UNITED STATES OF AMERICA

DEPARTMENT OF ENERGY

OFFICE OF FOSSIL ENERGY

GULF LNG LIQUEFACTION COMPANY, LLC	FE DOCKET NO. 12-101-LNG

OPINION AND ORDER GRANTING LONG-TERM AUTHORIZATION TO EXPORT LIQUEFIED NATURAL GAS TO NON-FREE TRADE AGREEMENT NATIONS

DOE/FE ORDER NO. 4410

JULY 31, 2019

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FREQUENTLY USED ACRONYMS

AEO	Annual Energy Outlook
Bcf/d	Billion Cubic Feet per Day
Bcf/yr	Billion Cubic Feet per Year
CPP	Clean Power Plan
DOE	U.S. Department of Energy
EIA	U.S. Energy Information Administration
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FE	Office of Fossil Energy, U.S. Department of Energy
FERC	Federal Energy Regulatory Commission
FTA	Free Trade Agreement
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GLLC	Gulf LNG Liquefaction Company, LLC
IECA	Industrial Energy Consumers of America
LCA	Life Cycle Analysis
LNG	Liquefied Natural Gas
Mcf	Thousand Cubic Feet
MMBtu	Million British Thermal Units
mtpa	Million Metric Tons per Annum
NEPA	National Environmental Policy Act
NERA	NERA Economic Consulting
NETL	National Energy Technology Laboratory
NGA	Natural Gas Act

I. INTRODUCTION

On August 31, 2012, Gulf LNG Liquefaction Company, LLC (GLLC) filed an Application[1] with the Office of Fossil Energy (FE) of the Department of Energy (DOE) under section 3(a) of the Natural Gas Act (NGA).[2] GLLC requests long-term, multi-contract authorization to export domestically produced liquefied natural gas (LNG) from a natural gas liquefaction facility (the Gulf LNG Liquefaction Project or Project) that it proposes to site, construct, and operate at the Gulf LNG Terminal located in Jackson County, Mississippi, near the city of Pascagoula. The Gulf LNG Terminal is an existing import terminal owned by GLLC's affiliate, Gulf LNG Energy, LLC (Gulf Energy).[3] GLLC seeks to export this LNG by vessel to any country with which the United States does not have a free trade agreement (FTA) requiring national treatment for trade in natural gas, and with which trade is not prohibited by U.S. law or policy (non-FTA countries).[4]

In the Application, GLLC requested authority to engage in exports of up to 11.5 million metric tons per annum (mtpa) of LNG, which it stated was equivalent to 1.5 billion cubic feet (Bcf) per day (Bcf/d) of natural gas, or 547.5 Bcf per year (Bcf/year).[5] In an Update to the

[1] Gulf LNG Liquefaction Company, LLC, Application for Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Countries, FE Docket No. 12-101-LNG (Aug. 31, 2012) [hereinafter App.].
[2] 15 U.S.C. § 717b(a). The authority to regulate the imports and exports of natural gas, including liquefied natural gas, under section 3 of the NGA (15 U.S.C. § 717b) has been delegated to the Assistant Secretary for FE in Redelegation Order No. 00-002.04G issued on June 4, 2019.
[3] App. at 5.
[4] In the Application, GLLC is not seeking to export LNG to FTA countries under NGA section 3(c), 15 U.S.C. § 717b(c), because it already has that authority in FE Docket No. 12-47-LNG. *See infra* at 3. The United States currently has FTAs requiring national treatment for trade in natural gas with Australia, Bahrain, Canada, Chile, Colombia, Dominican Republic, El Salvador, Guatemala, Honduras, Jordan, Mexico, Morocco, Nicaragua, Oman, Panama, Peru, Republic of Korea, and Singapore. FTAs with Israel and Costa Rica do not require national treatment for trade in natural gas.
[5] App. at 1.

Application filed on July 23, 2019,[6] GLLC modified its requested export volume to align it with an order issued by the Federal Energy Regulatory Commission (FERC) on July 16, 2019, in FERC Docket No. CP15-521-000.[7] In that order, FERC authorized: (i) GLLC and Gulf Energy to site, construct, and operate the Gulf LNG Liquefaction Project in a maximum production capacity of 10.85 mtpa of LNG, and (ii) Gulf LNG Pipeline, LLC (Gulf Pipeline) to modify its existing pipeline facilities to provide for bi-directional flow on its system and to provide feed gas to the Gulf LNG Liquefaction Project.[8]

In the Update, GLLC estimates that the Project capacity approved by FERC—10.85 mtpa of LNG—"is equivalent to 558.9 Bcf/yr (1.531 Bcf/d) of natural gas," using an updated conversion factor.[9] In light of the FERC Order and GLLC's Update, we will review the Application as requesting an export volume equivalent to 558.9 Bcf/yr of natural gas.[10] Additionally, as part of the Update, GLLC informs DOE/FE of changes to its upstream ownership since the time it filed its Application (*see infra* § IV.A).[11]

[6] Gulf LNG Liquefaction Company, LLC, Update in Support of Pending Non-Free Trade Agreement Authorization, FE Docket No. 12-101-LNG (July 23, 2019) [hereinafter Update].
[7] *Gulf LNG Liquefaction Company, LLC*, *et al.*, Order Granting Authorization Under Section 3 of the Natural Gas Act, 168 FERC ¶ 61,020 (July 16, 2019) [hereinafter FERC Order].
[8] *Id.* at ¶¶ 1, 7 n.12. In 2007, FERC authorized Gulf Energy to site, construct, and operate the Gulf LNG Terminal, and Gulf Pipeline to construct and operate a related pipeline. *See Gulf LNG Energy, LLC*, 118 FERC ¶ 61,128 (2007). Gulf Energy's and Gulf Pipeline's facilities were placed into service in 2011. *See* FERC Order at ¶¶ 3-5 (procedural history). Gulf Pipeline is a wholly owned subsidiary of Gulf Energy. *Id*. ¶ 4 n.6.
[9] Update at 1. We note that GLLC uses DOE/FE's conversion factor, whereby 1 mtpa of LNG is equivalent to 51.75 Bcf of natural gas. *See* U.S. Dep't of Energy, Small-Scale Natural Gas Exports; Notice of Proposed Rulemaking, 82 Fed. Reg. 41,570, 41,573 (Sept. 1, 2017) ("When converting from million metric tons to billion cubic feet, DOE uses a conversion factor of 51.75 Bcf per million metric tons of dry natural gas."); Update at 1.
[10] DOE/FE's long-standing practice is to authorize export volumes up to the known (or FERC-approved) maximum liquefaction capacity of a facility, but not in excess of that amount. *See*, *e.g.*, *Freeport LNG Expansion, L.P.*, *et al.*, DOE/FE Order No. 3357, FE Docket No. 11-161-LNG, Order Conditionally Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Freeport LNG Terminal on Quintana Island, Texas, to Non-Free Trade Agreement Nations, at 162 (Nov. 15, 2013) (finding "[t]here is no basis for authorizing exports in excess of the maximum liquefaction capacity of a planned facility," and thus authorizing a reduced export volume to reflect "the Project's planned liquefaction capacity.").
[11] Update at 1-2.

GLLC requests this non-FTA authorization for a period of 20 years, commencing on the earlier of the date of first export or 10 years from the date the authorization is granted. Additionally, GLLC requests the authorization on its own behalf and as agent for other entities that hold title to the LNG at the time of export.[12]

Previously, on June 15, 2012, DOE/FE issued Order No. 3104 to GLLC in FE Docket No. 12-47-LNG.[13] That order authorized GLLC to export domestically produced LNG from the proposed Gulf LNG Liquefaction Project at the Gulf LNG Terminal to FTA countries in a volume equivalent to 547.5 Bcf/yr of natural gas (1.5 Bcf/d) for a period of 25 years.[14]

On November 5, 2012, DOE/FE published a notice of the Application in this proceeding in the *Federal Register* (Notice of Application).[15] The Notice of Application called on interested persons to submit protests, motions to intervene, notices of intervention, and comments by January 4, 2013.[16] DOE/FE received one filing in opposition to the Application—a motion to intervene, protest, and comments submitted by Sierra Club.[17]

DOE/FE has reviewed the Application and Update, Sierra Club's filing opposing the Application, DOE's economic and environmental studies, the final environmental impact statement (EIS) for the Project prepared by FERC staff, the FERC Order, and the most recent projections of the U.S. Energy Information Administration (EIA), among other evidence

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[12] App. at 1-2.
[13] *Gulf LNG Liquefaction Company, LLC*, DOE/FE Order No. 3104, FE Docket No. 12-47-LNG, Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Gulf LNG Energy, LLC Terminal to Free Trade Agreement Nations (June 15, 2012).
[14] *Id*.
[15] Gulf LNG Liquefaction Company, LLC, Application for Long-Term Authorization to Export Liquefied Natural Gas Produced from Domestic Natural Gas Resources to Non-Free Trade Agreement Countries for a 20-Year Period; Notice of Application, 77 Fed. Reg. 66,454 (Nov. 5, 2012) [hereinafter Notice of Application].
[16] DOE finds that the requirement for public notice of applications in 10 C.F.R. Part 590 is applicable only to non-FTA applications under NGA section 3(a).
[17] Sierra Club, Motion to Intervene, Protest, and Comments, FE Docket No. 12-101-LNG (Jan. 4, 2013) [hereinafter Sierra Club Mot.].

discussed below. On the basis of this substantial administrative record, DOE/FE has determined that it has not been shown that GLLC's proposed exports will be inconsistent with the public interest, as would be required to deny the Application, as updated, under NGA section 3(a). DOE/FE therefore grants the Application in the volume of 558.9 Bcf/yr of natural gas (1.53 Bcf/d).[18]

Because the export volumes authorized in GLLC's FTA order (DOE/FE Order No. 3104) and this Order each reflect the planned liquefaction capacity of the Gulf LNG Liquefaction Project, as approved by FERC, the FTA and non-FTA volumes are not additive.

Additionally, as discussed below, DOE/FE participated as a cooperating agency in FERC's environmental review of the Gulf LNG Liquefaction Project under the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. § 4321 *et seq*. FERC issued the final EIS for the Gulf LNG Liquefaction Project on April 17, 2019.[19] After an independent review, DOE/FE adopted the final EIS on April 26, 2019 (DOE/EIS-0504),[20] and the U.S. Environmental Protection Agency (EPA) published a notice of the adoption on May 3, 2019.[21] As an Appendix to this Order, DOE/FE is issuing the Record of Decision (ROD) under NEPA for the proposed Project. This Order requires GLLC's compliance with the 131 environmental conditions recommended in the final EIS and adopted in the FERC Order.[22]

[18] *See infra* §§ IX-XI.
[19] Federal Energy Regulatory Comm'n, *Gulf LNG Liquefaction Project Final Environmental Impact Statement*, Docket No. CP15-521-000 (Apr. 17, 2019), *available at*: https://www.ferc.gov/industries/gas/enviro/eis/2019/04-17-19-FEIS/FEIS.pdf [hereinafter final EIS].
[20] Letter from Amy Sweeney, DOE/FE, to Julie Roemele, U.S. EPA (Apr. 26, 2019) (adoption of final EIS).
[21] U.S. Envtl. Protection Agency, Environmental Impact Statements; Notice of Availability, 84 Fed. Reg. 19,074 (May 3, 2019).
[22] *See also infra* § XI (Ordering Para. H); *see also infra* § VI.

The volume approved in this Order—1.53 Bcf/d of natural gas—brings DOE/FE's cumulative total of approved non-FTA exports of LNG and compressed natural gas to 34.52 Bcf/d of natural gas.[23]

II. BACKGROUND

A. DOE's LNG Export Studies

1. 2012 EIA and NERA Studies

In 2011, DOE/FE engaged EIA and NERA Economic Consulting (NERA) to conduct a two-part study of the economic impacts of U.S. LNG exports, which together was called the "2012 LNG Export Study." The first part, performed by EIA and published in January 2012, assessed how specified scenarios of increased natural gas exports could affect domestic energy markets. Specifically, EIA examined how prescribed levels of natural gas exports (at 6 Bcf/d and 12 Bcf/d) above baseline cases could affect domestic energy markets.

The second part, performed by NERA under contract to DOE, evaluated the macroeconomic impact of LNG exports on the U.S. economy. NERA used a general equilibrium macroeconomic model of the U.S. economy with an emphasis on the energy sector and natural gas in particular. The 2012 NERA Study projected that, across all scenarios studied—assuming either 6 Bcf/d or 12 Bcf/d of LNG export volumes—the United States would experience net economic benefits from allowing LNG exports.

[23] *See infra* § VIII.E.

In December 2012, DOE/FE published a notice of availability of the 2012 LNG Export Study in the *Federal Register* for public comment.[24] DOE/FE subsequently responded to the public comments in connection with the LNG export proceedings identified in that notice.[25]

2. 2014 and 2015 LNG Export Studies

By May 2014, in light of the volume of LNG exports to non-FTA countries then-authorized by DOE/FE and the number of non-FTA export applications still pending, DOE/FE determined that an updated study was warranted to consider the economic impacts of exporting LNG from the lower-48 states to non-FTA countries.[26] DOE announced plans to undertake new economic studies to gain a better understanding of how higher levels of U.S. LNG exports—at levels between 12 and 20 Bcf/d of natural gas—would affect the public interest.[27]

DOE/FE commissioned two new macroeconomic studies. The first, *Effect of Increased Levels of Liquefied Natural Gas Exports on U.S. Energy Markets*, was performed by EIA and published in October 2014 (2014 EIA LNG Export Study or 2014 Study).[28] The 2014 Study assessed how specified scenarios of increased natural gas exports could affect domestic energy markets. At DOE's request, this 2014 Study served as an update of EIA's January 2012 study of

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[24] *See* 2012 LNG Export Study, 77 Fed. Reg. 73,627 (Dec. 11, 2012), *available at*: http://energy.gov/sites/prod/files/2013/04/f0/fr_notice_two_part_study.pdf (Notice of Availability of the LNG Export Study).

[25] *See*, *e.g.*, *Freeport LNG Expansion L.P., et al.,* DOE/FE Order No. 3282, FE Docket No. 10-161-LNG, Order Conditionally Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Freeport LNG Terminal on Quintana Island, Texas to Non-Free Trade Agreement Nations, at 56-109 (May 17, 2013).

[26] Because there is no natural gas pipeline interconnection between Alaska and the lower 48 states, DOE/FE generally views those LNG export markets as distinct. Accordingly, DOE/FE focuses on LNG exports from the lower-48 states for purposes of determining macroeconomic impacts.

[27] *See* U.S. Dep't of Energy, Office of Fossil Energy, Request for an Update of EIA's January 2012 Study of Liquefied Natural Gas Export Scenarios (May 29, 2014), *available at*: http://energy.gov/fe/downloads/request-update-eia-s-january-2012-study-liquefied-natural-gas-export-scenarios (memorandum from FE to EIA).

[28] U.S. Energy Info. Admin., *Effect of Increased Levels of Liquefied Natural Gas Exports on U.S. Energy Markets* (Oct. 2014), *available at*: https://www.eia.gov/analysis/requests/fe/pdf/lng.pdf.

LNG export scenarios and used baseline cases from EIA's *Annual Energy Outlook 2014* (AEO 2014).[29]

The second study, *The Macroeconomic Impact of Increasing U.S. LNG Exports*, was performed jointly by the Center for Energy Studies at Rice University's Baker Institute and Oxford Economics under contract to DOE/FE (together, Rice-Oxford) and published in October 2015 (2015 LNG Export Study or 2015 Study).[30] The 2015 Study was a scenario-based assessment of the macroeconomic impact of levels of U.S. LNG exports, sourced from the lower-48 states, under different assumptions including U.S. resource endowment, U.S. natural gas demand, international LNG market dynamics, and other factors. The 2015 Study considered export volumes ranging from 12 to 20 Bcf/d of natural gas, as well as a high resource recovery case examining export volumes up to 28 Bcf/d of natural gas. The analysis covered the 2015 to 2040 time period.

In December 2015, DOE/FE published a Notice of Availability of the 2014 and 2015 Studies in the *Federal Register*, and invited public comment on those Studies.[31] DOE/FE subsequently responded to the public comments in connection with the LNG export proceedings identified in that notice.[32]

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[29] Each Annual Energy Outlook (AEO) presents EIA's long-term projections of energy supply, demand, and prices. It is based on results from EIA's National Energy Modeling System (NEMS) model.

[30] Center for Energy Studies at Rice University Baker Institute and Oxford Economics, *The Macroeconomic Impact of Increasing U.S. LNG Exports* (Oct. 29, 2015), *available at*: http://energy.gov/sites/prod/files/2015/12/f27/20151113_macro_impact_of_lng_exports_0.pdf.

[31] U.S. Dep't of Energy, Macroeconomic Impacts of LNG Exports Studies; Notice of Availability and Request for Comments, 80 Fed. Reg. 81,300, 81,302 (Dec. 29, 2015).

[32] *See*, *e.g.*, *Sabine Pass Liquefaction, LLC,* DOE/FE Order No. 3792, FE Docket No. 15-63-LNG, Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel From the Sabine Pass LNG Terminal Located in Cameron Parish, Louisiana, to Non-Free Trade Agreement Nations, at 66-121 (Mar. 11, 2016).

3. 2018 LNG Export Study

a. Overview

At the time DOE commissioned the 2018 LNG Export Study in 2017, 25 non-FTA applications were pending before DOE/FE.[33] In light of both the volume of LNG requested for export in those pending applications and the cumulative volume of non-FTA exports then-authorized (equivalent to 21.35 Bcf/d of natural gas), DOE/FE determined that a new macroeconomic study was warranted.[34] Accordingly, DOE/FE, through its support contractor KeyLogic Systems, Inc., commissioned NERA to conduct the 2018 LNG Export Study. DOE published the 2018 LNG Export Study on its website on June 7, 2018,[35] and concurrently provided notice of the availability of the Study, as discussed below.[36]

Like the four prior economic studies, the 2018 Study examines the impacts of varying levels of LNG exports on domestic energy markets. However, the 2018 Study differs from DOE/FE's earlier studies in the following ways:

(i) Includes a larger number of scenarios (54 scenarios) to capture a wider range of uncertainty in four natural gas market conditions than examined in the previous studies;

(ii) Includes LNG exports in all 54 scenarios that are market-determined levels, including the three alternative baseline scenarios that are based on the projections in EIA's *Annual Energy Outlook 2017* (AEO 2017);[37]

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[33] *See* U.S. Dep't of Energy, Study on Macroeconomic Outcomes of LNG Exports; Notice of Availability of the 2018 LNG Export Study and Request for Comments, 83 Fed. Reg. 27,314 (June 12, 2018) (identifying 25 docket proceedings) [hereinafter 2018 Study Notice].

[34] Additionally, as of the date of the 2018 Study, DOE/FE had authorized a cumulative total of LNG exports to FTA countries under section 3(c) of the NGA in a volume of 59.33 Bcf/d of natural gas. These FTA volumes are not additive to the authorized non-FTA volumes.

[35] *See* NERA Economic Consulting, Macroeconomic Outcomes of Market Determined Levels of U.S. LNG Exports (June 7, 2018), *available at*: https://www.energy.gov/sites/prod/files/2018/06/f52/Macroeconomic%20LNG%20Export%20Study%202018.pdf [hereinafter 2018 LNG Export Study or 2018 Study].

[36] *See* 2018 Study Notice.

[37] U.S. Energy Info. Admin., *Annual Energy Outlook 2017* (with projections to 2050) (Jan. 5, 2017), *available at*: https://www.eia.gov/outlooks/aeo/pdf/0383(2017).pdf.

(iii) Examines unconstrained LNG export volumes beyond the levels examined in the previous studies;

(iv) Examines the likelihood of those market-determined LNG export volumes; and

(v) Provides macroeconomic projections associated with several of the scenarios lying within the more likely range of exports.[38]

b. Methodology and Scenarios

In its Response to Comments published in the *Federal Register* in December 2018, DOE/FE provided a detailed discussion of the methodology and scenarios used in the 2018 Study, including NERA's Global Natural Gas Model (GNGM) and N_{ew}ERA models.[39] The 2018 Study develops 54 scenarios by identifying various assumptions for domestic and international supply and demand conditions to capture a wide range of uncertainty in natural gas markets. The scenarios include three baseline cases based on EIA's AEO 2017 projections (the most recent EIA projections available at the time), with varying assumptions about U.S. natural gas supply.[40] The three cases for U.S. natural gas supply derived from AEO 2017 are:

i. AEO 2017's Reference case, which provides a central estimate of U.S. natural gas production;

ii. High Oil and Gas Resource and Technology (HOGR) case, which provides more optimistic resource development estimates than the Reference case; and

iii. Low Oil and Gas Resource and Technology (LOGR) case, which provides less optimistic resource development estimates than the Reference case.[41]

[38] *See* 2018 Study Notice, 83 Fed. Reg. at 27,316.
[39] *See* U.S. Dep't of Energy, Study on Macroeconomic Outcomes of LNG Exports; Response to Comments Received on Study, 83 Fed. Reg. 67,251 (Dec. 28, 2018) [hereinafter 2018 Study Response to Comments].
[40] 2018 Study Response to Comments, 83 Fed. Reg. at 67,256 (stating that the differences in the natural gas production levels across these cases arise from varying assumptions around unproven offshore resources, onshore shale gas resources, tight gas resources, and conventional and tight oil associated gas resources, as well as the costs of producing these resources).
[41] *See id*.

Alternative scenarios add other assumptions about future U.S. and international demand for natural gas. The three cases for U.S. natural gas demand are:

i. AEO 2017's Reference case, which provides a central estimate of U.S. natural gas demand;

ii. A Robust Economic Growth case, which provides a high estimate for U.S. natural gas demand driven by higher levels of gross domestic product growth; and

iii. A Renewables Mandate case, which provides a low estimate for U.S. natural gas demand driven by the imposition of a stringent renewables mandate.[42]

International assumptions are based on EIA's *International Energy Outlook* 2017 (IEO 2017) and the International Energy Agency's (IEA) *World Energy Outlook* 2016 (WEO 2016).

As noted above, the 2018 Study also examines the likelihood of conditions leading to various export scenarios. This unique feature provides not only quantification of the effects to the U.S. natural gas market and its overall economy under each of the scenarios outlined, but also an assessment of the probability of each of these scenarios, and thus the probability of the natural gas and macroeconomic outcomes associated with each scenario.[43]

In developing this aspect of the Study, NERA first developed estimates of the probabilities for the level of U.S. supply and demand, as well as supply and demand in the rest of the world.[44] DOE/FE and KeyLogic, Inc. contacted a set of independent experts recommended by DOE (referred to as the peer reviewers) to obtain their probability assignments for these same four metrics. After receiving feedback from the peer reviewers, NERA reevaluated the original probability assignments to arrive at the final probabilities. These peer-reviewed probabilities of uncertainties surrounding developments in the international and domestic natural gas markets

[42] *See id*.
[43] *See id*.
[44] *See id*.

were, in turn, combined to develop the 54 export scenarios and their associated macroeconomic impacts.

c. Study Results

The 54 scenarios in the 2018 Study provide a wide range of results. NERA chose to focus on a subset of more likely outcomes, given DOE's assumptions about the probabilities associated with U.S. natural gas production, demand, and supply, as well as demand for natural gas in the rest of the world. NERA's key results include the following:

- The more likely range of LNG exports in the year 2040 was judged to range from 8.7 to 30.7 Bcf/d of natural gas.
- U.S. natural gas prices range from $5 to approximately $6.50 per million British thermal unit (MMBtu) in 2040 (in constant 2016 dollars) under Reference case supply assumptions. These central cases have a combined probability of 47%.
- Levels of gross domestic product (GDP) are most sensitive to assumptions about U.S. supply of natural gas, with high supply driving higher levels of GDP. For each of the supply scenarios, higher levels of LNG exports in response to international demand consistently lead to higher levels of GDP. GDP achieved with the highest level of LNG exports in each group exceeds GDP with the lowest level of LNG exports by $13 to $72 billion in 2040 (in constant 2016 dollars).
- About 80% of the increase in LNG exports is satisfied by increased U.S. production of natural gas, with positive effects on labor income, output, and profits in the natural gas production sector.

- Chemical industry subsectors of the economy that rely heavily on natural gas for energy and as a feedstock continue to exhibit robust growth even at higher LNG export levels. This growth is only insignificantly slower than cases with lower LNG export levels.

- Even the most extreme scenarios of high LNG exports outside the more likely probability range (exhibiting a combined probability of less than 3%) show higher overall economic performance in terms of GDP, household income, and consumer welfare than lower export levels associated with the same domestic supply scenarios.[45]

d. DOE/FE Proceeding

On June 12, 2018, DOE published a notice of availability of the 2018 LNG Export Study and a request for comments.[46] The purpose of the notice of availability was "to enter the 2018 LNG Export Study into the administrative record of the 25 pending non-FTA export proceedings [identified in the notice] and to invite comments on the Study for consideration in the pending and future non-FTA application proceedings."[47] DOE received 19 comments on the 2018 LNG Export Study from a variety of sources, including participants in the natural gas industry, environmental organizations, and individuals.[48] Of those, nine comments supported the Study,[49]

[45] *See* 2018 Study Response to Comments, 83 Fed. Reg. at 67,255.
[46] *See* 2018 Study Notice.
[47] *Id*., 83 Fed. Reg. at 27,315.
[48] The public comments are posted on the DOE/FE website at: https://fossil.energy.gov/app/docketindex/docket/index/10.
[49] Supporting comments were filed by the Marcellus Shale Coalition; the Center for Liquefied Natural Gas (CLNG); the Pennsylvania Chamber of Business and Industry; the American Petroleum Institute (API); Cheniere Energy, Inc.; Jordan Cove Energy Project L.P. (JCEP); LNG Allies; NextDecade Corp.; and Anonymous. The Anonymous comment is comprised of five comments filed by the same anonymous author.

eight comments opposed the 2018 Study and exports of LNG,[50] one comment took no position,[51] and one comment was non-responsive.[52]

DOE/FE has evaluated the comments to the 2018 Study. DOE/FE summarized and responded to these comments in the Response to Comments document, published on December 28, 2018.[53] As explained in the Response to Comments, DOE/FE determined that none of the eight comments opposing the 2018 Study provided sufficient evidence to rebut or otherwise undermine the 2018 Study.[54]

DOE/FE incorporates into the record of this proceeding the 2018 LNG Export Study, the 2018 Study Notice, the public comments received on the 2018 Study, and the 2018 Study Response to Comments—which together constitute the full proceeding for the 2018 LNG Export Study.

e. DOE/FE Conclusions

Based upon the record in the 2018 Study proceeding, DOE/FE determined that the 2018 Study provides substantial support for non-FTA applications within the export volumes considered by the 2018 Study—ranging from 0.1 to 52.8 Bcf/d of natural gas.[55] The principal conclusion of the 2018 LNG Export Study is that the United States will experience net economic benefits from the export of domestically produced LNG.[56] DOE highlighted the following key findings of the Study:

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[50] Opposing comments were filed by Patricia Weber; Oil Change International; Food & Water Watch; Industrial Energy Consumers of America (IECA); Oregon Wild; Sierra Club; Deb Evans and Ron Schaaf (the Evans Schaaf Family); and Jody McCaffree (individually and as executive director of Citizens for Renewables/Citizens Against LNG). Oil Change International and Food & Water Watch filed identical comments.
[51] Comment of John Young.
[52] Comment of Vincent Burke.
[53] *See* 2018 Study Response to Comments, 83 Fed. Reg. at 67,260-72.
[54] *See id*. at 67,272.
[55] *See id*.
[56] *See id*.

- "Increasing U.S. LNG exports under any given set of assumptions about U.S. natural gas resources and their production leads to only small increases in U.S. natural gas prices."[57]

- "Increased exports of natural gas will improve the U.S. balance of trade and result in a wealth transfer into the United States."[58]

- "Overall [U.S.] GDP improves as LNG exports increase for all scenarios with the same U.S. natural gas supply condition.[59]

- "There is no support for the concern that LNG exports would come at the expense of domestic natural gas consumption."[60]

- "[A] large share of the increase in LNG exports is supported by an increase in domestic natural gas production."[61]

- "Natural gas intensive [industries] continue to grow robustly at higher levels of LNG exports, albeit at slightly lower rates of increase than they would at lower levels."[62]

DOE/FE also observed that EIA's projections in *Annual Energy Outlook 2018* (AEO 2018) showed market conditions that will accommodate increased exports of natural gas.[63] DOE/FE concluded that, when compared to prior AEO Reference cases—including AEO 2017's Reference case used in the 2018 Study—the AEO 2018 Reference case projected increases in domestic natural gas production in excess of what is required to meet projected increases in domestic consumption.[64]

For all of these reasons, DOE/FE found that "the 2018 LNG Export Study is fundamentally sound and supports the proposition that exports of LNG from the lower 48 states, in volumes up to and including 52.8 Bcf/d of natural gas, will not be inconsistent with the public

[57] *Id*. (quoting 2018 LNG Export Study at 55).
[58] 2018 Study Response to Comments, 83 Fed. Reg. at 67,273 (quoting 2018 LNG Export Study at 64).
[59] *Id*. (quoting 2018 LNG Export Study at 67).
[60] *Id*. (quoting 2018 LNG Export Study at 77).
[61] *Id*.
[62] *Id*. (quoting 2018 LNG Export Study at 70).
[63] U.S. Energy Info. Admin., *Annual Energy Outlook 2018* (with projections to 2050) (Feb. 6, 2018), *available at*: https://www.eia.gov/outlooks/aeo/pdf/AEO2018.pdf.
[64] 2018 Study Response to Comments, 83 Fed. Reg. at 67,273.

interest."[65] DOE stated, however, that it will consider each application to export LNG as required under the NGA and NEPA based on the administrative record compiled in each individual proceeding.[66]

B. DOE's Environmental Studies

On June 4, 2014, DOE/FE issued two notices in the *Federal Register* proposing to evaluate different environmental aspects of the LNG production and export chain. First, DOE/FE announced that it had conducted a review of existing literature on potential environmental issues associated with unconventional natural gas production in the lower-48 states. The purpose of this review was to provide additional information to the public concerning the potential environmental impacts of unconventional natural gas exploration and production activities, including hydraulic fracturing. DOE/FE published its draft report for public review and comment, entitled *Draft Addendum to Environmental Review Documents Concerning Exports of Natural Gas from the United States* (Draft Addendum).[67] DOE/FE received public comments on the Draft Addendum, and on August 15, 2014, issued the final Addendum with its response to the public comments contained in Appendix B.[68]

Second, DOE/FE commissioned the National Energy Technology Laboratory (NETL), a DOE applied research laboratory, to conduct an analysis calculating the life cycle greenhouse gas (GHG) emissions for LNG exported from the United States. The purpose of this analysis was to determine: (i) how domestically-produced LNG exported from the United States compares with

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[65] *Id*. (citing 2018 LNG Export Study at 63 & Appendix F).
[66] *See* 2018 Study Response to Comments, 83 Fed. Reg. at 67,273.
[67] Dep't of Energy, Draft Addendum to Environmental Review Documents Concerning Exports of Natural Gas From the United States, 79 Fed. Reg. 32,258 (June 4, 2014). DOE/FE announced the availability of the Draft Addendum on its website on May 29, 2014.
[68] Dep't of Energy, Addendum to Environmental Review Documents Concerning Exports of Natural Gas From the United States, 79 Fed. Reg. 48,132 (Aug. 15, 2014) [hereinafter Addendum]; *see also* http://energy.gov/fe/addendum-environmental-review-documents-concerning-exports-natural-gas-united-states.

regional coal (or other LNG sources) for electric power generation in Europe and Asia from a life cycle GHG perspective, and (ii) how those results compare with natural gas sourced from Russia and delivered to the same markets via pipeline. DOE/FE published NETL's report entitled, *Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States* (LCA GHG Report).[69] DOE/FE also received public comments on the LCA GHG Report and responded to those comments in prior orders.[70]

With respect to both the Addendum and the LCA GHG Report, DOE/FE takes all public comments into consideration in this decision and makes those comments, as well as the underlying studies, part of the record in this proceeding.

C. Judicial Decisions Upholding DOE's Non-FTA Authorizations

In 2015 and 2016, Sierra Club petitioned the U.S. Court of Appeals for the District of Columbia Circuit (D.C. Circuit) for review of five long-term LNG export authorizations issued by DOE/FE under the standard of review discussed below. Sierra Club challenged DOE/FE's approval of LNG exports from projects proposed or operated by the following authorization holders: Freeport LNG Expansion, L.P., *et al*.; Dominion Cove Point LNG, LP; Sabine Pass Liquefaction, LLC; and Cheniere Marketing, LLC, *et al*. The D.C. Circuit subsequently denied four of the five petitions for review: one in a published decision issued on August 15, 2017 (*Sierra Club I*),[71] and three in a consolidated, unpublished opinion issued on November 1, 2017

[69] Dep't of Energy, Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas From the United States, 79 Fed. Reg. 32,260 (June 4, 2014) [hereinafter LCA GHG Report]. DOE/FE announced the availability of the LCA GHG Report on its website on May 29, 2014.
[70] *See*, *e.g.*, *Magnolia LNG, LLC*, DOE/FE Order No. 3909, FE Docket No. 13-132-LNG, Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel From the Proposed Magnolia LNG Terminal to be Constructed in Lake Charles, Louisiana, to Non-Free Trade Agreement Nations, at 95-121 (Nov. 30, 2016) (description of LCA GHG Report and response to comments).
[71] *Sierra Club v. U.S. Dep't of Energy*, 867 F.3d 189 (Aug. 15, 2017) (denying petition for review of the LNG export authorization issued to Freeport LNG Expansion, L.P., *et al*.).

(*Sierra Club II*).[72] Sierra Club did not seek further judicial review of either decision. In January 2018, Sierra Club voluntarily withdrew its fifth and remaining petition for review.[73]

In *Sierra Club I*, the D.C. Circuit concluded that DOE/FE had complied with both section 3(a) of the NGA and NEPA in issuing the challenged non-FTA authorization to Freeport LNG Expansion, L.P. and its related entities (collectively, Freeport). DOE/FE had granted the Freeport application in 2014 in a volume equivalent to 0.4 Bcf/d of natural gas, finding that Freeport's proposed exports were in the public interest under NGA section 3(a). DOE/FE also considered and disclosed the potential environmental impacts of its decision under NEPA. Sierra Club petitioned for review of the Freeport authorization, arguing that DOE fell short of its obligations under both the NGA and NEPA. The D.C. Circuit rejected Sierra Club's arguments in a unanimous decision, holding that, "Sierra Club has given us no reason to question the Department's judgment that the [Freeport] application is not inconsistent with the public interest."[74]

First, the Court rejected Sierra Club's principal NEPA argument concerning the alleged indirect effects of LNG exports, such as the effects related to the likely increase in natural gas production and usage that would result from the Freeport export authorization.[75] The Court found that DOE "offered a reasonable explanation as to why it believed the indirect effects pertaining to increased [natural] gas production were not reasonably foreseeable."[76] The Court thus held that, "[u]nder our limited and deferential review, we cannot say that the Department

[72] *Sierra Club v. U.S. Dep't of Energy,* 703 Fed. Appx. 1 (D.C. Cir. Nov. 1, 2017) (denying petitions for review in Nos. 16-1186, 16-1252, and 16-1253 of the LNG export authorizations issued to Dominion Cove Point LNG, LP, Sabine Pass Liquefaction, LLC, and Cheniere Marketing, LLC, *et al*., respectively).
[73] *See Sierra Club v. U.S. Dep't of Energy*, No. 16-1426, Per Curiam Order (D.C. Cir. Jan. 30, 2018) (granting Sierra Club's unopposed motion for voluntary dismissal)
[74] *Sierra Club I,* 867 F.3d at 203.
[75] *Id.* at 192.
[76] *Id*. at 198.

failed to fulfill its obligation under NEPA by declining to make specific projections about environmental impacts stemming from specific levels of export-induced [natural] gas production."[77]

Second, the Court rejected Sierra Club's challenge to DOE's examination of the potential "downstream" GHG emissions resulting from the indirect effects of exports—*i.e.*, those resulting from the transport and usage of U.S. LNG abroad.[78] The Court pointed to DOE's LCA GHG Report, finding there was "nothing arbitrary" about the scope of DOE's analysis of GHG emissions in that Report.[79]

Third, in reviewing Sierra Club's claims under the NGA, the Court found that Sierra Club "repeats the same argument it made to support its NEPA claim—namely, that the Department arbitrarily failed to evaluate foreseeable indirect effects of exports."[80] Having "already rejected this argument" under NEPA, the Court determined that "Sierra Club offers no basis for reevaluating the scope of DOE's evaluation for purposes of the Natural Gas Act."[81]

Subsequently, in the consolidated *Sierra Club II* opinion issued on November 1, 2017, the D.C. Circuit ruled that "[t]he court's decision in [*Sierra Club I*] largely governs the resolution of the [three] instant cases."[82] Upon its review of the remaining "narrow issues" in those cases, the Court again rejected Sierra Club's arguments under the NGA and NEPA, and upheld DOE/FE's actions in issuing the non-FTA authorizations in those proceedings.[83] The D.C. Circuit's decisions in *Sierra Club I and II* guide our review in this proceeding.

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[77] *Id*. at 201.
[78] *Id*.
[79] *Id*. at 202.
[80] *Sierra Club I,* 867 F.3d at 203.
[81] *Id.*
[82] *Sierra Club II,* 703 Fed. Appx. 1, at *2.
[83] *Id*.

III. PUBLIC INTEREST STANDARD

Section 3(a) of the NGA sets forth the standard for review of the Application:

> [N]o person shall export any natural gas from the United States to a foreign country or import any natural gas from a foreign country without first having secured an order of the [Secretary of Energy[84]] authorizing it to do so. The [Secretary] shall issue such order upon application, unless after opportunity for hearing, [he] finds that the proposed exportation or importation will not be consistent with the public interest. The [Secretary] may by [the Secretary's] order grant such application, in whole or part, with such modification and upon such terms and conditions as the [Secretary] may find necessary or appropriate.[85]

DOE—as affirmed by the D.C. Circuit—has consistently interpreted NGA section 3(a) as creating a rebuttable presumption that a proposed export of natural gas is in the public interest.[86] Accordingly, DOE will conduct an informal adjudication and grant a non-FTA application unless DOE finds that the proposed exportation will not be consistent with the public interest.[87] Before reaching a final decision, DOE must also comply with NEPA.

Although NGA section 3(a) establishes a broad public interest standard and a presumption favoring export authorizations, the statute does not define "public interest" or identify criteria that must be considered in evaluating the public interest. In prior decisions, DOE has identified a range of factors that it evaluates when reviewing an application for export authorization. These factors include economic impacts, international impacts, security of natural

[84] The Secretary's authority was established by the Department of Energy Organization Act, 42 U.S.C. § 7172, which transferred jurisdiction over imports and export authorizations from the Federal Power Commission to the Secretary of Energy.
[85] 15 U.S.C. § 717b(a).
[86] *See Sierra Club*, 867 F.3d at 203 ("We have construed [NGA section 3(a)] as containing a 'general presumption favoring [export] authorization.'") (quoting *W. Va. Pub. Serv. Comm'n v. U.S. Dep't of Energy*, 681 F.2d 847, 856 (D.C. Cir. 1982)).
[87] *See id.* ("there must be 'an affirmative showing of inconsistency with the public interest' to deny the application" under NGA section 3(a)) (quoting *Panhandle Producers & Royalty Owners Ass'n v. Econ. Regulatory Admin.*, 822 F.2d 1105, 1111 (D.C. Cir. 1987)).

gas supply, and environmental impacts, among others. To conduct this review, DOE looks to record evidence developed in the application proceeding.

DOE's prior decisions have also looked to certain principles established in its 1984 Policy Guidelines.[88] The goals of the Policy Guidelines are to minimize federal control and involvement in energy markets and to promote a balanced and mixed energy resource system. The Guidelines provide that:

> The market, not government, should determine the price and other contract terms of imported [or exported] natural gas …. The federal government's primary responsibility in authorizing imports [or exports] will be to evaluate the need for the gas and whether the import [or export] arrangement will provide the gas on a competitively priced basis for the duration of the contract while minimizing regulatory impediments to a freely operating market.[89]

While the Policy Guidelines are nominally applicable to natural gas import cases, DOE subsequently held in Order No. 1473 that the same Policy Guidelines should be applied to natural gas export applications.[90]

In Order No. 1473, DOE stated that it was guided by DOE Delegation Order No. 0204-111.[91] That delegation order directed the regulation of exports of natural gas "based on a consideration of the domestic need for the gas to be exported and such other matters as the Administrator [of the Economic Regulatory Administration] finds in the circumstances of a particular case to be appropriate."[92]

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[88] New Policy Guidelines and Delegations Order Relating to Regulation of Imported Natural Gas, 49 Fed. Reg. 6684 (Feb. 22, 1984) [hereinafter 1984 Policy Guidelines].
[89] *Id*. at 6685.
[90] *Phillips Alaska Natural Gas Corp.*, *et al*., DOE/FE Order No. 1473, FE Docket No. 96-99-LNG, Order Extending Authorization to Export Liquefied Natural Gas from Alaska, at 14 (Apr. 2, 1999) (citing *Yukon Pacific Corp.*, DOE/FE Order No. 350, Order Granting Authorization to Export Liquefied Natural Gas from Alaska, 1 FE ¶ 70,259, at 71,128 (1989)).
[91] *See id*. at 13 and n.45.
[92] DOE Delegation Order No. 0204-111 (Feb. 22, 1984), at 1 (¶ (b)); *see also* 1984 Policy Guidelines, 49 Fed. Reg. at 6690 (incorporating DOE Delegation Order No. 0204-111). In February 1989, the Assistant Secretary for Fossil

Although DOE Delegation Order No. 0204-111 is no longer in effect, DOE's review of export applications has continued to focus on: (i) the domestic need for the natural gas proposed to be exported, (ii) whether the proposed exports pose a threat to the security of domestic natural gas supplies, (iii) whether the arrangement is consistent with DOE's policy of promoting market competition, and (iv) any other factors bearing on the public interest, as determined by DOE.

IV. DESCRIPTION OF REQUEST

A. Description of Applicant and Updated Ownership Information

GLLC is a Delaware limited liability company with its principal place of business in Birmingham, Alabama.[93] GLLC is a wholly owned subsidiary of Gulf LNG Holdings Group, LLC (Gulf LNG Holdings).[94]

In the Update, GLLC informed DOE/FE that the ownership of Gulf LNG Holdings has changed since it filed its Application. According to GLLC, Gulf LNG Holdings' ownership is currently as follows:

- Kinder Morgan, Inc., indirectly through its wholly owned subsidiary, Southern Gulf LNG Company, LLC, owns 50%;
- A subsidiary of Thunderbird Resources Equity, Inc., which is partially owned and controlled by GSO Capital Partners (a wholly owned subsidiary of The Blackstone Group, LP) owns 30%;
- A subsidiary of Zenith Energy U.S., L.P., a privately held company controlled by Warburg Pincus LLC, Kelso and Company, and certain members of Zenith management, owns 15.83846%; and

Energy assumed the delegated responsibilities of the Administrator of the Economic Regulatory Administration. *See* Applications for Authorization to Construct, Operate, or Modify Facilities Used for the Export or Import of Natural Gas, 62 Fed. Reg. 30,435, 30,437 n.15 (June 4, 1997) (citing DOE Delegation Order No. 0204-127, 54 Fed. Reg. 11,436 (Mar. 20, 1989)).

[93] App. at 4.

[94] *Id*.; *see also* Update at 1.

- Chatham Holdings IV, LLC, a subsidiary of Chatham Asset Management, LLC, which is directed by Chatham Asset, GP, LLC, owns 4.16154%.[95]

We construe GLLC's Update to its then-pending Application as a notification about a change in its upstream ownership, pursuant to DOE/FE's Change in Control Procedures.[96]

B. Gulf LNG Liquefaction Project

GLLC states that the proposed Gulf LNG Liquefaction Project will be located on and adjacent to the footprint of the currently operating import facilities at the Gulf LNG Terminal in Jackson County, Mississippi.[97] The import terminal includes a marine berthing facility; two full containment LNG storage tanks capable of storing a total of approximately 320,000 cubic meters of LNG; and a storm surge protection wall surrounding the facilities. Additionally, the import terminal has a storage capacity of 6.6 Bcf of natural gas.[98]

As approved by FERC, the Gulf LNG Liquefaction Project will include (but is not limited to) the following facilities:

- Two natural gas liquefaction trains, each with a maximum capacity of more than 5.4 mtpa;
- Pretreatment facilities and ancillary and support facilities;
- An extension of the storm surge protection system; and
- Two marine offloading facilities (one permanent and one temporary).[99]

In sum, the Project will enable the receipt, treatment, liquefaction, and export of up to 10.85 mtpa of natural gas as LNG.[100]

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[95] Update at 1-2.
[96] *See* U.S. Dep't of Energy, Procedures for Changes in Control Affecting Applications and Authorizations to Import or Export Natural Gas, 79 Fed. Reg. 65,541 (Nov. 5, 2014) (procedures for changes in control applicable to pending non-FTA applications).
[97] *See* App. at 1, 6; FERC Order at ¶¶ 6, 12; final EIS at ES-2.
[98] FERC Order at ¶ 3; *see also* App. at 6.
[99] FERC Order at ¶ 7; *see also* App. at 5-6; final EIS at ES-2 to ES-3.
[100] *Id*. at ¶ 6.

C. Project Pipelines

Gulf Pipeline owns and operates an approximately 5-mile long natural gas pipeline (the Gulf Pipeline) that connects the Gulf LNG Terminal with two interstate pipeline systems (owned by Gulfstream Natural Gas System, LLC and Destin Pipeline Company, LLC) and with the BP Gas Processing Facility.[101] Additionally, Florida Gas Transmission Company, LLC (Florida Gas) and Transcontinental Gas Pipe Line Company, LLC (Transco) operate the Pascagoula Lateral, extending from an interconnection with the Gulf Pipeline facilities to interconnections with Florida Gas and Transco.[102]

As approved by FERC, Gulf Pipeline will modify its existing pipeline system to provide bi-directional flow, thus allowing natural gas to flow to or from the expanded Gulf LNG Terminal and its existing intra- and interstate pipeline interconnections.[103]

D. Source of Natural Gas

GLLC states that natural gas to be exported from the Project will be sourced using the integrated U.S. natural gas pipeline system, thus providing access to both conventional and unconventional supply basins throughout the United States.[104] According to GLLC, this access will ensure maximum flexibility to source natural gas based on prevailing supply and market conditions.[105]

E. Business Model

GLLC requests authorization to export LNG to non-FTA countries on its own behalf and as agent for other entities that will hold title to the LNG at the time of export.[106] GLLC states

[101] FERC Order at ¶ 4.
[102] *Id*. at ¶ 5.
[103] *Id*. at ¶ 7 n.12; *see also* final EIS at ES-3.
[104] App. at 3.
[105] *Id* at 6, 10.
[106] *Id*. at 7.

that it will comply with all DOE/FE requirements for exporters and agents, including filing any long-term natural gas supply or export contracts with DOE once those agreements are executed. GLLC further states that, when acting as agent, it will register with DOE/FE each LNG title holder for which it seeks to export LNG as agent, and will comply with other registration requirements as set forth in recent DOE/FE orders.[107]

V. APPLICANT'S PUBLIC INTEREST ANALYSIS

A. Overview

GLLC asserts that the requested authorization to export LNG to non-FTA countries is not inconsistent with the public interest and should be granted.[108] In support of this position, GLLC addresses the following factors: (i) the economic impacts of the proposed exports, including regional benefits; (ii) impacts on domestic natural gas supply and demand; (iii) international benefits; and (iv) environmental benefits.

GLLC relies, in part, on two studies that it commissioned Navigant Consulting, Inc. (Navigant) to undertake. First, the Navigant Market Analysis Study—attached as Appendix A to the Application—analyzed the possible impacts that GLLC's proposed exports would have on natural gas supply and pricing.[109] Second, the Navigant Economic Impact Assessment Study—attached as Appendix B to the Application—evaluated the "material economic benefits in the Southeast region" where the Project is to be located.[110] These studies are discussed below.

B. Domestic Need for the Natural Gas to be Exported

GLLC asserts that, under all scenarios analyzed in the Navigant Market Analysis Study, U.S. total and recoverable reserves of natural gas will be far in excess of total natural gas

[107] *Id.* at 7-9.
[108] *Id*. at 11.
[109] *Id*. at 12; *see also id*. at 16 n.28.
[110] App. at 12; *see also id*. at 27 n.73.

demand during the period of the requested export authorization.[111] Citing the Navigant Market Analysis Study and other third-party studies, GLLC states that the United States can meet domestic demand for natural gas with domestic natural gas resources for more than 90 years (based on 2011-era projections).[112] GLLC also points to EIA's *Annual Energy Outlook 2012* (AEO 2012), which projected that domestic natural gas production will grow more quickly than domestic demand for consumption.[113]

Additionally, GLLC cites a number of reports illustrating that demand for natural gas in the U.S. industrial, residential, and commercial sectors is unlikely to outpace supply.[114] For example, the Navigant Market Analysis Study showed that the proposed exports would have "little effect on the overall total of demand for natural gas in the U.S."[115] Citing this Study, GLLC states that, "[c]ontrary to the concerns expressed that LNG exports will deplete U.S. resources, the demand induced by such exports will incentive production, yielding net positives across all scenarios."[116] In sum, GLLC maintains that "the U.S. has sufficient natural gas resources available at modest prices to meet domestic demand over the 20-year [authorization] period."[117]

C. Economic Impacts

GLLC states that the Navigant Market Analysis Study supports the conclusion that its proposed exports will have a "minimal impact" on domestic natural gas prices.[118] According to GLLC, any "upward pressure" on prices due to increased demand for exports would likely be

[111] *Id*. at 20; *see also generally id*. at 15-27.
[112] *Id.* at 17.
[113] *Id*. at 15.
[114] *Id*. at 17-19.
[115] *Id*. at 22.
[116] App. at 22.
[117] *Id*. at 26-27.
[118] *Id*. at 25.

offset by a reduction in domestic price volatility—thus encouraging natural gas production in the United States.[119] For these reasons, GLLC asserts that U.S. LNG exports, including its proposed exports, will "encourage a more reliable and stable domestic natural gas market with less volatility, which will benefit all market participants.[120]

Next, citing the Navigant Economic Impact Assessment Study, GLLC asserts that the Gulf LNG Liquefaction Project "will significantly stimulate local, regional and national economies during both [the] construction and operation phases"[121] as well as provide additional economic benefits associated with the exploration and production of natural gas to support its authorization.[122] In particular, GLLC identifies the economic benefits expected to occur on a regional basis in and around the city of Pascagoula (including elsewhere in Mississippi and Alabama), driven by the creation of thousands of jobs related to the Project's construction, operation, and maintenance.[123]

GLLC further states that its Project will enhance the value of existing LNG-associated infrastructure, add to the local property tax base, and generate additional federal and state tax revenues.[124] Thus, on the basis of the Navigant Economic Impact Assessment Study, GLLC maintains that "[j]ob creation, indirect spending and tax revenue will all see positive growth as a result" of its proposed exports.[125]

[119] *Id*. at 25-26.
[120] *Id*. at 12.
[121] *Id*. at 27.
[122] App. at 29.
[123] *Id*. at 28-29.
[124] *Id*. at 29-30.
[125] *Id*. at 27.

D. International Benefits

GLLC states that its proposed exports will help to stabilize global energy markets at a time when demand for U.S. natural gas is expected to grow, particularly in Asia.[126] GLLC contends that its exports will provide an alternative source of supply and alternative pricing in the global natural gas market by, for example, reducing European reliance on Russian natural gas supplies that are tied to high oil-indexed pricing.[127]

GLLC further states that its exports will have wider geopolitical benefits in support of U.S. policy—including the liberalization of the global natural gas market by "fostering increased liquidity and trade prices established by market forces."[128] According to GLLC, the ability of U.S. LNG exports to diversify global LNG supplies will provide economic and strategic benefits to the United States and its allies.[129]

Additionally, GLLC notes that its exports will help to realign the U.S. balance of trade by reducing the U.S. trade deficit.[130]

E. Environmental Benefits

GLLC states that its exports will provide environmental benefits, namely by enabling overseas generators to switch from oil or coal to cleaner natural gas.[131] GLLC also maintains that its Project will have "relatively small environmental impacts" because the construction will take place entirely within a brownfield development area.[132]

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[126] *Id*. at 30-31.
[127] *Id*. at 31-33.
[128] App. at 32.
[129] *Id*. at 32-35.
[130] *Id*. at 31-32.
[131] *Id*. at 35 (citation omitted).
[132] *Id*. at 3, 35.

VI. FERC PROCEEDING

A. FERC's Pre-Filing Procedures

Authorizations issued by FERC permitting the siting, construction, and operation of LNG export terminals are reviewed under NGA section 3(a) and (e), 15 U.S.C. § 717b(a), (e). FERC's approval process for such an application consists of a mandatory pre-filing process during which the environmental review required by NEPA commences,[133] and a formal application process that starts no sooner than 180 days after issuance of a notice that the pre-filing process has commenced.[134]

On May 21, 2014, FERC began its pre-filing review of the Gulf LNG Liquefaction Project.[135] FERC established pre-filing Docket No. PF13-4-000 to place information related to the Project into the public record.[136] On July 31, 2014, FERC issued a Notice of Intent to Prepare an Environmental Impact Statement for the proposed Project.[137] DOE agreed to participate as a cooperating agency in FERC's environmental review.[138]

B. FERC's Environmental Review

On June 19, 2015, GLLC, Gulf Energy, and Gulf Pipeline together filed an application with FERC under section 3 of the NGA to site, construct, and operate the Gulf LNG

[133] 18 C.F.R. § 157.21.
[134] *Id*. § 157.21(a)(2)(i-ii).
[135] *See* final EIS at ES-3; *see also* Gulf LNG Liquefaction Company, LLC, *et al*., Approval to Initiate the Commission's Pre-Filing Process for the GLLC Liquefaction Project, FERC Docket No. PF13-4-000 (May 21, 2014).
[136] *See* final EIS at ES-3.
[137] Gulf LNG Liquefaction Company, LLC, *et al*., Notice of Intent to Prepare an Environmental Impact Statement for the Planned Gulf LNG Liquefaction Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Meeting, FERC Docket No. PF13-4-000, 79 Fed. Reg. 46,793 (Aug. 11, 2014); *see also* final EIS at ES-3.
[138] Final EIS at ES-1.

Liquefaction Project, and—in the case of Gulf Pipeline—to make minor modifications to the Gulf Pipeline.[139] FERC assigned Docket No. CP15-521-000 to the proposal.

In compliance with NEPA, FERC staff issued a Notice of Availability of a Draft Environmental Impact Statement on November 15, 2018, and placed the draft EIS into the public record.[140] On April 17, 2019, FERC staff issued the final EIS for the Gulf LNG Liquefaction Project.[141] The final EIS responded to comments received on the draft EIS, and addressed numerous potential impacts of the Project, including (but not limited to) wetlands, geological conditions, water resources, air quality, and cumulative impacts.

Based on its environmental analysis, FERC staff concluded in the final EIS that "approval of the proposed Project, with the mitigation measures recommended in the EIS, would have some adverse environmental impacts; however, these impacts would be avoided or reduced to less-than-significant levels."[142] The final EIS contained 131 site-specific environmental mitigation measures, which it recommended that FERC attach as conditions to any authorization of the Project.[143]

C. FERC's Order Granting Authorization

On July 16, 2019, FERC issued its Order authorizing GLLC and Gulf Energy under section 3 of the NGA to site, construct, and operate the Gulf LNG Liquefaction Project with a liquefaction capacity of up to 10.85 mtpa of LNG.[144] FERC also authorized Gulf Pipeline to

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[139] *See* Gulf LNG Liquefaction Company, LLC, *et al*., Notice of Application for Authorizations under the Natural Gas Act, FERC Docket Nos. PF13-4-000 and CP15-521-000 (July 1, 2015); *see also* ES-11.
[140] *See* Gulf LNG Liquefaction Company, LLC, *et al*., Notice of Availability of the Draft Environmental Impact Statement for the Proposed Gulf LNG Liquefaction Project, Docket No. CP15-521-000 (Nov. 15, 2018); *see also* ES-4; FERC Order at ¶ 17.
[141] FERC Order at ¶ 18.
[142] Final EIS at 1.
[143] *See id*. at 5-12 to 5-29 (list of mitigation measures); *see also* FERC Order at ¶ 18.
[144] FERC Order at ¶¶ 1, 15, 66 (Ordering Para. (A)).

make related modifications to its pipeline facilities under its Part 157 blanket construction certificate.[145]

In granting the authorization, FERC cited the final EIS in stating that "most of the direct environmental impacts from construction of the proposed facilities would be temporary or short term."[146] FERC further concluded that "[a]ll impacts from construction and operation of the facilities will be reduced to less-than-significant levels if the project is constructed and operated in accordance with applicable laws and regulations and the environmental mitigation measures recommended in the final EIS and adopted by this order."[147] On this basis, FERC found that the Gulf LNG Liquefaction Project "is not inconsistent with the public interest."[148] FERC also adopted the 131 environmental mitigation measures recommended in the final EIS and included them as conditions in an appendix to the Order.[149]

FERC reviewed and addressed the major environmental issues addressed in the final EIS.[150] For example, FERC pointed to the estimate in the final EIS that "operation of the export project may result in an incremental increase in GHG emissions of up to 2,621,009 mtpy of carbon dioxide equivalent (CO_2e), and a total of 3,086,998 CO_2e GHG emissions including existing facility GHG emissions."[151] FERC further stated that the "operational emissions of these facilities could potentially increase annual CO_2e emissions based on the 2017 levels by approximately 0.05 percent at the national level."[152]

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[145] *Id*. at ¶¶ 1, 7 n.12.
[146] *Id*. at ¶ 12 (citing final EIS at 5-1).
[147] *Id*.
[148] *Id*. at ¶ 15; *see also id*. at ¶ 64.
[149] *Id*. at ¶¶ 15, 63-64, and Appendix (Environmental Conditions).
[150] *See generally* FERC Order at ¶¶ 19-65.
[151] *Id*. at ¶ 54 (citing final EIS at 4-112, 4-114, and 4-121).
[152] *Id*.

On the basis of these estimates, FERC acknowledged the finding in the final EIS that "the quantified GHG emissions from the construction and operation of the project will contribute incrementally to climate change."[153] However, FERC stated that it "has previously concluded it could not determine a project's incremental physical impacts on the environment caused by GHG emissions," and therefore "concluded it could not determine whether a project's contribution to climate change would be significant."[154]

Additionally, FERC considered the cumulative impacts of the Gulf LNG Liquefaction Project with other projects or actions in the same geographic and temporal scope.[155] Citing the final EIS, FERC observed that "the project would not significantly impact resources within cumulative impact geographic areas, but would, when considering nearby concurrent construction, result in increased workers, substantial traffic, and effects on public services in the area."[156] FERC noted, however, that with the mitigation measures proposed by GLLC, the construction-related impacts on local traffic and barge traffic would be temporary.[157]

In sum, FERC agreed with the conclusions presented in the final EIS and found that "the project, if constructed and operated as described in the final EIS, is an environmentally acceptable action."[158]

[153] *Id*. at ¶ 55 (citing final EIS at 4-230).
[154] *Id*. (citations omitted).
[155] *Id*. at ¶ 61 (citing final EIS at 4-196 to 4-197).
[156] FERC Order at ¶ 61 (citing final EIS at ES-9).
[157] *Id.* at ¶ 46.
[158] *Id.* at ¶ 64.

VII. CURRENT PROCEEDING BEFORE DOE/FE

A. Overview

In response to the Notice of Application, DOE/FE received one filing: Sierra Club's motion to intervene, protest, and comments.[159] GLLC did not submit a response to Sierra Club's filing.

B. Sierra Club's Motion to Intervene, Protest, and Comments

In support of its motion to intervene, Sierra Club states that its members live and work throughout the area that will be affected by the Gulf LNG Liquefaction Project, including in the regions of Mississippi that will be affected by the associated infrastructure. Additionally, Sierra Club states that its members live in the domestic natural gas fields that will likely see increased production as a result of GLLC's exports, and that its members everywhere will be affected by increased natural gas prices resulting from the proposed exports.[160] Sierra Club states that, as of January 2013, it had 1,319 members in Mississippi and 590,264 members overall. Sierra Club states that its members have vital economic, aesthetic, spiritual, personal, and professional interests in the proposed Gulf LNG Liquefaction Project.[161]

In protesting the Application, Sierra Club contends that exports from the Gulf LNG Liquefaction Project are not in the public interest and are not supported by adequate environmental and economic analysis, as is required to satisfy the NGA and NEPA. Sierra Club argues that: (i) the construction and operation of the Gulf LNG Liquefaction Project, the proposed pipeline lateral, and other infrastructure will directly impact the environment; (ii) exports from the Project will induce additional natural gas production—primarily the hydraulic

[159] *See* Sierra Club, Motion to Intervene, Protest, and Comments, FE Docket No. 12-101-LNG (Jan. 4, 2013) [hereinafter Sierra Club Mot.].
[160] *Id*. at 2.
[161] *Id*.

fracturing of unconventional natural gas sources—with associated environmental harms; and (iii) exports from the Project will result in increased natural gas prices and an increase in coal-fired electricity generation, thereby increasing emissions of greenhouse gases, as well as emissions of conventional and toxic air pollutants.[162] Below, we summarize Sierra Club's principal arguments.

a. Public Interest Analysis

Sierra Club argues that the NGA and NEPA impose obligations upon DOE that must be considered before it can authorize the proposed exports. In this regard, Sierra Club argues that DOE/FE must reject its position that domestic need is the only factor to be considered in the public interest analysis under NGA section 3(a).[163] Sierra Club also challenges DOE/FE's reliance on the 1984 Policy Guidelines in evaluating the public interest, stating that, although the Policy Guidelines are "germane here," they are "merely guidelines" and thus cannot create a norm binding DOE.[164]

b. Alleged Need for Programmatic EIS

Sierra Club maintains that DOE/FE's analysis must not be confined only to the local, direct effects of the Application, but must also consider the indirect and cumulative effects from GLLC's proposal and all other LNG export proposals currently pending before DOE/FE and FERC.[165]

Sierra Club further contends that a programmatic EIS is appropriate here.[166] In support of this argument, Sierra Club states that, "because the effects of [LNG] projects are cumulative,

[162] *See id*. at 4.
[163] *Id*. at 5-7.
[164] *Id*. at 6 n.7 (quotation and citation omitted).
[165] Sierra Club Mot. at 9, 12.
[166] *Id*. at 9-10, 12-13.

and because each approval alters the price and production effects of exports, DOE/FE must consider these projects' interactions."[167] Sierra Club argues that DOE/FE can best conduct this analysis in the context of a programmatic EIS that considers the impacts of all natural gas export proposals at once.[168]

c. Alleged Environmental Impacts of the Requested Authorization, Including Induced Natural Gas Production

Sierra Club asserts that construction and operation of the Gulf LNG Liquefaction Project will impose a range of significant local environmental impacts, including but not limited to air pollution, disruption of aquatic habitat, increased noise and light pollution, and impacts on fish and wildlife.[169]

Addressing potential air pollution, Sierra Club contends that construction and operation of the Gulf LNG Liquefaction Project will emit harmful quantities of carbon monoxide, nitrogen oxides, volatile organic compounds, and GHGs, and also will likely emit harmful sulfur dioxides and particulate matter. Sierra Club asserts that each of these types of emissions will have injurious environmental and health impacts.[170]

Next, Sierra Club argues that the Gulf LNG Liquefaction Project will cause environmental impacts greater than the local impacts because the planned exports will induce additional natural gas production in the United States.[171] Sierra Club asserts that the impacts of induced natural gas production are reasonably foreseeable, and that NEPA and the NGA require DOE/FE to consider the effects of this additional natural gas production.[172] Sierra Club asserts

[167] *Id*. at 12.
[168] *Id.* at 13.
[169] *Id.* at 18-23.
[170] *See id*. at 19-23.
[171] Sierra Club Mot. at 23.
[172] *Id*. at 23, 26-29.

that much of the induced production will come from shale gas and other unconventional sources.[173] In the context of this proceeding, Sierra Club states that the requested authorization could induce approximately 0.8 Bcf/d of natural gas from shale gas and other unconventional sources.[174]

Sierra Club maintains that available tools enable DOE/FE and GLLC to predict where this increased natural gas production will occur. Sierra Club points to the Application, where GLLC indicates that the most likely sources of natural gas for the proposed exports are "from Texas and Louisiana."[175] Sierra Club cites EIA's National Energy Modeling System (NEMS) in arguing that models can provide more sophisticated predictions as to where production supplying additional exports from the Project would occur.

Sierra Club states that NEPA regulations, applicable case law, and recent EPA scoping comments call for DOE/FE to consider the environmental effects of induced natural gas production because "induced production is not only an effect of the project—it is part of the justification offered for it" and "is therefore plainly a 'reasonably foreseeable' effect" that DOE/FE must analyze and consider.[176]

Moreover, Sierra Club contends that "[n]atural gas production—from both conventional and unconventional sources—is a significant air pollution source, can disrupt ecosystems and watersheds, leads to industrialization of entire landscapes, and presents challenging waste disposal issues."[177] Sierra Club asserts that the proposed Project will induce significant production-related air emissions. Specifically, Sierra Club asserts that the new natural gas

[173] *Id.* at 24, 29.
[174] *Id*.
[175] *Id*. (citing App., Appendix B, at 40).
[176] *Id.* at 26.
[177] Sierra Club Mot. at 29.

demand caused by the requested authorization allegedly will be responsible for an increase in emissions of methane, volatile organic compounds, sulfur dioxide, hydrogen sulfide, and particulate matter.[178]

Sierra Club argues that natural gas production also poses risks to ground and surface water. Sierra Club notes that most of the increased production will involve hydraulic fracturing, a process of injecting various chemicals into gas-bearing formations at high pressures to fracture rock and release natural gas. According to Sierra Club, each step of this process requires large quantities of water that could drastically impact aquatic ecosystems and human communities. Sierra Club also contends that hydraulic fracturing poses a serious risk of groundwater contamination from the chemicals added to the drilling mud and fracturing fluid and from naturally occurring chemicals in deeper formations mobilized during the hydraulic fracturing process. Sierra Club asserts that hydraulic fracturing has resulted in groundwater contamination in numerous documented instances.[179]

Sierra Club states that natural gas production, particularly hydraulic fracturing, produces liquid and solid wastes, including drilling mud, drill cuttings, "flowback," and produced water. Sierra Club states that these wastes are often stored on site in open pits that can have harmful air emissions and can leach into shallow groundwater. Sierra Club also notes that flowback and produced water must be disposed offsite, with a common method being underground injection wells. Sierra Club claims that underground injection of hydraulic fracturing wastewater appears to have induced earthquakes in several regions—a phenomenon known as induced seismicity.[180]

[178] *Id*. at 30-39.
[179] *Id*. at 42-47.
[180] *Id*. at 47-50.

In addition to the air and water pollution impacts of natural gas, Sierra Club argues that increased natural gas production will transform the landscape of regions overlying shale gas plays, bringing industrialization to previously rural landscapes and significantly affecting ecosystems, plants, and animals.[181]

Sierra Club further asserts that, in addition to the above-described production-related impacts, exports from the Gulf LNG Liquefaction Project will increase air pollution by increasing the amount of coal used for domestic electricity production.[182]

Additionally, Sierra Club argues that LNG exports will increase GHG emissions both domestically and globally. Sierra Club contends that a 2012 study by the International Energy Agency predicts that international trade in LNG will lead many countries to use natural gas in place of renewable energy (instead of displacing fossil fuels).[183] Even assuming importing countries substitute natural gas for coal or fuel oil, Sierra Club claims that the liquefaction, transportation, and regasification process is energy intensive and increases the lifecycle GHG emissions of LNG compared to methods of consumption where the natural gas remains in a gaseous phase. Sierra Club argues that, for these reasons, U.S. LNG has little, if any, advantage over coal, and thus it is unlikely that LNG exports will reduce global GHG emissions.[184]

d. Alleged Economic Impacts

Turning to economic harms, Sierra Club broadly contends that the proposed exports will increase domestic natural gas prices, and that those price increases will harm the majority of the

[181] *Id*. at 39-42.
[182] *Id*. at 54-56.
[183] Sierra Club Mot. at 57.
[184] *Id*. at 57-62.

American public by decreasing real wages and reducing employment in energy-intensive industries.[185]

Sierra Club alleges that GLLC overstates the economic benefits associated with the proposed exports because it relies on a "flawed 'input-output' method of assessing economic consequences."[186] According to Sierra Club, the Navigant Economic Impact Assessment Study fails to provide a counterfactual analysis considering how the proposed action might displace other economic activity. Sierra Club thus argues that "[j]obs associated with production that would have occurred anyway are not 'created by' the GLLC project, and cannot be treated as a benefit of the project."[187]

The most immediate and dramatic economic effect of exports, according to Sierra Club, will be job losses in energy intensive industries, such as manufacturing.[188] Sierra Club adds that even natural gas-producing regions likely will be worse off in the long term, despite short-term job growth as a result of increased natural gas production.[189] Sierra Club contends that GLLC (and the 2012 NERA Study) fail to adequately address the disruption of communities caused by induced natural gas production due to the "boom-bust" cycle associated with extractive industries and the inability of many regions to convert temporary boom cycles into permanent growth.[190] Sierra Club further faults the 2012 NERA Study for failing to give adequate weight to the negative economic impacts of LNG exports on wage-earning households and for assuming (incorrectly, in Sierra Club's view) that "consumers" in general will derive benefits from owning equity stakes in companies within the natural gas industry.[191]

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[185] *Id*. at 50, 62-66.
[186] *Id.* at 62.
[187] *Id.* at 63; *see also id*. at 64-65.
[188] *Id.* at 4, 18, 50, 64-66.
[189] Sierra Club Mot. at 66.
[190] *Id*.
[191] *Id.* at 65-66.

In sum, Sierra Club asserts that the Gulf LNG Liquefaction Project, alone or considered in tandem with other export approvals, will increase natural gas prices, lower wages, lower employment, and remove wealth from most of the economy, concentrating any gains within the narrow sector of the American economy that owns LNG and natural gas capital.

VIII. DISCUSSION AND CONCLUSIONS

In reviewing GLLC's Application, DOE/FE has considered both its obligations under NGA section 3(a) and NEPA. To accomplish these purposes, DOE/FE has examined a wide range of information addressing environmental and non-environmental factors, including:

- The Application, the Update to the Application, and Sierra Club's filing in opposition to the Application;
- FERC's final EIS and July 16, 2019 Order, including the 131 environmental conditions adopted in that Order;
- The Draft Addendum, comments received in response to the Draft Addendum, and the final Addendum;
- The LCA GHG Report (and the supporting NETL document), including comments submitted in response to those documents; and
- The 2018 LNG Export Study, including comments received in response to that Study.

A. Procedural Matters

Sierra Club's motion to intervene was granted by operation of law under 10 C.F.R. § 590.303(g) when GLLC did not oppose or otherwise answer the motion.[192]

[192] *See infra* § XI (Ordering Para. Q).

B. Non-Environmental Issues

1. Public Interest Standard

As discussed above (*supra* § 3), NGA section 3(a) requires DOE to evaluate whether a proposed export of natural gas to non-FTA countries will be "consistent with the public interest."[193] Sierra Club contends that DOE/FE may not rely on the 1984 Policy Guidelines in evaluating the public interest, as those Guidelines were promulgated for natural gas imports rather than exports and are not binding.

A public interest standard in a statute is understood to be an "'instrument for the exercise of discretion by the expert body which Congress has charged to carry out its legislative policy.'"[194] Accordingly, in prior proceedings, DOE/FE has identified a range of factors that it considers in evaluating the public interest. DOE's review of applications to export U.S. LNG focuses on: (i) the domestic need for the natural gas proposed to be exported, (ii) whether the proposed exports pose a threat to the security of domestic natural gas supplies, (iii) whether the arrangement is consistent with DOE's policy of promoting market competition, and (iv) any other factors bearing on the public interest, as determined by DOE. DOE/FE previously determined that the goals of the 1984 Policy Guidelines—to minimize federal control and involvement in energy markets and to promote a balanced and mixed energy resource system—apply to exports of natural gas, as well as imports.[195] In *Sierra Club I* and *II*, the D.C. Circuit upheld DOE/FE's decision-making on the basis of this statutory and regulatory framework.[196]

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[193] 15 U.S.C. § 717b(a).
[194] *See*, *e.g.*, *Federal Comm. Comm'n v. WNCN Listeners Guild*, *et al.*, 450 U.S. 582, 593 (1981) (quoting *Federal Comm. Comm'n v. Pottsville Broadcasting Co.*, 309 U.S. 134, 308 (1940)).
[195] *See Phillips Alaska Natural Gas Corp.*, *et al.*, DOE/FE Order No. 1473, FE Docket No. 96-99-LNG, Order Extending Authorization to Export Liquefied Natural Gas from Alaska, at 14 (Apr. 2, 1999).
[196] *See*, *e.g.*, *Sierra Club I*, 867 F3d. at 193-94, 203.

The 2018 LNG Export Study (like DOE's prior economic studies) is an essential part of DOE/FE's analysis, as are EIA's projections on natural gas supply and demand on which the Study is based. For example, the 2018 Study determined that chemical industry subsectors of the economy that rely heavily on natural gas for energy and as a feedstock will continue to exhibit robust growth even at higher LNG export levels, and that this growth is only insignificantly slower than cases with lower LNG export levels.[197] These findings of the 2018 Study, as well as the others described herein, demonstrate that DOE/FE considers a wide range of issues and potential impacts to ensure that the proposed exports are consistent with the public interest. Further, DOE considers each application based on the administrative record compiled in each individual proceeding. Sierra Club has not shown that DOE/FE's analysis of these factors in evaluating the public interest is unreasonable as applied to this proceeding.

2. Significance of the 2018 LNG Export Study

As discussed above, DOE/FE commissioned the 2018 LNG Export Study and invited public comments on the Study. DOE/FE analyzed this material in its Response to Comments published in the *Federal Register* on December 28, 2018. On the basis of the 2018 Study, DOE/FE concluded that the United States will experience net economic benefits from the issuance of authorizations to export domestically produced LNG.[198] The 2018 Study further supports the proposition that exports of LNG from the lower-48 states, in volumes up to and including 52.8 Bcf/d of natural gas, will not be inconsistent with the public interest.[199]

We take administrative notice of EIA's recent authoritative projections for natural gas supply, demand, and prices, set forth in the *Annual Energy Outlook 2019* (AEO 2019), issued on

[197] 2018 Study Response to Comments, 83 Fed. Reg. at 67,259.
[198] *See* 2018 Study Response to Comments, 83 Fed. Reg. at 67,272; *see also supra* § II.A.3.
[199] *See* 2018 Study Response to Comments, 83 Fed. Reg. at 67,273.

January 24, 2019.[200] DOE/FE has assessed AEO 2019 to evaluate any differences from AEO 2017, which formed the basis for the 2018 LNG Export Study.[201] The AEO 2017 Reference case shows lower net LNG exports of 12.5 Bcf/d of natural gas in 2050, compared with the AEO 2019 Reference case that shows net LNG exports of 13.8 Bcf/d in 2050. As discussed below, the AEO 2019 Reference case is even more supportive of exports than the AEO 2017 Reference case.

EIA's projections in AEO 2019 continue to show market conditions that will accommodate increased exports of natural gas. When compared to the AEO 2017 Reference case, the AEO 2019 Reference case projects increases in domestic natural gas production—well in excess of what is required to meet projected increases in domestic consumption.

For these reasons, we reaffirm that the 2018 LNG Export Study is fundamentally sound. The 2018 Study, as well as AEO 2019, support our finding that GLLC's proposed authorization will not be inconsistent with the public interest.

3. GLLC's Application

Upon review, DOE/FE finds that several factors identified in the Application (as modified in the Update), as well as in the 2018 LNG Export Study, support a grant of GLLC's requested authorization under NGA section 3(a).

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[200] U.S. Energy Info. Admin., *Annual Energy Outlook 2019* (with projections to 2050) (Jan. 24, 2019), *available at*: https://www.eia.gov/outlooks/aeo/pdf/aeo2019.pdf.

[201] AEO 2017 included two versions of the Reference case—one with, and one without, the implementation of the Clean Power Plan (CPP). In recent non-FTA orders, we discussed both versions of the AEO 2017 Reference case, noting that the U.S. Environmental Protection Agency (EPA) was reviewing the CPP and considering an alternative regulatory approach. On June 19, 2019, EPA repealed the CPP and issued the final Affordable Clean Energy (ACE) rule. *See* U.S. Envtl. Protection Agency, Repeal of the Clean Power Plan; Emission Guidelines for Greenhouse Gas Emissions From Existing Electric Utility Generating Units; Revisions to Emission Guidelines Implementing Regulations, 84 Fed. Reg. 32,520 (July 8, 2019). Accordingly, in this Order, we refer *only* to the AEO 2017 Reference case without the CPP. The AEO 2019 Reference case does not include the CPP, so the comparisons between AEO 2017 and AEO 2019 are consistent in that regard.

First, due to the vintage of the Application (before DOE/FE had issued its first LNG export study), GLLC points to the Navigant Market Analysis Study, as well as EIA data and third-party studies, in asserting that the United States has significant natural gas resources available to meet both projected future domestic needs and demand for the proposed exports. We agree, based on more recent projections and analyses. Specifically, we find that the 2018 LNG Export Study and AEO 2019 continue to project robust domestic supply conditions that are more than adequate to satisfy both domestic needs and exports of LNG, including those proposed in the Application.[202]

Second, the 2018 LNG Export Study indicates that exports of LNG will generate net economic benefits to the broader U.S. economy.[203] Indeed, the 2018 Study consistently shows macroeconomic benefits to the U.S. economy in every scenario, as well as positive annual growth across the energy intensive sectors of the economy.[204]

Third, as discussed below, over the 20-year term of the authorization, the proposed exports will improve the liquidity of international natural gas markets and will make a positive contribution to the United States' trade balance. For these reasons, we agree with GLLC that its proposed exports are consistent with U.S. policy.[205]

Sierra Club argues that the requested authorization has not been shown to be consistent with the public interest. It contends that the net economic benefits projected in the Navigant Economic Assessment Study will be limited to a relatively small, affluent segment of the population. Sierra Club argues that, independent of the distributional economic impacts of LNG exports, the proposed exports likely will have a negative impact on the U.S. economy by

[202] *See*, *e.g.*, 2018 Study Response to Comments, 83 Fed. Reg. at 67,262.
[203] *Id*.
[204] *See* 2018 Study Response to Comments, 83 Fed. Reg. at 67,268-69 (citing 2018 LNG Export Study at 67, 70).
[205] App. at 30-35.

increasing the price of natural gas and eliminating jobs in energy intensive industries. Sierra Club further asserts that, although some regions may benefit from job growth because of additional natural gas production, the benefits will be temporary and will be overtaken by a "boom-bust" cycle characteristic of economies built on extractive industries.

On review, DOE/FE finds that the record evidence showing that the proposed exports will be in the public interest outweighs Sierra Club's concerns. DOE has considered and rejected each of the arguments raised by Sierra Club in earlier proceedings based on the 2012, 2014, and 2015 LNG Export Studies and, more recently, in the 2018 LNG Export Study proceeding. The 2018 Study showed, for example, that "overall GDP improves as LNG exports increase for all scenarios with the same U.S. natural gas supply conditions."[206] The 2018 Study also showed that energy intensive industries will continue to grow robustly even at higher levels of LNG exports, albeit at slightly lower rates of increase than they would at lower levels.[207]

In response to Sierra Club's claim that the proposed exports will physically exhaust existing resources (resulting in a "bust"), we refer to the findings of the 2018 Study and EIA's projections in AEO 2019 indicating there will be substantial natural gas supply available into the foreseeable future. To the extent Sierra Club alleges that "bust" cycles will be brought on by price declines that render existing natural gas resources uneconomical to produce, we do not see compelling evidence that the exports will exacerbate this risk. If anything, we agree with GLLC that it is more likely that GLLC's ability to export to non-FTA countries will deepen and diversify the market for U.S.-produced natural gas, diminishing the potential for a precipitous price-driven downturn in production activities.[208]

[206] 2018 Study Response to Comments, 83 Fed. Reg. at 67,259.
[207] *Id*.
[208] We also note that Sierra Club did not offer specific evidence to rebut GLLC's evidence of the local and regional economic benefits associated with the proposed exports, as determined by Navigant.

Finally, we note that in the consolidated *Sierra Club II* case, the D.C. Circuit rejected Sierra Club's argument that DOE "erred by failing to consider distributional impacts" when evaluating the public interest under NGA section 3(a).[209] The Court upheld DOE/FE's conclusion that "given that exports will benefit the economy as a whole and absent stronger record evidence on the distributional consequences, [DOE/FE] could not say that ... exports were inconsistent with the public interest on these grounds."[210] On this basis, the Court held that DOE/FE had "adequately addressed" Sierra Club's concerns regarding distributional impacts.[211]

Likewise, in this proceeding, Sierra Club has not provided a quantitative analysis of the distributional consequences of authorizing LNG exports at the household level. Absent stronger record evidence on these alleged distributional consequences, we cannot say that increased LNG exports are inconsistent with the public interest on these grounds.

Accordingly, based on the 2018 Study and the more recent data in AEO 2019, DOE/FE finds that the market will be capable of sustaining the level of exports requested in GLLC's Application over the authorization term without negative economic impacts, including domestic price impacts (discussed below).

4. Price Impacts

Sierra Club alleges that higher volumes of LNG exports, including GLLC's proposed exports, will lead to large increases in domestic prices of natural gas. We disagree, based on both the data available at the time Sierra Club raised these concerns and the most recent data available today. As discussed above, the 2018 LNG Export Study projects the economic impacts of LNG exports in a range of scenarios, including scenarios that exceed the current amount of

[209] *See Sierra Club v. U.S. Dep't of Energy,* Nos. 16-1186, 16-1252, 16-1253, 703 Fed. Appx. 1, at *3 (D.C. Cir. Nov. 1, 2017) (*Sierra Club II*), discussed *supra* § II.C.
[210] *Id*. (internal quotations omitted and alteration in original).
[211] *Id*.

LNG exports authorized in the final non-FTA export authorizations to date (equivalent to a total of 34.52 Bcf/d of natural gas with the issuance of this Order). The 2018 Study found that, "[i]ncreasing U.S. LNG exports under any given set of assumptions about U.S. natural gas resources and their production leads to only small increases in U.S. natural gas prices."[212]

Additionally, DOE/FE has analyzed AEO 2019 to evaluate any differences from AEO 2017, which formed the basis for the 2018 LNG Export Study. Comparing key results from 2050 (the end of the projection period in the AEO 2017 Reference case) shows that the Reference case outlook in AEO 2019 projects lower-48 market conditions that would be even more supportive of LNG exports than in AEO 2017, including higher production coupled with lower prices. For example, for the year 2050, the AEO 2019 Reference case anticipates nearly 10% more natural gas production in the lower-48 than the AEO 2017 Reference case.[213] It also projects an average Henry Hub natural gas price that is lower than the AEO 2017 Reference case by 17%. Table 1 below shows these comparisons:

[212] *See* 2018 Study Response to Comments, 83 Fed. Reg. at 67,258 (citing 2018 LNG Export Study at 55).
[213] *See supra* note 201.

Table 1: Year 2050 Reference Case Comparisons in AEO 2017 and AEO 2019

	AEO 2017 Reference Case	AEO 2019 Reference Case
Lower-48 Dry Natural Gas Production (Bcf/d)	107.9	118.3
Total Natural Gas Consumption (Bcf/d)	92.4	95.8
Electric Power Sector Consumption (Bcf/d)	31.8	33.3
Net Exports by Pipeline (Bcf/d)	3.4	8.9
Net LNG Exports (Bcf/d)	12.5	13.8
LNG Exports – Total (Bcf/d)	12.7	14.1
Henry Hub Spot Price ($/MMBtu) (Note 1)	$5.88 (2018$)	$4.87 (2018$)

Note 1: Prices adjusted to 2018$ with the AEO 2017 projection of a Gross Domestic Product price index.

For these reasons, and as explained in DOE/FE's Response to Comments on the 2018 Study, we find that Sierra Club's arguments concerning domestic price increases are not supported by the record evidence.[214]

5. Benefits of International Trade

We have not limited our review to the 2018 LNG Export Study and data from AEO 2019, but have considered the international consequences of our decision. As discussed above, we

[214] *See* 2018 Study Response to Comments, 83 Fed. Reg. at 67,267-69 (§ VI.G) (DOE/FE's response to comments on natural gas price impacts).

review applications to export LNG to non-FTA nations under section 3(a) of the NGA. The United States' commitment to free trade is one factor bearing on that review.

Additionally, an efficient, transparent international market for natural gas with diverse sources of supply provides both economic and strategic benefits to the United States and our allies. Indeed, increased production of domestic natural gas has significantly reduced the need for the United States to import LNG. In global trade, LNG shipments that would have been destined to U.S. markets have been redirected to Europe and Asia, improving energy security for many of our key trading partners. To the extent U.S. exports can diversify global LNG supplies and increase the volumes of LNG available globally, these exports will improve energy security for many U.S. allies and trading partners. As such, we agree with GLLC that authorizing its exports may advance the public interest for reasons that are distinct from and additional to the economic benefits identified in the 2018 LNG Export Study.

C. Environmental Issues

In reviewing the potential environmental impacts of GLLC's proposal to export LNG, DOE/FE has considered both its obligations under NEPA and its obligation under NGA section 3(a) to ensure that the proposal is not inconsistent with the public interest.

1. Adoption of FERC's Final EIS

DOE/FE participated in FERC's environmental review of the proposed Gulf LNG Liquefaction Project as a cooperating agency. Because DOE was a cooperating agency, DOE/FE is permitted to adopt without recirculating the final EIS, provided that DOE/FE has conducted an independent review of the EIS and determines that its comments and suggestions have been satisfied.[215] For the reasons set forth below, DOE/FE has not found that the arguments raised in

[215] *See* 40 C.F.R. § 1506.3(c).

the FERC proceeding, the current proceeding, or the 2018 LNG Export Study proceeding detract from the reasoning and conclusions contained in the final EIS. Accordingly, DOE has adopted the final EIS (DOE/EIS-0504) (*see supra* § I), and hereby incorporates the reasoning contained in the final EIS in this Order. Additionally, in the Appendix to this Order, DOE/FE is issuing the Record of Decision (ROD) under NEPA for the proposed Project.

2. Scope of NEPA Review

Sierra Club's protest is based principally on its argument that, under NEPA, DOE/FE must consider the potential for increased domestic natural gas production and associated increased environmental impacts resulting from the proposed Project. In particular, Sierra Club maintains that DOE/FE cannot grant the requested authorization without taking a "hard look" at the effects of induced natural gas production attributable to the Project. Since the time that Sierra Club filed its protests on GLLC's Application, however, the D.C. Circuit has unanimously ruled in DOE's favor in the *Sierra Club I* and *II* cases, denying Sierra Club's petitions for review with respect to this argument.[216] The Court held that DOE "offered a reasoned explanation as to why it believed the indirect effects pertaining to increased gas production were not reasonably foreseeable" under NEPA.[217] We find that the Court's conclusions and reasoning control Sierra Club's similar arguments in this proceeding, and we therefore decline to address them further.

3. Environmental Impacts Associated with Induced Production of Natural Gas

The current rapid development of natural gas resources in the United States likely will continue, with or without the export of natural gas to non-FTA nations.[218] Nevertheless, a

[216] *See Sierra Club I*, 867 F.3d at 198; *see generally id*. at 196-200; *see also Sierra Club II*, 703 Fed. Appx. 1, *2-3 ("Given the speculative and nonspecific nature of the additional information about the location of incremental gas production, it was neither arbitrary nor capricious for the Department not to engage in a more localized analysis.").
[217] *See Sierra Club I*, 867 F.3d at 198.
[218] Addendum at 2.

decision by DOE/FE to authorize exports to non-FTA nations could accelerate that development by some increment. As discussed above, the Addendum reviewed the academic and technical literature covering the most significant issues associated with unconventional natural gas production, including impacts to water resources, air quality, greenhouse gas emissions, induced seismicity, and land use.

The Addendum shows that there are potential environmental issues associated with unconventional natural gas production that need to be carefully managed, especially with respect to emissions of volatile organic compounds and methane, and the potential for groundwater contamination. These environmental concerns do not lead us to conclude, however, that exports of natural gas to non-FTA nations should be prohibited. Rather, we believe the public interest is better served by addressing these environmental concerns directly—through federal, state, or local regulation, or through self-imposed industry guidelines where appropriate—rather than by prohibiting exports of natural gas. Unlike DOE, environmental regulators have the legal authority to impose requirements on natural gas production that appropriately balance benefits and burdens, and to update these regulations from time to time as technological practices and scientific understanding evolve.

By comparison, section 3(a) of the NGA is too blunt an instrument to address these environmental concerns efficiently. A decision to prohibit exports of natural gas would cause the United States to forego entirely the economic and international benefits discussed herein, but would have little more than a modest, incremental impact on the environmental issues identified by Sierra Club.

For these reasons, we conclude that the environmental concerns associated with natural gas production do not establish that exports of natural gas to non-FTA nations are inconsistent

with the public interest. We note that the D.C. Circuit in *Sierra Club I* rejected Sierra Club's arguments on this basis, and we find that the Court's conclusions and reasoning control in this proceeding.[219]

4. Greenhouse Gas Impacts Associated with U.S. LNG Exports

Sierra Club and other commenters on the Life Cycle Greenhouse Gas (LCA GHG) Report, the Addendum, and the 2018 LNG Export Study (as well as DOE/FE's earlier economic studies) expressed concern that exports of natural gas could have a negative effect on the GHG intensity and total amount of energy consumed in foreign nations.

The LCA GHG Report estimated the life cycle GHG emissions of U.S. LNG exports to Europe and Asia, compared with certain other fuels used to produce electric power in those importing countries.[220] The key findings for U.S. LNG exports to Europe and Asia are summarized in Figures 1 and 2 below:

[219] *See Sierra Club I*, 867 F.3d at 203 (rejecting argument that DOE arbitrarily failed to evaluate foreseeable indirect effects of exports under NGA section 3(a)); *see supra* § II.C.
[220] *See supra* § II.B.

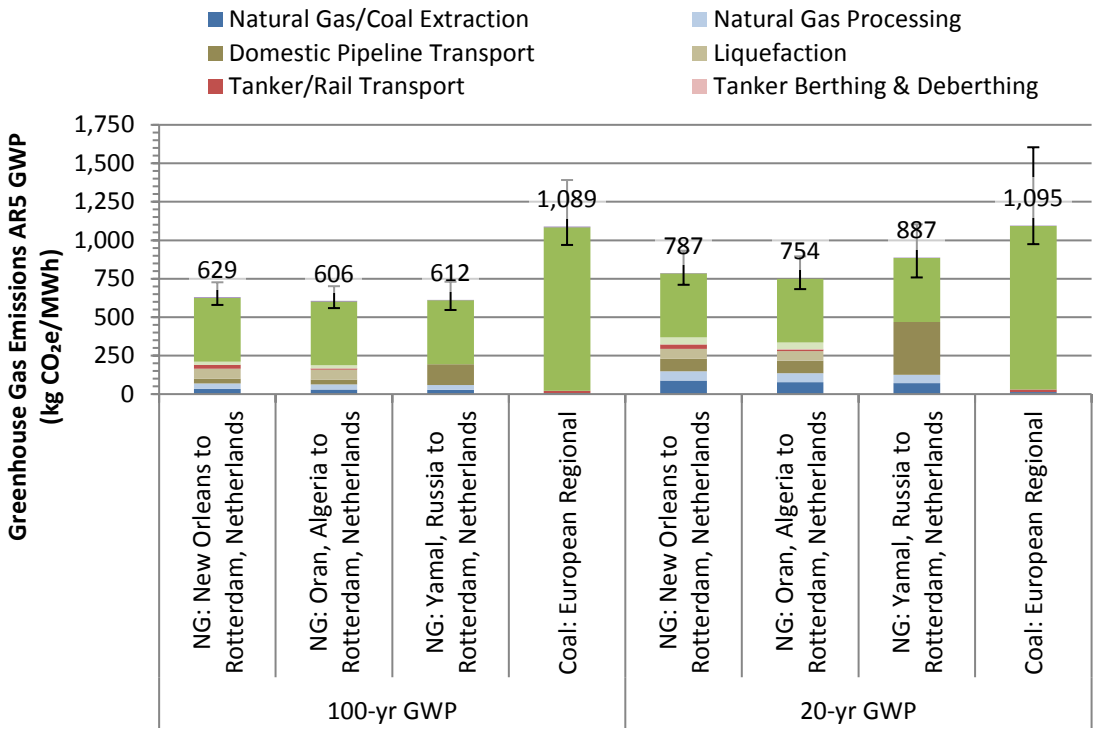

Figure 1: Life Cycle GHG Emissions for Natural Gas and Coal Power in Europe[221]

[221] LCA GHG Report at 9 (Figure 6-1).

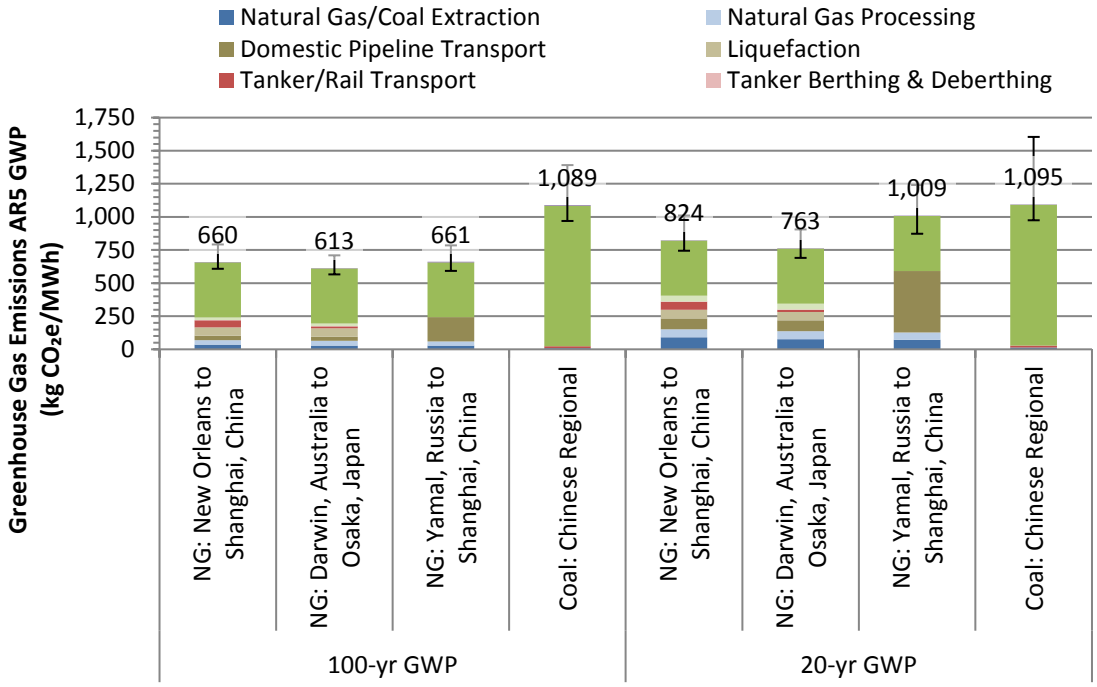

Figure 2: Life Cycle GHG Emissions for Natural Gas and Coal Power in Asia[222]

While acknowledging substantial uncertainty, the LCA GHG Report shows that to the extent U.S. LNG exports are preferred over coal in LNG-importing nations, U.S. LNG exports are likely to reduce global GHG emissions. Further, to the extent U.S. LNG exports are preferred over other forms of imported natural gas, they are likely to have only a small impact on global GHG emissions.[223]

The LCA GHG Report does not answer the ultimate question whether authorizing exports of natural gas to non-FTA nations will increase or decrease global GHG emissions, because regional coal and imported natural gas are not the *only* fuels with which U.S.-exported LNG would compete. U.S. LNG exports may also compete with renewable energy, nuclear energy, petroleum-based liquid fuels, coal imported from outside East Asia or Western Europe, indigenous natural gas, synthetic natural gas derived from coal, and other resources, as well as

[222] *Id.* at 10 (Figure 6-2).
[223] *Id*. at 9, 18.

efficiency and conservation measures. To model the effect that U.S. LNG exports would have on net global GHG emissions would require projections of how each of these fuel sources would be affected in each LNG-importing nation. Such an analysis would not only have to consider market dynamics in each of these countries over the coming decades, but also the interventions of numerous foreign governments in those markets.

The uncertainty associated with estimating each of these factors would likely render such an analysis too speculative to inform the public interest determination in this or other non-FTA LNG export proceedings. Accordingly, DOE/FE elected to focus on the discrete question of how U.S. LNG compares on a life cycle basis to regional coal and other sources of imported natural gas in key LNG-importing countries. The conclusions of the LCA GHG Report, combined with the observation that many LNG-importing nations rely heavily on fossil fuels for electric generation, suggests that exports of U.S. LNG may decrease global GHG emissions, although there is substantial uncertainty on this point as indicated above. Based on the record evidence, however, we see no reason to conclude that U.S. LNG exports will increase global GHG emissions in a material or predictable way.

Finally, we note that, in *Sierra Club I*, the D.C. Circuit ruled in DOE's favor on the argument that DOE/FE should have evaluated additional variables in the LCA GHG Report, such as the potential for LNG to compete with renewable energy sources in certain import markets. The D.C. Circuit rejected Sierra Club's argument, saying it fell "under the category of flyspecking" and that the Court "[saw] nothing arbitrary about the Department's decision."[224] We find that the Court's conclusions and reasoning control Sierra Club's similar arguments in this proceeding, and we therefore decline to address them further.

[224] *Sierra Club I*, 867 F.3d at 202 (internal quotations and citation omitted).

D. Other Considerations

The conclusion of the 2018 LNG Export Study is that the United States will experience net economic benefits from the export of domestically produced LNG. Nonetheless, our decision in this Order is not premised on an uncritical acceptance of that Study. Certain public comments received on the 2018 Study identify significant uncertainties and even potential negative impacts from LNG exports. The economic impacts of higher natural gas prices and potential increases in natural gas price volatility are two of the factors that we view most seriously. Yet we also have taken into account factors that could mitigate these impacts, such as the current oversupply situation and data indicating that the natural gas industry would increase natural gas supply in response to increasing exports. Further, we note that it is far from certain that all or even most of the proposed LNG export projects will ever be realized because of the time, difficulty, and expense of commercializing, financing, and constructing LNG export terminals, as well as the uncertainties inherent in the global market demand for LNG.

More generally, DOE/FE continues to subscribe to the principle set forth in our 1984 Policy Guidelines[225] that, under most circumstances, the market is the most efficient means of allocating natural gas supplies. However, agency intervention may be necessary to protect the public in the event there is insufficient domestic natural gas for domestic use. There may be other circumstances as well that cannot be foreseen that would require agency action.[226] Given

[225] 1984 Policy Guidelines, 49 Fed. Reg. 6684.

[226] Some commenters previously asked DOE to clarify the circumstances under which the agency would exercise its authority to revoke (in whole or in part) previously issued LNG export authorizations. In past orders, DOE/FE stated that it could not precisely identify all the circumstances under which such action might be considered. More recently, on June 15, 2018, DOE/FE issued a policy statement addressing this issue. *See* U.S. Dep't of Energy, Policy Statement Regarding Long-Term Authorizations to Export Natural Gas to Non-Free Trade Agreement Countries, 83 Fed. Reg. 28,841 (June 21, 2018). DOE/FE noted that it has never rescinded a long-term non-FTA export authorization and stated that it "does not foresee a scenario where it would rescind one or more non-FTA authorizations." *Id*. at 28,843.

these possibilities, DOE/FE recognizes the need to monitor market developments closely as the impact of successive authorizations of LNG exports unfolds.

E. Conclusion

We have reviewed the evidence in the record and relevant precedent in earlier non-FTA export decisions and have not found an adequate basis to conclude that GLLC's proposed exports will be inconsistent with the public interest. We further find that Sierra Club has failed to overcome the statutory presumption that the proposed export authorization is not consistent with the public interest.

In deciding whether to grant a final non-FTA export authorization, we also consider the cumulative impacts of the total volume of all non-FTA export authorizations. With the issuance of this Order, there are currently 36 final non-FTA authorizations in a cumulative volume of exports totaling 34.52 Bcf/d of natural gas, or approximately 12.6 trillion cubic feet per year, as follows: Sabine Pass Liquefaction, LLC (2.2 Bcf/d),[227] Carib Energy (USA) LLC (0.04 Bcf/d),[228] Cameron LNG, LLC (1.7 Bcf/d),[229] FLEX I (1.4 Bcf/d),[230] FLEX II (0.4 Bcf/d),[231]

[227] *Sabine Pass Liquefaction, LLC*, DOE/FE Order No. 2961-A, FE Docket No. 10-111-LNG, Final Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas from Sabine Pass LNG Terminal to Non-Free Trade Agreement Nations (Aug. 7, 2012).
[228] *Carib Energy (USA) LLC*, DOE/FE Order No. 3487, FE Docket No. 11-141-LNG, Final Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas in ISO Containers by Vessel to Non-Free Trade Agreement Nations in Central America, South America, or the Caribbean (Sept. 10, 2014).
[229] *Cameron LNG, LLC*, DOE/FE Order No. 3391-A, FE Docket No. 11-162-LNG, Final Opinion and Order Granting Long-Term Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Cameron LNG Terminal in Cameron Parish, Louisiana, to Non-Free Trade Agreement Nations (Sept. 10, 2014).
[230] *Freeport LNG Expansion, L.P.*, *et al.*, DOE/FE Order No. 3282-C, FE Docket No. 10-161-LNG, Final Opinion and Order Granting Long-Term Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Freeport LNG Terminal on Quintana Island, Texas, to Non-Free Trade Agreement Nations (Nov. 14, 2014) (FLEX I Final Order).
[231] *Freeport LNG Expansion, L.P.*, *et al.*, DOE/FE Order No. 3357-B, FE Docket No. 11-161-LNG, Final Opinion and Order Granting Long-Term Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Freeport LNG Terminal on Quintana Island, Texas, to Non-Free Trade Agreement Nations (Nov. 14, 2014) (FLEX II Final Order).

Dominion Cove Point LNG, LP (0.77 Bcf/d),[232] Cheniere Marketing, LLC and Corpus Christi Liquefaction, LLC (2.1 Bcf/d),[233] Sabine Pass Liquefaction, LLC Expansion Project (1.38 Bcf/d),[234] American Marketing LLC (0.008 Bcf/d),[235] Emera CNG, LLC (0.008 Bcf/d),[236] Floridian Natural Gas Storage Company, LLC,[237] Air Flow North American Corp. (0.002 Bcf/d),[238] Bear Head LNG Corporation and Bear Head LNG (USA), LLC (0.81 Bcf/d),[239] Pieridae Energy (USA) Ltd.,[240] Sabine Pass Liquefaction, LLC Design Increase (0.56 Bcf/d),[241]

[232] *Dominion Cove Point LNG, LP*, DOE/FE Order No. 3331-A, FE Docket No. 11-128-LNG, Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas from the Cove Point LNG Terminal in Calvert County, Maryland, to Non-Free Trade Agreement Nations (May 7, 2015).
[233] *Cheniere Marketing, LLC and Corpus Christi Liquefaction, LLC*, DOE/FE Order No. 3638, FE Docket No. 12-97-LNG, Final Order and Opinion Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Proposed Corpus Christi Liquefaction Project to Be Located in Corpus Christi, Texas, to Non-Free Trade Agreement Nations (May 12, 2015).
[234] *Sabine Pass Liquefaction, LLC*, DOE/FE Order No. 3669, FE Docket Nos. 13-30-LNG, 13-42-LNG, & 13-121-LNG, Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Sabine Pass LNG Terminal Located in Cameron Parish, Louisiana, to Non-Free Trade Agreement Nations (June 26, 2015).
[235] *American LNG Marketing LLC*, DOE/FE Order No. 3690, FE Docket No. 14-209-LNG, Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas in ISO Containers Loaded at the Proposed Hialeah Facility Near Medley, Florida, and Exported by Vessel to Non-Free Trade Agreement Nations (Aug. 7, 2015).
[236] *Emera CNG, LLC,* DOE/FE Order No. 3727, FE Docket No. 13-157-CNG, Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Compressed Natural Gas by Vessel From a Proposed CNG Compression and Loading Facility at the Port of Palm Beach, Florida, to Non-Free Trade Agreement Nations (Oct. 19, 2015).
[237] *Floridian Natural Gas Storage Co., LLC*, DOE/FE Order No. 3744, FE Docket No. 15-38-LNG, Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas in ISO Containers Loaded at the Proposed Floridian Facility in Martin County, Florida, and Exported by Vessel to Non-Free Trade Agreement Nations (Nov. 25, 2015).
[238] *Air Flow North American Corp*., DOE/FE Order No. 3753, FE Docket No. 15-206-LNG, Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas in ISO Containers Loaded at the Clean Energy Fuels Corp. LNG Production Facility in Willis, Texas, and Exported by Vessel to Non-Free Trade Agreement Nations in Central America, South America, the Caribbean, or Africa (Dec. 4, 2015).
[239] *Bear Head LNG Corporation and Bear Head LNG (USA)*, DOE/FE Order No. 3770, FE Docket No. 15-33-LNG, Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export U.S.-Sourced Natural Gas by Pipeline to Canada for Liquefaction and Re-Export in the Form of Liquefied Natural Gas to Non-Free Trade Agreement Countries (Feb. 5, 2016).
[240] *Pieridae Energy (USA) Ltd*., DOE/FE Order No. 3768, FE Docket No. 14-179-LNG, Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export U.S.-Sourced Natural Gas Natural Gas by Pipeline to Canada for Liquefaction and Re-Export in the Form of Liquefied Natural Gas to Non-Free Trade Agreement Countries (Feb. 5, 2016).
[241] *Sabine Pass Liquefaction, LLC,* DOE/FE Order No. 3792, FE Docket No. 15-63-LNG, Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel From the Sabine Pass LNG Terminal Located in Cameron Parish, Louisiana, to Non-Free Trade Agreement Nations (Mar. 11, 2016).

Cameron LNG, LLC Design Increase (0.42 Bcf/d),[242] Cameron LNG, LLC Expansion Project (1.41 Bcf/d),[243] Lake Charles Exports, LLC (2.0 Bcf/d),[244] Lake Charles LNG Export Company, LLC,[245] Carib Energy (USA), LLC (0.004),[246] Magnolia LNG, LLC (1.08 Bcf/d),[247] Southern LNG Company, L.L.C. (0.36 Bcf/d),[248] the FLEX Design Increase (0.34 Bcf/d),[249] Golden Pass Products LLC (2.21 Bcf/d),[250] Delfin LNG LLC,[251] the Lake Charles LNG Export Company, LLC Design Increase (0.33 Bcf/d),[252] the Lake Charles Exports, LLC Design Increase,[253] Eagle

[242] *Cameron LNG*, *LLC*, DOE/FE Order No. 3797, FE Docket No. 15-167-LNG, Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Cameron Terminal Located in Cameron and Calcasieu Parishes, Louisiana, to Non-Free Trade Agreement Nations (Mar. 18, 2016).
[243] *Cameron LNG*, *LLC*, DOE/FE Order No. 3846, FE Docket No. 15-90-LNG, Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from Trains 4 and 5 of the Cameron LNG Terminal Located in Cameron and Calcasieu Parishes, Louisiana, to Non-Free Trade Agreement Nations (July 15, 2016).
[244] *Lake Charles Exports, LLC*, DOE/FE Order No. 3324-A, FE Docket No. 11-59-LNG, Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Lake Charles Terminal in Calcasieu Parish, Louisiana, to Non-Free Trade Agreement Nations (July 29, 2016).
[245] *Lake Charles LNG Export Co., LLC*, DOE/FE Order No. 3868, FE Docket No. 13-04-LNG, Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Lake Charles Terminal in Calcasieu Parish, Louisiana to Non-Free Trade Agreement Nations (July 29, 2016).
[246] *Carib Energy (USA) LLC*, DOE/FE Order No. 3937, FE Docket No. 16-98-LNG, Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas in ISO Containers Loaded at Designated Pivotal LNG, Inc. Facilities and Exported by Vessel to Non-Free Trade Agreement Nations in Central America, South America, or the Caribbean (Nov. 28, 2016).
[247] *Magnolia LNG, LLC*, DOE/FE Order No. 3909, FE Docket No. 13-132-LNG, Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel From the Proposed Magnolia LNG Terminal to be Constructed in Lake Charles, Louisiana, to Non-Free Trade Agreement Nations (Nov. 30, 2016).
[248] *Southern LNG Company, L.L.C.*, DOE/FE Order No. 3956, FE Docket No. 12-100-LNG, Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Elba Island Terminal in Chatham County, Georgia, to Non-Free Trade Agreement Nations (Dec. 16, 2016).
[249] *Freeport LNG Expansion, L.P.*, *et al.*, DOE/FE Order No. 3957, FE Docket No. 16-108-LNG, Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Freeport LNG Terminal on Quintana Island, Texas, to Non-Free Trade Agreement Nations (Dec. 19, 2016).
[250] *Golden Pass Products LLC*, DOE/FE Order No. 3978, FE Docket No. 12-156-LNG, Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Golden Pass LNG Terminal Located in Jefferson County, Texas, to Non-Free Trade Agreement Nations (Apr. 25, 2017).
[251] *Delfin LNG LLC*, DOE/FE Order No. 4028, FE Docket No. 13-147-LNG, Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from a Proposed Floating Liquefaction Project and Deepwater Port 30 Miles Offshore of Louisiana to Non-Free Trade Agreement Nations (June 1, 2017).
[252] *Lake Charles LNG Export Co.*, *LLC*, DOE/FE Order No. 4010, FE Docket No. 16-109-LNG, Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Lake Charles Terminal in Calcasieu Parish, Louisiana, to Non-Free Trade Agreement Nations (June 29, 2017).
[253] *Lake Charles Exports*, *LLC*, DOE/FE Order No. 4011, FE Docket No. 16-110-LNG, Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Lake Charles Terminal in Calcasieu Parish, Louisiana, to Non-Free Trade Agreement Nations (June 29, 2017).

LNG Partners Jacksonville II LLC (0.01 Bcf/d),[254] Mexico Pacific Limited LLC (1.7 Bcf/d),[255] Venture Global Calcasieu Pass, LLC (1.7 Bcf/d),[256] Energía Costa Azul, S. de R.L. de C.V. (Mid-Scale Project) (0.44 Bcf/d),[257] Energía Costa Azul, S. de R.L. de C.V. (Large-Scale Project) (1.3 Bcf/d),[258] Port Arthur LNG, LLC (1.91 Bcf/d),[259] Driftwood LNG LLC (3.88 Bcf/d),[260] FLEX4 (0.72 Bcf/d),[261] and this Order.

On February 5, 2019, DOE/FE vacated a non-FTA authorization previously issued to Flint Hills Resources, LP, in a volume of 0.01 Bcf/d, at the company's request.[262] Additionally, we note that the volumes authorized for export in the *Lake Charles Exports* and *Lake Charles LNG Export* orders are both 2.0 Bcf/d and 0.33 Bcf/d, respectively, yet are not additive to one another because the source of LNG approved under all of those orders is the Lake Charles

[254] *Eagle LNG Partners Jacksonville II LLC*, DOE/FE Order No. 4078, FE Docket No. 17-79-LNG, Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas in ISO Containers Loaded at The Eagle Maxville Facility in Jacksonville, Florida, and Exported by Vessel to Free Trade Agreement and Non-Free Trade Agreement Nations (Sept. 15, 2017).
[255] *See Mexico Pacific Limited LLC*, DOE/FE Order No. 4312, FE Docket No. 18-70-LNG, Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export U.S.-Sourced Natural Gas by Pipeline to Mexico for Liquefaction and Re-Export in the Form of Liquefied Natural Gas to Non-Free Trade Agreement Countries (Dec. 14, 2018).
[256] *Venture Global Calcasieu Pass, LLC,* DOE/FE Order No. 4346, FE Docket Nos. 13-69-LNG, 14-88-LNG, 15-25-LNG, Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations (March 5, 2019).
[257] *Energía Costa Azul, S. de R.L. de C.V.,* DOE/FE Order No. 4364, FE Docket No. 18-144-LNG, Opinion and Order Granting Long-Term Authorization to Re-Export U.S-Sourced Natural Gas in the Form of Liquefied Natural Gas from Mexico to Non-Free Trade Agreement Countries (ECA Mid-Scale Project) (Mar. 29, 2019).
[258] *Energía Costa Azul, S. de R.L. de C.V.,* DOE/FE Order No. 4365, FE Docket No. 18-145-LNG, Opinion and Order Granting Long-Term Authorization to Re-Export U.S-Sourced Natural Gas in the Form of Liquefied Natural Gas from Mexico to Non-Free Trade Agreement Countries (ECA Large-Scale Project) (Mar. 29, 2019).
[259] *Port Arthur LNG, LLC*, DOE/FE Order No. 4372, FE Docket No. 15-96-LNG, Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations (May 2, 2019).
[260] *Driftwood LNG LLC,* DOE/FE Order No. 4373, FE Docket No. 16-144-LNG, Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations (May 2, 2019).
[261] *Freeport LNG Expansion, L.P., et al*., DOE/FE Order No. 4374, FE Docket No. 18-26-LNG, Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations (May 28, 2019).
[262] *Flint Hills Resources, LP*, DOE/FE Order Nos. 3809-A and 3829-A, FE Docket No. 15-168-LNG, Order Granting Request to Vacate Long-Term, Multi-Contract Authorizations to Export LNG to Free Trade Agreement Nations and to Non-Free Trade Agreement Nations (Feb. 5, 2019) (vacating, in relevant part, DOE/FE Order No. 3829 authorizing the export of 0.01 Bcf/d of natural gas to non-FTA countries).

Terminal. Likewise, the *Carib* and *Floridian* orders are both 14.6 Bcf/yr of natural gas (0.04 Bcf/d), yet are not additive to one another because the source of LNG approved under both orders is from the Floridian Facility.[263] Additionally, the volumes authorized for export in the *Bear Head* and *Pieridae US* orders are not additive; together, they are limited to a maximum of 0.81 Bcf/d to reflect the current capacity of the Maritimes Northeast Pipeline at the U.S.-Canadian border.[264]

In sum, the total export volume granted to date is within the range of scenarios analyzed in the 2018 LNG Export Study. The 2018 Study found that exports of LNG from the lower-48 states, in volumes up to and including 52.8 Bcf/d of natural gas, will not be inconsistent with the public interest.[265]

DOE/FE will continue taking a measured approach in reviewing the other pending applications to export natural gas. Specifically, DOE/FE will continue to assess the cumulative impacts of each succeeding request for export authorization on the public interest with due regard to the effect on domestic natural gas supply and demand fundamentals.

The reasons in support of proceeding cautiously are several: (1) the 2018 LNG Export Study, like any study based on assumptions and economic projections, is inherently limited in its predictive accuracy; (2) applications to export significant quantities of domestically produced LNG are still a relatively new phenomena with uncertain impacts; and (3) the market for natural

[263] *See Floridian Natural Gas Storage Co., LLC*, DOE/FE Order No. 3744, at 22 (stating that the quantity of LNG authorized for export by Floridian in DOE/FE Order No. 3744 "will be reduced by the portion of the total approved volume of 14.6 Bcf/yr that is under firm contract directly or indirectly to Carib Energy (USA), LLC"); *see also id*. at 21 (Floridian "may not treat the volumes authorized for export in the [*Carib* and *Floridian*] proceedings as additive to one another.").
[264] *See Bear Head LNG Corporation and Bear Head LNG (USA)*, DOE/FE Order No. 3770, at 178-79 (stating that the quantity of LNG authorized for export by Bear Head LNG and Pieridae US "are not additive; together, they are limited to a maximum of 0.81 Bcf/d to reflect the current capacity of the M&N US Pipeline.").
[265] *See* 2018 Study Response to Comments, 83 Fed. Reg. at 67,273 (citing 2018 LNG Export Study at 63 & Appendix F).

gas has experienced rapid reversals in the past and is again changing rapidly due to economic, technological, and regulatory developments. The market of the future very likely will not resemble the market of today. In recognition of these factors, DOE/FE intends to monitor developments that could tend to undermine the public interest in grants of successive applications for exports of domestically produced LNG and to attach terms and conditions to LNG export authorizations to protect the public interest.

IX. FINDINGS

On the basis of the findings and conclusions set forth above, DOE/FE grants GLLC's Application, as modified in the Update, subject to the Terms and Conditions and Ordering Paragraphs set forth below.

X. TERMS AND CONDITIONS

To ensure that the authorization issued by this Order is not inconsistent with the public interest, DOE/FE has attached the following Terms and Conditions to the authorization. GLLC must abide by each Term and Condition or face appropriate sanction.

A. Term of the Authorization

GLLC requests a 20-year term for the authorization. GLLC's requested 20-year non-FTA term is consistent with our practice in the non-FTA export authorizations issued to date. The 20-year term will begin on the date when GLLC commences commercial export of domestically produced LNG from the Gulf LNG Liquefaction Project, but not before.

B. Commencement of Operations

GLLC requests that this authorization commence on the earlier of the date of first export or 10 years from the date of the issuance of this Order. Consistent with our final non-FTA authorizations issued to date, DOE/FE will add as a condition of the authorization that GLLC must commence commercial LNG export operations no later than seven years from the date of

issuance of this Order. The purpose of this condition is to ensure that other entities that may seek similar authorizations are not frustrated in their efforts to obtain those authorizations by authorization holders that are not engaged in actual export or re-export operations.

C. Commissioning Volumes

GLLC will be permitted to apply for short-term export authorizations to export Commissioning Volumes prior to the commencement of the first commercial export of domestically sourced LNG from the Gulf LNG Liquefaction Project. "Commissioning Volumes" are defined as the volume of LNG produced and exported under a short-term authorization during the initial start-up of each LNG train, before each LNG train has reached its full steady-state capacity and begun its commercial exports pursuant to GLLC's long-term contracts.[266] The Commissioning Volumes will not be counted against the maximum level of volumes previously authorized in GLLC's FTA authorization (DOE/FE Order No. 3104) or in this Order.

D. Make-Up Period

GLLC will be permitted to continue exporting for a total of three years following the end of the 20-year term established in this Order, solely to export any Make-Up Volume that it was unable to export during the original export period. The three-year term during which the Make-Up Volume may be exported shall be known as the "Make-Up Period."

The Make-Up Period does not affect or modify the total volume of LNG previously authorized in GLLC's FTA authorization (DOE/FE Order No. 3104) or in this Order. Insofar as

[266] For additional discussion of Commissioning Volumes and the Make-Up Period referenced below, *see Freeport LNG Expansion, L.P.*, *et al.*, DOE/FE Order Nos. 3282-B & 3357-A, FE Docket Nos. 10-161-LNG & 11-161-LNG, Order Amending DOE/FE Order Nos. 3282 and 3357, at 4-9 (June 6, 2014).

GLLC may seek to export additional volumes not previously authorized for export, it will be required to obtain appropriate authorization from DOE/FE.

E. Transfer, Assignment, or Change in Control

DOE/FE's natural gas regulations prohibit authorization holders from transferring or assigning authorizations to import or export natural gas without specific authorization by the Assistant Secretary for Fossil Energy.[267] DOE/FE has found that this requirement applies to any change in control of the authorization holder. This condition was deemed necessary to ensure that DOE/FE will be given an adequate opportunity to assess the public interest impacts of such a transfer or change.

DOE/FE construes a change in control to mean a change, directly or indirectly, of the power to direct the management or policies of an entity whether such power is exercised through one or more intermediary companies or pursuant to an agreement, written or oral, and whether such power is established through ownership or voting of securities, or common directors, officers, or stockholders, or voting trusts, holding trusts, or debt holdings, or contract, or any other direct or indirect means.[268] A rebuttable presumption that control exists will arise from the ownership or the power to vote, directly or indirectly, 10% or more of the voting securities of such entity.[269]

F. Agency Rights

GLLC requests authorization to export LNG on its own behalf and as agent for other entities that hold title to the LNG at the time of export, pursuant to long-term contracts. DOE/FE previously has determined that, in LNG export orders in which Agency Rights have been

[267] 10 C.F.R. § 590.405.
[268] *See* U.S. Dep't of Energy, Procedures for Changes in Control Affecting Applications and Authorizations to Import or Export Natural Gas, 79 Fed. Reg. 65,541, 65,542 (Nov. 5, 2014).
[269] *See id*.

granted, DOE/FE shall require registration materials filed for, or by, an LNG title-holder (Registrant) to include the same company identification information and long-term contract information of the Registrant as if the Registrant had filed an application to export LNG on its own behalf.[270]

To ensure that the public interest is served, this authorization shall be conditioned to require that where GLLC proposes to export LNG from the Gulf LNG Liquefaction Project as agent for other entities that hold title to the LNG (Registrants), it must register with DOE/FE those entities on whose behalf it will export LNG in accordance with the procedures and requirements described herein.

G. Contract Provisions for the Sale or Transfer of LNG to be Exported

DOE/FE will require that GLLC file or cause to be filed with DOE/FE any relevant long-term commercial agreements, including liquefaction tolling agreements, pursuant to which GLLC exports LNG as agent for a Registrant. DOE/FE finds that the submission of all such agreements or contracts within 30 days of their execution using the procedures described below will be consistent with the "to the extent practicable" requirement of section 590.202(b).[271]

In addition, DOE/FE finds that section 590.202(c) of DOE/FE's regulations[272] requires that GLLC file, or cause to be filed, all long-term contracts associated with the long-term supply of natural gas to the Project, whether signed by GLLC or the Registrant, within 30 days of their execution.

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[270] *See*, *e.g.*, *Cameron LNG, LLC*, DOE/FE Order No. 3846, FE Docket No. 15-90-LNG, Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from Trains 4 and 5 of the Cameron LNG Terminal to Non-Free Trade Agreement Nations, at 128-29 (July 15, 2016); *Freeport LNG Expansion, L.P., et al.*, DOE/FE Order No. 2913, FE Docket No. 10-160-LNG, Order Granting Long-Term Authorization to Export Liquefied Natural Gas from the Freeport LNG Terminal to Free Trade Agreement Nations, at 7-8 (Feb. 10, 2011).
[271] 10 C.F.R. § 590.202(b).
[272] *Id*. § 590.202(c).

DOE/FE recognizes that some information in GLLC's or a Registrant's long-term commercial agreements associated with the export of LNG, and/or long-term contracts associated with the long-term supply of natural gas to the Project, may be commercially sensitive. DOE/FE therefore will provide GLLC the option to file or cause to be filed either unredacted contracts, or in the alternative (A) GLLC may file, or cause to be filed, long-term contracts under seal, but it also will file either: (i) a copy of each long-term contract with commercially sensitive information redacted, or (ii) a summary of all major provisions of the contract(s) including, but not limited to, the parties to each contract, contract term, quantity, any take or pay or equivalent provisions/conditions, destinations, re-sale provisions, and other relevant provisions; and (B) the filing must demonstrate why the redacted information should be exempted from public disclosure.[273]

To ensure that DOE/FE destination and reporting requirements included in this Order are conveyed to subsequent title holders, DOE/FE will include as a condition of this authorization that future contracts for the sale or transfer of LNG exported pursuant to this Order shall include an acknowledgement of these requirements.

H. Export Quantity

This Order grants GLLC's Application, as modified in the Update, in the volume of LNG requested, up to the equivalent of 558.9 Bcf/yr of natural gas.

I. Combined FTA and Non-FTA Export Authorization Volumes

The volumes of LNG authorized for export in GLLC's FTA authorization (DOE/FE Order No. 3104) and this Order reflect the planned liquefaction capacity of the Gulf LNG

[273] *Id*. § 590.202(e) (allowing confidential treatment of information in accordance with 10 C.F.R. § 1004.11).

Liquefaction Project, as approved by FERC. Accordingly, GLLC may not treat the FTA and non-FTA export volumes as additive to one another.

XI. ORDER

Pursuant to section 3 of the Natural Gas Act, it is ordered that:

A. Gulf LNG Liquefaction Company, LLC (GLLC) is authorized to export domestically produced LNG in a volume up to the equivalent of 558.9 Bcf/yr of natural gas. GLLC is authorized to export this LNG by vessel from the proposed Gulf LNG Liquefaction Project to be located at the Gulf LNG Terminal in Jackson County, Mississippi, near the city of Pascagoula. This authorization is for a term of 20 years to commence from the date of first commercial export, but not before. GLLC is authorized to export the LNG on its own behalf and as agent for other entities who hold title to the natural gas, pursuant to one or more long-term contracts (a contract greater than two years).

B. GLLC may export Commissioning Volumes prior to the commencement of the terms of this Order, pursuant to a separate short-term export authorization. The Commissioning Volumes will not be counted against the export volumes previously authorized in GLLC's FTA authorization or in this Order.

C. GLLC may continue exporting for a total of three years following the end of the 20-year export term, solely to export any Make-Up Volume that it was unable to export during the original export period. The three-year Make-Up Period allowing the export of Make-Up Volumes will not affect or modify the export volumes previously authorized in GLLC's FTA authorization or in this Order. Insofar as GLLC may seek to export additional volumes not previously authorized, it will be required to obtain appropriate authorization from DOE/FE.

D. GLLC must commence export operations using the planned liquefaction facility no later than seven years from the date of issuance of this Order.

E. The LNG export quantity authorized in this Order is equivalent to 558.9 Bcf/yr of natural gas.

F. This LNG may be exported to any country with which the United States does not have a FTA requiring national treatment for trade in natural gas, which currently has or in the future develops the capacity to import LNG, and with which trade is not prohibited by U.S. law or policy.

G. GLLC shall ensure that all transactions authorized by this Order are permitted and lawful under U.S. laws and policies, including the rules, regulations, orders, policies, and other determinations of the Office of Foreign Assets Control of the U.S. Department of the Treasury and FERC. Failure to comply with these requirements could result in rescission of this authorization and/or other civil or criminal penalties.

H. GLLC shall ensure compliance with all terms and conditions established by FERC in the final EIS, including the 131 environmental conditions adopted in the FERC Order issued on July 16, 2019. Additionally, this authorization is conditioned on GLLC's on-going compliance with any other preventative and mitigative measures at the Gulf LNG Liquefaction Project imposed by federal or state agencies.

I. (i) GLLC shall file, or cause others to file, with the Office of Regulation, Analysis, and Engagement a non-redacted copy of all executed long-term contracts associated with the long-term export of LNG as agent for other entities from the Project. The non-redacted copies must be filed within 30 days of their execution and may be filed under seal, as described above.

(ii) GLLC shall file, or cause others to file, with the Office of Regulation, Analysis, and Engagement a non-redacted copy of all executed long-term contracts associated with the long-

term supply of natural gas to the Project. The non-redacted copies must be filed within 30 days of their execution and may be filed under seal, as described above.

J. GLLC is permitted to use its authorization to export LNG as agent for other LNG title-holders (Registrants), after registering those entities with DOE/FE. Registration materials shall include an agreement by the Registrant to supply GLLC with all information necessary to permit GLLC to register that person or entity with DOE/FE, including: (1) the Registrant's agreement to comply with this Order and all applicable requirements of DOE/FE's regulations at 10 C.F.R. Part 590, including but not limited to destination restrictions; (2) the exact legal name of the Registrant, state/location of incorporation/registration, primary place of doing business, and the Registrant's ownership structure, including the ultimate parent entity if the Registrant is a subsidiary or affiliate of another entity; (3) the name, title, mailing address, e-mail address, and telephone number of a corporate officer or employee of the Registrant to whom inquiries may be directed; and (4) within 30 days of execution, a copy of any long-term contracts not previously filed with DOE/FE, described in Ordering Paragraph I of this Order.

Any change in the registration materials—including changes in company name, contact information, length of the long-term contract, termination of the long-term contract, or other relevant modification—shall be filed with DOE/FE within 30 days of such change(s).

K. GLLC, or others for whom GLLC acts as agent, shall include the following provision in any agreement or other contract for the sale or transfer of LNG pursuant to this Order:

> Customer or purchaser acknowledges and agrees that it will resell or transfer LNG, purchased hereunder for delivery only to countries identified in Ordering Paragraph F of DOE/FE Order No. 4410 issued July 31, 2019, in FE Docket No. 12-101-LNG, and/or to purchasers that have agreed in writing to limit their direct or indirect resale or transfer of such natural gas or LNG to such countries. Customer or purchaser further commits to cause a report to be provided to Gulf LNG Liquefaction Company, LLC that identifies the country (or countries) into which the LNG was actually delivered, and to include in any resale contract for such LNG the necessary

conditions to ensure that Gulf LNG Liquefaction Company, LLC is made aware of all such actual destination countries.

L. Within two weeks after the first export authorized in Ordering Paragraph A occurs, GLLC shall provide written notification of the date that the first export occurred.

M. GLLC shall file with the Office of Regulation, Analysis, and Engagement, on a semi-annual basis, written reports describing the status of the proposed Gulf LNG Liquefaction Project. The reports shall be filed on or by April 1 and October 1 of each year, and shall include information on the status of the Project, the date the Project is expected to commence first exports of LNG, and the status of any associated long-term supply and export contracts.

N. With respect to any change in control of the authorization holder, GLLC must comply with DOE/FE's Procedures for Change in Control Affecting Applications and Authorizations to Import or Export Natural Gas.[274]

O. Monthly Reports: With respect to the exports authorized by this Order, GLLC shall file with the Office of Regulation, Analysis, and Engagement, within 30 days following the last day of each calendar month, a report on Form FE-746R indicating whether exports of LNG have been made. The first monthly report required by this Order is due not later than the 30th day of the month following the month of first export. In subsequent months, if exports have not occurred, a report of "no activity" for that month must be filed. If exports of LNG have occurred, the report must give the following details of each LNG cargo: (1) the name(s) of the authorized exporter registered with DOE/FE; (2) the name of the U.S. export terminal; (3) the name of the LNG tanker; (4) the date of departure from the U.S. export terminal; (5) the country (or countries) into which the LNG was actually delivered; (6) the name of the supplier/seller; (7) the volume in thousand cubic feet (Mcf); (8) the price at point of export per million British

[274] *See* 79 Fed. Reg. at 65,541-42.

thermal units (MMBtu); (9) the duration of the supply agreement; and (10) the name(s) of the purchaser(s).

(Approved by the Office of Management and Budget under OMB Control No. 1901-0294.)

P. All monthly report filings on Form FE-746R shall be made to the U.S. Department of Energy (FE-34), Office of Fossil Energy, Office of Regulation, Analysis, and Engagement, according to the methods of submission listed on the Form FE-746R reporting instructions available at https://www.energy.gov/fe/services/natural-gas-regulation.

Q. The motion to intervene submitted by Sierra Club was granted by operation of law.[275]

Issued in Washington, D.C., on July 31, 2019.

Steven E. Winberg
Assistant Secretary
Office of Fossil Energy

[275] 10 C.F.R. § 590.303(g).

APPENDIX: RECORD OF DECISION

The Department of Energy's Office of Fossil Energy (DOE/FE) prepared this Record of Decision (ROD) and Floodplain Statement of Findings pursuant to the National Environmental Policy Act of 1969 (NEPA),[276] and in compliance with the Council on Environmental Quality (CEQ) implementing regulations for NEPA,[277] DOE's implementing procedures for NEPA,[278] and DOE's "Compliance with Floodplain and Wetland Environmental Review Requirements."[279]

As discussed above, DOE/FE participated as a cooperating agency with FERC in preparing an environmental impact statement (EIS) analyzing the potential environmental impacts of the proposed Gulf LNG Liquefaction Project (or Project), including modifications to the associated pipeline, that would be used to support the export authorization sought from DOE/FE.[280] In accordance with 40 C.F.R. § 1506.3, DOE/FE adopted the EIS on April 26, 2019 (DOE/EIS-0504),[281] and EPA published a notice of the adoption on May 3, 2019.[282]

A. Alternatives

The EIS assessed alternative methods that could be used to achieve the objectives of the Gulf LNG Liquefaction Project. The range of alternatives analyzed included the No-Action Alternative, system alternatives, terminal expansion alternatives, supply dock alternatives, alternative construction support area sites, alternative pipeline modification sites, and alternative power sources.[283] Alternatives were evaluated and compared to the proposed Project to

[276] 42 U.S.C. § 4321 *et seq*.
[277] 40 C.F.R. § 1500-08.
[278] 10 C.F.R. § 1021.
[279] *Id*. § 1022.
[280] *See* Federal Energy Regulatory Comm'n, *Gulf LNG Liquefaction Project Final Environmental Impact Statement*, Docket No. CP15-521-000 (Apr. 17, 2019), *available at*: https://www.ferc.gov/industries/gas/enviro/eis/2019/04-17-19-FEIS/FEIS.pdf [hereinafter final EIS].
[281] Letter from Amy Sweeney, DOE/FE, to Julie Roemele, U.S. EPA (Apr. 26, 2019) (adoption of final EIS).
[282] U.S. Envtl. Protection Agency, Environmental Impact Statements; Notice of Availability, 84 Fed. Reg. 19,074 (May 3, 2019).
[283] Final EIS at 3-1 to 3-15.

determine if the alternatives were environmentally preferable and/or technically and economically feasible.

In analyzing the No-Action Alternative, the EIS reviewed the effects and actions that could result if the Gulf LNG Liquefaction Project was not constructed. The EIS determined that other LNG export projects could be developed that could result in similar environmental impacts in the region.[284] FERC staff concluded that the No-Action Alternative would not meet the objectives of the Project, and an alternative project to meet market demand would not likely provide a significant environmental advantage over the proposed action.[285]

The EIS evaluated system alternatives for the Gulf LNG Liquefaction Project by reviewing LNG facility terminal expansion system alternatives and pipeline modification system alternatives. The EIS reviewed 23 existing, approved, or proposed liquefaction projects that are either stand-alone or expansion projects.[286] Based on this evaluation, the EIS concluded that each of the potential alternatives lacked significant environmental advantages over the Project.[287] While analyzing the pipeline modification system alternatives, the EIS concluded that potential impacts of the pipeline modifications would be negligible.[288] Additionally, installation of a new pipeline to either the existing Gulf Pipeline or the Project would not provide a significant environmental advantage.[289]

The EIS also evaluated terminal expansion alternatives, including alternative sites and plot plans. The EIS used six elements within siting criteria to assess alternative sites within a

[284] *Id*. at 3-2.
[285] *Id.* at 3-3.
[286] *Id.* at ES-9, 3-3 to 3-6.
[287] *Id*. at 3-3.
[288] *Id.* at 3-5.
[289] Final EIS at 3-5.

four-mile radius of the proposed Gulf LNG Liquefaction Project.[290] The EIS concluded that none of the alternatives offered significant environmental advantages over the proposed site.[291] When evaluating alternative plot plans, the EIS examined six alternative facility configurations based on six different criteria to reduce environmental impacts on nearby wetlands and surrounding existing land uses.[292] The EIS found that no alternatives offered an environmental advantage over the proposed configuration.[293]

Next, the EIS evaluated supply dock alternatives focused on two categories: the number of supply docks and site locations. The EIS evaluated three different numbers of supply docks including the existing two supply dock configurations.[294] Additionally, the EIS evaluated supply dock locations throughout the vicinity of the proposed Project, but were unable to identify any reasonable alternative sites for the supply dock(s).[295] After evaluating each of those considerations, the EIS found that the proposed sites and configurations is the preferred alternative.[296]

The EIS also evaluated alternative construction support area sites for the Gulf LNG Liquefaction Project. While evaluating sites surrounding the site of the proposed Project, it determined that the fragmentation and other impacts (such as transportation, air quality, and noise quality) limited alternatives.[297] GLLC further committed to restore the impacted areas to pre-construction condition following completion of the Project's construction.[298] After

[290] *Id.* at 3-7.
[291] *Id*.
[292] *Id.* at 3-8 to 3-9.
[293] *Id*. at 3-9 to 3-10.
[294] *Id.* at 3-10 to 3-12.
[295] Final EIS at 3-11.
[296] *Id.*
[297] *Id.* at 3-12.
[298] *Id.*

evaluating those considerations, the EIS found the proposed construction support area sites are the preferred alternatives.[299]

Additionally, the EIS evaluated alternative pipeline modification sites at the existing metering facilities. The proposed facility modifications are within the existing pipeline right-of-way limiting the environmental impact in the surrounding area.[300] As a result, the EIS did not require further evaluation of alternative sites.[301]

Finally, the EIS evaluated two alternative power sources for the Gulf LNG Liquefaction Project: gas-fire turbines and electricity.[302] The EIS evaluated the use of those power sources for the LNG train refrigeration compressors and for additional on-site power generation.[303] Two factors evaluated within the alternatives are operational emissions and power generation requirements.[304]

For the LNG train refrigeration compressors, the EIS concluded that calculating emissions from imported power from the grid would be complicated due to the varying power sources (fossil fuels and renewables).[305] Additionally, utilizing purchased power would likely require a re-configuration of the electrical motor refrigeration compressors to accommodate the power requirements.[306] This change would also require purchasing more electricity than required to compensate for power losses during transmission.[307] Overall, the EIS concluded that purchasing power did not offer a significant environmental advantage over the proposed gas-fire

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[299] *Id.*
[300] *Id.*
[301] Final EIS at 3-12.
[302] *Id.* at 3-12 to 3-14.
[303] *Id.*
[304] *Id.*
[305] *Id.* at 3-13.
[306] *Id.*
[307] Final EIS at 3-13.

turbines for the refrigeration compressor.[308]

For the additional on-site power generation, the EIS determined that, when evaluating the factor of space-availability at the proposed site with the emissions analysis, the alternative of gas-turbines used for on-site power did not offer a significant advantage to the proposed purchase of power for additional on-site generation.[309]

B. Environmentally Preferred Alternative

When compared against the alternatives assessed in the EIS, the Gulf LNG Liquefaction Project—as modified by the mitigation measures recommended in the EIS—is the environmentally preferred alternative. Although the No-Action Alternative would avoid the environmental impacts identified in the EIS, the adoption of this alternative would not meet the objectives of the Project.[310]

C. Decision

DOE/FE has decided to issue Order No. 4410 authorizing Gulf LNG Liquefaction Company, LLC (GLLC) to export domestically produced LNG by vessel from the proposed Gulf LNG Liquefaction Project at the Gulf LNG Terminal to non-FTA countries in a volume equivalent to 558.9 Bcf of natural gas per year for a term of 20 years. DOE/FE's decision is based on: (i) the analysis of potential environmental impacts presented in the EIS; and (ii) DOE's determination in the Order that Sierra Club—the only intervenor-protestor opposing GLLC's Application—has failed to show that the proposed exports will be inconsistent with the public interest, as would be required to deny the Application (as updated) under NGA section 3(a).[311] DOE also considered the Addendum, which summarizes available information on

[308] *Id.* at 3-13 to 3-14.
[309] *Id.*
[310] *Id*. at 3-2.
[311] 15 U.S.C. § 717b(a).

potential upstream impacts associated with unconventional natural gas activities, such as hydraulic fracturing.

D. Mitigation

As a condition of its decision to issue Order No. 4410, DOE/FE is imposing requirements that will avoid or minimize the environmental impacts of the proposed Project. These conditions include the 131 environmental conditions recommended in the EIS and adopted by FERC in its Order authorizing the Project on July 16, 2019.[312] Mitigation measures beyond those included in DOE/FE Order No. 4410 that are enforceable by other federal and state agencies are additional conditions of DOE/FE Order No. 4410. With these conditions, DOE/FE has determined that all practicable means to avoid or minimize environmental harm from the Project have been adopted.

E. Floodplain Statement of Findings

DOE/FE prepared this Floodplain Statement of Findings in accordance with DOE's regulations, entitled "Compliance with Floodplain and Wetland Environmental Review Requirements."[313] The required floodplain assessment was conducted during development and preparation of the EIS, which determined that portions of the Gulf LNG Liquefaction Project would be located in the 100-year and 500-year flood plain. GLLC has proposed to design the Project to withstand a 500-year flood event, in accordance with FERC recommendations. [314] While placement of the Project within floodplains would be unavoidable, DOE/FE has determined that the Project's proposed design minimizes floodplain impacts to the extent practicable.

[312] *Gulf LNG Liquefaction Company, LLC*, *et al.*, Order Granting Authorization Under Section 3 of the Natural Gas Act, 168 FERC ¶ 61,020, ¶¶ 15, 63-64, and Appendix (Environmental Conditions) (July 16, 2019).
[313] 10 C.F.R. § 1022.
[314] Final EIS at 4-171 to 4-172.