

New Fortress Energy: Promises to Keep

Company's Short Track Record Misses Development Goals and Volume Sales Are Weak; Rising Electricity Prices, Environmental, Climate and Governance Concerns Cloud Future Outlook.

Executive Summary

The business model for New Fortress Energy (NFE) supports the expansion of natural gas use around the world. The company's financial progress has been slow. For a new company entering risky markets, asking investors for patience is not unreasonable—but ignoring red flags is perilous.

To date:

- The company's promise to investors to develop five to ten new liquefaction facilities by 2024 is unlikely to materialize. It currently owns one small liquefaction plant in Miami, Florida. Since November 2018, the company has not acquired or demonstrated substantial progress on any new liquefaction assets. The failure to build liquefaction assets exposes the company and its customers to market and price risks.
- Sales growth from its more mature assets in Puerto Rico and Jamaica have been slow to materialize. The company's utilization rates have been far below both the market average and maximum capacity levels.
- Recently, the Sagicor Group, a prominent full-service investment house in Jamaica, pulled its equity pledge of \$100 million from a power plant refinancing deal. NFE lost an opportunity to reduce debt levels that have been increasing as the company has added assets.
- Jamaica and Puerto Rico consumers have experienced significant electricity price increases linked to the electric grid's dependence on natural gas.
- In New Jersey, Pennsylvania and Puerto Rico, community concerns have resulted in litigation by or with the Federal Energy Regulatory Commission (FERC) and significant delays in a priority liquefaction project. An NFE project in Ireland faces considerable opposition from political and community organizations.

From a climate perspective, NFE's rationale is bankrupt. The Intergovernmental Panel on Climate Change (IPCC) and International Energy Agency (IEA) have sounded alarms that the world cannot afford more new oil and gas projects. Major

financial institutions are warning community and national governments to think twice about overexposure to natural gas. Market and policy analysts emphasize the expanding need, desirability and affordability of renewable energy investments.

For the most part, NFE's natural gas planned facilities are unnecessary, unwelcome and unaffordable.

NFE's presence in the market creates a risky financial and dysfunctional economic dependence on natural gas as a future resource for host nations and communities. In most instances, its new projects expose host communities to higher electricity prices and undermine efforts to build cheaper, more reliable and environmentally sound renewable energy.

Often, investors and host communities where the company has set up shop have not seen promised investment results, fiscal or consumer savings. In Puerto Rico, one of NFE's successful projects, the company's upgrade of a local power plant and delivery of LNG has not resulted in promised budget savings for Puerto Rico's public utility. In its facilities in Jamaica, NFE's business performance is marginal and natural gas prices have been cited as a cause of serious inflationary pressures. After four years of operation at its first and only liquefaction plant in Miami, the company has seen—at best—a 35% utilization rate in the U.S. market where facilities normally achieve more than 90%.

In places where the company is expanding such as Mexico, substantial market warnings to the government and investors that the country is overbuilding its natural gas capacity are being ignored. In Brazil, where NFE has taken a big bet on natural gas, there are serious questions about inflationary pressures. NFE has struck agreements in Nicaragua and Sri Lanka, both countries facing high levels of political and economic uncertainty, and where natural gas market volatility can only compound existing political and fiscal tensions.

In Pennsylvania and New Jersey, dozens of local city councils have expressed safety and health concerns. Citizen groups cite serious risks from natural gas transport are being met by the company with attempts to dodge responsible oversight of their plans to develop new processing plants, shipping logistics and terminals.

In Ireland, the company's recent attempt to revive an infrastructure project resurrected substantial opposition. Ireland recently issued a moratorium on new natural gas infrastructure projects and adopted a national Climate Action Plan that maximizes renewable energy.

At the end of the third quarter of 2021, the company showed a \$19 million gain, its first gain since 2016. The positive financial news driven by higher natural gas prices, volume sales and new assets in Brazil was met by improved ratings from credit agencies and a new stock issuance. The company also experienced growing expenses from rising natural gas prices, development outlays and interest payments from rising debt levels.

Looking forward, 2022 is a pivotal year for the company. As the year starts, NFE is:

- Building a large portfolio of development projects that requires more than \$3 billion in actual cash through 2023 against the company's \$2 billion cash resource projections, much of which is unlikely to materialize.
- Working on at least 16 projects that are slated for completion by end of 2023. The projects have a high degree of execution risk that is related to market demand, political and policy uncertainty.
- Working with a track record of operational results that are underwhelming. Even where NFE has been active in markets for more than five years, actual deliveries of natural gas and anticipated customer demand fall far short of capacity.
- Relying on a business model that is in direct conflict with global goals that call for substantial reductions in CO₂ emissions. The company is supporting some national government policies that promote continued gas drilling. In other places, it is undermining government policies and global efforts to promote climate healthy policies.

NFE launched a business five years ago that integrates natural gas processing with transportation logistics and end user delivery and service. The company's customer base is scattered across a range of economic and political systems, introducing wide variability in the quality of NFE's business partners and partner nations.

It remains to be seen whether these host economies have a growing customer base that can support profitable operations or whether the company's maiden contracts that usually contain only minimum volume requirements are actually the upper limit of the market.

The company's talents will be tested in 2022:

- Can NFE bring deals in Nicaragua, Brazil, Ireland and Sri Lanka from initial agreements to contract, construction and operation?
- Can the company settle on development plans and repair its damaged credibility for its liquefaction facility in Wyalusing, Penn., and its companion terminal operations in Gibbstown, N.J., that will satisfy a geographically wide range of communities and multiple levels of health, safety and environmental regulations?
- Can the company bring its Brazilian construction projects to fruition? And will the Brazilian economy and regulatory system support NFE's newly acquired terminal and natural gas power plant expansions?
- The company also will demonstrate in 2022 whether its foothold in Puerto Rico with deliveries to the San Juan natural gas/diesel plant and sales to industrial users represents a fixed ceiling or a launch pad for more natural gas investment. Its projects have been the subject of substantial controversy. Currently, Puerto Rico's law and integrated resource plan (IRP) call for

substantial increases in renewable energy to improve the commonwealth's environmental standing, grid resiliency and balance sheet.

- Is the recent withdrawal of Sagicor Investment from NFE's power plant in Jamaica an indication that equity partners are skittish and the company faces greater pressure to increase debt use beyond responsible limits?
- Can the company's use of the individual wealth of co-founders Wes Edens and Randal Nardone—coupled with new debt, more stock issuances and new revenues—sustain the ambitious development plans the company has launched?

The company faces logistical, technical and financial risks, and its brand as a global player in the natural gas markets puts NFE plans in direct conflict with climate policies while creating natural gas assets that are unlikely to improve troubled national economies.

Table 1: Primary Climate and Environmental Impediments

Location	Primary Climate, Environmental and Financial Risks
Pennsylvania	Regional, local government resolutions in opposition - safety/health
Puerto Rico	LNG crowds out renewables; failed to create savings; price inflation.
Miami, Florida	Underperformance/lack of transparency
Jamaica	LNG crowds out renewables; dependent natural gas/price volatility
Brazil	LNG crowds out renewables; dependent natural gas/price volatility
Nicaragua	Unstable political and economic environment
Ireland	Green Party policy opposition on environmental and climate grounds
Sri Lanka	Heavy reliance on LNG introduces price/volatility risks

A. Conclusion

NFE's business investments are on a collision course with global policy and capital allocation trends away from fossil fuels. The company claims its products curb emissions, but the expansion of natural gas is not climate neutral. The Intergovernmental Panel on Climate Change (IPCC) research shows that global methane emissions must be reduced at least 40% by 2030 to curb global warming to 1.5° C this century. President Biden's special envoy for climate has identified the reduction of methane emissions as the top priority of climate policy.

The company's claims that it is often replacing heavy polluting oil and diesel fuel resources with lower-emitting natural gas poses a false choice, since growth in renewable energy and other green investments now provide cheaper, more efficient and cleaner alternatives. In most of the countries, plans exist for the expansion of renewable energy. For NFE to succeed, the expansion of renewable energy must be reduced, delayed or cancelled as a matter of politics—not sound energy, climate or economic policy.

The company's plans to assist countries to grow natural gas resources will frustrate the national economic development goals of host countries. By pushing out the development of renewable energy investments in favor of natural gas, host countries and communities are increasing dependence on an energy resource that exposes economies to inflation, volatile pricing and the high likelihood of stranded assets with its attendant negative impacts on investment and banking performance.

The company acknowledges the highly speculative nature of its business and execution risks in the countries where it is doing business. At present the company has plans for no fewer than 16 new portfolio assets, including liquefaction facilities, on and offshore gasification assets, power plants and terminals. To date, the company has financed its operations on individual investments from its principals, additional stock issuance, borrowing and cash from operations. With the exception of the United States and Ireland (where political opposition is the strongest), most of NFE's plans will depend on uncertain economic growth in emerging markets. Some of the host governments, already wracked by the COVID-19 pandemic are unstable politically and financially.

Methodological Note: NFE Financial Reporting Anomalies Hinder Transparency

NFE started as a small company in the LNG space. Its growth hinges on an aggressive acquisition and build strategy. Its assets are designed to generate diversified revenue growth.¹

A number of NFE's financial reporting techniques contain irregularities that make it difficult to obtain an accurate view of its current business size and ultimately the trajectory, magnitude and durability of its advertised growth plans.

The financial presentation issues identified in this section run as a continuous impairment for any investor seeking to understand the company's achievements and challenges. NFE is a publicly traded company. As such, its ability to obtain and maintain investor confidence is critical. The high-risk nature of the business only increases the importance of transparency.

NFE measures the volume of liquefied natural gas that it buys, sells, processes and handles in gallons per day (gpd). The typical volume measurement in the industry is million tonnes per annum (MTPA).² The use of gallons per day in a financial presentation creates a misleading impression that the company's capacity is significant, when in fact it is quite small. For example, NFE's first and only liquefaction facility in Miami has a capacity of 100,000 gallons per day. This translates into 58,776 tons per annum.³ The Miami facility is the smallest liquefaction asset in the United States.⁴ The active permitted liquefaction facilities in the United States range in size from 2.75 million to 34.5 million tonnes per annum.⁵

For purposes of this report IEEFA has adopted NFE's gallons per day accounting treatment to adhere as closely as possible to the company's own description of its financial condition. However, understanding the small size of the plant helps to clarify the company's weak financial performance. The Miami plant, for example, has never surpassed an annual 35% utilization rate (See: Miami Liquefaction Project,

¹ The recent Brazil acquisitions have added substantially to the company's asset base and are expected to make a substantial contribution to company revenues during 2022 (See: Section II, C, 4 Brazil).

² See: Global Tech Australia. [Conversion Tables](#). Accessed January 26, 2022. Also see: NFE. [NFE Miami Liquefier Virtual Tour](#), Accessed February 14, 2022). According to NFE the Miami facility has a capacity of 0.1 Mtpa (Mtpa = million tons per annum) or 100,000 tons per annum.

³ Conversion Tables, *ibid*.

⁴ IHS Markit, Liquefaction Database: United States. Accessed January 23, 2022. (Proprietary) New Fortress Energy's Miami Liquefaction facility is not included on a list of six FERC permitted liquefaction facilities. If it were included, it would be the smallest facility by far. The only facility closest to Miami is Kinder Morgan's Elba Island facility with a capacity of 2.75 Mtpa.

⁵ Energy Information Administration, [Liquefaction Capacity](#). Accessed January 26, 2022. Also see: FERC. [North American LNG Export Terminals Existing, Approved but not yet built and proposed](#). December 21, 2021.

below); U.S. companies typically have utilization rates in the 90% range at liquefaction facilities that are significantly larger.⁶

Further, in New Fortress Energy's financial presentations, the company utilizes an unusual net revenue projection of future operations under the rubrics "Illustrative Segment Operating Margins," "Illustrative Total Segment Operating Margins Goal" and "Illustrative Future Goal."⁷ This accounting treatment creates what is effectively a future projected revenue. The augmentation is not quite a revenue guidance that is typically used by companies, but it is not a reckless accounting contrivance either. It serves as a kind of additional layer of financial reporting that is a highly optimistic projection of performance.

For example, the company states in an investor presentation that the revenue calculation embedded in the treatment is based on "binding contracts." NFE's typical contracts reportedly contain minimum volume amounts.

This is misleading. The company's illustrative revenue calculation is based on volume projections that are "substantially in excess of such minimum volume commitments." In the December investor presentation, NFE uses this accounting treatment 16 times to explain to investors how they should look at the company's current and future operations. No other company that IEEFA is aware of utilizes this approach to describe forward-looking net operating results. This accounting treatment is an unfortunate and unnecessary distraction. The treatment conjures up the perception of robust revenue growth.

Finally, the company does not fully inform its investors when the company fails to meet development benchmarks. NFE makes clear in its filings with the Securities and Exchange Commission (SEC) that it is a high-risk business operating in many places with marginal sovereign credit ratings, unstable economic and political environments where the company has little actual experience.⁸

These acknowledged weaknesses suggest the need for more and more frequent reporting. In many cases, the company fails to report project development status in a timely manner—particularly when projects appear to be stalled or canceled. For example, the company has often made announcements or discussed its corporate activity reflecting commitments in Angola,⁹ the Dominican Republic,¹⁰ the

⁶ International Gas Union (IGU). [World LNG Report](#). 2021, p. 42. In 2020, U.S. company utilization rates declined to 76.5%.

⁷ NFE. [Investor Presentation](#), December 2021.

⁸ NFE. [Form 10K](#), March 16, 2021, pp. 18-20.

⁹ NFE. [NFE Signs MOU With Angolan Ministries to Advance Natural Gas Infrastructure](#). June 5, 2019. NFE reports the development status of projects in the predevelopment, FID and In Construction stage. NFE. [Operational Facilities](#). Accessed January 24, 2022. Angola is not on that list.

¹⁰ NFE. [Form 10K](#), March 2019. The Dominican Republic is not on that list.

Philippines,¹¹ and Titusville, Fla.¹² When projects are stalled or canceled and this is not disclosed, investors are left in the dark. The reasons for the cancellation are essential for investors to know whether projects are well managed or not. To IEEFA's knowledge, none of these projects are moving forward in the development process. For example, the Titusville, Fla., project had its permit application rejected by the Department of Transportation (DOT) in 2018.¹³

NFE is adding assets and expecting commensurate revenue growth. Its business model is high risk and profitability will be difficult to achieve. Clear, accurate, consistent and reliable reporting is warranted.

¹¹ NFE. [NFE Signs MOU Philippine National Oil Company](#). October 15, 2020. NFE reports the development status of projects in the predevelopment, FID and in-construction stage. Also see: NFE. [Operations](#). Philippines is not on that list.

¹² The Titusville project was initiated in 2015 by American LNG an NFE subsidiary. The project faced community opposition See: Florida Today. [Concern raised over proposed Titusville LNG plant](#). March 17, 2017. Also see: U.S. Department of Transportation. [Special Permits Waiver – 2016-0073](#). October 2018. Also see: U.S. Department of Energy. [American LNG Change of Ownership Letter](#). March 2019. Also see: NFE, [Operations](#). Titusville is not on that list.

¹³ Pipeline and Hazardous Material Safety Administration (PHSMA). [Special Permits Waiver PHMSA 2016-0073](#). October 2, 2018.

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I. Background¹⁴

A. Origins and Business Strategy

New Fortress Energy's goal is to develop natural gas infrastructure that is clean, reliable and an integral part of local, regional and national economic development strategies. New Fortress Energy's Miami liquefaction facility and Montego Bay, Jamaica terminal commenced commercial operations in 2016. The company launched its initial public offering in 2018 as an integrated gas-to-power company that uses "stranded" natural gas to satisfy the world's growing demand for natural gas.¹⁵ The business model invests in host communities to diversify energy resources (by adding natural gas), reduce energy costs, build strong margins and contribute to pollution reduction strategies worldwide.

As a player in the liquified natural gas (LNG) space, NFE's integrated approach consists of linking assets in the LNG economic chain. Its strategy outlined in its 2018 IPO includes plans to:

- Build **liquefaction assets** supported by long-term, fixed-price contracts for feedgas that is strategically located to maximize extraction, processing, pipeline and transport networks. The company's 2018 IPO offered a "plan to develop five to ten additional liquefaction facilities over the next five years." NFE's objective is to supply "all existing and future customers with LNG produced primarily at our own liquefaction facilities."¹⁶ Control of a sufficient quantity of LNG would reduce company and customer risk from volatile natural gas prices, particularly during periods of high prices;
- Own and control LNG **logistical assets** that link liquefied natural gas by truck and rail to terminal loadings on large marine vessels;
- Charter and own **shipping assets**, liquefied natural gas carriers (LNGCs) and floating storage and regasification units (FSUs and FSRUs); and
- Build 10 to 20 **downstream terminal assets** during the next five years to deliver natural gas to service household and business power needs and industrial uses.

Through a combination of these assets, the company plans to generate fuel and capacity sales. NFE expects to generate revenues in the range of \$8 to \$10 per million metric British thermal units (MMBtu) across a diverse customer base with varying sizes, volumes, credit profiles, infrastructure requirements, generation mixes and delivery systems.

¹⁴ Except as otherwise noted this section draws from New Fortress Energy. [Form S-1](#). November 9, 2018.

¹⁵ The company uses an operational definition of stranded reserves to refer to natural gas reserves not connected to larger interstate or transnational pipelines and without linkages to end users.

¹⁶ NFE. [Form S-1](#), pp. 6-7.

NFE and its numerous subsidiaries are financed through a series of individual and banking loans and stock issuances.¹⁷ At the time of the IPO, Mr. Edens owned a substantial majority of the company's equity.

The company has a current market capitalization of \$4.8 billion.¹⁸ As of November 2021, NFE Energy Inc. is a "controlled company" with Wes Edens and Randal A. Nardone jointly holding more than half of the company's stock.^{19, 20}

Since the launching of the company in 2016, New Fortress Energy and its subsidiaries have commenced discussions or closed on development and supply contracts in Jamaica, Puerto Rico, Pennsylvania, Miami, Ireland, Sri Lanka, Nicaragua, Brazil and Mexico.

B. Bond Ratings

NFE holds a B1 rating and was upgraded with a positive outlook from Moody's in December 2021.²¹ The recent upgrade of the outlook to positive comes on the heels of the Brazilian acquisitions. NFE has successfully navigated two stock offerings.²² In November 2021, both Fitch and Standard & Poor's affirmed ratings in the BB family.²³ All have noted that the 2021 bumps in revenue from Puerto Rico, Jamaica and Brazil have been credit-positive.

C. Stock Performance

NFE is traded on the NASDAQ exchange.²⁴ The company's stock peaked in December 2020 at \$60 per share and since then has posted a steady decline to the low \$20-per-share range at the beginning of 2022.²⁵ In 2021, the company's price dropped

¹⁷ New Fortress Energy LLC (NFE LLC) was formed in 2018. In August 2020, NFE LLC was renamed New Fortress Energy, Inc. (NFE, Inc.). For the purposes of this paper, IEEFA refers to NFE and its subsidiaries as NFE. See: NFE. [Preliminary Prospectus Supplement; Form 424\(b\)\(5\)](#). December 15, 2020. A supplemental stock issuance of \$150 million Class A shares was completed in December 2020.

¹⁸ Yahoo Finance. [New Fortress Energy](#). Accessed February 14, 2022.

¹⁹ Securities and Exchange Commission (SEC). [New York Stock Exchange Company Guidance Reporting](#). Accessed January 23, 2022. The "controlled company" governance structure has typically generated investor concerns over reporting, decision-making, responsiveness to shareholder concerns and financial performance. See: Corporate Governance.net. [Controlled Companies Carry Negatives](#). October 2012.

²⁰ New Fortress Energy. [Form 10 Q](#), November 3, 2021, p. 108.

²¹ Moody's. [Moody's changes outlook on NFE Bond ratings to positive](#). December 2, 2021.

²² Form S-1, *op. cit.*

²³ Businesswire.com. [New Fortress Energy Announces Credit Rating Upgrade by SP Global Ratings](#). November 22, 2021. Also see: Fitch Rating Services. [Fitch Affirms New Fortress Energy IDR at 'BB-'; Outlook Stable](#). November 23, 2021.

²⁴ NASDAQ. [Nasdaq Welcomes New Fortress Energy LLC \(Nasdaq: NFE\) to the Nasdaq Stock Market](#). January 2019.

²⁵ Macrotrends. [NFE Stock Price History](#). Accessed February 11, 2022.

by 50%, from \$52 per share to \$24 per share.²⁶ The energy sector as a whole led the stock market with an increase of 53%.²⁷

Significant shareholders include Great Mountain Partners, Fortress Investment, Federated, Vanguard, Hermes, State Street, BlackRock and Fidelity.

D. Most Recent Additions

The company has been under contract with electricity providers in Jamaica since 2016 and Puerto Rico since 2019. It has operated a liquefaction asset in Miami since 2019. The company has been aggressively adding assets in Nicaragua, Brazil, Sri Lanka, Ireland, Pennsylvania and Mexico.

The company's most recent acquisitions closed in Brazil. NFE acquired the Nanook, a new Floating Storage Regasification Unit (FSRU) docked at the Sergipe Facility. In addition, NFE acquired a fleet of six other FSRUs, six LNG carriers and an interest in a floating liquefaction vessel (the Hilli). The majority of the fleet is in operation in Brazil, Kuwait, Indonesia, Jamaica and Jordan under contract arrangements.²⁸

In late December, NFE announced the signing of a memorandum of understanding (MoU) with Mauritania for delivery of natural gas from the company's Fast LNG apparatus. The Fast LNG concept allows the company to bring ships into Mauritania's coastal areas, dock next to liquefaction assets and then discharge LNG for processing.²⁹

II. NFE's Financial Outlook

A. Financial Outlook

The company's aggressive acquisition strategy added to its base of revenue-producing assets in 2021. Revenues from assets in Brazil, Nicaragua and Mexico are expected to rise appreciably and to fuel debt repayment and to finance additional capital construction in 2022.³⁰ Although most of the company's counterparties are in countries with BB or worse ratings, 2022 is expected to be a year with a relatively strong economic recovery that supports higher delivery volume and revenues for the company. Henry Hub futures are likely to take a dip but remain at somewhat elevated levels for most of 2022 and should allow the company to continue posting quarterly gains.³¹

This will also be a pivotal year as NFE seeks to deliver on its development and operations initiatives. The company is seeking to capitalize on full-year operations

²⁶ *Ibid.*

²⁷ Marketwatch. [The S&P's energy sector surged more than 50% last year – so how were green funds able to keep up with the stock market?](#) January 18, 2022.

²⁸ New Fortress Energy. [Form 10 Q](#). November 3, 2021.

²⁹ NFE. [NFE Signs MOU With Mauritania for Fast LNG and Gas to Power Project](#). December 21, 2021.

³⁰ Fitch Rating Services. [Fitch Affirms New Fortress Energy IDR at 'BB-'; Outlook Stable](#). November 23, 2021.

³¹ See Appendix for sources.

in Jamaica, Puerto Rico, Brazil and Mexico. It is launching significant construction initiatives in three additional sites in Brazil and one in Nicaragua. The company is expecting to achieve significant development benchmarks in Pennsylvania, Sri Lanka and Ireland.

1. Is the NFE Business Model Viable?

IEEFA estimates the company has pledged to complete 16 projects with an anticipated cash requirement of more than \$3 billion by the end of 2023.

Table 2: NFE Pipeline of Projects Globally With Commercial Operation Dates No Later Than 2023³²

Country	Location	Asset	Estimated Completion	Amount (\$USD Millions)
United States				
	Wyalusing, Pennsylvania	Liquefaction	1Q -2023	800
	Gibbstown, New Jersey	Terminal	1Q-2023	95
Mexico				
	Port of Pichilingue	La Paz ISO Flex 100 MW Power Plant	1Q - 2022	132
Nicaragua				
		Offshore Liquefaction		700
	Porto Sandino	OnShore Regasification 300 MW Power Plant	1Q-2022	
Brazil				
	Santa Catarina	Offshore LNG Facility	2Q-2022	50
	Baracarena	Onshore LNG Facility	1Q-2022	35
	Baracarena	Power Plant	1Q-2022	
	Suape	Onshore LNG Facility	1Q-2022	536
	Suape	1.4 GW Power Plant	1Q-2022	
Ireland				
	Shannon	Onshore Regasification Storage and Pipeline CHP Power Plant		566
Sri Lanka				
		Offshore Regas/Storage	1Q -2023	300
Total Estimated Cost				3214

In January 2021, the company identified approximately \$2 billion to \$3 billion in baseline potential resources to finance its construction ventures.³³ The company identified a combination of cash, debt and equity—\$600 million in cash, \$300 million to \$400 million in illustrative operating margins, \$200 million in a cash revolver, and \$1 billion to \$2 billion in asset sales. During 2021, the company provided a series of financial presentations that updated cash on hand, illustrative

³² See Appendix for sources.

³³ NFE. [Investor Update](#). January 21, 2021, p. 13.

profit margins from future operations, revolver credit facilities and asset sales as the source of its development resources.³⁴

As noted above, the company's operating revenues turned positive for the first time in the third quarter of 2021, posting a \$19 million gain for the nine months ending September 2021.³⁵ Revenues grew during 2021 but expenses also grew. The company's projected illustrative operating rates of \$300 million to \$400 million had not been achieved through the third quarter.³⁶

The company's debt burden increased to \$3.8 billion in the third quarter of 2021.³⁷ Debt levels increased to finance the Brazilian acquisitions and the fleet of chartered ships. The company's projections that \$1 billion to \$2 billion is available through asset sales is not fully substantiated. The valuations remain largely unspecified and capacity utilization estimates are far below maximum capacity levels and market outliers (see utilization discussion on Miami and Jamaica below). In January 2021, Edens highlighted the attractive valuation of the company's Jamaican assets as an example of a potential lucrative asset.³⁸ The loss of NFE's Jamaican equity partner later in the year is cause for concern.

The company has been slow to achieve its cash on hand and debt goals. At the end of the third quarter of 2021, cash on hand was \$300 million, the revolver was \$675 million, and debt grew substantially. The January 2021 projection anticipated \$600 million in cash and a \$200 million revolver.

At some point, adding projects and building new ones will need to be paid for with operational performance. As noted below, Puerto Rico, Jamaica and Miami are all relatively mature assets for NFE. Each facility posts weak delivery numbers relative to total capacity (see utilization discussions below). IEEFA's research suggests that the growth potential, especially in Puerto Rico, is limited by the size of the economy and the demand for natural gas for power or industrial purposes.³⁹

Similarly, it remains to be seen whether NFE's supply additions will be met with increased customer demand and increasing revenues at financially sustainable levels in Brazil, Sri Lanka, Nicaragua and Mexico.

At this point, the cost of NFE's new project pipeline seems to far exceed even the company's most optimistic estimates of \$2 billion to \$3 billion. Since the estimate was made in January 2021, cash has materialized at a lower level than anticipated,

³⁴ *Ibid.* Also see: NFE. [Q4 2020 Investor Presentation](#). March 2021. Also see: NFE. [Annual Investor Update](#). July 2021. Also see: NFE. [Investor Presentation](#). December 2021.

³⁵ NFE. [Form 10-Q](#). November 3, 2021.

³⁶ NFE. [Investor Update](#). January 21, 2021, p. 13.

³⁷ NFE. [Form 10-Q](#). November 3, 2021, pp. 28-29.

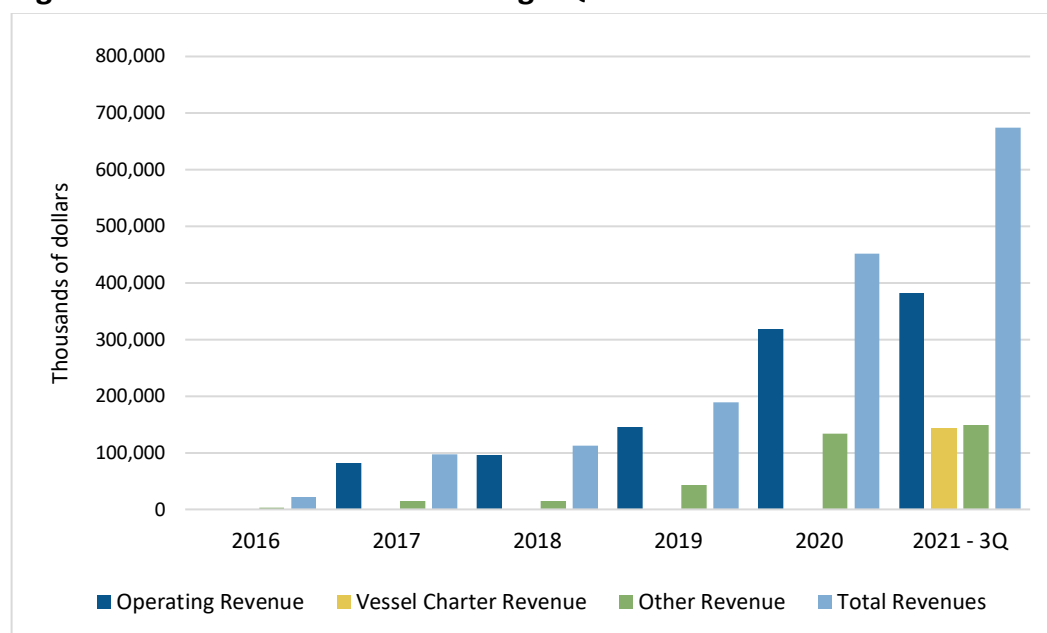
³⁸ Seeking Alpha. [New Fortress Energy's CEO Wes Edens Presents at Investor Update](#). January 2021.

³⁹ IEEFA. [Sanzillo Testimony Puerto Rico Senate](#). January 2022. Attached to Testimony is a listing of numerous reports, testimonies and opinion pieces on the Puerto Rico economy, energy and operations of its power grid, budget condition and practices and planning assumptions.

short- and long-term company debt has mushroomed and although margins have turned positive, they remain far below the January 2021 projections.

B. Revenue⁴⁰

Figure 1: NFE Revenues 2016 Through Q3 2021



NFE's principal revenue sources are derived from buying, selling and delivering natural gas. Through the third quarter of 2021, the company's principal operating revenues came from its contracts in Old Harbour, Jamaica (\$191 million), Puerto Rico (\$176 million) and Montego Bay, Jamaica, (\$79 million).⁴¹

The company also received \$143 million in vessel charter revenue and \$149 million in other revenue. Vessel charter income is derived from profits received from ship, equipment and lease transactions and various lease arrangements.⁴² The vessel charter revenue flowed from the two recent acquisitions in Brazil.

The company also benefited from related payments received from the profits from sales of equipment and leases, construction, installation and commissioning of

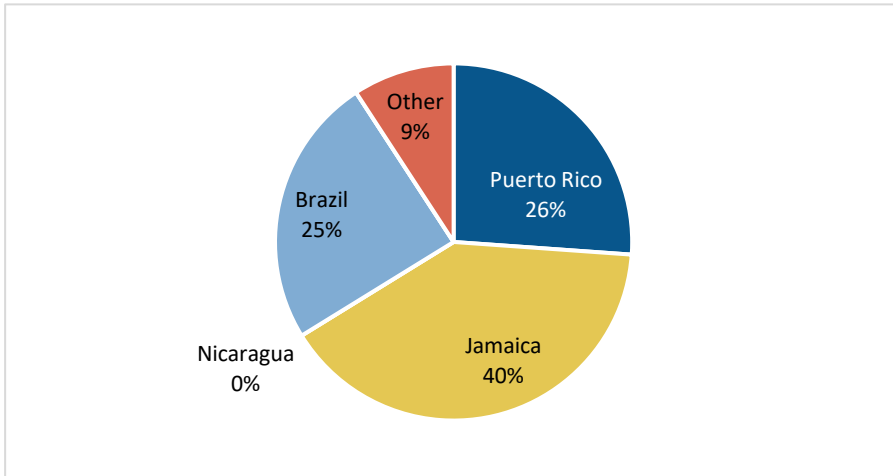
⁴⁰ Revenue consists of three categories: Operating Revenue that includes revenue from the sale of natural gas as well as outputs from natural gas power facilities. Other Revenue includes revenues from development services as well as interest on leases. Vessel Charter Revenue is derived from certain use rights the company has obtained under its merger agreement for the FSRU and LNG carriers. Revenues derived under these use agreements and for repositioning its fleet are carried under Vessel Charter Revenue. See: NFE. [Form 10-Q](#). November 3, 2021.

⁴¹ NFE. [Form 10-Q](#). November 3, 2021, pp. 45-46.

⁴² *Ibid.*, pp. 7-8, 61.

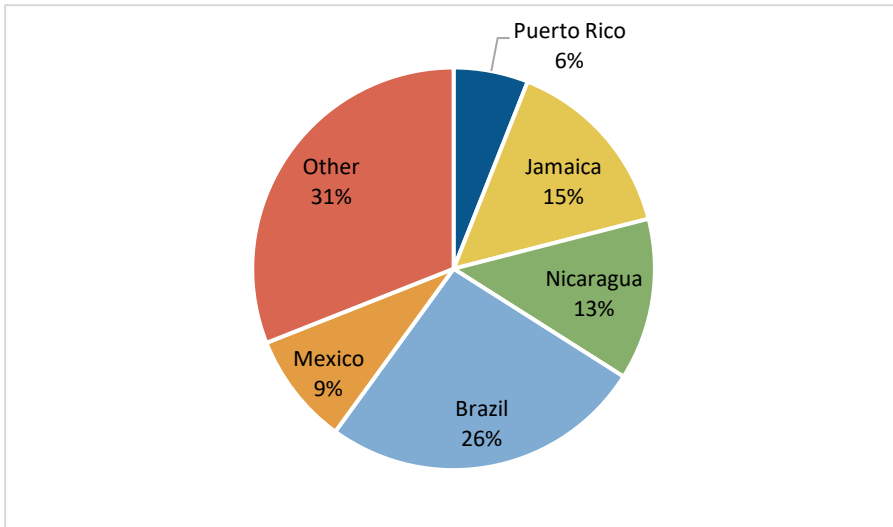
infrastructure, including natural gas plants and financing arrangements related to the development process.⁴³

Figure 2: NFE Revenue by Geography, Through Q3 2021



Through the third quarter of 2021, revenue from Jamaica (40%) drove the company’s \$676 million total, followed by Puerto Rico (26%). Jamaica was added in 2016 and Puerto Rico in 2020. Brazil, which was added in 2021, accounted for 25% even though it was counted on NFE’s balance sheet for fewer than three quarters.

Figure 3: 2022 Fitch Revenue Estimates



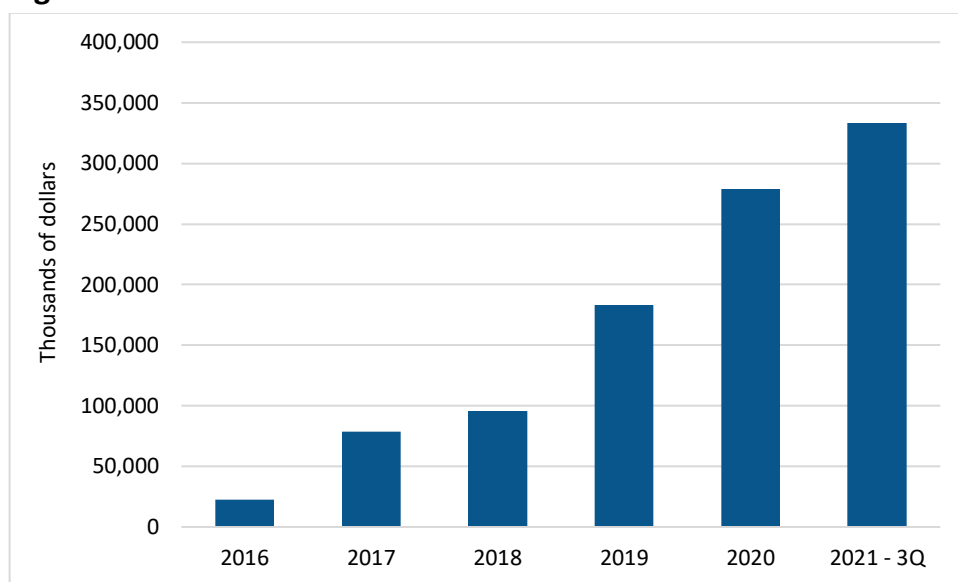
Fitch Ratings Service has provided an estimate of the company’s revenue outlook for 2022. Based on NFE’s rapid acquisition strategy and a full year calculation for Brazil, the company’s revenue base is expected to grow and add Mexico and Nicaragua to

⁴³ *Ibid.*, p. 6.

its Puerto Rico and Jamaica base operations. As the revenue base has diversified, credit agencies have noted the change positively.

C. Cost of Sales

Figure 4: Cost of Sales



The company accounts for its operating expenses by segmenting cost of sales, vessel operating expenses, operations and maintenance, selling and administrative, transaction and integration costs, depreciation and transaction costs. Through the third quarter of 2021, operating expenses totaled \$655.6 million.

Cost of sales included procuring feedgas and LNG; logistics and shipping to customers; third party transactions; and sales to the Miami facility for fuel preparation.⁴⁴ The cost of sales through the third quarter of 2021 were \$333.5 million (Figure 4).

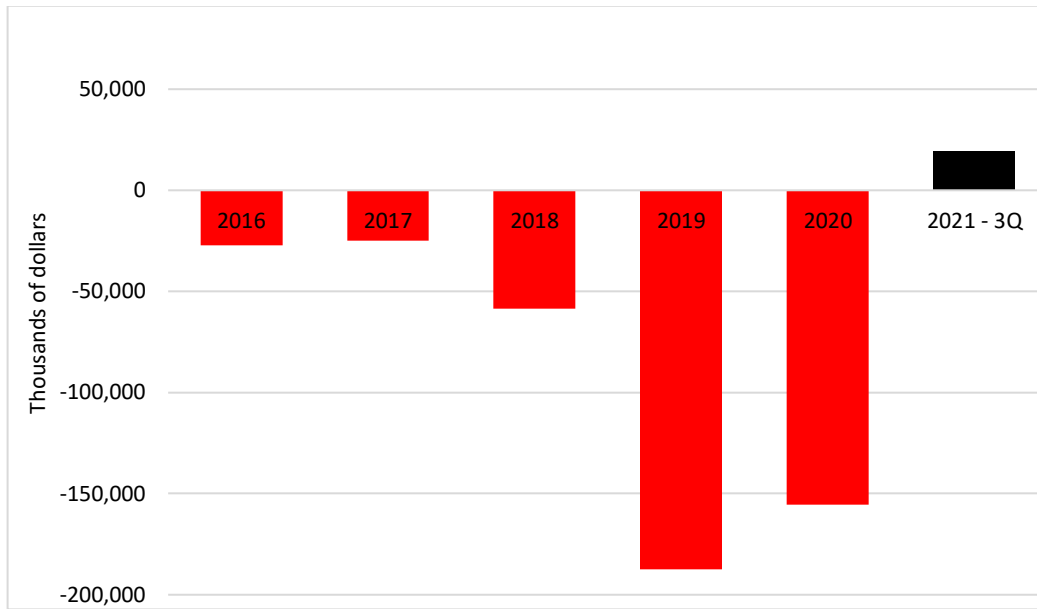
The increased cost of sales trend in 2021 reflects rising volumes in Puerto Rico, along with an increase in natural gas prices that increased expenses in Puerto Rico; Old Harbour, Jamaica; and Montego Bay, Jamaica.⁴⁵

⁴⁴ *Ibid.*, pp. 46, 51.

⁴⁵ *Ibid.*, pp. 45-46.

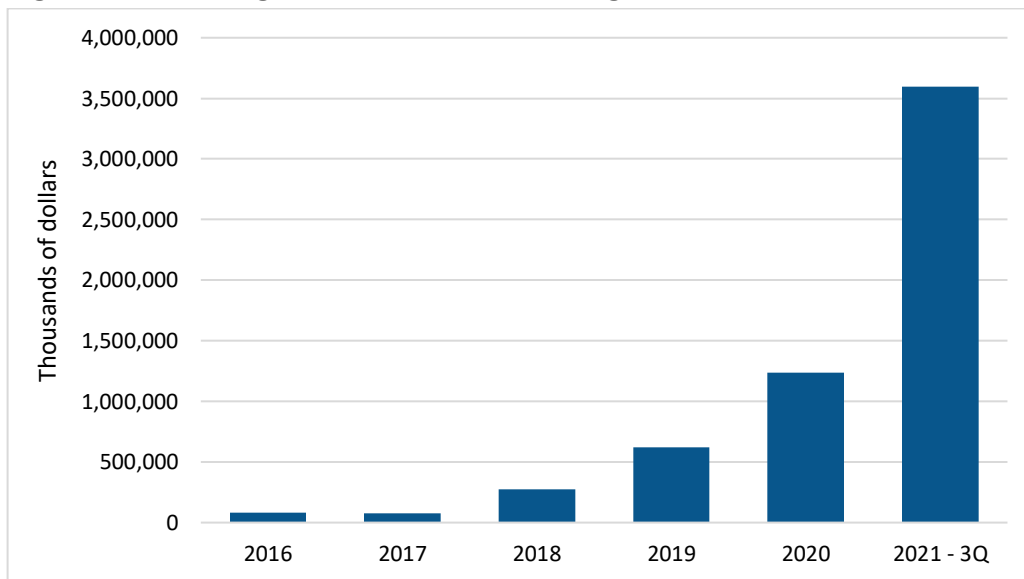
D. Gains and Losses

Figure 5: Operating Loss/Gain, 2016 Through Q3 2021



The company has experienced operational losses from 2016 through 2020. Through the third quarter of 2021, the company’s operating profile turned positive. In 2021, total revenues increased by \$220 million over 2020 receipts, and expenses increased by \$55 million. For the first three quarters of 2021, NFE posted an operating gain of \$19 million.

Figure 6: NFE Long-Term Debt 2016 Through Q3 2021



Through the third quarter of 2021, total long-term debt for NFE increased to \$3.8 billion, up from \$80 million in 2016. The new long-term indebtedness has been used to support acquisitions. NFE has also assumed other indebtedness (credit facilities and loans) connected to its acquisition of various parts of its fleet.⁴⁶

Through the third quarter of 2021, NFE's interest payments rose to \$107 million, up from full-year payments of \$65.7 million.

NFE acknowledges that it may take a considerable period of time before it can declare profits. The build-out of natural gas infrastructure takes time for development to occur and then for markets to firm up. The 2021 revenue increase reflects rising gas prices, the addition of an existing facility acquired through a transaction and some volume increase from its customers.

Revenue needs to grow robustly over the next several years to handle rising operations expenses, cash needs for development, payment of existing debt and stabilization of payouts to investors. The company is at risk of becoming too reliant on debt. Declining stock values suggest that investors will have little appetite for further erosion of stock value through more issuances. And, while controlling parties have considerable resources, it would appear there are limits. Without strong cash performance, the model does not work.

There are also factors that do not appear on the balance sheet that have a significant impact. There is little room for error in NFE's development plans. Project execution will need to be on time and on budget. Surprises like the recent withdrawal of equity support from NFE's power plant deal in Jamaica will cost the company in future debt payments.

III. NFE Project Descriptions: Existing Facilities, Proposed Projects, Performance and Risks⁴⁷

A. Overview

NFE has amassed 16 projects in its pipeline across a wide variety of countries. The project completion dates suggest a very aggressive construction schedule through 2023. Section II addressed the current financial position of the company and its ability to take on the financial commitments that come with the new investments. This section of the paper addresses NFE's actual performance in its existing portfolio, its strategic acquisitions and the local issues facing host states and nations, and critical risk factors for the company.

The company plans to assist host nations and communities to grow their natural gas resources. Most countries with natural gas aspirations seek to integrate this energy

⁴⁶ Moody's has issued supportive statements regarding the company's plans and execution to date. It has also warned that adding layers of debt and organizational complexity overtime may place downward pressure on future rate assessments. See: Moody's. [New Fortress Energy – Credit Opinion](#). December 6, 2021. (Proprietary)

⁴⁷ Except as otherwise noted information on project facility description, capacity, commitment and status are taken from New Fortress Energy. See: NFE. [Form 10-K](#). March 26, 2021.

choice with broader economic development goals. NFE's presence increases competition among local energy stakeholders and is often consistent with those economic development plans. Upon examination of NFE's strategic plans, IEEFA has concluded that the company's plans threaten the development of renewable energy, impedes actions to meet climate goals and undermines economic development goals by integrating natural gas and its attendant inflationary pressures into the country's grid system and economy.

Warnings regarding the negative financial, environmental and regulatory consequences of overbuilding natural gas resources have been issued in Puerto Rico, Mexico, Sri Lanka, Ireland and the United States (see discussions below). The exposure to increasing amounts of natural gas brings inflation, volatile pricing and the high likelihood of stranded assets with its attendant negative impacts on investment and banking performance. These undesirable economic outcomes are likely to undermine economic growth.⁴⁸

Furthermore, the company's claims that it is often replacing heavy polluting oil and diesel fuel resources with lower-emitting natural gas present a false choice, since growth in renewable energy and other green investments now provide cheaper, more efficient, cleaner alternatives that improve economic outlooks.⁴⁹

The company acknowledges the highly speculative nature of its business, execution risks and the countries where it is doing business.⁵⁰ With the exception of the United States and Ireland—where political opposition is the strongest—most of NFE's plans will depend on uncertain economic growth in emerging markets. Some host governments are unstable politically and financially.

Local opposition in Pennsylvania, New Jersey, Ireland and Puerto Rico has developed and identified significant public health and safety risks related to water management, environmental contamination and transport safety. In the United States, this combination of regulatory risks has scuttled many natural gas infrastructure projects.⁵¹

These concerns about NFE's potential in host countries are heightened when the company's track record (discussed in the next section) in places where it has finished construction and currently operating facilities is examined. Actual deliveries fall far below current capacity level where the company has built facilities and now has them up and running under contract, including Miami; Old Harbour, Jamaica; Montego Bay, Jamaica; and Puerto Rico. In Miami and Montego Bay, where NFE has had the longest operational presence, the robust customer base that would grow deliverable volumes has been slow to materialize. And in Puerto Rico, where

⁴⁸ IEEFA. [Examining Cracks in Emerging Asia's LNG-to-Power Value Chain](#). December 2021.

⁴⁹ IEEFA follows the development of renewable energy and other emerging green technologies. The potential that NFE's investments will result in stranded assets is high. The company's claims that its business mode is operational in tune with climate change goals strains credulity. See: IEEFA. [IEEFA Update: Financing the future of green energy](#). January 24, 2022.

⁵⁰ See S-1 Risk analysis. The same risk analysis appears in each of NFE's quarterly and annual SEC filings.

⁵¹ Moody's Investor Service. [Shifting environmental agendas raise long-term credit risk for natural gas investments](#). September 30, 2020. (Proprietary)

the company's utilization numbers barely exceeded their deliveries to PREPA, the company may have overbuilt its terminal capacity and failed to deliver on its promise to save hundreds of millions of dollars for a bankrupt public authority.

B. Poor Performance at Existing Facilities

1. Miami: Liquefaction Asset With Weak Performance and Fledgling Customer Base

The company owns a liquefaction facility in Miami that was commissioned in 2015 and has been in operation since 2016.⁵² The facility can process 100,000 gallons per day and consists of one liquefaction train, three storage tanks, and rail and truck delivery transfer capacity.⁵³ Rail deliveries are made over Florida East Coast Railways.⁵⁴ The plant supports its customer base in South Florida and the Caribbean.⁵⁵ The Miami facility is authorized under U.S. Department of Energy permits to supply LNG to both Free Trade Agreement (FTA) and non-FTA countries.

Table 3 shows NFE has reported that over the life of the facility, it has averaged between 28,000 and 35,000 gallons per day.⁵⁶ In 2020, the company delivered 35,000 gallons per day to customers.⁵⁷ NFE did not report revenue or volume performance results for the Miami facility through the third quarter of 2021.⁵⁸

Although the Miami facility appears to be an integral component of NFE's supply network, the company does not account for any revenue from the facility in the company's annual report or recent financial filings.

Table 3: Miami Liquefaction Facility Capacity vs. Actual Deliveries 2016-2020⁵⁹

Miami	Capacity GPD	Actual GPD Delivered	Actual Deliveries by Percent of Capacity
2016	100,000	4,384	4%
2017	100,000	22,740	23%
2018	100,000	28,000	28%
2019	100,000	31,000	31%
2020	100,000	35,000	35%

⁵² NFE. [Operations - Miami, Florida](#). Accessed January 20, 2022.

⁵³ NFE. [Form 10-K](#). March 4, 2020, p. 6.

⁵⁴ Florida East Coast Railway is currently owned by [Grupo Mexico](#).

⁵⁵ NFE. [Operations - Miami, Florida](#). Accessed January 24, 2022.

⁵⁶ NFE. [Form 10-K](#). March 26, 2019, p. 8.

⁵⁷ NFE. [Form 10-K](#). March 26, 2019, p. 5.

⁵⁸ A review of 1Q, 2Q and 3Q for 2021 provided no specific revenue reporting. Each report provides unspecified costs of sales references.

⁵⁹ NFE. [Form 10-K](#). March 26, 2019, p. 53. Also see: NFE. [Form 10-K](#). March 26, 2019, p. 5. Also see: NFE. [Form 10-K](#). March 4, 2020. Also see: NFE. [Form 10-K](#). March 26, 2021, p. 5. Also see: NFE. [Form 10-Q](#). November 3, 2021, p. 45.

Based on IEEFA's research, the Miami facility is the smallest liquefaction asset in the United States. The inability of the Miami plant to muster more than 35% capacity in any year over the last five years suggests that the business model misread the market demand for natural gas produced by the facility. Additional analysis is required to determine whether the location, costs of production, customer base, staff capacity or other factors are driving poor performance. The International Gas Union annual report on LNG puts average liquefaction capacity utilization in the United States at 76.5% during 2020 and 96% in 2019, the year prior to the pandemic.⁶⁰ The average plant in the United States is 30 times the size of the Miami plant.

NFE is planning to develop a network of liquefaction facilities to service its customer base. This is supposed to minimize price fluctuations from regional market volatility. The business plan was to build five to ten facilities by 2024. The Miami plant is the only one that has been brought from announcement to commercial operation. The other plant slated for Pennsylvania (see below) is stalled.

2. Jamaica

Jamaica's gross domestic product is \$13 billion; the country has a B2 stable credit rating. Its integrated resource plan (IRP) supports more investment in renewable energy. The goal is to increase renewable energy to 30% of the generation mix by 2040. In the medium term, the plan expands the use of liquefied natural gas and expansion of natural gas power plants, some to be owned by New Fortress.⁶¹ New Fortress has bought into two terminals (Montego Bay and Old Harbour) and taken ownership of a power plant, with plans for more. The company's sizable investment in Jamaica is accompanied by NFE's risk analysis that makes clear its long-term commitments are for minimum volumes and that the company's revenue expectations rest on substantially higher sales projections.⁶²

While the Jamaica IRP anticipates steady stable natural gas pricing, the history of the commodity shows significant periods of volatility.⁶³ The IRP notes that renewable energy offers reliable cost savings. Jamaica's energy choices make it particularly susceptible to natural gas price risk.⁶⁴ As natural gas prices have risen globally, Jamaica's utility has issued a warning to its consumers of significant electricity price increases.⁶⁵ Fossil fuel price increases at the pump and on the grid are contributing to inflationary pressures in the country, especially in the agricultural sector.⁶⁶ One local elected official has linked the current price spikes to

⁶⁰ International Gas Union. [World LNG Report 2021](#). June 2021, pp. 42-43.

⁶¹ Jamaica Ministry of Science, Energy and Technology. [Integrated Resource Plan](#). January 2020.

⁶² NFE. [Form 10-Q](#). November 3, 2021, p. 72.

⁶³ Reuters. [U.S. natgas volatility jumps to a record as prices soar worldwide](#). October 7, 2020.

⁶⁴ S&P Global Platts. [Global gas price volatility terribly destabilizing for market, Tellurian Souki says](#). September 28, 2021.

⁶⁵ Jamaica Gleaner. [JPS warns customers about higher electricity bills due to rising fuel costs](#). December 15, 2021.

⁶⁶ Jamaica Observer. [Food's energy threat](#). October 6, 2021.

the policy choice made by the government to accelerate the nation's dependence on natural gas generally, and NFE has been mentioned specifically in that context.⁶⁷

To date, NFE's delivery operations in Jamaica have fallen far short of the capacity base they have developed.

The Montego Bay facility in operation since 2016 has a capacity of 740,00 gallons of LNG per day and 7,000 cubic meters of onsite storage. The primary customer is Jamaica Public Service Company. The excess capacity beyond the contracted amounts is designed to serve industrial end users as NFE grows.⁶⁸

Table 4: Montego Bay Facility Capacity vs. Actual, 2017 Through 2021⁶⁹

Montego Bay	Capacity GPD	Actual GPD Delivered	Actual Deliveries by Percent of Capacity
2017	740,000	236,438	32%
2018	740,000	271,781	37%
2019	740,000	302,740	41%
2020	740,000	258,082	35%
2021	740,000	266,176	36%

According to NFE's annual filings, the Montego Bay facility is NFE's most mature terminal. The facility has a considerable amount of underused capacity each year. With an annual utilization rate of 36%, the Montego Bay Facility has been slowly absorbed into the Jamaica economy. Neither new power plant capacity nor increased demands from industrial customers have created a growing customer base.

The Old Harbour facility commenced operations in 2019 with two principal customers, South Jamaica Power Company (JSC) and Jamalco.⁷⁰ Old Harbour is an offshore facility with storage and regasification equipment supported by an FSRU. With a capacity of 6 million gallons per day, the facility serves power plants and industrial users.⁷¹

⁶⁷ Jamaica Observer. [Why is my light bill so high?](#) September 12, 2021.

⁶⁸ See: NFE. [Form 10-K](#). March 26, 2019, pp. 52-53.

⁶⁹ NFE. [Form 10-K](#). March 4, 2020, p. 51. Also see: NFE. [Form 10-K](#). March 26, 2021, p. 69. Also see: NFE. [Business Update](#). March 18, 2019.

⁷⁰ NFE. [Our liquefied natural gas \(LNG\) facilities are supplying positive energy around the world](#). Accessed January 20, 2022.

⁷¹ NFE. [Operational Facilities - Montego Bay, Jamaica](#). Accessed January 20, 2022.

Table 5: Old Harbour Facility GPD Capacity Versus Actual GPD Delivered 2019-2021⁷²

Old Harbor	Capacity GPD	Actual GPD Delivered	Actual Deliveries by Percent of Capacity
2019	6,000,000	60,822	1%
2020	6,000,000	526,027	9%
2021	6,000,000	632,353	10%

Old Harbour has a limited operating record.⁷³ Its best year yet was 2021. Table 5 shows only nine months of activity for the year, and the actual deliveries achieved 10% of capacity. Like the Montego Bay facility, the economy seems to be slow to absorb this existing capacity.

NFE's investment in Jamaica has also included a foray into the ownership and operation of power generation units. The company built a 150-megawatt (MW) combined heat and power plant (CHP) fueled by natural gas at Clarendon, Jamaica. The facility commenced construction in 2017 and opened for commercial operation in 2020. According to published reports, the plant had a planned cost of \$265 million to build.⁷⁴ The Clarendon Plant is supported by a long-term power purchase agreement (PPA) with the Jamaica Public Service Company, the sole utility on the island. NFE also has an agreement with a bauxite and alumina mining interest, a subsidiary of the Noble Group.

According to NFE's third-quarter statement in 2021, Old Harbour Terminal provided deliveries to Clarendon and the bauxite contracts of 81.3 million gallons per day.

In June 2021, NFE announced that Sagicor, a Jamaica-based financial services company, had agreed to take an equity position of \$100 million and to structure investments of another \$185 million on a sale and leaseback arrangement from local, regional and international investors.⁷⁵ NFE said the proceeds from the CHP financing would be used to close out the development costs of the plant's construction and then would use the company's enhanced credit position to finance the broader global agenda of the company.⁷⁶

When details of the final deal emerged in January 2021, Sagicor announced that it held \$100 million in NFE bonds and did not proceed with the equity infusion as originally planned, citing changing market conditions.⁷⁷ Sagicor remained the underwriter for the remaining investors, but the terms of the \$185 million and the

⁷² NFE. [Form 10-K](#). March 26, 2019. Also see: NFE. [Form 10-K](#). March 4, 2020, p. 51. Also see: NFE. [Form 10-Q](#). November 3, 2021, p. 45.

⁷³ For a discussion of the plant history and operational goals at the time of NFE's assumption of control see: Insurance Association of Jamaica. [Newly commissioned Old Harbour LNG terminal to grow output fivefold by December](#). July 23, 2019.

⁷⁴ Jamaica Gleaner. [Ground broken for Jamalco cogeneration power plant](#). December 1, 2017.

⁷⁵ NFE. [Sagicor Group Jamaica Finances Sale and Leaseback of New Fortress Energy's Clarendon Power Plant](#). June 17, 2021.

⁷⁶ NFE. [Form 10-Q](#). November 3, 2021.

⁷⁷ Jamaica Gleaner. [NFE cancels plan sell Jamalco power plant](#). January 19, 2022.

sources of any commitments were unknown. It appears that Jamaican banking regulatory approvals remained in place for the transaction to proceed.⁷⁸

NFE must now accept Sagicor's participation, if any, as a lender and not as an equity partner. This is a \$100 million debt burden that remains on NFE's balance sheet. As the company proceeds with its other projects, more disclosures to investors should explain whether the pullout of Sagicor was region- or deal-specific and/or related to the growing concerns over fossil fuels and climate change.

3. Puerto Rico: NFE's Natural Gas Project Crowds Out Cheaper Renewables and Safer Grid Alternatives

On March 5, 2019, NFEnergia LLC (NFE), a Puerto Rico limited liability company (and subsidiary of New Fortress Energy), entered into an agreement with the Puerto Rico Electric Power Authority (PREPA), the Commonwealth of Puerto Rico's public authority with responsibility for the Island's electricity system.⁷⁹ The purpose of the agreement was to retain NFE to upgrade PREPA's San Juan 5 and 6, a 440MW diesel-powered generation plant to burn natural gas as the primary energy source for the plant. Upon completion of the upgrade, the contract also called for NFE to deliver natural gas to the power plants. The company's terminal has a capacity of 2.7 million gallons per day.⁸⁰

PREPA claimed it would generate significant fuel savings by replacing diesel fuel with cheaper natural gas. This would provide a structural cost improvement as the authority developed a sustainable post-bankruptcy plan.⁸¹ PREPA's plan also called for more renewable energy investment with a similar aim of reducing fuel costs. The two processes would reduce emissions, support grid modernization and save money. NFE's PREPA contract would build on its micro- handling facility designed to serve the island's industrial users of natural gas.

The contract is part of a series of agreements entered into by PREPA and other commonwealth agencies to privatize the public authority. The NFE transaction was the first privatization contract for PREPA. It is to be followed by a series of other agreements for the management of the transmission and distribution system and generation.⁸² PREPA has been in bankruptcy since 2014 and is supervised by a federal Financial Oversight and Management Board (FOMB).

NFE was awarded a contract to convert a diesel-burning power station to natural gas and then deliver fuel to the newly upgraded generation plant for the next 20 years. Community residents opposed the project because it was inconsistent with

⁷⁸ *Ibid.*

⁷⁹ NFE/PREPA. [Fuel Sale and Purchase Agreement](#). March 5, 2019.

⁸⁰ NFE. [Operational Facilities - San Juan](#). Accessed January 24, 2022.

⁸¹ IEEFA. [IEEFA: Puerto Rico utility PREPA gave unfair advantage to NFE in awarding 1.5 billion power plant contract](#). June 10, 2020.

⁸² IEEFA. [Puerto Rico Grid Privatization Flaws Highlighted in First Two Months of Operation](#). August 2021.

the commonwealth's statutory goal to increase the amount of renewable energy on the island.

On March 3, 2021, a coalition of environmental organizations filed an opposition brief to PREPA's motion seeking approval by the Puerto Rico Energy Board (PREB) of its 10-year infrastructure plan.⁸³ The brief noted that the law in Puerto Rico called for an energy system served by 100% renewable energy by 2050. It noted that the legally binding IRP approved by the PREB supported a series of renewable energy projects. The brief detailed a multi-year attack on the renewable energy goal by PREPA. The opposition document also specified that recent submissions by PREPA to the government for federal funding to rebuild the grid did not include any projects to fund renewable energy.⁸⁴ The opposition document identified a series of planned natural gas plants that would substitute for the renewable energy projects.

A plan to achieve 100% renewable energy was not only the least-cost option for the energy system, it was also an integral part of PREPA and the commonwealth's plan to emerge from bankruptcy. An increase in renewable energy was a part of the plan to rein in annual costs by reducing PREPA's reliance on expensive, unreliable and volatile diesel oil prices.⁸⁵ The reduction in operating costs was designed to keep electricity prices affordable for residents and businesses, and served as a key component of Puerto Rico's balanced budget and economic recovery plan.

NFE benefited from a tainted procurement process in Puerto Rico. A review of the contract process conducted by IEEFA and CAMBIO demonstrated that NFE had an unfair advantage against its competitors. Company representatives met repeatedly with PREPA officials during the bidding process.⁸⁶

The company promised to save PREPA millions of dollars from the arrangement.⁸⁷ The construction project was completed during the 2021 fiscal year. So far, however, there has been no public report that identifies the amount of savings actually delivered.⁸⁸ Research conducted by IEEFA found that NFE's contract with PREPA contained no contractual obligations that required the company to deliver the actual savings that were promised in the company's bid submission.⁸⁹ There is a

⁸³ Puerto Rico Energy Bureau. [Opposition to PREPA's motion Seeking PREB Approval of 10-Year Infrastructure Plan](#). March 2, 2021.

⁸⁴ *Ibid.*, p. 4, 15.

⁸⁵ FOMB. [2021 Fiscal Plan of the Puerto Rico Electric Power Authority](#). May 27, 2021.

⁸⁶ IEEFA. [Is Puerto Rico's Energy Future Rigged?](#) June 2020.

⁸⁷ FOMB. [2020 Fiscal Plan for the Puerto Rico Electric Power Authority](#). June 29, 2020, p. 32, 62. Also see: FOMB. [2021 Fiscal Plan of the Puerto Rico Electric Power Authority](#). May 27, 2021.

⁸⁸ A review of the 2021 Certified Fiscal Plan does not provide any specific accounting of savings achieved under the New Fortress Energy contract. In a Motion to Leave to Answer (November 4, 2021) CP-21-496 000, NFE states that one of its customers projects savings of \$500 million over the next five years. NFE sources this savings estimate to PREPA's FY 2019 Certified Fiscal Plan. The FY 2020 FY Certified Plan identifies a maximum savings over five years of \$280 million and the FY 2021 Certified Plan no longer provides any specified actual or planned savings from the New Fortress conversion. See: *Ibid.*, pp. 81-82. Also see: FOMB. [2020 Fiscal Plan for the Puerto Rico Electric Power Authority](#). June 29, 2020.

⁸⁹ IEEFA. [Is Puerto Ricos Energy Future Rigged?](#) June 2020.

history of conflicting savings claims and of requests by the FOMB to PREPA to detail any actual savings.⁹⁰

Through the third quarter of 2021, NFE delivered 165.9 million gallons of LNG—an average of 609,000 gallons per day, or 23% of actual capacity.⁹¹

At the end of 2021, PREB passed along a 16.8% rate increase to customers, citing rising fuel oil and natural gas prices.⁹² Further, the FY 2021 certified fiscal plan states that PREPA remains exposed to fossil fuel price volatility.⁹³

In its initial application, NFE asserted that the U.S. Federal Energy Regulatory Commission (FERC) did not have jurisdiction over the facility. In June 2020, FERC ordered NFE to show cause why the agency did not have jurisdiction. In March 2021, the commission issued a final order asserting jurisdiction and directing the company to apply for approval of the San Juan project as an LNG-handling facility.⁹⁴ NFE is allowed to continue making deliveries pending the outcome of the jurisdictional dispute. NFE is appealing the FERC final order.

In May 2020, New Fortress Energy disclosed it was on the short list in Puerto Rico for the production of 500 MW of additional temporary energy.⁹⁵ The project was subsequently withdrawn. The company continues to discuss future power plant development as a component of its Puerto Rico growth strategy,⁹⁶ and it remains on the short-list as a potential operator for some or all of PREPA's existing power plants under the government's current privatization strategy, which could include converting additional units to natural gas.⁹⁷

NFE secured its contract in Puerto Rico under questionable circumstances. The delivery of the project was late, and the company apparently attempted to avoid FERC's regulatory oversight. The company has not delivered on its promised budget savings. Recent decisions by the island's regulator to grant rate increases to cover rising natural gas prices are making electricity unaffordable for more people and businesses on the island. As a policy matter, NFE's San Juan project encourages greater reliance on natural gas utilization in Puerto Rico, even though the applicable law and policy call for a 100% move to renewable energy.

C. Pipeline of New Projects and Critical Risk Factors

As shown in Table 2, NFE has at least 16 new facilities planned in locations that span the globe. The new proposed natural gas facilities pose financial and economic risks for the company and most of the host communities and nations. Increased reliance

⁹⁰ IEEFA. [Paying for Failure in Puerto Rico](#). April 2021.

⁹¹ NFE. [Form 10-Q](#). November 3, 2021, p. 46.

⁹² Amico Hoops. [Energy Bureau Approves 16.8 Increase in Electricity Bill](#). December 31, 2021.

⁹³ FOMB. [2021 Fiscal Plan for the Puerto Rico Electric Power Authority](#). May 27, 2021, p. 21.

⁹⁴ Federal Energy Regulatory Commission. [Order on Show Cause](#). March 19, 2021.

⁹⁵ Newsismybusiness.com, [New Fortress Energy short-listed for PREPA temporary power generation](#), May 7, 2020.

⁹⁶ NFE. [Annual Investor Update](#). July 2021.

⁹⁷ El Nuevo Dia. [En carrera ocho firmas para operar las plantas de la AEE](#). November 23, 2020.

on natural gas for most of the economies exposes them to rising prices and volatility. The diseconomies are clear in some places.

In each country, the company is subject to a series of environmental and climate objections. Public opposition to fossil fuel infrastructure has become a factor that has resulted in project cancellations based on political and regulatory considerations.⁹⁸ Many companies are not accurately assessing the changing nature of the markets and how public opposition drives regulators, elected officials and financial decisionmakers to reject projects.⁹⁹

It is uncertain which of the facilities will move forward. Given the company's mixed track record, growing issues related to debt management and growing risks related to LNG infrastructure, projects need to be viewed with caution. Finally, many of the host nations face uncertain economic, financial and political futures.

1. Pennsylvania: Planning, Opposition, Regulatory Hurdles

Basic Description: Procedural and Regulatory Landscape

NFE is exploring the construction of a 4 million gallon-per-day liquefaction facility in Wyalusing Township, Penn.¹⁰⁰ The facility would receive natural gas from pipelines connected to local fields in the Marcellus region, process natural gas to meet commercial needs and load the LNG for distribution by truck and rail.¹⁰¹ The natural gas would be offloaded to ships at the Gibbstown, N.J., terminal. LNG would then be shipped to foreign and domestic NFE customers.

Through 2020, NFE's affiliate has invested \$159 million for land acquisition and pre-development costs.¹⁰² In 2019, the company said it had signed an Engineering, Procurement and Construction (EPC) agreement for \$672 million and anticipated the plant would be operational by the first quarter of 2021.¹⁰³ To date, the company has not proceeded to Final Investment Decision (FID), citing community opposition, pandemic and supply chain-related matters.¹⁰⁴ No major construction efforts have been mobilized in either the Pennsylvania site or the Gibbstown terminal.¹⁰⁵

⁹⁸ Moody's. Regulated Electric & Gas Utilities – North America: Shifting environmental agendas raise long-term credit risk for natural gas investments. September 30, 2020 (Proprietary).

⁹⁹ IEEFA. [IEEFA Response to the U.S. Chamber of Commerce Analysis of the "Keep it in the Ground" Movement](#), February 2019.

¹⁰⁰ New Jersey Department of Environmental Protection. [Minor Source Plan Approval Application – Bradford County Real Estate Partners](#). December 18, 2018, p. 1. Bradford County Real Estate Partners is an affiliate of New Fortress Energy.

¹⁰¹ *Ibid.*, p. 1-1.

¹⁰² NFE. [Form 10-K](#). March 4, 2020.

¹⁰³ NFE. [NFE Business Update](#). March 18, 2019, p. 6. Also see: NFE. [Form S-1](#). November 9, 2018, p. 79.

¹⁰⁴ NFE. [DOT-SP 20534: Special Permit Renewal Pursuant to 49 C.F.R. § 107.109](#). November 29, 2021.

¹⁰⁵ DRN. [PHMSA Special Permit DOT-SP 20534 for LNG Transport by Rail Car](#). December 10, 2021, p. 5.

The Pennsylvania facility would be the company's second liquefaction asset. It is part of the company's broader plan to meet its strategic goal of building infrastructure to supply customer needs and reduce risks to the natural gas trading market.¹⁰⁶ In December 2019, NFE received a special permit from the Pipeline Hazardous Material Safety Administration (PHMSA) to transport LNG from the facility via rail to Gibbstown.¹⁰⁷ The Special Permit expired on November 30, 2021. NFE filed an extension request on November 29, 2021 to maintain its rights under the permit.¹⁰⁸

PHMSA states it is evaluating the application according to 49 CFR 107.113(a).¹⁰⁹ In addition, the company must receive approval from a host of agencies in order to proceed with the project.¹¹⁰

NFE's various permit requests are being challenged at the federal, regional, state and local level:

- The Army Corps of Engineers is being challenged for granting permission to demolish and construct docks needed to transport the LNG from Pennsylvania to the Gibbstown terminal.¹¹¹ The challenge is based on the failure of the Corps to conduct proper environmental evaluations, attend to transport safety issues and properly regulate air emissions.
- FERC must decide whether to exempt the port from its jurisdiction.¹¹² Two NFE subsidiaries have applied for exemptions for the liquefaction and shipping project at Wyalusing and at the Gibbstown Logistical Center.^{113, 114}
- At the regional level, the decision by the Delaware River Basin Commission to permit dredging to occur is being challenged.¹¹⁵
- At the state level, permit proceedings at the New Jersey Department of Environmental Protection are being challenged.¹¹⁶ Environmental organizations have provided the department with additional information

¹⁰⁶ NFE. [Form 10-K](#). March 16, 2021.

¹⁰⁷ U.S. Department of Transportation, Pipeline & Hazardous Materials Safety Administration, [Special Permit DOT-SP 20534](#). Issued December 5, 2019.

¹⁰⁸ NFE. [Renewal Application](#). November 29, 2021. The Rocket-Courier. [New Fortress Changes Course](#). December 5, 2019. Also see: PHMSA, DOT [Special Permit 20534](#), December 5, 2019.

¹⁰⁹ Delaware Riverkeeper. [Letter from Tristan Brown](#). December 21, 2021.

¹¹⁰ Delaware Riverkeeper. [Gibbstown logistics center LNG NGL Exports proposed](#). October 2021.

¹¹¹ Delaware Riverkeeper Network (DRN) v. U.S. Army Corps of Engineers, Civil Action No. 1:20-cv-4824 (NLH)(JS), [Motion for Summary Judgment](#), October 30, 2020.

¹¹² DRN. Letter to FERC, Delaware River Partners, LLC, FERC Docket no. CP 20-522-000, [Protest in Opposition to Petition for Declaratory Order](#), October 15, 2020.

¹¹³ DRN [Letter to FERC, Bradford County Real Estate Partners, LLC, FERC Docket No. CP20-524-000 Protest in Opposition to Petition for Declaratory Order](#), October 23, 2020.

¹¹⁴ DRN v. Delaware River Basin Commission (DRBC), [Complaint for Declaratory and Injunctive Relief](#), January 25, 2021.

¹¹⁵ *Ibid.*

¹¹⁶ Superior Court of New Jersey, Appellate Division, Docket No. A-000709-19, DRN versus Delaware River Partners LLC, (DRP), [Permit Challenge](#) No 0807-16-001.2, WFD 19001, May 28, 2020.

that the project is likely to release toxic polychlorinated biphenyls (PCBs).¹¹⁷ The permit appeal DRN v. NJDEP was lost in Superior Court and a Petition to the New Jersey Supreme Court was denied in January 2022.

- At the community level, citizens have organized in Pennsylvania and New Jersey to support local ordinances restricting rail or truck traffic; thousands of petitions have been submitted to agencies from potentially impacted residents.

NFE is requesting a waiver of FERC's jurisdiction of the project. Two separate regulatory proceedings would be necessary—one for the Wyalusing facility and one for the Gibbstown terminal. NFE contends that FERC has no jurisdiction because the project does not use a pipeline, which would place the project clearly within FERC's authority. NFE argues it will transport gas by truck and rail, and so does not fall within FERC jurisdiction.

The scope of public regulation divides and parcels the health risk into a confusing morass. NFE's project as a whole crosses state and county lines and creates the risk of catastrophic events. The public regulatory process has a rationale, but it is a rationale that is far removed from the community concerns and public health risk.¹¹⁸

A further broad, substantive policy objection is that the LNG-to-rail plan is contrary to the Biden administration's pledge to curb methane emissions. The administration has called a halt to LNG to rail projects.¹¹⁹

Federal health, safety and environmental regulatory issues reflect local and state government concerns regarding these risks. The various environmental and health and safety regulations fall within a patchwork of federal agencies and laws. Community and environmental concerns in Pennsylvania and New Jersey stress the need for decisions to be made in a coordinated manner.¹²⁰

The lack of coordination means the project requires a host of permits to move forward. The permit requests are being met with opposition from a growing coalition of organizations throughout the communities that are expected to host various parts of the New Fortress Energy development plans.¹²¹ The coalition is comprised of local community and environmental organizations, state and regional organizations, scientists, and other professionals who are raising substantive environmental concerns, as well as specific governance issues related to permit processes.

¹¹⁷ DRN to NJ Department of Environmental Protection (NJDEP), [Petition to Require Delaware River Partners, LLC to Apply for Individual NJDPES Permits Implementing the TMDL for PCBs in Zone 4 of the Tidal Delaware River Permits NJG0263541, NJG0304042 & NJG0299201](#), December 8, 2020.

¹¹⁸ For a comprehensive discussion of the regulatory issues involved, see: American Bar Association. [FERC Pipeline Siting Program Deals with Legal Challenge](#). Natural Resources and Environment, Spring 2016.

¹¹⁹ Natural Gas Intelligence, [Biden Administration Suspends LNG Rail](#), November 11, 2021.

¹²⁰ *Ibid.*

¹²¹ DRN, *op. cit.* Also see: Food and Water Watch. [Fracking Nightmare](#). August 2021.

Substantive Planning, Environmental and Economic Development Issues

Risk of Explosions During Transport

A significant level of concern stems from the plan to ship LNG from the Wyalusing site by rail or truck to the terminal in Gibbstown.¹²² LNG is a volatile gas that has caused major explosions and damage in other communities.¹²³ Communities along the rail or truck route will be at considerable risk. (The exact routes have not been specified but the Special Permit restricts the rail transport from Wyalusing to Gibbstown with no stops or diversions). The U.S. Department of Transportation has proposed to suspend the LNG-by-rail program, recognizing a series of unresolved safety concerns that include explosions and leakage. The lack of any federal program and the rules and procedures it would provide undermines the policy basis upon which the Pennsylvania Department of Environmental Protection is acting, according to organizations opposed to the project.¹²⁴ For example, NFE proposed transporting LNG in older tank cars that would be out of compliance with proposed federal rules.

FERC: Need, Health and Climate Issues

The FERC oversight dispute concerns the regulation of the liquefaction facility in Wyalusing and natural gas terminals in Gibbstown, New Jersey that are not connected to pipelines. NFE has applied for exemption from FERC oversight.¹²⁵ Opponents of the project have raised several substantive and procedural points including:¹²⁶ 1) the high risk of an accident during rail and/or truck traffic between the Wyalusing facility and Gibbstown port; 2) the emissions contributing to climate change; and 3) FERC's obligations under the Natural Gas Act to regulate the construction of facilities and transport of natural gas in the United States for both domestic and foreign markets. NFE's applications for the Wyalusing and Gibbstown segments of the project are separate under current rules, despite the project being an integrated downstream LNG initiative that requires cross-state coordination and international shipping logistics.¹²⁷

Community-Based Land, Water, Air and Historic Preservation Issues

Community and local government opposition to the plant, rail and truck routes and terminal construction and use is extensive.¹²⁸ Dozens of elected local councils in

¹²² Delaware Currents. [The Storage and Transportation of LNG: What Could Go Wrong?](#) March 11, 2021.

¹²³ Protect Northern PA. [The Long and Winding Route](#). January 2021.

¹²⁴ The Washington Post. [Proposal to build LNG terminal on Delaware River could pose early test for the Biden administration](#). January 5, 2021.

¹²⁵ Federal Register. [Bradford County Real Estate Partners LLC; Notice of Petition for Declaratory Order](#). September 29, 2020.

¹²⁶ Letter signed by 97 organizations to Governor Murphy outlining problems and steps to solve the outstanding issues. January 8, 2021. (Proprietary)

¹²⁷ E&E News. ['Major gap.' Gas industry FERC petitions stoke NEPA concerns](#). September 22, 2021.

¹²⁸ DRN.org. [Gibbstown Logistics Center LNG NGL Exports Proposed](#). October 2021.

Pennsylvania, New Jersey and Delaware have passed resolutions opposing the project. Fifteen New Jersey communities have passed resolutions directed to Governor Phil Murphy, calling on him to reject permits for the Gibbstown terminal component of NFE's plan or to other agencies such as PHMSA advocating that the Special Permit be stopped and the national ban on LNG by rail be reinstated through federal rulemaking. Thousands of petitions opposing the terminal and/or the railcar transport of LNG have been submitted to agencies. The resolutions cite unsafe conditions and also call upon the Army Corps of Engineers to conduct a review of the project.¹²⁹

Ten local governments in Pennsylvania have also passed resolutions opposing the project.¹³⁰

In addition to the climate, environmental and jurisdictional matters being raised, Pennsylvania residents and historic preservationists object to the liquefaction facility and potential pipeline sites at a former village that supported the Moravian Native American tribe and contend the development would desecrate land and culture.¹³¹

Opposition has also been voiced from elected officials and residents of Philadelphia¹³² and Allentown¹³³ based on public health and safety, environmental and climate concerns. Twenty-five states and local elected officials from Philadelphia and surrounding communities voiced opposition to the project at the Delaware River Commission.¹³⁴

The Gibbstown terminal opposition is also based on the plans to develop a port, dredge 45 acres of sensitive river bottom that would harm federally endangered species, and add new roads, underground storage capacity, warehouses and rail infrastructure that would affect the Delaware River.¹³⁵

Corporate Citizenship and Governance Issues

NFE's approach to community and regulatory relations has harmed the company's credibility. From the outset, the company sought special permits that avoided research and studies that would protect public health and the environment.¹³⁶ The special permit, for example, provided approval of substandard tank cars to

¹²⁹ Food and Water Watch. [Trenton Votes to Oppose Gibbstown Fracked Gas](#). December 6, 2021.

¹³⁰ Protect Northern PA. [The Long and Winding Route](#). January 2021.

¹³¹ Pennsylvania Department of Environmental Protection. [Bradford County Real Estate Partners, Comment Document](#). Undated.

¹³² Philadelphia Inquirer. [Plan to send LNG trains through Philly to S. Jersey port sparks outrage from residents, environmentalists](#). September 20, 2020.

¹³³ DRN. [Delaware Riverkeeper Network Liquefied Natural Gas Rail Transport Community Impacts](#). November 12, 2021.

¹³⁴ DRN. [Joint Letter Twenty Five State and Local elected Officials to Delaware River Basin Commission Re: Opposition to the New Fortress Project](#), December 4, 2020.

¹³⁵ DRN. [Factsheet: Gibbstown Logistics Center Plans to Export Liquefied Natural Gas \(LNG\)](#). Visited February 20, 2022.

¹³⁶ DRN. [Letter to President Biden Re: PHMSA Special Permit DOT-SP 20534 for LNG Transport by Rail Car](#), August 1, 2021.

transport natural gas. Community residents also point out that the company has not met critical development and construction deadlines after being granted the special permit.¹³⁷ The groups also argued that the original permit didn't protect public health and safety.¹³⁸

2. Mexico

Mexico's relatively strong and diversified economy boasts a GDP of \$1.5 trillion. The country, however, has a Baa1 negative credit rating from Moody's, based in part on subsidies to the state-owned fossil fuel company Petroleos Mexicanos (Pemex).¹³⁹ The nation's electricity system is also facing warnings that its overreliance on natural gas and failure to adopt clear renewable energy policies puts utility finances at risk.¹⁴⁰ Comisión Federal de Electricidad (CFE) is rated Baa1/Aaa negative. The negative outlook is driven in large part by the expectation of rising debt levels to pay for expansion plans, high exposure to natural gas markets due to increased imports and reliability concerns. Of special concern is the potential for further downgrades of the Mexican government, the key financial backer of CFE.¹⁴¹

NFE's La Paz Facility is planned as an ISOFlex receiving station and 100MW natural gas power plant located at the Port of Pichilingue in Baja California. The facility will be capable of supplying 1.8 million gallons per day. The receiving station is expected to take LNG from an offshore supply vehicle and supply power plants being developed by NFE, as well as industrial customers and hotels.¹⁴² NFE announced in July 2021 that the terminal has begun delivering natural gas supplies to two power plants.¹⁴³ The facility has contracted for 29% of capacity from unspecified sources.¹⁴⁴ There have been no actual volume or revenue filings by the company because the facility has only recently opened.

In October, Mexican President Manuel López Obrador submitted legislation to reform the electricity system in Mexico, including calls for the elimination of the country's regulator. The president has staked his administration on several major infrastructure projects, including natural gas expansion.¹⁴⁵ According to Moody's, the plan would increase the nation's reliance on natural gas. Several new natural gas

¹³⁷ DRN. [PHMSA Special Permit DOT-SP 20534 for LNG Transport by Rail Car](#). December 10, 2021.

¹³⁸ Pennsylvania Department of Environmental Protection. [Commonwealth of Pennsylvania Department of Environmental Protection Air Quality Program](#). July 24, 2019.

¹³⁹ Moody's, Government of Mexico – Baa1 negative, Credit Opinion, November 18, 2021. (Proprietary). International Monetary Fund. [Mexico – 2021 Article IV Consultation Press and Staff Report](#). November 5, 2021.

¹⁴⁰ Moody's. [Comisión Federal de Electricidad \(CFE\) Credit Update](#). January 6, 2022. (Proprietary)

¹⁴¹ International Renewable Energy Agency, (IRENA). [Renewable Energy Prospects in Mexico](#). May 2015.

¹⁴² NFE. [Operations](#). Accessed January 25, 2022.

¹⁴³ NFE. [New Fortress Energy Commences Operations in Baja California Sur](#). July 14, 2021.

¹⁴⁴ NFE. [Operational Terminals](#). Accessed January 20, 2022.

¹⁴⁵ Natural Gas Intelligence. [Constitutional reform unlikely in 2022 but Mexico energy sector still high analysts say](#). January 10, 2022.

pipelines and generation assets are planned for importing natural gas.¹⁴⁶ The initiative faces opposition, and Moody's points to a policy drift in Mexico that is undermining private sector confidence and support for increased investment in renewable energy.¹⁴⁷ Other analysts see the build-up of the fossil fuel sector being in direct opposition to renewable energy and climate initiatives.¹⁴⁸ Further, the economic result of the president's initiatives are likely to increase electricity prices.¹⁴⁹

NFE's planned natural gas expansions in Mexico takes place against a backdrop of financial warnings about the expansion. The current controversy in Mexico puts NFE on the side of the president's controversial plan to increase Mexico's reliance on fossil fuels.

3. Nicaragua

Nicaragua's gross national product is \$12.6 billion, and its bond rating is b3 (stable).¹⁵⁰ NFE plans to build, own and operate an offshore liquefaction, receiving and storage asset and an onshore regasification unit (Puerto Sandino Facility). The project is expected to be able to handle 2.4 million gallons per day and currently has commitments for 29% of capacity. NFE also anticipates building a 300MW power plant.¹⁵¹ The initial operations are underwritten by a 25-year power purchase agreement with Nicaragua's electricity distribution companies.¹⁵² The project was slated for completion in fourth quarter of 2021 with operations of the power plant expected in the first quarter of 2022.¹⁵³

The Puerto Sandino facility has an estimated price tag of \$700 million; the company said in February 2020 that it was funded from cash on hand.¹⁵⁴

In November 2021, President Joe Biden issued a ban on political officials from Nicaragua entering the United States in response to allegations about the integrity of the Central American country's elections.¹⁵⁵ The administration of Nicaraguan

¹⁴⁶ Natural Gas Intelligence. [Five Mexico natural gas projects to watch in 2022](#). January 2022. Also see: S&P Global Platts. [Mexico oil output to benefit from private producers in 2022 gas to stay underfunded](#). December 20, 2021.

¹⁴⁷ Moody's, [Mexico president's proposal to reform electricity sector is credit-negative](#). October 6, 2020.

¹⁴⁸ Forbes. [Political risk and analysis: Is Mexico declaring war against clean energy?](#) April 22, 2021.

¹⁴⁹ Americas Quarterly. [Mexico's Energy Reform 3 Risks to Investors](#). February 3, 2022.

¹⁵⁰ Moody's Investor Service. [Government Of Nicaragua – B3 Stable: Regular Update](#). August 16, 2021. (Proprietary)

¹⁵¹ NFE. [Operations](#). Accessed January 25, 2022.

¹⁵² Oil and Gas 360. [New Fortress energy signs 25-year agreement for 300 mw power plant](#). February 17, 2020.

¹⁵³ NFE. [Form 10-Q](#). November 3, 2021. Also see: BNamericas.com. [Nicaragua closed 2021 with greater energy coverage and installed capacity](#). January 7, 2022.

¹⁵⁴ NFE. [New Fortress Energy Signs 25-Year Agreement for 300 MW Gas Power Plant](#). February 17, 2020.

¹⁵⁵ Reuters. [Biden Bans Nicaragua officials entering United States](#). November 17, 2021.

President Daniel Ortega reportedly reshuffled its energy ministry to move forward with the NFE deal. NFE has made no public statements about the controversy.¹⁵⁶

4. Brazil

As part of Brazil's decision to open up its gas markets, NFE has taken advantage of a series of asset sales to greatly expand its operations in South America, paying \$1.98 billion in cash and stock to acquire four coastal facilities:¹⁵⁷

- An existing 9.5 million gallons per day LNG receiving facility and a 50% interest in an existing 1.5GW power plant power in Sergipe. The facility has a current utilization of 3%.
- A 9.5 million GPD offshore LNG facility at Santa Catarina expected to come online during the second quarter of 2022. Construction on the facility has started with an estimated price of \$72 million.¹⁵⁸
- A 9.5 million gallons per day onshore facility and power plant at Barcarena was slated to begin operations in January 2022. The facility has committed capacity of 6%.
- A 9.5 million GPD existing onshore facility and power plant at Suape with operations expected to begin during the first quarter of 2022 with committed capacity of 3%. The estimated price is \$536 million.¹⁵⁹

The plans include new construction of both terminal and power plant capacity to be added throughout early 2022. The total price of planned construction in Brazil is unspecified. Since the announcement of the acquisitions, New Fortress Energy has disclosed agreements for natural gas supplies to Brazil's industrial customers. Deliveries are to start in the first quarter of 2022.¹⁶⁰

As NFE enters its first full year of development activity and operations on existing facilities, Brazil's economy is likely to be growing slowly.¹⁶¹ The country's 2020 GDP was BRL 7.4 trillion (USD \$1.4 trillion).¹⁶² Brazil has a bond rating of Ba2 stable.

¹⁵⁶ Argus Media. [Nicaragua reshuffles energy team ahead of LNG Launch](#). November 22, 2021. Also see: Confidential. [New Fortress Energy builds gas plant risks involvement with sanctioned parties](#). October 1, 2021.

¹⁵⁷ NFE. [Form 10-Q](#). November 3, 2021, p. 10.

¹⁵⁸ Archytele. [New Fortress energy begin construction of LNG Terminal in Brazil](#). November 19, 2021.

¹⁵⁹ Empresiz de Pesquia Energetics. [Indicative LNG Terminals Plan](#). October 2021, p. 34.

¹⁶⁰ NFE. [New Fortress Energy Signs Agreements with Unigel to Provide Natural Gas to Fertilizer Plants in the States of Sergipe and Bahia](#). August 11, 2021.

¹⁶¹ Moody's Investor Service. [Government Of Brazil: FAQ On Sovereign Credit Challenges Amid Rising Political Risk](#). October 25, 2021. Also see: Moody's Investor Services. [Issuer Comment](#). December 10, 2021. (Proprietary)

¹⁶² IMF. [Brazil 2021 Article IV Consultation Press Release Staff Report and Statement](#). September 22, 2021.

With elections in 2022 taking place in a highly charged environment, the implementation of fiscal reforms may slow down as well.

The most recent 10-year electricity plan published in 2019 anticipates a decline in hydropower and coal-fired generation and the need for new LNG terminal capacity, as well as increases in solar and wind.¹⁶³ The country's plan for a substantial expansion of LNG imports includes multiple new terminals and power plants including those proposed by NFE.¹⁶⁴ Although natural gas expansion has the support of the Brazilian government, market and tariff policies that also favor an increase in distributed generation and rooftop solar have resulted in an increase in market share to 11%.¹⁶⁵

The Brazilian government has lost credibility as a climate leader given national policies that allow greater deforestation.¹⁶⁶ International environmental organizations have expressed strong reservations about Brazil's LNG natural gas expansion, fearing it will crowd out renewable energy.

The country faces immediate electricity price shocks from drought conditions that have curtailed the use of hydropower.¹⁶⁷ The country's efforts to increase natural gas imports adds a risk that the country is exchanging hydropower risks for price volatility from natural gas. The shift to more imported natural gas during the last year has contributed to the rising prices for electricity and other basic necessities in the country.¹⁶⁸ Debate in the country includes pressure on the government to expand reliance on renewable energy.¹⁶⁹

The investment is a significant step for NFE. It could serve as a robust source of revenue for the company from the terminals, liquefaction, new fleet of ships and power plants.

5. Ireland

NFE has entered into an agreement to develop an LNG facility and CHP plant in Shannon, Ireland.¹⁷⁰ Ireland's GDP is \$440 billion,¹⁷¹ and it has been assigned an A2 rating. The project consists of an onshore regasification, storage and pipeline connection into Ireland's national gas network. The company is also applying for approval to build a combined heat and power plant. The project was put on hold in

¹⁶³ Patria Amada Brazil. [PDE 2029 Ten Year Energy Expansion Plan](#). 2019.

¹⁶⁴ Empresa de Pesquisa Energetica. [Indicative LNG Terminals Plan](#). October 2021.

¹⁶⁵ Moody's. Brazil 2021 Outlook Stable, Regulated Distribution Companies. December 2020 (Proprietary). Also see: Moody's. Power Generation: Brazil enhanced regulation to spur natural gas market. September 2020 (Proprietary).

¹⁶⁶ Al Jazeera. [Brazil pledges 50 percent emissions cut by 2030 in change of tone](#). November 1, 2021.

¹⁶⁷ Argus Media. [Viewpoint 2022 Brazil to struggle with power prices](#). December 28, 2021.

¹⁶⁸ The Associated Press. [Brazil's inflation hits double digits, punishing the poor](#). October 8, 2021.

¹⁶⁹ Folha de San Paulo. [Electricity Bills Will Increase 6.78% in Brazil with New Energy Tariff](#). September 1, 2021. Also see: Power Magazine. [Key Trends Point to Strong Growth for Brazil's Renewable Energy Landscape in 2022 and Beyond](#). December 16, 2021.

¹⁷⁰ An Bord Pleanola. [Inspector's Report ABP-304007-19](#). April 2021.

¹⁷¹ IMF. [Ireland 2021 Article IV Consultation Press Release and Staff Report](#). June 15, 2021.

2019 pending policy deliberations in Ireland, but the company announced in 2021 that it was reviving its application.¹⁷² The announcement was followed by renewed controversy over the prospects of the plant and the risks of the project for the host community.¹⁷³ Green Party officials have appealed to the nation's planning arm to reject the proposal.¹⁷⁴ A petition with 1,545 signatures opposing the project has been submitted to Ireland's planning body.¹⁷⁵

Ireland's recently released climate plan calls for 80% of the electricity system to be obtained from renewable energy by 2050.¹⁷⁶ Opponents of the New Fortress facility argue that: 1) natural gas is not a climate-neutral fuel but that methane leakage makes it a risk to the climate; 2) Ireland's current reserves and capacity are sufficient to meet the country's needs; 3) approving the facility will crowd out investments in renewable energy; 4) an energy security study is underway and will be released in 2022, and no project approvals of this magnitude should be considered until the issue fully discussed;¹⁷⁷ and 5) safety risks to the surrounding population have not been considered.

Shannon LNG faces a multi-layered set of risks stemming from climate, local environmental and economic factors, domestic energy planning priorities and long-term economic development choices. The planning process is expected to be completed in March 2022. The overall outlook for a foreign investment project in the energy space in Ireland at this point is highly uncertain.

6. Sri Lanka (Sri Lanka Facility)

Sri Lanka's 2020 GDP was \$80 billion and its credit rating Caa2. The country faces persistent structural budget deficits while it is looking to attract additional foreign investment. Interest on government-supported debt consumed 70% of revenues in 2020.¹⁷⁸ The country's indebtedness is driven in large measure by decades of oil payments to importers.¹⁷⁹ The country and international investment community are coming to grips with the likelihood that the country faces bankruptcy and the need for debt restructuring.¹⁸⁰

In September 2021, NFE acquired a 40% interest in a 310MW power plant in Colombo, Sri Lanka. The company plans to build an offshore LNG receiving storage and regasification terminal with capacity of 1.2 million gallons per day of LNG. This

¹⁷² An Bord Pleanála. [Case Docket 311233](#). Accessed January 23, 2022. Also see: [The Independent. US backer revives its plans for €650m Shannon LNG project](#). June 22, 2021.

¹⁷³ RTE. [No realistic prospect of liquefied natural gas terminal in Kerry](#). July 5, 2021.

¹⁷⁴ Radio Kerry. [Green Party groups make submission to An Bord Pleanála on Shannon LNG](#). November 5, 2021.

¹⁷⁵ Safety Before LNG. [76 Irish Politicians join over One and a half Thousand people lodging submission against Shannon LNG at An Bord Pleanála](#). October 2021.

¹⁷⁶ Government of Ireland. [Climate Action Plan 2021 - Securing Our Future](#). November 5, 2021.

¹⁷⁷ The Irish Times. [Shannon gas plan would make a mockery of Irish climate goals](#). September 3, 2021.

¹⁷⁸ Moody's Investor Service. [Government Of Sri Lanka – Caa2 Stable: Update Following Downgrade To Caa2, Outlook Stable](#). October 29, 2021. (Proprietary)

¹⁷⁹ Tamil Guardian. [Sri Lanka turns Mannar's basin and fossil fuels pay debt](#). September 19, 2021.

¹⁸⁰ BBC News. [Crisis-hit Sri Lanka asks China to restructure its debt](#). January 10, 2022.

would be the first natural gas facility in Sri Lanka. The current electricity system is predominantly hydropower, coal and oil with a small amount of renewable energy. The system is run by the state-owned Ceylon Electricity Board, which has been criticized for blackouts for several years running.¹⁸¹

In 2017, the United Nations Development Programme, under the auspices of the Asian Development Bank, developed a pathway for Sri Lanka to move toward a 100% renewable energy system.¹⁸² The most recent generation expansion plan calls for a significant expansion of renewable energy, curtailment of coal use, elimination of oil and an increase in natural gas reliance from zero to approximately 25%.¹⁸³ Sri Lanka has also announced a plan to create a state-owned operation to develop the country's fossil fuel resources, build pipelines and other transport options to minimize exposure to international gas markets.¹⁸⁴ The plan will rely on a network of public private partnerships to develop resources and necessary infrastructure. The project being discussed, and the terms of the deal are expected to be agreed to in the first half of 2022. Operations are anticipated for early 2023.¹⁸⁵ NFE has not identified any specific funding mechanism for the construction involved with the project.¹⁸⁶

It remains to be seen how the investments will take place, given the current financial and economic crises facing the country.¹⁸⁷ It also remains to be seen how the political and economic problems will impact NFE's negotiations. Discussions have commenced between Sri Lankan officials to address the structural financial issues facing the country and to avoid bankruptcy.¹⁸⁸

IV. NFE Business Model in Direct Conflict With Global Climate Aspirations

New Fortress Energy makes countless claims to prospective host communities that it brings financial benefits in the form of lower electricity prices and the broader economic benefits that flow from low, stable prices. As shown throughout this report, natural gas expansion introduces substantial financial risk into the electricity, economic, financial and fiscal structures of the hosts.

NFE also makes an environmental case for the use of natural gas. The company argues that it is usually replacing diesel and other heavy oil uses, thereby reducing both toxic pollutants and carbon emissions. These arguments might bear some

¹⁸¹ Economy Next. [Sri Lanka faces blackouts after CEB official resisting unsolicited deals removed](#). December 2, 2021.

¹⁸² Asia Development Bank. [Sri Lanka on Path to 100% Renewable Energy, Says Joint Report by UNDP and ADB](#). August 17, 2017.

¹⁸³ Ceylon Electricity Board. [Long-Term Generation Expansion Plan](#). October 2021.

¹⁸⁴ Economy Next. [Sri Lanka to set up another energy SOE for natural gas](#). November 24, 2021.

¹⁸⁵ NFE. [New Fortress Energy Finalizes Contract with Government of Sri Lanka for LNG Terminal, Investment into 310 MW Yugadanavi Power Plant, and Gas Supply to Country's Power Plants](#). September 21, 2020.

¹⁸⁶ NFE, [New Fortress Energy to Develop New 350 MW Power Plant in Sri Lanka](#). July 13, 2021.

¹⁸⁷ Foreign Policy. [How to End Sri Lanka's Food Crisis](#). September 27, 2021.

¹⁸⁸ BBC News, *op. cit.*

validity if it wasn't also true that in all of the host communities discussed in this report, efforts to maximize energy sources with least-cost, zero-pollution and carbon-free technologies are not being exhausted.

Regardless of the intentions or design of national host country climate policies, NFE's presence undermines efforts to encourage renewable energy. NFE's environmental claims to being climate positive do not stand up under close examination. The International Energy Agency (IEA) has made it clear that for the world to meet meaningful climate goals there can be no more greenfield development around the world—yet that is precisely NFE's business model.¹⁸⁹

The company's business model has been criticized as failing to meet Environmental, Social and Governance (ESG) tests.¹⁹⁰ Despite the claims that the company is a contributor to climate solutions it may be only a matter of time before index and other funds publicly raise ESG concerns about the company. Natural gas drilling and transport is inherently risky to the environment; natural gas methane emissions corrode any climate action agenda. The company's activity in Puerto Rico and support for the controversial plans in Mexico are plainly in conflict with climate goals. Socially, natural gas expansion is more expensive than renewable energy, which ensures inflationary pressures from volatile natural gas prices and increased prices for basic necessities.

NFE's model also contributes to inequality and poverty in most of the countries where it does business by putting upward pressure on prices. From a governance standpoint, NFE is frequently working in direct and indirect opposition to national climate plans. In Ireland and the U.S., LNG policy trends run contrary to evolving climate and environmental policies. In Mexico, Brazil, Nicaragua, Jamaica and Sri Lanka, where government policy is supportive of natural gas expansion, the company is introducing dysfunctional energy, financial and fiscal dynamics, and supporting policies harmful to the climate. In addition, the ownership model and its unusual accounting treatments raise governance concerns.

An overview of natural gas and its impact on the climate, environment and public health shows a very different picture than the one presented by NFE.

Natural gas is a mixture of gases extracted from fossil fuel reserves in the ground, and is often associated with oil deposits.¹⁹¹ Between 66 percent and 77 percent of natural gas (before processing) is methane. An additional 7 percent to 15 percent typically is comprised of "natural gas liquids," principally ethane, propane, butanes and pentanes,¹⁹² which can be marketed for petrochemical uses.

¹⁸⁹ International Energy Agency. [Net Zero by 2050](#). May 2021.

¹⁹⁰ Financial Times, [New Fortress gas deal raises clean energy yellow card](#). March 2021.

¹⁹¹ In contrast, "renewable natural gas" (biomethane) is generated by anaerobic digestion, as opposed to oxygenated composting or decomposition, of organic materials—such as from landfills or livestock waste. It is usually a small-scale operation, but capture and controlled combustion of renewable natural gas from landfills or livestock waste can significantly reduce methane emissions from such sources.

¹⁹² Pennsylvania State University. [Natural Gas Composition and Specifications](#). Accessed November 27, 2021. Some natural gas contains high amounts (ranging from 3% to 26%) of

After extraction, the gas travels through “gathering lines” (small pipelines) to processing plants that separate hydrocarbons and fluids from the methane to produce “pipeline quality” dry natural gas for transport. The processing removes water and oil, along with some sulfur and carbon dioxide. It also separates natural gas liquids (ethane, butane, etc.), which can be marketed for petrochemical production.

The processed natural gas is usually almost entirely methane.¹⁹³ It travels through “feeder” pipelines to distribution centers, storage facilities or—as in the case of gas export projects—liquefaction facilities that cool and condense the gas to a liquid state for shipping.

Throughout this industrial process and delivery system harmful methane emissions escape into the atmosphere.

A. Methane Is a Powerful Greenhouse Gas

Compared mass-to-mass, methane is 86 times more powerful as a warming agent than carbon dioxide over a 20-year time frame.¹⁹⁴ Approximately 25% of the net global warming that has occurred in recent decades is estimated to be due to methane.¹⁹⁵ Rick Duke, senior advisor to the U.S. special presidential envoy on climate change, said methane is “by far the top priority short-lived climate pollutant that we need to tackle to keep 1.5° C within reach.”¹⁹⁶

According to scenarios analyzed by the Intergovernmental Panel on Climate Change (IPCC), global methane emissions must be reduced at least 40% by 2030 to achieve least cost-pathways that curb global warming to 1.5° C this century—the target set in Paris in December 2015—when combined with substantial reductions of carbon dioxide and other climate pollutants.¹⁹⁷ The United Nations Environment Programme report states that transition to renewable energy and economy-wide energy efficiency would “substantially contribute to methane mitigation over the next few decades.”¹⁹⁸ While a variety of measures to reduce methane emissions from the natural gas system could make a difference,¹⁹⁹ they may take many years to

nitrogen gas, or significant concentrations of hydrogen sulfide. The remaining components of natural gas vary depending on the resource’s location and primarily include carbon dioxide (zero to 8%), nitrogen (zero to 5%), hydrogen sulfide (zero to 5%), oxygen (zero to 0.2%), and trace amounts of helium or other rare gases.

¹⁹³ The smell typically associated with natural gas is an odorant called mercaptan, which is added before the gas is delivered to the end-user, to aid in detecting leaks.

¹⁹⁴ IPCC. *Climate Change 2014: Synthesis Report*. 2014, p. 87, Box 3.2, Table 1. Also see: G. Myhre, *et al.* *Climate Change 2013: Anthropogenic and Natural Radiative Forcing*. Ed. By T.F. Stocker, *et al.* Cambridge England: Cambridge University Press, 659-740. 2013.

¹⁹⁵ *Ibid.*

¹⁹⁶ United Nations Environment Programme (UNEP). *Global Assessment: Urgent steps must be taken to reduce methane emissions this decade*. May 6, 2021.

¹⁹⁷ UNEP. *Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions*. 2021, p. 6-ES and section 4.1.

¹⁹⁸ UNEP, *op. cit.*, p. 11-ES and Section 4.3.

¹⁹⁹ If leak controls and other measures were rigorously and broadly implemented, the industry could cut emissions by 29 million to 57 million tons annually. See: UNEP, *op. cit.*, p. 10-ES and section 4.2.

implement effectively. Achieving such measures on the part of a myriad of companies throughout the gas industrial pathway from drilling to end use is not likely to happen voluntarily throughout the industrial sector; it will require rules, monitoring and enforcement. Given the time constraint, decision-makers should not make the problem worse by approving new gas infrastructure projects.

B. Methane Is a Volatile Organic Compound That Produces Ground-Level Ozone (Smog)

Methane reacts with nitrogen oxides in the presence of sunlight to produce ground-level ozone, also known as photochemical smog, a particularly harmful form of air pollution.²⁰⁰ The UNEP report declared, “Ozone attributable to anthropogenic methane emissions causes approximately half a million premature deaths per year globally and harms ecosystems and crops by suppressing growth and diminishing production.”²⁰¹ It found that reducing 1 million tonnes of methane prevents:

- Roughly 1,430 premature deaths per year from respiratory or cardiovascular disease, as well as avoiding roughly 4,000 asthma-related accident and emergency department visits.²⁰²
- Losses of 55,000 tons of wheat, 17,000 tons of soybeans, 42,000 tons of maize and 31,000 tons of rice due to ozone exposure per year.²⁰³

Methane reduction contributes not only to climate goals but also to public health and agricultural production.²⁰⁴

C. The Amount of Methane Released From the Natural Gas Industry Is Greater Based on Aerial and Satellite Data Than Estimations Previously Suggested

The amount of methane in the atmosphere is rising faster now than at any time since the 1980s. Oil and gas extraction, processing and distribution account for 23% of human-caused emissions. Coal accounts for 12%.²⁰⁵ The venting and flaring of natural gas in the United States more than doubled between 2017 and 2018, from 255,488 million cubic feet to 470,601 million cubic feet.²⁰⁶

For many years, natural gas enjoyed a reputation as a better option for reducing greenhouse gas emissions than coal because the smokestack emissions from a modern, efficient natural gas plant emits 50 to 60 percent less carbon dioxide than a

²⁰⁰ National Academies of Sciences, Engineering and Medicine. [Improving Characterization of Anthropogenic Methane Emissions in the United States](#). 2018.

²⁰¹ UNEP, *op. cit.*, p. 8-ES, Sections 1.1 and 3.3.

²⁰² UNEP, *op. cit.*, p. 8-ES, Section 3.4.

²⁰³ UNEP, *op. cit.*, p. 8-ES, Section 3.5.

²⁰⁴ UNEP, *op. cit.*, p. 9-ES, sections 1.1, 4.4 and 5.

²⁰⁵ UNEP, *op. cit.*, pp. 6-ES, 8-ES, and Sections 1, 1.1, 2.1 and 4.1.

²⁰⁶ Energy Information Administration. [Natural Gas Gross Withdrawals and Production](#). Accessed November 28, 2021. Roughly half of that amount is drilled in Texas.

typical modern coal plant.²⁰⁷ The problem, however, is that the system of drilling, processing and delivering natural gas for end uses is fraught with emissions of methane, and methods for estimating fugitive methane emissions, such as the U.S. Environmental Protection Agency (EPA) model for estimating pipeline leaks, can no longer be deemed accurate.

Using ground-based, facility-scale measurements with validation by aircraft observations, and synthesizing recent studies of atmospheric measurements, Alvarez, et al. (2018) found U.S. emissions were roughly 60 percent more than estimated by EPA. The study investigated several segments of the oil and natural gas industry, including production, processing, and transmission prior to local distribution pipeline transport or end use.²⁰⁸

To reach the impact of local distribution and end use, a subsequent academic study, Plant, et al. (2019) based its analysis on direct observations, rather than estimates, of methane emissions from major urban centers on the east coast of the United States. The researchers from the University of Michigan, Harvard University, and the National Oceanic and Atmospheric Administration, conducted 20 research flights totalling 120 flight hours to measure air contamination from older, leak-prone urban centers. Their study found that observed methane emissions were more than double the amount estimated in the EPA inventory for four of the six areas observed.²⁰⁹ The six urban centers observed comprise roughly 14.4 percent of the natural gas distribution loss for the United States.²¹⁰

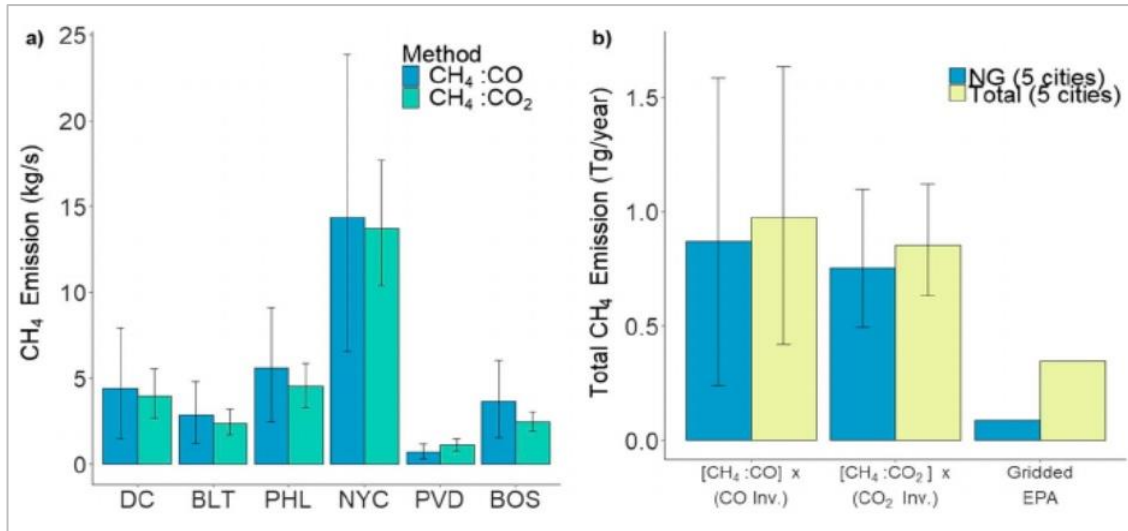
²⁰⁷ National Energy Technology Laboratory (NETL). [Cost and performance baseline for fossil energy plants, Vol. 1: Bituminous coal and natural gas to electricity. Rev. 2. DOE/NETL-2010/1397.](#) November 2019.

²⁰⁸ R. A. Alvarez *et al.*, [Assessment of methane emissions from the U.S. oil and gas supply chain](#), *Science* 361:186-88, 2018.

²⁰⁹ Genevieve Plant, et al., [Large Fugitive Methane Emissions From Urban Centers Along the U.S. East Coast](#), *Geophysical Research Letters* 46 (14): 8500-8507, July 28, 2019.

²¹⁰ *Ibid.*

Figure 7: (a) Methane Emissions (kg/s) for the Six Urban Regions as Observed and Analysed and (b) Summed Total Emissions (Tg/year)²¹¹ for the Five Largest Cities Compared to Gridded EPA Inventory²¹²

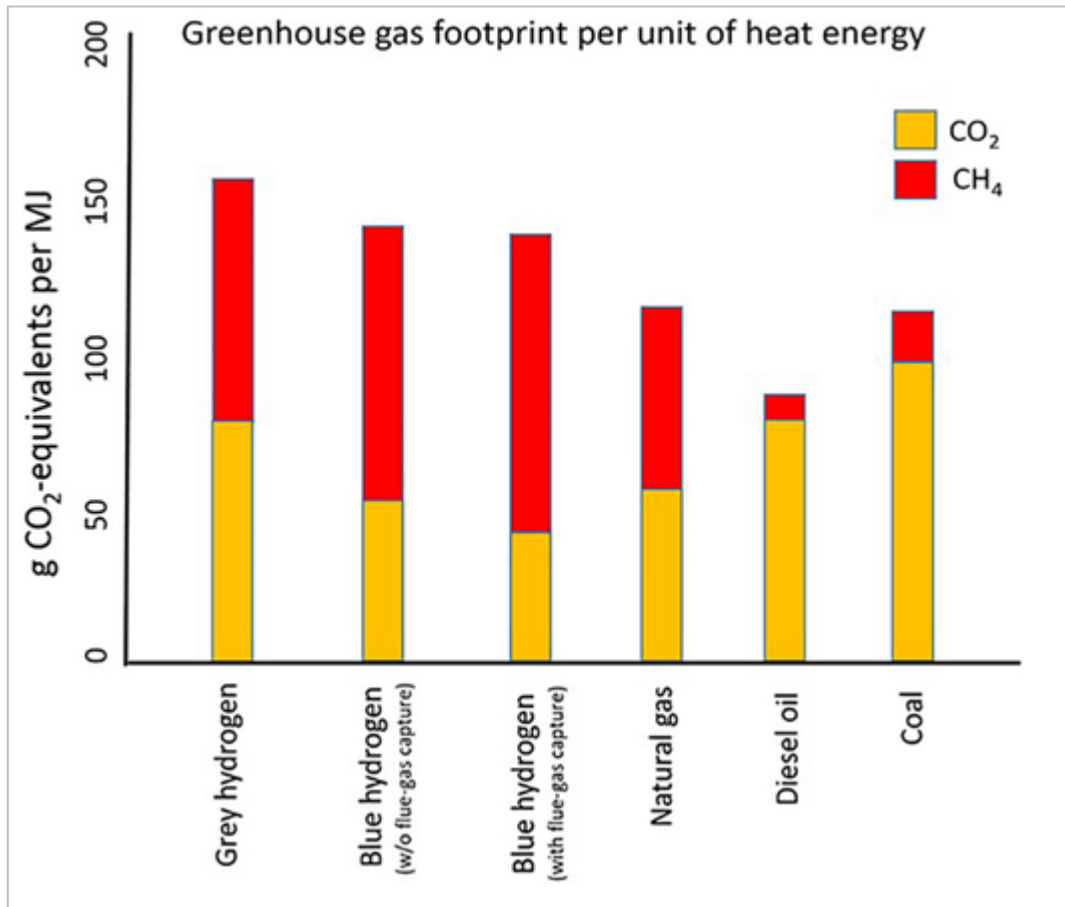


Relying on these two studies and other information, Howarth and Jacobson (August, 2021), found that the greenhouse gas emissions (measured in carbon equivalents) from natural gas and coal are roughly equivalent because of the role of methane emissions. Their conclusion was drawn as part of a broader effort to compare emissions of blue and grey hydrogen with other fossil fuels, the results of which is shown in the figure below:

²¹¹ One Tg equals 1 million tons.

²¹² Plant, *op cit.*, p. 8505, Figure 4.

Figure 8: Howarth & Jacobson Comparison of GHG Emissions of Fossil Fuels and Hydrogen



Source: R. Howarth and M. Jacobson. *How green is blue hydrogen?* *Energy Science and Engineering*. 9: 1676-1687, 1683. July 26, 2021.

Since then, the researchers who conducted the municipal impacts study have evaluated urban methane emissions based on satellite data from the TROPospheric Monitoring (TROPOMI) instrument included on the Sentinel-5 Precursor satellite for methane and carbon monoxide. They determined that the EPA inventory underestimates methane emissions not only for the large eastern cities previously examined, but also for four additional cities. For all but the smallest emitter of methane, emission estimates from the TROPOMI-based analysis proved to be significantly larger than the levels estimated by inventories. They found when considering all eight cities in the aggregate, the satellite data yielded a total emission rate 2.8 times greater than the EPA inventory total. The researchers concluded that “a large correction to estimated urban natural gas emissions appears warranted,” observing that, “Such a correction would have a significant impact on the loss rate of the natural gas supply chain.”²¹³

²¹³ Genevieve Plant, *et al.* [Evaluating urban methane emissions from space using TROPOMI methane and carbon monoxide observations](#). *Remote Sensing of Environment*. 268. January 2022.

The researchers also examined data for three large municipalities outside the U.S.— Mexico City, Buenos Aires, and Mumbai. Again, emissions appeared to greatly exceed inventory estimates, suggesting that substantial urban methane emissions may exist across different countries and urban typology.

D. Hydraulic Fracturing for Extraction of Natural Gas Is a Water-Intensive, Messy Business

Shale gas is extracted by injecting water containing sand and chemical additives at high pressure to fracture the underground rock formation and release the gas. Typically, the injection fluid is 90 percent water, 9 percent sand, and 1 percent chemical additives that include friction reducers, surfactants, acids and other compounds.²¹⁴

Hydraulic fracturing (fracking) often requires the use of large volumes of water, and the amount of water used increases as laterals become longer in response to depletion of more easily accessible reserves. A U.S. Geological Survey (USGS) report found that from 2000 to 2014, median annual water volume estimates for hydraulic fracturing in horizontal wells had risen from about 177,000 gallons per oil or gas well to more than 4 million gallons per oil well and 5.1 million gallons per gas well.²¹⁵ In contrast, it reported that median annual water use from vertical and directional wells remained below 671,000 gallons per well.²¹⁶ A study of shale and gas production in Vaca Muerta, Argentina, similarly noted that water use has increased over the last decade, as the length of the horizontal portions of the drilling process has increased.²¹⁷

The fluid used for fracking contains water, sand, and several toxic chemicals. The water becomes contaminated by toxic chemicals in the fracking process, and disposal of contaminated water is a problematic challenge.²¹⁸ Some of this water is “consumed,” in that it is not returned to the water cycle, which is a special problem for areas with limited water resources; some is reused in the fracking process; and some is disposed through underground injection.

The USGS reports that not only the fracking itself, but the disposal of fracking wastewater through deep well injection, can cause earthquakes. It reports that while the annual number of earthquakes in the central and eastern United States averaged 25 per year from 1973 to 2008 for quakes of magnitude 3 or higher, at least 100 such earthquakes have occurred each year since 2013. The rate peaked in

²¹⁴ Karapataki, C. [Techno-economic analysis of water management options for unconventional natural gas developments in the Marcellus Shale](#). Researchgate Publications, 2012.

²¹⁵ U.S. Geological Survey. [Water used for hydraulic fracturing varies widely across United States](#). June 30, 2015. Also see: T. Gallegos, *et al.* [Hydraulic fracturing water use variability in the United States and potential environmental implications](#). Water Resources Research. June 16, 2015.

²¹⁶ U.S. Geological Survey, *op cit.* Conventional extraction uses even less, approximately 20,000 to 80,000 gallons of fluid. E. Walker, *et al.* [Water use for hydraulic fracturing of oil and gas in the South Platte River Basin, Colorado](#). J American Water Resources Assn. 53:839-853. June 2017.

²¹⁷ Stockholm Environment Institute. [Working Paper: Watershed implications of shale oil and gas production in Vaca Muerta, Argentina](#). April 2021.

²¹⁸ T. Colborn, *et al.* [Natural Gas Operations from a Public Health Perspective](#). Human and Ecological Risk Assessment: An International Journal. 17(5):1039-1056. 20 September 2011.

2015 at 1,010 and then declined to 130 in 2019—still much higher than the earlier average.²¹⁹ The USGS noted:

Fracking intentionally causes small earthquakes (magnitudes smaller than 1) to enhance permeability, but it has also been linked to larger earthquakes. The largest earthquake known to be induced by hydraulic fracturing in the United States was a M4 earthquake in Texas. In addition to natural gas, fracking fluids and saltwater trapped in the same formation as the gas are returned to the surface. These wastewaters are frequently disposed of by injection into deep wells. The injection of wastewater and saltwater into the subsurface can also cause earthquakes that are large enough to be damaging ... The largest earthquake known to be induced by wastewater disposal was a M5.8 earthquake that occurred near Pawnee, Oklahoma in 2016.²²⁰

Improperly cased oil or gas wells also can leach methane, radioactive material, and other gases into the surrounding groundwater, which can sometimes reach drinking water supplies.

E. The Host Country or Community for an LNG Export Terminal Bears an Unfair Burden

When a company builds and operates an LNG export terminal, the public in the host country or community bears the upstream burden and much of the midstream burden of air pollution, water pollution, and habitat impacts. These impacts result from:

- **Natural gas drilling and extraction**—including water consumption, water pollution, equipment energy needs and fugitive emissions
- **Natural gas drilling and extraction wastewater disposal**— including the need to prevent earthquakes from deep underground injection of wastewater
- **Pipeline transport for processing**
- **The processing of the extracted gas**
- **Pipeline transport of the processed gas to the liquefaction plant**— including pipeline construction impacts and gas leakage
- **Pipeline compression plants impacts**
- **The liquefaction process, and**
- **Transport to the export terminal** for loading onto ships.

²¹⁹ U.S. Geological Survey. [Induced Earthquakes](#). Accessed November 29, 2021.

²²⁰ U.S. Geological Survey. [Does the production of oil and gas from shale cause earthquakes? If so, how are the earthquakes related to these operations?](#) Accessed November 29, 2021.

Fugitive methane emissions are typically released from all of these stages of the process.

The host bears the burden of the greenhouse gas (GHG) impacts from the upstream system and much of the midstream system, as well. The greenhouse gas emissions become part of the host country's proportionate responsibility to address climate change.

The more natural gas is extracted for LNG export, the more action the host country will need to take, in terms of emission reductions and mitigation efforts to offset the additional GHG pollution from LNG export, to meet its national climate goals.

In return, the public primarily gains only more smog and higher prices for natural gas at home.²²¹

F. The Importing Country That Receives the LNG Will Experience More GHG Pollution Than It Likely Anticipates

The receiving country will see pollution emissions from the local distribution and end-use burning of natural gas.

Burning natural gas does produce lower nitrogen oxide emissions, and much lower emissions of sulfur dioxide and particulates, all of which irritate the respiratory and cardiovascular system, in comparison to coal.²²² And, as noted above, it emits less carbon dioxide. Nevertheless, natural gas combustion remains a significant emitter of carbon dioxide and nitrogen oxides.

The importing country also experiences the fugitive emissions of methane that can occur from the unloading and regasification of the LNG and the transport of the restored natural gas to local distribution points. The Plant, et al. (2019) study is particularly relevant here.

Also, to the extent that the gas is distributed to homes for cooking or heating, it can cause indoor air health risks. A meta-analysis of 41 studies—including research conducted in Australia, Austria, Canada, China, the Czech Republic, Germany, Japan, the Netherlands, New Zealand, Spain, Russia, the United Kingdom, and the United States—found that cooking with gas increases the risk of asthma in children.²²³ A University of Queensland study attributed more than 12 percent of childhood asthma impacts (measured in disability adjusted life-years) in Australia to gas cooking stoves, which are used in well over a third of households in the country.²²⁴

²²¹ IEEFA. [Booming U.S. natural gas exports fuel high prices](#). November 4, 2021.

²²² National Renewable Energy Laboratory. [Life Cycle Assessment of Coal-Fired Power Production](#). 1999. Also see: National Renewable Energy Laboratory. [Life Cycle Assessment of a Natural Gas Combined-Cycle Power Generation System](#). 2000.

²²³ Weiwei Lin, et al. [Meta-analysis of the effects of indoor nitrogen dioxide and gas cooking on asthma and wheeze in children](#). *International Journal of Epidemiology*. 42(6):1724-1737. December 2013.

²²⁴ L. Knibbs, et al., [Damp housing, gas stoves, and the burden of childhood asthma in Australia](#). *Medical Journal of Australia*. 208 (7): 299-302. April 16, 2018. The report found that

Appendix: NFE Proposed Facilities, Completion Dates, Estimated (\$USD), Source

Asset	Estimate Complete	\$USD Millions	Source
Liquefaction	1Q -2023	800	https://ir.newfortressenergy.com/static-files/39bfc12d-ea34-4bbb-a997-3315bf0063d8
Terminal	1Q -2023	95	https://www.state.nj.us/drbc/library/documents/dockets/061219/CommentResponse_2017-009-2.pdf
La Paz ISO Flex	Q1 - 2022	132	https://ir.newfortressenergy.com/static-files/39bfc12d-ea34-4bbb-a997-3315bf0063d8
100 MW Power Plant			
		700	https://www.argusmedia.com/en/news/2233087-new-fortress-to-launch-lng-project-in-nicaragua
Offshore Liquefaction			
OnShore Regasification			
300 MW Power Plant	Q1 -2022		
Offshore LNG Facility	Q2 -2022	50	https://ir.newfortressenergy.com/static-files/39bfc12d-ea34-4bbb-a997-3315bf0063d8
Onshore LNG Facility	Q1 -2022	35	https://ir.newfortressenergy.com/static-files/39bfc12d-ea34-4bbb-a997-3315bf0063d8
Power Plant	Q1 -2022		
Onshore LNG Facility	Q1 -2022	536	https://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/PublicacoesArquivos/publicacao-620/PITER%202021_English_October2021.pdf , p. 34
1.4 GW Power Plant	Q1 -2022		https://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/PublicacoesArquivos/publicacao-620/PITER%202021_English_October2021.pdf , p. 34
Onshore Regasification		566	https://www.pleanala.ie/anbordpleanala/media/abp/cases/reports/304/r304007.pdf?r=396536722246 , p. 13
Storage and Pipeline			
CHP Power Plant			
Offshore Regas/Storage	Q1 -2023	300	https://ir.newfortressenergy.com/static-files/61822434-f4b8-4ebd-bc9d-e8808a0d6fb9

7.9 percent of asthma burden impacts were due to damp housing. It further found that if all homes were equipped with systems to vent the gas outside, the asthma burden would drop to 3.4 percent.

About IEEFA

The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

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