EDF ENVIRONMENTAL DEFENSE FUND
Finding the ways that work

U.S. LNG Commitment and Wasted Gas Analysis

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The U.S. recently committed to provide an additional 50 BCM/yr of U.S. LNG to the European Union to offset Russian gas imports. Environmental Defense Fund (EDF) estimates that reducing waste of natural gas from leaks and flaring could comprise more than half of that 50 BCM/yr commitment.

EDF's current estimate of methane emissions in the U.S. in 2019 is 13 - 16 Tg/yr CH4. The lower bound 13 Tg/yr estimate is derived from TROPOMI satellite data. The upper bound 16 Tg/yr is derived from the Alvarez et al. synthesis model, which uses site-level emission factors and GHGI data to estimate total emissions. Assuming a 90% overall CH4 content in natural gas and a methane density of 0.668 kg/m3, this range is equivalent to 22 - 27 BCM/yr emitted natural gas.

Estimates of total wasted gas due to flaring in the U.S. range from 14 - 17 BCM[1] in 2019[2]. Summing wasted gas from both emissions and flaring yields total wasted gas in the U.S. of 35 - 44 BCM/yr as of 2019.

If roughly 70% of methane emissions can be captured rather than vented or leaked[3], an additional 15 - 19 BCM/yr natural gas would be available and could be sent to the E.U. as LNG. Additionally, if 90% of flaring could be eliminated and the additional natural gas captured, 12 - 16 BCM/yr natural gas would be available. The total 27 - 34 BCM/yr of recovered natural gas is at least 55% of what the U.S. has pledged to provide the E.U. as LNG, as illustrated in Table 1.

EDF has also estimated emissions reductions that the new NSPS OOOOb/OOOOc rule proposed by EPA could achieve. There are several uncertainties that make it challenging to definitely calculate potential emissions savings from the rule; however, as a midpoint, EDF estimates that the rule as currently proposed could reduce 5 Tg/yr CH4 in 2026, when the full rule takes effect. This emissions reduction, which is equal to 8 BCM/yr natural gas, would constitute 16% of what the U.S. has pledged to provide the E.U. as LNG. Although this proposed rule will likely generate additional recovered natural gas from a reduction in flaring, specific policy language has not yet been proposed so we have not yet estimated those savings.

Furthermore, EDF estimates that ambitious, comprehensive national standards (including monthly aerial screening and universal tank controls) could reduce up to 10 Tg/yr CH4 in 2026. This emissions reduction estimate is equivalent to 17 BCM/yr natural gas. For this scenario, EDF also assumes 75% of flaring[4] could be eliminated via regulatory efforts underway at EPA and BLM, generating a further 11 BCM/yr of natural gas. The total 28 BCM/yr of recovered natural gas represents 56% of what the U.S. pledged to provide the E.U. as LNG.

Table 1. Summary of Domestic Results

	Total 2019 U.S. Wasted Gas (BCM)		**70% emissions + 90% flared gas (BCM)**		**2026 Gas Savings frwom Proposed EPA Rule (BCM)**	**2026 Gas Savings from Strong Federal Rule (BCM)**
Range	Low	High	Low	High	Mid Point	Midpoint
Emissions	22	27	15	19	8	17
Flared	14	17	12	16	0	11
Total	**35**	**44**	**27**	**34**	**8**	**28**
% of 50 BCM commitment	**70%**	**88%**	**55%**	**68%**	**16%**	**56%**

EDF also compared potential reductions in wasted natural gas from the Global Methane Pledge and Zero Routine Flaring Initiative[5] to the current E.U. natural gas imports (430 BCM/yr in 2020 from both natural gas and LNG) and Russian natural gas exports (240 BCM/yr in 2020), finding that the natural gas savings from the Global Methane Pledge plus Zero Routine Flaring could meet at least 26% of current E.U. natural gas imports or, alternately, replace at least 47% of Russian exports.

EDF uses IEA data to estimate total global methane emissions from oil and gas production in 2020 to be 72 Tg/yr methane. Assuming a 90% overall CH4 content in natural gas and a methane density of 0.668 kg/m3, this is equivalent to 120 BCM/yr wasted natural gas. Total global wasted gas due to flaring in 2020 is estimated to be 141 BCM/yr. Summing these two estimates yields total wasted natural gas globally of 261 BCM/yr.

The Global Methane Pledge, launched at COP 26 in November 2021, aims to reduce global methane emissions from all sectors by 30% from 2020 levels by 2030. As of May 2022, over 100 countries have signed on, representing nearly half of global anthropogenic methane emissions. EDF estimates the recovered natural gas from these signatory countries under the Pledge under two different scenarios. If each signatory country meets an individual 30x30 goal (where technically feasible), 63 BCM/yr natural gas would be recovered in 2030. If each signatory country achieves its maximum technically feasible reductions, 82 BCM/yr natural gas would be recovered. EDF also estimated the gas savings associated with the World Bank Zero Routine Flaring Initiative, finding an additional 50 BCM/yr natural gas could be recovered. These total gas savings would comprise 26-31% of the current E.U. natural gas imports or 47-55% of total Russian natural gas exports, illustrated in Table 2.

Table 2. Summary of Global Results

	Total 2020 Global Wasted Gas (BCM)	2030 Gas Savings if every signatory country meets 30x30 goal + Zero Routine Flaring (BCM)	2030 Gas Savings if every signatory country achieves maximum abatement + Zero Routine Flaring (BCM)
Emissions	120	63	82
Flared	141	50	50
Total	261	113	132
% of total EU natural gas imports	61%	26%	31%
% of total Russian natural gas exports	109%	47%	55%

[1] Low end Source: Rystad Energy. High end Source: World Bank. worldbank.org/en/programs/gasflaringreduction/global-flaring-data

[2] Flaring emissions in 2020 were noticeably lower due to the onset of the COVID-19 pandemic.

[3] According to IEA, 70% of emissions that can realistically be reduced. iea.org/reports/global-methane-tracker-2022/strategies-to-reduce-emissions-from-fossil-fuel-operations#abstract

[4] World Bank Zero Routine Flaring FAQ indicates between 65%-85% of flaring is routine. We use 75% as a midpoint estimate for flaring reductions from eliminating routine flaring. worldbank.org/en/programs/zero-routine-flaring-by-2030/qna#10

[5] Assumes 75% of flared gas volume from signatory countries is routine. worldbank.org/en/programs/zero-routine-flaring-by-2030

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