 2015, 2023, and 2024

Throughput Category	Natural Gas Volume (MMscf)		
	2015 Baseline	2023	2024
Total Storage Annual Volume of Injections to Storage	199,522	242,960	152,127
Total Storage Annual Volume of Gas Used Onsite	N/A	2,114	1,424
Total Transmission Annual Volume of Gas Used Onsite	7,717	9,934	8,612
Total Transmission Volume of Annual Gas transported to or for Customers in state	1,832,676	1,792,246	1,646,247
Total Transmission Volume of Annual Gas transported for Customers out of state	16,775	15,086	14,822
Total Distribution Annual Volume of Gas Used Onsite	261	647	631
Total Throughput	**2,056,950**	**2,062,987**	**1,823,863**
Total Emissions	**4,072**	**2,461**	**2,407**
System-wide Leak Rate $\left(\frac{Total\ Emissions}{Total\ Throughput}\right)$	**0.20%**	**0.12%**	**0.13%**

2023 Data Adjustments and Corrections

This report reflects adjustments to the 2023 data reported in the 2025 Joint Report. The change in emissions accounting in the 2023 respondent filings was updated for consistency and comparability with the current 2024 data.

The adjustments made to 2023 emissions include:

- Pacific Gas & Electric (PG&E):
    - The Stations Leaks & Emissions category of Transmission M&R Stations was adjusted from 559,222 Mscf to 37,833 Mscf. The emissions decrease was due to the change from using population-based EFs to leaker-based EFs. PG&E submitted a proposal to change the 2015 baseline, as well as the corresponding data for 2023 and 2024. For further information, see Appendix A.
    - The Stations Leaks & Emissions category of Distribution M&R Stations was corrected from 2,572 Mscf to 3,111 Mscf. The change was due to further review of the originally reported leak data.
    - As a result of these changes, the total 2023 emissions for PG&E changed from 1,490,564 Mscf to 846,155 Mscf.

- Southern California Gas (SoCalGas):
    - The Blowdowns category of Transmission Pipelines was corrected from 11,785 Mscf to 11,730 Mscf. SoCalGas reviewed this category and decreased the number of reported blowdown events from 2,450 to 2,449.

- The Stations Leaks & Emissions category of Transmission M&R Stations was adjusted from 114,838 Mscf to 2,438 Mscf. The change was due to the change from using population-based EFs to leaker-based EFs. SoCalGas submitted a proposal to change the 2015 baseline, as well as the data for 2023 and 2024. For further information, see Appendix A.
- The Component Fugitive Leaks category of Transmission Compressor Stations decreased from 8,658 Mscf to 8,553 Mscf. The change was due to corrections in the number of days leaking for 19 of the 599 leaks.
- The Pipeline Leaks category of Distribution Mains and Service Pipelines decreased from 477,931 Mscf to 472,038 Mscf. The decrease is due to the following changes:
  - The number of known leaks was corrected from 14,638 leaks to 14,153 leaks.
  - The estimated number of unknown leaks was corrected from 1,832 leaks to 1,794 leaks.
- The All Damages category of Distribution Mains and Service Pipelines increased from 64,097 Mscf to 64,957 Mscf. SoCalGas had reviewed this category since the original submission and corrected the number of damages from 3,174 events to 3,255 events.
- The Meter Leaks category of Customer Meters decreased from 534,261 Mscf to 534,183 Mscf. SoCalGas reviewed this category and corrected the number of leaks from 58,384 leaks to 58,373 leaks.
- The Storage Leaks and Emissions category of Underground Storage decreased from 327 Mscf to 286 Mscf. SoCalGas reviewed this category and corrected the number of leaks from 594 leaks to 593 leaks.
- The Compressor and Component Fugitive Leaks category of Underground Storage increased from 21,366 Mscf to 21,403 Mscf. SoCalGas reviewed this category and corrected the number of leaks from 1,139 leaks to 1,129 leaks.
- As a result of these changes, the total 2023 emissions for SoCalGas decreased from 1,311,294 Mscf to 1,193,619 Mscf.

- San Diego Gas & Electric (SDG&E):
  - The Blowdowns category of Transmission Pipelines was adjusted from 1,318 Mscf to 117 Mscf. The change was due to the review and correction of the previously reported emissions from a single blowdown event.
  - The Blowdowns category of Transmission Compressor Stations increased from 578 Mscf to 1,881 Mscf. The change was due to SDG&E's review of the previously reported emissions from an Emergency Shut Down test (ESD) and additional blowdown events. The original estimate of the ESD was 131 Mscf, which has been corrected to 821 Mscf.
  - The Pipeline Leaks category of Distribution Mains and Service Pipelines was adjusted from 11,079 Mscf to 14,691 Mscf. The change is due to the following changes:
    - The number of known leaks was corrected from 580 to 579.
    - The estimated number of unknown leaks was corrected from 119 to 140.
  - The Stations Leaks & Emissions category of Distribution M&R Stations was adjusted from 80,493 Mscf to 782 Mscf. The change was due to the change from using population-based EFs to leaker-based EFs. &E submitted a proposal to change the 2015 baseline, as well as the data for 2023 and 2024. For further information, see Appendix A.

- As a result of these changes, the total 2023 emissions for SDG&E decreased from 258,754 Mscf to 182,757 Mscf.

Impacts of CARB's Oil and Gas Methane Regulation

CARB's Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities, also known as the California Oil and Gas Regulation[35] (COGR) was adopted in 2017 and amended in 2023. The regulation requires quarterly leak survey frequency at transmission compressor stations and underground gas storage facilities. The regulation also requires repairs within specified timeframes for components found to be leaking above the allowed thresholds.

Both the NGLA Program and COGR require descriptive reporting entries, such as compressor facility name, types of compressors, and facility address. The data collected under the NGLA Program are used to determine the total annual emissions, whereas COGR collects and evaluates quarterly reports of compressor component leaks to determine compliance with the program requirements, including whether the reported leaks exceed the concentration thresholds. COGR also requires annual emissions flow rate measurements from reciprocating compressor rod packing and centrifugal compressor wet seals to determine whether emissions remain below the allowable emission flow rates. If component leaks or compressor emission flow rates exceed the COGR thresholds, operators are required to complete repairs within the specified timeframes.

Both PG&E's and SoCalGas's NGLA data report benefits from the COGR due to the increased granularity of the data collected. CPUC/CARB Staff reviewed both of the companies' submittals and provide the following summary of their respective reporting of Transmission Compressor Stations and Underground Storage.

The Compressor and Component Fugitive Leaks subsection of Transmission Compressor Stations includes the leaks from the transmission compressor units, such as connectors, valves, and pressure relief valves. For PG&E, the emissions from this category increased from 5,525 Mscf in 2023 to 17,839 Mscf in 2024. PG&E provided the explanation for the change was due to moving pressure relief valve leaks from the Component Vented Emissions worksheet to this section.

The Storage Fugitive Leaks and Emissions subsection of Underground Storage includes the leaks from wellhead valves, surface casing leakage, and downhole safety valve tests. For PG&E, the emissions from this category decreased from 3,175 Mscf in 2023 to 1,747 Mscf in 2024. PG&E provided the explanation that the change was due to a formula change to more accurately capture the duration of each leak.

The Compressor and Component Fugitive Leaks subsection of Underground Storage includes the valves on the underground storage compressor units, such as from connectors, valves, and pressure relief valves. For PG&E, the emissions from this category increased from 3,353 Mscf in 2023 to 6,505 Mscf in 2024. PG&E provided the explanation for the change was due to an increase in detected leaks.

For Compressor and Component Fugitive Leaks subsection of Transmission Compressor Stations,

[35] The CARB Oil and Gas Methane Regulation is promulgated under 17 California Code of Regulations (CCR), Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 13.

SoCalGas reported an emissions decrease from 8,553 Mscf in 2023 to 5,033 Mscf in 2024. SoCalGas provided the explanation for the change was due to the following:

> "Emissions decreased year-over-year by 3,520 Mscf or 41.2 percent. Emissions decreased because of the total leak count and average number of leak-days decreased year-over-year. The decrease in leak counts may be related to the continued efforts to detect and repair leaks >1,000 ppm during CARB Oil and Gas quarterly leak surveys."

In SoCalGas's Storage Fugitive Leaks and Emissions subsection of Underground Storage, the emissions decreased from 268 Mscf in 2023 to 183 Mscf in 2023. SoCalGas provided the explanation for the change was due to the following:

> "Emissions from surface equipment leaks decreased by 103 Mscf or 36.0 percent. The decrease can be attributed to a reduction in the number of leaks from surface equipment and a reduction in the average number of leak-days in 2024 relative to 2023. The decrease in leak counts may be related to the continued efforts to detect and repair leaks >1,000 ppm during CARB Oil and Gas quarterly leak surveys."

For SoCalGas's Component Fugitive Leaks subsection of Underground Storage, the emissions decreased from 21,403 Mscf in 2023 to 14,350 Mscf in 2024. SoCalGas provided the explanation for the change was due to the following:

> "Emissions from surface equipment leaks decreased year-over-year by 7,053 Mscf or 33.0 percent because fewer leaks were identified in 2024 relative to 2023. The decrease in leak counts may be related to the continued efforts to detect and repair leaks >1,000 ppm during CARB Oil and Gas quarterly leak surveys."

Summary of Gas Company– Estimated Natural Gas Emissions

In 2024, the overall NG emissions decreased by about 2 percent from 2023. Table 5 shows the YOY change in NG emissions for each gas company from 2023 to 2024. Table 5 also highlights that the four largest gas companies are responsible for approximately 99 percent of the total NG emissions in 2023 and 2024, while the remaining six gas companies account for approximately 1 percent of the total NG emissions. Changes in NG emissions for individual gas companies from 2023 to 2024 are described in this section.

Table 5: Total Natural Gas Emissions by Gas Company

Entity	2015 Baseline		2023		2024		2015 Baseline to 2024 Change		2023 - 2024 YOY Change	
	Mscf	% Total	Mscf	% Total	Mscf	% Total	Mscf	% Change	Mscf	% Change
Pacific Gas & Electric	1,665,959	41%	846,155	34%	796,113	33%	(869,846)	(52%)	(50,042)	(6%)
Southern California Gas	1,953,797	48%	1,193,619	48%	1,193,823	50%	(759,974)	(39%)	204	0.02%
San Diego Gas & Electric	204,878	5%	182,757	7%	187,346	8%	(17,533)	(9%)	4,589	3%
Southwest Gas	214,307	5%	218,187	9%	212,733	9%	(1,574)	(1%)	(5,454)	(2%)
Wild Goose Storage	24,003	0.6%	7,149	0.3%	4,285	0.2%	(19,718)	(82%)	(2,864)	(40%)
Gill Ranch Storage	3,636	0.1%	4,309	0.2%	6,036	0.3%	2,400	66%	1,727	40%
Lodi Gas Storage	3,919	0.1%	8,114	0.3%	3,828	0.2%	(91)	(2%)	(4,286)	(53%)
Central Valley Gas Storage	806	0.02%	721	0.03%	1,811	0.1%	1,005	125%	1,090	151%
West Coast Gas	700	0.02%	204	0.01%	332	0.01%	(368)	(53%)	128	63%
Alpine Natural Gas	6	<1%	263	0.01%	264	0.01%	258	4,614%	1	0.4%
Total	**4,072,012**	**100%**	**2,461,478**	**100%**	**2,406,571**	**100%**	**(1,665,441)**	**(41%)**	**(54,907)**	**(2%)**

While NG emissions are expressed in units of MMscf in Tables 1 through 4 to provide a high-level overview of emissions, Tables 5 through 18 use units of thousands of standard cubic feet (Mscf) to provide additional detail, consistent with the units that gas companies reported in their submittals for Appendix 8 of the reporting template. Staff have directed respondents to report units rounded to the nearest 1 Mscf in submittals for Appendix 8 of the reporting template to mitigate any rounding errors.

The following subsections provide a summary of the changes in NG emissions for each company by system category from 2023 to 2024. These summaries are based on information provided by respondents as part of their report filings, including gas company responses to Staff follow-up questions.

This 2025 Joint Report is the first year of implementing the change for calculating Stations Leaks and Emissions for Transmission (PG&E, SoCalGas) and Distribution (SDG&E) M&R stations from population-based EFs to leaker-based EFs. This calculation is performed by summing the individual categories of Component Vented Emissions and Component Fugitive Leaks. The Transmission M&R Stations leaker-based EFs are from the U.S. EPA tables W-1 and W-4, Subpart W, Part 98, published on

May 14, 2024. The leaker-based EFs for Distribution M&R Stations are from the U.S. EPA tables W-1 and W-6, Subpart W, Part 98, and were established using a particular method in surveying the facilities for leaks (i.e., Method 21 vs. non-Method 21). Effectively, the 2015 Baseline for these categories and 2023 and 2024 reported emissions are all on the same basis and can provide meaningful comparisons. For more information, see Appendix A.

Changes in NG emissions for individual gas companies from 2023 to 2024 are described in this section.

Pacific Gas and Electric (PG&E)

PG&E's emissions decreased 50,042 Mscf or 6 percent from 846,155 Mscf in 2023 to 796,113 Mscf in 2024. The emissions decrease is mainly attributed to the following categories: Pipeline Leaks (decrease of 40,709 Mscf), Blowdowns from Transmission Pipelines (decrease of 26,122 Mscf) and Meter Leaks (decrease of 15,358 Mscf). Some categories did see increases, most notably a third-party struck a transmission line, resulting in the All Damages category in Transmission Pipelines increasing by 37,186 Mscf. The All Damages category of Distribution Mains and Services Pipelines also increased by 18,942 Mscf.

The YOY changes in emissions or changes in inventory counts are summarized below by reporting source category:

Transmission Pipeline

- For the Pipeline Leaks category, the emissions decreased 1,544 Mscf or 43 percent from 3,583 Mscf in 2023 to 2,039 Mscf in 2024. The change was due to an EF reduction from 1.55 to 0.98 scf/d/mi in alignment with EPA subpart W as well as the reclassification of 733 miles of transmission pipeline to high pressure distribution pipeline.
- For the All Damages category, the emissions increased from 1,784 Mscf in 2023 to 38,970 Mscf in 2024. The change was due to a third-party line strike caused by farm equipment, which resulted in estimated emissions of 38,970 Mscf. PG&E explained:
  - "PG&E experienced an increase in YOY damage emissions largely due to a single incident where a third party damaged a pipeline (line strike from farm equipment). PG&E is continuing to make significant efforts to prevent pipeline dig-ins as a part of BP-24.
- For the Blowdowns category, the emissions decreased 26,122 Mscf or 47 percent from 55,499 Mscf in 2023 to 29,377 Mscf in 2024. The change was due to significantly fewer blowdowns in 2024, as well as fewer large blowdowns in 2024.
  - Staff noted that due to blowdown emissions reduction measures 210,954 Mscf of methane abatement occurred in 2024.
- For the Component Vented Emissions category, the emissions decreased 11,182 Mscf or 39 percent from 28,624 Mscf in 2023 to 17,442 Mscf in 2024. The change was due to the correction of double reporting of components and the correction of EFs.

- Transmission M&R Stations
  - For the Station Leaks & Emissions, Leaker-Based category there are two subcategories of Component Vented Emissions category and Component Fugitive Leaks, which are summed

together. The total emissions decreased 8,810 Mscf or 23 percent from 37,833 Mscf in 2023 to 29,022 Mscf in 2024. For more information, see Appendix A.

- Transmission Compressor Stations
  - For the Compressor Vented Emissions category, the emissions decreased 1,795 Mscf or 22 percent from 8,036 Mscf in 2023 to 6,241 Mscf in 2024. The change was due to a net decrease in hours in pressurized operating mode.
  - For the Component Vented Emissions category, the emissions decreased 16,198 Mscf or 78 percent from 20,739 Mscf in 2023 to 4,541 Mscf in 2024. The change was due to the moving of a pressure relief valve leaks from this section to the "Component Fugitive Leaks" tab.
  - For the Component Fugitive Leaks category, the emissions increased 12,314 Mscf or 223 percent from 5,525 Mscf in 2023 to 17,839 Mscf in 2024. The change was due to the moving of a pressure relief valve leaks from the "Component Fugitive Leaks" tab to this section.
- Distribution Mains and Services Pipelines
  - For the Pipeline Leaks category, the emissions decreased 40,709 Mscf or 14 percent from 283,604 Mscf in 2023 to 242,895 Mscf in 2024. The change was due to the accelerated leak repair of super emitter leaks. Staff confirmed the count of grade 1 leaks discovered increased from 3,739 leaks in 2023 to 4,218 leaks in 2024. The count of grade 2 leaks decreased from 2,647 leaks in 2023 to 2,304 leaks in 2024. The count of grade 3 leaks increased from 4,176 in 2023 to 4,225 in 2024.
  - For the All Damages category, the emissions increased 18,942 Mscf or 46 percent from 41,225 Mscf in 2023 to 60,167 Mscf in 2024. PG&E explained:
    - "PG&E saw higher emissions in 2024 due to an improvement in reporting methodology where the gas flow equation was updated. Also, the rise in reported damages contributed to the increase in emissions."
- Distribution M&R Stations
  - For the Station Leaks & Emissions, leaker-based category, the emissions increased 4,482 Mscf or 144 percent from 3,111 Mscf in 2023 to 7,593 Mscf in 2024. The change was due to an increase in unsurveyed leaks, as well as a correction to the count of leaks in 2023, which is described in the section on 2023 adjustments.
- Customer Meters
  - For the Meter Leaks – Leak Based category, the emissions decreased 15,358 Mscf or 7 percent from 209,060 Mscf in 2023 to 193,702 Mscf in 2024. The change was due to the decrease in detected leaks from 150,962 leaks in 2023 to 113,897 leaks in 2024
  - For the All Damages category, the emissions decreased 2,395 Mscf or 68 percent from 3,503 Mscf in 2023 to 1,108 Mscf in 2024. The change was due to a decrease in reported damages from 154 in 2023 to 71 in 2024.
- Underground Storage
  - For the Storage Leaks and Emissions category, the emissions decreased 1,428 Mscf or 45 percent from 3,175 Mscf in 2023 to 1,747 Mscf in 2024. PG&E explained:
  - Staff notes a significant decrease from 3,175 Mscf in 2023 to 1,747 Mscf in 2024.

        - "Wells/wellheads are surveyed daily, so the number of days leaking for wellhead leaks was calculated using the formula: Repair Date minus (-) Discovery Date plus (+) 1 day. This method more accurately captures the duration of each leak, resulting in a reduction in reported emissions."
    - For the Blowdowns category, the emissions decreased 3,476 Mscf or 33 percent from 10,578 Mscf in 2023 to 7,102 Mscf in 2024. The change was due to due to a correction of the double counting of blowdowns.
    - For the Component Fugitive Leaks category, the emissions increased 3,152 Mscf or 94 percent from 3,353 Mscf in 2023 to 6,505 Mscf in 2024. The change was due to an increase in detected leaks.

Southern California Gas (SoCalGas)

SoCalGas's emissions increased 204 Mscf or 0.02 percent from 1,193,619 Mscf in 2023 to 1,193,823 Mscf in 2024. The emissions increase is mainly attributed to the category of Pipeline Leaks in Distribution Mains and Services, which increased by 46,677 Mscf. This was offset by decreases in Meter Leaks (decrease of 28,443 Mscf), All Damages in Transmission Pipelines (decrease of 7,481 Mscf), and Compressor and Component Fugitive Leaks in Underground Storage (decrease of 7,053 Mscf).

The YOY changes in emissions or changes in inventory counts are summarized below by reporting category:

- Transmission Pipeline
    - For the All Damages category, the emissions decreased from 7,481 Mscf in 2023 to no emissions in 2024. SoCalGas explained:
        - "The reduction occurred because there weren't any damages that were reportable under this category for emission year (EY) 2024. Notably, a mudslide caused an Unusual Large Leak from a Transmission Pipeline during 2024, and the details of this leak are discussed in the "Unusual Large Leak" section of this document."
    - For the Blowdowns category, the emissions decreased 2,639 Mscf or 22 percent from 11,730 Mscf in 2023 to 9,091 Mscf in 2024. SoCalGas explained:
        - "The reduction can be attributed to decreased project activity and a reduction in the average volume released per pipeline blowdown during 2024 relative to 2023."
        - Staff noted that a sum of 375,378 Mscf of methane abatement occurred in 2024.
- Transmission M&R Stations
    - For the Station Leaks & Emissions, Leaker-Based category there are two subcategories of Component Vented Emissions category and Component Fugitive Leaks, which are summed together. The total emissions increased 670 Mscf or 27 percent from 2,438 Mscf in 2023 to 3,108 Mscf in 2024. For more information, see Appendix A.
- Transmission Compressor Stations
    - For the Compressor Vented Emissions category, the emissions decreased 2,180 Mscf or 15 percent from 14,366 Mscf in 2023 to 12,186 Mscf in 2024. SoCalGas explained:
        - "On average, compressors operated less in 2024 than in 2023. The decrease in average operating hours contributed to the decrease in emissions year-over-year."

  - For the Blowdowns category, the emissions increased 2,971 Mscf or 27 percent from 10,967 Mscf in 2023 to 13,938 Mscf in 2024. The change was due to the average blowdown being larger in 2024 than during 2023.
  - For the Component Vented Emissions category, the emissions increased 2,644 Mscf or 90 percent from 2,922 Mscf in 2023 to 5,566 Mscf in 2024. The change was due to asset verification and asset data enhancements. There was also an increase in the number of devices from 139 devices in 2023 to 264 devices in 2024.
  - For the Compressor and Component Fugitive Leaks category, the emissions decreased 3,520 Mscf or 41 percent from 8,553 Mscf in 2023 to 5,033 Mscf in 2024. SoCalGas explained:
    - "Emissions decreased because the total leak count and average number of leak-days decreased year-over-year. The decrease in leak counts may be related to the continued efforts to detect and repair leaks >1,000 ppm during CARB Oil and Gas quarterly leak surveys."
- Distribution Mains and Services Pipelines
  - The Pipeline Leaks category's emissions increased 46,677 Mscf or 10 percent from 472,038 Mscf in 2023 to 518,715 Mscf in 2023. SoCalGas explained:
    - "Notably, updates to EY 2023 data were completed to remove leaks or move leaks to different Appendix sections based on additional details that were collected since the EY 2023 Report was initially filed. Because the Emission Year 2023 data have undergone these updates, there is not currently an accurate comparison between Emission Years 2023 and 2024."
    - Staff compared the data and confirmed that the number of known leaks decreased from 14,153 leaks in 2023 to 12,972 leaks in 2024.
    - Staff compared the data and confirmed that the estimated number of unknown leaks increased from 1,794 leaks in 2023 to 2,114 leaks in 2024.
- Distribution Metering and Regulating Stations
  - For the Station Leaks & Emissions, Leak Based category, Staff combined emissions reported by SoCalGas as "Component Vented Emissions" and "Component Fugitive Leak." The combined emissions increased 565 Mscf or 9 percent from 6,333 Mscf reported in 2023 to 6,898 Mscf in 2024. Since SoCalGas does not include a single category for "Station Leaks & Emissions, Leak Based," Staff summed the two categories of "Component Vented Emissions" and "Component Fugitive Leaks" to ensure reporting consistency and integrity.
- Meter Set Assembly Systems
  - The Meter Leaks – Leak Based category's emissions decreased 28,443 Mscf or 5 percent from 534,183 Mscf in 2023 to 505,740 Mscf in 2024. The change was due to the decrease in number of leaks from 58,373 leaks in 2023 to 53,343 leaks in 2024.
- Underground Storage
  - For the Storage Leaks & Emissions category, the emissions decreased 103 Mscf or 36 percent from 286 Mscf in 2023 to 183 Mscf in 2024. SoCalGas explained:
    - "The decrease can be attributed to a reduction in the number of leaks from surface equipment and a reduction in the average number of leak-days in 2024 relative to

2023. The decrease in leak counts may be related to the continued efforts to detect and repair leaks >1,000 ppm during CARB Oil and Gas quarterly leak surveys."

- For the Compressor Vented Emissions category, the emissions decreased 1,588 Mscf or 34 percent from 4,669 Mscf in 2023 to 3,081 Mscf in 2024. SoCalGas explained:
  - "On average, compressors operated less in 2024 than in 2023. The decrease in average operating hours contributed to the decrease in emissions year-over-year."
- For the Blowdowns category, the emissions decreased 794 Mscf or 37 percent from 2,165 Mscf in 2023 to 1,371 Mscf in 2024. The change was due to a reduction in the number of blowdowns at the Storage Fields during 2024 relative to 2023. Staff noted the number of blowdown events decreased from 3,835 events in 2023 to 2,770 events in 2024.
- For the Component Vented Emissions category, the emissions decreased 1,241 Mscf or 58 percent from 2,126 Mscf in 2023 to 885 Mscf in 2024. The change was due to the decrease in number of gas-powered pneumatics at Honor Rancho and Aliso Canyon.
- For the Compressor and Component Fugitive Leaks category, emissions decreased 7,053 Mscf or 33 percent from 21,403 Mscf in 2023 to 14,350 Mscf in 2024. SoCalGas explained:
  - "Emissions from surface equipment leaks decreased year-over-year by 7,053 Mscf or 33.0 percent because fewer leaks were identified in 2024 relative to 2023. The decrease in leak counts may be related to the continued efforts to detect and repair leaks >1,000 ppm during CARB Oil and Gas quarterly leak surveys."

San Diego Gas & Electric (SDG&E)

SDG&E's emissions increased 4,589 Mscf or 3 percent from 182,757 Mscf in 2023 to 187,346 Mscf in 2024. The emissions increase is mainly attributed to the category of Pipeline Leaks in Distribution Mains and Services, which increased by 5,539 Mscf. This was offset by decreases in Component Vented Emissions in Transmission Pipelines (decrease of 589 Mscf), and All Damages in Customer Meters (decrease of 539 Mscf).

The YOY changes in emissions or changes in inventory counts are summarized below by reporting category:

- Transmission Pipeline
  - For the Blowdowns category, Staff noted 4,922 Mscf of methane abatement occurred in 2024 due to blowdown reduction measures.
  - For the Component Vented Emissions category, the emissions decreased from 589 Mscf in 2023 to no emissions in 2024. The change was due to the asset verification and asset data enhancements.
- Transmission M&R Stations
  - For the Station Leaks & Emissions category, the emissions stayed nearly the same at 21,792 Mscf in 2023 and 21,767 Mscf in 2024. The change was due to the number of facilities decreasing from 16 facilities in 2023 to 14 facilities in 2024.
- Transmission Compressor Stations

  - For the Compressor Vented Emissions category, the emissions decreased 282 Mscf or 20 percent from 1,387 Mscf in 2023 to 1,105 Mscf in 2024. SDG&E explained:
    - "On average, compressors operated less in 2024 than in 2023. The decrease in average operating hours contributed to the decrease in emissions year-over-year."
  - For the Component Vented Emissions category, the emissions decreased 167 Mscf or 50 percent from 336 Mscf in 2023 to 169 Mscf in 2024. SDG&E reported that the change was due to an asset verification process and asset data enhancements.
  - For the Compressor and Component Fugitive Leaks category, the emissions increased 46 Mscf or 9 percent from 502 Mscf in 2023 to 548 Mscf in 2024. The change was due to the number of leaks increasing from 42 leaks in 2023 to 43 leaks in 2024 and an increase in average leak duration in 2024 relative to 2023.
- Distribution Mains and Services Pipelines
  - For the Pipeline Leaks category, the emissions increased 5,539 Mscf or 38 percent from 14,691 Mscf in 2023 to 20,230 Mscf in 2024.
    - The change was due to the number of known leaks increasing from 579 leaks in 2023 to 745 leaks in 2024.
    - Also, the change was due to the estimated number of unknown leaks increasing from 140 leaks in 2023 to 184 leaks in 2024.
  - For the All Damages category, the emissions increased 336 Mscf or 5 percent from 6,707 Mscf in 2023 to 7,043 Mscf in 2024. The change was due to the number of damage events increasing from 320 events in 2023 to 347 events in 2024.
- Distribution Metering and Regulating Stations
  - For the Station Leaks & Emissions, Leaker-Based category, there are two subcategories of Component Vented Emissions category and Component Fugitive Leaks, which are summed together. The total emissions decreased 138 Mscf or 18 percent from 782 Mscf in 2023 to 644 Mscf in 2024. For more information, see Appendix A.
- Meter Set Assembly Systems
  - For the Meter Leaks (i.e. population-based category), the emissions increased 462 Mscf or 0.3 percent from 132,317 Mscf in 2023 to 132,779 Mscf in 2024. The change was due to the number of meters increasing from 914,996 in 2023 to 918,315 in 2024.
  - For the All Damages category, the emissions decreased 539 Mscf or 40 percent from 1,359 Mscf in 2023 to 820 Mscf in 2024. Although the number of damage events increased from 176 events in 2023 to 287 events in 2024, SDG&E explained:
    - "The decrease in emissions can be attributed to a reduction in the average emission volume per damage event in 2024 relative to 2023."

Southwest Gas (SWG)

SWG's 2024 emissions decreased 5,454 Mscf or 2 percent from 218,186 Mscf in 2023 to 212,732 Mscf in 2024. The emissions are mainly attributed to the following categories:

- For the Station Leaks & Emissions category of Transmission M&R Stations (i.e., Population-Based category), Transmission-to-Transmission Interconnects (7) remained the same from the previous year, and emissions remained constant at 10,884 Mscf.
- In Distribution M&R Stations sub-category Station Leaks & Emissions, the emissions decreased by 5,148 Mscf or 3 percent from 175,423 Mscf in 2023 to 170,275 Mscf in 2024. The change was due to 9 stations being abandoned in 2024 and 2 new stations installed for a yield of 7 less stations in 2024.
- In Customer Meters' sub-category Meter Leaks, the emissions increased 34 Mscf or 0.1 percent from 29,783 Mscf in 2023 to 29,817 Mscf in 2024. The change was due to the increase in the meter count from 207,645 meters in 2023 to 207,866 meters in 2024.

Wild Goose Storage (WGS)

WGS's 2024 emissions decreased 2,864 Mscf or 40 percent from 7,149 Mscf in 2023 to 4,285 Mscf in 2024. The emissions are mainly attributed to the following Underground Storage sub-categories:

- Compressor Vented Emissions decreased 1,381 Mscf or 95 percent from 1,454 in 2023 to 73 Mscf in 2024. The change was due to low-emission packing being installed on select compressors and to a decrease in compressor runtime.
- Blowdown emissions decreased 1,886 Mscf or 54 percent from 3,508 Mscf in 2023 to 1,622 Mscf in 2024. The change was due to fewer preventative maintenance events that require blowdowns.

Gill Ranch Storage (GRS)

GRS's 2024 emissions increased 1,727 Mscf or 40 percent from 4,309 Mscf in 2023 to 6,036 Mscf in 2024. The emissions are mainly attributed to the following Underground Storage sub-categories:

- Blowdown emissions increased 1,845 Mscf or 54 percent from 3,403 Mscf in 2023 to 5,248 Mscf in 2024. The change was due to the increased number of blowdowns from 154 events in 2023 to 309 events in 2024.
- Compressor and Component Fugitive Leaks emissions decreased 73 Mscf or 87 percent from 84 Mscf in 2023 to 11 Mscf in 2024. The change was due to the decrease in the number of leaks from 7 leaks in 2023 to 1 leak in 2024.

Lodi Gas Storage (LGS)

LGS's 2024 emissions decreased 4,286 Mscf or 53 percent from 8,114 Mscf in 2023 to 3,828 Mscf in 2024. The emissions are mainly attributed to the following categories:

- Blowdown emissions sub-category of Transmission Pipelines decreased 200 Mscf or 50 percent from 402 Mscf in 2023 to 202 Mscf in 2024. The change was due to fewer preventative maintenance events and inline pipeline inspections.

- Compressor Vented Emissions sub-category of Underground Storage decreased by 4,265 Mscf or 69 percent from 6,215 Mscf in 2023 to 1,950 Mscf in 2024. The change was due to fewer preventative maintenance events that require blowdowns.

Central Valley Gas Storage (CVGS)

CVGS's 2024 emissions increased 1,090 Mscf or 151 percent from 721 Mscf in 2023 to 1,811 Mscf in 2024. The emissions are mainly attributed to the following Underground Storage sub-categories:

- Compressor Vented Emissions increased 330 Mscf from 627 Mscf in 2023 to 957 Mscf in 2024. The change was due to an improvement in measurement method as the utility no longer relies on the time of running in operating mode to calculate emissions, but instead now uses a packing meter on each unit to measure emissions.
- Blowdown emissions increased 704 Mscf from 73 Mscf in 2023 to 777 Mscf in 2024. Most of the emissions for this category were attributed to two larger Emergency Shutdown events in 2024 compared to one smaller event in 2023, as well as one Process Shut Down event in 2024 compared to no events in 2023.

West Coast Gas (WCG)

WCG's 2024 emissions increased 128 Mscf or 63 percent from 204 Mscf in 2023 to 332 Mscf in 2024. The emissions are mainly attributed to Customer Meter Leaks, with emissions of 194 Mscf in 2023 and the same in 2024. The emissions change was from the All Damages sub-category of Distribution Mains and Services Pipeline:

- All Damages increased from no emissions in 2023 to 105 Mscf in 2024. The change was due to the increase in the number of events from no events in 2023 to two events in 2024.

Alpine Natural Gas (ANG)

ANG's 2024 emissions were nearly constant from 263 Mscf in 2023 to 264 Mscf in 2024. The emissions are mainly attributed to Customer Meter Leaks, with emissions of 258 Mscf in 2023 and 260 Mscf in 2024.

Summary of Natural Gas Emissions Grouped by Source Classification

As described in the Executive Summary, the NG emissions were grouped and evaluated by source classification, which has been useful for helping gas companies identify strategies to reduce emissions. For example, NG emissions reductions in Population-Based source classifications can only be achieved by reducing the number of pieces of equipment or by changing how emissions are measured (e.g., emissions factors). However, in other source classifications where discrete leaks are measured, NG emissions reductions can be achieved through strategies that reduce the number of leaks while keeping the same number of pieces of equipment.

Population-Based

Population-Based emissions were historically the largest source classification. However, recent changes in SoCalGas's and PG&E's Transmission M&R emissions estimates from Population-based to Leaker-based methodologies have reduced the share of emissions estimated through Population-based methods. In 2024 Population-based leaks amounted to 369,381 Mscf, or 15 percent of total emissions. To provide a more detailed analysis of Population-Based emissions, Table 6 shows the four individual emission sources that are part of this source classification.

Population-Based emissions, which are calculated based on the number of units within a system category multiplied by an EF, stay constant unless a change is made to the number of units, the EF, or both. The categories of Transmission M&R Stations, Customer Meters, and Distribution M&R Stations have undergone significant changes by the larger utilities with their development of leak measurement methods, rather than population counts. Table 6 includes emissions from those categories that are still estimated by the population count method.

Table 6: Population-Based Natural Gas Emissions

System Category, Population-Based Emissions	2015 Baseline [Mscf]	2023 [Mscf]	2024 [Mscf]	2015 Baseline to 2024 Change		2023 - 2024 YOY Change	
				Mscf	% Change	Mscf	% Change
Transmission Pipelines, Pipeline Leaks	5,238	4,943	3,383	(1,855)	(35%)	(1,560)	(32%)
Transmission M&R Stations, Station Leaks & Emissions	22,261	32,697	32,672	10,411	47%	(25)	(<1%)
Distribution M&R Stations, Station Leaks & Emissions	184,084	175,427	170,276	(13,808)	(8%)	(5,151)	(3%)
Customer Meters, Meter Leaks	153,832	162,552	163,050	9,218	6%	498	0.3%
Total Population-Based Emissions	**365,415**	**375,619**	**369,381**	**3,966**	**1%**	**(6,238)**	**(2%)**

Graded Pipeline Leaks

The following source classification, Graded Pipeline Leaks, with emissions of 782,966 Mscf in 2024, is described later in the report in the section that analyzes the results of Distribution Mains and Services.

Leaker-Based

The third source classification, Leaker-Based emissions, includes three categories applying this methodology. They are Transmission M&R Station Leaks and Emissions, Distribution M&R Station Leak and Emissions, and Customer Meter Leaks, accounting for 746,708 Mscf in 2024, or 31 percent of the inventory.

Blowdowns

The fourth source classification with 125,009 Mscf in 2024 is Blowdowns. Table 7 shows Blowdown emissions by system category. Blowdowns experienced a 16 percent decrease of 23,534 Mscf from 2023. The reduction from the 2015 Baseline emissions of 478,376 Mscf or 79 percent is primarily due to project bundling and the implementation of cross-compression practices, which move NG that would otherwise be vented to an adjacent pipeline.

Table 7: Blowdown Natural Gas Emissions

System Category	2015 Baseline [Mscf]	2023 [Mscf]	2024 [Mscf]	2015 Baseline to 2024 Change		2023 - 2024 YOY Change	
				Mscf	% Change	Mscf	% Change
Transmission Pipeline	455,055	67,748	38,803	(416,252)	(91%)	(28,945)	(43%)
Transmission M&R Stations	65,582	7,350	13,116	(52,466)	(80%)	5,766	78%
Transmission Compressor Stations	31,088	51,472	54,913	23,825	77%	3,441	7%
Distribution Mains and Services	5,046	1,503	1,199	(3,847)	(76%)	(304)	(20%)
Distribution M&R Stations	256	420	398	142	55%	(22)	(5%)
Underground Storage	46,358	20,050	16,580	(29,778)	(64%)	(3,470)	(17%)
Total	**603,385**	**148,543**	**125,009**	**(478,376)**	**(79%)**	**(23,534)**	**(16%)**

Vented Emissions

Vented Natural Gas Emissions accounted for 141,591 Mscf in 2024. Table 8 shows the detailed composition of Vented emissions. This classification includes the controlled release of NG from pneumatic devices (e.g., compressors, valves and meters) across the transmission, storage, and distribution stages.

Table 8: Vented Natural Gas Emissions

System Category	2015 Baseline [Mscf]	2023 [Mscf]	2024 [Mscf]	2015 Baseline to 2024 Change		2023 – 2024 YOY Change	
				Mscf	% Change	Mscf	% Change
Transmission Pipelines, Components, Vented	44,095	30,411	19,192	(24,903)	(56%)	(11,219)	(37%)
Transmission Pipelines, Odorizers	2,570	3,117	3,039	469	18%	(78)	(3%)
Transmission Compressors Stations, Compressors	106,257	23,789	19,532	(86,725)	(82%)	(4,257)	(18%)
Transmission Compressors Stations, Components, Vented	15,360	23,997	10,276	(5,084)	(33%)	(13,721)	(57%)
Customer Meters, Vented	2,363	942	1,758	(605)	(26%)	816	87%
Underground Storage, Compressors	98,597	15,273	8,531	(90,066)	(91%)	(6,742)	(44%)
Underground Storage, Components, Vented	95,084	82,571	79,255	(15,829)	(17%)	(3,316)	(4%)
Underground Storage, Dehydrator Vented	13	4	8	(5)	(38%)	4	100%
Total	**364,339**	**180,104**	**141,591**	**(222,748)**	**(61%)**	**(38,513)**	**(21%)**

All Damages

The next category, All Damages, increased by 45,220 Mscf or 31 percent from 145,731 Mscf in 2023 to 190,951 Mscf in 2024. This includes damages from individuals and construction companies to transmission pipelines, distribution pipelines, and customer meters. In their best practices submittal, gas companies mentioned that they conduct communication and educational campaigns to encourage individuals to contact the company before digging.

Other Leaks

The final source classification, Other Leaks, increased 3,679 Mscf or 8 percent from 46,286 Mscf in 2023 to 49,965 Mscf in 2024. This category includes Component Leaks and Storage Leaks in both Transmission Compressor Stations and Underground Storage.

Detailed Natural Gas Emissions

Natural Gas Emissions by System Category, Emission Source, and Source Classification

Table 9 summarizes and compares the 2015 Baseline, 2023, and 2024 NG emissions by system category, emission source, and source classification. In some cases, "N/A" is designated under a reporting year to show that the category was not available due to not being part of the template at that time. In other cases, "N/A" is used under the four rightmost columns to show that the emission total or percent change could not be calculated due to division by zero or because a category was not part of the template.

Table 9: Natural Gas Emissions by System Category, Emission Source, and Source Classification

System Category	Emission Source	Source Classification	2015 Baseline	2023	2024	2015 Baseline to 2024 Change		2023 - 2024 YOY Change	
			Mscf	Mscf	Mscf	Mscf	%	Mscf	%
Transmission Pipelines	Pipeline Leaks	Population-Based	5,238	4,943	3,383	(1,855)	(35%)	(1,560)	(32%)
	All Damages	Damages	81,793	9,265	38,970	(42,823)	(52%)	29,705	321%
	Blowdowns	Blowdown	455,055	67,748	38,803	(416,252)	(91%)	(28,945)	(43%)
	Component V. Emissions	Vented	44,095	30,411	19,192	(24,903)	(56%)	(11,219)	(37%)
	Odorizers	Vented	2,570	3,117	3,039	469	18%	(78)	(3%)
Transmission M&R Stations	Station Leaks & Emissions	Population-Based	22,261	32,697	32,672	10,411	47%	(25)	(0.1%)
	Station Leaks & Emissions	Leaker-Based	46,982	40,271	32,131	(14,851)	(32%)	(8,140)	(20%)
	Blowdowns	Blowdown	65,582	7,350	13,116	(52,466)	(80%)	5,766	78%
Transmission Compressor Stations	Compressor Emissions	Vented	106,257	23,789	19,532	(86,725)	(82%)	(4,257)	(18%)
	Blowdowns	Blowdown	31,088	51,472	54,913	23,825	77%	3,441	7%
	Component Ven. Emissions	Vented	15,360	23,997	10,276	(5,084)	(33%)	(13,721)	(57%)
	Component Fugitive Leaks	Other Leaks	34,090	14,580	23,420	(10,670)	(31%)	8,840	61%
	Storage Tank Leaks & Emissions	Other Leaks	278	170	3	(275)	(99%)	(167)	(98%)
Distribution Mains & Services	Pipeline Leaks	Pipeline Leaks	1,235,602	771,455	782,966	(452,636)	(37%)	11,511	1%
	All Damages	Damages	230,912	113,531	133,663	(97,249)	(42%)	20,132	18%
	Blowdowns	Blowdown	5,046	1,503	1,199	(3,847)	(76%)	(304)	(20%)
Distribution M&R Stations	Station Leaks & Emissions	Population-Based	184,084	175,427	170,276	(13,808)	(8%)	(5,151)	(3%)
	Station Leaks & Emissions	Leaker-Based	19,167	10,226	15,135	(4,032)	(21%)	4,909	48%
	All Damages	Damages	0	0	21	21	N/A	21	N/A
	Blowdowns	Blowdown	256	420	398	142	55%	(22)	(5%)
Customer Meters	Meter Leaks	Population-Based	153,832	162,552	163,050	9,218	6%	498	0.3%
	Meter Leaks	Leaker-Based	972,061	743,243	699,442	(272,619)	(28%)	(43,801)	(6%)
	All Damages	Damages	5,233	22,935	18,297	13,064	250%	(4,638)	(20%)
	Vented Emissions	Vented	2,363	942	1,758	(605)	(26%)	816	87%
Underground Storage	Storage Leaks & Emissions	Other Leaks	5,182	3,462	1,966	(3,216)	(62%)	(1,496)	(43%)
	Compressor Emissions	Vented	98,597	15,273	8,531	(90,066)	(91%)	(6,742)	(44%)
	Blowdowns	Blowdown	46,358	20,050	16,580	(29,778)	(64%)	(3,470)	(17%)
	Component Ven. Emissions	Vented	95,084	82,571	79,255	(15,829)	(17%)	(3,316)	(4%)
	Component Fugitive Leaks	Fugitive	107,572	28,074	24,576	(82,996)	(77%)	(3,498)	(12%)
	Dehydrator Ven. Emissions	Vented	13	4	8	(5)	(38%)	4	100%
Total			**4,072,012**	**2,461,478**	**2,406,571**	**(1,665,441**	**(41%)**	**(54,907)**	**(2%)**

Description of the Seven System Categories

Transmission Pipelines

PG&E, SoCalGas, SDG&E and LGS reported Transmission Pipeline emissions. The total emissions decreased 12,097 Mscf or 10 percent from 115,484 Mscf in 2023 to 103,387 Mscf in 2024, with most of the decrease attributed to reductions in blowdown emissions and component vented emissions.

- Pipeline Leaks decreased by 1,560 Mscf from 4,943 Mscf in 2023 to 3,383 Mscf in 2024. Typically, emissions for this category have remained constant because the emissions are based on the miles of transmission pipelines, which does not vary much YOY. The observed decrease was caused by PG&E reducing the EF in accordance with EPA subpart W guidance, as well as reclassifying portions of their high-pressure pipeline from transmission to distribution.
- In 2024, All Damages increased by 29,705 Mscf or 321 percent from 9,265 Mscf in 2023 to 38,970 Mscf in 2024. These emissions are event-based and can fluctuate significantly YOY.
- Blowdowns showed a YOY reduction of 28,945 Mscf or 43 percent from 67,748 Mscf in 2023 to 38,803 Mscf in 2024. There are several factors affecting blowdowns and the potential for YOY fluctuations, including the cyclical nature of O&M; the ability to bundle projects; the amount of pipeline replacement; the size, length and pressure of the pipelines affected; and the number of safety events occurring.
- Component Vented Emissions decreased by 11,219 Mscf or 37 percent from 30,411 Mscf in 2023 to 19,192 Mscf in 2024. This reduction is primarily attributable to a tabulation correction in PG&E reporting that removed transmission M&R and compressor station leaks from Transmission Pipeline leaks.
- Odorizer emissions remained relatively constant with 3,117 Mscf in 2023 and 3,039 Mscf in 2024.

Table 10: Transmission Pipelines Natural Gas Emissions

Source	2015 Baseline		2023		2024		2023 - 2024 YOY Change	
	Mscf	% Total	Mscf	% Total	Mscf	% Total	Mscf	% Change
Pipeline Leaks	5,238	1%	4,943	4%	3,383	3%	(1,560)	(32%)
All Damages	81,793	14%	9,265	8%	38,970	38%	29,705	321%
Blowdowns	455,055	77%	67,748	59%	38,803	38%	(28,945)	(43%)
Component Vented Emissions	44,095	7%	30,411	26%	19,192	19%	(11,219)	(37%)
Odorizers	2,570	<1%	3,117	3%	3,039	3%	(78)	(3%)
Total	**588,751**	**100%**	**115,484**	**100%**	**103,387**	**100%**	**(12,097)**	**(10%)**

Transmission M&R Stations

PG&E, SoCalGas, SDG&E, SWG, and CVGS reported total Transmission M&R Stations emissions of 77,919 Mscf in 2024. This system category was historically largely Population-Based.[36] However, since the 2024 Joint Report, both SoCalGas and PG&E have transitioned to using Leaker-Based methodologies for this category.

- Station Leaks & Emissions estimated through Population-based methodologies decreased 25 Mscf or 0.1 percent from 32,697 Mscf in 2023 to 32,672 Mscf in 2024.
- Station Leaks & Emissions estimated through Leaker-based methodologies decreased 8,140 Mscf or 20 percent from 40,271 in 2023 to 32,131 in 2024.
- In 2024, Blowdowns increased 5,766 Mscf or 17 percent YOY from 7,350 Mscf in 2023 to 13,116 Mscf in 2024.

Table 11: Transmission M&R Stations Natural Gas Emissions

Source	2015 Baseline		2023		2024		2023 - 2024 YOY Change	
	Mscf	% Total	Mscf	% Total	Mscf	% Total	Mscf	% Change
Station Leaks & Emissions, Population	22,261	17%	32,697	41%	32,672	42%	(25)	(0.1%)
Station Leaks & Emissions, Leaker	46,982	35%	40,271	50%	32,131	41%	(8,140)	(20%)
Blowdowns	65,582	49%	7,350	9%	13,116	17%	5,766	78%
Total	**134,825**	**100%**	**80,318**	**100%**	**77,919**	**100%**	**(2,399)**	**(3%)**

Transmission Compressor Stations

PG&E, SoCalGas, and SDG&E reported 2024 total Transmission Compressor Station emissions of 108,144 Mscf, which is a 5,864 Mscf or 5 percent decrease from 2023 emissions of 114,008 Mscf.

- Compressor Emissions decreased by 4,257 Mscf or 18 percent YOY from 23,789 Mscf in 2023 to 19,532 Mscf in 2024. The decrease in emissions is due to variances in pressurized operating hours and compressor-specific EFs.
- In 2024, Blowdowns increased by 3,441 Mscf or 7 percent from 51,472 Mscf in 2023 to 54,913 Mscf in 2024.

[36] Population-Based emissions in this category are calculated based on the number of Transmission M&R stations multiplied by an EF to obtain the emission estimate.

- Component Vented Emissions decreased by 13,721 Mscf or 57 percent from 23,997 Mscf in 2023 to 10,276 Mscf in 2024.
- Compressor and Component Fugitive Leaks increased by 8,840 Mscf, or 61 percent from 14,580 Mscf in 2023 to 23,420 Mscf in 2024. Compressor and Component Leaks are further described in the section, "Impacts of CARB's Oil and Gas Methane Regulation."
- Storage Tank Leaks and Emissions decreased by 167 Mscf, from 170 Mscf reported in 2023 to 3 Mscf in 2024.

Table 12: Transmission Compressor Stations Natural Gas Emissions

Source	2015 Baseline		2023		2024		2023 - 2024 YOY Change	
	Mscf	% Total	Mscf	% Total	Mscf	% Total	Mscf	% Change
Compressor Emissions	106,257	57%	23,789	21%	19,532	18%	(4,257)	(18%)
Blowdowns	31,088	17%	51,472	45%	54,913	51%	3,441	7%
Component Vented Emissions	15,360	8%	23,997	21%	10,276	10%	(13,721)	(57%)
Compressor and Component Fugitive Leaks	34,090	18%	14,580	13%	23,420	22%	8,840	61%
Storage Tank Leaks & Emissions	278	0.1%	170	0.1%	3	<1%	(167)	(98%)
Total	**187,073**	**100%**	**114,008**	**100%**	**108,144**	**100%**	**(5,864)**	**(5%)**

Distribution Mains & Services

PG&E, SoCalGas, SDG&E, SWG, WCG, and ANG reported total Distribution M&S Emissions of 917,828 Mscf in 2024, which is an increase of 31,339 Mscf or 4 percent from 886,489 Mscf in 2023.

- Pipeline Leaks increased 11,511 Mscf or 1 percent from 771,455 Mscf in 2023 to 782,966 Mscf in 2024. This category is the single largest category in the whole inventory and is further described in the section below, "Detailed Description of Distribution Mains and Services Leaks and Emissions."
- All Damages increased by 20,132 Mscf from 113,531 Mscf in 2023 to 133,663 Mscf in 2024.
- Blowdowns decreased 304 Mscf or 20 percent from 1,503 Mscf reported in 2023 to 1,199 Mscf reported in 2024.

Table 13: Distribution Mains and Services Emissions

Source	2015 Baseline		2023		2024		2023 - 2024 YOY Change	
	Mscf	% Total	Mscf	% Total	Mscf	% Total	Mscf	% Change
Pipeline Leaks	1,235,602	84%	771,455	87%	782,966	85%	11,511	1%
All Damages	230,912	16%	113,531	13%	133,663	15%	20,132	17%
Blowdowns	5,046	0.3%	1,503	0.2%	1,199	0.1%	(304)	(20%)
Total	**1,471,560**	**100%**	**886,489**	**100%**	**917,828**	**100%**	**31,339**	**4%**

Detailed Description of Distribution Mains and Services Leaks and Emissions

The data provided by gas companies include leak discovery date, repair date, leak grade, pipeline classification as either main or service, pipeline material, method of discovery, and emissions calculation.

Table 14 shows the count of each leak grades 1 – 3, Above Ground Hazardous leaks, and Above Ground Non-Hazardous leaks. Grade 3 leaks make up 79 percent of the Distribution mains and services leaks inventory that is not repaired by the end of the year. A significant amount of grade 3 leaks carryover from previous years. In addition, PG&E uses an approved protocol where it prioritizes the repair of its "Super Emitters" to maximize the emissions reduction and as a result more grade 3 leaks are carried over to subsequent years.

Table 14: Leak Count by Grade in 2024

Leak Grade	Carried Over from 2023	Discovered in 2024	Repaired in 2024	Estimated Un-surveyed	Remaining Total	% of Total
Grade 1	18	7,626	(7,400)	N/A	**244**	**1%**
Grade 2	2,276	5,221	(4,008)	N/A	**3,489**	**19%**
Grade 3	11,731	7,912	(5,186)	N/A	**14,457**	**79%**
Above Ground – Hazardous	0	0	0	0	**0**	**0%**
Above Ground - Non-Hazardous	0	0	0	0	**0**	**0%**
Total	14,025	20,759	(16,594)	0	**18,190**	**100%**

For further analysis on leak repairs, Table 15 shows the average days to repair per gas company and per grade, along with a weighted average for 2024.

As shown on Table 15, the Grade 1 leaks are repaired quickly, taking a weighted average of two days to fix. Grade 2 leaks show more variability across the four gas companies with a range from 11 to 185 days to repair, with a weighted average of 157 days to repair. Finally Grade 3 leaks show the most variability with a range from 28 to 759 days to repair, and a weighted average of 477 days to repair.

Table 15: Average Days to Repair by Gas Company, 2024

Company	Average Days to Repair		
	Grade 1	Grade 2	Grade 3
Pacific Gas & Electric	2	170	759
Southern California Gas	1	185	286
San Diego Gas & Electric	1	24	NA
Southwest Gas	1	11	28
2024 - Weighted Average	**2**	**157**	**477**

Distribution M&R Stations

PG&E, SoCalGas, SDG&E, SWG, and ANG reported 2024 total emissions in this category of 185,830 Mscf, which decreased by 243 Mscf or 0.1 percent from the 186,073 Mscf reported in 2023 (see Table 16).

- The Station Leaks & Emissions is a Population-Based category for SWG and ANG decreased 5,151 Mscf or 3 percent from 175,427 Mscf in 2023 to 170,276 Mscf in 2024.
- PG&E, SoCalGas, and SDG&E reported Station Leaks & Emissions using Leaker-Based methodologies, which showed an increase of 4,909 Mscf or 48 percent from 10,226 Mscf in 2023 to 15,135 Mscf in 2024. This is largely attributable to an increase in PG&E's estimation of the number of unsurveyed leaks.
- All damages increased from no emissions in 2023 to 21 Mscf in 2024 from SDG&E.
- Blowdown emissions decreased by 22 Mscf or 5 percent from 420 Mscf reported in 2023 to 398 Mscf in 2024.

Table 16: Distribution M&R Stations Natural Gas Emissions

Source	2015 Baseline		2023		2024		2023 - 2024 YOY Change	
	Mscf	% Total	Mscf	% Total	Mscf	% Total	Mscf	% Change
Station Leaks & Emissions, Population-Based	184,084	90%	175,427	94%	170,276	92%	(5,151)	(3%)
Station Leaks & Emissions, Leaker-Based	19,167	9%	10,226	5%	15,135	8%	4,909	48%
All Damages	0	0%	0	0%	21	0.01%	21	NA
Blowdowns	256	0.1%	420	0.2%	398	0.2%	(22)	(5%)
Total	**203,507**	**100%**	**186,073**	**100%**	**185,830**	**100%**	**(243)**	**(0.1%)**

Customer Meters

PG&E, SoCalGas, SDG&E, SWG, WCG, and ANG reported Customer Meter emissions totaling 882,546 Mscf in 2024, which decreased by 47,125 Mscf or 5 percent from 929,672 Mscf in 2023.

- Meter Leaks reported using Population-Based methods, as reported by ANG, SDG&E, SWG, and WCGC increased by 498 Mscf or 0.3 percent from 162,552 Mscf in 2023 to 163,050 Mscf in 2024.
- Meter Leaks reported using Leaker-Based methods, as reported by PG&E and SoCalGas decreased by 43,801 Mscf or 6 percent from 743,243 Mscf in 2023 to 699,442 Mscf in 2024.
- The All Damages category was not part of the 2015 reporting but was added in 2019. This category decreased by 4,638 Mscf or 20 percent from 22,935 Mscf in 2023 to 18,297 Mscf in 2024.
- Vented Emissions increased by 816 Mscf or 87 percent YOY from 942 Mscf in 2023 to 1,758 Mscf in 2024. These blowdown emissions are a function of O&M activity levels and vary YOY due to a variety of repair work and maintenance performed on Customer Meters.

Table 17: Customer Meters Natural Gas Emissions

Source	2015 Baseline		2023		2024		2023 - 2024 YOY Change	
	Mscf	% Total	Mscf	% Total	Mscf	% Total	Mscf	% Change
Meter Leaks, Population-Based	153,832	14%	162,552	17%	163,050	18%	498	0.3%
Meter Leaks, Leaker-Based	972,061	86%	743,243	80%	699,442	79%	(43,801)	(6%)
All Damages	5,233	0.5%	22,935	2%	18,297	2%	(4,638)	(20%)
Vented Emissions	2,363	0.2%	942	0.1%	1,758	0.2%	816	87%
Total	**1,133,489**	**100%**	**929,672**	**100%**	**882,546**	**100%**	**(47,125)**	**(5%)**

Underground Storage

PG&E, SoCalGas, CVGS, GRS, LGS, and WGS reported Underground Storage systems emissions for 2024. As seen in Table 18 below, Underground Storage emissions decreased by 18,518 Mscf or 12 percent from 149,434 Mscf in 2023 to 130,916 Mscf in 2024.

- Storage Leaks and Emissions decreased by 1,496 Mscf or 43 percent from 3,462 Mscf in 2023 to 1,966 Mscf in 2024. This emission source is further described in the section, "Impacts of CARB's Oil and Gas Methane Regulation."
- Compressor Emissions decreased by 6,742 Mscf or 44 percent from 15,273 Mscf in 2023 to 8,531 Mscf in 2024.
- Blowdown emissions decreased by 3,470 Mscf or 17 percent from 20,050 Mscf in 2023 to 16,580 Mscf in 2024.
- Component Vented Emissions remained relatively constant with a decrease of 3,316 Mscf or less than 4 percent from 82,571 Mscf in 2023 to 79,255 Mscf in 2024.
- Compressor and Component Fugitive Leaks decreased by 3,498 Mscf or 12 percent from 28,074 Mscf in 2023 to 24,576 Mscf in 2024. The component leaks sub-category is further described in the 2021 Joint Report section, "Impacts of CARB's Oil and Gas Methane Regulation."
- Dehydrator Vented Emissions increased 4 Mscf from 4 Mscf in 2023 to 8 Mscf in 2024.

Table 18: Underground Storage Natural Gas Emissions

Source	2015 Baseline		2023		2024		2023 - 2024 YOY Change	
	Mscf	% Total	Mscf	% Total	Mscf	% Total	Mscf	% Change
Storage Leaks & Emissions	5,182	2%	3,462	2%	1,966	2%	(1,496)	(43%)
Compressor Emissions	98,597	28%	15,273	10%	8,531	7%	(6,742)	(44%)
Blowdowns	46,358	13%	20,050	13%	16,580	13%	(3,470)	(17%)
Component Vented Emissions	95,084	27%	82,571	55%	79,255	61%	(3,316)	(4%)
Compressor and Component Fugitive Leaks	107,572	30%	28,074	19%	24,576	19%	(3,498)	(12%)
Dehydrator Vented Emissions	13	<1%	4	<1%	8	<1%	4	100%
Total	**352,806**	**100%**	**149,434**	**100%**	**130,916**	**100%**	**(18,518)**	**(12%)**

Unusual Large Leaks

A single unusual large leak event resulting in 137,835 Mscf of emissions was reported by SoCalGas in 2024 as the result of a mudslide that damaged a transmission pipeline. No unusual large leaks were reported in 2023.

Lessons Learned and Conclusion

Lessons Learned

In 2024, Staff worked with gas companies to evaluate and approve emission estimation methodologies and adjustments to the 2015 Baseline emissions, refine the reported annual data, and determine YOY changes in emissions. The processes for the submittal and review of the annual reported data collection were the same as previous years. As in prior years, there were lessons learned from this year's submittal and review process, some of which include:

- Staff received a request to designate to the category of unusual large leak, a large methane emissions release of 137,835 Mscf, which occurred due to a mudslide. Staff agreed that this designation would be appropriate as this category was created to separate emissions such as these from usual daily operations. The magnitude of this one leak would present an artificial inflation in the total of all utilities' emissions in 2024, and would likely be followed by a corresponding decrease in 2025. Staff have used this designation previously in the 2015 and 2016 report for emissions from the Aliso Canyon Gas Leak. The current definition of this category, which appears in the Summary of Appendix 8, specifies the duration of an unusual large leak should be more than 24 hours to be considered as unusually large. Although the leak in this case was only 2.5 hours staff determined it should qualify as an unusual large leak. CPUC approved the designation as an unusual large leak for this report, while noting the definition will be discussed for possible revision at the 2026 Winter Workshop.
- Data management: To improve the data review process in the next annual data request, Staff will recommend file size limits no larger than 30 MB, and request Excel spreadsheets for data submittals.

The 2026 Winter Workshop will be the appropriate venue for further collaboration and discussion among CPUC, CARB, and gas companies on topics discussed in this report. Staff plan to discuss with the utilities practices that have contributed most to emissions reductions to date, how to best communicate historical trends, and next steps for the NGLA Program.

Conclusion

CPUC and CARB staff continue to work collaboratively with gas companies to provide for the public the total estimated NG emissions associated with fugitive leaks and vented emissions from the natural gas transmission and distribution system in California and the system-wide NG leak rate while maintaining safety as the highest priority, as ordered by the CPUC decision approving the Natural Gas Leak Abatement Program, consistent with Senate Bill 1371 (D.17-06-015).

Staff will continue working with interested parties to update methodologies and EFs that can improve the existing baseline and annual emissions reductions achieved. Total reductions in the 2024 estimated NG emissions resulted from the application of best practices, the implementation of COGR, and changes in methodologies and EFs. With net reported reductions to date of 41 percent from the adjusted 2015 Baseline, emission reductions have exceeded the NGLA Program's statewide emission reduction goal of 40 percent by 2030, several years ahead of schedule and progress will continue to be made in future years.

Appendices

Appendix A: CPUC/SPD Approval of Methodology and 2015 Baseline Emissions Changes

In the current reporting year, Southern California Gas (SoCalGas), San Diego Gas & Electric (SDG&E) and Pacific Gas & Electric (PG&E) proposed methodology changes and adjustments to the 2015 Baseline to account for improved methodologies. CPUC and CARB worked collaboratively with SoCalGas, SDG&E, and PG&E to evaluate their proposed adjustments. On October 3, 2025, CPUC sent approval letters to SoCalGas and SDG&E approving adjustments to the emission calculation methodologies and 2015 Baseline of their Transmission Metering and Regulating Stations (Appendix 2) and Distribution Metering and Regulating Stations (Appendix 5), respectively. Following this, CPUC sent an approval letter to PG&E on October 8, 2025, also approving adjustments to the emission calculation methodology and 2015 Baseline of their Transmission Metering and Regulating Stations (Appendix 2).

SPD's letters approving the adjusted 2015 Baseline emissions for SoCalGas, SDG&E, and PG&E are provided in Sections A.1, A.2 and A.3, respectively, of this appendix.

A.1 SPD Letter Approving Methodology Change and Adjusted 2015 Baseline Emissions for SoCalGas

STATE OF CALIFORNIA GAVIN NEWSOM, *Governor*

PUBLIC UTILITIES COMMISSION
505 Van Ness Avenue
San Francisco, CA 94102-3298

Safety Policy Division
Approval of Methodology Changes and Adjusted 2015 Baseline Emissions
Transmission Metering and Regulating Stations (Appendix 2)
Southern California Gas Company
SB 1371, R.15-01-008

October 3, 2025

1. Summary of CPUC/SPD Approvals of Methodology Changes and Adjusted 2015 Baseline Emissions

The California Public Utility Commission/Safety Policy Division (CPUC/SPD) approves the change from a population-based to leaker-based methodology using recently updated U.S. EPA Emission Factors (EFs) for calculating the annual volume of natural gas (NG) emissions from Transmission Metering and Regulating (M&R) Stations proposed by Southern California Gas (SoCalGas). SPD also approves the corresponding adjusted 2015 baseline emissions, shown below:

Appendix #	System Category	Source Category	2015 Baseline Emissions (Mscf, NG)	
			Original (Population-Based)[1]	Adjusted (Leaker Based)[2]
2	Transmission M&R Stations	[1]Station Emissions	110,296	N/A
		[2]Component Vented Emissions	N/A	6,220
		[2]Component Fugitive Leaks	N/A	386
		Total	110,296	6,606

[1]Including vented emissions and fugitive leaks added together.
[2]2017 data.

Periodically updating emission factors (EFs) is good practice. Staff note that to produce the most accurate emissions estimates, other factors (number of leaks and duration of those leaks) also play critical roles in determining the magnitude of these estimates. U.S. EPA new EFs (Tables W-1 and W-4, Subpart W, Part 98) were established using a particular method in surveying the facilities for leaks (i.e., Method 21 vs. non-Method 21). To use these EFs, utilities must adhere to the corresponding method in surveying their leaks, and the surveying equipment must have the same sensitivity or better than that of the U.S. EPA's.

The CPUC may audit Natural Gas Leak Abatement (NGLA) Program emission measurement practices and self-reported data in the future, including site visits and/or review of records used to determine baseline adjustments. Additional adjustments to the 2015 baseline emissions may be made in the future because of audit and verification activities.

Please refer to Section 3 of this document for details regarding the approved U.S. EPA EFs and adjustments to 2015 Baseline Emissions.

2. Background

On September 14, 2014, Governor Jerry Brown signed into law SB 1371 (Leno, 2014) requiring reporting and mitigation of emissions from CPUC-regulated gas pipeline facilities.[37] The bill requires gas corporations to file a report summarizing utility leak management practices, a list of new natural gas leaks by grade, a list of open leaks that are being monitored or are scheduled to be repaired, and a best estimate of gas loss due to leaks.

SB 1371 also requires the adoption of rules and procedures to minimize natural gas leakage from Commission-regulated natural gas pipeline facilities consistent with Section 192.703(c) of Subpart M of Title 49 of the Code of Federal Regulation, the Commission's General Order (GO) 112-F, and the State's goal of reducing GHG emissions.

In January 2015, the Commission opened an Order Instituting Rulemaking (R.) 15-01-008 to implement the provisions of SB 1371. On June 15, 2017, the Commission in decision (D.) 17-06015 approved the NGLA Program consistent with SB 1371. This decision established Best Practices (BPs) and reporting requirements for the NGLA Program to be developed by CPUC in consultation with the California Air Resources Board (CARB).[38] The decision implements these and other practices and requirements to support the State's goal to reduce methane emissions 40% by 2030 relative to 2013, established in SB 1383 (Lara, 2016).[39] This decision also affirmed that the 2015 Baseline emissions estimates will provide the starting point to measure future natural gas emissions reductions.[40]

On August 15, 2019, the Commission approved D.19-08-020 establishing additional policies and mechanisms for the NGLA Program pursuant to SB 1371 and SB 1383. This decision adopted a restriction

[37] Leno, Chapter 525, Statutes of 2014.

[38] Leno, 2014; Pub. Util. Code §§ 975, 977, 978.

[39] Lara, Chapter 395, Statutes of 2016: docs.cpuc.ca.gov/PublishedDocs/Published/G000/M311/K449/311449621.PDF.

[40] docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=190740714, Finding of Fact #13, Pg. 145.

on rate recovery beginning in 2025, for emissions greater than 20% below the 2015 Baseline levels for Pacific Gas and Electric Company (PG&E) and SoCalGas to ensure they achieve their intended emissions reductions.

This decision also specified that CPUC, in consultation with CARB, may approve adjustments to the utilities' 2015 baseline emissions, and that the new baseline shall be used for determining rate recovery for methane emissions.

CPUC, CARB, and SoCalGas have been collaborating to improve emission measurement and adjustment methods, as well as to adjust the 2015 baseline emissions to incorporate these improvements. An adjusted baseline will help CPUC and SoCalGas to more accurately estimate forecasted emissions reductions of proposed measures and more effectively evaluate the absolute and relative cost-effectiveness of proposed measures in future Compliance Plans. Improved emissions estimates and baseline adjustments will also better align with the Annual Joint Reports, resulting in more cohesive public reporting of data.

3. Explanation of Methodology Changes and Adjustments to 2015 Baseline Emissions

This section explains the adjustments made to the emissions estimate methodology and baseline emissions estimate, from a population-based to a leaker-based methodology.

a. Number of Stations

Since 2015, the annual reporting template has used population-based emission factors (EFs) to estimate emissions from Transmission M&R Stations. Such "population-based" approaches estimate emissions by assuming an average EF that a class of station emits and multiplying the total number of stations by that EF. SoCalGas informed CPUC that the magnitude of these emissions (110,296 Mscf) did not fit with observations in the field and these EFs did not account for the specific leaks and components that have the potential to emit. In addition, the population based EFs did not allow operators to account for emission abatement efforts such as increased survey frequency and repair prioritization.

This emissions measurement method is now revised from the population-based approach to a leaker-based approach, with the sum of the two categories for Component Vented Emissions and Component Fugitive Leaks as indicated in the next two sections. Because SoCalGas does not have adequate measurements from 2015, the adjusted baseline instead uses 2017 as a proxy year.

The leaker-based EFs are from the U.S. EPA, Tables W-1 and W-4, Subpart W, Part 98, published on May 14, 2024. Prior to this approval, the following sequence of collaborative events took place between CPUC, CARB, and utilities:

*The Joint Utilities (SoCalGas, San Diego Gas and Electric [SDG&E], PG&E, and Southwest Gas) delivered a presentation on this subject, titled "Proposed Modification to Appendix 2 & 5 Emission Factors" at the Winter Workshop on February 12, 2025.

*CPUC sent the Joint Utilities a set of questions on March 25, 2025, to request a better understanding of the source of the U.S. EPA EFs and received a reply on April 17, 2025.

*CPUC hosted a virtual meeting with CARB and the utilities on April 21, 2025, titled, "NGLA EF Change Discussion." During this meeting, SoCalGas shared their own study that investigated potential EFs for their transmission M&R stations, with conclusions they stated supported use of the U.S. EPA EFs.

*After SoCalGas sent their study titled, "Transmission M&R Station Emission Quantification Report," CPUC and CARB asked a set of follow-up questions clarifying methods, results, and conclusions on July 11, 2025, and received the reply on July 22, 2025.

*CPUC sent a final set of five questions to SoCalGas, SDG&E, and PG&E regarding leak survey methods for M&R stations on August 13, 2025. PG&E replied with more information about their use of infrared detection methods on August 20, 2025. SoCalGas and SDG&E replied with a similar description of using infrared detection methods on August 22, 2025.

b. Component Vented Emissions

The Component Vented Emissions records the leaker-based measurements associated with the operational design and function of the components, such as pneumatic devices which 'bleed' gas by design. The following EFs were adopted from the U.S. EPA, leaker-based EFs, Table W-1, Subpart W, Part 98, for pneumatic devices with various bleed rates.

System Category	Source Category	Component (pneumatic devices)	Emission Factor* (Mscf/day/dev, NG)
Transmission M&R Stations	Component Vented Emissions	Continuous Low Bleed	0.163
		Continuous High Bleed	0.720
		Intermittent Bleed	0.055

SoGalGas proposed to use the 2017 data, as a proxy baseline, to support a leaker-based methodology and reported that the 2017 pneumatic emissions in its Transmission M&R Stations are approximately 6,220 Mscf, as shown below:

Source Category	2015 Baseline Emissions (Mscf, NG)	
	Original (Population-based)	Adjusted* (Leaker-based)
Component Vented Emissions	N/A	6,220

*2017 data.

c. Component Fugitive Leaks

The Component Fugitive Leaks records the leaker-based measurements associated with the unintentional release of emissions from components, such as connector, valves, and other treaded connections. The following EFs were derived from the U.S. EPA, Table W-4, Subpart W, Part 98 for a non-Method 21 leaks survey, as specified in SS 98.234(a)(1), (3) or (5). These EFs measure total hydrocarbon emissions and are converted to NG volumes, using California's average hydrocarbon molar content of 0.98, reported by the utilities.

System Category	Source Category	Component	Emission Factor* (Mscf/day/dev, NG)
Transmission M&R Stations	Component Fugitive Leaks	Valve	0.257
		Connector	0.228
		Open-Ended Line	0.451
		Pressure Relief Valve	0.080
		Meter	0.117
		Other	0.164

*Adjusted to California's NG total hydrocarbon content (0.98).

SoCalGas reported that the 2017 total vented emissions, as the sum of all fugitive natural gas from component leaks in the Transmission M&R Stations, are approximately 386 Mscf.

Source Category	2015 Baseline Emissions (Mscf, NG)	
	Original (Population-based)	Adjusted* (Leaker-based)
Component Fugitive Leaks	N/A	386

*2017 data.

To have a common basis for comparison, CPUC/SPD requested SoCalGas to revise the 2024-2025 reporting year emissions to have the same methodology of determining the Transmission M&R Stations emissions, which is the sum of the Component Vented Emissions and Component Fugitive Leaks for each of those years.

4. Conclusion

The above changes to the methodology and 2015 baseline are subject to CPUC audit and verification. The CPUC may decide to audit elements of the NGLA Program in the future, including site visits and/or review

of records used to determine baseline adjustments. Additional adjustments to the 2015 baseline emissions may be made in the future as a result of utility requests, or audit and verification activities.

SPD approves SoCalGas's proposed adjustments to its methodology and 2015 baseline changes for Appendix 2.

Danjel Bout
Director, Safety Policy Division

A.2 SPD Letter Approving Methodology Change and Adjusted 2015 Baseline Emissions for SDG&E

STATE OF CALIFORNIA GAVIN NEWSOM, *Governor*

PUBLIC UTILITIES COMMISSION
505 Van Ness Avenue
San Francisco, CA 94102-3298

Safety Policy Division
Approval of Methodology Changes and Adjusted 2015 Baseline Emissions
Distribution Metering and Regulating Stations (Appendix 5)
San Diego Gas and Electric SB 1371,
R.15-01-008

October 3, 2025

1. Summary of CPUC/SPD Approvals of Methodology Changes and Adjusted 2015 Baseline Emissions

The California Public Utility Commission/Safety Policy Division (CPUC/SPD) approves the change from a population-based to leaker-based methodology using recently updated U.S. EPA Emission Factors (EFs) for calculating the annual volume of natural gas (NG) emissions from Distribution Metering and Regulating (M&R) Stations proposed by San Diego Gas & Electric (SDG&E). SPD also approves the corresponding adjusted 2015 baseline emissions, shown below:

Appendix #	System Category	Source Category	2015 Baseline Emissions (Mscf, NG)	
			Original (Population-Based)[1]	Adjusted (Leaker-Based)[2]
5	Distribution M&R Stations	[1]Station Emissions	80,973	N/A
		[2]Component Vented Emissions	N/A	0
		[2]Component Fugitive Leaks	N/A	496
Total			80,973	496

[1]Including vented emissions and fugitive leaks added together.
[2]2019 data.

Periodically updating emission factors (EFs) is good practice. Staff note that to produce the most accurate emissions estimates, other factors (number of leaks and duration of those leaks) also play critical roles in determining the magnitude of these estimates. U.S. EPA new EFs (Tables W-1 and W-6, Subpart W, Part 98) were established using a particular method in surveying the facilities for leaks (i.e., Method 21 vs. non-Method 21). To use these EFs, utilities must adhere to the corresponding method in surveying their leaks, and the surveying equipment must have the same sensitivity or better than that of the U.S. EPA's.

The CPUC may audit Natural Gas Leak Abatement (NGLA) Program emission measurement practices and self-reported data in the future, including site visits and/or review of records used to determine baseline adjustments. Additional adjustments to the 2015 baseline emissions may be made in the future because of audit and verification activities.

Please refer to Section 3 of this document for details regarding the approved U.S. EPA EFs and adjustments to 2015 Baseline Emissions.

2. Background

On September 14, 2014, Governor Jerry Brown signed into law SB 1371 (Leno, 2014) requiring reporting and mitigation of emissions from CPUC-regulated gas pipeline facilities.[41] The bill requires gas corporations to file a report summarizing utility leak management practices, a list of new natural gas leaks by grade, a list of open leaks that are being monitored or are scheduled to be repaired, and a best estimate of gas loss due to leaks.

SB 1371 also requires the adoption of rules and procedures to minimize natural gas leakage from Commission-regulated natural gas pipeline facilities consistent with Section 192.703(c) of Subpart M of Title 49 of the Code of Federal Regulation, the Commission's General Order (GO) 112-F, and the State's goal of reducing GHG emissions.

In January 2015, the Commission opened an Order Instituting Rulemaking (R.) 15-01-008 to implement the provisions of SB 1371. On June 15, 2017, the Commission in decision (D.) 17-06015 approved the NGLA Program consistent with SB 1371. This decision established Best Practices (BPs) and reporting requirements for the NGLA Program to be developed by CPUC in consultation with the California Air Resources Board (CARB).[42] The decision implements these and other practices and requirements to support the State's goal to reduce methane emissions 40% by 2030 relative to 2013, established in SB 1383 (Lara, 2016).[43] This decision also affirmed that the 2015 Baseline emissions estimates will provide the starting point to measure future natural gas emissions reductions.[44]

On August 15, 2019, the Commission approved D.19-08-020 establishing additional policies and mechanisms for the NGLA program pursuant to SB 1371 and SB 1383. This decision adopted a restriction

[41] Leno, Chapter 525, Statutes of 2014.

[42] Leno, 2014; Pub. Util. Code §§ 975, 977, 978.

[43] Lara, Chapter 395, Statutes of 2016: docs.cpuc.ca.gov/PublishedDocs/Published/G000/M311/K449/311449621.PDF.

[44] docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=190740714, Finding of Fact #13, Pg. 145.

on rate recovery beginning in 2025, for emissions greater than 20% below the 2015 Baseline levels for Pacific Gas and Electric Company (PG&E) and SoCalGas to ensure they achieve their intended emissions reductions.

This decision also specified that CPUC, in consultation with CARB, may approve adjustments to the utilities' 2015 baseline emissions, and that the new baseline shall be used for determining rate recovery for methane emissions.

CPUC, CARB, and SDG&E have been collaborating to improve emission measurement and adjustment methods, as well as to adjust the 2015 baseline emissions to incorporate these improvements. An adjusted baseline will help CPUC and SDG&E to more accurately estimate forecasted emissions reductions of proposed measures and more effectively evaluate the absolute and relative cost-effectiveness of proposed measures in future Compliance Plans. Improved emissions estimates and baseline adjustments will also better align with the Annual Joint Reports, resulting in more cohesive public reporting of data.

3. Explanation of Methodology Changes and Adjustments to 2015 Baseline Emissions

This section explains the adjustments made to the emissions estimate methodology and baseline emissions estimate, from a population-based to a leaker-based methodology.

a. Number of Stations

Since 2015, the annual reporting template has used population-based emission factors (EFs) to estimate emissions from Distribution M&R Stations. Such "population-based" approaches estimate emissions by assuming an average EF that a class of station emits and multiplying the total number of stations by that EF. SDG&E informed CPUC that the magnitude of these emissions (80,973 Mscf) did not fit with observations in the field and these EFs did not account for the specific leaks and components that have the potential to emit. In addition, the populationbased EFs did not allow operators to account for emission abatement efforts such as increased survey frequency and repair prioritization.

This emissions measurement method is now revised from the population-based approach to a leaker-based approach, with the sum of the two categories for Component Vented Emissions and Component Fugitive Leaks as indicated in the next two sections. Because SDG&E does not have adequate measurements from 2015, the adjusted baseline instead uses 2019 as a proxy year.

The leaker-based EFs are from the U.S. EPA, Tables W-1 and W-6, Subpart W, Part 98, published on May 14, 2024. Prior to this approval, the following sequence of collaborative events took place between CPUC, CARB, and utilities:

*The Joint Utilities (SoCalGas, San Diego Gas and Electric [SDG&E], PG&E, and Southwest Gas) delivered a presentation on this subject, titled "Proposed Modification to Appendix 2 & 5 Emission Factors" at the Winter Workshop on February 12, 2025.

*CPUC sent the Joint Utilities a set of questions on March 25, 2025, to request a better understanding of the source of the U.S. EPA EFs and received a reply on April 17, 2025.

*CPUC hosted a virtual meeting with CARB and the utilities on April 21, 2025, titled, "NGLA EF Change Discussion." During this meeting, SoCalGas shared their own study that investigated potential

EFs for their transmission M&R stations, with conclusions they stated supported use of the U.S. EPA EFs.

*After SoCalGas sent their study titled, "Transmission M&R Station Emission Quantification Report," CPUC and CARB asked a set of follow-up questions clarifying methods, results, and conclusions on July 11, 2025, and received the reply on July 22, 2025.

* CPUC sent a final set of five questions to SoCalGas, SDG&E, and PG&E regarding leak survey methods for M&R stations on August 13, 2025. PG&E replied with more information about their use of infrared detection methods on August 20, 2025. SoCalGas and SDG&E replied with a similar description of using infrared detection methods on August 22, 2025.

b. Component Vented Emissions

The Component Vented Emissions records the leaker-based measurements associated with the operational design and function of the components, such as pneumatic devices which 'bleed' gas by design. The following EFs were adopted from the U.S. EPA, leaker-based EFs, Table W-1, Subpart W, Part 98, for pneumatic devices with various bleed rates.

System Category	Source Category	Component (pneumatic devices)	Emission Factor* (Mscf/day/dev, NG)
Distribution M&R Stations	Component Vented Emissions	Continuous Low Bleed	0.163
		Continuous High Bleed	0.720
		Intermittent Bleed	0.055

SDG&E proposed to use the 2019 data, as a proxy baseline, to support a leaker-based methodology. It reported that there were no pneumatics in its Distribution M&R Stations in 2019, so the adjusted 2015 baseline emissions are set to zero, as shown below:

Source Category	2015 Baseline Emissions (Mscf, NG)	
	Original (Population-based)	Adjusted* (Leaker-based)
Component Vented Emissions	N/A	0

*2019 data.

c. Component Fugitive Leaks

The Component Fugitive Leaks records the leaker-based measurements associated with the unintentional release of emissions from components, such as connector, valves, and other treaded connections. The following EFs were derived from the U.S. EPA, Table W-6, Subpart W, Part 98 for a non-Method 21 leaks survey, as specified in SS 98.234(a)(1), (3) or (5). These EFs measure total methane emissions and are converted to NG volumes, using California's average methane molar content of 0.934, reported by the utilities.

System Category	Source Category	Component	Emission Factor* (Mscf/day/dev, NG)
Distribution M&R Stations	Component Fugitive Leaks	Connector	0.071
		Block Valve	0.023
		Control Valve	0.393
		Pressure Relief Valve	0.011
		Orifice Meter	0.009
		Regulator	0.032
		Open-Ended Line	1.097

*Adjusted to California's NG methane content (0.934).

SDG&E reported that the 2019 total vented emissions, as the sum of all fugitive natural gas from component leaks in the Distribution M&R Stations, are approximately 496 Mscf.

Source Category	2015 Baseline Emissions (Mscf, NG)	
	Original (Population-based)	Adjusted* (Leaker-based)
Component Fugitive Leaks	N/A	496

*2019 data.

To have a common basis for comparison, CPUC/SPD requested SDG&E to revise the 2024-2025 reporting year emissions to have the same methodology of determining the Distribution M&R Stations emissions, which is the sum of the Component Vented Emissions and Component Fugitive Leaks for each of those years.

4. Conclusion

The above changes to the methodology and 2015 baseline are subject to CPUC audit and verification. The CPUC may decide to audit elements of the NGLA Program in the future, including site visits and/or review of records used to determine baseline adjustments. Additional adjustments to the 2015 baseline emissions may be made in the future as a result of utility requests, or audit and verification activities.

SPD approves SDG&E's proposed adjustments to its methodology and 2015 baseline changes for Appendix 5.

Danjel Bout
Director, Safety Policy Division

A.3 SPD Letter Approving Methodology Change and Adjusted 2015 Baseline Emissions for PG&E

STATE OF CALIFORNIA GAVIN NEWSOM, *Governor*

PUBLIC UTILITIES COMMISSION
505 Van Ness Avenue
San Francisco, CA 94102-3298

Safety Policy Division
Approval of Methodology Changes and Adjusted 2015 Baseline Emissions
Transmission Metering and Regulating Stations (Appendix 2)
Pacific Gas and Electric Company
SB 1371, R.15-01-008

October 8, 2025

1. Summary of CPUC/SPD Approvals of Methodology Changes and Adjusted 2015 Baseline Emissions

The California Public Utility Commission/Safety Policy Division (CPUC/SPD) approves the change from a population-based to leaker-based methodology using recently updated U.S. EPA Emission Factors (EFs) for calculating the annual volume of natural gas (NG) emissions from Transmission Metering and Regulating (M&R) Stations proposed by Pacific Gas & Electric (PG&E). SPD also approves the corresponding adjusted 2015 baseline emissions, shown below:

Appendix #	System Category	Source Category	2015 Baseline Emissions (Mscf, NG)	
			Original (Population-Based)[1]	Adjusted (Leaker-Based)[2]
2	Transmission M&R Stations	[1]Station Emissions	579,240	N/A
		[2]Component Vented Emissions	N/A	31,545
		[2]Component Fugitive Leaks	N/A	8,831
Total			579,240	40,376

[1]Including vented emissions and fugitive leaks added together.
[2]2022 data.

Periodically updating emission factors (EFs) is good practice. Staff note that to produce the most accurate emissions estimates, other factors (number of leaks and duration of those leaks) also play critical roles in determining the magnitude of these estimates. U.S. EPA new EFs (Tables W-1 and W-4, Subpart W, Part 98) were established using a particular method in surveying the facilities for leaks (i.e., Method 21 vs non-Method 21). To use these EFs, utilities must adhere to the corresponding method in surveying their leaks, and the surveying equipment must have the same sensitivity or better than that of the U.S. EPA's.

CPUC may audit Natural Gas Leak Abatement (NGLA) Program emission measurement practices and self-reported data in the future, including site visits and/or review of records used to determine baseline adjustments. Additional adjustments to the 2015 baseline emissions may be made in the future because of audit and verification activities.

Please refer to Section 3 of this document for details regarding the approved U.S. EPA EFs and adjustments to 2015 Baseline Emissions.

2. Background

On September 14, 2014, Governor Jerry Brown signed into law SB 1371 (Leno, 2014) requiring reporting and mitigation of emissions from (CPUC-regulated gas pipeline facilities.[45] The bill requires gas corporations to file a report summarizing their utility leak management practices, including a list of new natural gas leaks categorized by grade, a list of open leaks that are being monitored or scheduled for repair, and a best estimate of gas loss due to leaks.

SB 1371 also requires the adoption of rules and procedures to minimize natural gas leakage from Commission-regulated natural gas pipeline facilities consistent with Section 192.703(c) of Subpart M of Title 49 of the Code of Federal Regulation, the Commission's General Order (GO) 112-F, and the State's goal of reducing GHG emissions.

In January 2015, the Commission opened an Order Instituting Rulemaking (R.) 15-01-008 to implement the provisions of SB 1371. On June 15, 2017, the Commission, in decision (D.) 1706-015, approved the NGLA Program, consistent with SB 1371. This decision established Best Practices (BPs) and reporting requirements for the NGLA Program to be developed by CPUC in consultation with the California Air Resources Board (CARB).[46] The decision implements these and other practices and requirements to support the State's goal of reducing methane emissions by 40% by 2030, relative to 2013, as established in SB 1383 (Lara, 2016).[47] This decision also affirmed that the 2015 Baseline emissions estimates will provide the starting point to measure future natural gas emissions reductions.[48]

On August 15, 2019, the Commission approved D.19-08-020 establishing additional policies and mechanisms for the NGLA program pursuant to SB 1371 and SB 1383. This decision adopted a restriction

[45] Leno, Chapter 525, Statutes of 2014.

[46] Leno, 2014; Pub. Util. Code §§ 975, 977, 978.

[47] Lara, Chapter 395, Statutes of 2016: docs.cpuc.ca.gov/PublishedDocs/Published/G000/M311/K449/311449621.PDF.

[48] docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=190740714, Finding of Fact #13, Pg. 145.

on rate recovery beginning in 2025, for emissions greater than 20% below the 2015 Baseline levels for Pacific Gas and Electric Company (PG&E) and SoCalGas to ensure they achieve their intended emissions reductions.

This decision also specified that CPUC, in consultation with CARB, may approve adjustments to the utilities' 2015 baseline emissions, and that the new baseline shall be used for determining rate recovery for methane emissions.

CPUC, CARB, and PG&E have been collaborating to improve emission measurement and adjustment methods, as well as to adjust the 2015 baseline emissions to incorporate these improvements. An adjusted baseline will help CPUC and PG&E more accurately estimate the forecasted emissions reductions of proposed measures and more effectively evaluate the absolute and relative cost-effectiveness of these measures in future Compliance Plans. Improved emissions estimates and baseline adjustments will also better align with the Annual Joint Reports, resulting in more cohesive public reporting of data.

3. Explanation of Methodology Changes and Adjustments to 2015 Baseline Emissions

This section explains the adjustments made to the emissions estimate methodology and baseline emissions estimate, from a population-based to a leaker-based methodology.

a. Number of Stations

Since 2015, the annual reporting template has used population-based emission factors (EFs) to estimate emissions from Transmission M&R Stations. Such "population-based" approaches estimate emissions by assuming an average EF that a class of station emits and multiplying the total number of stations by that EF. PG&E informed the CPUC that the magnitude of these emissions (579,240 Mscf) did not align with field observations, and these EFs did not account for the specific leaks and components that have the potential to emit. In addition, the population-based EFs did not allow operators to account for emission abatement efforts such as increased survey frequency and prioritized repairs.

This emissions measurement method was revised from the population-based approach to a leaker-based approach, with the sum of the two categories for Component Vented Emissions and Component Fugitive Leaks as indicated in the next two sections. Because PG&E does not have adequate measurements from 2015, the adjusted baseline instead uses 2022 as a proxy year.

The leaker-based EFs are from the U.S. EPA, Tables W-1 and W-4, Subpart W, Part 98, published on May 14, 2024. Prior to this approval, the following sequence of collaborative events took place between CPUC, CARB, and utilities:

*The Joint Utilities (SoCalGas, San Diego Gas and Electric [SDG&E], PG&E, and Southwest Gas) delivered a presentation on this subject, titled "Proposed Modification to Appendix 2 & 5 Emission Factors" at the Winter Workshop on February 12, 2025. *CPUC sent the Joint Utilities a set of questions on March 25, 2025, to request a better understanding of the source of the U.S. EPA EFs and received a reply on April 17, 2025.

*CPUC hosted a virtual meeting with CARB and the utilities on April 21, 2025, titled, "NGLA EF Change Discussion." During this meeting, SoCalGas shared their own study that investigated potential

EFs for their transmission M&R stations, with conclusions they stated supported use of the U.S. EPA EFs.

*After SoCalGas sent their study titled, "Transmission M&R Station Emission Quantification Report," CPUC and CARB asked a set of follow-up questions clarifying methods, results, and conclusions on July 11, 2025, and received the reply on July 22, 2025.

*CPUC sent a final set of five questions to SoCalGas, SDG&E, and PG&E regarding leak survey methods for M&R stations on August 13, 2025. PG&E replied with more information about their use of infrared detection methods on August 20, 2025. SoCalGas and SDG&E replied with a similar description of using infrared detection methods on August 22, 2025.

b. Component Vented Emissions

The Component Vented Emissions records the leaker-based measurements associated with the operational design and function of the components, such as pneumatic devices. The following EFs were adopted from the U.S. EPA, leaker-based EFs, Table W-1, Subpart W, Part 98, for pneumatic devices with various bleed rates.

System Category	Source Category	Component (pneumatic devices)	Emission Factor* (Mscf/day/dev, NG)
Transmission M&R Stations	Component Vented Emissions	Continuous Low Bleed	0.163
		Continuous High Bleed	0.720
		Intermittent Bleed	0.055

PG&E proposed to use the 2022 data, as a proxy baseline, to support a leaker-based methodology and reported that the 2022 pneumatic emissions in its Transmission M&R Stations are approximately 31,545 Mscf, as shown below:

Source Category	2015 Baseline Emissions (Mscf, NG)	
	Original (Population-based)	Adjusted* (Leaker-based)
Component Vented Emissions	N/A	31,545

*2022 data.

c. Component Fugitive Leaks

The Component Fugitive Leaks records the leaker-based measurements associated with the unintentional release of emissions from components, such as connector, valves, and other treaded connections. The following EFs were derived from the U.S. EPA, Table W-4, Subpart W, Part

98 for a non-Method 21 leaks survey, as specified in SS 98.234(a)(1), (3) or (5). These EFs measure total hydrocarbon emissions and are converted to NG volumes, using California's average hydrocarbon molar content of 0.98, reported by the utilities.

System Category	Source Category	Component	Emission Factor* (Mscf/day/dev, NG)
Transmission M&R Stations	Component Fugitive Leaks	Valve	0.257
		Connector	0.228
		Open-Ended Line	0.451
		Pressure Relief Valve	0.080
		Meter	0.117
		Other	0.164

*Adjusted to California's NG total hydrocarbon content (0.98).

PG&E reported that the 2022 total vented emissions, as the sum of all fugitive natural gas from component leaks in the Transmission M&R Stations, are approximately 8,831 Mscf.

Source Category	2015 Baseline Emissions (Mscf, NG)	
	Original (Population-based)	Adjusted* (Leaker-based)
Component Fugitive Leaks	N/A	8,831

*2022 data.

To have a common basis for comparison, SPD requests PG&E to revise the 2024-2025 reporting year emissions to have the same methodology of determining the Transmission M&R Stations emissions, which is the sum of the Component Vented Emissions and Component Fugitive Leaks for each of those years.

4. Conclusion

The above changes to the methodology and 2015 baseline are subject to CPUC audit and verification. The CPUC may decide to audit elements of the NGLA Program in the future, including site visits and/or review of records used to determine baseline adjustments. Additional adjustments to the 2015 baseline emissions may be made in the future as a result of utility requests, or audit and verification activities.

SPD approves PG&E's proposed adjustments to its methodology and 2015 baseline changes for Appendix 2.

Danjel Bout
Director, Safety Policy Division

Appendix B: Definitions

For the purposes of SB 1371, the definitions of "leak" and "gas -loss" and the formula for calculating a "system-wide gas leak rate" were defined in a different manner than elsewhere. A "leak" was defined as any breach, whether intentional or unintentional, whether hazardous or non-hazardous, of the pressure boundary of the gas system that allows NG to leak into the atmosphere. Any vented or fugitive emission to the atmosphere is considered a "leak". Examples of leaking components include defective gaskets, seals, valve packing, relief valves, pumps, compressors, etc. Gas blowdowns during operations, maintenance, and testing (including hydro-testing) were also included as leaks. Consequently, this leak definition is broader than the Pipeline Hazardous Material and Safety Administration's (PHMSA) definition.

The gas respondents are required by Federal Law, 49 CFR 192, to survey their systems for leaks, which could be hazardous to public safety or property. To accomplish this, the gas companies developed graded leak programs to detect, prioritize and repair the safety related types of leaks. The same definitions are used within this report and are as follows:

- Graded Leaks – hazardous leaks or, which could potentially become hazardous as described below:[49]
    - A "grade 1 leak" is a leak that represents an existing or probable hazard to persons or property and requiring prompt action, immediate repair, or continuous action until the conditions are no longer hazardous.
    - A "grade 2 leak" is recognized as being non-hazardous at the time of detection but justifies scheduled repair based on the potential for creating a future hazard.
    - A "grade 3 leak" is a leak that is not hazardous at the time of detection and can reasonably be expected to remain not hazardous.
- Vented Emissions are releases of gas to the atmosphere, which occur during operations or maintenance, for a safety reason. Some examples are:
    - Purging (i.e., "blowdown") gas prior to hydro-testing a line.
    - Gas releases designed into the equipment function, such as gas emitting from relief valve vents or pneumatic equipment.
    - Gas releases caused by operations, maintenance, testing, training, etc.
    - Ungraded Leaks are the remaining leaks, which are not hazardous to persons and/or property.

For further information please see CPUC GO 112-F.

Lastly, in 2014 the system-wide gas leak rate was calculated as a percent of total input for the 12 months ending June 30 of the reporting year. However, Staff determined that there were problems with this calculation and opted not to report a leak rate using this formula. The formula for calculating a system-wide gas leak was written as follows:

> Pipeline Hazardous Material and Safety Administration (PHMSA) Modified Equation for Lost and Unaccounted for (LAUF) Gas:

[49] Refer to GO 112-F for more information on grade 1, grade 2, and grade 3 leaks.

> [(Purchased gas + produced gas + transported gas entering the gas system) minus (customer use +company use + appropriate adjustments + gas injected into storage + transported gas leaving the gas system)] divided by (Purchased gas + produced gas + transported gas entering the gas system) = System Wide Gas Leak Rate.
>
> Note: transported gas includes gas purchased by customers and transported in common carrier pipelines.

In section 5 of the 2015 Joint Report, "Baseline System-Wide Emissions Rate," Staff determined the value for 2015 to be 0.32 percent by using the total emissions from all source categories (6,601.2 MMscf) divided by the Total Annual Volume of Gas Transported (2,056,950 MMscf). The five sources for Total Annual Volume of Gas Transported include:

- Gas Injected into Storage
- Storage – Gas Used by the Gas Department
- Gas Transported to Customers in the State
- Gas Transported to Customers out of State
- Distribution – Gas Used by the Gas Department

Appendix C: Article 3, Section 975 (c) and (e)(6)

Article 3. Section 975

(c) As soon as practicable, the commission shall require gas corporations to file a report that includes, but is not limited to, all the following:

(1) A summary of utility leak management practices.

(2) A list of new natural gas leaks in 2013 by grade.

(3) A list of open leaks that are being monitored or are scheduled to be repaired.

(4) A best estimate of gas loss due to leaks.

(e) The rules and procedures adopted pursuant to subdivision (d) shall accomplish all the following:

(6) to the extent feasible, require the owner of each commission-regulated gas pipeline facility that is an intrastate transmission or distribution line to calculate and report to the commission and the State Air Resources Board a Baseline system-wide leak rate, to periodically update that system-wide leak rate calculation, and to annually report measures that will be taken in the following year to reduce the system-wide leak rate to achieve the goals of the bill.

Appendix D: Conversion of Natural Gas to Carbon Dioxide Equivalents

The conversion of NG volume to carbon dioxide equivalent mass requires the use of a GWP value. CARB used a methane GWP value of 25 (100-year value) from the IPCC, AR4, which was utilized in CARB's 2022 GHG Inventory. The following calculations show the conversion of the total emissions from this report. The conversion was done in two steps. In the first step, the calculation shows the volumetric NG that contains exactly one metric ton of methane.

$$1\ MT\ CH4 * \frac{2{,}204.62\ lbs\ CH4}{1\ MT\ CH4} * \frac{1\ lb\ mole}{16.04246\ lb\ CH4} * \frac{379.48\ scf\ of\ CH4\ gas}{1\ lb\ mole}$$

$$* \frac{1.0\ scf\ of\ natural\ gas}{0.934\ scf\ of\ CH4\ gas} * \frac{1\ Mscf}{1{,}000\ scf} = 55.835\ Mscf\ of\ natural\ gas$$

Using this volumetric unit, the 2024 total emissions, 2,406,571 Mscf, is equivalent to about 1.078 MMTCO2e, as shown below:

$$2{,}406{,}571\ Mscf\ natural\ gas * \frac{1\ MT\ CH4}{55.835\ Mscf\ of\ natural\ gas} * \frac{25\ CO2e}{1\ CH4} = 1{,}077{,}537\ MT\ CO2e$$

CARB has also used the GWP value of 72 (AR4, 20-year) in the Short-Lived Climate Pollutant Reduction Strategy and Oil and Gas Methane Regulation to emphasize the outsized, short-term impacts of methane emissions. Based on the higher GWP, the 2024 total emissions, 2,406,571 Mscf is about 3.103 MMTCO2e, as follows:

$$2{,}406{,}571\ Mscf\ natural\ gas * \frac{1\ MT\ CH4}{55.835\ Mscf\ of\ natural\ gas} * \frac{72\ CO2e}{1\ CH4} = 3{,}103{,}306\ MT\ CO2e$$

The use of 1.0 scf of NG per 0.934 scf of CH4 gas accounts for composition of NG being not 100 percent methane. The American Gas Association (AGA) published a value of 93.4 percent to be used as a default

methane concentration that is comparable to what respondents reported.[50] The standard cubic foot "scf" for measuring gas is based on 60 degrees Fahrenheit at atmosphere pressure.

In addition, respondents reported trace amounts of concentration for ethane, inert gases, and other elements and compounds. There was not an entry for carbon dioxide explicitly, and so it cannot be assumed that all the inert gas was carbon dioxide. A calculation was performed that showed CO2 emissions from the inert gases would be less than 0.1 percent of the total and is excluded in this report.

[50]AGA, GHG Guidelines, Pg. 39, April 18, 2008.