UNITED STATES OF AMERICA

DEPARTMENT OF ENERGY

OFFICE OF FOSSIL ENERGY

ANNOVA LNG COMMON INFRASTRUCTURE, LLC	)	FE DOCKET NO. 19-34-LNG

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

DOE/FE ORDER NO. 4491

FEBRUARY 10, 2020

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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
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
Tcf	Trillion Cubic Feet

I. INTRODUCTION

On February 26, 2019, Annova LNG Common Infrastructure, LLC (Annova) filed an application (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] Annova filed a Supplement to the Application on March 13, 2019.[3] Annova requests long-term, multi-contract authorization to export domestically produced liquefied natural gas (LNG) from proposed natural gas liquefaction and export facilities (the Annova LNG Brownsville Project or the Project) that it proposes to site, construct, and operate on the Brownsville Ship Channel in Cameron County, Texas.[4] Annova 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).[5]

Annova requests authority to export LNG to non-FTA countries in a volume up to 6.95 million metric tons per annum (mtpa) of LNG, which it states is equivalent to approximately 360 billion cubic feet (Bcf) per year (Bcf/yr) of natural gas, or approximately 0.99 Bcf per day (Bcf/d).[6]

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[1] Annova LNG Common Infrastructure, LLC, Application for Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations, FE Docket No. 19-34-LNG (Feb. 26, 2019) [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] Annova LNG Common Infrastructure, LLC, Supplemental Info., FE Docket No. 19-34-LNG (Mar. 13, 2019) [hereinafter Supp.].

[4] App. at 1.

[5] In the Application, Annova 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. 13-140-LNG. *See infra* at 2. 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.

[6] App. at 1.

Annova requests the non-FTA authorization for a period of 20 years, commencing on the earlier of the date of first export or seven years from the date the authorization is granted. Additionally, Annova requests the authorization on its own behalf and as agent for other entities that hold title to the LNG at the time of export.[7]

On February 20, 2014, in Order No. 3394, DOE/FE granted the application of a different Annova entity, Annova LNG, LLC, requesting authority to export domestically produced LNG to FTA countries in a volume of 342 Bcf/yr for a term of 30 years.[8] Subsequently, in Order No. 3464, DOE/FE approved the transfer of this FTA authorization from Annova LNG, LLC to Annova, the applicant in this proceeding.[9] On July 11, 2019, in Order No. 3394-A, DOE/FE approved Annova's request to amend the FTA export authorization to increase the approved export volume to 360 Bcf/yr of natural gas, among other modifications.[10]

On March 26, 2019, DOE/FE published a notice of the Application in the *Federal Register* (Notice of Application).[11] The Notice of Application called on interested persons to submit protests, motions to intervene, notices of intervention, and comments by May 28, 2019.[12] DOE/FE received one comment opposing the Application from an anonymous commenter.[13] No

[7] App. at 1-2, 4.
[8] *Annova LNG, LLC*, DOE/FE Order No. 3394, FE Docket No. 13-140-LNG, Order Granting Long-Term, Multi-Contract Authorization To Export Liquefied Natural Gas by Vessel from the Proposed Annova LNG Terminal in Brownsville, Texas, to Free Trade Agreement Nations (Feb. 20, 2014).
[9] *Annova LNG Common Infrastructure, LLC & Annova LNG, LLC*, DOE/FE Order No. 3464, FE Docket Nos. 13-140-LNG and 14-004-CIC, Order Approving Change in Control to Annova LNG Common Infrastructure, LLC of Authorization Allowing Exports of Liquefied Natural Gas to Free Trade Agreement Nations (July 17, 2014).
[10] *Annova LNG Common Infrastructure, LLC*, DOE/FE Order No. 3394-A, FE Docket No. 13-140-LNG, Order Amending Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas to Free Trade Agreement Nations (July 11, 2019).
[11] Annova LNG Common Infrastructure, LLC, Application for Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations, Notice of Application, 84 Fed. Reg. 11,291 (Mar. 26, 2019) [hereinafter Notice of Application].
[12] 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).
[13] Comment from Anonymous, FE Docket No. 19-34-LNG (May 25, 2019).

protests or motions to intervene in opposition to the Application were filed, and therefore the Application is uncontested.[14]

Most recently, on November 22, 2019, the Federal Energy Regulatory Commission (FERC) issued an order authorizing Annova and its affiliated entities (Annova LNG Brownsville A, LLC; Annova LNG Brownsville B, LLC; and Annova LNG Brownsville C, LLC) (collectively, Annova) to site, construct, and operate the Project with a maximum liquefaction capacity of 6.95 mtpa, which Annova states is equivalent to approximately 0.99 Bcf/d (360 Bcf/yr) of natural gas.[15] DOE/FE notes that certain parties to the FERC proceeding have sought rehearing of the FERC Order, and that rehearing proceeding is ongoing.[16]

DOE/FE has reviewed the Application and Supplement, the comment 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 discussed below. On the basis of this substantial administrative record, DOE/FE has determined that it has not been shown that Annova's proposed exports will be inconsistent with the public interest, as would be required to deny the Application under NGA section 3(a). DOE/FE therefore grants the Application in the volume requested—360 Bcf/yr of natural gas.[17] Because the export volumes authorized in Annova's FTA order (DOE/FE Order No. 3394, as amended by Order Nos. 3464 and 3394-A) and this Order each reflect the planned liquefaction capacity of the

[14] 10 C.F.R. § 590.102(b).
[15] *Annova LNG Common Infrastructure, LLC, et al.*, Order Granting Authorizations Under Section 3 of the Natural Gas Act, 169 FERC ¶ 61,132, at ¶4 (Nov. 22, 2019) [hereinafter FERC Order].
[16] *See, e.g.*, Federal Energy Regulatory Comm'n, Order Granting Rehearing for Further Consideration, Annova LNG Common Infrastructure, LLC, *et al.*, Docket No. CP16-480-000 (Jan. 21, 2020).
[17] *See infra* §§ VIII-XI.

Annova LNG Brownsville 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 Annova LNG Brownsville Project under the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. § 4321 *et seq*. FERC issued the final EIS for the Annova LNG Brownsville Project on April 19, 2019.[18] After an independent review, DOE/FE adopted the final EIS on April 26, 2019 (DOE/EIS-0518),[19] and the U.S. Environmental Protection Agency (EPA) published a notice of the adoption on May 3, 2019.[20] As an Appendix to this Order, DOE/FE is issuing the Record of Decision (ROD) under NEPA for the proposed Project. This Order requires Annova's compliance with the 131 environmental conditions recommended in the final EIS and adopted in the FERC Order.[21]

Concurrently with this Order, DOE/FE is issuing three additional non-FTA orders as follows:

(i) *Texas LNG Brownsville LLC*, in a volume equivalent to 204.4 Bcf/yr (0.56 Bcf/d);[22]

(ii) *Corpus Christi Liquefaction Stage III, LLC*, in a volume equivalent to 582.14 Bcf/yr (1.59 Bcf/d);[23] and

[18] Federal Energy Regulatory Comm'n, *Annova LNG Brownsville Project Final Environmental Impact Statement*, Docket No. CP 16-480-000 (Apr. 19, 2019), *available at*: https://ferc.gov/industries/gas/enviro/eis/2019/04-19-19-FEIS/FEIS-volume-I.pdf [hereinafter Final EIS].
[19] Letter from Amy Sweeney, DOE/FE, to Julie Roemele, U.S. Envtl. Prot. Agency (Apr. 26, 2019) (adoption of final EIS).
[20] U.S. Envtl. Prot. Agency, Environmental Impact Statements; Notice of Availability, 84 Fed. Reg. 19,074 (May 3, 2019).
[21] *See* FERC Order at ¶ 89 & Appendix; *see also infra* § XI (Ordering Para. H); *see also infra* § VI.
[22] *Texas LNG Brownsville LLC*, DOE/FE Order No. 4489, FE Docket No. 15-62-LNG, Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations (Feb. 10, 2020).
[23] *Corpus Christi Liquefaction Stage III, LLC*, DOE/FE Order No. 4490, FE Docket No. 18-78-LNG, Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations (Feb. 10, 2020).

(iii) *Rio Grande LNG, LLC*, in a volume equivalent to 1318 Bcf/yr (3.61 Bcf/d).[24]

The volumes approved in this Order—0.99 Bcf/d—and the three additional orders total 6.75 Bcf/d of natural gas. Together, these orders bring DOE/FE's cumulative total of approved non-FTA exports of LNG and compressed natural gas to 44.81 Bcf/d of natural gas.[25]

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.

[24] *Rio Grande LNG, LLC*, DOE/FE Order No. 4492, FE Docket No. 15-190-LNG, Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations (Feb. 10, 2020).
[25] *See infra* § VIII.D.

In December 2012, DOE/FE published a notice of availability of the 2012 LNG Export Study in the *Federal Register* for public comment.[26] DOE/FE subsequently responded to the public comments in connection with the LNG export proceedings identified in that notice.[27]

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.[28] 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.[29]

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).[30] 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

[26] *See* U.S. Dep't of Energy, Notice of Availability of 2012 LNG Export Study and Request for Comments, 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.

[27] *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).

[28] 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.

[29] *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, *available at*: http://energy.gov/fe/downloads/request-update-eia-s-january-2012-study-liquefied-natural-gas-export-scenarios (May 29, 2014) (memorandum from FE to EIA).

[30] 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).[31]

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).[32] 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.[33] DOE/FE subsequently responded to the public comments in connection with the LNG export proceedings identified in that notice.[34]

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[31] 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.

[32] 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.

[33] 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).

[34] *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.[35] 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.[36] 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,[37] and concurrently provided notice of the availability of the Study, as discussed below.[38]

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);[39]

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[35] *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].

[36] 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.

[37] *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].

[38] *See* 2018 Study Notice.

[39] 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.[40]

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.[41] 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.[42] 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.[43]

[40] *See* 2018 Study Notice, 83 Fed. Reg. at 27,316.
[41] *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].
[42] 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).
[43] *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.[44]

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.[45]

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.[46] 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

[44] *See id*.
[45] *See id*.
[46] *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.[47]

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.[48] 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."[49] 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.[50] Of those, nine comments supported the Study,[51]

[47] *See* 2018 Study Response to Comments, 83 Fed. Reg. at 67,255.
[48] *See* 2018 Study Notice.
[49] *Id*. at 27,315.
[50] The public comments are posted on the DOE/FE website at: https://fossil.energy.gov/app/docketindex/docket/index/10.
[51] 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,[52] one comment took no position,[53] and one comment was non-responsive.[54]

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.[55] 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.[56]

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.[57] 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.[58] DOE highlighted the following key findings of the Study:

[52] 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.
[53] Comment of John Young.
[54] Comment of Vincent Burke.
[55] *See* 2018 Study Response to Comments, 83 Fed. Reg. at 67,260-72.
[56] *See id*. at 67,272.
[57] *See id*.
[58] *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."[59]

- "Increased exports of natural gas will improve the U.S. balance of trade and result in a wealth transfer into the United States."[60]

- "Overall [U.S.] GDP improves as LNG exports increase for all scenarios with the same U.S. natural gas supply condition.[61]

- "There is no support for the concern that LNG exports would come at the expense of domestic natural gas consumption."[62]

- "[A] large share of the increase in LNG exports is supported by an increase in domestic natural gas production."[63]

- "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."[64]

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.[65] 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.[66]

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

[59] *Id*. (quoting 2018 LNG Export Study at 55).
[60] 2018 Study Response to Comments, 83 Fed. Reg. at 67,273 (quoting 2018 LNG Export Study at 64).
[61] *Id*. (quoting 2018 LNG Export Study at 67).
[62] *Id*. (quoting 2018 LNG Export Study at 77).
[63] *Id*.
[64] *Id*. (quoting 2018 LNG Export Study at 70).
[65] 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.
[66] 2018 Study Response to Comments, 83 Fed. Reg. at 67,273.

interest."[67] 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.[68]

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).[69] 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.[70]

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. DOE commissioned this life cycle analysis (LCA) to inform its public interest review of non-FTA applications, as part of its

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[67] *Id*. (citing 2018 LNG Export Study at 63 & Appendix F).
[68] *See* 2018 Study Response to Comments, 83 Fed. Reg. at 67,273.
[69] U.S. 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.
[70] U.S. 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.

broader effort to evaluate different environmental aspects of the LNG production and export chain.

DOE sought to determine: (i) how domestically-produced LNG exported from the United States compares with 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. In June 2014, DOE/FE published NETL's report entitled, *Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States* (LCA GHG Report or 2014 Report).[71] DOE/FE also received public comments on the LCA GHG Report and responded to those comments in prior orders.[72] DOE has relied on the 2014 Report in its review of all subsequent applications to export LNG to non-FTA countries.[73]

Most recently, in 2018, DOE commissioned NETL to conduct an update to the 2014 LCA GHG Report, entitled *Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas From the United States: 2019 Update* (LCA GHG Update or 2019 Update).[74] As with the 2014 Report, the LCA GHG Update compared life cycle GHG emissions of exports of domestically produced LNG to Europe and Asia, compared with alternative fuel sources (such as

[71] U.S. 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.
[72] *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).
[73] *See, e.g.*, *Venture Global Plaquemines LNG, LLC*, DOE/FE Order No. 4446, FE Docket No. 16-28-LNG, Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations, 14-15, 38-41 (Oct. 16, 2019).
[74] Nat'l Energy Tech. Lab., *Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States: 2019 Update* (DOE/NETL 2019/2041) (Sept. 12, 2019), *available at*: https://www.energy.gov/sites/prod/files/2019/09/f66/2019%20NETL%20LCA-GHG%20Report.pdf. Although the LCA GHG Update is dated September 12, 2019, DOE announced the availability of the LCA GHG Update on its website and in the *Federal Register* on September 19, 2019.

regional coal and other imported natural gas) for electric power generation in the destination countries. Although core aspects of the analysis—such as the scenarios investigated—were the same as the 2014 Report, the LCA GHG Update contained the following three changes:

- Incorporated NETL's most recent characterization of upstream natural gas production, set forth in NETL's April 2019 report entitled, *Life Cycle Analysis of Natural Gas Extraction and Power Generation* (April 2019 LCA of Natural Gas Extraction and Power Generation);[75]

- Updated the unit processes for liquefaction, ocean transport, and regasification characterization using engineering-based models and publicly-available data informed and reviewed by existing LNG export facilities, where possible; and

- Updated the 100-year global warming potential (GWP) for methane (CH_4) to reflect the current Intergovernmental Panel on Climate Change's Fifth Assessment Report.[76]

In all other respects, the LCA GHG Update was unchanged from the 2014 Report.[77]

The LCA GHG Update demonstrated that the conclusions of the 2014 LCA GHG Report remained the same. Specifically, the 2019 Update concluded that the use of U.S. LNG exports for power production in European and Asian markets will not increase global GHG emissions from a life cycle perspective, when compared to regional coal extraction and consumption for power production.[78] On this basis, DOE/FE found that the 2019 Update supports the proposition that exports of LNG from the lower-48 states will not be inconsistent with the public interest.[79] Additional details are discussed below (*see infra* § VIII.B.3) and in DOE's Response to Comments on the 2019 Update.

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[75] Nat'l Energy Tech. Lab., *Life Cycle Analysis of Natural Gas Extraction and Power Generation* (DOE/NETL-2019/2039) (Apr. 19, 2019), *available at*: https://www.netl.doe.gov/energy-analysis/details?id=3198.
[76] *See* U.S. Dep't of Energy, Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas From the United States; Notice of Availability of Report Entitled Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas From the United States: 2019 Update and Request for Comments, 84 Fed. Reg. 49,278, 49,279 (Sept. 19, 2019).
[77] *See* U.S. Dep't of Energy, Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas From the United States: 2019 Update – Response to Comments, 85 Fed. Reg. 72, 75 (Jan. 2, 2020) [hereinafter DOE Response to Comments on 2019 Update].
[78] *See id*. at 78, 85.
[79] *See id*. at 86.

With respect to the Addendum, the 2014 LCA GHG Report, and the 2019 LCA GHG Update, 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*),[80] and three in a consolidated, unpublished opinion issued on November 1, 2017 (*Sierra Club II*).[81] 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.[82]

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

[80] *Sierra Club v. U.S. Dep't of Energy*, 867 F.3d 189 (D.C. Cir. 2017) (denying petition for review of the LNG export authorization issued to Freeport LNG Expansion, L.P., *et al*.).
[81] *Sierra Club v. U.S. Dep't of Energy,* 703 Fed. App'x 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).
[82] *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)

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."[83]

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.[84] 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."[85] The Court thus held that, "[u]nder our limited and deferential review, we cannot say that the Department 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."[86]

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.[87] 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.[88]

[83] *Sierra Club I*, 867 F.3d at 203.
[84] *Id*. at 192.
[85] *Id*. at 198.
[86] *Id*. at 201.
[87] *Id*.
[88] *Id*. at 202.

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."[89] 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."[90]

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."[91] 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.[92]

The D.C. Circuit's decisions in *Sierra Club I and II* continue to guide DOE's review of applications to export LNG to non-FTA countries.

III. PUBLIC INTEREST STANDARD

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

> [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[93]] 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

[89] *Sierra Club I*, 867 F.3d at 203.
[90] *Id.*
[91] *Sierra Club II*, 703 Fed. App'x 1, at *2.
[92] *Id.*
[93] 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.

> such terms and conditions as the [Secretary] may find necessary or appropriate.[94]

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.[95] 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.[96] 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 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.[97] The goals of the Policy Guidelines are to minimize federal control and

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[94] 15 U.S.C. § 717b(a).

[95] *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)).

[96] *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)). As of August 24, 2018, qualifying small-scale exports of natural gas to non-FTA countries are deemed to be consistent with the public interest under NGA section 3(a). *See* 10 C.F.R. § 590.102(p); 10 C.F.R. § 590.208(a); *see also* U.S. Dep't of Energy, Small-Scale Natural Gas Exports; Final Rule, 83 Fed. Reg. 35,106 (July 25, 2018).

[97] U.S. Dep't of Energy, New Policy Guidelines and Delegations Order Relating to Regulation of Imported Natural Gas, 49 Fed. Reg. 6684 (Feb. 22, 1984) [hereinafter 1984 Policy Guidelines].

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.[98]

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.[99]

In Order No. 1473, DOE stated that it was guided by DOE Delegation Order No. 0204-111.[100] 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."[101]

Although DOE Delegation Order No. 0204-111 is no longer in effect,[102] 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

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[98] *Id*. at 6685.
[99] *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 (Apr. 2, 1999), at 14 (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)).
[100] *See id*. at 13 and n.45.
[101] 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 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)).
[102] DOE Delegation Order No. 0204-111 was later rescinded by DOE Delegation Order No. 00-002.00 (¶ 2) (Dec. 6, 2001), and DOE Redelegation Order No. 00-002.04 (¶ 2) (Jan. 8, 2002).

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

Annova is a Delaware limited liability company with its principal place of business in Baltimore, Maryland. Annova is an indirect subsidiary of Exelon Corporation, a publicly traded company formed under the laws of Pennsylvania with its principal place of business in Chicago, Illinois.[103] Additionally, Annova has informed DOE/FE of various updates to its indirect ownership as indicated in the docket index for this proceeding.[104]

B. The Annova LNG Brownsville Project

Annova states that the proposed Project will be located on the south bank of the Brownsville Ship Channel in Cameron County, Texas. The Project will be built on an approximately 731-acre parcel of undeveloped land. Annova states that this site is available to Annova through a real estate lease option agreement with the Brownsville Navigation District (also referred to as the Port of Brownsville).[105] In the Supplement to the Application, Annova states that the lease option (as amended and restated in 2016) will go into effect when Annova notifies the Port of Brownsville that it will move forward with the Project.[106]

[103] App. at 2-3.
[104] *See* U.S. Dep't of Energy, Notice of Ownership Change, FE Docket Nos. 13-140-LNG & 19-34-LNG (July 25, 2019) (finding a change in control); Annova LNG Common Infrastructure, LLC, Notice of Ownership Change, FE Docket Nos. 13-140-LNG & 19-34-LNG (Apr. 26, 2019); U.S. Dep't of Energy, Statement of Change in Control, FE Docket Nos. 13-140-LNG & 19-34-LNG (Apr. 4, 2019) (finding no change in control); Annova LNG Common Infrastructure, LLC, Statement of Change in Control, FE Docket No. 13-140-LNG (Nov. 16, 2018).
[104] App. at 5.
[105] *Id*. at 5; *see also* FERC Order at ¶ 5 n.7.
[106] Supp. at 1.

As approved by FERC, the Project will consist of the following major components: gas pre-treatment facilities, six liquefaction, two LNG storage tanks, a marine vessel loading berth, a new access road, and associated infrastructure and support facilities.[107] Annova states that each of the liquefaction trains will have a nameplate capacity of 1 mtpa, for a maximum output at optimal operating conditions of 6.95 mtpa.[108] Annova states that it will commission the Project in three stages, with each stage consisting of two liquefaction trains.[109]

C. Project Pipeline

Annova states that a third party will construct, operate, and own an intrastate lateral pipeline that will transport natural gas to the Project from the existing intrastate system of Valley Crossing Pipeline, LLC.[110] Annova states that the intrastate pipeline is estimated to be constructed in 2023.[111]

D. Source of Natural Gas

Annova states that natural gas for the Project will include supplies available in the U.S. natural gas supply and transmission system.[112]

E. Business Model

Annova requests this authorization on its own behalf and as agent for other entities that will hold title to the LNG at the time of export.[113] Annova states that, to date, it has not yet entered into long-term natural gas supply or export contracts for the requested exports. Annova states that it will file all long-term, binding contracts associated with the export of LNG from the

[107] FERC Order at ¶ 6.
[108] *Id*. at ¶¶ 4, 6; App. at 5.
[109] App. at 5; FERC Order at ¶ 7.
[110] App. at 5; *see also* Supp. at 1-2; FERC Order at ¶ 9 (discussing anticipated modifications to the Valley Crossing Pipeline); final EIS at 1-15 to 1-17.
[111] App at 5.
[112] *See id*.
[113] *Id*. at 4.

Project, once executed, in accordance with established policy and precedent, and will comply with all DOE/FE requirements for exporters and agents, including registration requirements. Annova 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 set forth in recent DOE/FE orders.[114]

V. APPLICANT'S PUBLIC INTEREST ANALYSIS

A. Overview

Annova asserts that the requested authorization to export LNG to non-FTA countries is not inconsistent with the public interest and should be granted.[115] In support of this position, Annova addresses the following factors: (i) impacts on domestic natural gas supply, demand, and prices; (ii) the economic impacts of the proposed exports including regional benefits; (iii) international impacts; and (iv) environmental impacts.

B. Impacts on Domestic Natural Gas Supply and Demand

Annova maintains that, during the period of the requested export authorization, U.S. total and recoverable reserves of natural gas will exceed projected U.S. natural gas demand and increased LNG exports, including the proposed exports from the Project.[116] Annova cites the U.S. Energy Information Agency's (EIA) *Annual Energy Outlook 2018* (AEO 2018), which projects that natural gas production will outpace natural gas consumption between 2017 and 2050.[117] Further, Annova states that it commissioned ICF, LLC (ICF) to conduct a report analyzing the economic impacts of the proposed Project, including natural gas supply and

[114] *Id.* at 4, 6.
[115] *Id.* at 6.
[116] App. at 9.
[117] *Id.* at 9 (citing U.S. Energy Info. Admin., *Annual Energy Outlook 2018*, at 61-62 (Feb. 2018), *available at:* https://www.eia.gov/outlooks /aeo/pdf/AEO2018.pdf).

demand trends. Published on December 18, 2018, the ICF Report is entitled *Economic Impacts of the Proposed Annova Liquefaction Project: Information for DOE Non-FTA Permit Application*.[118] According to Annova, ICF found that a large portion of the technically recoverable resources is economic at relatively low wellhead prices. ICF estimated that between 1,200 and 1,400 trillion cubic feet (Tcf) of U.S. and Canadian gas resources are available at prices between $3.50 and $4.00 per million British thermal units (MMBtu).[119] Annova points out that ICF's estimates are "significantly higher" than EIA's estimates because they are based on current technology without future advancements.[120]

Annova notes EIA's projection that natural gas production will grow at a faster pace than natural gas consumption.[121] In addition, Annova argues that the ICF Report shows that the U.S. natural gas market rebalances to accommodate incremental increases in LNG exports by increasing domestic production, contracting U.S. domestic natural gas consumption, and increasing net natural gas imports from Canada and Mexico.[122] Annova further states that the incremental LNG export volumes attributable to the Project would result in only a small reduction in U.S. natural gas consumption of 0.11 Bcf/d in 2045, mostly as a result of natural gas declines in the power sector.[123] Finally, Annova asserts that, under both EIA and ICF estimates, technically recoverable resources greatly exceed forecasted natural gas demand, including exports from the Project over the requested authorization term.[124]

[118] *Id*. at 12 (citing ICF, *Economic Impacts of the Proposed Annova Liquefaction Project: Information for DOE Non-FTA Permit Application* (Dec. 18, 2018) (Appendix C to Application) [hereinafter ICF Report]).
[119] *Id.* at 11 (citing ICF Report at 17).
[120] *See id.*
[121] *Id.* at 12.
[122] App. at 12 (citing ICF Report at 46).
[123] *Id.* at 13 (citing ICF Report at 50).
[124] *Id.* at 13.

C. International Impacts

Annova asserts that the Project will also provide international benefits. Annova claims that the exports from the Project will "reduce the U.S. balance of trade deficit by $2.0 billion annually, or a total of $44.1 billion between 2024 and 2045."[125] Further, Annova cites DOE/FE's previous orders allowing the export of natural gas to support their argument that LNG exports "reduce the need for the United States to import LNG, diversify global LNG supplies, and improve energy security for key U.S. allies and trading partners."[126]

D. Economic Impacts

Annova maintains that the United States will experience net economic benefits from the exportation of LNG. Annova refers to the findings in DOE's LNG Export Studies to support this argument.[127] Specifically, Annova states that the 2018 Study finds that, while there is upward pressure on natural gas prices under increased natural gas exports, increased exports lead to higher levels of GDP and consumer wellbeing.[128]

Annova asserts that the ICF Report further supports their assertion and the findings of the DOE LNG Export Studies. According to Annova, the ICF Report finds that while natural gas prices are expected to rise with increased LNG exports, domestic natural gas prices will remain moderate.[129] Specifically, the increased exports due to the Project would have a minimal impact on that already moderate increase.[130] Finally, Annova reasserts that any moderate increase in the

[125] *Id.* at 19 (citing ICF Report at 56).
[126] *Id.* (citations omitted).
[127] App. at 14-18.
[128] *Id.* at 16 (citing 2018 Study at 18-21).
[129] *Id*. at 17.
[130] *Id*. at 17-18.

price of domestic natural gas would be offset by the overall macroeconomic benefits to the U.S. economy.[131]

Annova further asserts that the Project will have numerous local, regional, and national benefits. According to Annova, the ICF Report found that construction and operation of the Project would increase employment both nationally and in Texas.[132] Annova states that the Project would also increase federal, state, and local government revenues.[133] According to Annova, this increase would include an annual average increase of $1.05 billion in federal government revenues and an $88 million average annual increase in state and local government revenues.[134] Further, Annova states that the LNG exports from the Project will result in $3.2 billion annual incremental value nationally, and the Project will result in $0.68 billion annual average incremental value added in Texas.[135]

E. Environmental Impacts

Annova maintains that LNG exports may have environmental benefits because natural gas burns cleaner than other fossil fuels.[136] Annova cites DOE's 2014 LCA GHG Report (discussed above) in stating that, in most scenarios analyzed, power generation from imported natural gas results in lower GHG emissions than coal.[137] Annova also notes that the United

[131] *Id.* at 18.
[132] *Id*.
[133] *Id.*
[134] *Id*. at 18-19.
[135] App. at 19
[136] *See id.* at 21.
[137] *Id*. at 21 (citing 2014 LCA GHG Report).

States should not forego the economic and international benefits of exporting LNG when there will be little more than a modest, incremental impact on environmental issues.[138]

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,[139] and a formal application process that starts no sooner than 180 days after issuance of a notice that the pre-filing process has commenced.[140]

On March 11, 2015, FERC began its pre-filing review of the Project.[141] FERC established pre-filing Docket No. PF15-15-000 to place information related to the Project into the public record.[142] On July 23, 2015, FERC issued a Notice of Intent to Prepare an Environmental Impact Statement for the proposed Project.[143] DOE agreed to participate as a cooperating agency in FERC's environmental review.[144]

B. FERC's Environmental Review

On July 13, 2016, Annova and its affiliated entities (Annova LNG Brownsville A, LLC; Annova LNG Brownsville B, LLC; and Annova LNG Brownsville C, LLC) (collectively,

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[138] *Id*. at 20 (citation omitted).
[139] 18 C.F.R. § 157.21.
[140] *Id*. § 157.21(a)(2)(i-ii).
[141] Final EIS at 1-10.
[142] *See id*.
[143] Final EIS at 1-10; *see also Annova LNG Common Infrastructure, LLC, et al.*, Notice of Intent To Prepare an Environmental Impact Statement for the Planned Annova LNG Brownsville Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Meeting, FERC Docket No. PF15-15-000, 80 Fed. Reg. 45,525 (July 30, 2015).
[144] *See id.* at 45,527; *see also* final EIS at ES-1.

Annova) filed an application with FERC under section 3 of the NGA to site, construct, and operate the Project.[145] FERC assigned Docket No. CP16-480-000 to Annova's proposal.

In compliance with NEPA, FERC staff issued a Notice of Availability of a Draft Environmental Impact Statement on December 14, 2018, and placed the draft EIS into the public record.[146] On April 19, 2019, FERC staff issued the final EIS for the Project.[147] The final EIS responded to comments received on the draft EIS, and addressed numerous potential impacts of the proposed Project, including but not limited to wetlands, geological conditions, water resources, air quality, and cumulative impacts.[148]

Based on its environmental analysis, FERC staff concluded in the final EIS that "impacts on the environment from the proposed Project would be reduced to less than significant levels with the implementation of Annova's proposed impact avoidance, minimization, and mitigation measures and the additional measures recommended by FERC staff."[149] The final EIS contained 131 site-specific environmental mitigation measures, which FERC staff recommended that FERC attach as conditions to any authorization of the Project.[150]

[145] Final EIS at 1-1.
[146] *Annova LNG Common Infrastructure, LLC, et al.*, Notice of Availability of the Draft Environmental Impact Statement for the Proposed Annova LNG Brownsville Project, FERC Docket No. CP16-480-000, 83 Fed. Reg. 65,650 (Dec. 21, 2018); *see also* FERC Order at ¶ 27.
[147] *Annova LNG Common Infrastructure, LLC, et al.*, Notice of Availability of the Final Environmental Impact Statement for the Proposed Annova LNG Brownsville Project, FERC Docket No. CP16-480-000, 84 Fed. Reg. 17,824 (Apr. 26, 2019); *see also* FERC Order at ¶ 28.
[148] *See* final EIS at ES-3 to ES-4; FERC Order at ¶ 28.
[149] Final EIS at ES-14.
[150] *See id*. at 5-16 to 5-36 (list of mitigation measures).

C. FERC's Order Granting Authorization

On November 22, 2019, FERC issued its Order authorizing Annova to site, construct, and operate the Annova LNG Brownsville Project with a liquefaction capacity of up to 6.95 mtpa of LNG.[151]

In granting the authorization, FERC cited the final EIS in stating that "most of the direct environmental impacts from construction of the proposed Annova LNG Brownsville Terminal are expected to be temporary or short term during construction and operation."[152] FERC further found that "[w]ith the exception of certain cumulative impacts contributed by the Annova LNG Brownsville Terminal … implementation of Annova's proposed mitigation measures and additional measures recommended by staff in the EIS and adopted in this order would ensure that impacts in the project area would be avoided or minimized and most impacts would not be significant."[153] On this basis, FERC approved Annova's application under NGA section 3.[154] FERC also adopted the 131 mitigation measures recommended in the final EIS and included them as environmental conditions in the appendix of the Order.[155]

FERC considered the major environmental issues reviewed in the final EIS.[156] In addressing GHG emissions, for example, FERC pointed to the estimate in the final EIS that "operation of the Annova LNG Brownsville Project could result in GHG emissions of up to 367,295 metric tonnes per year of carbon dioxide equivalent (CO_2e)."[157] FERC further stated

[151] FERC Order at ¶¶ 4, 25.
[152] *Id*. at ¶ 20 (citing final EIS at 5-1).
[153] *Id*. (citing final EIS at 5-1).
[154] *Id*. at ¶ 25.
[155] *Id*. at ¶ 89 & Appendix (Environmental Conditions).
[156] *See generally* FERC Order at ¶¶ 26-91.
[157] *Id*. at ¶ 76 (citing final EIS at 4-185 at Tables 4.11.1-4, 4-186 at Tables 4.11.1-5.).

that the "operational emissions of this project could potentially increase annual CO_2e emissions based on the 2017 levels by approximately 0.0064 percent at the national level."[158]

On the basis of these estimates, FERC acknowledged the finding in the final EIS that "the quantified greenhouse gas emissions from the construction and operation of the project will contribute incrementally to climate change."[159] However, FERC stated that, "as [it] has previously concluded, it cannot 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."[160]

Additionally, FERC considered the cumulative impacts of the Project with other projects or actions in the same geographic and temporal scope.[161] First, FERC stated that, for the majority of resources where a level of impact could be ascertained, the Project's contribution to cumulative impacts "would not be significant," and the potential cumulative impacts of the Project and other overlapping projects "would be temporary, minor, moderate or insignificant."[162] Next, FERC observed that the Project combined with other projects with the geographic scope (including the proposed Texas LNG and Rio Grande LNG Projects) would contribute to certain significant cumulative impacts, including but not limited to impacts to surface water quality in the Brownsville Ship Channel, habitat loss for certain federally listed animal species, and impacts on visual resources due to the presence of aboveground structures.[163]

[158] *Id*.
[159] *Id*. at ¶ 77 (citing final EIS at 4-331).
[160] *Id*. (citations omitted).
[161] *Id*. at ¶ 82 (citing final EIS at 4-279 to 4-290).
[162] FERC Order at ¶ 83 (citing final EIS at 4-290 to 4-342, 5-12 to 5-15).
[163] *Id*. at ¶ 83; *see also id*. at ¶¶ 84-87 (discussing potentially significant cumulative impacts).

In addressing these potentially significant cumulative impacts, FERC noted that "[t]he final EIS discusses applicable mitigation measures, laws, and regulations protecting environmental resources, as well as permitting requirements to minimize effects on those resources."[164] FERC further emphasized that it "has the authority to take whatever steps are necessary to ensure the protection of environmental resources during construction and operation of the project," including the authority to impose any additional measures deemed necessary to ensure compliance with the intent of the conditions of the FERC Order.[165]

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 EIS, is an environmentally acceptable action."[166] FERC also found that that the Annova LNG Brownsville Project is not inconsistent with the public interest under NGA section 3.[167]

We note that certain parties have requested rehearing of the FERC Order, and that rehearing proceeding is ongoing.[168]

VII. CURRENT PROCEEDING BEFORE DOE/FE

In response to the Notice of Application, DOE/FE received one anonymous comment.[169] The commenter does not specifically address Annova's Application. Rather, the commenter generally "recommend[s] not exporting natural gas."[170] The commenter asserts that exporting natural gas "would result in over development when we should be shrinking and conserving our use of resources."[171]

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[164] *Id.* at ¶ 83.
[165] FERC Order at ¶ 89.
[166] *Id.* at ¶ 90.
[167] *See id*.
[168] *See, e.g.*, Federal Energy Regulatory Comm'n, Order Granting Rehearing for Further Consideration, Annova LNG Common Infrastructure, LLC, *et al.*, Docket No. CP16-480-000 (Jan. 21, 2020).
[169] Comment of Anonymous, FE Docket No. 19-34-LNG (May 25, 2019).
[170] *Id*.
[171] *Id*.

VIII. DISCUSSION AND CONCLUSIONS

In reviewing Annova'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 (which is uncontested under DOE/FE's regulations), the Supplement to the Application, and the anonymous comment filed in opposition to the Application;
- FERC's final EIS and 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 2014 LCA GHG Report and the 2019 LCA GHG Update, including comments submitted in response to those documents; and
- The 2018 LNG Export Study, including comments received in response to that Study.

A. Non-Environmental Issues

1. 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.[172] 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.[173] 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.[174]

[172] *See supra* § II.A.3.
[173] *See* 2018 Study Response to Comments, 83 Fed. Reg. at 67,272.
[174] *See id.* at 67,273.

We take administrative notice of EIA's recent authoritative projections for natural gas supply, demand, and prices, set forth in the *Annual Energy Outlook 2020* (AEO 2020), issued on January 29, 2020.[175] DOE/FE has assessed AEO 2020 to evaluate any differences from AEO 2017, which formed the basis for the 2018 LNG Export Study.[176] The AEO 2017 Reference case without the CPP shows lower net LNG exports of 12.5 Bcf/d of natural gas in 2050, compared with the AEO 2020 Reference case that shows net LNG exports of 15.8 Bcf/d in 2050. As discussed below, the AEO 2020 Reference case is even more supportive of exports than the AEO 2017 Reference case.

EIA's projections in AEO 2020 continue to show market conditions that will accommodate increased exports of natural gas. When compared to the AEO 2017 Reference case without the CPP, the AEO 2020 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 2020, support our finding that Annova's proposed authorization will not be inconsistent with the public interest.

[175] U.S. Energy Info. Admin., *Annual Energy Outlook 2020* (Jan. 29, 2020), *available at*: https://www.eia.gov/outlooks/aeo/pdf/aeo2020.pdf.

[176] 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. Prot. 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 2020 Reference case does not include the CPP, so the comparisons between AEO 2017 and AEO 2020 are consistent in that regard.

2. Annova's Application

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

First, Annova points to DOE's 2018 LNG Export Study and the ICF Report 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 that the 2018 LNG Export Study and AEO 2020 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.[177]

Second, the 2018 LNG Export Study indicates that exports of LNG will generate net economic benefits to the broader U.S. economy.[178] Indeed, the 2018 Study consistently shows macroeconomic benefits in every scenario, as well as positive annual growth across the energy intensive sectors of the U.S. economy.[179]

Third, over the 20-year term of the authorization, the proposed exports will improve the Unites States' ties with its trading partners and make a positive contribution to the United States' trade balance. For these reasons, we agree with Annova that its proposed exports are consistent with U.S. policy.[180]

Accordingly, based on the 2018 Study and the more recent data in AEO 2020, DOE/FE finds that the market will be capable of sustaining the level of exports requested in Annova's

[177] *See*, *e.g.*, 2018 Study Response to Comments, 83 Fed. Reg. at 67,262.
[178] *Id*.
[179] *See id.* at 67,268-69 (citing 2018 LNG Export Study at 67, 70).
[180] App. at 12-14.

Application over the authorization term without negative economic impacts, including domestic price impacts (discussed below).

3. Price Impacts

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 LNG exports authorized in the final non-FTA export authorizations to date (equivalent to a total of 44.81 Bcf/d of natural gas with the issuance of this Order and the three additional non-FTA orders being issued today). 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."[181]

Additionally, DOE/FE has analyzed AEO 2020 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 Reference case projections from AEO 2017) shows that the Reference case outlook in AEO 2020 projects lower-48 market conditions that would be even more supportive of LNG exports than in AEO 2017, including higher production and demand coupled with lower prices. For example, for the year 2050, the AEO 2020 Reference case anticipates over 13% more natural gas production in the lower-48 than the AEO 2017 Reference case. It also projects an average Henry Hub natural gas price that is lower than the AEO 2017 Reference case by over 38%. Table 1 below shows these comparisons:

[181] *See* 2018 Study Response to Comments, 83 Fed. Reg. at 67,258 (citing 2018 LNG Export Study at 55).

Table 1: Year 2050 Reference Case Comparisons in AEO 2017 and AEO 2020

	AEO 2017 Reference Case	AEO 2020 Reference Case
Lower-48 Dry Natural Gas Production (Bcf/d)	107.9	122.3
Total Natural Gas Consumption (Bcf/d)	92.4	100.0
Electric Power Sector Consumption (Bcf/d)	31.8	33.4
Net Exports by Pipeline (Bcf/d)	3.4	6.5
Net LNG Exports (Bcf/d)	12.5	15.8
LNG Exports – Total (Bcf/d)	12.7	15.9
Henry Hub Spot Price ($/MMBtu) (Note 1)	$6.00 (2019$)	$3.69 (2019$)

Note 1: Prices adjusted to 2019$ with the AEO 2017 projection of a Gross Domestic Product price index.

For these reasons, as explained in DOE/FE's Response to Comments on the 2018 Study, and as discussed in Annova's ICF Report, we find that arguments concerning domestic price increases are not supported by the record evidence.[182]

4. Benefits of International Trade

We have not limited our review to the 2018 LNG Export Study and data from AEO 2020, but have considered the international consequences of our decision. As discussed above, we

[182] *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 the United States' 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. Therefore, we agree with Annova 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.

B. Environmental Issues

In reviewing the potential environmental impacts of Annova'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 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 final EIS and determines that its comments and suggestions have been satisfied.[183] For the reasons set forth below, DOE/FE has not found that the arguments raised in the FERC

[183] *See* 40 C.F.R. § 1506.3(c).

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-0518) (*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. 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.[184] Nevertheless, a 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 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. Additionally, the anonymous commenter contends that the export of natural gas may lead to the overdevelopment of natural resources.[185] 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-

[184] Addendum at 2.
[185] *See supra* at § VII.

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.

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.[186]

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

Sierra Club and other commenters on the Addendum, 2014 Life Cycle Greenhouse Gas (LCA GHG) Report, the 2019 LCA GHG Update, and the 2018 LNG Export Study (as well as DOE/FE's earlier economic studies) expressed concern that exports of U.S. LNG may have a negative effect on the total amount of energy consumed in foreign nations and on global GHG emissions.

As explained above, both the 2014 LCA GHG Report and the 2019 Update estimated the life cycle GHG emissions of U.S. LNG exports to Europe and Asia, compared with certain other

[186] *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.

fuels used to produce electric power in those importing countries.[187] The 2019 Update was based on the most current available science, methodology, and data from the U.S. natural gas system to assess GHGs associated with exports of U.S. LNG.[188]

The 2019 Update demonstrates that the conclusions of the 2014 LCA GHG Report have not changed.[189] While acknowledging uncertainty, the LCA GHG Update 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 on per unit of energy consumed basis for power production.[190] 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.[191]

The LCA GHG Update (like the 2014 Report) does not provide information on whether authorizing exports of U.S. LNG to non-FTA nations will increase or decrease GHG emissions on a global scale.[192] Recognizing there is a global market for LNG, exports of U.S. LNG will affect the global price of LNG which, in turn, will affect energy systems in numerous countries. DOE further acknowledges that regional coal and imported natural gas are not the only fuels with which U.S.-exported LNG will 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. However, 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.[193] Such an analysis would not only have to consider market

[187] *See supra* § II.B.
[188] Response to Comments on 2019 Update, 85 Fed. Reg. at 85.
[189] *See id*.
[190] *See id*. at 85; *see also id*. at 86.
[191] *See id*.
[192] *See id*. at 81.
[193] Response to Comments on 2019 Update, 85 Fed. Reg. at 81.

dynamics in each of these countries over the coming decades, but also the interventions of numerous foreign governments in those markets. Moreover, the uncertainty associated with estimating each of these factors would likely render such an analysis too speculative to inform the public interest determination in DOE's non-FTA proceedings.[194] Based on the evidence, however, DOE sees no reason to conclude that U.S. LNG exports will increase global GHG emissions in a material or predictable way.[195]

Finally, we note that the D.C. Circuit held in *Sierra Club I* that there was "nothing arbitrary about the Department's decision" to compare emissions from exported U.S. LNG to emissions of coal or other sources of natural gas, rather than renewables or other possible fuel sources.[196] The Court's decision in *Sierra Club I* guided DOE's development of the 2019 Update.[197]

C. 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 and data indicating that the natural gas industry would increase natural

[194] *See id*.
[195] *See id*. at 86.
[196] *Sierra Club I*, 867 F.3d at 202 (finding that "Sierra Club's complaint 'falls under the category of flyspecking'") (citation omitted).
[197] *See supra* at § II.B, C.

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[198] 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.[199] Given these possibilities, DOE/FE recognizes the need to monitor market developments closely as the impact of successive authorizations of LNG exports unfolds.

D. 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 Annova's proposed exports will be inconsistent with the public interest. We further find that the anonymous commenter in this proceeding has failed to overcome the statutory presumption that the proposed export authorization is in the public interest.

[198] 1984 Policy Guidelines, 49 Fed. Reg. 6684.

[199] In previous orders, some commenters asked DOE to clarify the circumstances under which the agency would exercise its authority to revoke (in whole or in part) issued LNG export authorizations. 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.

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 and the three additional non-FTA orders being issued concurrently (*see supra* § I), there are currently 42 final non-FTA authorizations in a cumulative volume of exports totaling 44.81 Bcf/d of natural gas, or approximately 16.4 Tcf per year, as follows: Sabine Pass Liquefaction, LLC (2.2 Bcf/d),[200] Carib Energy (USA) LLC (0.04 Bcf/d),[201] Cameron LNG, LLC (1.7 Bcf/d),[202] FLEX I (1.4 Bcf/d),[203] FLEX II (0.4 Bcf/d),[204] Dominion Cove Point LNG, LP (0.77 Bcf/d),[205] Cheniere Marketing, LLC and Corpus Christi Liquefaction, LLC (2.1 Bcf/d),[206] Sabine Pass Liquefaction, LLC Expansion Project (1.38 Bcf/d),[207] American

[200] *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).
[201] *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).
[202] *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).
[203] *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).
[204] *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).
[205] *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).
[206] *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).
[207] *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).

Marketing LLC (0.008 Bcf/d),[208] Emera CNG, LLC (0.008 Bcf/d),[209] Floridian Natural Gas Storage Company, LLC,[210] Air Flow North American Corp. (0.002 Bcf/d),[211] Bear Head LNG Corporation and Bear Head LNG (USA), LLC (0.81 Bcf/d),[212] Pieridae Energy (USA) Ltd.,[213] Sabine Pass Liquefaction, LLC Design Increase (0.56 Bcf/d),[214] Cameron LNG, LLC Design Increase (0.42 Bcf/d),[215] Cameron LNG, LLC Expansion Project (1.41 Bcf/d),[216] Lake Charles

[208] *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).

[209]*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).

[210] *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).

[211] *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).

[212] *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).

[213] *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).

[214] *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).

[215] *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).

[216] *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).

Exports, LLC (2.0 Bcf/d),[217] Lake Charles LNG Export Company, LLC,[218] Carib Energy (USA), LLC (0.004),[219] Magnolia LNG, LLC (1.08 Bcf/d),[220] Southern LNG Company, L.L.C. (0.36 Bcf/d),[221] the FLEX Design Increase (0.34 Bcf/d),[222] Golden Pass Products LLC (2.21 Bcf/d),[223] Delfin LNG LLC,[224] the Lake Charles LNG Export Company, LLC Design Increase (0.33 Bcf/d),[225] the Lake Charles Exports, LLC Design Increase,[226] Eagle LNG Partners Jacksonville II

[217] *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).
[218] *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).
[219] *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).
[220] *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).
[221] *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).
[222] *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).
[223] *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).
[224] *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).
[225] *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 Lake Charles, Louisiana, to Free Trade Agreement and Non-Free Trade Agreement Nations (June 29, 2017).
[226] *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 Lake Charles, Louisiana, to Free Trade Agreement and Non-Free Trade Agreement Nations (June 29, 2017).

LLC (0.01 Bcf/d),[227] Mexico Pacific Limited LLC (1.7 Bcf/d),[228] Venture Global Calcasieu Pass, LLC (1.7 Bcf/d),[229] ECA Liquefaction, S. de R.L. de C.V. (Mid-Scale Project) (0.44 Bcf/d),[230] Energía Costa Azul, S. de R.L. de C.V. (Large-Scale Project) (1.3 Bcf/d),[231] Port Arthur LNG, LLC (1.91 Bcf/d),[232] Driftwood LNG LLC (3.88 Bcf/d),[233] FLEX4 (0.72 Bcf/d),[234] Gulf LNG Liquefaction Company, LLC (1.5 Bcf/d),[235] Eagle LNG Partners Jacksonville LLC (0.14 Bcf/d),[236] Venture Global Plaquemines LNG, LLC (3.40 Bcf/d),[237] Texas LNG Brownsville LLC

[227] *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).
[228] *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).
[229] *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).
[230] *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), *as amended ECA Liquefaction, S. de R.L. de C.V.*, DOE/FE Order No. 4364-A, FE Docket No. 18-144-LNG, Order Granting Request to Transfer Authorizations (Oct. 7, 2019).
[231] *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).
[232] *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).
[233] *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).
[234] *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).
[235] *Gulf LNG Liquefaction Co., LLC*, DOE/FE Order No. 4410, FE Docket No. 12-101-LNG, Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations (July 31, 2019).
[236] *Eagle LNG Partners Jacksonville LLC*, DOE/FE Order No. 4445, FE Docket No. 16-15-LNG, Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations (Oct. 3, 2019).
[237] *Venture Global Plaquemines LNG, LLC*, DOE/FE Order No. 4446, FE Docket No. 16-28-LNG, Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations (Oct. 16, 2019).

(0.56 Bcf/d),[238] Corpus Christi Liquefaction Stage III, LLC (1.59 Bcf/d),[239] Rio Grande LNG, LLC (3.61 Bcf/d),[240] 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.[241] 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 Terminal.[242] 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.[243] 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.[244]

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[238] *Texas LNG Brownsville LLC*, DOE/FE Order No. 4489, FE Docket No. 15-62-LNG, Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations (Feb. 10, 2020).
[239] *Corpus Christi Liquefaction Stage III, LLC*, DOE/FE Order No. 4490, FE Docket No. 18-78-LNG, Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations (Feb. 10, 2020).
[240] *Rio Grande LNG, LLC*, DOE/FE Order No. 4492, FE Docket No. 15-190-LNG, Opinion and Order Granting Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations (Feb. 10, 2020).
[241] *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).
[242] *Lake Charles LNG Export Co., LLC*, DOE/FE Order No. 4010, at 55; *see also Lake Charles Exports, LLC*, DOE/FE Order No. 4011, at 54.
[243] *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.").
[244] *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.").

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.[245] DOE/FE further notes that, to date, the amount of U.S. LNG export capacity that is operating or under construction totals 15.54 Bcf/d of natural gas across eight large-scale export projects in the lower-48 states.[246]

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 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.

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[245] *See* 2018 Study Response to Comments, 83 Fed. Reg. at 67,273 (citing 2018 LNG Export Study at 63 & Appendix F).

[246] U.S. Energy Info. Admin., *U.S. Liquefaction Capacity* (Jan. 30, 2020), *available at*: https://www.eia.gov/naturalgas/U.S.liquefactioncapacity.xlsx (total of 15.54 Bcf/d calculated by adding Column N in "Existing & Under Construction" worksheet).

IX. FINDINGS

On the basis of the findings and conclusions set forth above, DOE/FE grants Annova's Application in FE Docket No. 19-34-LNG 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. Annova must abide by each Term and Condition or face appropriate sanction.

A. Term of the Authorization

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

B. Commencement of Operations

As requested by Annova and consistent with our final non-FTA authorizations issued to date, DOE/FE will add as a condition of the authorization that Annova 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

Annova 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 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 Annova's long-term contracts.[247] The Commissioning Volumes will not be counted against the maximum level of volumes previously authorized in Annova's FTA authorization ((DOE/FE Order No. 3394, as amended by Order Nos. 3464 and 3394-A) or in this Order.

D. Make-Up Period

Annova 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 Annova's FTA authorization (DOE/FE Order No. 3394, as amended by Order Nos. 3464 and 3394-A) or in this Order. Insofar as Annova 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.[248] DOE/FE has found that this requirement applies to any change in control of the authorization holder. This condition was deemed necessary to ensure

[247] 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).
[248] 10 C.F.R. § 590.405.

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.[249] 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.[250]

F. Agency Rights

Annova 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 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.[251]

[249] *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).
[250] *See id*.
[251] *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).

To ensure that the public interest is served, this authorization shall be conditioned to require that where Annova proposes to export LNG from the 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 Annova file or cause to be filed with DOE/FE any relevant long-term commercial agreements, including liquefaction tolling agreements, pursuant to which Annova 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).[252]

In addition, DOE/FE finds that section 590.202(c) of DOE/FE's regulations[253] requires that Annova 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 Annova or the Registrant, within 30 days of their execution.

DOE/FE recognizes that some information in Annova'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 Annova the option to file or cause to be filed either unredacted contracts, or in the alternative (A) Annova 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

[252] 10 C.F.R. § 590.202(b).
[253] *Id*. § 590.202(c).

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.[254]

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 Annova's Application in the full volume of LNG requested for export to non-FTA countries up to the equivalent of 360 Bcf/yr of natural gas.

I. Combined FTA and Non-FTA Export Authorization Volumes

The volumes of LNG authorized for export in Annova's FTA authorization (DOE/FE Order No. 3394, as amended by Order Nos. 3464 and 3394-A) and this Order reflect the planned liquefaction capacity of the Project, as approved by FERC. Accordingly, Annova 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. Annova LNG Common Infrastructure, LLC (Annova) is authorized to export domestically produced LNG by vessel from the proposed Annova LNG Brownsville Project (Project) to be located on the Brownsville Ship Channel in Cameron County, Texas, in a volume up to the equivalent of 360 Bcf/yr of natural gas. This authorization is for a term of 20 years to commence from the date of first commercial export, but not before. Annova is authorized to

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

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. Annova 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 Annova's FTA authorization or in this Order.

C. Annova 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 Annova's FTA authorization or in this Order. Insofar as Annova may seek to export additional volumes not previously authorized, it will be required to obtain appropriate authorization from DOE/FE.

D. Annova must commence export operations using the planned Project 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 360 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. Annova 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. Annova 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 November 22, 2019. Additionally, this authorization is conditioned on Annova's on-going compliance with any other preventative and mitigative measures at the Project imposed by federal or state agencies.

I. (i) Annova 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) Annova 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. Annova 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 Annova with all information necessary to permit Annova 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. Annova, or others for whom Annova 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. 4491, issued February 10, 2020, in FE Docket No. 19-34-LNG, and/or to purchasers that have agreed in writing to limit their direct or indirect resale or transfer of such LNG to such countries. Customer or purchaser further commits to cause a report to be provided to Annova LNG Common Infrastructure, 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 Annova LNG Common Infrastructure, LLC is made aware of all such actual destination countries.

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

M. Annova shall file with the Office of Regulation, Analysis, and Engagement, on a semi-annual basis, written reports describing the status of the proposed 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, Annova must comply with DOE/FE's Procedures for Change in Control Affecting Applications and Authorizations to Import or Export Natural Gas.[255]

O. Monthly Reports: With respect to the exports authorized by this Order, Annova 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 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

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

available at https://www.energy.gov/fe/services/natural-gas-regulation.

Issued in Cairo, Egypt, on February 10, 2020.

Steven Eric Winberg
Assistant Secretary
Office of Fossil Energy

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),[256] and in compliance with the Council on Environmental Quality (CEQ) implementing regulations for NEPA,[257] DOE's implementing procedures for NEPA,[258] and DOE's "Compliance with Floodplain and Wetland Environmental Review Requirements."[259]

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 Annova LNG Brownsville Project (the Project) that would be used to support the export authorization sought from DOE/FE.[260] In accordance with 40 C.F.R. § 1506.3, DOE/FE adopted the EIS on April 26, 2019 (DOE/EIS-0518),[261] and EPA published a notice of the adoption on May 3, 2019.[262]

A. Alternatives

The EIS assessed alternative methods that could be used to achieve Annova's Project objectives.[263] The range of alternatives analyzed included the No-Action Alternative, system alternatives, alternative sites, access road alternatives, process and design alternatives, and dredged material placement area alternatives.[264] Alternatives were evaluated and compared to

[256] 42 U.S.C. § 4321 *et seq*.
[257] 40 C.F.R. Parts 1500-08.
[258] 10 C.F.R. Part 1021.
[259] *Id*. Part 1022.
[260] Federal Energy Regulatory Comm'n, *Annova LNG Brownsville Project Final Environmental Impact Statement*, Docket Nos. CP16-480-000 (Apr. 19, 2019), *available at:* https://www.ferc.gov/industries/gas/enviro/eis/2019/04-19-19-FEIS/FEIS-volume-I.pdf.
[261] Letter from Amy Sweeney, DOE/FE, to Julie Roemele, U.S. Envtl. Prot. Agency (Apr. 26, 2019) (adoption of final EIS).
[262] U.S. Envtl. Prot. Agency, Environmental Impact Statements; Notice of Availability, 84 Fed. Reg. 19,074 (May 3, 2019).
[263] Final EIS at 3-1 to 3-24.
[264] *Id*.

the proposed Project to determine if the alternatives would be environmentally preferable.[265]

In analyzing the No-Action Alternative, the EIS reviewed the effects and actions that could result if the Project was not constructed.[266] The EIS determined that the stated purpose of the Project would not be met under the No-Action Alternative.[267] In addition, the EIS determined that, with or without the No-Action Alternative, other LNG export projects could be developed in the Gulf Coast region or elsewhere in the United States that could result in environmental impacts of comparable significance, especially those projects in a similar regional setting.[268] The EIS concluded that the No-Action Alternative was not a reasonable alternative to meet the objectives of the Project.[269]

The EIS evaluated system alternatives for the Project's LNG export terminal by reviewing LNG facility system and its associated facilities alternatives.[270] The EIS reviewed nine existing, approved, or proposed liquefaction projects along the Texas Gulf Coast.[271] Based on this evaluation, the EIS concluded that each of the potential alternatives would not provide a significant environmental advantage over the Project.[272]

The EIS also evaluated alternative sites for the Project.[273] The EIS assessed five potential alternative sites near or within the Brownsville Shipping Channel that met, at a minimum, five project site criteria.[274] The EIS concluded that none of the alternatives would offer significant

[265] *Id.*
[266] *Id.* at 3-3.
[267] *Id.*
[268] *Id.*
[269] Final EIS at 3-3.
[270] *Id.* at 3-3 to 3-11.
[271] *Id.*
[272] *Id.* at 3-11.
[273] *Id.* at 3-11 to 3-16.
[274] *Id.*

environmental advantages or would be feasible relative to the proposed site.[275]

The EIS evaluated access road alternatives for the Project.[276] In addition to the Project's proposed access road route, the EIS analyzed two alternative access road routes to minimize potential impacts on wildlife and wetlands in the area.[277] The EIS concluded that neither alternative access road route would provide a significant environmental advantage over the proposed access road route.[278]

The EIS also evaluated process and design alternatives for the Project—specifically, power generation, carbon capture, compressor power, and flare design.[279] First, the EIS analyzed power generation, comparing the proposed grid-supplied power generation to on-site power generation.[280] The EIS determined that on-site power generation would increase local ambient air emission impacts around the LNG facility and would result in increased local noise, increased water usage to provide cooling for the power plant, and increased physical footprint and visual impacts for the Project.[281] As a result, the EIS concluded the alternative would not provide a significant environmental advantage over the Project's proposed grid-supplied power generation.[282]

Second, the EIS analyzed the feasibility of carbon capture for the proposed Project.[283] The EIS could not identify a use for captured CO_2 and thus could not recommend carbon capture for CO_2 emissions from the Project.[284] Third, the EIS compared the Project's proposed use of

[275] Final EIS at 3-16.
[276] *Id.* at 3-17 to 3-19.
[277] *Id.*
[278] *Id.* at 3-17 to 3-19.
[279] *Id.* at 3-19 to 3-23.
[280] Final EIS at 3-19 to 3-21.
[281] *Id.* at 3-21.
[282] *Id.*
[283] *Id*
[284] *Id.*

electric motor-driver compressors using grid-based electricity to the use of natural gas-fired turbine compressors, as an alternative.[285] The EIS concluded the alternative would not provide a significant environmental advantage when comparing local air quality impacts with those of the proposed electric motor-driven compressors.[286]

Fourth, the EIS evaluated flare designs for the proposed Project.[287] Along with the proposed ground flare system, the EIS analyzed two alternative flare systems to address concerns related to visual impacts and potential impact on migrating birds.[288] In analyzing the two alternatives versus the proposed ground flare system, the EIS determined that neither alternative would provide a significant environmental advantage.[289]

Finally, the EIS evaluated dredge material placement area alternatives for the proposed Project.[290] The two alternative areas analyzed consisted of a single-site alternative and a dual-site alternative, in addition to the Project's proposed dredged material placement area.[291] After analyzing the alternatives, the EIS concluded that neither would offer a significant environment advantage to the proposed area.[292]

B. Environmentally Preferred Alternative

When compared against the alternatives assessed in the EIS, the Project—as modified by the recommended mitigation measures—is the environmentally preferred alternative to meet the Project's objectives.[293]

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[285] *Id.* at 3-21 to 3-22.
[286] Final EIS at 3-22.
[287] *Id.* at 3-22 to 3-23.
[288] *Id.*
[289] *Id.*
[290] *Id.* 3-23 to 3-24.
[291] *Id.*
[292] Final EIS at 3-24.
[293] *Id*.

C. Decision

DOE/FE has decided to issue Order No. 4491 authorizing Annova to export domestically produced LNG by vessel from the proposed Annova LNG Brownsville Project to non-FTA countries in a volume equivalent to 360 Bcf/yr of natural gas 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 the single commenter opposing Annova'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 under NGA section 3(a).[294] DOE/FE also considered the Addendum, which summarizes available information on potential upstream impacts associated with unconventional natural gas activities, such as hydraulic fracturing.[295]

D. Mitigation

As a condition of its decision to issue Order No. 4491, DOE/FE is imposing requirements that will avoid or minimize the environmental impacts of the Project. These conditions include the 131 environmental conditions recommended in the EIS and adopted by FERC in its order authorizing the Project on November 22, 2019.[296] Mitigation measures beyond those included in Order No. 4491 that are enforceable by other federal and state agencies are additional conditions of Order No. 4491. 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

[294] 15 U.S.C. § 717b(a).
[295] U.S. 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).
[296] *Annova LNG Common Infrastructure, LLC, et al.*, Order Granting Authorizations Under Section 3 of the Natural Gas Act, 169 FERC ¶ 61,132 (Nov. 22, 2019).

Requirements." The required floodplain assessment was conducted during development and preparation of the EIS, which determined that portions of the Project would be located in the 100-year and 500-year flood plain. Annova has proposed to design the Project to withstand a 500-year flood event, in accordance with FERC recommendations.[297] While the placement of the Project within floodplains would be unavoidable, DOE/FE has determined that the proposed design for the Project minimizes floodplain impacts to the extent practicable.

[297] Final EIS at 4-249.