

LIFECYCLE GREENHOUSE GAS INTENSITY OF COVE POINT’S LNG COMPARED TO COAL

There is great concern about the impacts of exported “fracked” liquefied natural gas (LNG) on the global climate. That is because natural gas is 80 to 98 percent methane, which is approximately 84 times as potent a greenhouse gas (GHG) as carbon dioxide over a 20-year frame. **Using the EPA’s low-range leakage estimate of 1.4% throughout the entire lifecycle of the LNG supply chain, Cove Point’s gas would be 80% as bad as coal in terms of greenhouse gas emissions.**^{1,2}

Current estimates vary about the quantities of methane leaked into the atmosphere during the natural gas fuel cycle, but some estimate range from 1.4 to 7.9 percent of the total produced gas. The National Oceanic and Atmospheric Administration and the University of Colorado, Boulder recently measured leakage rates between 6 and 12 percent at fracked gas fields in Uintah County, Utah.³ A more recent study published in the Proceedings of the National Academies of Science by the National Oceanic and Atmospheric Administration, Harvard, the Lawrence Berkley National Laboratory and others, found that **“regional methane emissions due to fossil fuel extraction and processing could be 4.9 ± 2.6 times larger than in EDGAR, the most comprehensive global methane inventory.”** The authors concluded that their “results cast doubt on the US EPA’s recent decision to downscale its estimate of national natural gas emissions by 25–30%.”⁴ **These results indicate that the lifecycle emissions from exported LNG would likely be as bad as or worse than coal and that natural gas cannot contribute to reducing greenhouse gas pollution unless the lifecycle methane leakage rate can be kept well under 3%.**

The chart below shows the lifecycle carbon intensity of Cove Point LNG vs. the lifecycle carbon intensity of coal. The leakage estimates were estimated from a range of 0 to 12 percent and were distributed equally across the natural gas fuel cycle. Export emissions were derived from the Dominion Cove Point LNG’s CPCN application to the PSC and emission calculations from the academic literature.^{5,6} Combustion emissions were based on EIA’s emissions factor for CO₂ from natural gas combustion of 117.1 lbs/MMBtu. The lifecycle greenhouse intensity from coal was derived by modifying a Worldwatch Institute study to scale up the upstream coal methane emissions from a 100-year time frame to a 20-year timeframe.⁷

Leakage Rate	20-year Timeframe					
	GHG Emissions - Combustion (lbs/Mmbtu)	GHG Emissions - Leakage (lbs/Mmbtu)	GHG Emissions - Exports (lbs/Mmbtu)	GHG Emissions - Total (lbs/Mmbtu)	GHG Emissions - Coal (lbs/Mmbtu)	% as Bad as Coal (GHGs)
0.0%	117.1	0.0	30.8	147.9	237.3	62%

¹ Leaked Methane: U.S. Environmental Protection Agency. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2011*. Rep. no. EPA 430-R-13-001. 12 Apr. 2013.

² Total Production from 2011: U.S. Energy Information Administration. "U.S. Natural Gas Gross Withdrawals and Production."

³ "CIRES and NOAA Scientists Observe Significant Methane Leaks in a Utah Natural Gas Field." *University of Colorado Boulder*. N.p., 5 Aug. 2013.

⁴ "Anthropogenic Emissions of Methane in the United States." *Proceedings of the National Academy of Sciences* 18 Oct. 2013.

⁵ Table 9-18 of Dominion’s 2013 Maryland PSC Application, Resource Report 9 - Air & Noise Quality

⁶ Based on average tanker size and ship and gasification emissions from Jaramillo 2007 and Techne 1998

⁷ Worldwatch Institute. *Comparing Lifecycle Greenhouse Gas Emissions from Natural Gas and Coal*. 25 Aug. 2011.

1.0%	115.9	30.5	30.7	177.1	237.3	75%
1.4%	115.4	43.5	30.6	189.6	237.3	80%
2.0%	114.8	60.7	30.5	206.0	237.3	87%
3.0%	113.6	90.5	30.4	234.6	237.3	99%
4.0%	112.5	120.1	30.3	262.9	237.3	111%
5.0%	111.4	149.4	30.1	290.9	237.3	123%
6.0%	110.3	178.4	30.0	318.7	237.3	134%
7.0%	109.2	207.1	29.9	346.2	237.3	146%
8.0%	108.1	235.6	29.7	373.4	237.3	157%
9.0%	107.0	263.7	29.6	400.3	237.3	169%
10.0%	106.0	291.6	29.5	427.0	237.3	180%
11.0%	104.9	319.2	29.3	453.4	237.3	191%
12.0%	103.9	346.5	29.2	479.6	237.3	202%

