

## SDG&E, June 13th, 2025

### Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

#### In Response to Data Request, R15-01-008 2025 June Report

#### Appendix 6; Rev. 03/27/2025

Notes:

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

Response:

#### Customer Meter Total Leaks and Emissions:

Number of Meters	Meter Type	Emission Factor (Mscf/yr)	Annual Emissions (Mscf)
886,031	Residential	0.148	131,133
30,705	Commercial	0.051	1,566
1,579	Industrial	0.051	81
Sum Total			132,779



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● 2010 年 10 月 1 日起, 凡在中华人民共和国境内销售货物或者提供加工、修理修配劳务以及进口货物的单位和个人, 均应按照《中华人民共和国增值税暂行条例》及实施细则缴纳增值税。

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1. The first step in the process of creating a new product is to identify a market need. This involves conducting market research to understand the target audience's preferences and pain points. Once a need is identified, the next step is to develop a concept that addresses this need. This concept should be unique, valuable, and feasible. The third step is to create a prototype, which allows the team to test the concept and gather feedback. The fourth step is to refine the product based on the feedback received. This may involve making changes to the design, features, or pricing. The final step is to launch the product and monitor its performance in the market. This involves tracking sales, customer feedback, and market trends to ensure the product remains competitive and relevant.

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Country	Year	Population (millions)	GDP (billion USD)	Life expectancy (years)	Infant mortality (per 1,000 live births)	Healthcare expenditure (billion USD)	Healthcare expenditure per capita (USD)
USA	2019	328.6	21.4	78.1	10.5	1,100	3,346
China	2019	1,412.6	14.3	77.1	16.9	590	418
Germany	2019	82.7	4.0	81.1	4.1	110	1,329
France	2019	67.4	3.0	82.4	3.8	100	1,485
UK	2019	67.0	2.9	81.2	4.0	100	1,485
Japan	2019	126.3	5.0	84.4	2.8	100	1,485
Canada	2019	37.7	1.7	82.7	4.0	100	1,485
Italy	2019	60.3	1.9	83.7	3.5	100	1,485
Spain	2019	45.9	1.4	83.5	3.5	100	1,485
Sweden	2019	10.0	0.5	83.5	3.5	100	1,485
Norway	2019	5.4	0.4	82.7	3.5	100	1,485
Denmark	2019	5.6	0.4	82.7	3.5	100	1,485
Netherlands	2019	17.1	0.9	82.1	3.5	100	1,485
Belgium	2019	11.3	0.6	82.1	3.5	100	1,485
Australia	2019	25.4	1.3	83.7	3.5	100	1,485
South Korea	2019	51.7	1.7	83.4	3.5	100	1,485
South Africa	2019	60.2	0.4	62.7	37.5	100	1,485
India	2019	1,380.0	2.9	73.4	30.6	100	1,485
Brazil	2019	214.0	1.9	73.4	30.6	100	1,485
Russia	2019	146.5	1.6	73.4	30.6	100	1,485
Argentina	2019	45.9	0.4	73.4	30.6	100	1,485
Colombia	2019	50.0	0.4	73.4	30.6	100	1,485
Peru	2019	33.0	0.4	73.4	30.6	100	1,485
Venezuela	2019	28.3	0.4	73.4	30.6	100	1,485
Egypt	2019	101.3	0.4	73.4	30.6	100	1,485
Mexico	2019	128.1	1.3	73.4	30.6	100	1,485
Chile	2019	18.7	0.4	73.4	30.6	100	1,485
Uruguay	2019	3.6	0.4	73.4	30.6	100	1,485
Paraguay	2019	7.3	0.4	73.4	30.6	100	1,485
Bolivia	2019	11.0	0.4	73.4	30.6	100	1,485
Ecuador	2019	17.4	0.4	73.4	30.6	100	1,485
Costa Rica	2019	5.1	0.4	73.4	30.6	100	1,485
Panama	2019	4.1	0.4	73.4	30.6	100	1,485
Guatemala	2019	17.0	0.4	73.4	30.6	100	1,485
Honduras	2019	9.6	0.4	73.4	30.6	100	1,485
Nicaragua	2019	6.6	0.4	73.4	30.6	100	1,485
El Salvador	2019	6.5	0.4	73.4	30.6	100	1,485
Jamaica	2019	2.8	0.4	73.4	30.6	100	1,485
Trinidad and Tobago	2019	1.3	0.4	73.4	30.6	100	1,485
Barbados	2019	0.3	0.4	73.4	30.6	100	1,485
Suriname	2019	0.6	0.4	73.4	30.6	100	1,485
Guyana	2019	0.8	0.4	73.4	30.6	100	1,485
French Polynesia	2019	0.3	0.4	73.4	30.6	100	1,485
Guadeloupe	2019	0.4	0.4	73.4	30.6	100	1,485
Martinique	2019	0.4	0.4	73.4	30.6	100	1,485
Reunion	2019	0.8	0.4	73.4	30.6	100	1,485
Mayotte	2019	0.2	0.4	73.4	30.6	100	1,485
French Guiana	2019	0.8	0.4	73.4	30.6	100	1,485
St. Martin	2019	0.1	0.4	73.4	30.6	100	1,485
St. Pierre and Miquelon	2019	0.1	0.4	73.4	30.6	100	1,485
Wallis and Futuna	2019	0.1	0.4	73.4	30.6	100	1,485
Polynesia	2019	0.1	0.4	73.4	30.6	100	1,485
French Southern Territories	2019	0.1	0.4	73.4	30.6	100	1,485
Aruba	2019	0.1	0.4	73.4	30.6	100	1,485
Curaçao	2019						

*(continued)*

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In Response to Data Request, R15-01-008 2025 June Report  
Appendix 6; Rev. 03/27/2025

Notes:

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.  
At utilities request, fill out with two, three, or four categories that correspond to the bubble-size classification and label the type of leak, whether AG-Haz, or AG-Non-Haz  
If highlighted cells are filled in, the other cells will auto-populate

The term "Non-leaker EF" aligns with CARB's definition for "No Bubble EF" for the event of finding a leak even though not through bubble testing  
The number of miles surveyed (Column C) should be the number of unique miles surveyed, and should not include any repeated miles surveyed multiple times per year (Column D).

To clarify the definition of O&M Leaks (Column K), the following criteria for O&M Leaks should be met: (1) occur stochastically across the whole territory, (2) are leak reported by customers, (3) found quickly after occurring, (4) found independently of survey activities but would have been found later by surveyors, and (5) considered a small number of leaks.

To clarify the definition of Survey Leaks (Column G), the following criteria for Survey Leaks should be met: (1) found from company employees or contractors actively searching for leaks (2) including, but not limited to, compliance survey leaks and non-compliance survey leaks (e.g. Super Emitter Programs, Aerial Methane Mapping, Corrosion Surveying.)

Please provide the additional information requested on lines 58-60.

Summary of Data by Meters Survey Interval and Results for Annual System Leak Rate and Resulting Number of Unknown Leaks for Each Meter

Meter Classification (AG-Haz, AG-Non-Haz); Bubble Size Category	Total System Meters per survey Cycle	Meters on Annual Survey $[M_{x,A}]$	Meters on Multi-Year Survey Cycles $[M_{x,Int}]$	Survey Interval (yrs) $[I]$	Meters Surveyed Annually from Multi-Year Survey Cycles $[M_{x,I}]$	Total # of Leaks Detected from Survey $[N_{x,L}]$	Annual Leak Rate [Leaks / Meter] $R_x = \frac{N_{x,L}}{M_{x,A} + (I \times M_{x,I})}$	# of Unknown Leaks $N_{x,unk} = \overline{R}_x \times (M_{x,Int}^{Tot} - M_{x,I}) \times \frac{I}{2}$	Total # of Leaks Detected from O&M* $[N_{x,O}]$
Not applicable				1			-	-	
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At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

Response:

Damage to MSAs (Customer, third party, natural disasters, etc.)

[illegible]

[illegible]

Sum Total	820
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Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.  
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Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.  
At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

Include items like the following in this tab (Note whether emissions are included in the MSA EF used to estimate emissions for the MSA population and show only the event count.):  
Gas vented during all Regulator Change outs due to other than vent leakage.  
Large Customer MSA Regulator Inspection - External Regulator Inspections. List avg. amount vented.  
Large Customer MSA Regulator Inspection - Regulator change out & Internal Reg Inspection. List avg. amount vented.  
Diaphragm - CSF Read & Verify - List amount vented thru meter during read & verify order for decreased usage.  
Diaphragm - CSF Clock Test - List amount vented during Clock Test  
Diaphragm - CSF Registration Check - List amount ventedn during Registration Checks  
Diaphragm Size 1,2,3 Meter Change Out - List avg. gas vented on Size 1 Meter Change Out  
All Meter Change Out Size 4 thru 28 - List avg. gas vented for Size 5 to 10 Meter Change outs  
Field Meter Test of Diaphragm & Rotary - List avg. gas vented for Size 9 Meters  
Customer Orifice Meter Plate Insp. - Orifice Plate Inspected Monthly. List avg. amount vented

Response:

Customer Meter Blowdowns:				
Number of Blowdowns	Meter Type	Emission Factor (Mscf/yr)	Annual Emissions (Mscf)	Explanatory Notes / Comments
621	CI	0.005	3.11	All Meter Change Out Size 4 thru 28 - Use avg. gas vented of 5 scf for Size 5 to 10 Meter Change outs
189	CI	0.005	0.95	Field Meter Test of Diaphragm & Rotary - Use avg. gas vented of 5 scf for Size 9 Meters
105	CI	0.015	1.58	Filter Changeout + straight Filter Removal - Estimated avg. gas vented = 15 scf/ea.
1,485	CI	0.006	8.91	Large Customer MSA Regulator Inspection @ 6 scf/insp - Sum of Regulator change out/2 + Internal Reg + IPR + straight reg removal.
1,544	CI	0.002	3.09	Large Customer MSA Regulator Inspection - External Regulator Inspections @ 2 scf/insp. At SDGE External Reg inspection done at meter change out.
15,426	CI/R	0.000625	9.64	Diaphragm - CSF Clock Test - Vent 0.625 scf/inspection during Clock Test and Registration Checks
19,740	CI/R	0.000625	12.34	Diaphragm - CSF Registration Check - Vent 0.625 scf/inspection during Clock Test and Registration Checks
13,719	CI/R	0.001	13.72	Diaphragm Size 1,2,3 Meter Change Out - Use avg. gas vented of 1 scf on Size 1 Meter Change Out
303	CI/R	0.001	0.30	Customer MSA Size 1-2 Standard Pressure Removals. Assumed avg vent 1 scf
33	CI/R	0.003	0.10	Customer MSA Size 3-4 Standard Pressure Removals. Assumed avg vent 3 scf
15	CI	0.005	0.08	Customer MSA Size 5+ Standard Pressure Removals. Assumed avg vent 5 scf
69	CI	0.005	0.35	Customer MSA M&R-Maintained Removals (Estimated gas vented 5 scf/ea.)
28	CI	0.03	0.84	Transmission maintained - Filter Changeout or Filter Inspection w/parts replacement - Estimated avg. gas vented = 30 scf/ea.
4	CI	0.02	0.08	Transmission maintained - Relief Valve Inspection at Customer MSAs - Estimated avg. gas vented = 20 scf/insp. (annual test with Nitrogen, gas vented is volume of gas in valve)
8	CI	0.002	0.02	Transmission maintained gas chromatographs/analyzers - 2 scf/inspection
6	CI	0.025	0.15	Transmission maintained meters - 25 scf/inspection
2	CI	0.002	0.00	Transmission maintained Pneumatic Device Annual Inspection - Estimated avg. gas vented = 2 scf/insp. (Actuators & Controllers)
6	CI	0.02	0.12	Producer Relief Valve Transmission maintained Inspection at Customer MSAs - Estimated avg. gas vented = 20 scf/insp.
1	CI	0.03	0.03	Producer Filter Changeout or Filter Inspection w/parts replacement - Estimated avg. gas vented = 30 scf/ea.
2	CI	0.025	0.05	Producer Meters - 25 scf/inspection
2	CI	0.002	0.00	Producer Gas chromatographs/analyzers - 2 scf/inspection
7	CI	0.002	0.01	Producer Pneumatic Device Annual Inspection - Estimated avg. gas vented = 2 scf/insp. (Actuators & Controllers)
Sum Total			55	

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

## Appendix 6; Rev. 03/27/2025

This worksheet is intended to capture the actual number of equipment and components in this asset category that vent emissions as a part of their design and normal function. By listing the number and types of components (not captured elsewhere in other templates) that vent emissions we hope to obtain information that may provide insight into how to evolve to a method of reporting emissions based on the actual number of units and types emitting rather than a crude population based estimate.

No emissions estimates from this worksheet should be included in Appendix 8, as this is being collected for informational purposes at this time.

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

**Customer Meter Component/Equipment Vented Emissions (Informational Purposes Only):**

ID (Number of Devices)	Geographic Location	Device Type	Bleed Rate	Manufacturer	Number of Days Emitting	Engineering or Manufacturer's based Estimate of Emissions	Annual Emissions (Mscf)	Explanatory Notes / Comments
4	P	I			366	0.0576	84.33	Transmission Pneumatics
Sum Total							84	



**Identified MSA Leaks**

Added	Removed
	2403023

Appendix 6; Rev. 03/27/2025

Header column "Comment" boxes displayed below for reference.	
In Response to Data Request, Description and Definition of Required Contents (If not self-explanatory)	
Meter Leaks, Population Based	
Number of Meters	
Meter Type	CI = commercial or industrial meter R = residential meter
Emission Factor (Mscf/yr)	
Annual Emissions (Mscf)	
Identified MSA Leaks, Leaker	
ID	
Geographic Location	GIS, zip code, or equivalent
Meter Classification (Commercial/Industrial or Residential)	If available, indicate whether the meter is commercial or industrial "CI", or a residential "R" meter.  If that information is not available then note as "N/A".  CI = Commercial or Industrial R = Residential N/A = not available
Leak Classification (Grade)	AH = Above Ground Hazardous AN = Above Ground Non-hazardous AM = Above Ground Non-hazardous Minor  If Above Ground, and operator uses the Bubble grading methodology with an alphanumeric grade, then provide an explanation for the meaning each grade in the notes above the table. <b>For example:</b> A = grade A - Large Leak or equates to with AH above with an approximate EF of 10.2035 scfh. B = grade B - Equates to AN above with an approximate EF of 0.5138 scfh. Etc.  If the MSA leak is Below ground <b>and not included in DM&amp;S</b> , then use the following grades:  1 = grade 1 2 = grade 2 3 = grade 3 N = Non-Graded
Leak Discovery Method	S = Routine Leak Survey M = O&M (e.g. O&M activities, third party reports, customer odor reports, etc.)
Discovery Date (DD/MM/YY)	
Leak Repair Date (MM/DD/YY)	Use the date the leak ceases emitting NG.
If not repaired by 12/31/xx List the Scheduled Date of Repair (DD/MM/YY)	The final repair may be completed after the leak has been stopped.  If leak is open, specify the scheduled date of repair Otherwise type "M," signifying that the leak is being monitored with no scheduled date of repair Then, provide the reason for not scheduling a repair in Comments column.
Reason for Not Scheduling a Repair	If repair hasn't been scheduled, then provide the reason for not scheduling a repair in this column. If using a reason code, then provide a table with codes and corresponding explanations.
Number of Days Leaking	Leak Duration (in days) = End Date + 1 day - Start date End Date: The repair date or December 31st of subject year, which ever is earlier. Start Date: If discovered by survey use January 1st or prior survey date whichever is more recent, or if an O&M or customer called in leak, then use discovery date for start of the leak. (Leaks carried over should use January 1st as start date for emissions calculations.)  For O&M discovered leaks, assume that the leak begins with the discovery date <u>thru</u> repair date or December 31st of subject year, whichever is earlier.
Number of Days to Repair.	Leak Discovery date minus repair date or 12/31 of the subject year plus 1 = number of days to repair for the subject year.  Addition of 1 day to include the date repaired.
Comments or Additional Information	
Meter Leaks, Leak Count, Leaker	
Meter Classification (AG-Haz, AG-Non-Haz); Bubble Size Category	Utilities should add rows according to their bubble size categories and nomenclature, and should include a no-bubble category. For example, include a row for each: Foam/ Indeterminate; Bubbles; Soap Blown Off; and No Bubbles.
Total System Meters per survey Cycle	
Meters on Annual Survey $[M_{A,1}]$	
Meters on Multi-Year Survey Cycles $[M_{A,700}]$	
Survey Interval (yrs) $[I]$	
Meters Surveyed Annually from Multi-Year Survey Cycles $[M_{A,1}]$	

In Response to Data Request, Description and Definition of Required Contents (If not self-explanatory)	
Total # of Leaks Detected from Survey [ $N_{XL}$ ]	
Annual Leak Rate [Leaks / Meter]	$R_X = \frac{N_{XL}}{M_{XA} + (I \times M_{XI})}$
# of Unknown Leaks	$N_{X,unk} = R_X^- \times (M_{X,not}^- - M_{XI}) \times \frac{I}{2}$ <p>If the operator changed the leak survey cycle during the report year that requires more detailed calculations based on the approved calculation methodology to determine the number of unknown leaks an additional worksheet may be added to show the calculations.</p>
Total # of Leaks Detected from O&M* [ $N_{X,O}$ ]	
All Damages	
ID	
Geographic Location	GIS, zip code, or equivalent
Damage Type	E = Excavation Damage N = natural force damage O = other outside force damage
Meter Type	CI = commercial or industrial meter R = residential meter
Leak Classification (Grade)	AH = Above Ground Hazardous AN = Above Ground Non-hazardous AM = Above Ground Non-hazardous Minor
Discovery Date (DD/MM/YY)	
Leak Repair Date (MM/DD/YY)	Use the date the leak ceases emitting NG. The final repair may be completed after the leak has been stopped.
If not repaired by 12/31/xx List the Scheduled Date of Repair (DD/MM/YY)	If leak is open, specify the scheduled date of repair. Otherwise type "M," signifying that the leak is being monitored with no scheduled date of repair. Then, provide the reason for not scheduling a repair in the Column provided.
Reason for Not Scheduling a Repair	Provide the reason for not scheduling a repair.
Number of Days Leaking	<p>If date and time stamp are reliable and used consistently by respondent, then emissions may be calculated based on actual time leaking. E.G. Repair time - damage event time = duration of event.</p> <p>If respondent has average or historical leak duration based on the nature and circumstances of damages, then these may be applied to like damage events. The emissions factors should be adequately supported and explained in the filing.</p> <p>If actual time stamps and historical averages are not available, then whole days should be used in the engineering calculation. The leak begins with the damage event date thru repair date or December 31st of subject year, whichever is later. E.G. Days Leaking = Repair date - date of damage + 1 day.</p>
Engineering Estimate (Mscf/Day)	
Annual Emissions (Mscf)	
Explanatory Notes / Comments	
Vented and Blowdown Emissions	
Number of Blowdowns	For metering set assembly (MSA)
Meter Type	CI = commercial or industrial meter R = residential meter
Emission Factor (Mscf/event)	
Annual Emissions (Mscf)	
Explanatory Notes / Comments	
Component Vented Emissions	
ID	
Geographic Location	GIS, zip code, or equivalent
Device Type	C = connector OE = open-ended line M = meter P = pneumatic device PR = pressure relief valve V = valve O = other devices
Bleed Rate	L = low bleed I = intermittent bleed H = high bleed NA = not applicable
Manufacturer	
Number of Days Emitting	Because the emissions are a factor of design or function, these emissions counted for the entire year.
Engineering or Manufacturer's based Estimate of Emissions	
Annual Emissions (Mscf)	<p>The emissions should be based on 365 days times the actual volume emitting if known, or the approved Emissions Factor.</p> <p>Note whether the emissions are based on actual volumetric measures in the next column.</p>
Explanatory Notes / Comments	