

## Emissions Summary

	Baseline Year	Target Year	Target Year
	2015	2025	2030
Historical Net Emissions (Metric Tons CO2e)	7,127,540		
Forecasted Net Sales Demand Emissions (Metric Tons CO2e)		7,920,635	7,721,324
Emissions Reduction Required (% of baseline)		4%	22%
Emission Target (Metric Tons CO2e)		6,842,439	5,559,481
Emission Reduction Required (Metric Tons CO2e)		1,078,197	2,161,842

## Clean Heat Resources Emission Reductions

### Demand Side Customer Emission Reductions (Metric Tons CO2e)

	179,627	987,327
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### Recovered Methane Emissions Reductions (Metric Tons CO2e)

Total Recovered Methane Emissions Reductions (Metric Tons CO2e)	214,912	315,014
Allowable Recovered Methane Emissions Reductions (%)	1%	5%
Allowable Recovered Methane Emissions Reductions (Metric Tons CO2e)	269,549	491,328
Recovered Methane Emissions Reductions Below Allowable Limit?	Yes	Yes

### Other Supply Side Resources Emissions Reductions (Metric Tons CO2e)

	0	121,274
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### Total Emission Reductions Achieved (Metric Tons CO2e)

	394,539	1,423,615
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### Creditable Emissions Reductions Achieved (Metric Tons CO2e)

	394,539	1,423,615
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## Emissions Reduction Target Demonstration (Clean Heat Resources)

	2025	2030
Clean Heat Plan Projected Emissions (Net Forecast Emissions - Creditable Reductions)	7,526,096	6,297,708
Clean Heat Plan Emissions Target	6,842,439	5,559,481
Difference	683,658	738,227
Does CHP Portfolio Meet Target?	No	No

Emissions Summary	Baseline Year	Target Year	Target Year
	2015	2025	2030
Historical Net Emissions (Metric Tons CO2e)	7,127,540		
Forecasted Net Sales Demand Emissions (Metric Tons CO2e)		7,920,635	7,721,324
Emissions Reduction Required (% of baseline)		4%	22%
Emission Target (Metric Tons CO2e)		6,842,439	5,559,481
Emission Reduction Required (Metric Tons CO2e)		1,078,197	2,161,842
<b>Clean Heat Resources Emission Reductions</b>			
Demand Side Customer Emission Reductions (Metric Tons CO2e)		179,627	987,327
Recovered Methane Emissions Reductions (Metric Tons CO2e)			
Total Recovered Methane Emissions Reductions (Metric Tons CO2e)		214,912	315,014
Allowable Recovered Methane Emissions Reductions (%)		1%	5%
Allowable Recovered Methane Emissions Reductions (Metric Tons CO2e)		269,549	491,328
Recovered Methane Emissions Reductions Below Allowable Limit?		Yes	Yes
Other Supply Side Resources Emissions Reductions (Metric Tons CO2e)		0	121,275
"Clean Heat Plus" Resources Emissions Reductions (Metric Tons CO2e)		200,087	738,226
Total Emission Reductions Achieved (Metric Tons CO2e)		594,626	2,161,843
Creditable Emissions Reductions Achieved (Metric Tons CO2e)		594,626	2,161,843

Row added to calculate the emissions reduction required

Changed the equation in these squares to be the total methane reductions, rather than adding multiple lines within methan section  
 These percentages reference the baseline emissions rather than the emission reduction required in each year  
 These values are based on the emissions reductions required in each year

Changed equation in these squares to just the total Other Supply Side Reductions, rather than just the first project within the section

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Emissions Reduction Target Demonstration (Clean Heat Resources)	2025	2030
Clean Heat Plan Projected Emissions (Net Forecast Emissions - Creditable Reductions)	7,326,009	5,559,481
Clean Heat Plan Emissions Target	6,842,439	5,559,481
Difference	483,571	(1)
Does CHP Portfolio Meet Target?	No	Yes
Forecasted Total Net Emissions	7,326,009	5,559,481

Historical and Forecasted Usage (Dth)		2015	2022	2023	2024	2025	2026	2027	2028	2029	2030
End Use CO2 Emissions	Sales Customer Residential	91,508,079	105,152,926	98,542,017	99,318,133	99,796,636	99,954,959	99,469,182	98,905,932	97,676,342	97,111,531
	Sales Customer Small Commercial	32,235,828	36,898,028	35,845,033	36,855,020	37,167,136	37,018,857	36,911,592	36,884,808	36,544,104	36,363,717
	Sales Customer Large Commercial	5,290,135	9,141,044	9,133,692	9,375,097	9,457,969	9,423,579	9,395,844	9,405,426	9,332,906	9,292,786
	Sales Customer Interdepartmental	49,742	7,969	27,855	27,855	27,855	27,855	27,855	27,855	27,855	27,855
	Sales Customer Interruptible	1,332,767									
	<b>Total Sales Customer Usage</b>	<b>130,416,551</b>	<b>151,199,967</b>	<b>143,548,598</b>	<b>145,576,105</b>	<b>146,449,595</b>	<b>146,425,250</b>	<b>145,804,473</b>	<b>145,224,022</b>	<b>143,581,207</b>	<b>142,795,889</b>
	Aggregate Sales Customers > 460,000 Mscf/yr (customer must report to EPA)	0	595,863	601,881	607,961	614,102	620,243	626,445	632,710	639,037	645,427
	Transport Customer Firm Transport (interruptible included in this line for 2022-2030)	92,210,458	140,607,950	144,607,432	141,208,974	132,416,411	143,412,988	136,223,791	140,169,739	139,706,891	140,002,298
	Transport Customer Interruptible Transport	17,530,727									
	Transport Customer Type 3										
	<b>Total Transport Customer Usage</b>	<b>109,741,185</b>	<b>140,607,950</b>	<b>144,607,432</b>	<b>141,208,974</b>	<b>132,416,411</b>	<b>143,412,988</b>	<b>136,223,791</b>	<b>140,169,739</b>	<b>139,706,891</b>	<b>140,002,298</b>
	System Asset Ownership Changes (+ for gains, - for losses)	0									
	System Asset Ownership Changes (+ for gains, - for losses)	0									
	System Asset Ownership Changes (+ for gains, - for losses)	0									
	<b>Total Asset Ownership Change Usage</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Historical Sales, Demand/Sales Forecasts</b>											
<b>Total Usage</b>	<b>240,157,736</b>	<b>292,403,779</b>	<b>288,757,911</b>	<b>287,393,040</b>	<b>279,480,108</b>	<b>290,458,480</b>	<b>282,654,709</b>	<b>286,026,471</b>	<b>283,927,135</b>	<b>283,443,614</b>	
<b>Usage Net of Transport Customers &amp; Sales Customers &gt; 460,000 Mscf/yr</b>	<b>130,416,551</b>	<b>151,199,967</b>	<b>143,548,598</b>	<b>145,576,105</b>	<b>146,449,595</b>	<b>146,425,250</b>	<b>145,804,473</b>	<b>145,224,022</b>	<b>143,581,207</b>	<b>142,795,889</b>	
<b>Carbon Dioxide Emissions Resulting from Combustion of Gas by Residential, Commercial, and Industrial Customers (SB 21-264 (3)(c)(I)(B))</b>											
CO2	6,921,255	8,024,238	7,618,177	7,725,778	7,772,134	7,770,842	7,737,897	7,707,093	7,619,908	7,578,231	
Net End Use Emissions	6,921,255	8,024,238	7,618,177	7,725,778	7,772,134	7,770,842	7,737,897	7,707,093	7,619,908	7,578,231	
<i>Source: EPA Subpart NN Calculation after Statutorily excluded customer types removed</i>											
LDC CH4 Emissions	<b>Methane Leaked from the transportation and delivery of gas to customers, and leakages from delivery to other distribution companies (SB 21-264 (3)(c)(I)(A and C))</b>										
	CH4	206,286			149,571	148,501	147,431	146,359	145,235	144,163	143,093
	Total Estimated Leakage	206,286			149,571	148,501	147,431	146,359	145,235	144,163	143,093
	<i>Source: EPA Subpart W Calculations (our calculation of subpart W emissions factor)</i>										
<b>Total Covered Emissions (Metric Tons CO2e)</b>											
Total Emissions for CHP	7,127,540				7,920,635	7,918,273	7,884,256	7,852,327	7,764,071	7,721,324	

Demand Side Clean Heat Resources	Status	2025 Emissions Reductions		2030 Emissions Reductions	
		2025 Savings (Dth)	(tCO2e)	2030 Savings (Dth)	(tCO2e)
Additional Gas DSM	New	1,294,470	68,698	3,530,019	187,339
Electrification	New	2,090,232	110,929	15,074,088	799,987
<b>Total Demand Side Reductions</b>		<b>3,384,702</b>	<b>179,627</b>	<b>18,604,107</b>	<b>987,327</b>

Potential supporting documentation sources

Supply Side Recovered Methane Resources		2025 Replacement (Dth)	2025 Methane Credits (tCO2e)	2030 Replacement (Dth)	2030 Methane Credits (tCO2e)
Livestock	New	1,822,289	186,677	1,654,490	172,972
Landfill Gas	New	370,000	28,235	999,000	69,761
Coal Mine Methane	New	0	0	140,671	72,281
MSW	New	0	0	0	0
<b>Recovered Methane Totals</b>		<b>2,192,289</b>	<b>214,912</b>	<b>2,794,161</b>	<b>315,014</b>

Supporting documentation source

Recovered Methane Protocol Calculated Annual Credits

Supply Side Clean Heat Resources		2025 Replacement (Dth)	2025 Emissions Reductions (tCO2e)	2030 Replacement (Dth)	2030 Emissions Reductions (tCO2e)
Hydrogen	New	0	0	3,711,888	121,274
<b>Supply Side Reductions</b>		<b>0</b>	<b>0</b>	<b>3,711,888</b>	<b>121,274</b>

Supporting documentation sources

Calculation of net emissions savings from hydrogen project

<b>Grand Totals</b>		<b>5,576,990</b>	<b>394,539</b>	<b>25,110,157</b>	<b>1,423,615</b>
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Demand Side Clean Heat Resources	Status	2025 Emissions Reductions		2030 Emissions Reductions		Potential supporting documentation sources
		2025 Savings (Dth)	(tCO2e)	2030 Savings (Dth)	(tCO2e)	
Additional Gas DSM	New	1,294,470	68,698	3,530,019	187,339	
Electrification	New	2,090,232	110,929	15,074,088	799,987	
<b>Total Demand Side Reductions</b>		<b>3,384,702</b>	<b>179,627</b>	<b>18,604,107</b>	<b>987,327</b>	

Supply Side Recovered Methane Resources	Status	2025 Replacement (Dth)	2025 Methane Credits (tCO2e)	2030 Replacement (Dth)	2030 Methane Credits (tCO2e)	Supporting documentation source
		Livestock	New	1,822,289	186,677	
Landfill Gas	New	370,000	28,235	999,000	69,761	
Coal Mine Methane	New	0	0	140,671	72,281	
MSW	New	0	0	0	0	
<b>Recovered Methane Totals</b>		<b>2,192,289</b>	<b>214,912</b>	<b>2,794,161</b>	<b>315,014</b>	

Supply Side Clean Heat Resources	Status	2025 Emissions Reductions		2030 Emissions Reductions		Supporting documentation sources
		2025 Replacement (Dth)	(tCO2e)	2030 Replacement (Dth)	(tCO2e)	
Hydrogen	New	0	0	3,711,888	121,275	
<b>Supply Side Reductions</b>		<b>0</b>	<b>0</b>	<b>3,711,888</b>	<b>121,275</b>	

"Clean Heat Plus" Resources	Status	2025 Cumulative Emissions Reductions (tCO2e)		2030 Cumulative Emissions Reductions (tCO2e)		Supporting documentation sources
		2025 Annual Replacement (Dth)	2025 Cumulative Emissions Reductions (tCO2e)	2030 Annual Replacement (Dth)	2030 Cumulative Emissions Reductions (tCO2e)	
Certified Natural Gas	New	20,000	87	116,868,077	373,226	
Offsets	New	20,000	200,000	36,500	365,000	
<b>Clean Heat Plus Reductions</b>		<b>40,000</b>	<b>200,087</b>	<b>116,904,577</b>	<b>738,226</b>	

<b>Grand Totals</b>		<b>5,616,990</b>	<b>594,626</b>	<b>142,014,734</b>	<b>2,161,843</b>	
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Clean Heat

Year	Net Customer Sales Gas Forecasted (Dth)	Customer End Use CO2 Emissions (metric tons)	Gas Leakage (scf)	Gas Leakage CH4 Emissions (metric tons CO2e)	Total Emissions (metric tons CO2e)	Clean Heat Resource Emissions Reductions (metric tons CO2e)	Estimated Net Emissions (Metric Tons CO2e)	Percent Reduction from Baseline
2035	113,599,479	6,028,766	0	143,093	6,171,859	1,423,615	4,748,244	33%
2040	108,629,373	5,765,001	0	143,093	5,908,094	1,423,615	4,484,478	37%
2045	103,958,804	5,517,132	0	143,093	5,660,225	1,423,615	4,236,610	41%
2050	103,282,489	5,481,240	0	143,093	5,624,333	1,423,615	4,200,717	41%

Clean Heat Plus

Year	Net Customer Sales Gas Forecasted (Dth)	Customer End Use CO2 Emissions (metric tons)	Gas Leakage (scf)	Gas Leakage CH4 Emissions (metric tons CO2e)	Total Emissions (metric tons CO2e)	Clean Heat Resource Emissions Reductions (metric tons CO2e)	Estimated Net Emissions (Metric Tons CO2e)	Percent Reduction from Baseline
2035	113,599,479	6,028,766	0	143,093	6,171,859	2,161,843	4,010,016	44%
2040	108,629,373	5,765,001	0	143,093	5,908,094	2,161,843	3,746,251	47%
2045	103,958,804	5,517,132	0	143,093	5,660,225	2,161,843	3,498,382	51%
2050	103,282,489	5,481,240	0	143,093	5,624,333	2,161,843	3,462,490	51%

Emission Factors

CO2	117 lbs/MMBtu gas combusted	Factor for 100% CO2 conversion in Subpart NN
CO2	0.05307 Metric Ton/Dth	

Conversion Constants

2000 lbs/Short Ton  
 2204.62 lbs/Metric Ton

Lookup Tables

Status Look-up	Description
Approved	Approved in a prior PUC decision
Pending	Subject to current PUC proceeding
New	Proposed new resource in Clean Heat Plan
Required	Required by federal, state, or local statute or regulation