



Investing in climate chaos

How German banks and companies enable fracking LNG projects

1. Summary

Over the past ten years, German banks and technology companies have provided nearly \$5 billion in loans for the construction of LNG (liquefied natural gas) export terminals in the US. In addition, bonds amounting to around \$675 million were also secured. The largest backers were Deutsche Bank (loans: \$1.9 billion; bonds: \$528 million) and Landesbank Baden-Württemberg (LBBW) (loans: \$1.4 billion). Other supporters were the international arm of the German state bank KfW IPEX-Bank (loans: \$614 million), Siemens (loans: \$436 million), Bayerische Landesbank (BayernLB) (loans: \$310 million), Landesbank Hessen-Thüringen Girozentrale (Helaba) (loans: \$250 million), DZ Bank (loans: \$50 million) and Allianz Global Investors (bonds: \$147 million). Between Januar 2022 - April 2023 alone, support from German banks added up to \$2.94 billion. The banks' promise to actively support climate protection is thus reduced to absurdity.

The money not only enabled construction to be carried out at seven LNG export sites in the US. It also provided massive support for the American fracking industry, as the terminals enable an increased sale of fracked gas - with the corresponding consequences for the climate and the environment, as well as the health of the local population. 80% of the fossil gas produced in the United States of America (US) is via fracking. Most projects are located in Louisiana or Texas. Residents are often People of Color, Indigenous or Latino populations. Total emissions from the combustion of the fossil gas - calculated on the basis of the maximum annual export capacities of the respective terminals - amount to around 416 million tons of CO₂. This corresponds to nearly 56% of Germany's total greenhouse gas emissions in 2022 (746 million tons of CO₂ equivalents). These emissions threaten to also jeopardize the achievement of global climate targets.

In addition to direct financing of projects, long-term supply contracts have also been signed between US LNG operators and German companies. Most deliveries are scheduled to start in 2026 or 2027 and will run for up to 20 years. This conflicts with the German Climate Protection Act, which stipulates greenhouse gas neutrality by 2045.

The LNG projects made possible with the help of German banks and companies not only directly exacerbate the ongoing climate emergency - they also destroy the livelihoods of local people. Wetlands, which naturally protect against recurring hurricanes and are home to many species, are also increasingly being destroyed by these projects.

The economic lifetime of LNG terminals is 20 to 50 years. Most of the US LNG terminals co-financed by German banks have only been in operation for a few years, but already have a number of significant operational problems, including serious accidents. Some terminals have even yet to be built. This means either a decades-long commitment to the use of fossil gases, or the construction of stranded assets. Banks thus face either the reputational risk of actually lying with regard to the sustainability and climate promises they promote or the economic risk of stranded assets. The likelihood is high that we will further cement our dependence on fossil fuels by building LNG terminals on both sides of the Atlantic.

2. Introduction

Even before Russia's invasion of Ukraine, the question of US LNG exports to the EU was not a purely energy-related one, but above all a geopolitical one. Since the Trump-Juncker deal in July 2018^[i], aimed at preventing a trade war, US LNG imports to the EU increased by 2,240% by February 2022.^[iii] In the process, the US competed primarily with Qatar and Russia for the European LNG market.^[iii] In 2022, the US exported about 55 billion cubic meters (bcm) of gas to the EU, equivalent to 63% of Germany's gas consumption in 2022.^[iv] The construction of German LNG import terminals and the export of US fracked gas directly to Germany has been a central part of the geopolitical debate in recent years^[v] - primarily because of Germany's support for the Nord Stream pipelines. For example, in August 2020, then-Finance Minister and now Chancellor Olaf Scholz offered the Trump administration €1 billion (approximately \$1.18 billion) in taxpayer funds to build two LNG import terminals, but only in exchange for lifting sanctions against the construction of the Nord Stream 2 pipeline.^[vi]

Since Russia's war against Ukraine, the importance of the geopolitical dimension has once again increased, coupled with the desire to replace Russian pipeline gas with LNG. The expansion of infrastructure for importing LNG is being massively driven forward. Germany now has an LNG Acceleration Act, which declares fossil fuel terminals as basically approvable until 2043 and completely suspends environmental impact assessments for floating terminals (so called Floating Storage Units or FSRUs).^[vii] The German government wants to directly finance 50% of the onshore LNG terminal in Brunsbüttel via the state bank KfW^[viii] and has chartered five FSRUs, operated by RWE and Uniper, among others^[ix]. At least 12 terminals (onshore and offshore) along with connecting pipelines are listed by the LNG Acceleration Act.^[x] In addition to at least one purely private FSRU terminal near Lubmin, plans are being advanced by RWE - on behalf of the German government - for an offshore jetty for additional FSRUs off the island of Rügen.^[xi]

German companies and state-owned enterprises such as EnBW, RWE, Uniper and SEFE (Securing Energy for Europe, formerly Gazprom) have signed long-term contracts for fracked gas from the US. Siemens Energy stated during the 2023 Annual General Meeting that it had participated in 20 to 30 LNG projects worldwide in the last fiscal year, for example as a component supplier or service provider¹. Some German banks have also been investing in US LNG export terminals for years. This briefing intends to provide an overview of the banks and companies involved.

3. Bonds and loans issued by German banks and companies to finance US LNG terminals^[xii]

Over a period of around ten years, German banks and companies have provided nearly \$5 billion in financing for the construction of US LNG export terminals, enabling these projects or making them more likely. In doing so, they have simultaneously provided massive support to the US fracking industry, which profits by selling the gas through the terminals. According to the US Energy Information Agency, about 80% of the gas in the US in 2022 was extracted through fracking.^[xv] The negative environmental and health impacts as well as human rights violations of the fracking industry are well documented.^[xvi] Studies and measurements also show that fracking contributes significantly to global warming. The banks involved clearly place the need for climate protection and resulting risks in the background when it comes to ongoing investments in new fossil fuel projects.



Source: John Allaire, Louisiana (US)

¹ Oral response from Siemens Energy to a question from the "Dachverband der kritischen Aktionärinnen und Aktionäre" (critical shareholders).

Bonds and loans from German banks and companies to finance US LNG terminals

Project	Main owner	Export capacity (in billion m ³ /year) ^[xiii]	Maximum CO ₂ emissions (in million tons/year) ²	Investor	Loan (in million \$)	Bond underwriting ^[xiv] (in million \$)	Financial year	Status
Cameron LNG (Phase I) - Louisiana	Sempra	21.97	45.13	BayernLB	75	-/-	2014	Operating
				Deutsche Bank	75.7	-/-	2014	
				Helaba	75	-/-	2014	
Corpus Christi LNG (Phase I) - Texas	Cheniere	16.35	33.58	Deutsche Bank	-/-	17.52	2021	Operating
				KfW IPEX- Bank	14.4	-/-	2018	
				LBBW	127.21	-/-	2018, 2015	
				Siemens	50	-/-	2018	
Corpus Christi LNG (Phase II) - Texas	Cheniere	8.18	16.8	Deutsche Bank	-/-	8.76	2021	Operating
				KfW IPEX- Bank	7.2	-/-	2018	
				LBBW	36.2	-/-	2018	
				Siemens	25	-/-	2018	
Corpus Christi LNG (Phase III) - Texas	Cheniere	16.15	33.17	Helaba	100	-/-	2022	Under Construction
				KfW IPEX- Bank	100	-/-	2022	
				Siemens	50	-/-	2022	
Cove Point LNG - Maryland	Dominion	8.38	17.21	Siemens	40	-/-	2021	Operating
Elba Island LNG - Georgia	Blackstone	3.58	7.35	BayernLB	35	-/-	2017	Operating
				KfW IPEX- Bank	35	-/-	2017	
				Siemens	28	-/-	2017	
Freeport LNG - Texas	Freeport	24.32	49.95	Deutsche Bank	340.04	163.2	2019, 2018, 2017, 2016, 2015, 2014	Operating
				Siemens	74.16	-/-	2021	

² CO₂ combustion emissions per year for LNG are calculated in this document as follows: for example, for 21.97 bcm/year = 21.97 bcm gas * 0.2 kg CO₂/kWh * 10.27 kWh/m³ = 45.13 million tons CO₂/year. A conservative approach was taken: LNG emissions are even higher - see for example: the "full emissions including upstream (extraction and transport) are roughly 40% higher for LNG" (thinkstep, 2017, "Greenhouse Gas Intensity of Natural Gas", available on 3/21/2023 at http://gasnam.es/wp-content/uploads/2017/11/NGVA-thinkstep_GHG_Intensity_of_NG_Final_Report_v1.0.pdf).

Project	Main owner	Export capacity (in billion m ³ /year) ^[xiii] .	Maximum CO ₂ emissions (in million tons/year) ²	Investor	Loan (in million \$)	Bond underwriting ^[xiv] (in million \$)	Financial year	Status
Plaquemines LNG (Phase I) - Louisiana	Venture Global	19.67	40.5	Deutsche Bank	706.2	-/-	2022	Under Construction
				LBBW	606.8	-/-	2022	
Plaquemines LNG (Phase II) - Louisiana	Venture Global	19.67	40.5	Deutsche Bank	298.56	-/-	2022,2023	Planned
				DZ Bank	50	-/-	2022,2023	
				Helaba	75	-/-	2022,2023	
				KfW IPEX- Bank	100	-/-	2022,2023	
				LBBW	298.56	-/-	2022,2023	
Port Arthur LNG	Sempra Infra- struktüre/ Conoco- Phillips	17.68	36.31	KfW IPEX- Bank	356.9	-/-	2023	Planned
				BayernLB	200	-/-	2023	
Sabine Pass LNG (Phase I) - Louisiana	Cheniere	40.88	83.97	Allianz Global Investors	-/-	98	2021	Operating
				Deutsche Bank	477.44	335.63	2021, 2014, 2013, 2012	
				LBBW	266.09	-/-	2015, 2013, 2012	
				Siemens	169.23	-/-	2013	
Sabine Pass LNG (Phase II) - Louisiana	Cheniere	5.72	11.75	Allianz Global Investors	-/-	49	2021	Operating
				Deutsche Bank	-/-	3.49	2021	
				LBBW	96.34	-/-	2015	
Total		203.89	416.04		4,989.03	675.6		

Maximum generated emissions

Total emissions - calculated based on the maximum annual export capacities of the respective terminals - amount to around 416 million tons of CO₂. This corresponds to nearly 56% of Germany's total greenhouse emissions in 2022 (746 million tons of CO₂ equivalents). The amount even exceeds the emissions from the German energy sector in 2022 by more than 60% (256 million tons CO₂ equivalents).^[xvii]

Source: John Allaire, Louisiana (US)



Overview of the individual banks and their projects

Ranking (by investment amount - descending)	Funder	Projects	Loan (in million \$) - added up	Bond underwriting ^[xviii] (in million \$) - added up
1	Deutsche Bank	Cameron LNG (Phase I), Corpus Christi LNG (Phase I and II), Freeport LNG, Plaquemines LNG (Phase I and II), and Sabine Pass LNG (Phase I and II)	1,897.94	528.6
2	LBBW	Corpus Christi LNG (Phase I and II), Plaquemines (Phase I and II), and Sabine Pass LNG (Phase I and II)	1,431.2	-/-
3	KfW IPEX Bank	Corpus Christi LNG (Phase I, II and III), Elba Island LNG and Port Arthur LNG	613.5	-/-
4	Siemens	Corpus Christi LNG (Phase I, II and III), Cove Point LNG, Elba Island LNG, Freeport LNG and Sabine Pass LNG (Phase I)	436.39	-/-
5	BayernLB	Cameron LNG (Phase I), Elba Island LNG and Port Arthur LNG	310	-/-
6	Helaba	Cameron LNG (Phase I), Corpus Christi LNG (Phase III) and Plaquemines LNG. (Phase II)	250	-/-
7	DZ Bank	Plaquemines LNG (Phase II)	50	-/-
8	Allianz Global Investors	Sabine Pass LNG (Phase I and II)	-/-	147

4. Fracking gas supply contracts^[xix]

4.1 Overview of signed supply contracts

US LNG Export Terminal	US Project sponsor	German Contractors	Contracted gas quantity/year (billion m ³ /year)	Contract-term	Possible related German LNG Import terminals (sites)	Maximum CO ₂ Emissions (in million tons) ³
CP2 LNG (Calcasieu Pass)^[xx] - planned, in Louisiana	Venture Global	EnBW (Energie Baden-Württemberg AG) ^[xxi]	1.36	20 years (with 10-year extension option) - 2026 onwards (with Phase I of the project) ^[xxii] .	Stade ^[xxiii] , Brunsbüttel ^[xxiv]	55.87
Plaque mines^[xxv] - planned, in Louisiana⁴	Venture Global	EnBW ^[xxvi]	1.36	20 years (with 10-year extension option) - from 2026 (with phase II of the project)	Stade ^[xxvii] , Brunsbüttel ^[xxviii]	55.87
Port Arthur (Phase I and II)^[xxix] – planned, in Texas⁵	Sempra Infrastructure/ConocoPhillips	RWE ^[xxx]	3.06	15 years - from 2027	Brunsbüttel ^[xxxi] , Wilhelmshaven ^[xxxii] , Lubmin ^[xxxiii] , Rügen ^[xxxiv]	94.28
		ConocoPhillips ^[xxxv]	6.8 ^[xxxvi] (plus 30 % of the shares in Phase I of Port Arthur LNG)	20 years - from 2027	Brunsbüttel ^[xxxvi]	279.34
		Ineos ^[xxxvii]	1.9 (with an extension option of 0.27 - Phase II)	20 years - from 2027	Brunsbüttel ^[xxxviii]	78.05
Total			14.48			563.41

³ Quantity related to contracted gas supply for the contracted period of time (without extension option).

⁴ On March 13th, 2023, Venture Global announced the final investment decision for the Plaquemines project. Lenders also include Deutsche Bank, LBBW, KfW IPEX-Bank, Helaba and DZ Bank.

⁵ On March 20th, 2023, Sempra Infrastructure announced the final investment decision for the Port Arthur project. ConocoPhillips, Ineos and RWE are explicitly mentioned as partners.

Even though the signed contracts theoretically leave the buyers the option of where to resell the LNG or where to import it, the link to the planned German sites is clear. It is noticeable that most deliveries will not take start before 2026/2027 and are expected to last up to 20 years - some contracts have even extension options. Delivering fracked gas to German LNG terminals after 2045, however, would contradict the German Climate Protection Act, which stipulates climate neutrality by 2045. Also, by 2030, Germany wants to reduce greenhouse gas emissions by as much as 65% compared to 1990.^[xxxix]

Maximum generated emissions

How this can be reconciled with investments in one of the most climate-intensive fossil fuels, namely LNG, and which primarily comes from fracking, is not apparent. The total emissions alone that would result from burning the gas from the above four supply contracts over the contracted term would equate to nearly 76% of Germany's greenhouse gas emissions in 2022 (746 million tons of CO₂ equivalents) and would represent more than twice the emissions of Germany's energy sector last year (256 million Tons CO₂ equivalents).^[xxvi] A comparison with Germany's maximum CO₂ budget to just meet the 1.5°C limit⁶ illustrates the significance of the total emissions from these contracts: they correspond to almost one fifth of what Germany is still allowed to maximally emit.^[xl]

4.2 Additional contracts with a transatlantic dimension

4.2.1 RWE - Woodside

Back in 2018, after the announcement of the first capacity booking contract between RWE and German LNG Terminal for Brunsbüttel^[xli], RWE signed a supply agreement with the global LNG trader Woodside for US gas from Corpus Christi.^[xlii] According to the initial agreement, the contract expired in December 2022. However, in 2021, the companies announced a 7-year contract starting in 2025 for the supply of LNG from Woodside's "global portfolio".^[xliii] The contracted annual supply volume of 1.14 bcm is fairly close to Woodside's underwritten US LNG offtake volume for the Corpus Christi export terminal (which is also supported financially by German banks).^[xliv] The contract volume corresponds to a maximum of 16.39 million tons of CO₂ emissions over the contracted time period.

4.2.2 Uniper - Woodside

In September 2022, Uniper, which was nationalized by the German federal government, signed an LNG supply contract with Woodside. The contract runs until 2039. According to the official press release, the contract will cover the supply of up to twelve LNG cargoes or approximately 1 bcm per year from Woodside's "global portfolio".^[xlv]

⁶ With 50% probability: 3.100 million tons of CO₂ equivalents.

This corresponds to a maximum of 36.97 million tons of CO₂ emissions over the entire term of the contract. Shortly after the Uniper deal, Woodside announced the signing of two binding long-term contracts over 20 years for 3.4 bcm of US LNG annually from the Commonwealth Export Terminal in Louisiana.^[xlvi] Market analysts expect Woodside to fulfill its contractual obligations to Uniper through the Commonwealth deal.^[xlvii]

4.2.3 Uniper - Jera

On the same day as the signing of the contract with Woodside, Uniper also informed about the intended cooperation with the Japanese energy company JERA regarding green ammonia, but also LNG from the US. The companies agreed to work to "meet immediate needs for LNG supplies and for new, longer-term supplies".^[xlviii] JERA had already secured a 25.7% stake in Freeport LNG Development in January 2022.^[xlix]

4.3.4 Trafigura - SEFE

(secured via a German government guarantee)

In December 2022, Trafigura, one of the world's leading independent commodity traders, announced a \$3 billion credit and gas supply deal. Trafigura commits to inject significant volumes of gas into the European gas grid over the next four years and ultimately deliver it to Germany. It will deliver the gas - according to its own statements from its extensive portfolio as well as long-term US LNG contracts - to SEFE.^[l] SEFE, in turn, agreed in the deal to book regasification capacities of at least 4 bcm per year from 2027 for 20 years at the planned LNG import site Stade, equivalent to 164.32 million tons of CO₂ emissions over the entire contract term.^[li] The deal is financed by credits and was arranged by Deutsche Bank and another bank. To secure the deal, the German government issued an Untied Loan Guarantee (ULG).^{8[lii][liii]}

⁷ The fire in Freeport cost JERA \$751 million in losses (Reuters, 2022, "Japan's JERA to book \$751 mln loss related to fire at Freeport LNG in FY22/23", available on 3/21/2023 at <https://www.reuters.com/business/energy/japans-jera-book-751-mln-loss-related-fire-freeport-lng-fy2223-2022-10-28/>).

⁸ ULG guarantees are intended to serve Germany's supply of raw materials. Projects that guarantee the supply of mineral or energy resources to the German economy are classified as eligible. In the case of a transaction for the supply of, for example, gas or minerals to Germany, the German government can insure lenders, usually (German) banks financing the transactions, against credit default risks (i.e.: payment defaults on the part of the borrower or debtor).

4.3 The Role of the German Federal Government

At the end of 2021, Germany signed the Glasgow Statement ^[liv] together with 38 other countries and institutions. The German government committed to cease direct public financing of international fossil fuel projects - for example via untied loan guarantees (ULG), export credit guarantees or government loans - by the end of 2022. However, the German government is not implementing the Glasgow Statement. On the contrary, it enabled a fracking gas supply deal by means of an ULG. Through KfW IPEX-Bank, it also contributed to a loan for the Corpus Christi LNG export terminal. In addition, the German government is involved in long-term fracked gas supply contracts through companies that are now state-owned.

5. Climate and environmental impacts, social impacts and financial risks

5.1 Climate impact

According to a Climate Action Tracker analysis published in November 2022 as part of COP27, ^[lvi] LNG infrastructure currently under construction worldwide, as well as additional planned infrastructure, could generate more emissions by 2030 than the International Energy Agency's Net Zero scenario actually allows by then. ^[lvii] By 2050, cumulative LNG emissions could consume about 10% of the global carbon budget remaining under the Paris Climate Agreement. Current LNG expansion is thus torpedoing efforts to mitigate the climate emergency.

In 2018, the Intergovernmental Panel on Climate Change (IPCC) illustrated in clear terms and scenarios why it is so essential to limit global warming to 1.5°C. For instance, *"a range of climate change impacts ... could be avoided by limiting global warming to 1.5°C compared to 2°C or more."* ^[lviii] Differences between the two scenarios, *"include an increase in mean temperature in most land and ocean regions, hot extremes in most inhabited regions, heavy precipitation in several regions and the likelihood of drought and precipitation deficits in some regions"*. On March 20th, 2023, the IPCC highlighted in its synthesis report that - compared to 2018 - the challenge to contain global warming to 1.5°C *"has become even greater due to the continued increase in greenhouse gas emissions. The pace and scale of action to date, as well as current plans, are insufficient to address climate change"*. ^[lix]

Based on the above findings, the LNG export terminals co-financed by German banks and companies (in operation, under construction or in planning) evidently contribute significantly to global warming or substantially increase the risk of an unstoppable global warming. They are in direct contradiction with the green appearance that banks give themselves: for example, Deutsche Bank's signing of the

Net Zero Banking Alliance⁹ or KfW's commitment to financing in line with the Paris Climate Agreement¹⁰.

Maximum CO ₂ emissions (in million tons)	
US LNG Terminals co-financed by German banks and companies	Supply contracts signed by US companies with probable connection to Germany
416.04	563.41

Vitality, plans for German LNG terminals are also not in line with Germany's climate protection law, according to a study by the New Climate Institute published in December 2022. ^[lx]

5.2 Effects on site

The consequences for natural ecosystems, flora, fauna, and local people are dramatic: LNG projects not only exacerbate the climate emergency, leading among other things to rising sea levels and the loss of many coastal stretches, they also directly destroy natural habitats and the livelihoods of local people.

Threatened wetlands

According to the US Federal Energy Regulatory Commission (FERC), 27 export terminals are under construction (including expansion projects at existing LNG terminals). Construction of this infrastructure threatens wetlands in a total area equal to about half of Washington, D.C. Wetlands are sites of high biodiversity and mitigate the effects of hurricanes. The most threatened wetlands are in Louisiana. ^[lxi]

9 Deutsche Bank, 2021, "Die Deutsche Bank tritt der Net Zero Banking Alliance bei", available on 3/21/2023 at https://www.db.com/news/detail/20210421-deutsche-bank-joins-new-net-zero-banking-alliance?language_id=3.

10 KfW, 2023, "Sektorleitlinien - Finanzierungen im Einklang mit dem Pariser Klimaabkommen", available on 3/21/2023 at <https://www.kfw.de/sustainability/%C3%9Cabout-KfW/sustainability/strategy-management/sustainable-finance/sector-guidelines/>.

In November 2022, three US environmental groups filed a lawsuit against the Louisiana Department of Natural Resources. The reason is Venture Global LNG's exemption from the need for an environmental permit to build the Plaquemines LNG terminal. The plaintiffs point out that construction of the facility will destroy nearly 162 acres of wetlands that serve as storm shelters for surrounding parishes. The lawsuit was initially dismissed on jurisdictional grounds - the plaintiffs are currently reviewing other options.^[lxii]

Livelihoods of fishermen and women as well as indigenous communities threatened

The potential loss of these wetlands has also fueled protests from fishermen and women who fear for their livelihoods. The wetlands serve as nursery grounds for fish, crabs and shrimp - all-important components of Louisiana's commercial and recreational fisheries. The crab fishery alone employs 15,000 people and generates about \$1.3 billion annually, according to the Louisiana Seafood trade association.^[lxiii] In Texas, fishermen and women as well as indigenous communities also oppose the Rio Grande LNG export terminal project.^[lxiv]

Air pollution, accidents and environmental racism

A particular burden on local people is daily air pollution¹¹ from existing fossil fuel infrastructure (including LNG terminals).

In a January 2023 report, the non-governmental organization Louisiana Bucket Brigade documented, among other things, significant operational problems at the existing Cameron and Calcasieu Pass (CP1) LNG export terminals. Cameron LNG is operated by Sempra (co-contractor with RWE, ConocoPhillips, and Ineos), and Calcasieu Pass is operated by Venture Global (co-contractor with EnBW and LBBW). Both companies failed to properly report emissions and accidents that occur regularly. Since operations began in 2019, 67 spills releasing pollutants or methane emissions to the atmosphere have been documented for the Cameron LNG terminal. The terminal also does not appear to be prepared for Louisiana's extreme weather. As a result of Hurricane Laura in 2020, operations had to be suspended. High winds also led to greenhouse gas leaks in 2021. The state of Louisiana sent four warning letters to the operator, Sempra. So far the failures have not been corrected, nor has the company's misconduct had any other consequences.^[lxv]

For the Calcasieu Pass terminal operated by Venture Global, 91 days were documented between January 19th and May 31st 2022 where gas was flared and pollutants were emitted into the environment.

Five accidents were reported to the Louisiana Department of Environmental Quality during this period. The company was found not to be in full compliance with its reporting requirements.^[lxvi] Residents living near the terminal have documented constant flaring over several days with little to no interruption - including corresponding

noise and light pollution as well as air pollution.^[lxvii] On March 15th, 2023, the Louisiana Department of Environmental Quality was notified again in writing of the incidents (as well as others at other industrial sites, for example, the Sabine Pass LNG terminal).^[lxviii] In addition, the agency was presented with visual evidence of the harmful and hazardous pollution in the form of videos taken with special cameras, and an investigation was requested.^[lxix]



Flaring at the Calcasieu Pass terminal on February 12th, 2023.

Source: John Allaire, Louisiana (US)

Port Arthur, in Texas, is also a prime example of air pollution from fossil fuel projects and of environmental racism that has not been addressed. According to local press reports, the city's cancer rate is higher than the national average, especially among black and Hispanic residents, who are more likely than white residents to live near industrial facilities. Yet, Port Arthur is destined to become one of the largest LNG export hubs in the country - supplied primarily by fracked gas from the Permian Basin,^[lxx] dubbed the "Permian Climate Bomb" because its exploitation torpedoes compliance with the 1.5°C climate goal.^[lxxi] The Port Arthur Community Action Network (PACAN) opposes the Port Arthur LNG infrastructure and filed a lawsuit against it. The lawsuit focused primarily on lower pollution limits for Port Arthur LNG - set by the Texas Commission on Environmental Quality (TCEQ). PACAN won the case in May 2022, but TCEQ ignored the court ruling. The agency instead said that increasing pollution controls would be too expensive for Sempra (the operator).^[lxxii]

¹¹ Among others, by methane, benzene and volatile organic compounds.

Both Sempra and Venture have signed long-term contracts for the export of fracked gas with German companies and have received loans for the construction of LNG terminals from German banks.

Significantly, Indigenous people, people of color, Latinos, and low-income communities living near LNG export terminals often bear the brunt of any impacts.^[lxviii] The potential human rights violations that are already occurring and are expected to take place in the future as a result of these projects are also enabled by the contractors and co-funders from Germany.

5.3 Financial risks, stranded assets or fossil lock-in

The economic lifetime of LNG terminals is 20-50 years.^[lxvii] Most of the US LNG terminals co-financed by German banks started operations only a few years ago. Some terminals, for which German companies have signed long-term supply contracts, even have to be built first. This means either a decades-long commitment to the use of fossil gas, which makes compliance with the Paris Agreement impossible (a so-called fossil lock-in), or - if the climate commitments are to be met - the terminals must be shut down before the end of their planned economic lifetime and will become stranded assets. Banks face hence either the reputational risk of actually lying with regard to the sustainability and climate promises they promote or the economic risk of stranded assets.

Reputational risk: lawsuits against permits and faltering review of US gas export policy

Additional risks to funders and contractors arise from lawsuits challenging the permits or construction of the terminals. In March 2023, environmental groups Sierra Club, Center for Biological Diversity Healthy Gulf, the Louisiana Bucket Brigade and the Turtle Island Restoration Network filed a lawsuit against FERC over its approval of the Commonwealth LNG terminal in southwest Louisiana. The groups argue that FERC violated the National Environmental Policy Act (NEPA) and the Natural Gas Act by approving the polluting project based on the agency's flawed Environmental Impact Statement (EIS).^[lxv]

Another lawsuit was also filed against the Department of Energy (DoE) in March 2023. Sierra Club, Center for Biological Diversity, Delaware Riverkeeper Network, Environment America and Friends of the Earth complain that the Department of Energy did not respond in a timely manner to a petition that was filed ten years ago.

The original petition^[lxvi] asks DoE to issue a clear policy for LNG export applications. It should include criteria to determine whether the export is in the public interest, as required by law under the Natural Gas Act. Without such an approach, DoE fails to weigh up the far-reaching climate impacts of LNG exports. Also left unaddressed would be the local impact of gas export facilities as well as the impact of increased exports on the price of domestic gas.^[lxvii]

Overcapacities and gas availability

For Germany and the European Union, studies by the German Institute for Economic Research (DIW), the Institute for Energy Economics and Financial Analysis (IEEFA) and the New Climate Institute^[lxviii] show that the planned LNG terminal capacities are too high. With the planned decline in gas demand due to climate policy at the EU level and in Germany, this leads to low utilization of the individual terminals, which makes the terminals economically risky. The same applies to an oversized expansion of terminals in the US, which are planned for full capacity utilization, although this is questionable in view of declining gas consumption.

On the other hand, it is unclear whether the LNG operators themselves have long-term contracts with producers of fracked gas in the US. If this is not the case, there would be a risk that, although long-term contracts for the supply of US LNG have been signed and final investment decisions for the construction of the terminals have been made, the supply of the terminals themselves with gas for liquefaction and export over the same period of time has not been contractually in a binding manner. Market analysts see at least a great lack of transparency on this issue.^[lxix]

Accident proneness

Ultimately, LNG terminals are vulnerable when in operation: the 2022 explosion near the Freeport LNG export terminal took 20% of US export capacity off the market for months.^[lxxx] Operations at the Corpus Christi site also had to be temporarily shut down in 2020 due to a gas explosion.^[lxxxi] The operational inadequacies of the Cameron and Calcasieu Pass terminals, as well as their vulnerability to increasingly extreme weather events, have already been outlined above. This, too, affects the cost-effectiveness of LNG terminals.

Endnotes

- i CSIS, 2018, "U.S. LNG into Europe after the Trump-Juncker Agreement", available on 3/21/2023 at <https://www.csis.org/analysis/us-lng-europe-after-trump-juncker-agreement>.
- ii European Commission, 2022, "EU-US LNG Trade: US liquefied natural gas (LNG) has the potential to help match EU gas needs", available on 3/21/2023 at https://energy.ec.europa.eu/system/files/2022-02/EU-US_LNG_2022_2.pdf.
- iii European Commission, 2022b, "Quarterly report on European gas markets", available on 3/21/2023, at https://energy.ec.europa.eu/system/files/2022-04/Quarterly%20report%20on%20European%20gas%20markets_Q4%202021.pdf.
- iv Food & Water Action Europe and Gastivists, 2022, "European Union Fracking: Coming to your doorstep", available on 3/21/2023 at https://www.foo-dandw-tereurope.org/wp-content/uploads/2023/03/Fracking_Coming_To_Your_Doorstep2022-1.pdf.
- v German Federal Ministry for Economic Affairs and Climate Protection, 2019, "Altmaier veranstaltet deutsch-amerikanische Konferenz zur Entwicklung des Flüssiggas (LNG)-Importmarktes", available on 3/21/2023 at <https://www.bmwk.de/Redaktion/DE/Pressemitteilungen/2019/20190212-altmaier-veranstaltet-german-american-conference-on-lng-import-market-development.html>.
- vi O. Scholz, 2022, "Our call of 05 August 2020", available on 3/21/2023 at https://www.duh.de/fileadmin/user_upload/download/Projektinformation/Energie/wende/200807_Schreiben_Scholz_Mnuchin.pdf.
- vii Green Legal Impact, 2022, "Neues LNG-Beschleunigungsgesetz geht zulasten von Klimaschutz sowie Klage- und Beteiligungsrechten", available on 3/21/2023 at <https://www.greenlegal.eu/wp/wp-content/uploads/2022/05/GLI-Positionspapier-zum-LNGG.pdf> and Federal Ministry of Justice, 2023, "Liquefied Natural Gas Acceleration Act", available on 3/21/2023 at <https://www.gesetze-im-internet.de/lngg/index.html>.
- viii German Federal Ministry for Economic Affairs and Climate Protection, 2022, "Kreditanstalt für Wiederaufbau (KfW), Gasunie und RWE unterzeichnen MoU zur Errichtung eines LNG-Terminals in Brunsbüttel", available on 3/21/2023 at <https://www.bmwk.de/Redaktion/DE/Pressemitteilungen/2022/03/20220305-kreditanstalt-fuer-wiederaufbau-gasunie-und-rwe-unterzeichnen-mou-zu-errichtung-eines-lng-terminal-in-brunsbuettel.html>.
- ix Federal Ministry of Economics and Climate Protection, 2022b, "Bundeswirtschaftsministerium sichert sich fünftes schwimmendes Flüssigerdgasterminal - Parallel wird Anlandung grünen Wasserstoffs aufgebaut", available on 3/21/2023 at <https://www.bmwk.de/Redaktion/DE/Pressemitteilungen/2022/09/20220901-bmwk-sichert-sich-fuenftes-schwimmendes-fluessigerdgasterminal-plus-anlandung-gruener-wasserstoff.html>, Federal Ministry of Economy and Climate Protection, 2022c, "Unterzeichnung des Chartervertrags für das fünfte schwimmende LNG-Terminal (FSRU)", available on 3/21/2023 at <https://www.bmwk.de/Redaktion/DE/Pressemitteilungen/2022/10/20221025-unterzeichnung-des-chartervertrags-fur-das-funfte-schwimmende-lng-terminal.html> and Federal Ministry of Economy and Climate Protection, 2023, "Bericht des Bundeswirtschafts- und Klimaschutzministeriums zu Planungen und Kapazitäten der schwimmenden und festen Flüssigerdgasterminals", available on 3/21/2023 at <https://www.bmwk.de/Redaktion/DE/Downloads/energy/20230303-lng-report.pdf?blob=publicationFile&v=6>.
- x Federal Ministry of Justice, 2023b, "Gesetz zur Beschleunigung des Einsatzes verflüssigten Erdgases (LNG-Beschleunigungsgesetz - LNGG). Anlage (zu § 2)", available on 3/21/2023 at <https://www.gesetze-im-internet.de/lngg/anlage.html>.
- xi energate messenger, 2023, "Mecklenburg-Vorpommern stellt sich gegen LNG-Pläne bei Rügen", available on 3/21/2023 at <https://www.energate-messen-ger.de/news/231333/mecklenburg-vorpommern-stellen-sich-gegen-lng-plaene-bei-ruegen>.
- xii Sierra Club, 2023, "US LNG Export Tracker", available on 3/21/2023 at <https://www.sierraclub.org/dirty-fuels/us-lng-export-tracker>. Source for financial data is the publication IJGlobal - Infrastructure Journal and Project Finance Magazine.
- xiii Converted from trillion cubic feet to trillion cubic meters based on conversion factors (BP, 2021, "Approximate conversion factors", available on 3/21/2023 at <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2022-approximate-conversion-factors.pdf>).
- xiv In addition to loans, the issuance of bonds is a common way for companies to raise funds on the financial market. Banks accompany the issuance of bonds and also hold bonds. Bonds are explained here: Börse Frankfurt, 2019, "Anlageformen an der Börse: Merkmale von Anleihen", available on 3/21/2023 at <https://www.boerse-frankfurt.de/wissen/wertpapiere/anleihen/anleihen>.
- xv U.S. Energy Information Administration, 2023, "How much shale gas is produced in the United States?", available on 3/21/2023 at <https://www.eia.gov/tools/faqs/faq.php?id=907&t=8>.
- xvi Concerned Health Professionals of NY, 2022, "Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking and Associated Gas and Oil Infrastructure", available on 3/21/2023 at <https://concernedhealthny.org/compendium/>, Permanent Peoples' Tribunal, 2019, "The Court's Judgments", available on 3/21/2023 at <https://concernedhealthny.org/compendium/> and University of Galway, 2021, "International Human Rights Impacts of Fracking report", available on 3/21/2023 at <https://concernedhealthny.org/compendium/> at <https://www.tribunalonfracking.org/judges-statements/> and University of Galway, 2021, "International Human Rights Impacts of Fracking report", available on 3/21/2023 at <https://www.universityofgalway.ie/media/irishcentreforhumanrights/files/reports/ICHR-Report-International-Human-Rights-Impacts-of-Fracking.pdf>.
- xvii Umwelt Bundesamt, 2023, "UBA-Prognose: Treibhausgasemissionen sanken 2022 um 1,9 Prozent", available on 3/21/2023, at <https://www.umweltbun-desamt.de/press/press-releases/uba-prognose-treibhausgasemissionen-sank-2022-um>.
- xviii Börse Frankfurt, 2019.
- xix Sierra Club, 2023.
- xx Venture Global, 2022, "Project Snapshot: CP2 LNG", available on 3/21/2023 at <https://venturegloballng.com/wp-content/uploads/2021/03/CP2-Factsheet.pdf>.
- xxi Venture Global, 2022b, "Submission of Contract and Summary of Major Provisions of Contract for Public Posting", available on 3/21/2023 at <https://www.energy.gov/sites/default/files/2022-07/CP2%20EnBW%20LNG%20DOE%20filing.pdf> and Venture Global, 2022c, "Submission of Contract and Summary of Major Provisions of Contract for Public Posting", available on 3/21/2023 at <https://www.energy.gov/sites/default/files/2022-10/CP2%20EnBW%20LNG%20DOE%20filing%20%28Updated%20ACQ%29.pdf>.
- xxii EnBW, 2022, "Venture Global LNG and EnBW Sign Contracts for LNG Deliveries from the U.S.", available on 3/21/2023 at <https://www.enbw.com/company/investors/news-and-publications/enbw-venture-global-lng.html>, Venture Global, 2022b and Venture Global, 2022c.
- xxiii EnBW signed a contract with 3 bcm regasification capacity with Hanseatic Energy Hub (Hanseatic Energy Hub, 2022, "Zukunftsflexible Buchung: EnBW setzt auf Stade für LNG- und Wasserstoffimport", available on 3/21/2023 at <https://www.hanseatic-energy-hub.de/news/detail/future-flexible-booking-enbw-relies-on-stade-for-lng-and-hydrogen-imports/>).

- xxiv German Federal Ministry for Economic Affairs and Climate Protection, 2023, "Weiteres schwimmendes LNG-Terminal für Deutschland geht in Brunsbüttel an den Start", available on 3/21/2023, at <https://www.bmwk.de/Redaktion/DE/Pressemitteilungen/2023/01/20230120-weiteres-schwimmendes-lng-terminal-fuer-deutsch-land-geht-in-brunsbuettel-an-den-start.html>.
- xxv Venture Global, 2023, "Plaquemines", available on 3/21/2023 at <https://ventureglobalng.com/project-plaquemines/> and Deutsche Umwelthilfe, 2023, "Deutsche Umwelthilfe und Sierra Club decken auf: Baden-württembergische Landesbank, EnBW finanzieren Import von Fracking-Gas aus den USA", available on 3/21/2023 at <https://www.duh.de/presse/pressemitteilungen/pressemitteilung/deutsche-umwelthilfe-und-sierra-club-decken-auf-baden-wuerttembergische-landesbank-and-enbw-finanzie/> and Venture Global, 2023b, "Venture Global announces final investment decision and financial close for phase two of Plaquemines LNG", available on 3/21/2023 at <https://ventureglobalng.com/press/venture-global-announces-final-investment-decision-and-financial-close-for-phase-two-of-plaquemines-lng/>.
- xxvi Venture Global, 2022d, "Submission of Contract and Summary of Major Provisions of Contract for Public Posting", available on 3/21/2023 at <https://www.energy.gov/sites/default/files/2022-07/Plaquemines%20EnBW%20DOE%20filing.pdf> and Venture Global, 2022e, "Submission of Contract and Summary of Major Provisions of Contract for Public Posting", available on 3/21/2023 at <https://www.energy.gov/sites/default/files/2022-10/Plaquemines%20EnBW%20DOE%20filing%20%28Updated%20ACQ%29.pdf>.
- xxvii Hanseatic Energy Hub, 2022.
- xxviii Federal Ministry of Economics and Climate Protection, 2023.
- xxix Port Arthur LNG, 2023, "Home", available on 3/21/2023 at <https://portarthurlng.com/> and Sempra, 2023, "Sempra Launches Port Arthur LNG Project", available on 3/21/2023 at <https://www.sempra.com/sempra-launches-port-arthur-lng-project>.
- xxx Sempra, 2022, "Sempra Infrastructure Announces Sale and Purchase Agreement with RWE for Port Arthur LNG", available on 3/21/2023 at <https://investor.sempra.com/news-releases/news-release-details/sempra-infrastructure-announces-sale-and-purchase-agreement-rwe> and RWE, 2022, "RWE Supply & Trading and Sempra Infrastructure unterzeichnen Liefervertrag für Flüssiggas aus den USA", available on 3/21/2023 at <https://www.rwe.com/-/media/RWE/documents/07-presse/rwe-supply-and-trading/2022/2022-12-28-rwest-und-sempra-infrastructure-unterzeichnen-liefervertrag-fuer-fluessiggas.pdf>.
- xxxi German Federal Ministry for Economic Affairs and Climate Protection, 2023, German LNG, 2022, "German LNG Terminal erreicht entscheidende Meilensteine bei der Entwicklung des LNG-Importterminals Brunsbüttel", available on 3/21/2023 at <https://germanlng.com/wp-content/uploads/2022/10/2022-10-11-PM-GLNG-T-groese-steps-forward-D-final.pdf> and LNGPrime, 2022, "ConocoPhillips, Ineos, RWE book capacity at German LNG terminal", available on 3/21/2023 at <https://lngprime.com/contracts-and-tenders/conocophillips-ineos-rwe-book-capacity-at-german-lng-terminal/63548/>.
- xxxii RWE, 2023, "Schwimmende LNG-Terminals", available on 3/21/2023 at <https://www.rwe.com/forschung-und-entwicklung/projektvorhaben/lng-schwimmende-terminals/>.
- xxxiii Federal Ministry of Economics and Climate Protection, 2022b.
- xxxiv energie zukunft, 2023, "Umwelt, Klima und wirtschaftlichen Nutzen unberücksichtigt gelassen", available on 3/21/2023 at <https://www.energiezukunft.eu/economy/environment-climate-and-economic-benefits-disregarded/>.
- xxxv ConocoPhillips, 2022, "ConocoPhillips and Sempra Infrastructure Sign Heads of Agreement for Large-Scale LNG Projects and Carbon Capture Activities", available on 3/21/2023 at <https://www.conocophillips.com/news-media/story/conocophillips-and-sempra-infrastructure-sign-heads-of-agreement-for-large-scale-lng-projects-and-carbon-capture-activities/> and Sempra, 2022b, "Sempra Announces Strategic Partnership with ConocoPhillips for Port Arthur LNG", available on 3/21/2023 at <https://www.sempra.com/sempra-announces-strategic-partnership-conocophillips-port-arthur-lng>.
- xxxvi ConocoPhillips has also entered into a strategic partnership with Sempra. In addition to the purchase agreement for approximately 6 bcm/year, ConocoPhillips also acquired 30% equity interest in Phase I of the Port Arthur LNG project.
- xxxvii INEOS, 2022, "INEOS signs long-term sales and purchase agreement for 1.4mtpa LNG from Sempra Infrastructure at Port Arthur, USA", available on 3/21/2023 at <https://www.ineos.com/news/shared-news/ineos-signs-long-term-sales-and-purchase-agreement-for-1.4mtpa-lng-from-sempra-infrastructure-at-port-arthur-usa/>.
- xxxviii German LNG, 2022 and LNGPrime, 2022.
- xxxix Federal Government, 2022, "Generationenvertrag für das Klima", available on 3/21/2023 at <https://www.bundesregierung.de/breg-de/themen/klimaschutz/klimaschutzgesetz-2021-1913672>.
- xl Sachverständigenrat für Umweltfragen, 2022, "Wie viel CO2 darf Deutschland maximal noch ausstoßen? Environmental Council updates CO2 budget", available on 3/21/2023, at https://www.umwelttrat.de/SharedDocs/Pressemitteilungen/DE/2020_2024/2022_06_fragen_und_antworten_zum_co2_budget.html?nn=400216.
- xli RWE, 2018, "RWE und German LNG Terminal vereinbaren Kapazitätsvertrag für erstes deutsches LNG-Terminal", available on 3/21/2023 at https://transparenz.schleswig-holstein.de/dataset/0e17f658-f5ee-4753-a9c9-9fe7f78d1cb6/resource/69131116-016f-4db5-9c2e-7a4f42e51035/download/anl-11-2018-09-06_press_release_rwe_und_german_lng_terminal8809852803721765062.pdf.
- xlii Woodside, 2018, "Woodside and RWE sign agreement for mid-term LNG supply", available on 3/21/2023 at <https://www.woodside.com/docs/default-source/media-releases/woodside-and-rwe-sign-agreement-for-mid-term-lng-supply.pdf>.
- xliiii RWE, 2021, "RWE und australischer LNG-Produzent Woodside schließen Liefervertrag für Flüssiggas ab", available on 3/21/2023 at <https://www.rwe.com/press/rwe-supply-and-trading/2021-02-19-rwe-and-australian-lng-producer-woodside-conclude-liquefied-natural-gas-supply-agreement/>.
- xliv Energy Intelligence, 2023, "Woodside Bolsters LNG Trading to Seize Gas Market Potential", available on 3/21/2023 at <https://www.energyintel.com/00000185-955a-d384-a3ef-9dfedc030000>.
- xlv Uniper, 2022, "Uniper and Woodside sign agreement for LNG supply to Europe", available on 3/21/2023 at <https://www.uniper.energy/news/uniper-and-woodside-sign-agreement-for-lng-supply-to-europe>.
- xlvi Natural Gas Intelligence, 2022, "Woodside Grows U.S. LNG Offtake with Commonwealth Deal After Commitment to Germany", available on 3/21/2023 at <https://www.naturalgasintel.com/woodside-grows-u-s-lng-offtake-with-commonwealth-deal-after-commitment-to-germany/>.
- xlvii Energy Intelligence, 2023.
- xlviii Uniper, 2022b, "JERA und Uniper kündigen Zusammenarbeit bei grünem Ammoniak und LNG aus den Vereinigten Staaten an", available on 3/21/2023 at <https://www.uniper.energy/news/de/jera-und-uniper-kuendigen-zusammenarbeit-bei-gruenem-ammoniak-und-lng-aus-den-vereinigten-staaten-an>.
- xliv Jera, 2023, "Our Business / Investment Projects Freeport LNG Project", available on 3/21/2023 at <https://www.jera.co.jp/english/business/projects/freeport>.

- l Trafigura, 2022, "Trafigura signs USD3 billion loan agreement guaranteed by the Federal Republic of Germany to secure gas supply", available on 3/21/2023, at <https://www.trafigura.com/press-releases/trafigura-signs-usd3-billion-loan-agreement-guaranteed-by-the-federal-republic-of-germany-to-secure-gas-supply/>.
- li LNGPrime, 2023, "SEFE books long-term capacity at HEH's Stade LNG terminal in Germany", available on 3/21/2023 at <https://lngprime.com/contracts-and-tenders/sefe-books-long-term-capacity-at-hehs-stade-lng-terminal-in-germany/71197/>.
- lii Trafigura, 2022.
- liii Federal Ministry of Finance, 2020, "Die Auslandsgewährleistungen des Bundes", available on 3/21/2023, at https://www.bundesfinanzministerium.de/Web/DE/Themes/Internationales_Finanzmarkt/Finanz_und_Waehrungspolitik/Auslandsgewaehrleistungen_des_Bundes/auslandsgewaehrleistungen.html.
- liv UN Climate Change Conference UK, 2021, "Statement on International Public Support for the Clean Energy Transition", available on 3/21/2023 at <http://ps://ukcop26.org/statement-on-international-public-support-for-the-clean-energy-transition/>.
- lv Climate Action Tracker, 2022, "Massive gas expansion risks overtaking positive climate policies", available on 3/21/2023 at <https://climateactiontracker.org/publications/massive-gas-expansion-risks-overtaking-positive-climate-policies/>.
- lvi Climate Action Tracker, 2022b, "Warming Projections Global Update", available on 3/21/2023 at https://climateactiontracker.org/documents/1094/CAT_2022-11-10_GlobalUpdate_COP27.pdf.
- lvii IEA, 2022, "An updated roadmap to Net Zero Emissions by 2050", available on 3/21/2023 at <https://www.iea.org/reports/world-energy-outlook-2022/an-updated-roadmap-to-net-zero-emissions-by-2050>.
- lviii IPCC, 2018, "Summary for Policymakers of IPCC Special Report on Global Warming of 1.5°C approved by governments", available on 3/21/2023 at <https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/>.
- lix IPCC, 2018b, "Special Report: Global Warming of 1.5 °C. Summary for Policymakers", available on 3/21/2023 at <https://www.ipcc.ch/sr15/chapter/spm/>.
- lx NewClimate Institute, 2023, "Pläne für deutsche Flüssigerdgas-Terminals nicht im Einklang mit dem deutschen Klimaschutzgesetz. Annex zur Kurzstudie", available on 3/21/2023, at <https://newclimate.org/sites/default/files/2023-02/LNG%20Deutschland%20Annex.pdf>.
- lxi Oil and Gas Watch, 2023, "Proposed LNG export terminals threaten 21,000 acres of wetlands, many in Louisiana", available on 3/21/2023 at <https://news.oilandgaswatch.org/post/proposed-lng-export-terminals-threaten-22-000-acres-of-wetlands-many-in-louisiana>.
- lxii Reuters, 2022b, "Green groups sue Louisiana over Venture Global LNG permit exemption", available on 3/21/2023 at <https://www.reuters.com/business/energy/green-groups-sue-louisiana-over-venture-global-lng-permit-exemption-2022-11-16/> and Acadiana Advocate, 2023, "Baton Rouge judge tosses lawsuit seeking to block Venture Global's Plaquemines LNG", available on 3/21/2023 at <https://www.reuters.com/business/> at https://www.theadvocate.com/acadiana/news/business/baton-rouge-judge-tosses-lawsuit-against-plaquemines-lng/article_12d7d9fe-c443-11ed-8c41-23af45911b3a.html.
- lxiii Oil and Gas Watch, 2023 and Louisiana Illuminator, 2022, "Shrimpers join environmentalists in protest of LNG terminal expansions", available on 3/21/2023 at <https://lailuminator.com/2022/11/10/shrimpers-join-environmentalists-in-protest-of-lng-terminal-expansions/> and Louisiana Seafood, 2023, "Louisiana Seafood Industry", available on 3/21/2023 at <https://www.louisianaseafood.com/industry>.
- lxiv Pipeline & Gas Journal, 2022, "Activists, Fishermen Argue Rio Grande LNG Terminal Permit is Too Obliging to Industry", available on 3/21/2023 at <https://pgjonline.com/news/2022/september/activists-fishermen-argue-rio-grande-lng-terminal-permit-is-too-obliging-to-industry>, United States Court of Appeals for the Fifth Circuit, 2023, "Petition for Review of an Order of the United States Army Corps of Engineers Agency No. SWG-2015-00114", available on 3/21/2023 at <https://finqfx.thomsonreuters.com/gfx/legaldocs/zdpxddlkkpx/Shrimpy%20Order.pdf> and Texas Tribune, 2022, "Texas Indigenous leaders target banks in fight against natural gas export terminals in Rio Grande Valley", available on 3/21/2023 at <https://www.texastribune.org/2022/10/18/texas-lng-natural-gas-export-terminals-brownsville-comecrudo-tribe/>.
- lxv Louisiana Bucket Brigade, 2022, "Gas export spotlight: operational problems at Cameron LNG and Calcasieu Pass", available on 3/21/2023 at https://labucketbrigade.org/wp-content/uploads/2023/01/Gas_Export_Spotlight_CameronCalcasieuPass.pdf.
- lxvi Louisiana Bucket Brigade, 2022b "Speed over safety", available on 3/21/2023 at <https://labucketbrigade.org/wp-content/uploads/2022/08/SpeedOver-Safety.pdf>.
- lxvii Louisiana Bucket Brigade, 2022.
- lxviii TCHD Consulting, 2023, "LEDEQ", available on 3/21/2023 at <https://earthworks.org/wp-content/uploads/2023/03/LDEQ-Letter-031423.pdf> and Earthworks, 2023, "LDEQ Continues Ignoring Pollution Complaints in Southwest Louisiana", available on 3/21/2023 at <https://earthworks.org/releases/ldeq-continues-ignoring-pollution-complaints-in-southwest-louisiana/>.
- lxix Louisiana OGI Monitoring Project, 2022, "Lake Charles", available on 3/21/2023 at <https://www.youtube.com/playlist?list=PL9BS7nDf-8tpnWs52cR30vz-H3YZ-dkJKVv>.
- lxx Texas Observer, 2021, "The Export Boom", available on 3/21/2023 at <https://www.texasobserver.org/the-export-boom/> and Texas Tribune, 2022b, "Port Arthur pollution fight shows how Texas blocks citizen protests", available on 3/21/2023 at <https://www.texastribune.org/2022/11/03/texas-port-arthur-lng-terminals-citizen-tceq/>.
- lxxi Permian Climate Bomb, 2023, "Exposing Massive Threats from Permian Basin Development", available on 3/21/2023 at <https://www.permianclimate-bomb.org/about>.
- lxxii Texas Tribune, 2022b.
- lxxiii Sierra Club, 2022, "Corpus Christi LNG Is An Environmental Injustice In Texas' Coastal Bend", available on 3/21/2023 at <https://www.sierraclub.org/texas/blog/2022/06/corpus-christi-lng-environmental-injustice-texas-coastal-bend>, Texas Tribune, 2022 and Texas Observer, 2021, "The Export Boom."
- lxxiv Merkel Energy GmbH, 2017, "Potenzialanalyse: LNG-Infrastruktur an der deutschen Nordseeküste unter Betrachtung besonders geeigneter Standorte", available on 3/21/2023 at <https://www.wilhelmshaven.de/PDF/Infomaterial/03/LNG-Studie-data.pdf?m=1513846738&> (page 38), ewi, 2022, "Entwicklungen der globalen Gasmärkte bis 2030: Szenarienbetrachtung eines beschränkten Handels mit Russland", available on 3/21/2023 at <https://gas.info/fileadmin/Public/PDF-Download/study-developments-of-global-gas-markets.pdf> (page 14), appea, 2023, "National and global benefits", available on 3/21/2023 at https://appea.com.au/wp-content/uploads/2020/06/LNG_national-global-benefits_WEB.pdf (page 3), and ESFC, 2023, "Construction of LNG terminals in Europe: a long-term perspective", available on 3/21/2023 at <https://esfccompany.com/en/articles/news/construction-of-lng-terminals-in-europe-a-long-term-perspective/>.
- lxxv Sierra Club, 2023b, "Lawsuit Challenges Approval of Methane Gas Export Facility in Southwest Louisiana", available on 3/21/2023 at <https://www.sierraclub.org/press-releases/2023/03/lawsuit-challenges-approval-methane-gas-export-facility-southwest-louisiana>.

