Institute for Policy Integrity
NEW YORK UNIVERSITY SCHOOL OF LAW

Liquefied Natural Gas (LNG) Export Facilities - Potential Operational and Downstream Emissions

March 2020

The Institute for Policy Integrity has compiled data on the operational and downstream greenhouse gas emissions of LNG export facilities that are currently operating, under construction, or approved but not yet under construction. This data comes from Federal Energy Regulatory Commission (FERC) environmental impact statements and environmental assessments, as well as the EPA's facility-level greenhouse gas reporting database.

Downstream emissions were calculated using the daily capacity (in billions of cubic feet of LNG) of each project multiplied by EPA's natural gas carbon dioxide emissions factor (117.1 lbs of CO2 per thousand cubic feet), and are based on the assumption that all exported LNG is combusted and does not replace another GHG-producing fuel. (While vented gas is not combusted, methane has a higher global warming potential than carbon dioxide; therefore these estimates remain conservative). Damages are calculated using the 2016 Interagency Working Group Social Cost of Carbon central (3%) estimate and based on emissions occurring in 2025, under the assumption that this is the year when all these facilities, if completed, will be operational. Operational emissions do not include construction, initial start-up, or other one-time or short-term emissions.

Location	Applicant/Project	Status	Operational Emissions (annual tons CO2e)	Monetized Damages from Annual Operational Emissions (2018$)	Downstream Emissions (annual tons CO2e)	Monetized Damages from Annual Downstream Emissions (2018$)	Total Annual Emissions Damages (2018$)
Sabine, LA	Cheniere/Sabine Pass LNG - Trains 1-5	Operating project	4,197,628	$233,849,856	67,855,345	$3,780,221,252	$4,014,071,108
Corpus Christi, TX	Cheniere - Corpus Christi LNG Train 2	Operating project	3,585,403	$199,742,801	27,917,628	$1,555,291,030	$1,755,033,831
Cove Point, MD	Dominion-Cove Point LNG	Operating project	936,286	$52,160,493	15,897,538	$885,651,836	$937,812,329
Corpus Christi, TX	Cheniere-Corpus Christi LNG Trains 1,2	Operating project	300,354	$16,732,721	13,958,814	$777,645,515	$794,378,236
Hackberry, LA	Sempra-Cameron LNG, Train 1	Operating project	60,468	$3,368,672	13,764,941	$766,844,883	$770,213,555
Elba Island, GA	Southern LNG Company Unit 1	Operating project	2,687	$149,693	678,553	$37,802,213	$37,951,905
Calcasieu Parish, LA	Driftwood LNG	Under construction project	9,540,000	$531,473,400	77,548,965	$4,320,252,860	$4,851,726,260
Sabine Pass, TX	ExxonMobil - Golden Pass	Under construction project	4,940,067	$275,211,133	40,713,207	$2,268,132,751	$2,543,343,884
Freeport, TX	Freeport LNG Dev/Expansion/Liquefication	Under construction project	2,295,931	$127,906,316	41,488,696	$2,311,335,280	$2,439,241,596
Cameron Parish, LA	Venture Global Calcasieu Pass	Under construction project	3,915,514	$218,133,285	27,336,010	$1,522,889,133	$1,741,022,418
Hackberry, LA	Sempra-Cameron LNG, Trains 2&3	Under construction project	3,429,424	$191,053,211	27,723,755	$1,544,490,397	$1,735,543,608
Sabine Pass, LA	Sabine Pass Liquefication	Under construction project	5,187,264	$288,982,477	13,571,069	$756,044,250	$1,045,026,728
Elba Island, GA	Southern LNG Company Units 2-10	Under construction project	969,465	$54,008,895	6,106,981	$340,219,913	$394,228,808
Brownsville, TX	Rio Grande LNG - Next Decade	Approved project	8,195,318	$456,561,166	69,794,069	$3,888,227,574	$4,344,788,740
Plaquemines Parish, LA	Venture Global LNG	Approved project	8,201,474	$456,904,117	65,916,621	$3,672,214,931	$4,129,119,047
Lake Charles, LA	Southern Union - Lake Charles LNG	Approved project	522,664	$29,117,593	42,651,931	$2,376,139,073	$2,405,256,666
Port Arthur, TX	Port Arthur LNG Trains 1&2	Approved project	5,185,699	$288,895,291	36,060,269	$2,008,917,580	$2,297,812,871
Corpus Christi, TX	Cheniere Corpus Christi LNG (Stg 3)	Approved project	619,735	$34,525,437	36,060,269	$2,008,917,580	$2,043,443,017
Hackberry, LA	Sempra-Cameron LNG	Approved project	9,029,617	$503,039,963	27,336,010	$1,522,889,133	$2,025,929,096
Pascagoula, MS	Gulf LNG Liquefication	Approved project	3,399,437	$189,382,635	29,080,862	$1,620,094,822	$1,809,477,458
Lake Charles, LA	Magnolia LNG	Approved project	2,793,930	$155,649,840	20,938,221	$1,166,468,272	$1,322,118,112
Coos Bay, OR	Jordan Cove	Approved project	2,363,353	$131,662,396	20,938,221	$1,166,468,272	$1,298,130,668
Brownsville, TX	Annova LNG Brownsville	Approved project	367,295	$20,462,004	17,448,517	$972,056,893	$992,518,898
Freeport, TX	Freeport LNG Dev	Approved project	541,855	$30,186,742	13,958,814	$777,645,515	$807,832,257
Brownsville, TX	Texas LNG Brownsville	Approved project	613,901	$34,200,425	10,662,983	$594,034,768	$628,235,193
Jacksonville, FL	Eagle LNG Partners	Approved project	221,641	$12,347,620	2,559,116	$142,568,344	$154,915,964
TOTAL			**81,416,410**	**$4,535,708,183**	**767,967,404**	**$42,783,464,072**	**$47,319,172,254**

Notes:

(1) List of facilities taken from FERC LNG website. *See* https://www.ferc.gov/industries/gas/indus-act/lng.asp.

(2) Annual emissions for existing facilities are based on 2018 data from EPA's FLIGHT database.

(3) Downstream emissions estimates based on FERC projections of terminal capacity in terms of billion cubic feet per day, multiplied by the natural gas CO2 emissions factor. A small portion of LNG may be used for non-combustion applications, and direct downstream emissions from those applications may be smaller; though indirect leakage could also occur, making the overall CO2-equivalent emissions larger.

(4) Emissions damages assumes all facilities are operating in 2025 and uses the 2016 IWG Social Cost of Carbon 3-percent discount rate estimate. *See* https://www.epa.gov/sites/production/files/2016-12/documents/sc_co2_tsd_august_2016.pdf. Values are in 2018$ using the CPI inflation calculator. If these monetized damages were being compared against other effects in a cost-benefit analysis, all future effects would be discounted back to present value.

(5) For not yet operational facilities, emissions data is usally provided in terms of "potential to emit."

(6) All operational emissions exclude construction, initial start up, and other one-time or short-term emissions.

PROPOSED PROJECTS

Location	Applicant/Project	Status	Operational Emissions (annual tons CO2e)	Monetized Damages from Annual Operational Emissions (2018$)	Downstream Emissions (annual tons CO2e)	Monetized Damages from Annual Downstream Emissions (2018$)	Total Annual Emissions Damages (2018$)
Nikiski, AK	Alaska Gasline	Proposed	15,393,806	$857,588,932	50,988,445	$2,840,566,255	$3,698,155,188
Cameron Parish, LA	Commonwealth, LNG	Proposed	-	-	22,876,945	$1,274,474,594	$1,274,474,594
Sabine Pass, LA	Sabine Pass Liquefication (3rd birth)	Proposed	16,349	$910,803	-	-	$910,803
TOTAL			**15,393,806**	**$857,588,932**	**73,865,390**	**$4,115,040,849**	**$4,973,540,584**
GRAND TOTAL			**96,810,216**	**5,393,297,115**	**841,832,793**	**46,898,504,921**	**52,292,712,838**

Notes:

(7) There is not yet an EIS for the Cameron Parish, LA Commonwealth LNG project, so there are no operational emissions estimates.

(8) There is no projected LNG capacity for this portion of the Sabine Pass project.