

Methods

Annual Inventory: Methane Emissions

A national annual inventory of methane emissions was estimated using the EI-ME model, a measurement-based, spatially explicit inventory of US oil and gas methane emissions¹ and 2024 activity data. In 2024, an estimated 14,700,000 metric tons of methane were emitted across the oil and gas sector (exclusive of flaring emissions, which are considered separately in the following section).

Internal models based on production forecasts from Rystad indicate that oil and gas methane emissions increased by 0.7% between 2024 and 2025 due to changing production. Therefore, we scale the 2024 national inventory calculated using the EI-ME model by 1.007 to approximate a 2025 sector wide total for methane emissions of 14,800,000 metric tons.

Internal models based on production forecasts from Rystad indicate that oil and gas methane emissions will increase by 2.2% between 2024 and 2026 due to changing production. Therefore, we scale the 2024 national inventory calculated using the EI-ME model by 1.022 to approximate a 2026 sector wide total for methane emissions of 15,100,000 metric tons.

2025 and 2026 estimates are forecasts which are subject to uncertainty arising from impacts on production that are not accounted for in the base 2024 inventory.

Annual Inventory: Production-segment Flared Gas

Production-segment flared gas data is combined from two sources. An analysis of 2024 Enverus data is used to estimate state totals for gas flared at wells in eight states (CO, MS, MT, ND, NM, TX, UT, WY). Other states do not have flared gas estimates available through Enverus, so state-level production flaring totals are obtained through spatial analysis of data gathered from NOAA's satellite-mounted Visual and Infrared Radiometer Suite of detectors (VIIRS).² For comparability with the production-level flaring volumes reported by Enverus, only VIIRS flaring detections from field types "Oil" and "Gas" are included. In total, we estimate that volumes of gas sent to flare at wells in the United States totaled 217 billion cubic feet of gas in 2024 (the most recent year of data available).

Annual Wasted Gas:

Assuming an 80% methane content of upstream gas and a methane density of 0.668 kg/m³ at a normal temperature and pressure, we convert the tons of methane emissions to natural gas, finding a total of 974 billion cubic feet of gas was wasted through methane emissions in 2024,

¹ Omara, M., Himmelberger, A., MacKay, K., Williams, J. P., Benmergui, J., Sargent, M., Wofsy, S. C., and Gautam, R.: Constructing a measurement-based spatially explicit inventory of US oil and gas methane emissions (2021), Earth Syst. Sci. Data, 16, 3973–3991, <https://doi.org/10.5194/essd-16-3973-2024>, 2024.

² <https://www.worldbank.org/en/programs/gasflaringreduction/global-flaring-data>

980 in 2025, and 995 in 2026. By summing methane emissions and flared gas, we estimate that 1,191; 1,198; and 1,212 billion cubic feet of gas were wasted in the United States in 2024, 2025, and 2026 respectively.

Per-second inventory (2026)

We allocate the 2026 wasted gas total evenly across the year, dividing the topline annual estimate by 31,536,000 (seconds per year) to get a per-second wasted gas rate of approximately 40 million cubic feet per second based on estimated 2026 emissions. Applying the average 2025 Henry Hub Gas Price to these estimates, we find that \$140.34 of gas is wasted per second.

Equivalencies

State-specific natural gas consumption³, number of consumers⁴, and natural gas heat content⁵ values are taken from EIA.

Using information on the natural gas to LNG conversion⁶ from the Canada Energy Regulator, we convert billion cubic feet of natural gas into an LNG volume in cubic meters (1.0 billion cubic feet natural gas = 4.8471×10^4 cubic meters LNG). Then, we divide this figure by 150,000 cubic meters, a recent LNG cargo capacity estimate for modern ships.⁷

Approximately 107 billion cubic meters of natural gas pass through the Strait of Hormuz annually, according to the EIA.⁸ The gas wasted each year in the United States is equivalent to nearly a third of this volume.

³ https://www.eia.gov/dnav/ng/NG_SUM_LSUM_A_EPG0_VRS_MMCF_A.htm

⁴ https://www.eia.gov/dnav/ng/ng_cons_num_a_EPG0_VN3_Count_a.htm

⁵ https://www.eia.gov/dnav/ng/ng_cons_heat_a_EPG0_VGTH_btucf_a.htm

⁶ <https://apps.cer-rec.gc.ca/Conversion/conversion-tables.aspx>

⁷ <https://www.sciencedirect.com/topics/engineering/natural-gas-carrier>

⁸ <https://www.eia.gov/todayinenergy/detail.php?id=65584>