

2026 Natural Gas Leak Abatement (NGLA) Winter Workshop

9:30am-4:10pm

Tuesday, February 3, 2026



California Public
Utilities Commission

Welcome, Introductions, and Agenda

CPUC



California Public
Utilities Commission

Housekeeping Notes

- **Audio**

- Please mute your microphone unless you are speaking

- **Questions**

- Please hold questions for Q&A sessions at the end of presentations, unless otherwise noted by speaker
- Click the hand next to your name in the participant list to raise hand → 
- Alternatively, type questions in the chat
- Staff will maintain a list of outstanding questions to resolve after the workshop

- **Timing**

- We will try to stick to starting times for each presentation outlined in the agenda

- **Recording**

- A link to the recording will be made available on the CPUC NGLA webpage (<https://www.cpuc.ca.gov/about-cpuc/divisions/safety-policy-division/risk-assessment-and-safety-analytics/natural-gas-leak-abatement>)

Agenda

PRESENTER	TOPIC	START TIME	END TIME
Introduction and Agency Reports			
CPUC/CARB	Introduction/Welcome	9:30 AM	9:40 AM
CPUC/CARB	Review of the 2025 Joint Report	9:40 AM	9:55 AM
Appendix-Specific R&D and Updates			
Sempra	Transmission Asset Data Enhancements	9:55 AM	10:10 AM
PG&E	Meter Set Prioritization: Class B vs. Class C/D Leaks	10:10 AM	10:30 AM
-	Break	10:30 AM	10:40 AM
Template and Reporting Updates			
CPUC/CARB	Proposed Changes to the 2025 Reporting Templates and Procedures	10:40 AM	11:05 AM
Sempra	Distribution Main and Service Leak Tracking Dashboard	11:05 AM	11:20 AM
PG&E	Methane Abatement Dashboard: Reporting Improvements	11:20 AM	11:35 AM
-	Lunch	11:35 AM	1:00 PM
Broader R&D Updates and Compliance Plan Efforts			
Sempra	Emission Reduction Strategies	1:00 PM	1:25 PM
PG&E	Programs Driving Methane Emissions Reductions	1:25 PM	1:55 PM
Sempra	2025 R&D Overview	1:55 PM	2:30 PM
-	Break	2:30 PM	2:40 PM
PG&E	R&D Project Update	2:40 PM	3:00 PM
All Participants	Open Forum: Current and Future State of NGLA Program	3:00 PM	4:00 PM
CPUC/CARB	Closing and Next Steps	4:00 PM	4:10 PM

Questions?

- Click the hand next to your name in the participant list 
- The host will call on your name when it is your turn to speak
- Or, type question into the chat





Review of the 2025 Joint Report

Natural Gas Leak Abatement Program
2026 CPUC Winter Workshop
February 3, 2026

Background

- The Report presents total industry emissions and the systemwide leak rate.
- CPUC issued data request and reporting template on March 27, 2025.
- All gas companies submitted the 2024 data on June 13, 2025.
- The list of questions sent to utilities in July required minimal correction of the initial submittals.
- CPUC/SPD sent out three approval letters in October for the 2015 Baseline Adjustments.

Total 2024 Statewide Natural Gas Emissions

- The 2025 total statewide NG emissions are about 2,407 MMscf:
 - 2% lower than the 2023 emissions
- D.17-06-015 targets 40% emissions reduction by 2030 from 2015 baseline
 - Total 2024 emissions for all utilities showed a 41% reduction from baseline

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%)

2024 Natural Gas Emissions by Utility

- D.19-08-020 restricts rate recovery beginning 2025, for emissions greater than 20% below the 2015 baseline for PG&E and SoCalGas.
 - PG&E: 52% reduction from the baseline
 - SoCalGas: 39% reduction from the baseline

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%)

Review of System Categories with Emission Decreases

- 12 MMscf decrease in Transmission Pipelines, mainly from Blowdowns
- 2 MMscf decrease in Transmission M&R Stations, mainly from station leaks
- 6 MMscf decrease in Transmission Compressor Station, mainly from Component Vented Emissions
- 47 MMscf decrease in Customer Meters, mainly from meter leaks
- 18 MMscf decrease Underground Storage, mainly from Compressor Vented 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)
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%)

Review of System Categories with Emission Increases

- 32 MMscf increase in Distribution Mains & Services, mainly from damages
- No noticeable change in Distribution Metering & Regulating Stations, mainly from offset of increase in leaker-based emissions with decrease in population-based 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	
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Total	4,072	100%	2,461	100%	2,407	100%	(1,665)	(41%)	(55)	(2%)

System-wide Leak Rate

- Four of the six throughput categories for 2024 were similar to 2023.
- The System-wide Leak Rate for 2024 was also similar to 2023.
- The System-wide Leak Rate has decreased from 2015 due to the decrease in the total emissions.

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 $\left(\frac{\text{Total Emissions}}{\text{Total Throughput}} \right)$	0.20%	0.12%	0.13%

Approved 2015 Baseline Adjustments

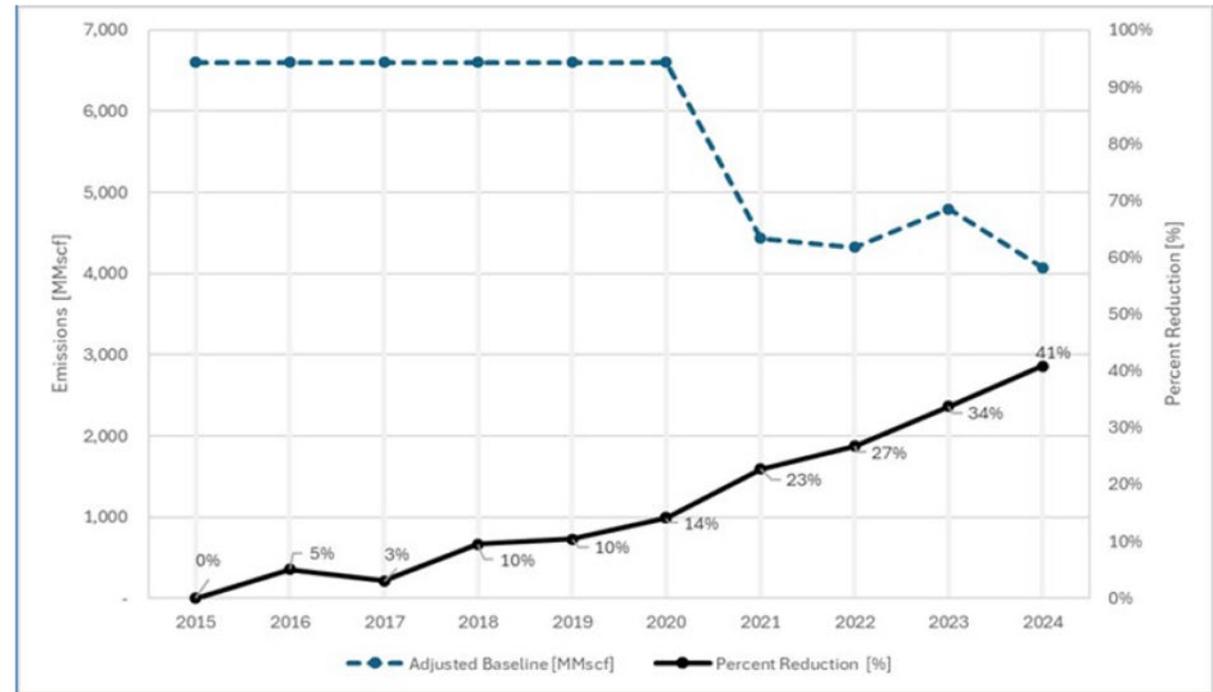
- The CPUC/SPD approved adjustments to the 2015 baseline emissions on October 3, 2025, for SoCalGas and SDG&E, and on October 8, 2025, for PG&E.
- The baseline adjustments were made to replace population-based emission factors with leaker-based emission factors.
- The leaker-base emission factors increase the accuracy of the emission estimates, utilizing the latest U. S. EPA EFs from Subpart W, Part 98, Tables W-1, W-4 and W-6.
- To use these EFs, utilities must adhere to the Method 21 or non-Method 21 requirements in surveying their leaks, and the surveying equipment must have the same sensitivity or better than that of the U. S. EPA's.
- All approvals are listed in Appendix A in the 2025 Joint Report.

SPD Approved the following adjusted 2015 baseline emissions	Natural Gas Volume (MSCF)	
	Original 2015 Baseline	Adjusted 2015 Baseline Emissions
Southern California Gas, Transmission M&R Stations	110,296	6,606
Pacific Gas and Electric, Transmission M&RR Stations	579,240	40,376
San Diego Gas and Electric, Distribution M&R Stations	80,973	496

Percent Reduction of the 2015 Baseline to 2024 Emission Inventory

- The Adjusted Baseline has evolved in response to each year's approved baseline adjustments.
- The Percent Reduction has increased due to improvements in measurement methods.
- Staff will work with utilities to include a further description of the percent reduction in the 2026 Joint Report.

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



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

Summary

- D.17-06-015 implements the State's goal of reducing the 2015 Baseline natural gas emissions by 40% by 2030
 - The total self-reported emissions for all utilities in 2024 has shown a 41% reduction from the 2015 Baseline.
- D.19-08-020 adopts a restriction on rate recovery beginning 2025, for emissions greater than 20% below the 2015 Baseline levels for PG&E and SoCalGas.
 - Both PG&E and SoCalGas are expected to exceed this target.



TRANSMISSION ASSET DATA ENHANCEMENTS

2026 Winter Workshop



Agenda

- » Background
- » Methodology and Scope
- » Achievements
- » Lessons Learned and Next Steps

Background - Transmission Venting Components

- » Included in “Component Vented Emissions” reporting category within NGLAP Annual Report Appendices
- » Emission estimates are population-based (i.e., device counts are multiplied by emission factors to estimate annual emissions)
- » Device counts are extracted from SoCalGas and SDG&E work management systems
- » Historically accounts for ~1% or less of total emissions for SoCalGas and SDG&E
- » During the 2020 Compliance Plan period (2021-2022), SoCalGas and SDG&E initiated efforts to verify and enhance asset data

Methodology and Scope

1. Field-verify assets
2. Record findings
3. Review work management systems to confirm accuracy
4. Update work management systems as necessary to reflect findings of field verification

Number of Facilities in Scope	SoCalGas	SDG&E
Transmission Compressor Station	7	1
Transmission Customer	187	15
Transmission Pipeline	206	27
Pressure Limiting Station	110	19
Producer Site	56	2
Total	566	64

Achievements

- » Completed asset verification process during 2025
 - Strengthens emission estimates
 - Supports emission reduction project planning
- » Asset verification provides co-benefits:
 - Streamlines work management
 - Enhances asset data for programs beyond the NGLAP

Number of Assets Verified	SoCalGas	SDG&E
Transmission Compressor Station	10,529	1,918
Transmission Customer	4,627	389
Transmission Pipeline	15,799	1,299
Pressure Limiting Station	4,204	1,231
Producer Site	3,808	155
Total	38,967	4,992



Lessons Learned and Next Steps

» Lessons Learned:

- Data validations (i.e., tools that restrict deviations from established data entry conventions) are critical for confirming consistency
- Standards/processes are important tools for confirming consistency in naming conventions and asset identification
- Asset verification is an ongoing process

» Next Steps:

- Maintain new asset management/verification process
- Validate asset data to confirm adherence to the process

Questions?

Meter Set Assembly (MSA) Leaks Prioritization

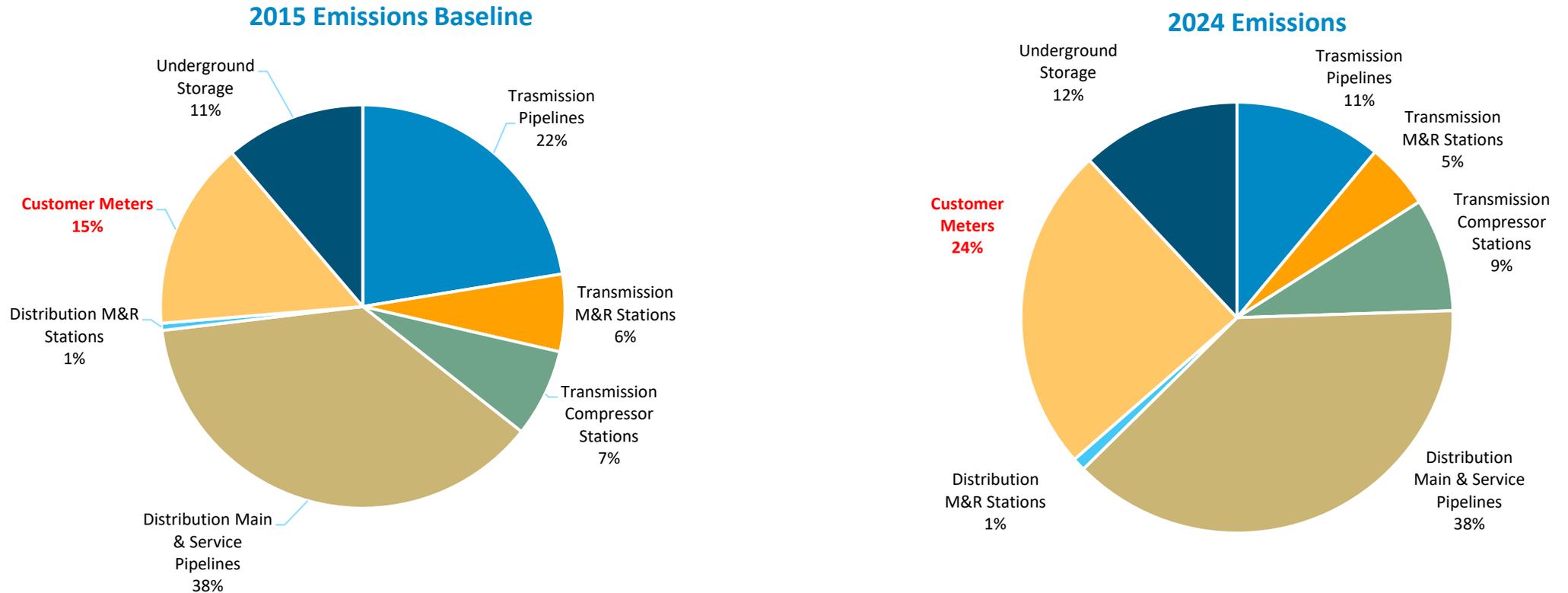
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February 2025





MSA Leaks: The Second Largest Emission Source

In 2024, meter set emissions accounted for 24% of the total reported emissions

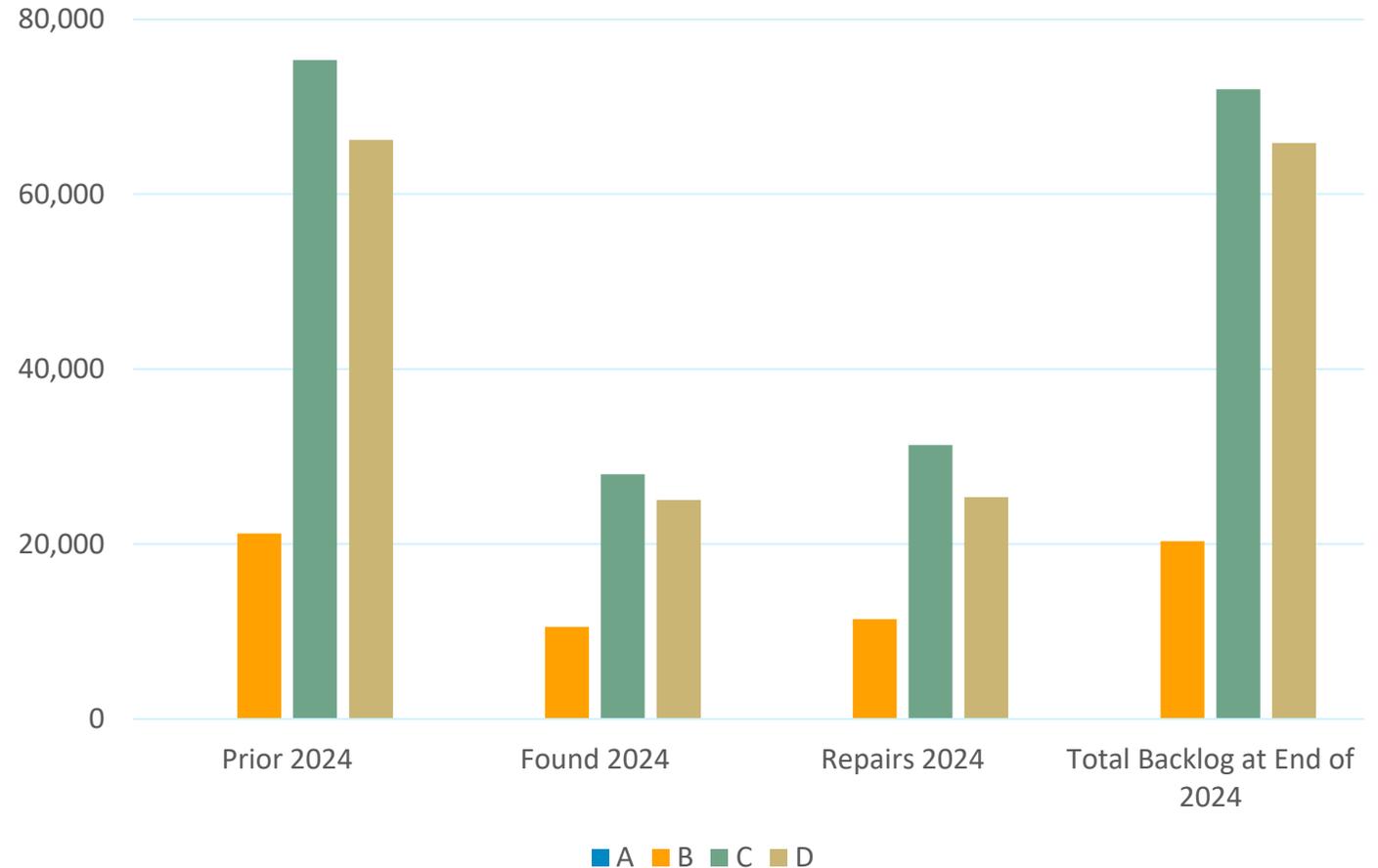




Class B Leaks: Largest Contributor of MSA Emissions

- In 2024, Class B meter set leaks accounted for ~ 56% of the customer meter emissions and **only ~ 13%** of the total population
- Class B leak emissions emit ~6-7X more methane than Class C and ~17-21X more than Class D
- Class B meter set leak repairs are more cost effective than Class C & D

MSA Leaks by Class (2024)

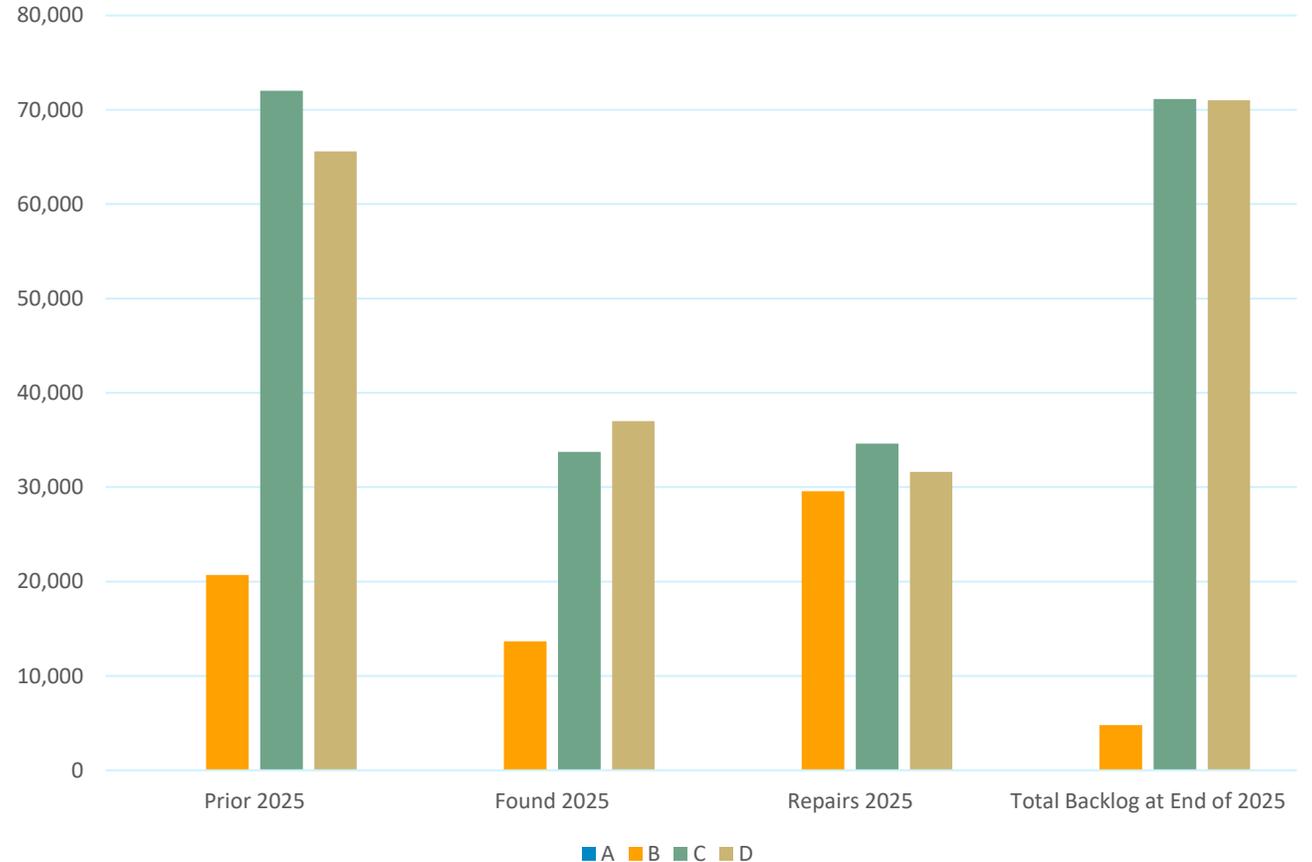




2025 Results: Prioritized Class B Leaks

- In 2025, three times more Class B leaks were repaired as compared to 2024
- On average over the last 5 years, ~15k Class B leaks are found
- The backlog of open Class B leaks dropped from ~13% to 3%
- Customer meter emissions in 2025 are estimated to be reduced by more than 40% compared to 2024

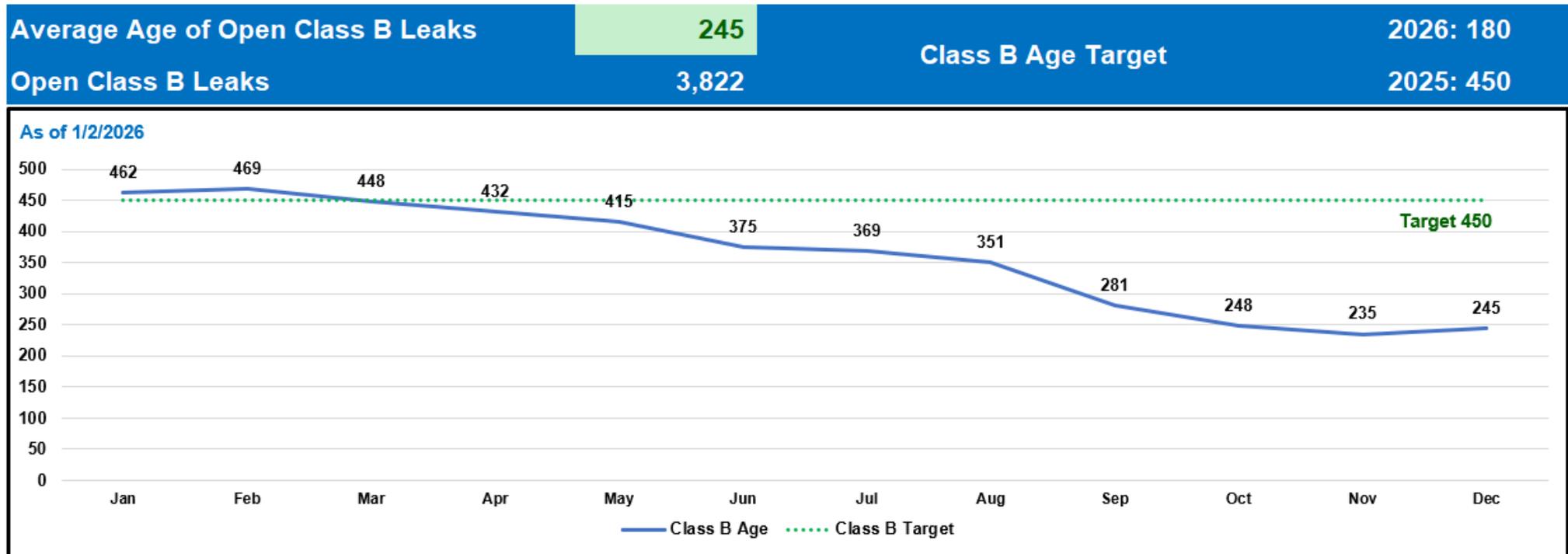
MSA Leaks by Class (2025)





2025 Results: Prioritized Class B Leaks

Average age of class B leaks decreased by 47%





Next Steps

- Continue to clear backlog of Class B leaks and reach Find-it/Fix-it state
- Continue to repair Class C and D leaks as “opportunistic repairs”
- Evaluate cost effective ways of repairing Class C and D leaks

Thank you





Proposed Changes to the 2026 Reporting Template and Procedures

Natural Gas Leak Abatement Program
2026 CPUC Winter Workshop
February 3, 2026

Overview

- Data Submittal
- Appendix 8, Summary Appendix
- Appendix 9, Emission Factor Appendix

Data Submittal

- Request the file size per Appendix submittal be limited to 30 MB.
- Request all Appendices be submitted as EXCEL spreadsheets.
- The email on March 31, 2026 will state this, as well as the Data Request Instructions will be updated with the highlighted language:

PART 1: INSTRUCTIONS FOR SUBMISSION

Data request responses must include:

1. Excel document **appendices** with leak data.
 - a. Do not send files larger than 30 MB. If there are special circumstances that require the file to be larger than 30 MB, please correspond with Staff.
 - b. Do not send PDFs of the EXCEL spreadsheets.
2. A word document that answers items (a) through (f) to accompany the leak data ("Supplemental Questionnaire R.15-01-008, 2025 Annual Report").

Please be sure to include the name of the utility in the name for each file.

Appendix 8, Summary Appendix

- Discuss a revision to the current definition of the Unusual Large Leak Category

- **Current Definition:**

"Any event at a gas storage facility or gas transmission system that results in the uncontrollable release of natural gas to the atmosphere for more than 24 hours."

37		Blowdowns	Vented	
38	Underground Storage	Component Vented Emissions	Vented	
39		Compressor and Component Fugitive Leaks	Fugitive	
40		Dehydrator Vent Emissions	Fugitive	
41	Unusual Large Leaks	Any event at a gas storage facility or gas transmission system that results in the uncontrollable release of natural gas to the atmosphere for more than 24 hours.		
42				
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< >
Year Over Year Comparison
Leak Rate Data
N

Appendix 8, Summary Appendix

- **Proposed Definition:**

Any event at a gas storage facility or gas transmission system that results in the uncontrollable release of natural gas to the atmosphere that would disrupt the year-over-year emission analysis. Please describe circumstances of the event, such as the cause, the magnitude, and means of stopping the emission release to CPUC/CARB. Then, management at CPUC/CARB will review the petition to use this categorical exemption, and inform the utility of the decision.

- If utilities have a revision to the proposed language, please correspond.

Appendix 9, Emission Factor Appendix

- Describe the change that occurred in October 2025 to update the emission factors for leaker based reporting for Transmission Metering and Regulating Stations (Appendix 2) and Distribution Metering and Regulating Stations (Appendix 5).
- <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-W>

Table W-4 to Subpart W of Part 98—Default Total Hydrocarbon Leaker Emission Factors

Expand Table

Equipment components	Emission factor (scf total hydrocarbon/hour/component)		
	If you survey using Method 21 as specified in § 98.234(a)(2)(i)	If you survey using Method 21 as specified in § 98.234(a)(2)(ii)	If you survey using any of the methods in § 98.234(a)(1), (3), or (5)
LEAKER EMISSION FACTORS—ONSHORE NATURAL GAS PROCESSING, ONSHORE NATURAL GAS TRANSMISSION COMPRESSION—NON-COMPRESSOR COMPONENTS, GAS SERVICE			
Valve ¹	6.42	4.12	10.5
Connector	5.71	3.66	9.3
Open-Ended Line	11.27	7.22	18.4
Pressure Relief Valve	2.01	1.29	3.28
Meter	2.93	1.88	4.79
Other ²	4.1	2.63	6.70

$$\frac{10.5 \text{ scf THC}}{1 \text{ hr}} * \frac{24 \text{ hr}}{1 \text{ day}} * \frac{1 \text{ Mscf}}{1,000 \text{ scf}} * \frac{1 \text{ NG}}{0.98 \text{ THC}} = \frac{0.257 \text{ Mscf NG}}{1 \text{ day}}$$

Appendix 9, Emission Factor Appendix

- Describe the change that occurred in October 2025 to update the emission factors for leaker based reporting for Transmission Metering and Regulating Stations (Appendix 2) and Distribution Metering and Regulating Stations (Appendix 5).

System Categories	Emission Source Categories	Emission Factor Sources	Previous Emission Factors	Current Emission Factors
Transmission M&R	M&R Stations - Direct Industrial Sales	MRR	<p># of leaks > 10,000 ppm x Subpart W EF (ref: Table W-3 of Subpart W of Part 98) Direct Sale = 12.2 Mscf/yr/station</p> <p>Non-compressor components Valve = 0.1572 Mscf/day/dev Connector = 0.1399 Mscf/day/dev Open-ended line = 0.276 Mscf/day/dev Pressure relief valve = 0.0492 Mscf/day/dev Meter = 0.0728 Mscf/day/dev</p>	<p># of leaks > 10,000 ppm x Subpart W EF (ref: Table W-3 of Subpart W of Part 98) Direct Sale = 12.2 Mscf/yr/station</p> <p>(ref: Table W-4 of Subpart W of Part 98) Compressor Components Continuous Low Bleed = 0.163 Mscf/day/dev Continuous High Bleed = 0.720 Mscf/day/dev Intermittent Bleed = 0.055 Mscf/day/dev</p> <p>Non-compressor Components Valve = 0.257 Mscf/day/dev Connector = 0.228 Mscf/day/dev Open-ended line = 0.451 Mscf/day/dev Pressure relief valve = 0.080 Mscf/day/dev Meter = 0.117 Mscf/day/dev Other = 0.164 Mscf/day/dev</p>

Appendix 9, Emission Factor Appendix

- Describe the change that occurred in October 2025 to update the emission factors for leaker based reporting for Transmission Metering and Regulating Stations (Appendix 2) and Distribution Metering and Regulating Stations (Appendix 5).
- <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-W>

Table W-6 to Subpart W of Part 98—Default Methane Leaker Emission Factors

Expand Table

Equipment components	Emission factor (scf methane/hour/component)		
	If you survey using Method 21 as specified in § 98.234(a)(2)(i)	If you survey using Method 21 as specified in § 98.234(a)(2)(ii)	If you survey using any of the methods in § 98.234(a)(1), (3), or (5)
Valve ²	14.84	9.51	24.2
Connector	5.59	3.58	9.13
Open-Ended Line	17.27	11.07	28.2
Pressure Relief Valve	39.66	25.42	64.8
Meter and Instrument	19.33	12.39	31.6
Other ³	4.1	2.63	6.70

$$\frac{24.2 \text{ scf Methane}}{1 \text{ hr}} * \frac{24 \text{ hr}}{1 \text{ day}} * \frac{1 \text{ Mscf}}{1,000 \text{ scf}} * \frac{1 \text{ NG}}{0.934 \text{ Methane}} = \frac{0.071 \text{ Mscf NG}}{1 \text{ day}}$$

Appendix 9, Emission Factor Appendix

- Describe the change that occurred in October 2025 to update the emission factors for leaker based reporting for Transmission Metering and Regulating Stations (Appendix 2) and Distribution Metering and Regulating Stations (Appendix 5).

System Categories	Emission Source Categories	Emission Factor Sources	Previous Emission Factors	Current Emission Factors
Distribution M&R Stations	Distribution M&R Station, Leaker Based	MRR	<p>Leaker EFs (Component Leaks identified per survey use the following EFs) Connector = 0.043 Mscf/day/dev Block Valve = 0.014 Mscf/day/dev Control Valve = 0.240 Mscf/day/dev Pressure Relief Valve = 0.007 Mscf/day/dev Orifice Meter = 0.005 Mscf/day/dev Regulator = 0.020 Mscf/day/dev Open-Ended Line = 0.671 Mscf/day/dev</p>	<p>(ref: Table W-1 of Subpart W of Part 98) Continuous Low Bleed = 0.163 Mscf/day/dev Continuous High Bleed = 0.720 Mscf/day/dev Intermittent Bleed = 0.055 Mscf/day/dev</p> <p>(Component Leaks identified per survey use the following EFs) (ref: Table W-6, column for "If you survey using any of the methods, in SS98.234 (a)(1), (3), or (5)") Connector = 0.071 Mscf/day/dev Block Valve = 0.023 Mscf/day/dev Control Valve = 0.393 Mscf/day/dev Pressure Relief Valve = 0.011 Mscf/day/dev Orifice Meter = 0.009 Mscf/day/dev Regulator = 0.032 Mscf/day/dev Open-Ended Line = 1.095 Mscf/day/dev</p>

Key Dates for the 2026 NGLA Reporting

- Prior to March 31: CPUC and CARB Staff will correspond with utilities about finalizing the reporting template changes mentioned in these slides.
- March 31: CPUC will send reporting template to gas companies.
- June 15: Emissions reports from gas companies due to CPUC.
- July: CPUC and CARB will send a list of follow-up questions and comments to gas companies.
- August 31: CPUC and CARB Staff have an internal deadline to finalize data.
- November 16: CPUC will send the Draft Joint Report to gas companies for review.
- December 31: CPUC will publish the Final Joint Report.



DISTRIBUTION MAIN AND SERVICE LEAK TRACKING DASHBOARD

February 3rd, 2026

Leak Dashboard

2023 - Launched a distribution main and service leak tracking dashboard.

Functionality includes:

- Tracks leaks detected
- Tracks leaks mitigated
- Displays leaks in GIS
- In Development – Decision Tree Positive (DT+) Dashboard



Dashboard – Leaks Detected and Mitigated

Features

- Displays detected leaks
 - Breakdown by date (monthly/quarterly/yearly)
 - Inventory tracking
 - Active/completed
 - Filterable by location, leak code, leak age, equipment type

Benefits

- Centralized platform for internal project stakeholders
 - Track and monitor leaks from detection to repair

Connectivity

- Links data from company databases
- Daily updates

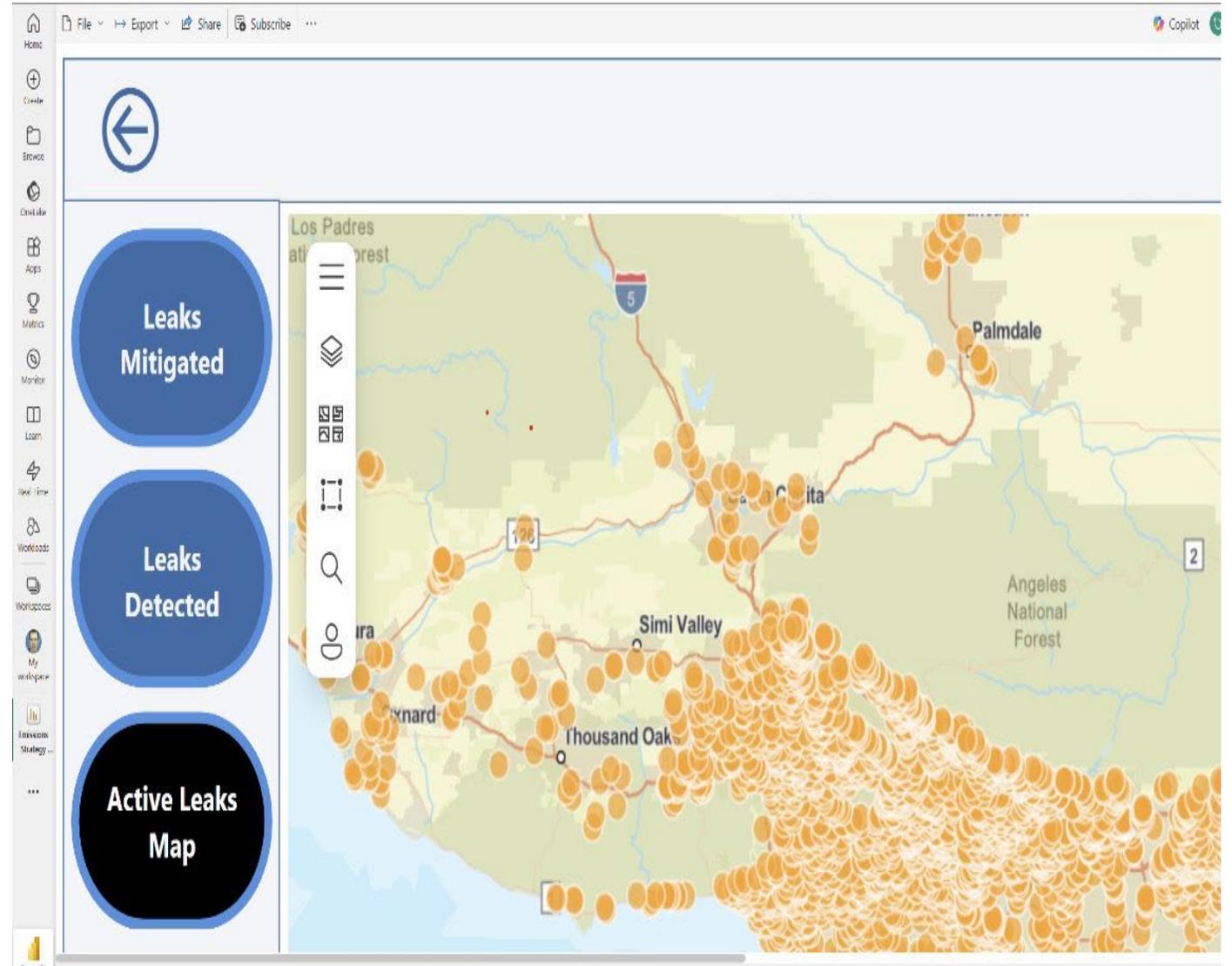
Dashboard – Geo Analytics

Features

- Utilizes ArcGIS modules
- Drill through features for active and mitigated leak data

Benefits

- Geographic tracking of active leaks by location, leak code, maintenance type, etc.
- Geographic leak density analysis



Drives Program Efficiencies:

- Reduces manual tracking
- Provides aging inventory reports
- Flags leaks with higher potential to emit
- Displays leaks geographically – identify opportunities to bundle repairs



DT+ Dashboard

2025/2026 – In Development.

Functionality:

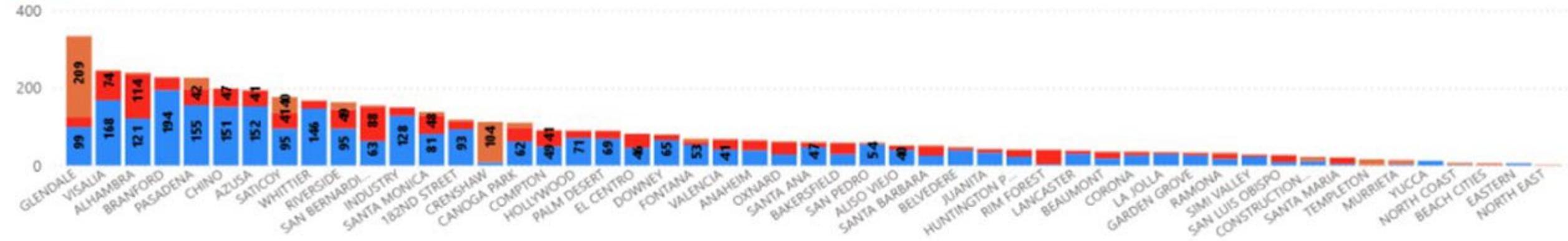
- Track DT+ leaks detected
- Planning Tool for Repairs
- Displayed in GIS
- Maximize Emission Reductions



Dashboard – Decision Tree Positive (DT+)

Total Code 2/3 Inventory by District and Large Leak Status

● NLL ● PLL ● Unknown



Features

- Decision tree identifies DT+ Leaks – data exported to dashboard
- Graphically displays DT+ Leaks by District
- Expedite planning, permitting, and repair activities.

Benefits

- Streamlined permitting with municipalities
- Optimal emission reductions.
- Improves average repair times.

Next Steps

Full Implementation:

- Real time DT+ updates – daily reports
- Repair DT+ leaks in 75 days or less



Questions?

Improvements in Reporting Practices

2026 Natural Gas Leak Abatement (NGLA) Winter Workshop
February 2025





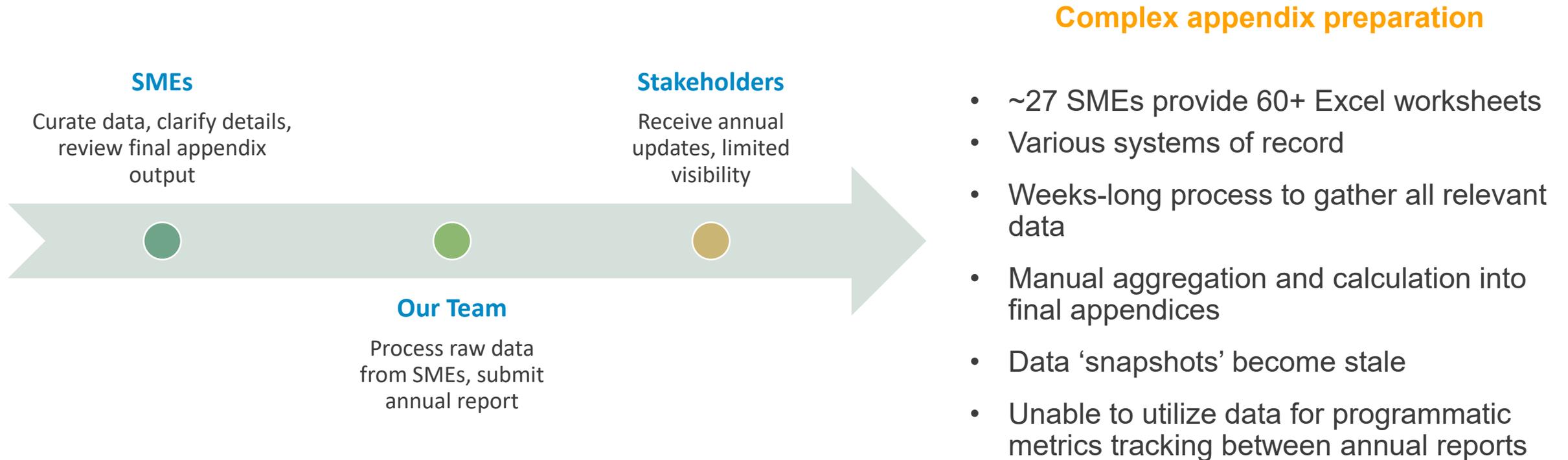
Agenda

- Project Motivation
- Our Vision
- Current State
- Illustrative Use Case



Project Motivation (“The Why?”)

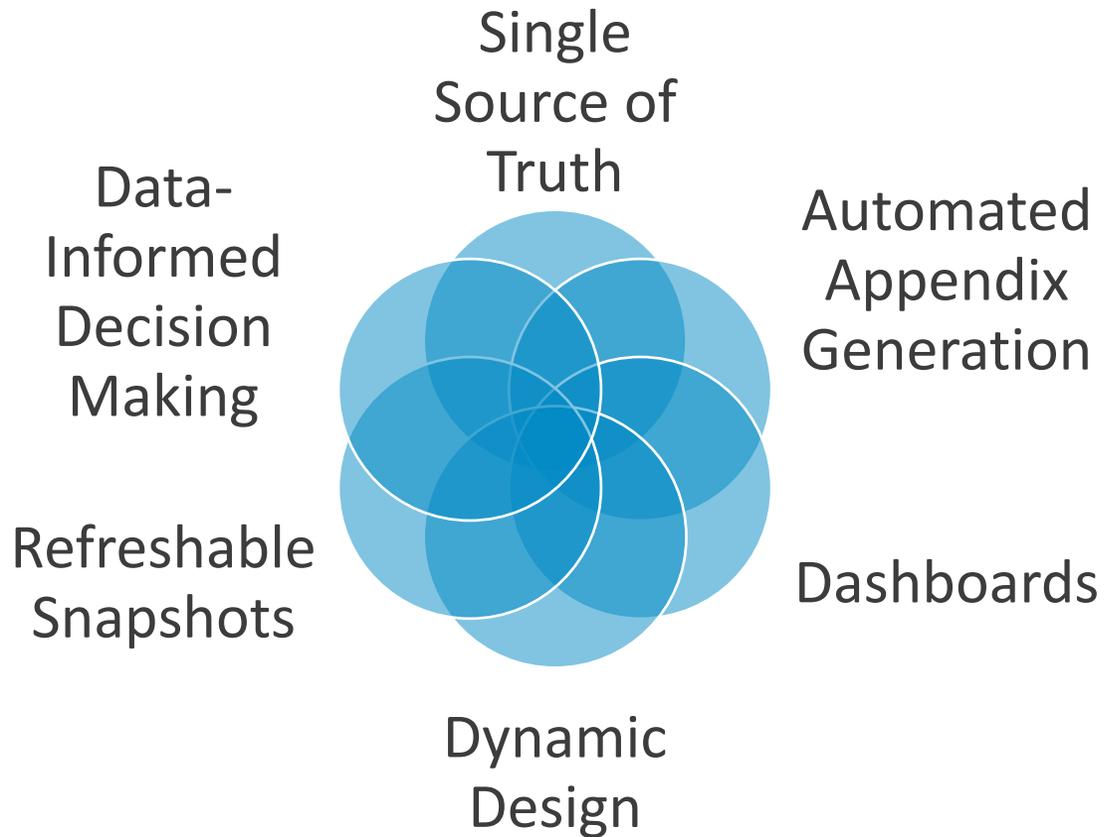
Preparing the annual NGLA report requires consolidating millions of data points from multiple teams and subject matter experts (SME). Automating this process allows our team to focus on emission-reduction efforts that deliver meaningful impact





Our Vision

Leveraging existing enterprise data-analytic platforms, we are developing a more dynamic reporting framework designed to streamline NGLA reporting and support accurate, ongoing performance indicator tracking



Internal Stakeholders

SMEs	Review and Approve Data
Our Team	Free to pursue emissions reductions programs
Leadership	Greater visibility



Current State

Initiated in 2025, the project has made measurable progress toward our vision and is on track for completion in 2026

20 refreshable datasets

- Monthly metrics available for KPI tracking

QC and standardization in progress

- Using previous process to validate tool accuracy

Value Added Today

- Leak repair scheduling team using tool for work resource planning
- Supports data-based decision making during operating reviews

Super Emitter Survey Applicability

Geospatial Applicability

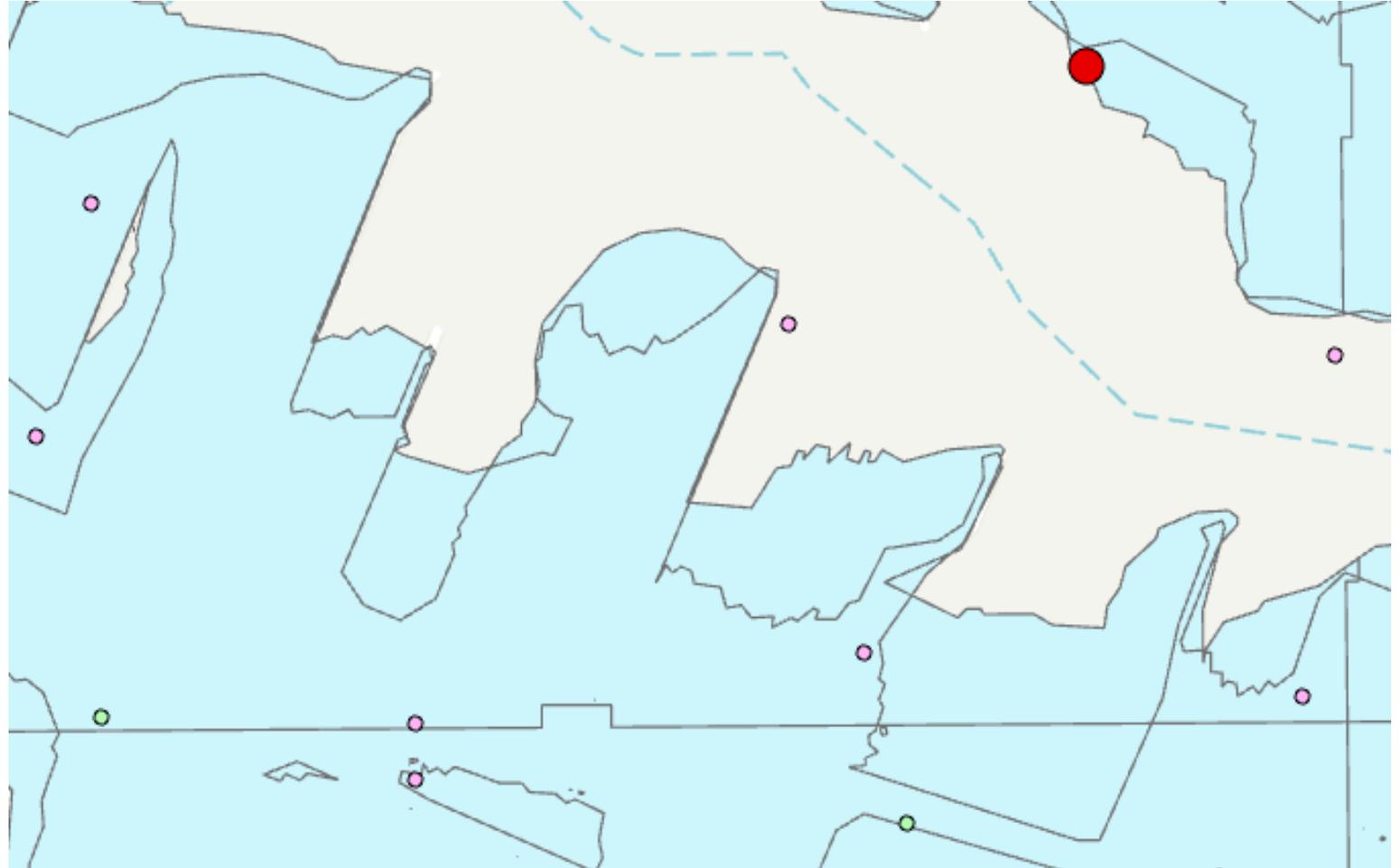
- Leak within or outside AMLD survey field-of-view?

Time-Based Applicability

- Leak found before AMLD survey date
- Leak not repaired before AMLD survey date

Applicability informs emission factor

- Super Emitter EF
- Non-SE EF
- Average EF



Thank You!





SOCALGAS EMISSION REDUCTION STRATEGIES

2026 Winter Workshop

Agenda

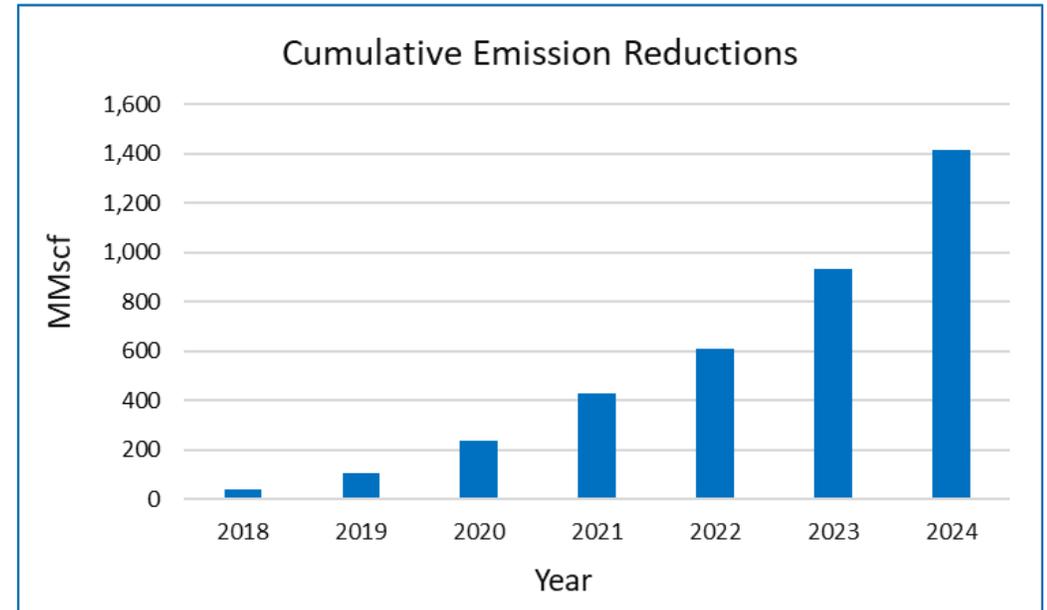
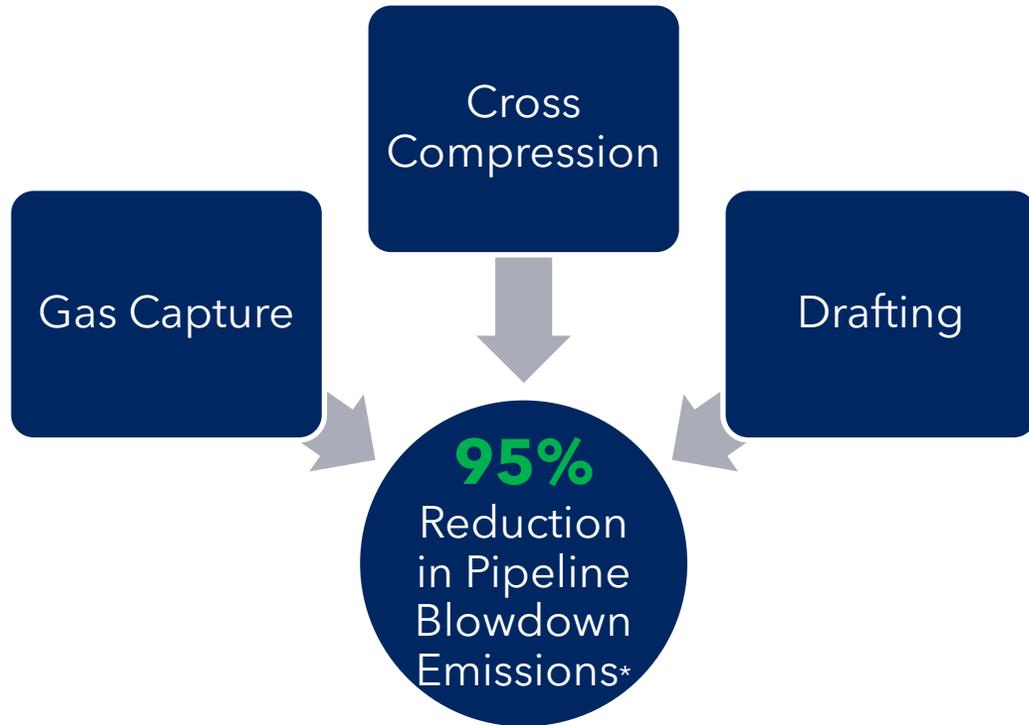
- » SoCalGas's Key Emission Reduction Strategies
 - Blowdown Reduction Activities
 - Leak Inventory Reduction
 - Increased Leak Survey
 - Aerial Monitoring
- » Opportunities for Emission Reductions
- » Potential Emission Estimate Refinements
- » Emission Reduction Program Outlook

Blowdown Reduction Activities

» 1.4 Bscf of emission reductions from 2018 through 2024

» Outlook:

- Program was fully authorized by Resolution G-3605
- Anticipating sustained emission reductions during 2026 and 2027
- Forecasting break-even or better standard cost effectiveness



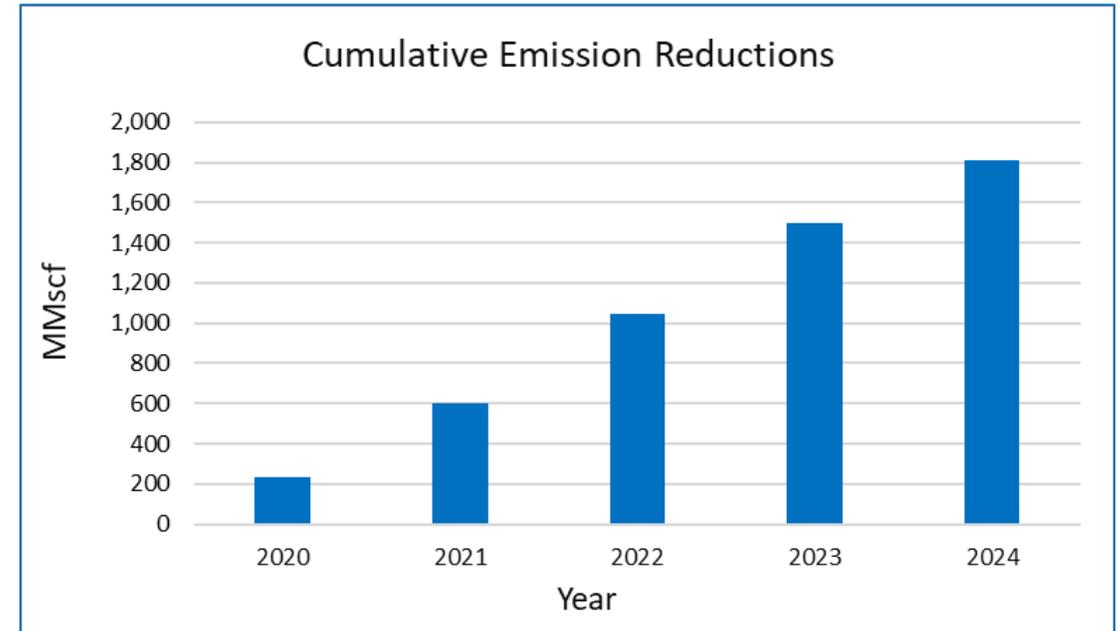
Leak Inventory Reduction



» 1.8 Bscf of emission reductions from 2020 through 2024

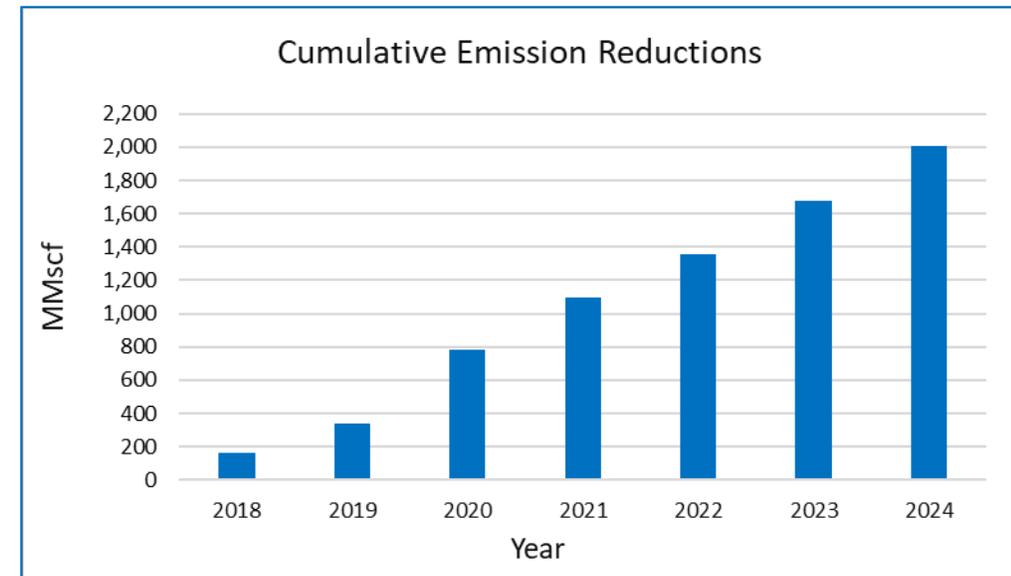
» Outlook:

- Anticipating increased emissions during 2026 and 2027 due to Resolution G-3605
- Leveraging Large Leak Prioritization Program to mitigate emissions from higher volume leaks
- Anticipating improved cost effectiveness in 2028



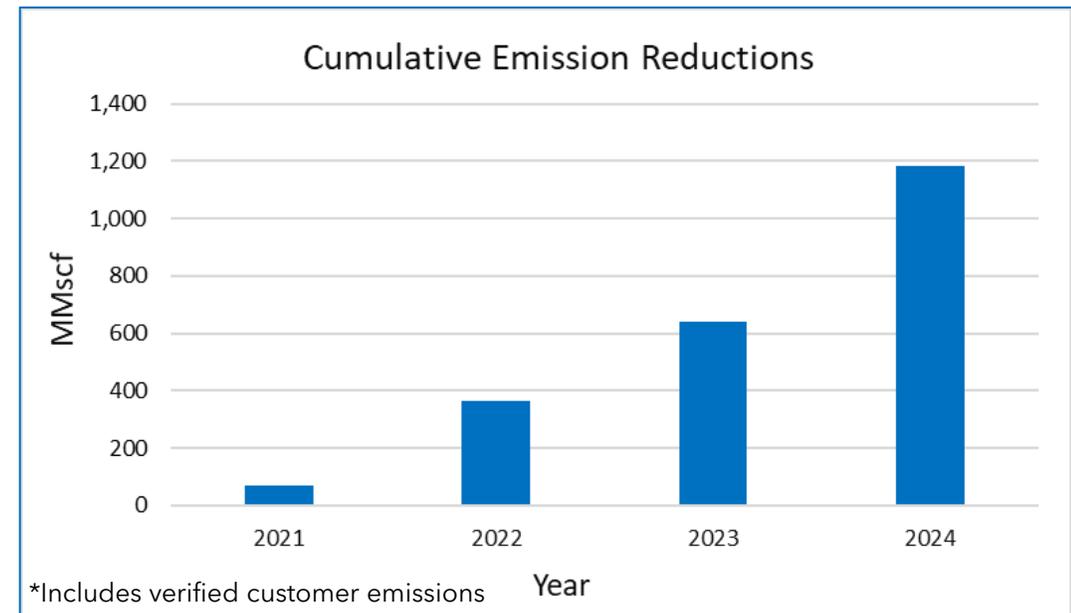
Increased Leak Survey

- » 2 Bscf of emission reductions from 2018 through 2024
- » Outlook:
 - Decelerated surveys on unprotected steel lines beginning in 2026 due to Resolution G-3605
 - Planning to continue accelerated surveys on vintage plastic lines
 - Anticipating increased emissions during 2026 and 2027 due to Resolution G-3605



Aerial Monitoring

- » 1.2 Bscf of emission reductions from 2021 through 2024*
- » Outlook:
 - Pausing program during 2026 and 2027 due to Resolution G-3605
 - Anticipating increased emissions during 2026 and 2027
 - Estimating break-even or better standard cost effectiveness in 2028 (w/SoCalGas system emissions only)



Opportunities for Emission Reductions

- » Reinstating key programs:
 - Leak Inventory Reduction
 - Aerial Monitoring
- » Shorter leak duration targets under the Large Leak Prioritization Program
- » Strategic implementation of vapor recovery systems at Compressor Stations
- » Enhanced quality and maintenance plans for compressor rod packing



Potential Emission Estimate Refinements

- » Transmission Pipeline (Appendix 1) leaker-based EFs
 - Emissions are currently estimated using mileage-based EFs
- » Company-specific vented emission EFs
 - Emissions are currently estimated using national-level EFs
 - Preliminary work is completed for Transmission M&R (Appendix 2) company-specific EFs
- » Further refinement of Distribution main/service (Appendix 4) unknown leak framework
 - Aerial survey mileage
 - Passive mobile survey with USPS

Emission Reduction Program Outlook

- » Expecting near-term increase in emissions due to Resolution G-3605
 - Reversal in this near-term increase is possible following the Test Year 2028 GRC Decision
- » Previously approved and existing programs must be maintained to sustain current level of emission reductions long-term
- » Continued exploration of cost-effective solutions for emission reductions

Questions?

Programs Driving Methane Emissions Reductions

2026 Natural Gas Leak Abatement (NGLA) Winter Workshop
February 2025



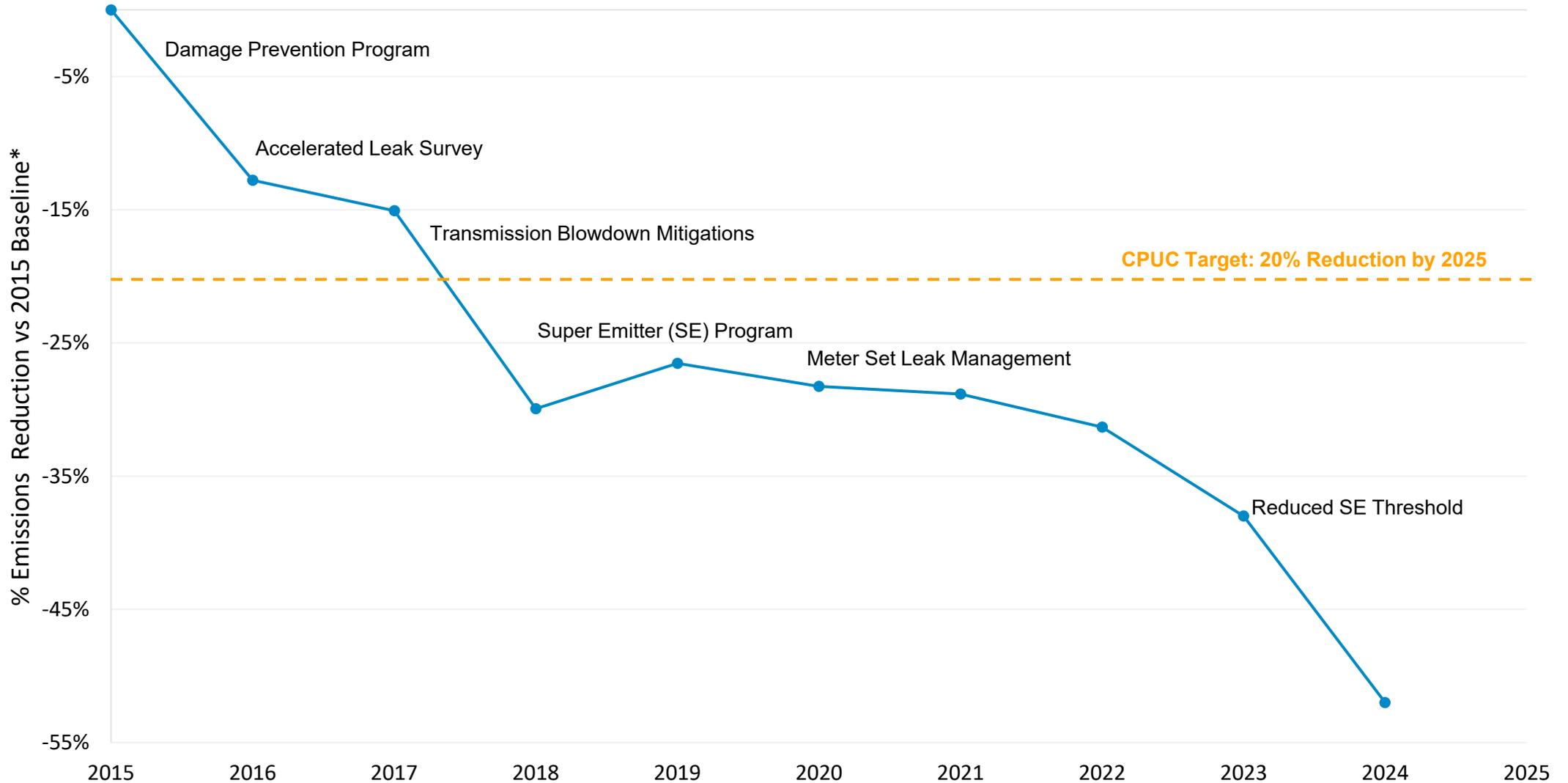


Agenda

- Introduction
- Top Reduction Strategies
 - Super Emitter Program
 - Meter Set Leak Management
 - Transmission Blowdown Emissions Reduction
- Potential for Continued Emissions Reductions
- Potential for Emissions Increases
- Potential for Improved Emissions Measurement and Accounting



Methane Emissions Reduction – Key Drivers



*Including CPUC-approved baseline adjustments in 2022, 2023, 2025



Super Emitter Program

Key Insight

- Methane emissions in gas distribution systems are driven by a small number of larger leaks (“Super Emitter”)

Opportunity

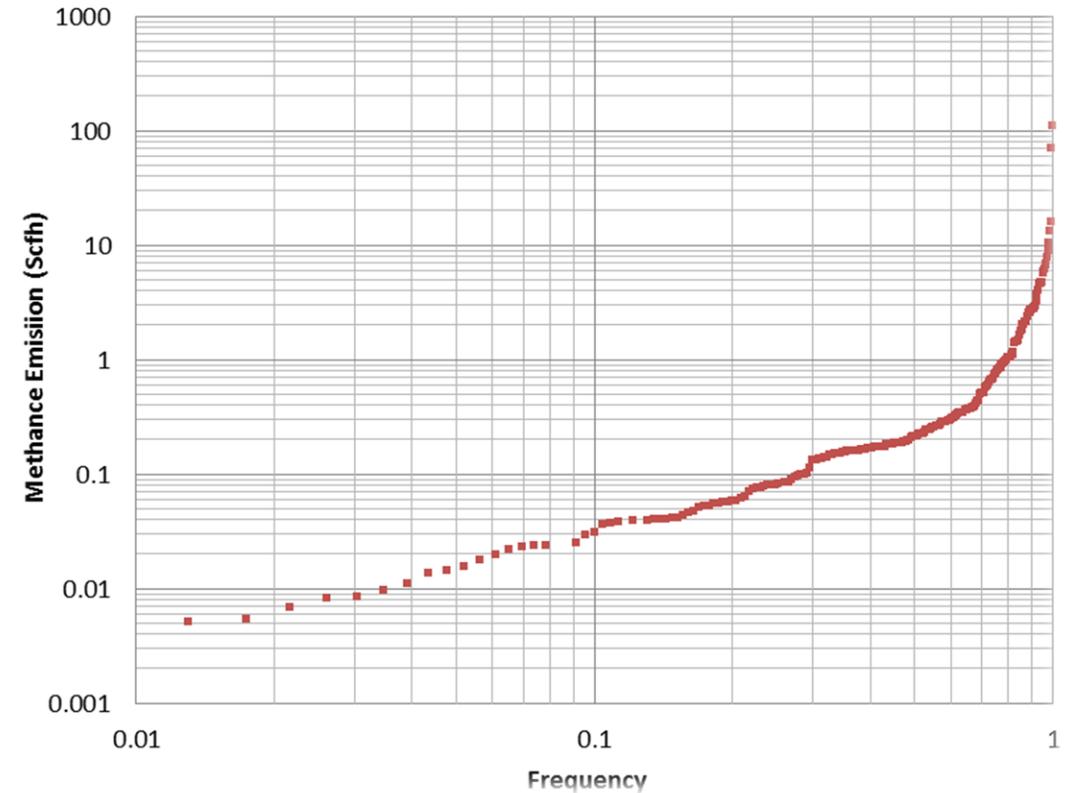
- Substantially reducing methane emissions by accelerating **detection** (with mobile surveys) and **repair of the larger leaks**

Program Launch

- Initiated in 2018 to identify and prioritize large leaks for repair
- Starting in 2023, PG&E has been progressively lowering the detection threshold prioritizing more large leaks for repair

Only about 2% of leaks in the distribution system were > 10 scfh but accounted for 56% of total emissions

WSU Study Data



Lamb et al., WSU (2015)

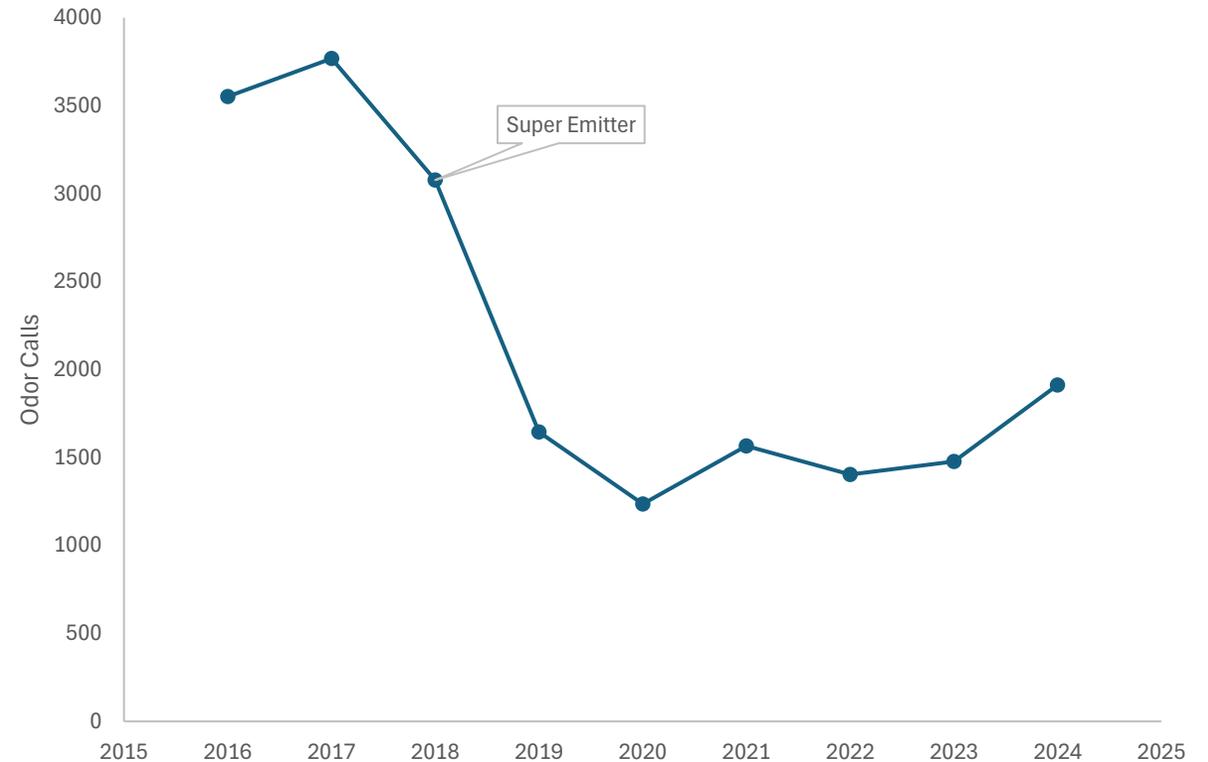


Super Emitter Program Results

Methane Abatement: In 2024, 239 MMscf from Distribution Pipeline leaks (relative to the 2015 baseline) of which **117 MMscf** is attributed to the SE program.

Year	2022	2023	2024
Threshold, SCFH	10	7	6
Coverage, miles	51,823	69,910	79,859
Leaks Prioritized for Accelerated Repair	117	164	248

Earlier detection and repair of larger leaks resulted in fewer customer odor calls



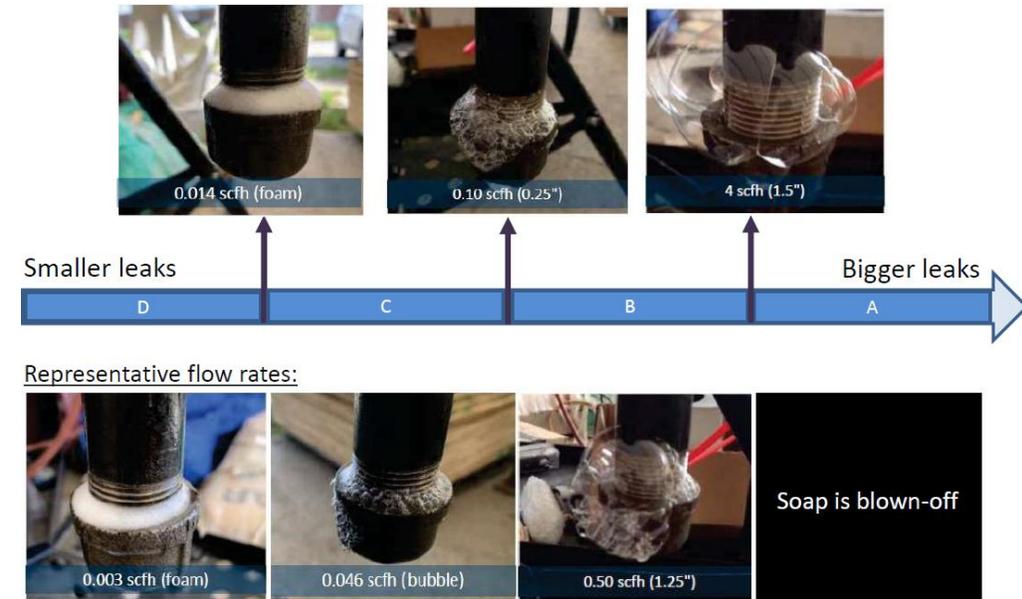


Meter Set Leak Management

Background

Prior to 2020, PG&E used the 1996 Gas Research Institute (GRI) population-based emission factor to estimate Meter Set Assembly (MSA) emissions.

In 2020, PG&E adopted a leak-based, bubble-classification approach that estimates emissions using measured leak indications, improving accuracy and enabling targeted mitigation.



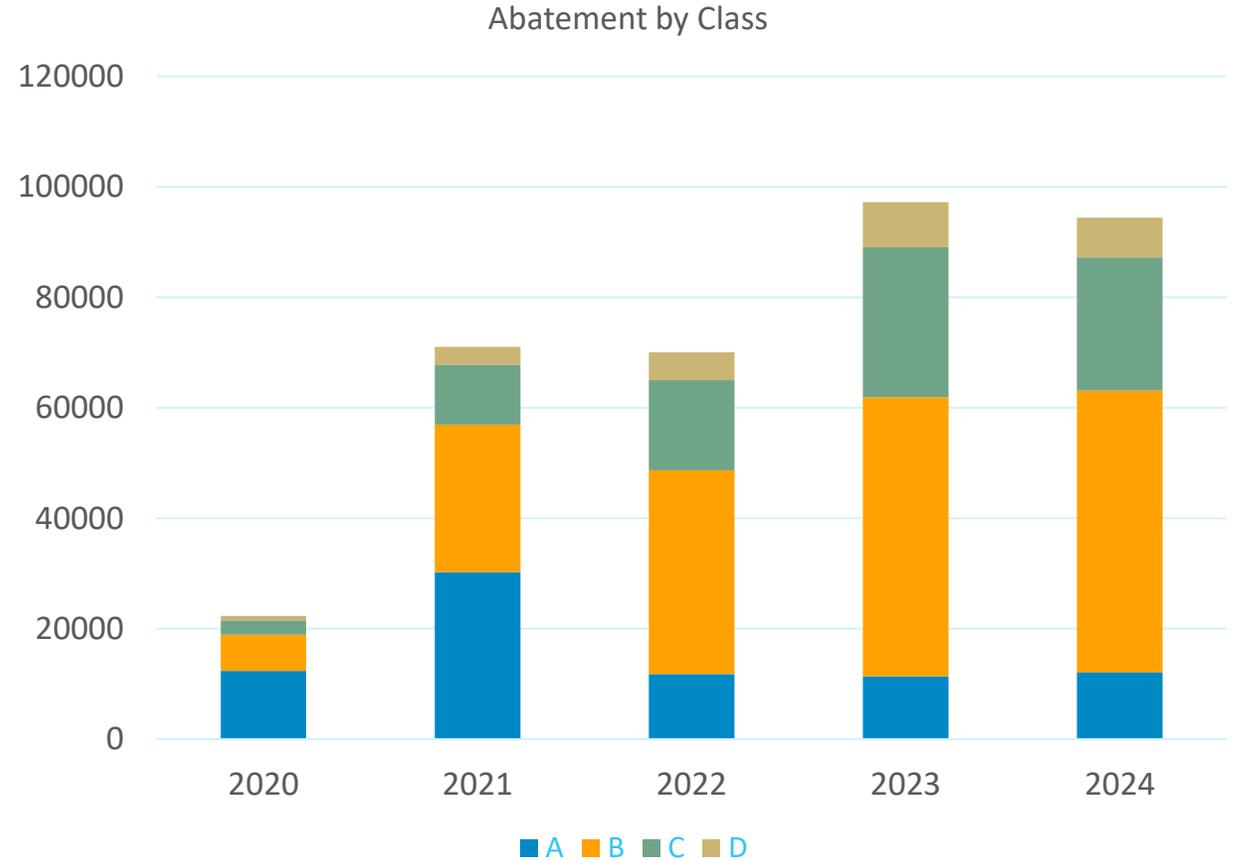
Leak-Based Methodology: Leak Surveyor performs traditional soap test on meter set leaks and documents bubble classification on mobile application.



Meter Set Leak Management Results

Achieved 56 MMscf methane abatement (relative to the 2015 baseline) in 2024.

In 2024, PG&E repaired 7,590 Class B leaks ahead of schedule, achieving ~106* MMscf emissions reduction.



*The calculation assumes the leak stays open on average for three years, which is the survey interval

Transmission Blowdown Emissions Reduction

Drafting: Transferring gas to a lateral or downstream system operating at a lower pressure.

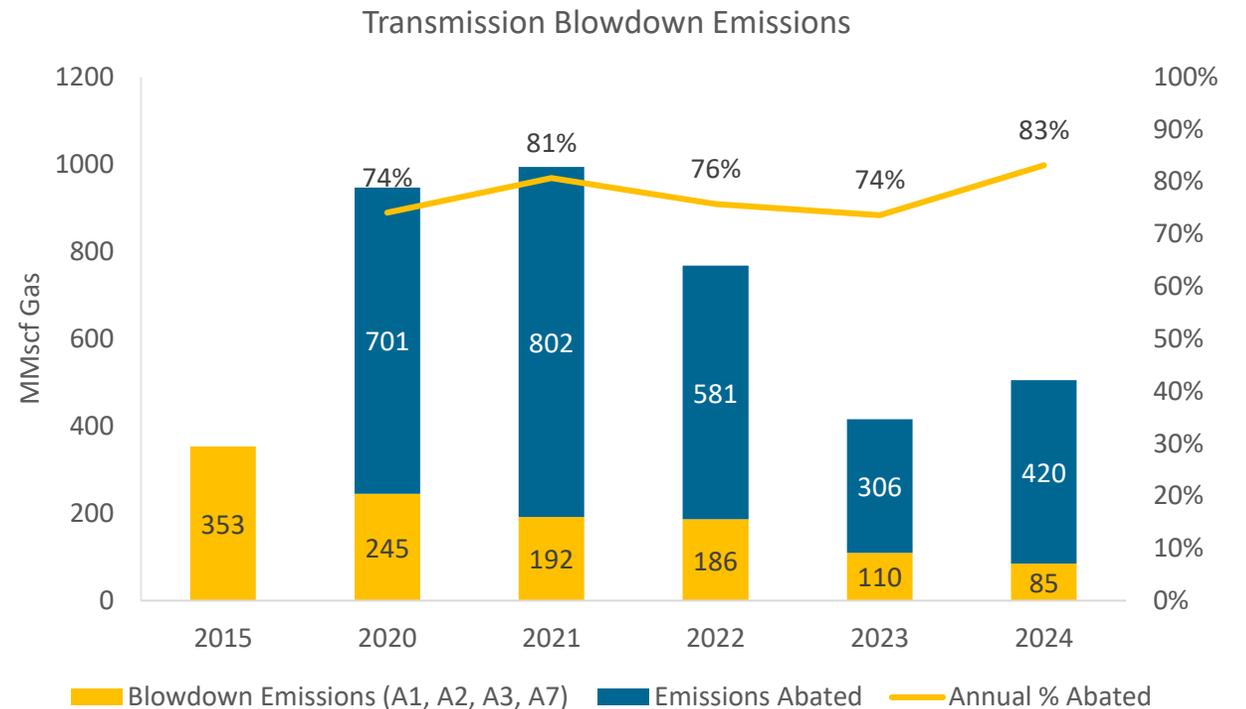
Cross Compression (XC): Compressing gas into a parallel system (e.g. CNG trailer).





Transmission Blowdown Results

- 2020-2024 estimated avoided vented emissions ~**2.8 Bcf**
 - **2 Bcf** abated from XC
 - **0.5 Bcf** abated from drafting
- RY2024 blowdowns emissions are 87% lower than the 2015 baseline
- On an annual basis, PG&E has mitigated potential emissions by at least 74%





Potential for Continued Emissions Reductions

Category	Opportunity	Challenges
Transmission Blowdowns	<ul style="list-style-type: none">○ Mid-scale blowdown mitigation	<ul style="list-style-type: none">○ Diminishing emissions reductions as blowdown volumes decrease, reducing cost-effectiveness
Distribution Pipeline Leaks	<ul style="list-style-type: none">○ Lowering Super Emitter threshold to prioritize additional high-emitting leaks for repair○ Increase Super Emitter survey frequency	<ul style="list-style-type: none">○ Higher marginal cost per unit of emissions avoided
Meter Set Leaks	<ul style="list-style-type: none">○ Prioritize meter set leak repairs based on leak classification○ Eliminate Class B leaks backlog	<ul style="list-style-type: none">○ Growth in the inventory of low-emitting leaks (Class C/D)



Potential for Increased Emissions

Distribution System

- Leaks backlog growth
 - Workforce or funding constraints, delaying repairs, increasing average leak duration

Transmission Systems

- Emergency events and third-party damage
 - Event-driven venting, requiring rapid unmitigated blowdowns



Risk of Sustaining Current Emissions Levels

Mains Replacement Program

- Reduction in replacement scope or pace could increase exposure to emissions growth from aging assets

Reprioritizing Funding Away from Current Methane Abatement Programs

- Leaks backlog growth
- Less frequent survey, delayed leak identification and higher cumulative emissions



Opportunity for Improved Emissions Measurement and Accounting

Measurement

- Transmission Control Valves
 - Misalignment of emissions factors between the appendices and the 2024 EPA Subpart W

Accounting

- Integrated Emissions Reporting Platform
 - Automated data processing reducing human error and improve data quality
- Transmission Leaks
 - Transitioning from mileage-based to leak-based reporting framework

Thank you





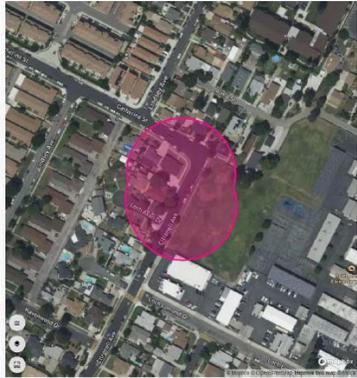
R&D OVERVIEW

February 3rd, 2026

Agenda

- » Passive Mobile Methane Detection
- » Improving Aerial Methane Mapping (AMM) Cost Effectiveness through Ferry Scans
- » Improved Advanced Meter Algorithms for Customer Leak Detection
- » Cost Effectiveness Framework
- » Pipe Thread Sealant Performance in Storage Applications
- » Meter Set Assembly (MSA) Failure Mode Analysis

Passive Mobile Methane Detection



Detected At	Max CH4 (ppm)	CH4 Delta	Background CH4 (ppm)	Latitude	Longitude
11/13/2025 19:44	22.265	17.37	4.895	33.99633	-118.08239
11/22/2025 20:20	19.769	12.42	7.351	33.99606	-118.08238
11/26/2025 15:40	13.811	8.89	4.924	33.99612	-118.08242
11/13/2025 19:45	12.42	7.09	5.331	33.99633	-118.08241
11/13/2025 19:44	11.197	6.25	4.944	33.99633	-118.0824
11/26/2025 15:40	10.188	5.24	4.943	33.99612	-118.08242
11/13/2025 19:45	9.278	5.27	4.004	33.99634	-118.0824

PROJECT
CANARY

ID	Max CH4	Correlation	CH4 Delta	Latitude	Longitude	C2H6/CH4 Ratio	Background CH4	Detection Count	Last Detected Date
16	22.265	1	17.37	33.996202	-118.082396	0.02	5.199	7	11/26/2025 20:40

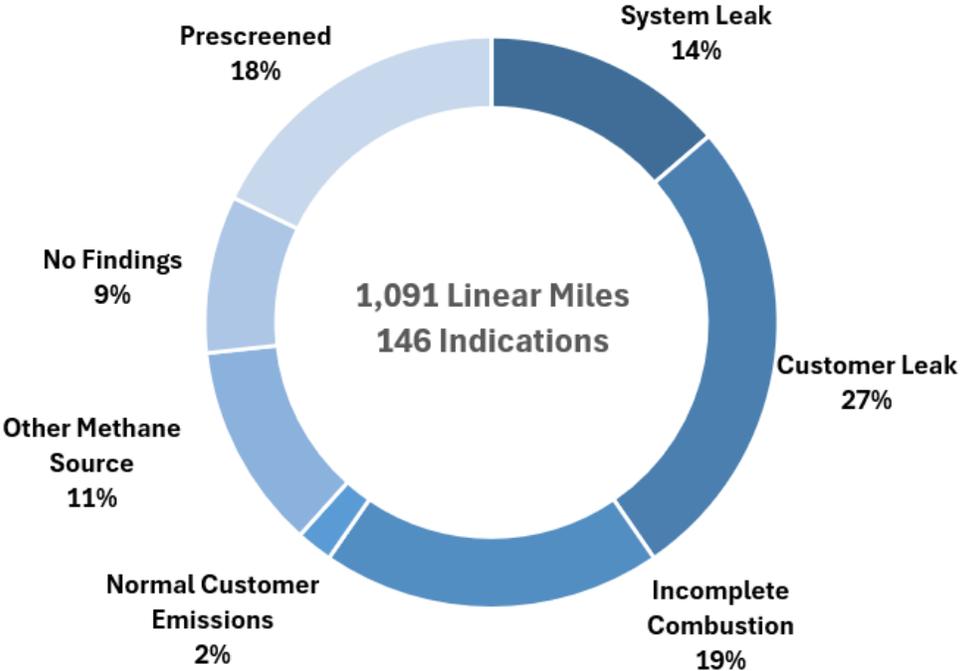


Passively detect methane emissions from normal vehicle operations and utilize data analytics to compile methane readings and potentially identify leak sources

- » Installation of 37 units on USPS trucks complete
- » Data collection began August 2025 and will run through December 2026
 - August Results
 - 5 indications
 - No leaks found upon investigation
 - September Results
 - 4 indications
 - 1 system leak
 - 3 no findings
 - October Results
 - 15 indications
 - 2 house line leaks
 - 4 system leaks
 - 9 no findings
 - November Results
 - 24 indications
 - 2 house line leaks
 - 12 system leaks
 - 2 field gas
 - 8 no findings

Improving Aerial Methane Mapping (AMM) Cost Effectiveness through Ferry Scans

- » Assess the feasibility and cost effectiveness of collecting methane detection data during ferry flights associated with the Aerial Methane Mapping (AMM) program
 - Field testing was conducted over a six-month period during routine AMM operations

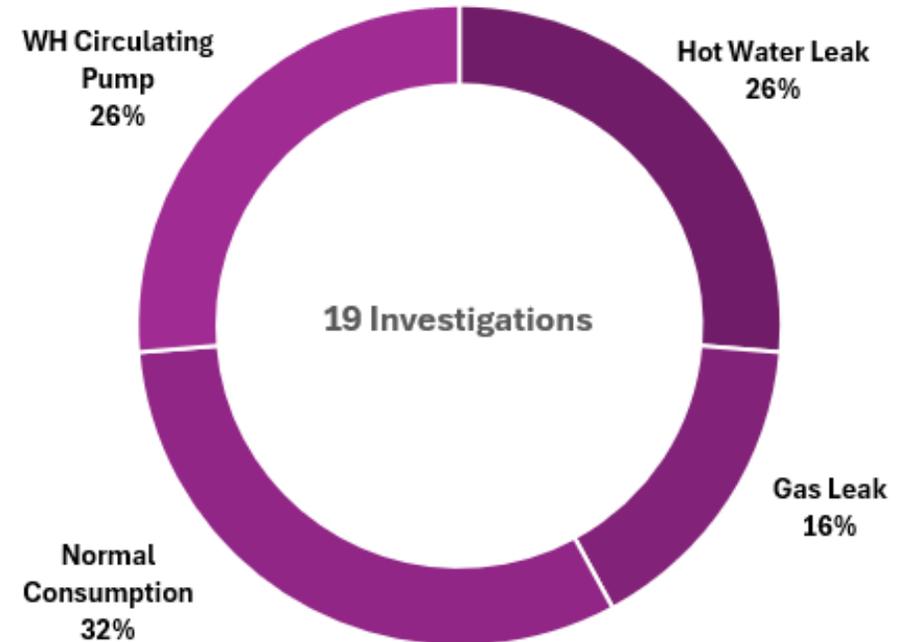


Sources	Cost-Effectiveness (\$/MCF)
System Leaks	\$10.81
System Leaks and Customer Leaks	\$3.70
System Leaks, Customer Leaks, and Incomplete Combustion	\$2.48



Improved Advanced Meter Algorithms for Customer Leak Detection

- » Evaluate whether customer leak detection algorithms can be improved by incorporating training data from verified customer leaks identified by the Aerial Methane Mapping (AMM) program.
 - Algorithms were validated against the AMM-derived dataset, achieving a 95% correct identification rate for customer leaks.
 - Algorithms were applied to four years of historical advanced meter data from areas outside AMM flight polygons generating 5,823 indications of potential anomalies
 - A single district was selected for follow-up investigation resulting in 19 customer visits.



Cost Effectiveness Framework

» Develop Methods to Quantify Ratepayer Benefits

- Reduced GHG Emissions: Climate and Health Benefits
- Improved Air Quality/Reduced Criteria Pollutants Emissions
- Improved Public and Employee Safety
- Improved Operational Efficiency
- Improved Reliability
- Improved Affordability

» Project Status

- Final report on framework completed
- Supplemental report on application of framework to a previous project (AMM) completed.
- Further refinement being pursued by greater SoCalGas RD&D program for adherence to EPIC framework

$$PV = \sum_{t=0}^n NB_t * \frac{1}{(1+r_t)^t}$$

Where:

PV = present value [current time-period \$]

t = time-period

n = number of time-periods during which the costs are incurred and/or the benefits are realized

NB_t = net benefits accrued during time-period t [time-period t \$] = B_t - C_t

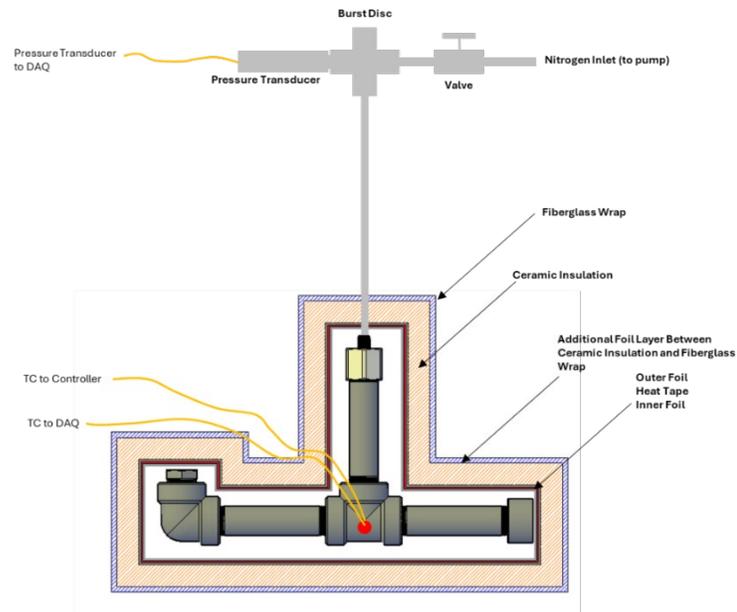
B_t = benefits accrued during time-period t [time-period t \$]

C_t = costs incurred during time-period t [time-period t \$]

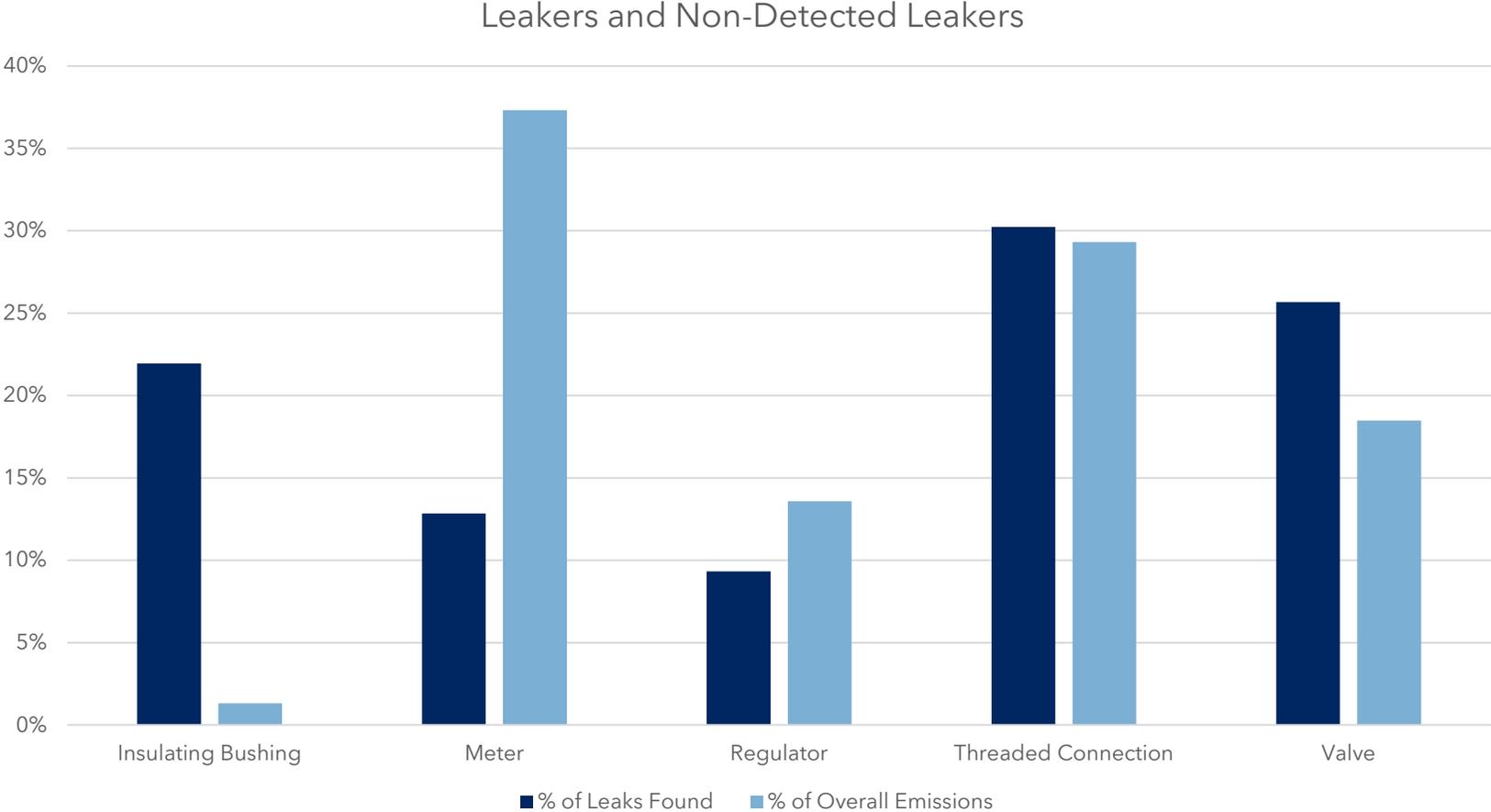
r_t = discount rate for time-period t [%/100]

Pipe Thread Sealant Performance in Storage Applications

- » Evaluate 16 commercially available thread sealants under SoCalGas storage operational conditions, including pressures up to 4,000 psig, temperatures up to 450°F
 - All pastes failed during high temperature testing
 - Three tape sealants successfully passed all laboratory testing
 - Only two tape sealants successfully passed six-month longevity testing under sustained 300°F and 3,400 psig conditions



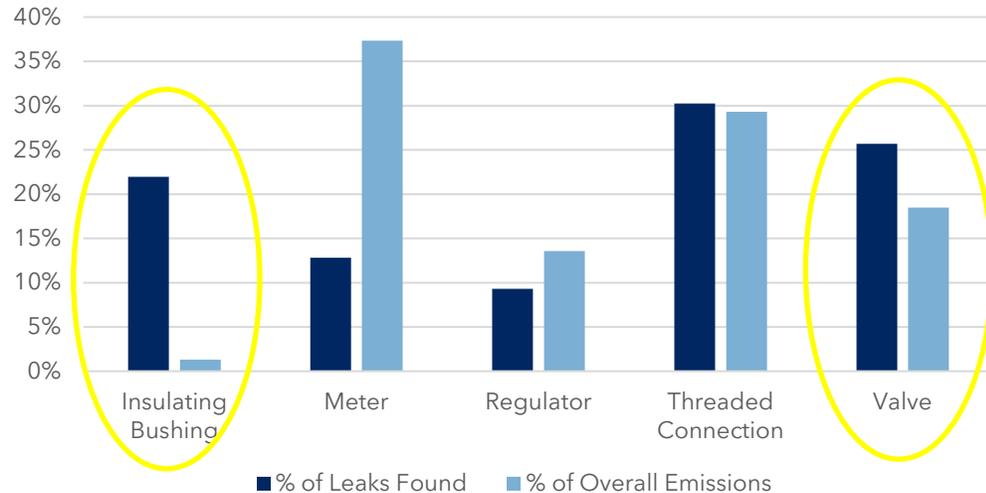
Meter Set Assembly (MSA) Failure Mode Analysis



Meter Set Assembly (MSA) Failure Mode Analysis



Leakers and Non-Detected Leakers

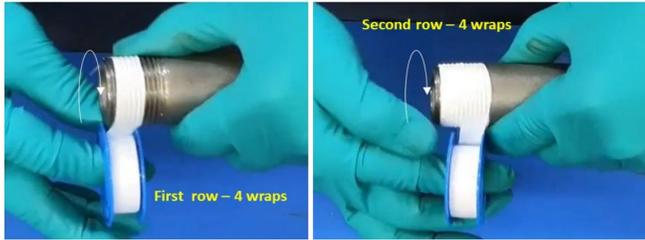


Potential Solution:

ISO 15848-1 certified valves with built-in insulating bushing

- » International standard for testing industrial valves (shut-off & control) to measure and qualify their performance in preventing fugitive emissions (unintended leaks) from stem seals and body joints
- » Emission reduction potential of ~138,000 MCF/yr

Meter Set Assembly (MSA) Failure Mode Analysis

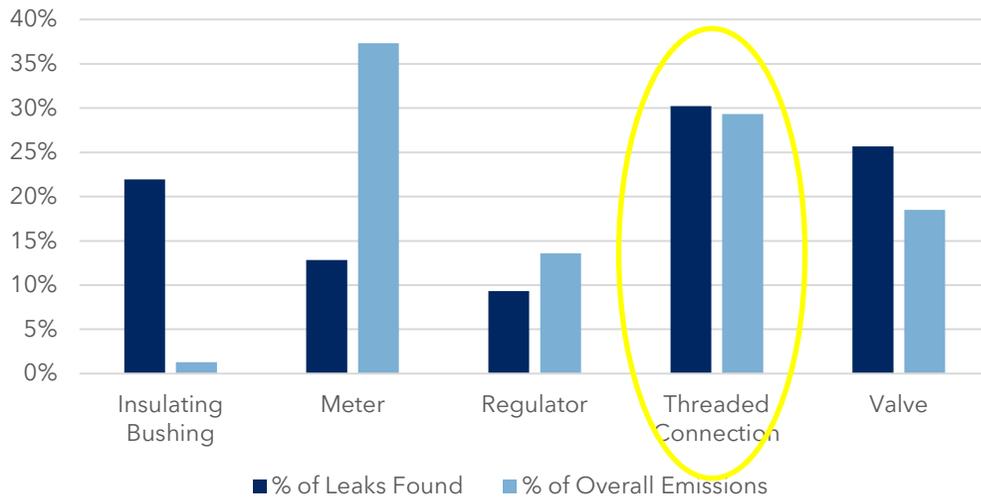


Potential Solution:

Sealant selection, sealant application, torque wrenches, compression fittings, and/or pre-fabricated assemblies

- » Emission reduction potential of ~173,000 MCF/yr
- » Potential additional cost benefit from operational efficiency improvements during meter set installations and rebuilds

Leakers and Non-Detected Leakers



Meter Set Assembly (MSA) Failure Mode Analysis

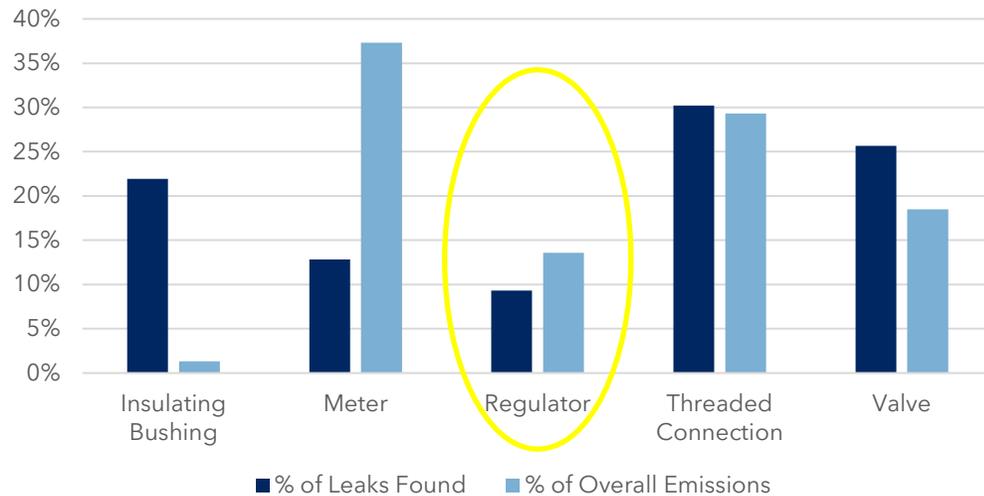


Potential Solution:

Two-stage non-venting pressure regulator

- » Emission reduction potential of ~51,000 MCF/yr
- » Potential additional emissions reduction benefit associated with venting from normal operation
 - Consortium research study underway to quantify related emissions

Leakers and Non-Detected Leakers



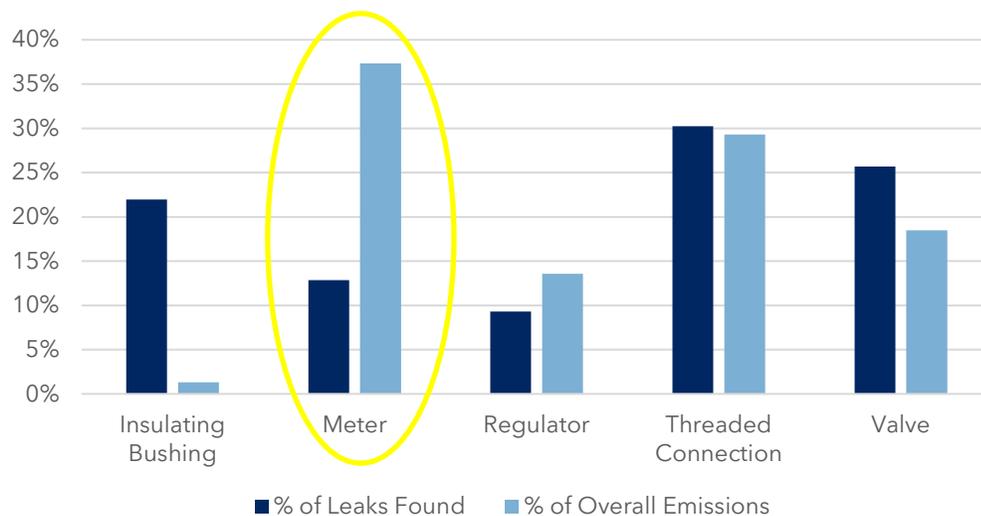
Meter Set Assembly (MSA) Failure Mode Analysis



Potential Solution: Ultrasonic meter

- » Emission reduction potential of ~143,000 MCF/yr
- » Potential additional ratepayer benefit from pressure data output provided by device (e.g., identification of more customer gas leaks/hot water leaks from data analytics)

Leakers and Non-Detected Leakers



Future Work

- » Pursuant to Resolution G-3605, SoCalGas will "...move its NGLA Research, Demonstration & Development projects as appropriate to its broader Research and Development program in its next GRC..."
- » These projects will be incorporated into new and existing initiatives within the broader Research and Development program, as appropriate

Questions?

Gas Research Development and Demonstration (RD&D) Program & Project Updates

2026 Natural Gas Leak Abatement (NGLA) Winter Workshop
February 2026





DM&S/Transmission Emissions

BP-17 Aerial Leak Detection via Drones Update

Drone Systems are vital tools for emergency response when difficult terrain make walking and mobile surveys inaccessible. They also possess the ability to quicken leak detection and improve localization.

- In 2025, PG&E continued testing the U10 drone mounted sensor
- The sensor was mounted and tested in conjunction with the RKI unit, which is already approved for use for waterway crossings
- After a successful pilot, the U10 sensor was deployed into operation in 2025





Transmission Emissions

Bridger Photonics Aerial Leak Detection and Quantification (BP-20) Update

Helicopter mounted sensors can enhance safety, improve leak detection, and reduce emissions.

- PG&E piloted Bridger Photonics Gas Mapping LiDAR in 2025
- Due to exceptional pilot results, PG&E deployed Bridger Photonics as the sole aerial service provider for transmission leak survey to enhance safety and improve leak detection





Underground Storage Emissions

BP-18 Continuous Monitoring of UGS Update

A continuous monitoring system in lieu of daily wellhead leak surveys can improve safety and reduce emissions.

- In 2025, PG&E tested the technical specs of stationary sensors for leak detection of wellheads with respect to the California Oil and Gas Rule requirements
- PG&E is currently deploying the continuous monitoring leak detection system at a small storage facility
- In 2026, PG&E plans to test the viability of at a larger, more complex facility





Meter Set Assembly Emissions

BP-21 LLFA[®] Putty

LLFA[®] Tape and putty for MSA repairs can reduce emissions, enhance safety, and drive affordability.

- PG&E expanded the LLFA tape pilot to 38 meter sets in 2025. While ultimately the product was successful on all MSAs, there was a steep learning curve with applying the product
- R&D in conjunction with GTI Energy investigated LLFA putty to determine if it could reduce installation error
- The product was successful on all samples and PG&E is currently assessing next steps internally





Purging Emissions

BP-5 OTD and Zevac Vacuum Purging Systems

Traditional purging methods result in emissions to the atmosphere that can pose safety risks. Vacuum purging systems can reduce emissions and enhance safety.

- In 2025, PG&E demonstrated 2 different vacuum purging technologies
- The Zevac and OTD vacuum purging systems were both tested at the Winter's Gas Safety Academy
- Both demos deemed successful. Operations is currently in process of testing the units in field





Future Potential Projects

PG&E Gas RD&D Plan Ideas

Potential ideas PG&E is exploring to improve affordability, enhance safety and reduce emissions.

- ❖ New ALD technologies
- ❖ Investigating all damage emission rates
- ❖ Analyzing smart meter MSA data
- ❖ Top-down flyovers to quantify emissions
- ❖ Piloting fixed wing aircrafts for leak detection
- ❖ Passive mobile detection to improve find rate
- ❖ Scanning drones for aerial leak detection



Thank you

Monique.Montague@pge.com



Open Forum Discussion

Current and Future State of the Natural Gas Leak Abatement Program



California Public
Utilities Commission

Open Forum Discussion – Question #1

Are there considerations of additional Natural Gas Leak Abatement Program goals?

Open Forum Discussion – Question #2

Are there any emission reduction technologies that teams are aware of that have the potential to reduce substantial emissions but are not yet widely available or cost-effective?

Open Forum Discussion – Question #3

Hydrogen blending demonstrations are being conducted in California. Are there any plans to modify the reporting framework to account for gas that may contain a percentage of blended hydrogen?

Open Forum Discussion – Additional Questions

The CPUC would like to invite any participants to provide any additional questions, comments, or topics for discussion.

Closing and Next Steps

CARB and CPUC



California Public
Utilities Commission

Final Questions?

- Click the hand next to your name in the participant list 
- The host will call on your name when it is your turn to speak
- Or, type question into the chat



THANK YOU

For more information and today's slides:

<https://www.cpuc.ca.gov/about-cpuc/divisions/safety-policy-division/risk-assessment-and-safety-analytics/natural-gas-leak-abatement>



California Public
Utilities Commission