

UNITED STATES OF AMERICA

DEPARTMENT OF ENERGY

OFFICE OF FOSSIL ENERGY

FREEPORT LNG EXPANSION, L.P.,)
FLNG LIQUEFACTION, LLC,) FE DOCKET NO. 11-161-LNG
FLNG LIQUEFACTION 2, LLC, AND)
FLNG LIQUEFACTION 3, LLC)

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

DOE/FE ORDER NO. 3357

NOVEMBER 15, 2013

TABLE OF CONTENTS

- I. INTRODUCTION..... 1
- II. SUMMARY OF FINDINGS AND CONCLUSIONS..... 7
- III. PUBLIC INTEREST STANDARD 7
- IV. DESCRIPTION OF REQUEST 9
 - A. Background 10
 - 1. Description of Applicant and Facility..... 10
 - 2. Procedural History 11
 - 3. FLEX’s Notice of Long-Term Contracts..... 13
 - 4. FLEX’s Amendment to Application..... 14
 - B. Liquefaction Project and Capacity 15
 - C. Business Model 17
 - D. Source of Natural Gas 18
 - E. Environmental Review 19
- V. APPLICANT’S PUBLIC INTEREST ANALYSIS 19
 - A. Impact of the Liquefaction Project on Natural Gas Prices..... 20
 - B. Domestic Natural Gas Supplies and Resource Base 23
 - C. Domestic Natural Gas Demand..... 25
 - D. Benefits to Local, Regional, and National Economy 27
 - E. Benefits of International Trade 28
 - F. Global Environmental Benefits..... 29
 - G. Benefits to National Energy Security..... 30
- VI. LNG EXPORT STUDY 31
 - A. EIA Study, *Effect of Increased Natural Gas Exports on Domestic Energy Markets* ... 32
 - 1. Methodology..... 32
 - 2. Scope of EIA Study 34
 - 3. Natural Gas Markets 35
 - 4. Results of EIA Study 35
 - 5. Wellhead Price Increases 36
 - 6. Increased Natural Gas Production and Supply 37
 - 7. Decreased Natural Gas Consumption..... 37
 - 8. Increased End-User Natural Gas and Electricity Delivered Prices 38
 - 9. Impact on Natural Gas Producer Revenues 39
 - 10. Impacts Beyond the Natural Gas Industry..... 40
 - B. NERA Study, *Macroeconomic Impacts of LNG Exports from the United States*..... 40
 - 1. Overview of NERA’s Findings 41
 - 2. Overview of NERA’s Methodology 43
 - 3. Scope of the NERA Study 45
 - 4. NERA’s Global Natural Gas Model 46
 - 5. The N_{ew}ERA Macroeconomic Model..... 48
 - 6. Relationship to the EIA Study 49
 - 7. Key Assumptions and Parameters of the NERA Study..... 49

8. Results of the NERA Study	50
VII. MOTIONS TO INTERVENE, COMMENTS, AND PROTEST IN RESPONSE TO THE NOTICE OF APPLICATION	57
A. Overview	57
B. Comments Opposing the Application	57
C. Proposed Intervenor Gulf Coast Environmental Labor Coalition	59
1. GCELC’s Motion to Intervene and Protest	59
2. FLEX’s Answer to GCELC	61
D. Proposed Intervenor American Public Gas Association	64
1. APGA’s Motion to Intervene and Protest	64
2. FLEX’s Answer to APGA	68
E. Proposed Intervenor Sierra Club	73
1. Sierra Club’s Motion for Leave to Intervene, Protest, and Comments	73
2. FLEX’s Answer to Sierra Club	80
3. Sierra Club’s Reply to FLEX’s Answer	84
4. FLEX’s Response to Sierra Club’s Reply	87
F. Proposed Intervenors America’s Energy Advantage, Inc., and Industrial Energy Consumers of America	88
1. Late-Filed Motions for Leave to Intervene, Protest, and Comments	88
2. FLEX’s Opposition to Late-Filed Motions	89
VIII. COMMENTS ON THE LNG EXPORT STUDY AND DOE/FE ANALYSIS	91
A. Data Inputs and Estimates of Natural Gas Demand	92
1. Comments	92
2. DOE/FE Analysis	95
B. Distributional Impacts	102
1. GDP Versus Welfare	102
2. Sectoral Impacts	103
3. Household and Distributional Impacts	110
4. Regional Impacts	112
C. Estimates of Domestic Natural Gas Supplies	114
1. Comments	114
2. DOE/FE Analysis	116
D. Modeling the LNG Export Business	121
1. Comments	121
2. DOE/FE Analysis	125
E. Cost of Environmental Externalities	131
1. Comments	131
2. DOE/FE Analysis	132
F. Prices and Volatility	133
1. Natural Gas Price Volatility	133
2. Linking the Domestic Price of Natural Gas to World Prices	135
G. Integrity of the LNG Export Study	137
1. Comments	137

2. DOE/FE Analysis	138
H. Peer Review	138
1. Comments	138
2. DOE/FE Analysis	139
I. Procedural Arguments.....	141
1. Comments	141
2. DOE/FE Analysis	143
IX. DISCUSSION AND CONCLUSIONS.....	144
A. Motions to Intervene	144
B. FLEX’s Application	147
1. Regional Impacts	148
2. Price Impacts	151
3. Conditional Authorization	152
C. Significance of the LNG Export Study	152
D. Benefits of International Trade	153
E. Other Considerations.....	154
F. Conclusion	155
X. TERMS AND CONDITIONS	157
A. Term of the Authorization.....	157
B. Commencement of Operations Within Seven Years	158
C. Transfer, Assignment, or Change in Control	158
D. Agency Rights.....	159
E. Contract Provisions for the Sale or Transfer of LNG to be Exported.....	160
F. Export Quantity	162
G. Combined FTA and Non-FTA Export Authorization Volume.....	163
H. Environmental Review	163
XI. FINDINGS	164
XII. ORDER	164

FREQUENTLY USED ACRONYMS

AEO	Annual Energy Outlook
APGA	American Public Gas Association
Bcf/d	Billion Cubic Feet per Day
Bcf/yr	Billion Cubic Feet per Year
CO ₂	Carbon Dioxide
DOE	U.S. Department of Energy
EIA	U.S. Energy Information Administration
EITE	Energy Intensive, Trade Exposed
EPA	U.S. Environmental Protection Agency
EUR	Estimated Ultimate Recovery
FDI	Foreign Direct Investment
FE	Office of Fossil Energy, U.S. Department of Energy
FERC	Federal Energy Regulatory Commission
FLEX	Freeport LNG Expansion, L.P. and FLNG Liquefaction LLC
FTA	Free Trade Agreement
GCELC	Gulf Coast Environmental Labor Coalition
GDP	Gross Domestic Product
GNGM	Global Natural Gas Model
IECA	Industrial Energy Consumers of America
kWh	Kilowatt-Hour
LNG	Liquefied Natural Gas
LTA	Liquefaction Tolling Agreement
Mcf	Thousand Cubic Feet
MMBtu	Million British Thermal Units
mtpa	Million Metric Tons per Annum
NEI	National Export Initiative
NEMS	National Energy Modeling System
NEPA	National Environmental Policy Act
NERA	NERA Economic Consulting
N _{ew} ERA	NERA's Macroeconomic Model
NGA	Natural Gas Act
NGLs	Natural Gas Liquids
NOA	Notice of Availability
Tcf/yr	Trillion Cubic Feet per Year
TRR	Technically Recoverable Resources

I. INTRODUCTION

On December 19, 2011, Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC (collectively, FLEX) filed an application (Application)¹ with the Office of Fossil Energy of the Department of Energy (DOE/FE) under section 3 of the Natural Gas Act (NGA)² for long-term, multi-contract authorization to export domestically produced liquefied natural gas (LNG) by vessel to nations with which the United States has not entered a free trade agreement (FTA) providing for national treatment for trade in natural gas (non-FTA countries).³ This is the second application that FLEX has filed seeking authorization to export LNG to non-FTA countries. FLEX filed its first non-FTA export application one year earlier, on December 17, 2010, in FE Docket No. 10-161-LNG. On May 17, 2013 in Order No. 3282, DOE/FE responded to that application by conditionally authorizing FLEX to export 1.4 billion cubic feet of natural gas per day (Bcf/d), or approximately 511 Bcf per year (Bcf/yr), for a 20-year period (*Freeport I*).⁴

In this Application, which FLEX states is separate from but “substantially similar” to its application in *Freeport I*,⁵ FLEX seeks to export up to the equivalent of approximately 1.4 Bcf/d (511 Bcf/yr) for a 25-year period. The requested 1.4 Bcf/d export volume would be in addition to the export volume conditionally granted by DOE/FE in *Freeport I*, and thus—if

¹ Application of Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC, LP for Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Countries, FE Docket No. 11-161-LNG (Dec. 19, 2011) [hereinafter FLEX App.]

² 15 U.S.C. § 717b. This authority is delegated to the Assistant Secretary for Fossil Energy pursuant to Redesignation Order No. 00-002.04F (July 11, 2013).

³ FLEX applied for and has been granted two authorizations to export the same quantity of LNG to any country with which the United States has, or in the future may enter into, a FTA requiring national treatment in natural gas (FTA countries). DOE/FE granted those FTA authorizations on February 17, 2011, and February 10, 2012. *See infra* Section IV.A.

⁴ *Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC*, DOE/FE Order No. 3282, 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 (May 17, 2013).

⁵ FLEX App. at 5.

granted in full—would bring FLEX’s combined export authorization to 2.8 Bcf/d.⁶ As in *Freeport I*, the proposed exports would originate from the Freeport LNG Terminal located on Quintana Island, Texas, southeast of the City of Freeport in Brazoria County, Texas. FLEX is requesting this authority to export LNG on its own behalf and as agent for third parties.

Freeport LNG Expansion, L.P. is a Delaware limited partnership and a wholly owned subsidiary of Freeport LNG Development, L.P. FLNG Liquefaction, LLC is a Delaware limited liability company and a wholly owned subsidiary of Freeport LNG Expansion, L.P. Both Freeport LNG Development, L.P. and FLNG Liquefaction, LLC have their principal place of business in Houston, Texas. FLEX, through one or more of its subsidiaries, proposes to develop, own, and operate natural gas liquefaction facilities to receive and liquefy domestic LNG for export.

On February 13, 2012, DOE/FE published a Notice of FLEX’s Application in the Federal Register.⁷ The Notice of Application called on interested persons to submit protests, motions to intervene, notices of intervention, and comments by April 13, 2012. Eleven comments were submitted in opposition to the Application. No comments were filed in support of the Application.⁸ DOE/FE also received three timely filed motions to intervene and protests filed by the Gulf Coast Environmental Labor Coalition (GCELC), the American Public Gas Association (APGA), and Sierra Club, and two motions for leave to intervene and comment filed out of time

⁶ DOE regulations require applicants to provide requested export volumes in terms of Bcf of natural gas. 10 C.F.R. § 590.202(b)(1). Accordingly, as discussed below, DOE/FE will authorize FLEX’s requested export in the equivalent of Bcf/yr of natural gas. *See infra* Sections X.F & XII.A.

⁷ Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC; Application for Long-Term Authorization to Export Domestically Produced Liquefied Natural Gas to Non Free Trade Agreement Countries, 77 Fed. Reg. 7568 (Feb. 13, 2012) [hereinafter Notice of Application].

⁸ DOE/FE notes that it received 13 letters and four resolutions passed by local entities in support of the Liquefaction Project in FLEX’s first non-FTA application proceeding, in FE Docket 10-161-LNG. Those supporting comments were discussed in *Freeport I*, DOE/FE Order No. 3282, at 22-24.

by America's Energy Advantage, Inc. and Industrial Consumers of America (IECA). Additional procedural history is set forth below in Section VII.

Between the time when FLEX filed its first non-FTA application in December 2010 and its current Application in December 2011, two significant developments occurred. First, in May 2011, DOE/FE issued *Sabine Pass*, DOE/FE Order No. 2961, the Department's first order granting a long-term authorization to export LNG produced in the lower-48 states to non-FTA countries.⁹ In that order, DOE/FE conditionally authorized Sabine Pass Liquefaction, LLC to export a volume of LNG equivalent to 2.2 Bcf/d of natural gas. Second, in August 2011, DOE/FE determined that further study of the economic impacts of LNG exports was warranted to better inform its public interest review under section 3 of the NGA.¹⁰ By that time, DOE/FE had conditionally granted the *Sabine Pass* order, and had also received FLEX's first non-FTA application and an application from Lake Charles Exports, LLC (Lake Charles Exports) to export LNG to non-FTA countries.¹¹ Together, the *Sabine Pass* conditional order, the first FLEX application, and the Lake Charles application proposed LNG export authorizations totaling the equivalent of up to 5.6 Bcf/d of natural gas. DOE/FE expected that more non-FTA export

⁹ *Sabine Pass Liquefaction, LLC*, DOE/FE Order No. 2961, Opinion and Order Conditionally Granting Long-Term Authorization to Export Liquefied Natural Gas From Sabine Pass LNG Terminal to Non-Free Trade Agreement Nations (May 20, 2011) [hereinafter *Sabine Pass*]. In August 2012, DOE/FE granted final authorization. *Sabine Pass Liquefaction, LLC*, DOE/FE Order No. 2961-A, 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).

¹⁰ DOE/FE stated in *Sabine Pass* that it "will evaluate the cumulative impact of the [Sabine Pass] authorization and any future authorizations for export authority when considering any subsequent application for such authority." DOE/FE Order No. 2961, at 33.

¹¹ On August 7, 2013, DOE/FE conditionally authorized Lake Charles Exports to export domestically-produced LNG in a volume equivalent to 2.0 Bcf/d of natural gas for a period of 20 years. See *Lake Charles Exports, LLC*, DOE/FE Order No. 3324, Order Conditionally Granting Long-Term Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel From the Lake Charles Terminal to Non-Free Trade Agreement Nations (Aug. 7, 2013) [hereinafter *Lake Charles Exports*].

applications would be filed imminently. Indeed, by the end of 2011, several more applications had been filed, including the current Application.¹²

Accordingly, DOE/FE engaged the U.S. Energy Information Administration (EIA) and NERA Economic Consulting (NERA) to conduct a two-part study of the economic impacts of LNG exports.¹³ First, in August 2011, DOE/FE requested that EIA assess how prescribed levels of natural gas exports above baseline cases could affect domestic energy markets. Using its National Energy Modeling System (NEMS), EIA examined the impact of two DOE/FE-prescribed levels of assumed natural gas exports (at 6 Bcf/d and 12 Bcf/d) under numerous scenarios and cases based on projections from EIA's 2011 Annual Energy Outlook (AEO 2011), the most recent EIA projections available at the time.¹⁴ The scenarios and cases examined by EIA included a variety of supply, demand, and price outlooks. EIA published its study, *Effect of Increased Natural Gas Exports on Domestic Energy Markets*, in January 2012.¹⁵ Second, in October 2011, DOE contracted with NERA to incorporate the forthcoming EIA case study output from the NEMS model into NERA's general equilibrium model of the U.S. economy. NERA analyzed the potential macroeconomic impacts of LNG exports under a range of global natural gas supply and demand scenarios, including scenarios with unlimited LNG exports.

¹² As of the date of this Order (and excluding FLEX's current Application), 21 applications for long-term export of LNG to non-FTA countries, in a volume of LNG equivalent to approximately 28.35 Bcf/d of natural gas, are pending before DOE/FE. The total volume of LNG at issue in the approved and pending non-FTA applications filed with DOE/FE to date is equivalent to approximately 34.12 Bcf/d of natural gas.

¹³ See 2012 LNG Export Study, 77 Fed. Reg. 73,627 (Dec. 11, 2012), available at http://energy.gov/sites/prod/files/2013/04/f0/fr_notice_two_part_study.pdf (Federal Register Notice of Availability of the LNG Export Study).

¹⁴ The Annual Energy Outlook (AEO) presents long-term projections of energy supply, demand, and prices. It is based on results from EIA's NEMS model. See discussion of the AEO 2011 projections at Section VIII.A *infra*.

¹⁵ See LNG Export Study – Related Documents, available at <http://energy.gov/fe/downloads/lng-export-study-related-documents> (EIA Analysis (Study - Part 1)).

DOE published the NERA study, *Macroeconomic Impacts of LNG Exports from the United States*, in December 2012.¹⁶

On December 11, 2012, DOE/FE published a Notice of Availability (NOA) of the EIA and NERA studies (collectively, the LNG Export Study).¹⁷ DOE/FE invited public comment on the Study, and stated that its disposition of the present case and 14 other LNG export applications then pending would be informed by the Study and the comments received in response thereto.¹⁸ The NOA required initial comments by January 24, 2013, and reply comments between January 25 and February 25, 2013.¹⁹ DOE/FE received over 188,000 initial comments and over 2,700 reply comments, of which approximately 800 were unique.²⁰ The comments also included 11 economic studies prepared by commenters or organizations under contract to commenters.

The public comments represent a diverse range of interests and perspectives, including those of federal, state, and local political leaders; large public companies; public interest organizations; academia; industry associations; foreign interests; and thousands of U.S. citizens. While the majority of comments are short letters expressing support or opposition to the LNG Export Study or to LNG exports in general, others contained detailed statements of differing points of views. The comments were posted on the DOE/FE website and entered into the public records of the 15 LNG export proceedings identified in the NOA, including the present

¹⁶ *See id.* (NERA Economic Consulting Analysis (Study - Part 2)).

¹⁷ 77 Fed. Reg. at 73,627.

¹⁸ *Id.* at 73,628.

¹⁹ *Id.* at 73,627. On January 28, 2013, DOE issued a Procedural Order accepting for filing any initial comments that had been received as of 11:59 p.m., Eastern time, on January 27, 2013.

²⁰ Because many comments were nearly identical form letters, DOE/FE organized the initial comments into 399 docket entries, and the reply comments into 375 entries. *See* http://www.fossil.energy.gov/programs/gasregulation/authorizations/export_study/export_study_initial_comments.html (Initial Comments – LNG Export Study) & http://www.fossil.energy.gov/programs/gasregulation/authorizations/export_study/export_study_reply_comments.html (Reply Comments – LNG Export Study).

proceeding.²¹ As discussed below, DOE/FE has carefully examined the comments and has considered them in its review of FLEX's Application.

Recently, on September 19, 2013, FLEX filed an Amendment and Supplement to its Application (Amendment), in which FLEX asked DOE/FE to add two new entities in Freeport's corporate family—FLNG Liquefaction 2, LLC and FLNG Liquefaction 3, LLC—as applicants in this proceeding (as well in FLEX's three other docket proceedings discussed below).²² This Amendment, if granted, will allow the original applicant, FLNG Liquefaction, LLC (also called FLNG Liquefaction 1), to own the first liquefaction train, and FLNG Liquefaction 2 and FLNG Liquefaction 3 to own the second and third liquefaction trains, respectively. FLEX states that, upon completion of the Liquefaction Project, the three liquefaction trains will be integrated with the existing regasification and import facility at the Freeport Terminal, such that the Project will be operated by FLNG Expansion as a single integrated LNG facility.

This Order grants FLEX's Amendment and conditionally grants FLEX's Application in a modified volume. Specifically, we are conditionally authorizing FLEX to export LNG in a volume equivalent to 0.4 Bcf/d of natural gas (146 Bcf/yr) for a 20-year term, which is less than the export volume of 1.4 Bcf/d requested in the Application. DOE/FE observes that, in a filing dated August 31, 2012, FLEX notified the Federal Energy Regulatory Commission (FERC) that the planned liquefaction capacity of the Liquefaction Project is 1.8 Bcf/d of natural gas. In connection with its environmental review obligations under the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. § 4321 *et seq.*, FERC thus will be examining a facility with a planned liquefaction capacity of 1.8 Bcf/d of natural gas, not the 2.8 Bcf/d combined export

²¹ See 77 Fed. Reg. at 73,629 & n.4.

²² Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC, Amendment and Supplement to Application of Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC, for Long-Term Authorization to Export Liquefied Natural Gas, FE Docket No. 11-161-LNG (Sept. 19, 2013).

volume proposed by FLEX in its two non-FTA proceedings. *See infra* Section IV.B. As there is no basis for DOE/FE to authorize exports in a volume greater than the Project's maximum liquefaction capacity, the export volume authorized herein represents the 0.4 Bcf/d marginal difference between FLEX's conditional authorization of 1.4 Bcf/d in *Freeport I* and the Project's planned liquefaction capacity of 1.8 Bcf/d. Additional details about FLEX, the requested export authorization, and the Amendment to FLEX's Application are discussed in more detail below.

II. SUMMARY OF FINDINGS AND CONCLUSIONS

Based on a review of the complete record and for the reasons set forth below, DOE/FE has concluded that the opponents of the FLEX Application have not demonstrated that the requested authorization will be inconsistent with the public interest and finds that the exports proposed in this Application are likely to yield net economic benefits to the United States. DOE/FE further finds that FLEX's proposed exports on behalf of other entities should be conditionally authorized at a volumetric rate not to exceed the capacity of the facilities to be used in the proposed export operations and subject to satisfactory completion of environmental review and other terms and conditions discussed below.

III. PUBLIC INTEREST STANDARD

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

[N]o person shall export any natural gas from the United States to a foreign country or import any natural gas from a foreign country without first having secured an order of the [Secretary of Energy²³] authorizing it to do so. The [Secretary] shall issue such order upon application, unless after opportunity for hearing, [he] finds that the proposed exportation or importation will not be consistent with the public interest. The [Secretary] may by [the Secretary's] order grant such application, in whole or part, with such modification and upon such terms and conditions as the [Secretary] may find necessary or appropriate.

²³ 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.

15 U.S.C. § 717b(a). This provision creates a rebuttable presumption that a proposed export of natural gas is in the public interest. DOE/FE must grant such an application unless opponents of the application overcome that presumption by making an affirmative showing of inconsistency with the public interest.²⁴

While 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 prior decisions, however, DOE/FE 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/FE looks to record evidence developed in the application proceeding.²⁵

DOE/FE’s prior decisions have also looked to certain principles established in its 1984 Policy Guidelines.²⁶ The goals of the Policy Guidelines are to minimize federal control and involvement in energy markets and to promote a balanced and mixed energy resource system.

The Guidelines provide that:

The market, not government, should determine the price and other contract terms of imported [or exported] natural gas The federal government’s primary responsibility in authorizing imports [or exports] will be to evaluate the need for the gas and whether the import [or export] arrangement will provide the gas on a competitively priced basis for the duration of the contract while minimizing regulatory impediments to a freely operating market.²⁷

²⁴See, e.g., *Sabine Pass*, Order No. 2961, at 28; *Phillips Alaska Natural Gas Corp. & Marathon Oil Co.*, DOE/FE Order No. 1473, Order Extending Authorization to Export Liquefied Natural Gas from Alaska, at 13 (April 2, 1999), citing *Panhandle Producers & Royalty Owners Ass’n v. ERA*, 822 F.2d 1105, 1111 (D.C. Cir. 1987).

²⁵See, e.g., *Sabine Pass*, DOE/FE Order No. 2961, at 28-42 (reviewing record evidence in issuing conditional authorization); *Freeport LNG*, DOE/FE Order No. 3282, at 109-14 (discussing same); and *Lake Charles Exports*, DOE/FE Order No. 3324, at 121-27.

²⁶New Policy Guidelines and Delegations Order Relating to Regulation of Imported Natural Gas, 49 Fed. Reg. 6684 (Feb. 22, 1984) [hereinafter 1984 Policy Guidelines].

²⁷*Id.* at 6685.

While nominally applicable to natural gas import cases, DOE/FE subsequently held in Order No. 1473 that the same policies should be applied to natural gas export applications.²⁸

In Order No. 1473, DOE/FE stated that it was guided by DOE Delegation Order No. 0204-111. That delegation order, which authorized the Administrator of the Economic Regulatory Administration to exercise the agency's review authority under NGA section 3, directed the Administrator to regulate exports "based on a consideration of the domestic need for the gas to be exported and such other matters as the Administrator finds in the circumstances of a particular case to be appropriate."²⁹ In February 1989, the Assistant Secretary for Fossil Energy assumed the delegated responsibilities of the Administrator of ERA.³⁰

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

IV. DESCRIPTION OF REQUEST

FLEX has applied for a long-term, multi-contract authorization to export domestically produced LNG up to the equivalent of 1.4 Bcf/d of natural gas (511 Bcf/yr) by vessel from the Freeport LNG Terminal for a 25-year term. FLEX requests that its authorization commence on the earlier of the date of first export or eight years from the date of issuance of the requested

²⁸ *Phillips Alaska Natural Gas*, DOE/FE Order No. 1473, 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).

²⁹ DOE Delegation Order No. 0204-111, at 1; *see also* 49 Fed. Reg. at 6690.

³⁰ *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)).

authorization. FLEX seeks authorization to export LNG from the Freeport Terminal to any non-FTA country that currently has or in the future develops the capacity to import LNG via ocean-going carrier and with which trade is not prohibited by United States law or policy. FLEX seeks to export this LNG on its own behalf and as agent for other entities holding title to the LNG.

A. Background

1. Description of Applicant and Facility

As stated above, FLEX is comprised of: (i) Freeport LNG Expansion, L.P., a wholly owned subsidiary of Freeport LNG Development, L.P. (FLNG Development); and (ii) FLNG Liquefaction, LLC, which, in turn, is a wholly-owned subsidiary of FLNG Expansion.

FLEX states that FLNG Development is a Delaware limited partnership with four limited partners: (1) Freeport LNG Investments, LLLP, a Delaware limited liability limited partnership, which owns a 20 percent limited partnership interest; (2) ZHA FLNG Purchaser, LLC, a Delaware limited liability company and wholly owned subsidiary of Zachry American Infrastructure, LLC, which owns a 55 percent limited partnership interest in FLNG Development; (3) Texas LNG Holdings, LLC, a Delaware limited liability company and wholly owned subsidiary of The Dow Chemical Company, which owns a 15 percent limited partnership interest; and (4) Turbo LNG, LLC, a Delaware limited liability company and wholly owned subsidiary of Osaka Gas Co., Ltd., which owns a 10 percent limited partnership interest in FLNG Development. In addition to these limited partners, FLEX states that FLNG Development has one general partner that manages the company: Freeport LNG-GP, Inc., a Delaware corporation that is owned 50 percent by one individual, Michael S. Smith, and 50 percent by ConocoPhillips Company.

Phase I Development. FLEX states that, in June 2004, the Federal Energy Regulatory Commission (FERC) issued an order authorizing FLNG Development to site, construct, and

operate what is now known as Phase I of the Freeport Terminal.³¹ FLEX completed the Phase I facilities in June 2008. They include an LNG ship marine terminal and unloading dock, LNG transfer lines and storage tanks, high-pressure vaporizers, and a 9.6-mile send-out pipeline extending to the Stratton Ridge meter station.

Phase II Development. FLEX states that, on September 26, 2006, FERC issued an order authorizing the Phase II expansion of the Freeport LNG Terminal, which included an expansion of the Freeport Terminal's send-out capacity.³² As described below, the Liquefaction Project facilities include some of the Phase II expansion facilities authorized by FERC in that order. In December 2011, FLEX states that that FLNG Development applied for an amendment to FERC's September 26, 2006 order. In the amendment, FLEX requested authority to reorient the marine berthing dock, eliminate one of the four authorized LNG unloading arms, and eliminate the authorized vaporization facilities, among other modifications.

2. Procedural History

To date, FLEX has filed four applications with DOE/FE seeking long-term authorization to export LNG:

- First FTA application filed in December 2010, in FE Docket No. 10-160-LNG;
- First non-FTA application in December 2010, in FE Docket No. 10-161-LNG;
- Second and current non-FTA Application filed in December 2011, pending in FE Docket No. 11-161-LNG; and
- Second FTA application filed in January 2012, in FE Docket No. 12-06-LNG.

³¹ *Freeport LNG Development, L.P.*, 107 FERC ¶ 61,278 (2004) (order granting rehearing and clarification); 108 FERC ¶ 61,523 (2004) (order amending NGA section 3 authorization,); 112 FERC ¶ 61,194 (2005) (order issuing authorization).

³² *Freeport LNG Development, L.P.*, 116 FERC ¶ 61,290 (2006).

FLEX's first FTA and non-FTA applications each sought to export domestically produced LNG in a volume equivalent to 1.4 Bcf/d of natural gas. On February 10, 2011, DOE/FE granted the FTA authorization in DOE/FE Order No. 2913.³³ On May 17, 2013, DOE/FE conditionally granted the non-FTA authorization in DOE/FE Order No. 3282. The export volume of 1.4 Bcf/d (511 Bcf/yr) for each authorization mirrored the liquefaction capacity of the Project known at that time, and thus were not additive. The authorizations issued in both proceedings were conditioned to reflect this fact.

FLEX's second FTA and non-FTA applications each sought to export a non-additive volume of LNG equivalent to an *additional* 1.4 Bcf/d of natural gas—which, if granted, would bring FLEX's total authorized FTA and non-FTA export volumes (in all four proceedings) to 2.8 Bcf/d of natural gas (1022 Bcf/yr). DOE/FE granted FLEX's second FTA authorization on February 10, 2012, in DOE/FE Order No. 3066.³⁴ In support of these requests for additional export volumes, FLEX explains that “[d]emand for liquefaction capacity has been significant since FLEX filed its initial export applications, and FLEX expects to secure long-term contracts for the liquefaction and export of an additional 1.4 Bcf/d.”³⁵ FLEX seeks the current authorization “[t]o support the commercialization and financing necessary ... to build facilities to meet that demand.”³⁶

The export volume of 1.4 Bcf/d of natural gas authorized in FLEX's second FTA order (DOE/FE Order No. 3066) and requested in the current Application mirror the liquefaction

³³ *Freeport LNG Expansion L.P. and FLNG Liquefaction, LLC*, DOE/FE Order No. 2913, Order Granting Long-Term Authorization to Export Liquefied Natural Gas from Freeport LNG Terminal to Free Trade Nations (Feb. 10, 2011).

³⁴ *Freeport LNG Expansion L.P. and FLNG Liquefaction, LLC*, DOE/FE Order No. 3066, Order Granting Long-Term Multi-Contract Authorization to Export Liquefied Natural Gas from Freeport LNG Terminal to Free Trade Agreement Nations (Feb. 10, 2012).

³⁵ FLEX App. at 5.

³⁶ *Id.* at 5-6.

capacity of the Liquefaction Project estimated at the time both applications were submitted, and thus are not additive. As explained below, however, the export volume authorized in Order No. 3066 remains the equivalent of 1.4 Bcf/d of natural gas, whereas DOE/FE is conditionally authorizing in this Order a lower, non-additive volume of LNG for export—the equivalent of 0.4 Bcf/d, or 146 Bcf/yr—to reflect a reduction in FLEX’s planned liquefaction capacity. *See infra* Sections IV.B, X.F, X.G.

3. FLEX’s Notice of Long-Term Contracts

FLEX filed letters on April 12 and October 25, 2013, in each of its four long-term docket proceedings providing information to DOE/FE as to the contracts it had executed to date.³⁷ In relevant part, FLEX states that one or more of its subsidiaries have executed a long-term Liquefaction Tolling Agreement (LTA)³⁸ with the following five customers:

- Chubu Electric Power Co., Inc., for a volume of natural gas totaling approximately 115,000,000 million BTUs of LNG per contract year, for 20 contract years beginning from completion of FLEX’s first liquefaction train;
- Osaka Gas Co., Ltd., for a volume of natural gas totaling approximately 115,000,000 million BTUs of LNG per contract year, for 20 contract years beginning from completion of FLEX’s first liquefaction train;
- BE Energy Company, for a volume of natural gas totaling approximately 230,000,000 million BTUs of LNG per contract year, for 20 contract years beginning from completion of FLEX’s second liquefaction train;
- SK E&S LNG, LLC, for a volume of natural gas totaling approximately 115,000,000 million BTUs of LNG per contract year, for 20 contract years beginning upon completion of construction and commencement of commercial operations of FLEX’s third liquefaction train; and

³⁷ Letter from John B. Tobola to J. Anderson, Long-Term Contracts, Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC, FE Docket No. 11-161-LNG (Apr. 12, 2013); Letter from L. Lo Baugh to J. Anderson, Long-Term Contracts, Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC, FE Docket No. 11-161-LNG (Oct. 25, 2013).

³⁸ References to LTAs and long-term contracts are synonymous for purposes of this Order.

- Toshiba Corporation, for a volume of natural gas totaling approximately 115,000,000 million BTUs of LNG per contract year, plus one-third of the production quantity available from FLEX's liquefaction facility in excess of the annual nameplate design production of 690,000,000 million BTUs, up to an additional 5,250,000 million BTUs of LNG per contract year, for 20 contract years beginning upon completion of construction and commencement of commercial operations of FLEX's third liquefaction train.³⁹

FLEX notes that it has filed with DOE/FE a copy of each long-term contract under seal, a form containing summary information from each contract, and a registration for each of these customers for whom it proposes to act as agent.

4. FLEX's Amendment to Application

As noted above, FLEX filed an Amendment to its Application on September 19, 2013, in which it asks DOE/FE to amend and supplement the Application to include FLNG Liquefaction 2 and FLNG Liquefaction 3 as applicants in this proceeding.⁴⁰ According to FLEX, at the time it filed the Application, it contemplated that applicant FLNG Liquefaction, LLC—the wholly owned subsidiary of co-applicant Freeport LNG Expansion, L.P.—would own the three liquefaction trains to be developed as part of the Liquefaction Project. Recently, however, FLEX has determined that each liquefaction train must be a separate legal entity for purposes of development, financing, and construction.

FLEX states that the first liquefaction train will be owned by FLNG Liquefaction, which is an authorization holder in Order 3282 (*Freeport I*) and both of FLEX's FTA orders. FLEX has established FLNG Liquefaction 2 and FLNG Liquefaction 3 to own the remaining two liquefaction trains—with FLNG Liquefaction 2 owning the second train, and FLNG Liquefaction 3 owning the third. FLEX states that both FLNG Liquefaction 2 and FLNG Liquefaction 3 are

³⁹ DOE/FE notes that any production in excess of the authorization granted in *Freeport I* and this Order would require an additional authorization from DOE and FERC.

⁴⁰ FLEX Amendment at 5. FLEX filed an analogous amendment and supplement in each of its three other long-term docket proceedings.

wholly-owned subsidiaries of FLNG Expansion and authorized to do business in the State of Texas.

FLEX explains that this ownership structure is a commercial necessity to meet the requirements of its LTA customers and vendors. It points to the fact that its three LTAs designate individual liquefaction trains. It further asserts that, as FLNG Liquefaction 2 and FLNG Liquefaction 3 are part of the same Freeport corporate family, this amendment will not constitute a change of control as defined in *Freeport I*.⁴¹ Finally, notwithstanding the separate ownership structure, FLEX states that the three completed liquefaction trains will be integrated with the regasification and import facility, such that the Liquefaction Project will be operated as a single integrated liquefaction, regasification, LNG export, and LNG import facility. According to FLEX, FLNG Expansion will continue to be the single point of contact with DOE, will coordinate all exports under FLEX's orders, and will act as agent for others, as stated in the Application.

B. Liquefaction Project and Capacity

Application. FLEX states that the Liquefaction Project facilities will be integrated into the existing Freeport Terminal, which presently consists of a marine berth, two 160,000 m³ full containment LNG storage tanks, LNG vaporization systems, associated utilities, and a 9.6-mile pipeline and meter station. According to FLEX, the proposed improvements to the Liquefaction Project will include facilities that were previously authorized by FERC in its September 26, 2006 order, including a second marine berthing dock and a third LNG storage tank. They will be contained within the previously authorized operational area of the Freeport Terminal. The expanded facility will be designed so that the addition of liquefaction capability will not preclude

⁴¹ See *Freeport I*, DOE/FE Order No. 3282, at 115-16.

the Freeport Terminal from operating in vaporization and send-out mode. FLEX further asserts that, when operating at full capacity, the Liquefaction Project will consume approximately 0.1 Bcf/d of natural gas to power the liquefaction facilities, resulting in a total natural gas volume requirement of 1.5 Bcf/d.

At the time it filed its Application, FLEX stated that it intended to file a formal application with FERC requesting that FERC issue an order authorizing the siting, construction, and operation of the Liquefaction Project. DOE/FE notes that, on August 12, 2012, FLEX filed its application with FERC pursuant to NGA § 3(a).⁴²

FERC Application and Revised Project Capacity. In its application filed with FERC, FLEX describes the Liquefaction Project as follows:

- “The main liquefaction components ... will be three propane pre-cooled mixed refrigerant trains, each with a nominal nameplate capacity of 4.4 [mtpa] of LNG ... for export, *which equates to a total liquefaction capacity of approximately 1.8 billion cubic feet per day ... of natural gas.*”⁴³
- “In addition ... Freeport LNG proposes to construct various facilities ... to support the liquefaction and export operation. These facilities include a natural gas pretreatment plant ..., several interconnecting pipelines and utility lines ..., and appurtenant structures.”⁴⁴

In a footnote, FLEX reiterates that the Liquefaction Project’s “[n]ameplate production is based on feed of 1.97 Bcf/d of pretreated natural gas, *of which 1.8 Bcf/d is converted to LNG available for export.*”⁴⁵

As these statements make clear, the planned liquefaction capacity of 1.8 Bcf/d of natural gas is less than the volume requested by FLEX, collectively, in its first non-FTA application and

⁴² Freeport LNG Development, L.P., FLNG Liquefaction, LLC, FLNG Liquefaction 2, LLC, and FLNG Liquefaction 3, LLC, Application for Authorization Under Section 3 of the Natural Gas Act, FERC Docket CP-12-509 (Aug. 31, 2012) [hereinafter FLEX FERC App.]

⁴³ FLEX FERC App., Resource Report 1 (Aug. 2012), at 1-1 (emphasis added).

⁴⁴ *Id.*

⁴⁵ *Id.* n.1 (emphasis added).

the current Application—which together would total a volume of LNG equivalent to 2.8 Bcf/d of natural gas. In light of this revised liquefaction capacity, this Order conditionally authorizes FLEX to export LNG in a volume equivalent to 0.4 Bcf/d, or 146 Bcf/yr, of natural gas. *See infra* Section X.F. and XII.A. This authorization of 0.4 Bcf/d of natural gas, together with the 1.4 Bcf/d of natural gas conditionally authorized for export in DOE/FE Order No. 3282, will cover all of the Liquefaction Project’s planned capacity of 1.8 Bcf/d of natural gas.

C. Business Model

FLEX states that, rather than enter into long-term natural gas supply or LNG export contracts, it expects that its business model will be based primarily on LTAs. Individual customers who hold title to natural gas will have the right to deliver that gas to FLEX and receive LNG. FLEX states that, like long-term supply contracts, LTAs will provide stable commercial arrangements between companies involved in natural gas services.

FLEX proposes to export LNG on its own behalf or as agent for others. FLEX anticipates that the title holder at the point of export⁴⁶ may be: (i) FLEX, (ii) one of FLEX’s LTA customers, or (iii) another party that has purchased LNG from an LTA customer pursuant to a long-term contract. FLEX requests authorization to register as agent for each LNG title holder for whom FLEX seeks to export LNG. FLEX proposes that this registration include a written statement by the title holder acknowledging and agreeing to comply with all applicable requirements included in FLEX’s export authorization, and to insert those requirements in any subsequent purchase or sale agreement entered into by that title holder. FLEX further proposes to file under seal with DOE/FE any relevant long-term commercial agreements between FLEX and an LNG title holder, including LTAs, once those agreements have been executed.

⁴⁶ Export occurs when the LNG is delivered to the flange of the LNG export vessel. *See Dow Chem. Co.*, DOE/FE Order No. 2859, Order Granting Blanket Authorization to Export Liquefied Natural Gas (Oct. 5, 2010).

At the time it submitted its Application, FLEX had not yet entered into any long-term LTAs for the LNG it proposes to export. As noted above, however, FLEX recently notified DOE/FE that it has executed long-term LTAs with Osaka Gas Company, Ltd., Chubu Electric Power Company, Inc., BP Energy Company, SK E&S LNG, LLC, and Toshiba Corporation. These five LTAs in total will permit the export of 690 million MMBtu of natural gas per year, representing approximately 1.8 Bcf/d. *See supra* Section IV.A.3. This contracted amount represents 100 percent of the total combined non-FTA export volume conditionally authorized for FLEX in DOE/FE Order No. 3282 and this Order.⁴⁷

D. Source of Natural Gas

FLEX anticipates that each LTA customer will rely on its own sources for natural gas. FLEX further anticipates that the source of natural gas supply for its proposed exports will come primarily from the Texas market, but may draw from the interconnected U.S. natural gas market. FLEX asserts that the Texas natural gas market is one of the largest in the world, and is highly liquid because it is connected to other major U.S. markets through a vast pipeline network. FLEX states that, although some of the proposed export supply may be secured through long-term contracts, it expects to draw large volumes of natural gas for itself and for its LTA customers from the spot market. In support of its requested authorization, FLEX cites the size, liquidity, and expanding development of the natural gas markets in close proximity to the Freeport Terminal, as well as the growth in domestic pipeline capacity both within Texas and in the United States generally.

⁴⁷ DOE/FE estimates are based on the most recent annual data used by EIA in AEO 2013, which show that, in 2011, the gross heat content of domestic dry natural gas consumption was estimated at 1,022 Btu per cubic foot. *See EIA Natural Gas Annual*, Table B2 for 2011, available at http://www.eia.gov/naturalgas/annual/pdf/appendix_b.pdf.

E. Environmental Review

FERC is responsible for ensuring that the siting, construction, and operation of LNG facilities are consistent with the public interest under section 3 of the NGA. FERC is also the lead agency under NEPA for purposes of review of the Liquefaction Project in FERC Docket No. CP12-509. DOE/FE is participating in FERC's NEPA environmental review as a cooperating agency.

FLEX requests that DOE/FE issue a conditional order approving its export authorization pending satisfactory completion of the environmental review and approval of the Liquefaction Project. DOE/FE's regulations⁴⁸ and precedent⁴⁹ support such an approach, and we find good cause for granting FLEX's request for a conditional order. Accordingly, this conditional Order makes preliminary findings on all issues except the environmental issues in this proceeding.

Additionally, DOE/FE is attaching a condition to this export authorization ordering that FLEX's authorization is contingent on both its satisfactory completion of the environmental review process and its on-going compliance with any and all preventative and mitigating measures imposed at the Freeport LNG Terminal by federal or state agencies. When the environmental review is complete, DOE/FE will reconsider this conditional Order in light of the information gathered as part of that review.

V. APPLICANT'S PUBLIC INTEREST ANALYSIS

FLEX states that its proposed export of domestically produced LNG is not inconsistent with the public interest, and therefore meets the standard under NGA section 3(a). Citing

⁴⁸ 10 C.F.R. § 590.402 (authorizing the Assistant Secretary to "issue a conditional order at any time during a proceeding prior to issuance of a final opinion and order").

⁴⁹ See, e.g., *Sabine Pass*, Order No. 2961, at 40-41, 43 (Ordering Paragraph F); *Freeport LNG*, Order No. 3282, at 120-21, 123 (Ordering Paragraph F); and *Lake Charles Exports*, Order No. 3324 at 15-16, 135-36 (Ordering Paragraph F).

DOE/FE precedent,⁵⁰ FLEX states that DOE/FE's public interest review focuses principally on the domestic need for natural gas proposed for export, as well as any other factors shown to be relevant to the public interest. FLEX summarizes its view that the proposed exports are not inconsistent with the public interest as follows:

The Liquefaction Project is positioned to provide the Gulf Coast region and the United States with significant economic benefits by increasing domestic natural gas production. The exportation of LNG will also create a material improvement in the United States' balance of trade. These benefits will be obtained with only a minimal effect on domestic natural gas prices. At current and forecasted rates of demand, the United States' natural gas reserves will meet demand for 100 years. The requested Export Authorization will allow the U.S. to benefit now from the natural gas resources that may not otherwise be produced for many decades, if ever.⁵¹

FLEX addresses the following seven factors in detail: (i) the impact of the proposed exports on natural gas prices; (ii) domestic natural gas supplies and resource base; (iii) domestic natural gas demand; (iv) benefits to the local, regional, and national economy; (v) balance of trade; and (vi) global environmental benefits; and (vii) national security benefits.

A. Impact of the Liquefaction Project on Natural Gas Prices

FLEX asserts that this export authorization, if granted, will not materially increase prices over the 25-year period for which FLEX has requested authorization. To support this position, FLEX cites a report by Deloitte Marketplace LLC issued in 2011, entitled *Made in America: The Economic Impact of LNG Exports from the United States* (Deloitte Report).⁵² FLEX states that the Deloitte Report is an independent assessment of the potential economic impacts of LNG

⁵⁰1984 Policy Guidelines, 49 Fed. Reg. 6684.

⁵¹ Application of Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC for Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Countries, FE Docket No. 10-161-LNG (Dec. 17, 2010), at 14 [hereinafter FLEX App.].

⁵² FLEX App. at 18, *citing* Deloitte Center for Energy Solutions & Deloitte Marketplace LLC, *Made in America: The Economic Impact of LNG Exports from the United States* (2011), available at http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/Energy_us_er/us_er_MadeinAmerica_LNGPaper_122011.pdf.

exports from the United States. FLEX further states that Deloitte’s model assumed that 6 Bcf/d of LNG exports would be realized from three Gulf Coast terminals—the Sabine Pass, Freeport, and Lake Charles LNG terminals.⁵³ According to FLEX, the Deloitte Report concludes that “the magnitude of domestic price increase that results from export of natural gas in the form of LNG is likely quite small.”⁵⁴ FLEX further asserts that the North American gas market is highly integrated, and all segments will work together to mitigate price impacts of demand changes from LNG Exports like the current authorization sought by FLEX.⁵⁵

In discussing the Deloitte Report, FLEX states that LNG exports from the Gulf Coast are expected to begin in 2016, when total domestic demand for LNG is projected by EIA (in AEO 2011) to be 26 Tcf/year. FLEX states that exports equivalent to 6 Bcf/d of natural gas (equivalent to 2.2 Tcf/year) are projected to represent an 8 percent increase in the projected 26 Tcf demand in 2016. Thus, according to FLEX, the results of Deloitte’s analysis demonstrates that the magnitude of LNG exports, while substantial on their own, are not very significant relative to the U.S. resource base or total U.S. demand.

FLEX further asserts that the domestic natural gas market in recent years has been characterized by increased production and flat demand. Citing data from EIA’s 2011 Short-Term Energy Outlook, FLEX states that total domestic dry consumption increased by 2.3 Tcf between 2007 and 2010, while domestic consumption increased only 1.0 Tcf during the same period. FLEX states that, coupled with the dramatic increase in economically recoverable supplies, the domestic price of natural gas has decreased significantly. As one example, FLEX notes that the average annual spot price for natural gas at Henry Hub located in southern

⁵³ *Id.*

⁵⁴ *Id.* (quoting Deloitte Report at 1).

⁵⁵ *Id.* (citing Deloitte Report at 10).

Louisiana dropped from \$8.24 per MMBtu in February 2007 to \$3.34 per MMBtu in November 2011. FLEX also notes that, in 2011, EIA projected that the annual average lower-48 wellhead price⁵⁶ for natural gas will remain under \$5.00 per MMBtu through at least 2018, rising to \$9.99 by 2035.⁵⁷

Turning to the impact of the proposed exports, FLEX states that market participants can adapt to known or announced changes in demand by changing incremental production to meet it. FLEX maintains that demand created by the proposed export authorization will be anticipated by the market over a long lead time, such that producers, midstream players, and consumers can act to mitigate any price impact.

FLEX maintains that any price impact will be determined by the marginal cost of supply required to meet the additional demand created by the export authorization. According to FLEX, the projected price impact of the incremental demand created by this export authorization will be small in the Houston Ship Channel market and insignificant in other domestic markets. Specifically, the Deloitte Report projects a weighted average price impact of \$0.12 per MMBtu on U.S. prices from 2016 to 2035, representing a 1.7 percent increase in the projected average U.S. citygate gas price of \$7.09/MMBtu over the same time period. Citing Deloitte, FLEX states that the projected price increases in Henry Hub and Houston Ship Channel gas prices are projected to be \$0.22/MMBtu and \$0.20/MMBtu, respectively, during this period. In downstream markets such as Illinois, New York, and California, FLEX predicts that the projected price impacts will be lower—generally only \$0.10/MMBtu or less. For comparison,

⁵⁶ “Lower-48” refers to the 48 contiguous states, excluding Alaska and Hawaii. Because there is no natural gas pipeline interconnection between Alaska and the lower 48 states, those LNG export markets generally are viewed as distinct. *See* 77 Fed. Reg. at 73,627 n.1 (explaining that the LNG Export Study did not consider the impact of exports of Alaska natural gas production).

⁵⁷ FLEX’s \$9.99 projection by 2035 is based on EIA’s price assessment using nominal dollars per unit. DOE/FE notes that, using 2009 dollars per unit, the same projection would be \$6.26 by 2035. Both figures are reflected in AEO2011. *See* AEO2011 at 115-16 (Table A1).

FLEX notes that the spot market price for one MMBtu of natural gas moved a daily average of \$0.16 per MMBtu at the Henry Hub, Houston Ship Channel, and Katy Hub during the period between 2007 and 2010.

FLEX asserts that the price impact of this export authorization will be small because the United States' total domestic natural gas reserves are so large and the interstate natural gas pipeline system is highly effective in supporting market liquidity. FLEX states that total U.S. recoverable reserves are estimated to meet domestic demand for the next 100 years. Moreover, FLEX believes that Texas, where the Liquefaction Project will be located, is well-positioned to meet additional demand for the Project without a material impact on domestic prices.

B. Domestic Natural Gas Supplies and Resource Base

FLEX states that the proposed exports will not materially impact the availability of natural gas supply within Texas or the United States. First, FLEX states that, as a result of technological advances in horizontal drilling and hydraulic fracturing, huge reserves of domestic shale gas that were previously infeasible or uneconomic to develop are now being profitably produced in many regions of the United States. According to FLEX, the United States is now estimated to have more natural gas resources than it can use in 100 years, which—combined with continued low production costs—will enable the United States to export LNG while also meeting domestic demand for decades to come. To support its position, FLEX cites the following data on natural gas reserves:

- Estimates by EIA in AEO 2011 of a total resource base of 2,543 Tcf;
- Estimates discussed in the *MIT Study on the Future of Natural Gas*, a report published in 2011 by the Massachusetts Institute of Technology's (MIT) Energy Initiative,⁵⁸ stating that estimates of recoverable gas resources in the United States currently range between 1,500 to almost 2,850 Tcf;

⁵⁸ MIT Energy Initiative, *MIT Study on the Future of Natural Gas* (2011) [hereinafter MIT Report].

- Estimates by IHS CERA Inc. that the total natural gas resource base in the United States is more than 3,000 Tcf, sufficient to supply current consumption for over 100 years; and
- Estimates by the Colorado School of Mines Potential Gas Committee in 2011 that the United States has a total resource base of 2,170 Tcf, with the Gulf Coast being the country's richest resource area.

Second, FLEX states that the United States is producing substantial quantities of natural gas from multiple sources, with production from unconventional resources—specifically shale gas—increasing in recent years. Citing EIA data, FLEX notes that production from these resources increased from 1.3 Tcf/yr in 2007 to 3.1 Tcf/yr in 2009. Other data referenced by FLEX shows similar trends in shale gas production:

- Forecasts by EIA in AEO 2011 that shale gas production will increase to 7.2 Tcf/yr by 2015 and to 12.25 Tcf/yr by 2035—a fourfold increase from 2009-2035;
- Forecasts by EIA in AEO 2011 that U.S. gas production will increase to approximately 27 Tcf in 2035, an average annual growth rate of 0.9 percent; and
- Forecasts by MIT in the MIT Report that total domestic gas production may grow by up to 45 percent through 2050.

Citing EIA, FLEX states that total domestic natural gas production was 22.6 Tcf in 2010—the second highest annual production in U.S. history, trailing the highest production year on record (1973) by only 0.7 Tcf. FLEX further maintains that production of natural gas at the top five U.S. shale plays (Marcellus, Haynesville, Woodford, Fayetteville, and Barnett) is expected to grow rapidly over the next decade. According to FLEX, the Eagle Ford shale in South Texas, discovered in 2008, is an additional play containing an estimated 20.8 Tcf of technically recoverable gas.

Third, FLEX considers the potential for the Liquefaction Project to impact the availability of natural gas supply locally and nationwide. FLEX states that, because the U.S. natural gas market is large, well-integrated, and liquid, economic dispatch pressure will operate

to meet the demand for natural gas that otherwise would have been satisfied by natural gas from Texas. Specifically, FLEX references a report that it commissioned in 2010 by Altos Management Partners (and attached to FLEX's first non-FTA application as Appendix B), entitled *Analysis of Freeport LNG Export Impact on U.S. Markets* (Altos Report),⁵⁹ in stating that increased production from the Midcontinent basin and from the Marcellus shale basin in the Northern Appalachian region will compensate for reduced flows out of Texas. Citing the Deloitte Report, FLEX also states that production increases in Northeastern U.S. gas markets will result in displacement of flows out of the Gulf Coast region.

Based on the Altos Report and other studies, FLEX anticipates that much of the 1.5 Bcf/d of feed gas that would meet demand created by this export authorization will be incremental production within Texas, largely from the Eagle Ford shale in South Texas. In addition, FLEX states that some gas produced in Texas that normally would be routed out of state will be routed to the Liquefaction Project. To put the requested export authorization in context, FLEX estimates that the total volume produced in Texas or flowing through Texas from other states is projected to be roughly 18 Bcf/d over the term of the requested authorization, as stated in the Altos Report. FLEX therefore concludes that Texas is well-positioned to absorb the increased demand without materially impacting the availability of gas supply within Texas or elsewhere.

C. Domestic Natural Gas Demand

FLEX asserts that the nature of the natural gas market has changed dramatically in recent years. FLEX points out that, a decade ago, per capita energy consumption was rising and

⁵⁹ See Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC, FE Docket 10-161-LNG, Appx. B: Thomas Choi, Dale Nesbitt, & Brad Barnds, *Analysis of Freeport LNG Export Impact on U.S. Markets* (Altos Mgmt. Partners, Inc. 2010) [hereinafter Altos Report].

expected to continue to rise. At that time, domestic natural gas supplies were believed inadequate to meet near-term future demand, to such a degree that DOE/FE was processing applications for LNG import authorization requests. FLEX states that experience has proved those assumptions obsolete. FLEX cites EIA's AEO 2011 Reference Case in projecting that the energy intensity of the U.S. economy, measured as primary energy use (in Btu) per dollar of GDP (in 2005 dollars), will decline by 1.9 percent year over year between 2009 and 2035.

FLEX further states that the continued growth of energy-efficiency measures has effectively dampened the per-person demand curve for energy and reduced the pressure on natural gas demand. Relying on data from EIA, FLEX asserts that the United States consumed 24.1 Tcf of natural gas in 2010. In AEO 2011, EIA predicted that domestic natural gas consumption will rise to only 26.6 Tcf in 2035. FLEX maintains that, assuming that the United States has 2,543 Tcf of recoverable reserves as projected by the EIA, domestic supply is sufficient to meet all domestic demand at current rates for over 100 years. FLEX further states that this export authorization, if granted, is projected to require approximately 13.7 Tcf of natural gas over the requested 25-year export term (the total of 1.5 Bcf/d over 25 years), which it states is 0.48 percent to 0.91 percent of the total estimated U.S. recoverable reserves, even assuming that no new gas reserves are identified.

FLEX predicts that the natural gas produced and exported under the requested export authorization will not be needed to meet domestic demand for decades, if ever. To support this statement, FLEX points to alternate sources of energy that may reduce (or already have reduced) the need for existing natural gas reserves. These potential sources include methane hydrates and renewable energy sources, such as wind and solar energy. Citing stimulus programs administered by DOE and the Department of Treasury, FLEX states that there has been an

enormous influx of capital for alternative energy development. FLEX believes that this investment will increase both the near-term and long-term contributions of alternative energy, while reducing future U.S. demand for natural gas and other fossil fuels.

FLEX asserts that alternative energy sources are likely to replace the natural gas reserves used to supply the Liquefaction Project by the time domestic demand requires them to be produced. According to FLEX, if this downward pressure on natural gas demand occurs as anticipated, it is reasonable to expect that the amount of natural gas required to supply the requested export authorization will never be needed in the United States, and thus might not be produced but for this project.

D. Benefits to Local, Regional, and National Economy

FLEX states that the requested export authorization will allow the United States to realize the economic benefits of natural gas resources that would not otherwise be realized for decades to come, if ever. FLEX maintains that the proposed exports will stimulate the local, regional, and national economies by directly and indirectly creating between 17,000 and 21,000 new jobs and by providing total economic benefits ranging from \$3.6 and \$5.2 billion per year from 2015 to 2040. Specifically, FLEX states that these benefits will include:

- Over the three- to four-year design and construction period for the additional liquefaction facilities necessary to produce the LNG that is the subject of the export authorization, the creation of more than 3,000 on-site engineering and construction jobs, hundreds of off-site jobs, and approximately 20 to 30 permanent operational jobs;
- The indirect creation of between 17,000 and 21,000 new jobs in the United States resulting from the increase in natural gas exploration and production;
- Substantial tax revenue to state and local governments;
- Increased economic activity related to exploration, production, and infrastructure construction, which is expected to benefit local businesses and result in additional community services, such as health care; and

- Increased indirect benefits throughout the natural gas exploration and production supply chain, including high-wage jobs, taxes, royalties, lease payments, expanded natural gas infrastructure, and increased state and federal tax revenue.

FLEX notes that, because the Liquefaction Project's capacity will develop in stages, the economic impact may phase in as the market develops for total potential LNG production.

Citing findings in the Altos Report and in studies examining the economic benefits of the Marcellus shale gas industry in Pennsylvania, FLEX states that the Liquefaction Project will have a "multiplier effect" that will create improvements across the U.S. economy. For every \$1.00 of direct natural gas expenditure, FLEX estimates that the Liquefaction Project will generate between \$1.34 and \$1.90 of gross economic benefits. This multiplier effect means that the estimated \$2.7 billion in direct expenditures per year required to produce the LNG for the proposed export authorization could yield total economic benefits between \$3.6 and \$5.2 billion per year, or \$90 to \$130 billion over the requested 25-year export term. In sum, FLEX maintains that the export authorization for the Liquefaction Project will have direct economic benefits for local and regional economies, while also indirectly creating significant improvements across the U.S. economy at large.

E. Benefits of International Trade

According to FLEX, the requested export authorization, if approved, will provide a significant beneficial impact on the United States' balance of trade. Assuming exports of 1.4 Bcf/d valued at \$7.50 per thousand cubic feet (Mcf), FLEX states that the export authorization will increase LNG exports by \$3.9 billion per year, which equates to 1.5 percent of the 2010 U.S. trade deficit for petroleum goods.

FLEX cites the National Export Initiative (NEI), created by Executive Order in March 2010, as supporting the need for greater exports of domestically produced LNG.⁶⁰ FLEX states that the NEI is intended to “enhance and coordinate Federal efforts to facilitate the creation of jobs in the United States through the promotion of exports,” with a “goal of doubling exports” by 2015.⁶¹ FLEX maintains that the export authorization, if granted, would materially advance these export goals and, in particular, would reduce the trade imbalance in the petroleum products sector, which it states is heavily skewed towards imports.

In support of its position, FLEX cites the U.S. Government’s first progress report on the NEI, issued in July 2010. According to FLEX, the progress report identified specific export accomplishments, such as trade agreements designed to add exports of U.S. pork and poultry totaling more than \$1 billion. FLEX states that, while this example is significant, it represents “a mere quarter of the [\$3.9 billion] export growth” that would result from the requested export authorization. FLEX concludes that approval of the export authorization will be a significant catalyst for creating exports and export-related jobs in the United States, and will promote federal policies to reduce trade barriers.

F. Global Environmental Benefits

FLEX claims that natural gas is the cleanest-burning fossil fuel. FLEX states that, when natural gas substitutes for coal or fuel oil, it significantly reduces total greenhouse gas emissions. FLEX cites data from the U.S. Environmental Protection Agency (EPA) in stating that, compared to the average coal-fired plant, natural gas-fired plants emit half as much carbon dioxide (CO₂), less than a third of the nitrogen oxides, and one percent of the sulfur oxides. According to FLEX, natural gas also produces approximately 25 to 30 percent less CO₂ than

⁶⁰ National Export Initiative, Exec. Order No. 13,534, 75 Fed. Reg. 12,433 (Mar. 16, 2010) [hereinafter NEI].

⁶¹ FLEX App. at 34 (quoting NEI, 75 Fed. Reg. at 12,433).

gasoline or diesel when used in vehicles, and is not a significant contributor to acid rain or smog formation.

Citing the EIA, FLEX states that natural gas-fired plants are much cheaper to build than new renewable or nuclear plants. As countries look for alternate sources of power generation beyond coal or oil and move to regulate or tax greenhouse gases, FLEX predicts that demand for LNG will continue to grow world-wide. FLEX states that the requested export authorization will offer significant global environmental benefits by supplying cleaner energy to help meet this increased world-wide demand in a safe, environmentally-friendly way.

G. Benefits to National Energy Security

FLEX asserts that the LNG exports associated with the requested authorization will not adversely affect, and indeed will support, U.S. energy security. FLEX notes that the proposed LNG exports will not degrade U.S. energy security because the United States has developed “massive” natural gas reserves that are sufficient to meet all domestic demand for decades, even without significant exports of LNG.⁶²

Additionally, FLEX maintains that LNG exports under the requested authorization will increase U.S. economic trade and bolster U.S. ties with foreign nations by providing them with access to a reliable supply of alternative, clean fuel. FLEX quotes the MIT Report in stating that “U.S. freedom of action in foreign policy is tied to global energy supply.”⁶³ FLEX also emphasizes the importance of “a global ‘liquid’ natural gas market” to promote “diversity of supply and resilience to disruptions” in the natural gas market world-wide.⁶⁴ Relying on a 2011 report prepared by the James A. Baker III Institute for Public Policy at Rice University,

⁶² FLEX App. at 36.

⁶³ FLEX App. at 38 (quoting MIT Report at 155).

⁶⁴ *Id.*

FLEX states that “[i]ncreased competition among world natural gas suppliers ‘reduces the threat that a Gas-OPEC can be formed,’ and ‘will trim the petro-power of energy production countries ... to assert themselves using an ‘energy’ weapon or ‘energy diplomacy’ to counter U.S. interests abroad.”⁶⁵ According to FLEX, “‘even though the U.S. is not significantly dependent on imports, American security interests can be strongly affected by the energy supply concerns of its allies.’”⁶⁶

Finally, FLEX states that the export authorization offers the United States a potential security advantage by selling exports into the international market using market-based pricing structures, which may offset those sources that seek to monopolize the natural gas industry.

VI. LNG EXPORT STUDY

DOE/FE recognized in *Sabine Pass* that the cumulative impact of *Sabine Pass* and additional future LNG export authorizations could affect the public interest. To address this issue, DOE/FE undertook a two-part study of the cumulative economic impact of LNG exports. The first part of the study was conducted by EIA and looked at the potential impact of additional natural gas exports on domestic energy consumption, production, and prices under several export scenarios prescribed by DOE/FE. The EIA study did not evaluate macroeconomic impacts of LNG exports on the U.S. economy. The second part of the study, performed by NERA Economic Consulting, assessed the potential macroeconomic impact of LNG exports using its energy-economy model (the “N_{ew}ERA” model). NERA built on the EIA Study requested by DOE/FE by calibrating the NERA U.S. natural gas supply model to the results of the study by EIA. The EIA study was limited to the relationship between export levels and domestic prices

⁶⁵ FLEX App. at 37 (quoting Kenneth B. Medlock III, Amy Meyers Jaffe, & Peter R. Hartley, *Shale Gas and U.S. National Security* at 54 (James A. Baker III Institute for Public Policy, July 2011)).

⁶⁶ FLEX App. at 38 (quoting MIT Report at 155).

without considering whether those quantities of exports could be sold at high enough world prices to support the calculated domestic prices. NERA used its Global Natural Gas Model (“GNGM”) to estimate expected levels of U.S. LNG exports under several scenarios for global natural gas supply and demand. A more detailed discussion of each study follows.

A. EIA Study, *Effect of Increased Natural Gas Exports on Domestic Energy Markets*

1. Methodology

DOE/FE asked EIA to assess how four scenarios of increased natural gas exports could affect domestic energy markets, particularly consumption, production, and prices. The four scenarios assumed LNG exports of:

- 6 Bcf/d, phased in at a rate of 1 Bcf/d per year (low/slow scenario);
- 6 Bcf/d phased in at a rate of 3 Bcf/d per year (low/rapid scenario);
- 12 Bcf/d phased in at a rate of 1 Bcf/d per year (high/slow scenario); and
- 12 Bcf/d phased in at a rate of 3 Bcf/d per year (high/rapid scenario).

According to EIA, total marketed natural gas production in 2011 was approximately 66 Bcf/d. Thus, exports of 6 Bcf/d and 12 Bcf/d represent roughly 9 percent and 18 percent of natural gas production in 2011, respectively.

DOE/FE also requested that EIA consider the above four scenarios of increased natural gas exports in the context of four cases from EIA’s AEO 2011. These four cases are:

- The AEO 2011 Reference Case;
- The High Shale Estimated Ultimate Recovery (EUR) case (reflecting optimistic assumptions about domestic natural gas supply, with the EUR per shale gas well for new, undrilled wells assumed to be 50 percent higher than in the Reference Case);
- The Low Shale EUR case (reflecting pessimistic assumptions about domestic natural gas supply, with the EUR per shale gas well for new, undrilled wells assumed to be 50 percent lower than in the Reference Case); and

- The High Economic Growth case (assuming the U.S. gross domestic product will grow at an average annual rate of 3.2 percent from 2009 to 2035, compared to 2.7 percent in the Reference Case, which increases domestic energy demand).

Taken together, the four scenarios with different additional export levels imposed from the indicated baseline case (no additional exports) presented 16 case scenarios:

Table 1: Case Scenarios Considered By EIA in Analyzing Impacts of LNG Exports

	AEO 2011 Cases	Export Scenarios
1	AEO 2011 Reference	Low/Slow
2	AEO 2011 Reference	Low/Rapid
3	AEO 2011 Reference	High/Slow
4	AEO 2011 Reference	High/Rapid
5	High EUR	Low/Slow
6	High EUR	Low/Rapid
7	High EUR	High/Slow
8	High EUR	High/Rapid
9	Low EUR	Low/Slow
10	Low EUR	Low/Rapid
11	Low EUR	High/Slow
12	Low EUR	High/Rapid
13	High Economic Growth	Low/Slow
14	High Economic Growth	Low/Rapid
15	High Economic Growth	High/Slow
16	High Economic Growth	High/Rapid

EIA used the final AEO 2011 projections issued in April 2011 as the starting point for its analysis and applied the NEMS model. Because NEMS did not generate a projection of LNG export demand, EIA specified additional natural gas demand levels as a proxy for projected export levels consistent with the scenarios prescribed by DOE/FE.

EIA assigned these additional exports to the West South Central Census Division. This meant that EIA effectively assumed that the incremental LNG exports would be shipped out of the Gulf Coast states or Texas.

EIA also counted any additional natural gas consumed during the liquefaction process within the total additional export volumes specified in the DOE/FE scenarios. Therefore the net

volumes of LNG produced for export were roughly 10 percent below the gross volumes considered in each export scenario. By way of illustration, the cases where cumulative export volumes are 6 Bcf/d, liquefaction would consume 0.6 Bcf/d and net exports of 5.4 Bcf/d.

EIA made other changes in modeled flows of gas into and out of the lower-48 United States where necessary to analyze the increased export scenarios.⁶⁷ Additionally, EIA assumed that a pipeline transporting Alaskan natural gas into the lower-48 states would not be built during the forecast period, thereby isolating the lower-48 states' supply response.

2. Scope of EIA Study

In the Preface to its study, EIA identifies several limiting factors governing use of the study results:

The projections in this report are not statements of what *will* happen but of what *might* happen, given the assumptions and methodologies used. The Reference case in this report is a business-as-usual trend estimate, reflecting known technology and technological and demographic trends, and current laws and regulations. Thus, it provides a policy-neutral starting point that can be used to analyze policy initiatives. EIA does not propose, advocate, or speculate on future legislative and regulatory changes.⁶⁸

Additionally, the EIA study recognizes that projections of energy markets over a 25-year period are highly uncertain, and that many events—such as supply disruptions, policy changes, and technological breakthroughs—cannot be foreseen. Other acknowledged limitations on the scope of the EIA study include:

- The NEMS model is not a world energy model, and therefore does not address the interaction between the potential for additional U.S. natural gas exports and developments in world natural gas markets;

⁶⁷ U.S. natural gas exports to Canada and U.S. natural gas imports from Mexico are exogenously specified in all the AEO 2011 cases. U.S. imports of natural gas from Canada are endogenously set in the model and continue to be so for this study. However, U.S. natural gas exports to Mexico and U.S. LNG imports that are normally determined endogenously within the model were set to the levels projected in the associated AEO 2011 cases for this study. EIA Study at 2-3.

⁶⁸ EIA study at ii (emphasis in original).

- Global natural gas markets are not integrated, and their nature could change substantially in response to significant changes in natural gas trading patterns;
- Macroeconomic results were not included in the analysis because energy exports are not explicitly represented in the NEMS macroeconomic module; and
- The domestic focus of the NEMS model makes it unable to account for all interactions between energy prices and supply/demand in energy-intensive industries that are globally competitive.

3. Natural Gas Markets

The EIA study recognized that natural gas markets are not integrated globally and natural gas prices span a wide range. EIA stated that the current large disparity in natural gas prices across major world regions is likely to narrow as markets become more globally integrated. However, key questions remain as to how quickly and to what extent convergence might occur.

U.S. market conditions are also variable, according to EIA, and lower or higher U.S. natural gas prices would tend to make additional exports more or less likely. EIA pointed out that prospects for LNG exports depend greatly on the cost-competitiveness of liquefaction projects in the United States relative to those at other locations.

EIA observed that relatively high shipping costs from the United States may add a cost disadvantage compared to exporting countries closer to key markets, such as in Asia. EIA notes that LNG projects in the United States would frequently compete not just against other LNG projects, but also against pipeline projects from traditional natural gas sources or projects to develop shale gas in Asia or Europe.

4. Results of EIA Study

EIA generally found that LNG exports will lead to higher domestic natural gas prices, increased domestic natural gas production, reduced domestic natural gas consumption, and

increased natural gas imports from Canada via pipeline. The impacts of exports, according to EIA, included:

- **Increased natural gas prices at the wellhead.** EIA stated that larger export levels would lead to larger domestic price increases; rapid increases in export levels would lead to large initial price increases that moderate somewhat in a few years; and slower increases in export levels would lead to more gradual price increases but eventually would produce higher average prices during the decade between 2025 and 2035.
- **Increased natural gas production and supply.** Increased exports would result in a supply response, *i.e.*, increased natural gas production that would satisfy about 60 to 70 percent of the increase in natural gas exports, with a minor additional contribution from increased imports from Canada. Across most cases, EIA stated that about three-quarters of this increased production would come from shale sources.
- **Decreased natural gas consumption.** Due to higher prices, EIA projects a decrease in the volume of gas consumed domestically. EIA states that the electric power sector, by switching to coal and renewable fuels, would account for the majority of this decrease but indicates that there also would be a small reduction in natural gas use in all sectors from efficiency improvements and conservation.
- **Increased end-user natural gas and electricity delivered prices.** EIA states that even while consuming less, on average, consumers will see an increase in their natural gas and electricity expenditures.

Additional details regarding these conclusions are discussed in the following sections.

5. Wellhead Price Increases

EIA projects that natural gas prices will increase in the Reference Cases even absent

expansion of natural gas exports. This baseline increase in natural gas prices bears an inverse relationship to projected increases in the volumes of natural gas produced from shale resources. Thus, in the high shale EUR Reference Case, the long-term natural gas price is lower than it is in the low shale EUR case.

While EIA projected a rising baseline price of gas without exports, EIA also found that the price of gas will increase over the rising baseline when exports occur. Exports are projected to impact natural gas prices in two ways. First, the export scenarios that contained rapid growth in exports experienced large initial price increases that moderated in the long run, while cases projecting a slow growth in exports experienced more gradual price increases. Second, cases with larger cumulative exports resulted in higher prices in the long-term relative to those cases with lower overall export levels. The largest price increase over the baseline exists in the Low Shale EUR case. The High Shale EUR case yields the smallest price response.

6. Increased Natural Gas Production and Supply

EIA projected that most of the additional natural gas needed for export would be provided by increased domestic production with a minor contribution from increased pipeline imports from Canada. The remaining portion of the increased export volumes would be offset by decreases in consumption resulting from the higher prices associated with the increased exports.

7. Decreased Natural Gas Consumption

EIA projected that greater export levels would lead to decreases in natural gas consumption. Most of this projected decrease would occur in the electric power sector. Increased coal-fired generation accounts for about 65 percent of the projected decrease in natural gas-fired generation. However, EIA also noted that the degree to which coal might be used in

lieu of natural gas depends on what regulations are in place. As noted above, EIA's projections reflected the laws and regulations in place at the time AEO 2011 was produced.

EIA further projected that small increases in renewable generation would contribute to reduced natural gas-fired generation. Relatively speaking, the role of renewables would be greater in a higher-gas-price environment (*i.e.*, the Low Shale EUR case) when renewables can more successfully compete with coal, and also in a higher-generation environment (*i.e.*, the High Economic Growth case), particularly in the later years.

EIA projected that increased natural gas exports would result in reductions in industrial natural gas consumption. However, the NEMS model does not capture the link between energy prices and the supply/demand of industrial commodities in global industries. To the extent that the location of production is sensitive to changes in natural gas prices, EIA acknowledged that industrial natural gas demand would be more responsive than shown in its analysis.

8. Increased End-User Natural Gas and Electricity Delivered Prices

EIA projected that, with increased natural gas exports, consumers would consume less and pay more on both their natural gas and electricity bills, and generally pay a little less for liquid fuels.

EIA projected that the degree of change to total natural gas bills with added exports varies significantly among economic sectors. This is because the natural gas commodity charge represents significantly different portions of each natural gas consuming sector's bill. However, EIA projected that natural gas expenditures would increase at the highest percentages in the industrial sector, where low transmission and distribution charges constitute a relatively small part of the delivered natural gas price.

EIA projected that average electricity prices would increase between 0.14 and 0.29 cents per kilowatt-hour (kWh) (between 2 and 3 percent) when gas exports are added. The greatest projected increase in electricity prices occurs in 2019 under the Low Shale EUR case for the high export/rapid growth export scenario, with an increase of 0.85 cents per kWh (9 percent).

EIA projected that, on average between 2015 and 2035, total U.S. end-use electricity expenditures as a result of added exports would increase between \$5 billion to \$10 billion (between 1 to 3 percent), depending on the export scenario. The High Macroeconomic Growth case shows the greatest average annual increase in natural gas expenditures over the same time period, with increases over the baseline (no additional exports) scenario ranging from \$6 billion to \$12 billion.

9. Impact on Natural Gas Producer Revenues

As part of its analysis, EIA considered the impact of natural gas exports on natural gas producer revenues. According to EIA, total additional natural gas revenues to producers from exports would increase from 2015 to 2035 between \$14 billion and \$32 billion over the AEO 2011 Reference Case, depending on the export scenario. These revenues reflect dollars spent to purchase and move the natural gas to the export facility, but do not include any revenues associated with the liquefaction and shipping process.

EIA cautioned that these projected increases in natural gas producer revenues do not represent profits and a large portion of the additional revenues would be expended to cover the costs associated with increased production, such as for equipment (*e.g.*, drilling rigs) and labor. In contrast, the additional revenues resulting from the higher price of natural gas that would have been produced and sold to largely domestic customers even in the absence of the additional

exports posited in the analysis would preponderantly reflect increased profits for producers and resource owners.

10. Impacts Beyond the Natural Gas Industry

EIA stated that, other than impacts on their energy expenditures, impacts on non-energy sectors were generally beyond the scope of its study. However, EIA did project impacts on total energy use and energy-related CO₂ emissions. EIA projected that annual primary energy consumption in the AEO 2011 Reference Case will average 108 quadrillion Btu between 2015 and 2035, with a growth rate of 0.6 percent. Also, cumulative CO₂ emissions are projected to total 125,000 million metric tons for that 20-year period.

According to EIA, the changes in overall energy consumption would largely reflect changes in the electric power sector. While additional exports would result in decreased natural gas consumption, changes in overall energy consumption would be relatively minor as much of the decrease in natural gas consumption would be replaced with increased coal consumption.

While lower domestic natural gas deliveries resulting from added exports are projected to reduce natural gas related CO₂ emissions, EIA projected that the increased use of coal in the electric sector would generally result in a net increase in domestic CO₂ emissions. Exceptions occur in scenarios where renewables are better able to compete against natural gas and coal. However, when also accounting for emissions related to natural gas used in the liquefaction process, EIA projected that additional exports would increase domestic CO₂ levels under all cases and scenarios, particularly in the earlier years of the projection period. EIA did not evaluate the effect of U.S. LNG exports on global CO₂ emissions.

B. NERA Study, Macroeconomic Impacts of LNG Exports from the United States

Because the NEMS model used by EIA did not account for the impact of energy price changes on global energy utilization patterns and did not include a full macroeconomic model,

DOE/FE commissioned NERA to provide such an analysis. NERA developed a two-step approach. First, it modeled energy markets by drawing on several of the scenarios that EIA had developed and adding global market scenarios developed through its GNGM model. Second, using its “N_{ew}ERA” energy-economy model, NERA drew conclusions regarding the domestic macroeconomic impacts of LNG exports. The impacts measured using the N_{ew}ERA macroeconomic model included price, welfare,⁶⁹ gross domestic product (GDP), aggregate consumption, aggregate investment, natural gas export revenues, sectoral output,⁷⁰ and wages and other household incomes. In addition, NERA identified impacts that would affect certain energy intensive, trade exposed (EITE) industries, as discussed below.

1. Overview of NERA’s Findings

NERA’s key findings include the following:

- **Net economic benefits across all scenarios.** Across all the scenarios studied, NERA projected that the United States would gain net economic benefits from allowing LNG exports. For every market scenario examined, net economic benefits increased as the level of LNG exports increased. Scenarios with unlimited exports had higher net economic benefits than corresponding cases with limited exports. In all cases, the benefits that come from export expansion outweigh the losses from reduced capital and wage income to U.S. consumers, and hence LNG exports have net economic benefits in spite of higher domestic natural gas prices.

Net benefits to the United States would be highest if the United States is able to produce large quantities of gas from shale at low cost, if world demand for natural gas increases rapidly,

⁶⁹ According to NERA, the measure of welfare used in its study is known as the “equivalent variation” and is the amount of income a household would be willing to give up in the case without LNG exports to achieve the benefits of LNG exports. NERA states that it measured welfare in present value terms, and therefore captures in a single number benefits and costs that might vary year by year over the period. NERA study at 6, n.5 & 55.

⁷⁰ NERA evaluated seven key sectors of the U.S. economy: agriculture, energy intensive sector, electricity, natural gas, motor vehicle, manufacturing, refined petroleum products, and services. *Id.* at 9.

and if LNG supplies from other regions are limited. If the promise of shale gas is not fulfilled and costs of producing gas in the United States rise substantially, or if there are ample supplies of LNG from other regions to satisfy world demand, the United States would not export LNG. Under these conditions, allowing exports of LNG would cause no change in natural gas prices and do no harm to the overall economy.

- **Natural gas price increases.** U.S. natural gas prices would increase if the United States exports LNG. However, the global market limits how high U.S. natural gas prices can rise under pressure of LNG exports because importers will not purchase U.S. exports if U.S. wellhead price rises above the cost of competing supplies.

Natural gas price changes attributable to LNG exports remain in a relatively narrow range across the entire range of scenarios. Natural gas price increases at the time LNG exports could begin range from zero to \$0.33 (2010\$/Mcf). Price increases that would be observed after five more years of potentially growing exports could range from \$0.22 to \$1.11 (2010\$/Mcf). The higher end of the range is reached only under conditions of ample U.S. supplies and low domestic natural gas prices, with smaller price increases when U.S. supplies are more costly and domestic prices higher.

- **Socio-economic impacts.** How increased LNG exports will affect different socioeconomic groups will depend on their income sources. Like other trade measures, LNG exports will cause shifts in industrial output and employment and in sources of income. Overall, both total labor compensation and income from investment are projected to decline, and income to owners of natural gas resources will increase. Different socioeconomic groups depend on different sources of income; workers with retirement savings that include shares of natural resource companies will benefit from higher incomes to those companies. Nevertheless,

impacts will not be positive for all groups in the economy. Households with income solely from wages or government transfers, in particular, might not participate in these benefits.

- **Competitive impacts and impact on employment.** Serious competitive impacts are likely to be confined to narrow segments of industry. About 10 percent of U.S. manufacturing, measured by value of shipments, has both energy expenditures greater than 5 percent of the value of its output and serious exposure to foreign competition. Employment in these energy-intensive industries is about one-half of one percent of total U.S. employment.

LNG exports are unlikely to affect the overall level of employment in the United States. There will be some shifts in the number of workers across industries, with those industries associated with natural gas production and exports attracting workers away from other industries. In no scenario is the shift in employment out of any industry projected to be larger than normal rates of turnover of employees in those industries.

Additional discussion of the above key findings is offered below and in the NERA study itself.

2. Overview of NERA's Methodology

NERA states that it attempted to answer two principal questions:

- At what price can various quantities of LNG exports be sold?
- What are the economic impacts on the United States of LNG exports?

To answer these questions, NERA used the GNGM model to estimate expected levels of U.S. LNG exports under several scenarios for global natural gas supply and demand. NERA also relied on the EIA study to characterize how U.S. natural gas supply, demand, and prices would respond if the specified level of LNG exports were achieved. Further, NERA examined the same 16 scenarios for LNG exports analyzed by EIA but added additional scenarios to reflect

global supply and demand. These additional scenarios were constructed on the basis of NERA's analytical model of global natural gas markets, as described below.

The resulting scenarios ranged from Reference Case conditions to stress cases with high costs of producing natural gas in the United States and exceptionally large demand for U.S. LNG exports in world markets. The three scenarios chosen for the U.S. resource outlook were the EIA Reference Case, based on AEO 2011, and two cases assuming different levels of EUR from new gas shale development. Outcomes of the EIA high demand case fell between the High and Low EUR cases and, therefore, would not have changed the range of results. The three different international outlooks were: (1) a Reference Case, based on EIA's International Energy Outlook 2011; (2) a Demand Shock case with increased worldwide natural gas demand caused by shutdowns of some nuclear capacity; and (3) a Supply/Demand Shock case that added to the Demand Shock a supply shock that assumed key LNG exporting regions did not increase their exports above current levels.

When the global and U.S. scenarios were combined with seven scenarios specifying limits on exports and export growth, NERA's analysis covered 63 possible scenarios. From these 63 scenarios, 21 scenarios resulted in some level of LNG export from the United States. Of these 21 scenarios, the GNGM model identified 13 "New ERA scenarios" that spanned the range of economic impacts from all of the scenarios and eliminated scenarios with essentially identical outcomes. The 13 scenarios included:

Table 2: N_{ew}ERA Scenarios Analyzed by NERA

	U.S. Scenarios	International Demand and Supply Scenarios	Export Scenarios
1	Reference	Supply and Demand Shock	Low/Rapid
2	Reference	Supply and Demand Shock	Low/Slow
3	Reference	Supply and Demand Shock	High/Rapid
4	Reference	Supply and Demand Shock	High/Slow
5	Reference	Demand Shock	Low/Rapid
6	Reference	Demand Shock	Low/Slow
7	Reference	Demand Shock	Low/Slowest
8	High EUR	Supply and Demand Shock	High/Rapid
9	High EUR	Supply and Demand Shock	High/Slow
10	High EUR	Supply and Demand Shock	Low/Rapid
11	High EUR	Supply and Demand Shock	Low/Slow
12	High EUR	Supply and Demand Shock	Low/Slowest
13	Low EUR	Supply and Demand Shock	Low/Slowest

To project the macroeconomic impacts of the above scenarios, NERA used its N_{ew}ERA model to compare the impacts of each of the 13 export scenarios to baselines with no LNG exports. NERA thus derived a range of projected impacts on the U.S. economy, including impacts on welfare, aggregate consumption, disposable income, GDP, and loss of wage income.

3. Scope of the NERA Study

NERA started its analysis with the domestic economic AEO 2011 cases and the export scenarios present in the EIA study.⁷¹ In addition to the export scenarios used by EIA, NERA added two export cases, including the “low/slowest case” and a “no restraints” case in which no regulatory restraints on exports existed. The low/slowest case assumed exports of 6 Bcf/d, with a growth rate of 0.5 Bcf/d per year, which is half the growth rate in the slow scenarios used by EIA.

Because NERA, unlike EIA, modeled the international gas market, NERA also created three international gas market scenarios not contained in the EIA study. The first was a business

⁷¹ For a full discussion of the scope, see pages 3-15 of the NERA study, http://energy.gov/sites/prod/files/2013/04/f0/nera_lng_report.pdf.

as usual Reference Case. The second assumed an international demand shock with increased worldwide natural gas demand caused by shutdowns of some nuclear capacity. Finally, NERA created an international scenario that added to the demand shock a supply shock that assumed key LNG exporting regions did not increase their exports above current levels.

While these additional aspects of the analysis expanded the scope of the NERA study relative to the study conducted by EIA, significant elements of the dynamics of the global natural gas trade and its domestic economic implications were outside the scope of the NERA study or beyond the reach of the modeling tools used.⁷² NERA expressly excluded the following factors from its analysis:

- The extent to which an overbuilding of liquefaction capacity could affect the ability to finance the projects and profitably export natural gas;
- The extent to which engineering or infrastructure limitations would impact the rate at which liquefaction capacity would come online, potentially impacting the cost of that capacity;
- The locations of the liquefaction facilities, or alternatives;
- The impacts of the liquefaction and exportation of natural gas on various regions within the United States;
- The extent to which the impacts of LNG export vary among different socio-economic groups; and
- The extent to which macroeconomic impacts to the United States would vary if the liquefaction projects were funded through foreign direct investment.

4. NERA's Global Natural Gas Model

The GNGM model is designed to estimate natural gas production, consumption, and

⁷² For a full discussion of the unexplored factors, see Appendix E of the NERA study, http://energy.gov/sites/prod/files/2013/04/f0/nera_lng_report.pdf.

trade in the major gas producing or consuming regions.⁷³ The model attempts to maximize the difference between surplus and cost, constrained by various factors including liquefaction capacity and pipeline constraints. The model divides the world into 12 regions and specifies supply and demand curves for each region. The regions are: Africa, Canada, China/India, Central and South America, Europe, Former Soviet Union, Korea/Japan, Middle East, Oceania, Sakhalin, Southeast Asia, and the United States. The GNGM model's production and consumption assumptions for these regions are based on projections contained in the Reference Cases of EIA's AEO 2011 and International Energy Outlook 2011. NERA ran the GNGM model in five-year increments between 2015 and 2035.

According to NERA, the characteristics of a regional market will affect LNG trading patterns and the pricing of natural gas within the region. With respect to trading patterns, NERA observed that a significant portion of LNG, such as LNG moving to Europe, is traded on a long-term basis using dedicated supplies and dedicated vessels moving to identified markets. On the other hand, NERA stated that some LNG markets, particularly those in Asia, operate on the basis of open market competitive bids in which LNG is delivered to those who value it the most. NERA also found that Southeast Asian and Australian suppliers most often market LNG to Asian markets; African suppliers deliver LNG most often to Europe; and Middle Eastern suppliers deliver LNG both to Europe and Asia.

With respect to the pricing of LNG in global markets, NERA states that the price differential, or "basis," between two regions reflects the difference in the pricing mechanism for each regional market. If pricing for two market hubs were set by the same mechanism and there were no constraints in the transportation system, the basis would simply be the cost of

⁷³ For a full discussion of GNGM, see page 20 of the NERA study, http://energy.gov/sites/prod/files/2013/04/f0/nera_lng_report.pdf.

transportation between the two market hubs. NERA asserts, however, that different pricing mechanisms set the price in each regional market, so the basis is often not set by transportation differences alone.

NERA offers the following example: Japan depends on LNG as its source for natural gas and indexes LNG prices to crude oil prices. For Europe, on the other hand, NERA states that LNG is only one of three potential sources of supply for natural gas. The others are interregional pipelines and indigenous production. According to NERA, the competition for market share between these alternative sources of supply will establish the basis for LNG prices in Europe. NERA further states that within North America, pricing at Henry Hub has been for the most part set by competition between different North American supply sources and has been independent of pricing in Japan and Europe.

5. The N_{ew}ERA Macroeconomic Model

NERA developed the N_{ew}ERA model to forecast how, under a range of domestic and international supply and demand conditions, U.S. LNG exports could affect the U.S. economy.⁷⁴ Like other general equilibrium models, N_{ew}ERA is designed to analyze long-term economic trends. NERA explained that, in any given year, actual prices, employment, or economic activity may differ from the projected levels.

The version of N_{ew}ERA used in NERA's analysis considered all sectors of the U.S. economy. In short, the model:

- Contains supply curves for domestic natural gas,
- Accounts for imports of Canadian pipeline gas and other foreign imports,

⁷⁴ For a full discussion of the N_{ew}ERA macroeconomic model, see pages 20 to 22 of the NERA study, http://fossil.energy.gov/programs/gasregulation/reports/nera_lng_report.pdf.

- Recognizes the potential for increases to U.S. liquefaction capacity, and
- Recognizes changes in international demand for domestically produced natural gas.

As discussed below, the results of the N_{ew}ERA model address changes in demand and supply of all goods and services, prices of all commodities, and impacts from LNG exports to U.S. trade, including changes in imports and exports. As with the GNGM model, NERA ran the N_{ew}ERA model in five-year increments for 2015 through 2035.

6. Relationship to the EIA Study

As explained above, EIA's study focused on potential impacts of natural gas exports to domestic energy markets. Specifically, the study considered impacts to natural gas supply, demand, and prices within the United States. To provide a fuller scope of analysis, DOE asked NERA to examine the net macroeconomic impact of domestic LNG exports on the U.S. economy. To conduct this analysis, NERA first modeled international demand for U.S. LNG utilizing its GNGM model. NERA then incorporated the results from the GNGM model into its N_{ew}ERA model, using the same parameters governing natural gas supply and demand that EIA used in the NEMS model.

NERA concluded that, in many cases, the global natural gas market would not accept the full amount of exports assumed in the EIA scenarios at export prices high enough to cover the U.S. wellhead prices calculated by EIA. In these cases, NERA replaced the export levels and price impacts found in the EIA scenarios with lower levels of exports (and prices) estimated by the GNGM model. These lower export levels were applied to the N_{ew}ERA model to generate projected impacts to the U.S. economy from LNG exports.

7. Key Assumptions and Parameters of the NERA Study

NERA implemented the following key assumptions and parameters, in part to retain

consistency with EIA's NEMS model:

i. All scenarios were derived from the AEO 2011 and incorporated EIA's assumptions about energy and environmental policies, baseline coal, oil and natural gas prices, economic and energy demand growth, and technology availability and cost in the corresponding AEO cases.

ii. U.S. exports compete with LNG exports from other nations, who are assumed to behave competitively and to adjust their export quantities in response to prevailing prices. The single exception to this assumption is that the export decisions of the global LNG market's one dominant supplier, Qatar, were assumed to be independent of the level of U.S. exports.

iii. Prices for natural gas used for LNG production were based on the Henry Hub price, plus a 15 percent markup (to cover operating costs of the liquefaction process).

iv. The LNG tolling (or reservation) fee—paid by the exporter to the operator of the liquefaction terminal for the right to reserve capacity—was based on a return of capital to the operator.

v. All financing of investment was assumed to originate from U.S. sources.

vi. The United States is assumed to have full employment, meaning that U.S. unemployment rates and the total number of jobs in the United States will not change across all cases.

8. Results of the NERA Study

As a result of its two-step analysis, the NERA study yielded two sets of results, reported

in five-year intervals beginning with 2015.⁷⁵ First, the GNGM model produced information regarding the conditions that will support exports of natural gas from the United States. Second, the N_{ew}ERA model provided information about the domestic macroeconomic impacts of natural gas exports. NERA found:

- **LNG exports would result in higher U.S. natural gas prices.** NERA found that the United States would only be able to market LNG successfully with higher global demand or lower U.S. costs of production than in the Reference Cases. According to NERA, the market limits how high U.S. natural gas prices can rise under pressure of LNG exports because importers will not purchase U.S. exports if the U.S. wellhead price rises above the cost of competing supplies. In particular, under NERA's modeling, the U.S. natural gas price does not become linked to oil prices in any of the cases examined.

- **Macroeconomic impacts of LNG exports are positive in all cases.** NERA found that the United States would experience net economic benefits from increased LNG exports in all cases studied. Only three cases had U.S. exports greater than the 12 Bcf/d maximum exports allowed in the cases analyzed by EIA.⁷⁶ NERA estimated economic impacts for these three cases with no constraint on exports, and found that even with exports reaching levels greater than 12 Bcf/d and associated higher prices than in the constrained cases, there were net economic benefits from allowing unlimited exports in all cases.

Across the scenarios, NERA projected that U.S. economic welfare would consistently increase as the volume of natural gas exports increased, including in scenarios with unlimited

⁷⁵ These calendar years are not actual, but represent modeling intervals after exports begin. For example, if the United States does not begin LNG exports until 2016, one year should be added to the dates for each year that exports commence after 2015.

⁷⁶ The first case combined U.S. Reference natural gas production with an international supply and demand shock. The second combined the High EUR domestic case with an international demand shock. The third combined the High EUR domestic case with an international supply and demand shock. NERA study at 6.

exports. The reason given was that even though domestic natural gas prices are pulled up by LNG exports, the value of those exports also rises so that there is a net gain for the U.S. economy measured by a broad metric of economic welfare or by more common measures such as real household income or real GDP. Although there are costs to consumers of higher energy prices and lower consumption and producers incur higher costs to supply the additional natural gas for export, these costs are more than offset by increases in export revenues along with a wealth transfer from overseas received in the form of payments for liquefaction services. The net result is an increase in U.S. households' real income and welfare. NERA noted, however, that net benefits to the U.S. economy could be larger if U.S. businesses were to take more of a merchant role. NERA assumed that foreign purchasers would take title to LNG when it is loaded at a U.S. port, so that any profits that could be made by transporting and selling in importing countries accrue to foreign entities. In cases where exports are constrained to maximum permitted levels, this business model sacrifices additional value from LNG exports that could accrue to the United States.

- **Sources of income would shift.** NERA states that at the same time that LNG exports create higher total income in the United States, exports would shift the composition of income so that both wage income and income from capital investment decline. NERA's measure of total income is GDP measured from the income side, that is, by adding up income from labor, capital, and natural resources and adjusting for taxes and transfers. According to NERA, expansion of LNG exports would have two major effects on income: it raises energy costs and, in the process, depresses both real wages and the return on capital in all other industries, but it also creates two additional sources of income. First, additional income would come in the form of higher export revenues and wealth transfers from incremental LNG exports at higher prices paid by overseas

purchasers. Second, U.S. households also would benefit from higher natural gas resource income or rents. These benefits differentiate market-driven expansion of LNG exports from actions that only raise domestic prices without creating additional sources of income. According to NERA, the benefits that come from export expansion would more than outweigh the losses from reduced capital and wage income to U.S. consumers, and hence LNG exports would have net economic benefits in spite of higher natural gas prices. According to NERA, this is the outcome that economic theory describes when barriers to trade are removed.

- **Some groups and industries will experience negative effects of LNG exports.** NERA concluded that, through retirement savings, an increasingly large number of workers will share in the higher income received by natural resource companies participating in LNG export-related activities. Nevertheless, impacts will not be positive for all groups in the economy. According to NERA, households with income solely from wages or transfers, in particular, might not participate in these benefits. NERA stated that higher natural gas prices can also be expected to have negative effects on output and employment, particularly in sectors that make intensive use of natural gas, while other sectors not so affected could experience gains. There clearly would be greater activity and employment in natural gas production and transportation and in construction of liquefaction facilities. Overall, NERA projected that declines in output in other sectors would be accompanied by similar reductions in worker compensation in those sectors, indicating that there will be some shifting of labor between different industries. However, even in the year of peak impacts, the largest projected change in wage income by industry would be no more than one percent, and even if all of this decline were attributable to lower employment relative to the baseline, NERA concluded that no sector analyzed in its study would experience reductions in employment more rapid than normal turnover. In fact, NERA asserted that most of

the changes in real worker compensation are likely to take the form of lower than expected real wage growth, due to the increase in natural gas prices relative to nominal wage growth.

- **Peak natural gas export levels (as specified by DOE/FE for the EIA study) and resulting price increases are not likely.** The export volumes selected by DOE/FE for the EIA Study define the maximum exports allowed in each scenario for the NERA macroeconomic analysis. Based on its analysis of global natural gas supply and demand, NERA projected achievable levels of exports for each scenario. The NERA scenarios that found a lower level of exports than the limits specified by DOE/FE are shown in Figure 5 of the NERA study, as modified from Tcf/yr to Bcf/d below.

**Table 3: NERA Export Volumes in Bcf/d,
Adapted from Figure 5 of the NERA Report**

NERA Export Volumes (in Bcf/d)	2015	2020	2025	2030	2035
U.S. Reference Case with International Demand Shock and lower than Low/Slow export levels	1.02	2.69	3.92	3.27	6.00
U.S. Reference Case with International Demand Shock and lower than Low/Rapid export levels	2.80	2.69	3.92	3.27	3.76
U.S. Reference Case with International Supply/Demand Shock and lower than High/Slow export levels	1.02	6.00	10.77	12.00	12.00
U.S. Reference Case with International Supply/Demand Shock and lower than High/Rapid export levels	3.02	8.00	10.77	12.00	12.00
U.S. High Shale EUR with International Supply/Demand Shock at Low/Slowest export levels	0.50	2.69	3.92	3.27	3.76

The cells in bold italics indicate the years in which the model's limit on exports is binding. All scenarios hit the export limits in 2015 except the NERA export volume case with Low/Rapid exports. In no case does the U.S. wellhead price increase by more than \$1.11/Mcf due to market-determined levels of exports. Even in cases in which no limits were placed on exports, competition between the United States and competing suppliers of LNG limits increases in both U.S. LNG exports and U.S. natural gas prices.

To match the characterization of U.S. supply and demand for natural gas in EIA's NEMS model, NERA calibrated its macroeconomic model so that for the same level of LNG exports assumed in the EIA Study, the NERA model reproduced the prices projected by EIA. Thus natural gas price responses were similar in scenarios where NERA export volumes were at the EIA export volumes. However, NERA determined that the high export limits were not economical in the U.S. Reference Case and that in these scenarios there would be lower exports than assumed by EIA. Because NERA estimated lower export volumes than were specified by DOE/FE for the EIA study, U.S. natural gas prices do not reach the highest levels projected by EIA. NERA states that this implies no disagreement with the EIA study. Instead, it reflects the fact that at the highest wellhead prices estimated by EIA, world demand for U.S. exports would fall far short of the levels of exports assumed in the EIA Study. Additionally, NERA found that U.S. wellhead prices would not become linked to oil prices in the sense of rising to oil price parity in any of the cases analyzed, even if the United States were exporting to regions where natural gas prices are presently linked to oil. NERA asserts that costs of liquefaction, transportation, and regasification would keep U.S. prices well below those in importing regions.

- **Serious competitive impacts are likely to be confined to narrow segments of U.S. industry.** NERA gave special attention to the potential impact of LNG exports on EITE

industries. NERA examined impacts on manufacturing industries where energy expenditures are greater than 5 percent of the value of the output created and the industries face serious exposure to foreign competition. Such industries, according to NERA, comprise about 10 percent of U.S. manufacturing and employment in these industries is one-half of one percent of total U.S. employment. NERA did not project that such energy-intensive industries as a whole would sustain a loss in employment or output greater than one percent in any year in any of the cases examined and pointed out that such a drop in employment would be less than normal rates of turnover of employees in the relevant industries.

- **Even with unlimited exports, there would be net economic benefits to the United States.** NERA estimated economic impacts associated with unlimited exports in cases in which even the High, Rapid limits were binding. In these cases, both LNG exports and prices were determined by global supply and demand. Even in these cases, NERA found that U.S. natural gas prices would not rise to oil parity or to levels observed in consuming regions, and net economic benefits to the U.S. increased over the corresponding cases with limited exports. To examine U.S. economic impacts under cases with even higher natural gas prices and levels of exports than in the unlimited export cases, NERA also estimated economic impacts associated with the highest levels of exports and U.S. natural gas prices in the EIA analysis, regardless of whether those quantities could actually be sold at the assumed netback prices. The price received for exports in these cases was calculated in the same way as in the cases based on NERA's GNGM model, by adding the tolling fee plus a 15 percent markup over Henry Hub to the Henry Hub price. Even with the highest prices estimated by EIA for these hypothetical cases, NERA found net economic benefits to the United States, with the net economic benefits growing as export volumes rise. Addressing this finding, NERA explained that LNG export

revenues from sales to other countries at those high prices would more than offset the costs of freeing that gas for export.

VII. MOTIONS TO INTERVENE, COMMENTS, AND PROTEST IN RESPONSE TO THE NOTICE OF APPLICATION

A. Overview

In response to the February 13, 2012 Notice of Application, DOE/FE received 11 comments in opposition to the Application. Comments in opposition were submitted by Kathy Davis, Roy Marsh, Jeannie Praeger, Harold Hendricks, Charles Owens, Jim Rio, Robin Rio, Diana Stokes, Larry Jones, David Collins, and Nancy Laurie. No comments were submitted in this proceeding supporting the Application.⁷⁷

In addition to the non-party commenters, the following three parties submitted timely motions to intervene and protest: Gulf Coast Environmental Labor Coalition (GCELC), the American Public Gas Association (APGA), and Sierra Club. Two parties, America's Energy Advantage and IECA, filed motions to intervene and comment out of time.

B. Comments Opposing the Application

The non-intervenor comments submitted in opposition to FLEX's application generally address the negative impacts that the commenters believe will result from a grant of the requested authorization. Several commenters, including Harold Hendricks, Charles Owens, Jim Rio, Robin Rio, Jeannie Praeger, and David Collins, argue that FLEX's proposed Liquefaction Project is inconsistent with the public interest and should be denied.

Specifically, some commenters dispute FLEX's argument that a grant of the requested authorization will support America's energy security by decreasing the United States' reliance on

⁷⁷ DOE/FE notes, however, that it received 17 comments in support of FLEX's Application in *Freeport I* (including four resolutions passed by local entities), with no comments opposing FLEX's Application in that proceeding. See *Freeport I*, DOE/FE Order No. 3282 at 1-2, 22-24.

foreign fuel. Kathy Davis asserts, for example, that such a statement is a “sham,” and that selling the United States’ natural resources to other countries will diminish both U.S. energy supplies and national security.⁷⁸ Jim Rio states that keeping natural resources in this country would benefit the United States and its citizens, whereas granting FLEX’s application would work against the nation as a whole. In particular, Mr. Rio argues that the United States should not export its natural resources while continuing to import resources from hostile countries. Robin Rio similarly asserts that FLEX should not be exporting U.S. resources at a critical time in our nation’s history, and maintains that keeping U.S. resources in this country will help the nation remain strong and energy independent. Finally, Larry Jones states that increasing export capacity would be bad for the U.S. economy because the use of domestic natural gas is increasing. He also urges DOE/FE to keep U.S. energy in the United States.

Other comments focus on environmental concerns allegedly related to FLEX’s proposed Liquefaction Project, including its location. Roy Marsh contends that FLEX’s characterization of the Liquefaction Project improvements as “‘contained within the previously authorized operational area of the Freeport Terminal on Quintana Island, Texas’” is a major error that is also a false statement.⁷⁹ Mr. Marsh argues that FLEX’s pretreatment gas facility is proposed to be built in a residential area that is more than six miles away from FLEX’s existing Quintana Island facility, in an area that is environmentally sensitive. He maintains that the gas pretreatment facility is an integral part of the liquefaction process.

Similarly, Ms. Davis states that she strongly disputes FLEX’s statement in the Application that the requested authorization will have a “‘significant environmental benefit.’”⁸⁰

⁷⁸ Comment of Kathy Davis, FE Docket No. 11-161-LNG (Feb. 19, 2012)

⁷⁹ Comment of Roy Marsh, FE Docket No. 11-161-LNG (Mar. 12, 2012) (quoting FLEX App.).

⁸⁰ *Id.* (quoting FLEX App.).

Both Ms. Davis and Diana Stokes counter that the proposed location of FLEX's facility is within four residential communities and on designated wetlands, such that the construction and operation of the facility will produce only negative environmental effects to area homeowners and to the adjoining Brazoria National Wildlife Refuge.

Commenters, including Mr. Collins, Nancy Laurie, Ms. Praeger, and Ms. Stokes, specifically assert that that toxic waste and emissions resulting from the construction and operation of FLEX's proposed facility will negatively impact neighboring residents, and could destroy or endanger many species of birds, fish, mammals, and other wildlife living in the Brazoria National Wildlife Refuge. Ms. Praeger emphasizes that the location of the proposed plant is not within city limits and therefore has no local supervision or regulatory authority. She is concerned that the proposed location is on a narrow county road that serves four subdivisions, and that, in the event of a catastrophic event (*e.g.*, the plant blows up), the residents will be trapped. Mr. Collins argues that the location for FLEX's facility is ill-conceived and that the requested permit should be denied until a new, more appropriate location is found.

Finally, Ms. Davis alleges that FLEX's various LNG documents contain numerous fallacies, conflicting statements, and discrepancies, which point to a company policy of deception. Ms. Davis alleges that FLEX is attempting to achieve its company goals without consideration for the environment, neighboring homes and families, our nation, or national security.

C. Proposed Intervenor Gulf Coast Environmental Labor Coalition

1. GCELC's Motion to Intervene and Protest

GCELC states that it consists of 25 different local labor unions and their constituent members totaling approximately 27,000 members throughout Louisiana, Mississippi, Texas, and Oklahoma. GCELE states that it provides a voice for workers and unions to engage their

neighbors and public officials on pressing environmental issues such as the proposed FLEX project. GCELC further explains that it has an interest in the protection and preservation of the Gulf Coast and Texas as a sustainable region balancing economic, social and environmental concerns. According to GCELC, at least 134 individual members and their families reside, work, and/or recreate in Brazoria County, Texas, within close proximity of the proposed FLEX project and thus will be directly affected by DOE/FE's decision on the requested authorization.

In its motion, GCELC references a report prepared by the staff of then-Representative Edward J. Markey entitled, "Drill Here, Sell There, Pay More" (Markey Report) and a letter from then-Representative Markey to then-Secretary of Energy Steven Chu dated January 4, 2012.⁸¹ GCELC quotes the response to Representative Markey's letter, dated February 24, 2012, and written by Christopher Smith (DOE Deputy Assistant Secretary for Oil and Natural Gas), in which Mr. Smith "indicated that a two-part independent study had been commissioned by DOE to evaluate and address 'the cumulative impact of Sabine Pass and additional future LNG export authorizations' on the public interest."⁸² GCELC states that, at the time of Deputy Assistant Secretary Smith's letter to Rep. Markey, only the EIA study has been completed and made available on EIA's website. *See supra* Section VI.A (discussion of EIA study). GCELC further states that the second part of DOE's study—now known as the NERA study (discussed in Section VI.B and VIII)—was not yet complete as of April 13, 2012, the date it filed its motion.

⁸¹ *See* Motion to Intervene and Protest of Gulf Coast Environmental Labor Coalition, FE Docket No. 11-161-LNG, at 3-4 (Apr. 13, 2012) [hereinafter GCELC Mot.].

⁸² *Id.* at 5 (quoting letter from DOE Deputy Assistant Secretary Christopher Smith to Rep. Edward J. Markey, at 3 (Feb. 24, 2012)).

Citing Deputy Assistant Secretary Smith’s letter, GCELC notes with approval that the NERA study will evaluate the macroeconomic impacts of LNG Export on the United States economy.⁸³

Addressing the statements made by DOE Deputy Assistant Secretary Smith concerning DOE’s two-part LNG export study, GCELC states that it: (1) applauds DOE’s efforts to reach a reasoned decision on applicants for authorization to export LNG to non-FTA countries, including the FLEX application at issue, but (2) asserts that “the FLEX Application should be denied ... unless the public is provided with an opportunity to comment on the FLEX application after reviewing the [NERA] study.”⁸⁴

2. FLEX’s Answer to GCELC

On May 10, 2012, FLEX filed a motion for leave to answer and answer of GCELC’s motion to intervene and protest. FLEX states that DOE/FE should deny GCELC’s motion to intervene and protest and to issue an order granting FLEX’s requested authorization for three reasons: (1) GCELC fails to state a claim of interest in the FLEX Application, (2) GCELC fails to show good cause for providing additional public comments, and (3) GCELC fails to show that approval of the FLEX Application is inconsistent with the public interest under NGA § 3(a).

First, FLEX asserts that GCELC failed to make a logical connection between the stated interests of its members and the pending FLEX Application, and thus does not qualify for intervention under governing DOE regulations, 10 C.F.R. § 590.303(b). Specifically, FLEX contends that GCELC fails to offer an explanation as to why its interest in the Gulf Coast region would be affected by approval of the FLEX Application, with or without an additional public comment period after the NERA study is published. FLEX asserts that GCELC is required under

⁸³ Although the NERA study was not published until December 2012—several months after GCELC filed its motion and protest—DOE/FE will use the term “NERA study” in place of GCELC’s reference to the “second DOE study” to maintain consistency with the rest of this Order.

⁸⁴ *Id.* at 6.

DOE regulations, 10 C.F.R. § 590.303(c), to provide factual and legal support to support its motion to intervene, which FLEX states that GCELC has failed to do.

Second, FLEX disputes GCELC's contention that approval of the FLEX Application would not be in the public interest unless "intervenor and other interested members of the public" are granted an opportunity to comment on the NERA study.⁸⁵ In FLEX's view, this objection to its Application is both procedural unnecessary and inappropriate. FLEX maintains that there is no logical nexus between GCELC's request for additional commenting procedures and the burden GCELC must bear to overcome the legally mandated presumption that the FLEX Application is not inconsistent with the public interest. FLEX further asserts that GCELC is not entitled to request a second comment period because GCELC failed to demonstrate that it satisfies the minimum requirement to be granted intervenor status. For these and other reasons, FLEX argues that GCELC fails to show good cause for DOE/FE to provide an additional public comment period solely on the NERA study.

Finally, FLEX asserts that GCELC has not overcome the rebuttable presumption set forth in NGA § 3(a) that proposed exports of natural gas are in the public interest. FLEX states that it submitted substantial evidence in support of its Application, whereas GCELC's protest is "thinly supported" and offers no challenge to either FLEX's evidence or the presumption that the FLEX Application is in the public interest.⁸⁶ FLEX seeks to discredit the Markey Report cited by GCELC, stating that it is a partisan document, has not been officially adopted by the Committee on Natural Resources, contains alarmist statements based on unrealistic assumptions about LNG

⁸⁵ Freeport LNG Expansion, L.P. & FLNG Liquefaction, LLC, Motion for Leave to Answer and Answer of Freeport LNG and FLNG Liquefaction LLC to Motion to Intervene and Protest of the Gulf Coast Environmental Labor Coalition, FE Docket No. 11-161-LNG, at 4 (May 10, 2012) (quoting GCELC Mot.).

⁸⁶ *Id.* at 6.

exports, and should be given no weight in DOE/FE's public interest analysis. Moreover, FLEX contends, GCELC's quotations from the Markey Report are based on cherry-picked data.

FLEX contends that the January 2012 EIA study—the first part of DOE's two-party study on LNG exports—supports FLEX's argument that its proposed LNG exports will have minimal effects on domestic natural gas prices. FLEX further argues that the “high-volume export scenario” modeled in the EIA study (and discussed above in Section VI.B) is unlikely to happen if lower supplies and higher prices make the domestic market more attractive to natural gas producers. According to FLEX, contrary to the impression GCELC hopes to convey, the EIA study projects only minimal price effects.

FLEX also cites EIA's Annual Energy Outlook 2012 Early Release Overview (AEO 2012 Early Release)⁸⁷ in asserting that there will be long-term increases in natural gas production mostly resulting from shale plays, even though the overall estimated resource base has been revised downward from AEO 2011—largely to reflect a decrease in the estimate for the Marcellus shale. FLEX notes that its proposed exports will be produced primarily from the Eagle Ford shale in South Texas (not the Marcellus shale), with any wellhead price impact from those exports distributed primarily within the large and highly liquid Texas and Gulf Coast regional gas market. According to FLEX, substantial quantities of natural gas are currently flared for lack of adequate market demand and infrastructure support, and LNG exports will help to reduce this waste of natural resources. FLEX states that both increased production and falling prices projected in the AEO 2012 Early Release Overview support the presumption that approving the FLEX Application is in the public interest. FLEX concludes by stating that GCELC's request for additional comment procedures is unrelated to DOE/FE's public interest

⁸⁷ EIA, Annual Energy Outlook 2012 Early Release Overview (Jan. 13, 2012).

determination, and therefore that DOE/FE should deny the protest and grant FLEX's Application.

D. Proposed Intervenor American Public Gas Association

1. APGA's Motion to Intervene and Protest

APGA is an association of municipal gas distribution systems, public utility districts, and other public agencies. According to APGA, its members are active participants in the domestic market for natural gas where they secure the supplies of natural gas to serve their end users.

APGA asserts that FLEX's request for authority to export domestically produced LNG is inconsistent with the public interest. APGA cites both the EIA study released in January 2012 and EIA's Annual Energy Outlook 2012 Early Release for the proposition that exporting domestic LNG will increase domestic natural gas prices. Specifically, APGA states that the EIA study concludes that exporting domestic LNG will significantly increase domestic natural gas prices. APGA further states that EIA's AEO 2012 Early Release substantially reduced the level of estimated technically recoverable natural gas in the Marcellus Shale formation. In APGA's view, these new projections undermine the basis for FLEX's Application, which (according to APGA) is founded on the notion that vast recoverable shale resources will keep domestic gas prices low.

APGA argues that, to the contrary, these exports will lead to potentially significant price increases that will jeopardize the viability of natural gas as a "bridge-fuel" in the transition away from coal-fired electricity generation. APGA states:

Inflated natural gas prices will ... inhibit efforts to foster natural gas as a transportation fuel, which is important to wean the U.S. from its historic, dangerous dependence on foreign oil. Furthermore, high natural gas and electricity prices will reverse the nascent trend toward renewed domestic

manufacturing before it gains momentum.⁸⁸

For these reasons, APGA asserts, exportation of significant quantities of domestic natural gas would have significant adverse implications for domestic natural gas, U.S. energy supply, and national security.

APGA maintains that DOE/FE must consider the cumulative impact of the proposed exports in this proceeding in light of FLEX's first non-FTA application then-pending in FE Docket No. 10-161-LNG (and subsequently granted in DOE/FE Order No. 3282) and other pending export applications. APGA states that it stands by the arguments it made in its protest in FLEX's prior proceeding, and that its concerns in that proceeding regarding FLEX's inflated estimates of recoverable natural gas and regulatory uncertainty surrounding alternative natural gas production have been borne out.

Focusing on its argument that LNG exports will increase domestic natural gas prices, APGA reiterates that "DOE/FE should not pursue policies that directly increase natural gas commodity prices for American consumers, thereby making natural gas less competitive in this country as a replacement for foreign-sourced fuels or for fuels that are less clean and more carbon-intensive."⁸⁹ APGA points out that FLEX did not commission a price study focused on the effect of the 1.4 Bcf/d of additional exports requested in this authorization, but instead relies on the Deloitte Report. APGA criticizes the Deloitte Report as inadequate because it allegedly:

- has an overly narrow scope, in that it analyzes a scenario where LNG capacity reaches only 6 Bcf/d and is limited to exports from just three export terminals, all on the Gulf Coast;
- fails to consider this specific FLEX Application or the total applied-for export capacity—which APGA states potentially could result in a roughly 21% increase in

⁸⁸ Motion for Leave to Intervene and Protest of the American Public Gas Association (Apr. 13, 2012), at 4 [hereinafter APGA Mot.].

⁸⁹ *Id.* at 7.

total natural gas demand in the United States based on the applied-for export capacity as of March 23, 2012;

- is based on outdated and likely inflated projections of over 2,170 Tcf of technically recoverable gas estimated by the Potential Gas Committee in April 2011, before EIA reduced its estimate for the technically recoverable gas in the Marcellus Shale by over 65 percent in AEO 2012; and
- does not account for variable factors, such as the rate of export development or economic growth trends.

APGA states that, in light of the “sobering” reduction by EIA in the amount of technically recoverable gas in the United States, DOE/FE must take a harder look at FLEX’s claims of “huge reserves” of natural gas as the basis for its Application.⁹⁰ Specifically, APGA states that DOE/FE must consider the EIA study—which, in its view, considers export scenarios more thoroughly than the Deloitte Report. APGA emphasizes that, whereas EIA analyzed four scenarios of export-related increases in natural gas demand in the context of four separate cases of potential natural gas supply and economic growth, the Deloitte Report considers only exports of 6 Bcf/d, which is EIA’s low export scenario.

APGA points out that under any of the scenarios analyzed in the EIA study, EIA forecasts that LNG exports will increase domestic natural gas prices. According to APGA, EIA “concluded that ‘rapid increases in export levels lead to large initial price increases,’ but that slower increases in export levels will, ‘eventually produce higher average prices during the decade between 2025 and 2035.’”⁹¹ APGA also asserts that future natural gas prices may be even higher than projected in the EIA study, due to EIA’s revised estimates of technically recoverable gas, the increasing regulatory uncertainty regarding the production of unconventional gas, and the potential for increased demand for natural gas in the electric

⁹⁰ *Id.* at 9 (quoting FLEX App. at 14).

⁹¹ *Id.* at 11 (quoting EIA study at 6).

generation sector.

In connection with its environmental concerns, APGA makes an economic argument. It states that drinking water contamination, waste water disposal, and the emissions of volatile organic compounds from fractured oil and gas wells are examples of the environmental issues leading to increased regulatory oversight and public opposition, which in turn could raise production costs and limit the amount of gas that can be recovered in an economically or politically acceptable manner. APGA specifically argues that EPA rules addressing greenhouse gas emissions and mercury and toxics emissions will force the retirement of coal-fired generators and drive up demand for natural gas in the electric generation sector. APGA contends that because the EIA did not consider these pending regulations in its Annual Energy Outlooks, natural gas prices likely will increase by more than projected in the EIA study. APGA asserts that electricity prices also will increase by more than anticipated in the EIA study.

Moving to the alleged effect of high natural gas prices, APGA states that the relatively low natural gas prices currently being experienced in the United States give the nation an opportunity to end its dependence on foreign oil, to attract renewed domestic manufacturing, and to stimulate displacement of gasoline with natural gas-fueled vehicles in the transportation sector. APGA argues that increased prices due to exports of LNG will jeopardize each of these prospects and ultimately threaten national security. APGA also contends that spiking electricity rates will have rippling effects on the U.S. economy. APGA further contends that FLEX, in citing the jobs its proposed project may create, does not acknowledge the many jobs in other sectors of the U.S. economy that may be destroyed if prices of natural gas increase and/or become more volatile.

Next, APGA asserts that FLEX's exports will not prove economical in the long-term, as

current international arbitrage opportunities may not last and natural gas likely will be abundant world-wide before the construction of LNG export facilities in the U.S. can be completed.

APGA predicts that exporting natural gas will tie domestic natural gas prices to international gas markets, “leaving the U.S. with the worst of all worlds, i.e., higher (and likely more volatile) domestic prices that thwart energy independence and that undermine the competitiveness of the manufacturing sector that relies heavily on natural gas as a process fuel.”⁹² APGA cautions that a convergence of international gas prices would be particularly devastating for FLEX, which anticipates acquiring “large volumes” of natural gas on the spot market.⁹³

APGA also argues that the higher fixed costs of LNG put it at a disadvantage in the world market compared to pipeline gas. APGA states that LNG from the United States likely will find itself competing with shale gas piped into Western Europe from Poland and Ukraine at lower fixed costs. In sum, APGA takes the position that, because the export of LNG likely will turn out to be a failed venture, DOE/FE should deny FLEX’s Application and the United States should instead export its technology and expertise in developing shale gas.

2. FLEX’s Answer to APGA

FLEX filed a motion for leave to answer and answer to APGA’s motion and protest on May 14, 2012.⁹⁴ In the answer, FLEX first argues that APGA fails to state a claim of interest sufficient to qualify for intervention in this proceeding under DOE regulations, 10 C.F.R. § 590.303(b) and (c). According to FLEX, APGA does not explain how its members’ interests might be affected by FLEX’s proposed LNG exports, but instead lists a series of highly improbable scenarios. FLEX further asserts that APGA’s stated concerns are not specific to the

⁹² APGA Mot. at 19.

⁹³ *Id.* at 21 (quoting FLEX App. at 10).

⁹⁴ Motion for Leave to Answer and Answer of Freeport LNG and FLNG Liquefaction LLC to Motion to Intervene and Protest of the American Public Gas Association, FE Docket No. 11-161-LNG (May 14, 2012).

FLEX Application, but instead raise general policy issues associated with LNG exports and regulation of the domestic natural gas market. FLEX charges that, because APGA has failed to state the facts on which it asserts a claim of interest, APGA's motion to intervene should be denied.

Turning to APGA's protest, FLEX asserts that APGA mischaracterizes FLEX's public interest arguments, overstates the conclusions reached in recent EIA studies, and fails to show that FLEX's proposed exports are inconsistent with the public interest. Pointing to APGA's statements warning about "the dangers and downsides of the U.S. become part of a global natural gas market,"⁹⁵ FLEX characterizes APGA as taking an isolationist stance that ignores the various factors considered by DOE/FE in its public interest analysis under NGA section 3(a), including whether the proposed LNG exports are consistent with DOE/FE policies promoting free and open trade.

FLEX maintains that its Application is buttressed by substantial evidence, including the Deloitte Report, showing that its proposed exports will have both minimal impacts in U.S. natural gas prices and significant benefits to the local, regional, and national economy, the U.S. balance of trade, American energy security, and the global environment. Noting APGA's reliance on EIA's study and EIA's AEO 2012 Early Release data to support its position, FLEX states that "APGA suggests that the 'most realistic' scenario will be high/rapid export development combined with Low Shale EUR [Estimated Ultimate Recovery], resulting in a 54% jump in domestic natural gas prices in 2018."⁹⁶ On the contrary, FLEX asserts, the rapid export scenarios in the EIA study are unrealistic. Citing a report by the Brookings Institute's Energy

⁹⁵ *Id.* at 4 (quoting APGA Mot. at 7).

⁹⁶ *Id.* at 6.

Security Initiative,⁹⁷ FLEX asserts that it is unlikely that all or even most of the currently applied-for LNG export authority will ever be realized because of the time, difficulty, and expense of commercializing, financing, and constructing LNG export terminals and the limitations in global market demand for LNG. Instead, FLEX predicts, LNG export capability in the United States will develop gradually over many years, and there will be abundant supplies to natural gas to meet both domestic and international demand.

Further, FLEX asserts that even EIA's high/rapid scenario projects only moderate price effects when applied to its Reference Case. FLEX argues that, as the EIA study itself makes clear, lower or higher U.S. natural gas prices would tend to make any given volume of additional exports more or less likely. FLEX argues that producers will be able to anticipate future demand and add supply, which will reduce price impacts. FLEX states that, unlike the EIA study, the Deloitte Report's model recognizes that there will be ample notice of increased demand, such that production will increase with demand, exerting downward pressure as prices. FLEX further states that EIA's AEO 2012 Early Release also calculates minimal price impacts, even after assuming that the United States becomes a net exporter of LNG by 2016 and an overall exporter of natural gas by 2021.

FLEX next reiterates its position that the United States has ample natural gas reserves. FLEX states that the AEO 2012 Early Release Overview projects long-term increases in natural gas production—specifically 7 percent more cumulative natural gas production from 2010 to 2035 than estimated in the AEO 2011 (primarily resulting from increased shale production), even though the overall estimated resource base had been revised downward. FLEX asserts that this decline in estimated unproved technically recoverable natural gas resources largely reflects a

⁹⁷ *Id.* (citing Brookings Institute Energy Initiative, *Liquid Markets: Assessing the Case for U.S. Exports of Liquefied Natural Gas* (May 2012)).

decrease in the current EIA estimate for the Marcellus shale. FLEX notes, by contrast, that its proposed exports will be produced primarily from the Eagle Ford shale in South Texas, such that wellhead price impacts will be distributed primarily within the Texas and Gulf Coast regional gas market. Rebutting APGA's argument that changes in the regulatory landscape may impose additional costs on producers, thereby reducing the total size of the resources available, FLEX counters that continuing rapid improvements in gas production technologies have increased both available resources and well productivity. Citing the Brookings Report, FLEX maintains that both initial production rates and ultimate well recovery have been growing across all production regions and driving down the per-unit cost of gas production.

Next, FLEX argues that LNG exports will not harm domestic power generation, industrial manufacturing, or transportation fuel demands. Citing the EIA study, FLEX states that domestic natural gas markets will balance future LNG exports largely through increased natural gas production (mostly from shale plays), with the rest supplied by natural gas that otherwise would have been consumed by the power-generating and industrial sectors. FLEX maintains that, despite APGA's discussion of new and revised EPA regulations allegedly forcing the retirement of coal-fired power plants, the price effects of LNG exports are likely to have only modest effects in the power generation sector. FLEX cites the EIA study in stating that LNG exports will increase electricity prices under reference case conditions by between 2 and 3 percent, as well as the Deloitte Report's forecast that electricity prices will rise by 1.2 percent in Louisiana and the Gulf Coast region, but by less than 1 percent in the Midwest.

FLEX disputes APGA's claim that small marginal price increases resulting from LNG exports will prevent natural gas from becoming a viable alternative fuel for power generation. FLEX counters that natural gas is considered an economical alternative at prices much higher

than projected in the highest price-impact scenarios. FLEX further observes that the power sector built natural gas-fired generation plants while prices were increasing, and will continue to benefit from the low prices and abundant supply of domestic shale gas.

FLEX acknowledges that the decline in natural gas prices has spurred new investments in the United States, but disputes that its proposed LNG exports will destroy American jobs by raising production costs for EITE industries. FLEX asserts that, because most European and Asian competitors use oil-based products as feedstock, U.S. companies enjoy significant cost advantages over global competitors and are unlikely to be affected by modest increases in natural gas prices resulting from LNG exports. FLEX also notes that increased LNG exports present a benefit to industrial consumers in the form of ethane, a liquid byproduct of natural gas production that is a primary feedstock for ethylene, used for a variety of applications.

FLEX rebuts APGA's argument that exporting LNG will cause international and domestic gas prices to converge and increase price volatility. FLEX states that the recent surge in natural gas production has resulted in much lower volatility than in the past decade, as new production eases the tight supply-demand balance that historically has caused price volatility. In addition, FLEX maintains that the LNG market is characterized by technical constraints that result in LNG facilities having a relatively constant demand for natural gas, which also prevents international shocks from impacting domestic prices. FLEX again stresses that new demand for LNG can be anticipated years in advance, allowing market players to adjust production and allocation.

Finally, FLEX asserts that limiting LNG exports by denying the FLEX Application would constitute a de facto subsidy to domestic consumers at the expense of domestic producers. FLEX asks DOE/FE to allow the markets to allocate U.S. natural gas supplies to their most

efficient uses, which it states will benefit the U.S. economy and is consistent with DOE/FE policy.

E. Proposed Intervenor Sierra Club

1. Sierra Club's Motion for Leave to Intervene, Protest, and Comments

Sierra Club filed its motion to intervene, protest, and comments on April 13, 2012.⁹⁸

Sierra Club asserts that its many thousands of members have a direct interest in ensuring that domestic natural gas production is conducted safely, and that exports of LNG do not adversely affect domestic consumers. Sierra Club states that, as of April 2012, it had 22,412 members in Texas, which includes members who live and work throughout the area that will be affected by the FLEX export plan. Sierra Club claims that other members live in and around drilling sites in the Marcellus Shale and other shale plays. Sierra Club also states that it has 608,095 total members, all of whom it claims will be affected by increased gas prices allegedly caused by FLEX's export plan.

Sierra Club contends that FLEX's Application is inconsistent with the public interest because it will produce negative economic consequences and significant environmental harm. Sierra Club argues that these harms will be exacerbated by the cumulative impact of other LNG export projects. More specifically, Sierra Club makes the following five non-environmental arguments:⁹⁹ (i) DOE/FE cannot consider this Application separately from FLEX's then-pending non-FTA application in FE Docket No. 10-161-LNG (subsequently granted in DOE/FE Order No. 3282); (ii) FLEX's proposal will cause economic harm by raising domestic gas prices

⁹⁸ Sierra Club's Motion to Intervene, Protest, and Comments, FE Docket No. 11-161-LNG (Apr. 13, 2012) [hereinafter Sierra Club Mot.].

⁹⁹ As stated herein, DOE/FE intends to review the environmental issues in this proceeding—including the environmental arguments raised by Sierra Club—following the completion of FERC's environmental review of the Liquefaction Project.

and eliminating domestic jobs; (iii) the economic benefits predicted by FLEX are uncertain and overstated; (iv) DOE/FE may not conditionally approve FLEX's proposal without a full EIS; and (v) if DOE approves FLEX's Application, it must impose rigorous monitoring conditions to ensure that FLEX's exportation of LNG does not harm the public interest.¹⁰⁰ These arguments are summarized below.

Consideration of FLEX's two non-FTA applications. Sierra Club asserts that DOE/FE should consider this Application together with FLEX's first non-FTA application (granted in DOE/FE Order No. 3282), rather than evaluate them separately as requested by FLEX. Sierra Club predicts that FLEX will experience economies of scale and other economic benefits from combined projects that double the volume of proposed exports, with each phase more likely to be completed if the other is also approved.

Alleged economic harm associated with FLEX's proposed exports. Citing the EIA study and the Markey Report, Sierra Club argues that LNG exports will significantly increase natural gas prices, which in turn will hurt American consumers and limit or eliminate manufacturing and farming jobs. Sierra Club states that EIA's estimates of price impacts are "striking" and significantly higher than those provided by FLEX in its Application.¹⁰¹ Sierra Club further states that DOE/FE must consider the cumulative effect of all authorized and pending exports—a point that it states FLEX concedes by not discussing price impacts solely attributable to its Liquefaction Project. Sierra Club asserts that, even if FLEX's project is considered in isolation, it will likely significantly increase gas prices.

¹⁰⁰ Sierra Club also argues that DOE/FE must not take action on FLEX's Application until DOE/FE's LNG export studies are complete and published for public comment but, as noted herein, that argument is now moot because both the EIA and NERA studies have been completed and Sierra Club has commented on them. *See infra* Section VIII.

¹⁰¹ Sierra Club Mot. at 40.

Citing the EIA report, Sierra Club states that lower exports will produce wellhead price increases of between 10 and 20 percent by 2020, while higher exports can push prices up by just under 40 percent. Sierra Club predicts that even sharper price increases will occur if the full 16 Bcf/d of export facilities proposed as of March 23, 2012, are placed into operation. Sierra Club states that consumers will respond to increased prices by decreasing consumption, yet still would pay a higher total gas bill. Sierra Club emphasizes the “very large” size of EIA’s projected price increases in absolute terms,¹⁰² stating that, in EIA’s low/slow export scenario, gas and electricity bill would increase by \$9 billion per year, with increases growing to \$20 billion per year in other scenarios. According to Sierra Club, industries dependant on natural gas—such as farming, steel production, fertilizer manufacturing, and chemical manufacturing—will be particularly impacted by these increases. Citing the Markey Report, Sierra Club maintains that increased costs to these industries likely will result in job losses or stymied job growth, which will offset the job growth associated with LNG exports in the natural gas production industry.

Sierra Club also asserts that DOE/FE, in evaluating the record in this proceeding, must use EIA’s estimates of price increases instead of FLEX’s “drastically lower” estimates.¹⁰³ Sierra Club states, for example, that the Deloitte Report (upon which FLEX relies) concluded that exporting 6 Bcf/d of LNG would increase the projected average U.S. citygate gas price by 1.7 percent, whereas EIA estimated increases to wellhead prices by 10 to 20 percent for the same volume of LNG exports. Stating that it is “unclear” why FLEX’s estimates are “low,” Sierra Club argues that it would be arbitrary and capricious for DOE/FE to use industry estimates instead of the EIA estimates as the basis for its analysis.¹⁰⁴

¹⁰² *Id.* at 43.

¹⁰³ *Id.* at 41.

¹⁰⁴ *Id.* at 42.

Economic benefits asserted by FLEX. Sierra Club criticizes FLEX’s Application for discussing only the purported benefits of FLEX’s proposed exports. According to Sierra Club, FLEX casts a wide net in hopes of capturing indirect and induced economic activity, while failing to recognize the alleged environmental and economic costs of that same activity. Sierra Club argues that the economic benefits of FLEX’s export proposal are uncertain, that only 20 to 30 jobs will be permanently created, and that thousands of other jobs that FLEX claims will be created will last for only the limited period in which the facility is constructed.

Sierra Club focuses its criticism on the fact that “FLEX’s argument rests entirely on analyses using the ‘input-output’ model[] to calculate economic benefits, primarily IMPLAN.”¹⁰⁵ According to Sierra Club, this model is too simplistic to account for the purported economic benefits associated with the Liquefaction Project.

Citing several studies, Sierra Club attacks the use of an IMPLAN model generally, stating that IMPLAN is limited because it:

- Fails to consider counterfactuals and foregone opportunities, *i.e.*, maps the consequences of a particular expenditure, without asking how the economy might have grown had investors and regulators made different choices;
- May not reflect actual spending patterns;
- Is static, providing a series of one-year snapshots such as “‘job-years,’” but not jobs held year to year or continuous employment numbers;¹⁰⁶
- Identifies the number of jobs supported by the predicted spending, but cannot determine how many jobs are created;
- As a result of these limitations, “is not readily able to ‘evaluate economic circumstances in which the change in the economy has been or will be rapid or large,’ or to deal with the complicated series of individual choices and community

¹⁰⁵ Sierra Club Mot. at 44.

¹⁰⁶ *Id.* at 47.

disruptions ...”¹⁰⁷

In sum, Sierra Club charges that the public interest test in NGA section 3(a) requires DOE/FE to determine whether the country would be better off with FLEX’s proposal, but an IMPLAN-based model cannot answer these questions because it does not reliably compare how the U.S. economy would fare with and without gas exports.

Turning to FLEX’s analysis, Sierra Club states that the analysis of economic benefits associated with FLEX’s Liquefaction Project is drawn from the Altos Report it commissioned to support its non-FTA application in FE Docket No. 10-161-LNG. According to Sierra Club, the Altos Report did not run an IMPLAN model but is “IMPLAN-based,” and thus FLEX’s analysis drawn from the Altos Report is “even more rudimentary” than IMPLAN.¹⁰⁸

Sierra Club states that Altos looked to three prior studies to estimate a generalized “economic multiplier” of how much total spending was created by natural gas expenditures (ranging from 1.34 to 1.9) and an estimate of jobs created per \$1 million spent (ranging from 6.2 to 7.7). Sierra Club states that the Altos Report considered FLEX’s initial proposed LNG exports totaling 1.4 Bcf/d of natural gas, and predicted that the proposed exports would require an investment of \$2.7 billion per year in gas production. Sierra Club states that Altos also concluded that nationwide induced gas production would lead to nearly 17,000 to 21,000 jobs and \$3.2 to \$5.2 billion in gross economic output. According to Sierra Club, of the three studies the Altos Report relied on, only the Considine study (Timothy J. Considine, *The Economic Impacts of the Marcellus Shale: Implications for New York, Pennsylvania and West Virginia*, A Report to the American Petroleum Institute (2010)) explicitly used the IMPLAN input-output

¹⁰⁷ *Id.* at 47 (quoting David Kay, *The Economic Impacts of Marcellus Shale Gas Drilling: What Have We Learned? What Are the Limitations?*, 5-6, 22-30 (Apr. 2011).

¹⁰⁸ *Id.* at 45.

model and considered shale gas extraction, and this study had the lowest estimate of job creation. Therefore, Sierra Club asserts that if the Altos Report's IMPLAN-based analysis is to be used at all, only the Considine study's job-creation estimate should be used, of approximately 17,000 jobs rather than 21,000 jobs. Sierra Club also maintains that DOE/FE should not afford the construction jobs and related economic benefits "much weight" in its public interest determination because every LNG export proposal will involve construction activities, regardless of the merits of the exports allowed by a particular project.

Sierra Club next asserts that available data show that the real economic effects of increasing gas production are more limited and equivocal than FLEX claims. Sierra Club introduces a study by Amanda Weinstein and Mark D. Partridge from Ohio State University (Weinstein study)¹⁰⁹ that allegedly shows no statistically significant difference in the income and employment figures in counties in Pennsylvania with significant drilling in the Marcellus shale compared to those without significant Marcellus drilling.

Sierra Club also cites a study by Susan Cristopherson, *The Economic Consequences of Marcellus Shale Gas Extraction: Key Issues* (Cristopherson study) that, according to Sierra Club, concludes that the boom-bust cycle inherent in gas extraction makes employment benefits tenuous and may leave some regions "hurting" if they are unable to convert the temporary boom into permanent growth.¹¹⁰ Sierra Club maintains that FLEX did not account for the costs, development issues, and displacement effects that confront drilling communities—including sudden population increases, damage to the tourism industry, and damage to roads and the environment from drilling operations—because IMPLAN cannot reliably capture these

¹⁰⁹ Sierra Club Mot. at 10-13 (discussing Amanda Weinstein and Mark D. Partridge, *The Economic Value of Shale Natural Gas in Ohio*, Ohio State University, Swank Program in Rural-Urban Policy (Dec. 2010)).

¹¹⁰ *Id.* at 48-49 (discussing Susan Cristopherson, CaRDI Reports, *The Economic Consequences of Marcellus Shale Gas Extraction: Key Issues* (Sept. 2011)).

consequences of gas extraction. Therefore, Sierra Club submits that DOE/FE cannot approve FLEX's Application on the "scanty and incomplete" record before it,¹¹¹ and maintains that DOE/FE must undertake its own inquiry into both the positive and negative impacts of gas export and extraction resulting from FLEX's proposed exports.

No conditional approval without a full EIS. Sierra Club argues that DOE/FE may not approve FLEX's proposal even conditionally until a full EIS has been issued pursuant to NEPA. Sierra Club claims that DOE/FE's general authority to issue conditional orders¹¹² does not trump DOE/FE's specific rules¹¹³ barring the agency from taking any action concerning a proposal that is the subject of an EIS, if that action tends to limit the choice of reasonable alternatives, or tends to determine subsequent development. Sierra Club argues that a conditional approval of the application would limit alternatives and subsequent choices in precisely the way prohibited by DOE/FE's rules. Sierra Club also contends that, prior to authorizing FLEX's proposed exports, DOE/FE has a statutory obligation to conduct a biological assessment in compliance with the Endangered Species Act and to initiate a consultation and analysis process pursuant to the National Historic Preservation Act to identify properties that may be affected by natural gas development.

DOE/FE monitoring requirements. Sierra Club concludes by stating that, if DOE/FE nonetheless approves FLEX's Application, it must impose rigorous monitoring conditions in light of the rapidly-changing circumstances associated with LNG exports. Sierra Club states that DOE/FE previously announced its intention to monitor environmental, economic, and other relevant considerations in *Sabine Pass*, but DOE/FE now has an obligation to expand those

¹¹¹ *Id.* at 52.

¹¹² *Id.* at 55 (citing 10 C.F.R. § 590.402).

¹¹³ *Id.* (citing 10 C.F.R. § 1021.211 & 40 C.F.R. § 1506.1).

provisions to ensure that the public interest is not impaired by gas exports. Sierra Club asserts that DOE/FE must provide more specific monitoring terms and thresholds that will trigger agency actions of various types, ranging from further study through reductions in export volume to a revocation of DOE/FE's approval.

2. FLEX's Answer to Sierra Club

On May 15, 2012, FLEX filed a motion for leave to answer and answer to Sierra's Club motion to intervene and protest.¹¹⁴ FLEX contends that DOE/FE should deny Sierra Club's motion and protest for five principal reasons:

First, FLEX argues that Sierra Club's stated concerns do not amount to a specific claim of interest in the FLEX Application as opposed to general opposition to domestic natural gas production and the exportation of LNG, and thus are insufficient to support Sierra Club's motion to intervene.

Second, FLEX disputes Sierra Club's argument that DOE/FE cannot issue a conditional order in this proceeding until FERC completes its environmental review of the Liquefaction Project. FLEX observes that DOE/FE routinely issues conditional authorizations concurrent with FERC's on-going review of environmental impacts under NEPA, and that DOE/FE's role as a cooperating agency in FERC's environmental review is supported by the Energy Policy Act of 2005, DOE/FE's NEPA regulations (10 C.F.R. § 1021.103), and federal caselaw.¹¹⁵ FLEX also states that Sierra Club's arguments concerning DOE/FE's alleged duties under the Endangered Species Act and/or the National Historic Preservation Act are irrelevant and should be given no weight, as DOE/FE has no jurisdiction over wellfield drilling activity as part of its review of

¹¹⁴ Motion for Leave to Answer and Answer of Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC to Motion to Intervene and Protest of Sierra Club, FE Docket No. 11-161-LNG (May 15, 2012) [hereinafter FLEX Answer to Sierra Club].

¹¹⁵ *Id.* at 6-8 (citing legal authorities).

FLEX's Application.

Third, turning to its public interest analysis, FLEX cites the conclusion of the Deloitte Report that “the magnitude of domestic price increase that results from export of natural gas in the form of LNG is likely quite small,”¹¹⁶ and states that Sierra Club's protest fails to rebut this or other evidence presented in FLEX's Application. FLEX further states that the Markey Report, on which Sierra Club relies, should be given no weight in DOE/FE's analysis because it “contain[s] alarmist and misleading statements based on unrealistic assumptions about how quickly LNG export facilities could be brought online and worst-case scenarios for recoverable domestic shale gas reserves.”¹¹⁷

According to FLEX, the Markey Report relies in part on an interpretation of the EIA study that is “at best extreme.”¹¹⁸ Further, FLEX contends that, of the various export-related demand scenarios considered by EIA, the rapid export scenarios are unrealistic because “[i]t takes years to design and construct an LNG export terminal, acquire necessary state and federal approvals, negotiate multiple long-term supply contracts with potential buyers, and secure financing for such an expensive project.”¹¹⁹ Therefore, “it is unlikely that all or even most of this applied-for export authority will ever be realized because of the time, difficulty, and expense of actually commercializing, financing and constructing LNG liquefaction and export facilities, and the limitations in global market demand for LNG.”¹²⁰ FLEX disputes Sierra Club's suggestion that the United States would export large quantities of LNG in the Low Shale EUR case, because it assumes that American companies will be exporting 12 Bcf/d within 4 years

¹¹⁶ *Id.* at 8-9 (quoting Deloitte Report at 1).

¹¹⁷ *Id.* at 13.

¹¹⁸ *Id.* at 13.

¹¹⁹ FLEX Answer to Sierra Club at 13-14.

¹²⁰ *Id.*

even if estimated recoverable supplies drop by 50 percent. According to FLEX, “[t]his hypothesis does not reflect real-world conditions or even the EIA Report itself,” which suggested that “the high-volume export scenario is unlikely to happen if lower supplies and higher prices make the domestic market more attractive to natural gas producers.”¹²¹

FLEX states that, contrary to the impression that Sierra Club seeks to convey, the EIA study projects only moderate price effects for AEO 2011’s Reference Shale EUR case, even under its “improbably rapid” export scenarios.¹²² But FLEX asserts that even these moderate price impacts are overstated because EIA assumes that investment by gas producers will lag behind new demand—meaning that prices will peak when export capacity is filled, then steadily taper off. FLEX states that, in fact, future exports will be fully anticipated by the market. FLEX distinguishes the Deloitte Report from the EIA study on this basis, stating that the Deloitte model recognizes that there will be ample notice of increased demand and assumes that producers will bring more supplies online, intermediaries will adjust flow, and consumers will react to price changes resulting from LNG exports. According to FLEX, “[p]roduction will increase with demand, exerting downward pressure on prices,” such that “any increases in prices would begin earlier and peak at a lower level than suggested by the EIA’s model.”¹²³ FLEX also notes that the “falling prices” projected in EIA’s AEO 2012 Early Release Overview—specifically, that wellhead prices in 2025 are projected to be \$0.24 lower than projected in the AEO 2011—undermine Sierra Club’s arguments concerning price impacts.

Fourth, FLEX acknowledges that, in the AEO 2012 Early Release Overview Reference Case, EIA reduced its projection of technically recoverable shale gas from 827 tcf to 482 tcf, but

¹²¹ *Id.* at 14-15.

¹²² *Id.* a 15.

¹²³ *Id.* at 16.

states that EIA nonetheless projects long-term increases in natural gas production. Specifically, FLEX contends that the 2012 Early Release Overview projects 7 percent more cumulative natural gas production from 2010 to 2035 than estimated in AEO 2011—primarily resulting from increased shale production—even though the overall estimated resource base has been revised downward. FLEX again emphasizes that this revision is due largely to a decrease in the estimate for the Marcellus shale, whereas FLEX’s proposed exports will be produced primarily from the Eagle Ford shale in South Texas.

Fifth, FLEX disputes Sierra Club’s argument that LNG exports will harm domestic power generation and industrial manufacturing. FLEX challenges Sierra Club’s prediction that the modest price impacts of LNG exports will cause some power generators to switch from gas to coal and to harm to domestic industries dependent on natural gas. According to FLEX, “[i]t is doubtful even members of the coal industry consider that to be a possibility.”¹²⁴ FLEX also points out that natural gas is considered an economical alternative at prices much higher than projected in even the highest price-impact scenarios, with demand for natural gas increasing in the power sector well before the shale gas revolution.

FLEX acknowledges that the decline in natural gas prices has been a boon to the U.S. industrial sector and spurred new investments in petrochemical and plastic facilities in the United States, but disputes that its proposed exports will destroy American jobs by raising production costs for EITE industries. FLEX asserts that U.S. companies enjoy significant cost advantages over global competitors and are unlikely to be affected by modest increases in natural gas prices resulting from LNG exports. FLEX claims that The Dow Chemical Company—the largest U.S.

¹²⁴ FLEX Answer at 18.

chemical company by revenue—acknowledged as much when its CEO “expressed tempered support for LNG exports of up to 15% of U.S. natural gas production.”¹²⁵

Finally, FLEX states that Sierra Club is incorrect in claiming that the economic benefits of natural gas production cited in the FLEX Application are overly optimistic. FLEX maintains that it relied upon a well-accepted economic multiplier to calculate its estimate of 17,000 to 21,000 jobs created by both the Liquefaction Project and the natural gas production required to support the proposed LNG exports. FLEX disagrees with Sierra Club’s claim that the NGA’s public interest analysis requires DOE/FE to determine “‘whether the country would be better off with FLEX’s proposal than without it.’”¹²⁶ FLEX asserts that the public policy aspects of this question have been answered—most notably, in President Obama’s 2012 State of the Union Address, in which the President committed to taking “‘every possible action to safely develop [natural gas] energy’”:

‘Experts believe [this supply of natural gas] will support more than 600,000 jobs by the end of the decade ... The development of natural gas will create jobs and power trucks and factories that are cleaner and cheaper, proving that we don’t have to choose between our environment and our economy.’¹²⁷

In FLEX’s view, the Presidential Administration’s position on whether the country is better off as a result of natural gas production is thus clear and unambiguous. In conclusion, FLEX maintains that Sierra Club’s protest should be denied because it has failed to demonstrate that the FLEX Application is inconsistent with the public interest.

3. Sierra Club’s Reply to FLEX’s Answer

On May 30, 2012, Sierra Club filed a motion to reply and reply comments in response to

¹²⁵ *Id.* at 19.

¹²⁶ *Id.* at 20 (quoting Sierra Club Mot. at 47).

¹²⁷ *Id.* (quoting Barack Obama, *Remarks by the President in State of the Union Address* (Jan. 2012)).

FLEX's answer to its motion to intervene and protest.¹²⁸ Sierra Club states that, although DOE/FE rules do not automatically provide parties the right to reply, DOE/FE rules allow a party to file a request for additional procedures. Sierra Club states that it requested the right to file a reply motion in its initial protest filing, and that it now timely renews that request, which it asserts there is good cause to grant.

In arguing that it qualifies for intervention in this proceeding, Sierra Club states that FLEX's arguments concerning Sierra Club's interests warranting intervention are misplaced for two reasons: first, Sierra Club states that it "has shown that FLEX's 'specific' proposal will cause or aggravate harms suffered by Sierra Club members ..." and, second, Sierra Club members live and work near the project site.¹²⁹ Sierra Club states that it has clearly and concisely set out the facts upon which its claimed interest is based, and DOE/FE's regulations require no more to support intervention.

Turning to its arguments addressing the merits of DOE/FE's public interest determination, Sierra Club first notes FLEX's agreement that environmental impacts are within the scope of the NGA's public interests standard, but states that it disagrees with FLEX's assertion that consideration of these impacts is discretionary. In Sierra Club's view, it is clear from DOE/FE's precedent (including *Sabine Pass*) and public statements that DOE/FE has already determined that environmental impacts will be considered under NGA § 3(a).

Sierra Club maintains that, because environmental impacts factor into the public interest determination, DOE/FE logically must assess environmental impacts before making this determination. Sierra Club argues that, not only is it "contrary to [DOE/FE] regulations" to

¹²⁸ Sierra Club's Motion to Reply and Reply Comments, FE Docket No. 11-161-LNG (May 30, 2012) [hereinafter Sierra Club Reply].

¹²⁹ *Id.* at 2.

postpone the NEPA analysis until after DOE/FE has assessed the public interest and granted a conditional authorization, but it is “incoherent” to do so.¹³⁰ “Analyzing environmental impacts after DOE/FE makes its public interest determination will inhibit, if not preclude, incorporation of these impacts into the public interest calculus.”¹³¹ Sierra Club asserts that, although DOE/FE may coordinate its NEPA review with FERC, this does not relieve DOE/FE of the obligation to wait until the NEPA process is complete before assessing the public interest. Indeed, in Sierra Club’s view, the NEPA regulations and related caselaw are clear that NEPA review is to be completed as early as possible in the process of agency decisionmaking.

Sierra Club next argues that FLEX fails to rebut its argument that FLEX both overstates the economic benefits of the project and fails to account for the economic costs the project will entail, in terms of job creation and domestic gas prices. As to impacts to natural gas prices, Sierra Club states that even a slow export scenario in EIA’s study involving the full volume of proposed exports would lead to increases comparable to those considered in EIA’s rapid 12 Bcf/d export scenario. Sierra Club also disputes FLEX’s characterization of the specific price increases predicted by EIA—which Sierra Club counters would, in fact, be significant and negatively affect manufacturing and other industries. In Sierra Club’s view, “[i]nsofar as FLEX disagrees as to whether a certain price increase will have significant impacts, the appropriate response is for DOE/FE to postpone evaluation of FLEX’s application until DOE/FE has conducted its forthcoming study of this issue [*e.g.*, the NERA study]” and provided an opportunity for public comment on it.¹³²

Finally, Sierra Club states that FLEX provided only a cursory response to the “numerous

¹³⁰ *Id.* at 3.

¹³¹ Sierra Club Reply at 3.

¹³² *Id.* at 8.

flaws” it identified in FLEX’s prediction of economic benefits from increased production—including the flaws inherent in an IMPLAN model and the fact that FLEX’s modeled predictions allegedly were contradicted by empirical analyses of communities where gas production has boomed.¹³³ Sierra Club rejects FLEX’s reliance on President Obama’s 2012 State of the Union address, stating that “[a]lthough the President plays a central role in the formation of administrative policy, this unsupported *factual* assertion taken from a speech is not the type of record that must inform agency decisionmaking.”¹³⁴

According to Sierra Club, the record shows that LNG exports will (1) raise gas prices, (2) cause significant economic disruption and support fewer jobs than FLEX claims, and (3) come with major environmental and resultant economic costs. Sierra Club maintains that, on this record, DOE/FE can only rationally conclude that FLEX’s proposed exports are not in the public interest.

4. FLEX’s Response to Sierra Club’s Reply

On June 14, 2012, FLEX filed a response to Sierra Club’s motion to reply and reply comments.¹³⁵ FLEX first argues that DOE/FE should not accept Sierra Club’s reply because it is procedurally defective. FLEX states that the motion was filed 47 days after the April 13, 2012 deadline for comments established in the Notice of Application, and Sierra Club has not demonstrated a basis for DOE/FE to waive the filing deadline. FLEX rejects the argument that Sierra Club properly requested a reply motion in a footnote in its timely initial protest filing. According to FLEX, this ““footnote motion”” does not comply with DOE/FE’s regulation governing motions and, even if it did, it was denied by operation of law under 10 C.F.R.

¹³³ *Id.*

¹³⁴ *Id.*

¹³⁵ Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC’s Response to the May 30, 2012 Motion to Reply and Reply Comments of Sierra Club, Docket No. 11-161-LNG (June 14, 2012).

§ 590.302(c) when DOE/FE did not grant it.¹³⁶ FLEX also states that the DOE/FE regulation governing interventions and answers, 10 C.F.R. § 590.303, does not provide for the filing of “replies” to an answer to a protest.

On the merits, FLEX seeks to rebut environmental arguments made by Sierra Club, to identify areas of agreement between FLEX and Sierra Club, and to clarify confusion allegedly raised in Sierra Club’s reply comments. FLEX reiterates its view that Sierra Club has failed to establish, in either of its motions, that FLEX’s proposed export is not consistent with the public interest:

Sierra Club has inundated the record of these proceedings with voluminous material. ... [It] has presented vigorous arguments against the exportation of LNG and the general production of natural gas in this country. Nevertheless, the record is clear. There is no credible evidence and no rational reason ... to find that the FLEX Application is not consistent with the public interest.¹³⁷

For these reasons, FLEX asks DOE/FE to promptly approve its Application.

F. Proposed Intervenors America’s Energy Advantage, Inc., and Industrial Energy Consumers of America

1. Late-Filed Motions for Leave to Intervene, Protest, and Comments

America’s Energy Advantage, Inc. and IECA filed nearly identical motions to comment and intervene in this proceeding on September 18 and 19, 2013, respectively.¹³⁸ As both motions acknowledge, the deadline to intervene and comment in this proceeding was April 13, 2012, meaning that these motions were filed more than 17 months late.

America’s Energy Advantage and IECA each state that they are moving to intervene and comment out of time in response to market developments that occurred after the April 13, 2012

¹³⁶ *Id.* at 3.

¹³⁷ *Id.* at 12-13.

¹³⁸ America’s Energy Advantage, Inc.’s Consolidated Motions to Comment and Intervene Out of Time, FE Docket No. 11-161-LNG (Sept. 18, 2013); Industrial Energy Consumers of America Consolidated Motions to Comment and Intervene Out of Time, FE Docket No. 11-161-LNG (Sept. 18, 2013).

deadline, which they assert establish good cause to grant their late intervention. In particular, they assert that the total number of applications to export LNG to non-FTA countries “ballooned” since that deadline.¹³⁹ Further, they state that only upon DOE’s issuance of the *Freeport I, Lake Charles Exports*, and *Dominion Cove Point*¹⁴⁰ orders—on May 17, August 7, and September 11, 2013, respectively—did it become apparent that their comments would be required in this proceeding. They also suggest that they needed additional time “to collect and summarize the comments of [their respective] members.”¹⁴¹

Finally, they claim that no party will be prejudiced by their late filing because their comments do not take any position with respect to whether FLEX’s Application should be granted. Rather, they “urge[] development of public interest criteria that will establish objective, comprehensive standards for reviewing and approving all LNG export applications, including that of FLEX, and an approach to reassessments of export authorizations in light of changed circumstances.”¹⁴²

2. FLEX’s Opposition to Late-Filed Motions

On October 3, 2013, FLEX filed an opposition to America’s Energy Advantage’s motion to comment and intervene.¹⁴³ Additionally, on October 1, 2013, FLEX filed a request for an extension of time until October 15, 2013, to reply to IECA’s motion to comment and intervene. FLEX stated that it had not been served with the IECA motion. DOE/FE subsequently granted

¹³⁹ America’s Energy Advantage Consolidated Mot. at 2; IECA Consolidated Mot. at 2.

¹⁴⁰ *Dominion Cove Point LNG, LP*, DOE/FE Order No. 3331, Order Conditionally Granting Long-Term Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel From the Cove Point LNG Terminal to Non-Free Trade Agreement Nations (Sept. 11, 2013) [hereinafter *Dominion Cove Point*].

¹⁴¹ America’s Energy Advantage Consolidated Mot., at 5; IECA Consolidated Mot. at 5.

¹⁴² *Id.*

¹⁴³ Answer of Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC in Opposition to Late-Filed Motion of America’s Energy Advantage, Inc. to Comment and Intervene, FE Docket No. 11-161-LNG (Oct. 3, 2013).

FLEX's request for an extension of time¹⁴⁴ and FLEX filed its opposition to IECA's motion on October 15, 2013.¹⁴⁵

FLEX asserts that IECA and America's Energy Advantage fail to establish good cause for their late-filed motions, and that they should be denied intervenor and party status and their comments and motions rejected. FLEX argues that both America's Energy Advantage and IECA filed their motions 17 months past the April 13, 2012 deadline established by DOE/FE in this proceeding, which it deems "excessively late."¹⁴⁶

FLEX further argues that neither proposed intervenor has provided a sound basis to be granted intervenor or party status. According to FLEX, member companies forming both America's Energy Advantage and IECA are highly sophisticated, with IECA in particular having a history of involvement in the LNG export proceedings in the media, before Congress, and before DOE/FE. Nevertheless, FLEX asserts, both America's Energy Advantage and IECA chose not to file an intervention or comments when required, offer no explanation for their failures, and make no suggestion that they made any effort to timely intervene. FLEX specifically rebuts the notion that America's Energy Advantage and IECA were unaware that DOE/FE would consider "changing circumstances" in the LNG industry until recently, when DOE/FE issued the conditional orders in *Freeport I*, *Lake Charles Exports*, and *Dominion Cove Point*. According to FLEX, this statement is not credible, as DOE/FE clearly and publicly stated on May 20, 2011, in *Sabine Pass*, Order No. 2961, that it would do precisely that.

¹⁴⁴ Letter Order from J. Anderson to L. Lo Baugh, Extension of Time to Reply, FE Docket No. 11-161-LNG (Nov. 1, 2013).

¹⁴⁵ Answer of Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC in Opposition to Late-Filed Motion of Industrial Energy Consumers of America, FE Docket No. 11-161-LNG (Oct. 15, 2013).

¹⁴⁶ *Id.* at 3.

Finally, FLEX argues that the proposed intervenors' requests for DOE/FE to suspend this proceeding pending a rulemaking and/or public hearings on DOE's public interest criteria under NGA § 3(a) is "out of time, improper, without merit, disruptive, unduly prejudicial, and contrary to DOE's regulations under the Natural Gas Act."¹⁴⁷

VIII. COMMENTS ON THE LNG EXPORT STUDY AND DOE/FE ANALYSIS

In the NOA, DOE/FE sought public comment on the EIA and NERA studies, including the modeling scenarios used in both studies. DOE/FE specifically invited comment on "the impact of LNG exports on: domestic energy consumption, production, and prices, and particularly the macroeconomic factors identified in the NERA analysis, including Gross Domestic Product (GDP), welfare analysis, consumption, U.S. economic sector analysis, and ... any other factors included in the analyses."¹⁴⁸ DOE noted that, "[w]hile this invitation to comment covers a broad range of issues, the Department may disregard comments that are not germane to the present inquiry."¹⁴⁹

As explained in the Introduction, DOE/FE spent several months reviewing the more than 188,000 initial and 2,700 reply comments received in response to the NOA. Given the volume of comments, it is neither practical nor desirable for DOE/FE to summarize each of them. Therefore, DOE/FE identifies below both: (i) the pertinent arguments by topic, with reference to representative comments, and (ii) DOE/FE's basis for the conclusions that it drew in reviewing those comments. In so doing, DOE/FE will respond to the relevant, significant issues raised by the commenters.¹⁵⁰

¹⁴⁷ *See id.* at 7.

¹⁴⁸ 77 Fed. Reg. at 73,629.

¹⁴⁹ *Id.*

¹⁵⁰ *See, e.g., Public Citizen v. F.A.A.*, 988 F.2d 186, 197 (D.C. Cir. 1993).

A. Data Inputs and Estimates of Natural Gas Demand

1. Comments

Several commenters, including Sierra Club,¹⁵¹ Dow Chemical Company (Dow), along with U.S. Representative Edward Markey, U.S. Senator Ron Wyden, Alcoa, Save Our Supplies, IECA, and Jannette Barth, challenge the data used as inputs to the LNG Export Study. Most of these commenters assert that NERA should have used projections from AEO 2012 or AEO 2013, rather than from AEO 2011, to produce a more accurate picture of the current and likely future state of the natural gas market and the likely macroeconomic impacts of LNG exports. These commenters assert that the AEO 2011 projections significantly underestimate actual and future demand for natural gas, especially in the U.S. electric, manufacturing, and transportation sectors, and in international markets. Some commenters identify additional factors, other than the vintage of the AEO 2011 data, to support their arguments that NERA underestimated present and future demand for natural gas. For example, Save Our Supplies argues that NERA underestimated international demand because the GNGM model did not appear to account for the continued growth of international LNG import infrastructure. Together, these commenters assert that the NERA study underestimated future demand for natural gas and, consequently, underestimated the likely increases to natural gas prices from LNG exports.

A number of commenters, including Sierra Club, Dow, Senator Wyden, Representative Markey, Jannette Barth, and Save Our Supplies maintain that, as compared to AEO 2011, the AEO 2013 Early Release Overview projects a substantial increase in demand for natural gas in

¹⁵¹ Sierra Club filed comments on behalf of itself and a coalition of non-profit organizations, including Catskill Citizens for Safe Energy, Center for Biological Diversity, Clean Air Council, Columbia Riverkeeper, Delaware Riverkeeper, Lower Susquehanna Riverkeeper, Shenandoah Riverkeeper, and Upper Green River Alliance [hereinafter Sierra Club].

the industrial manufacturing sector.¹⁵² Dow claims that there has been a manufacturing renaissance since completion of AEO 2011 involving announcements of approximately 100 capital investments representing some \$95 billion in new spending and millions of jobs driven largely by the supply and price outlook for natural gas. These investments, according to Dow, will add about 5 million new jobs and 6 Bcf/d of industrial gas demand by 2020, which Dow states is nearly a 30 percent increase in industrial demand relative to 2009, the baseline year for AEO 2011.

Dow also asserts that projections of future natural gas demand by industry are more than double the demand predicted in AEO 2011's High EUR case, which includes significantly higher demand than the Reference Case. In addition to significantly higher projections of demand for manufacturing, Dow refers to projections from Wood Mackenzie, CERA, and others that indicate a potential increase of transportation demand from 0.2 to 1.5 Bcf/d from 2013 to 2020. This compares to AEO 2011's projection of a modest increase for natural gas demand in the transportation sector of 0.1 to 0.2 Bcf/d. Dow states that the higher level of demand derived from Wood Mackenzie and CERA is the result of a projection of fleet vehicles converting to LNG and compressed natural gas.

According to Dow, AEO 2011 projects that natural gas demand for power generation will decrease through the end of the decade, whereas Wood Mackenzie and CERA predict that natural gas use in the power sector will increase 14 percent by 2020, ultimately resulting in 24.7 Bcf/d of power sector demand. This projected increase is due to unidentified, anticipated

¹⁵² During the time of the comment period on the LNG Export Study, the AEO 2013 Early Release was the most current AEO available, and is therefore discussed in many of the comments. On May 2, 2013, after the comment period had closed, EIA issued its final AEO 2013 projections. See U.S. Energy Information Administration, *Annual Energy Outlook 2013 with Projections to 2040* (April 2013), available at [http://www.eia.gov/forecasts/aeo/pdf/0383\(2013\).pdf](http://www.eia.gov/forecasts/aeo/pdf/0383(2013).pdf) [hereinafter AEO 2013]. Where appropriate, this Order uses the final projections from AEO 2013, which is the most current information available at this time.

changes in carbon policy, renewables policy, and nuclear policy favoring the use of natural gas in the power sector.

In addition to criticizing the projections of demand based on AEO 2011, Dow maintains that the level of exports authorized to date and additional exports that may be authorized in the future will drive up demand levels even higher. Specifically, Dow asserts that NERA's conclusion that prices will not increase by more than \$1.11/Mcf is based on a faulty assumption that natural gas exports will never rise above 6.72 Tcf/yr, or roughly 18.5 Bcf/d by 2025. Dow points out that authorized exports to FTA nations as of January 1, 2013 had already reached approximately 28 Bcf/d. Dow complains that NERA did not consider what would happen if exports attained the authorized levels. In that event, Dow asserts that domestic gas prices undoubtedly would spike. Other commenters, such as Citizens Against LNG, make similar arguments. Citizens Against LNG alleges that the NERA study is flawed because it failed to estimate the impact of the full potential volume of exports of approximately 31.41 Bcf/d to FTA nations and 24.80 Bcf/d to non-FTA nations.

Contrary to the above arguments, several commenters, such as Dominion Cove Point, Lakes Charles Exports, and Gulf LNG Liquefaction Company, LLC (Gulf LNG), argue that NERA reasonably relied on data from AEO 2011. These commenters state that NERA used the AEO 2011 data because the EIA portion of the LNG Export Study used that data, and DOE/FE sought to ensure consistency across both parts of the LNG Export Study. Further, a number of commenters, including America's Natural Gas Alliance, Exxon Mobil Corporation (ExxonMobil), Golden Pass Products LLC, American Petroleum Institute, former Secretary of Energy Spencer Abraham, Carl Foster, and the Western Energy Alliance, argue that NERA's use of the AEO 2011 data does not undermine the results of the LNG Export Study. These

commenters contend that the AEO 2013 Early Release data show higher production of natural gas and a more elastic supply of natural gas than the AEO 2011 data used by NERA, indicating that the domestic resource base could more easily accommodate increasing domestic demand as well as demand from new LNG export projects.

With respect to Dow's claim that there is \$95 billion of new investment in domestic manufacturing, Lake Charles Exports and Secretary Abraham argue that many of the projects listed by Dow are currently under consideration and not projected to commence operation until far into the future. These commenters assert that Dow provided no information as to when or whether these projects will materialize. The commenters conclude that there is no reasonable basis to believe that these domestic manufacturing investments will lead to an additional 6 Bcf/d in domestic natural gas demand as claimed by Dow.

2. DOE/FE Analysis

a. Use of AEO 2011 Projections

DOE's basis for relying on AEO 2011. The LNG Export Study was based on AEO 2011 projections, which were the most recent, final projections available in August 2011 when DOE commissioned the EIA study, and also in October 2011 when DOE commissioned the NERA study. As explained above, the NERA study was designed so that NERA would use the results from the EIA study as inputs to the NERA model to ensure congruence between the two studies, which together formed the single LNG Export Study. If both studies had not relied on the same data, meaningful comparison and cross-analysis of the two studies would have been impossible.

Although some commenters have asserted that DOE should have required EIA and NERA to use newer projections than those in AEO 2011, this argument does not acknowledge

either the timing of the AEO publication cycles, or the lead time required of EIA and NERA to conduct their work. Using the final AEO 2011 projections, EIA published its study on January 19, 2012. Only four days later, on January 23, 2012, EIA published the 2012 AEO “Early Release Overview,” which was a preliminary, abridged version of EIA’s forthcoming AEO 2012. It would not have been possible for EIA to use the 2012 Early Release projections in its study without starting over once that data had been published.

Indeed, EIA did not publish the final AEO 2012 until June 2012, six months after EIA had published its study for this proceeding. By that time, the NERA study was well underway. NERA published its final report in December 2012—the same month that EIA released the AEO 2013 Early Release Overview. As stated above, EIA did not publish the final AEO 2013 projections until May 2, 2013.

In an undertaking of this scope and magnitude, it was perfectly reasonable to base the LNG Export Study on AEO 2011, which contained the best, most authoritative economic projections available when DOE/FE commissioned the EIA and NERA studies. Once both studies were underway, a decision to use AEO 2012 or AEO 2013 Early Release projections would have required EIA and NERA to abandon their existing work and redo much, if not all, of their analyses.

Courts have repeatedly recognized that agencies are not required to redo a study simply because newer data become available, “particularly given the many months required to conduct full [analysis] with ... new data.”¹⁵³ Requiring DOE to start over with new data “would lead to

¹⁵³ *Theodore Roosevelt Conserv. P’ship v. Salazar*, 616 F.3d 497, 511 (D.C. Cir. 2010) (quotations and citations omitted) (alteration in original).

significant costs and potentially endless delays.”¹⁵⁴ Moreover, under the commenters’ rationale, DOE’s LNG Export Study and administrative process would run indefinitely, as DOE would have to start over with new AEO projections whenever they became available. As the Supreme Court has observed, if an agency were required to rehear new evidence before it issues a final administrative decision, “there would be little hope that the administrative process could ever be consummated in an order that would not be subject to reopening.”¹⁵⁵

No material change using post-AEO 2011 projections. Further, we are not persuaded that using the AEO 2012 final projections, or the AEO 2013 Early Release or final projections, would have materially affected the findings of the LNG Export Study. Commenters point to the fact that AEO 2012 and the AEO 2013 Early Release Overview forecast greater domestic natural gas consumption in the years ahead than did AEO 2011. The commenters are correct in this observation, but it is also true that AEO 2012 and AEO 2013 Early Release Overview projected much greater domestic natural gas production than did AEO 2011. An analysis from Navigant Consulting, Inc. (Navigant), appended to the initial comments submitted by Jordan Cove Energy Project, L.P., correctly notes the increasing gas production projections in the later EIA analyses: For the period of 2013-2035, there was an average percentage increase in forecast total domestic natural gas consumption between AEO 2011 and AEO 2013 of 5.6 percent, while the increase in forecast total natural gas production was 16 percent. This important

¹⁵⁴ *Sierra Club v. U.S. Envtl. Prot. Agency*, 356 F.3d 296, 308 (D.C. Cir. 2004) (upholding EPA’s decision to use an existing computer model in lieu of a newly-released version).

¹⁵⁵ *Vermont Yankee Nuclear Power Corp. v. Natural Res. Def. Council*, 435 U.S. 519, 554-55 (1978).

context helps explain why the more recent AEO 2013 assumptions actually indicate the beneficial market impacts that come along with LNG exports.¹⁵⁶

Further, using the final AEO 2013 Reference Case—which is now the most recent information available—Table 4 below illustrates that, although total natural gas consumption projected for 2035 increased by 6 Bcf/d between AEO 2011 and 2013 (from 72.7 Bcf/d to 78.7 Bcf/d), total domestic dry gas production increased by more than twice that amount, increasing by 13.8 Bcf/d (from 72.1 Bcf/d to 85.9 Bcf/d). In addition, the projected 2035 Henry Hub price declined from \$7.07/MMBtu to \$6.32/MMBtu, despite net exports (including both pipeline and LNG exports) rising from -0.5 Bcf/d in AEO 2011 to +7.0 Bcf/d in AEO 2013. Although the data used in Table 4 for “AEO 2013 Reference Case” refer to the final AEO 2013 projections, the data are unchanged from the AEO 2013 Early Release projections. As the table shows, the updated 2013 projections suggest domestic supply and demand conditions that are more favorable, not less favorable, to exports.

¹⁵⁶ Comments of Navigant Consulting, Inc., at 6 (attached to Initial Comments of Jordan Cove Energy Project, L.P.).

Table 4: Comparison of AEO Results

Projections for 2035	AEO 2011 Reference Case	AEO 2012 Reference Case	AEO 2013 Reference Case	AEO 2011 High Shale EUR Case
Total Natural Gas Consumption (Bcf/d)	72.7	73.0	78.7	81.2
Electric Power Sector Consumption (Bcf/d)	21.6	24.5	25.9	26.4
Transportation Sector Consumption (Bcf/d)	0.4	0.4	1.6	0.7
Domestic Dry Gas Production (Bcf/d)	72.1	76.5	85.9	82.5
Net Natural Gas Exports by Pipeline (Bcf/d)	-0.1	1.9	3.0	1.9
Net Natural Gas Exports as LNG (Bcf/d)	-0.4	1.8	4.0	-0.4
Henry Hub Price	\$7.07/MMBtu (2009\$)	\$7.37/MMBtu (2010\$)	\$6.32/MMBtu (2011\$)	\$5.35/MMBtu (2009\$)

We again note that NERA modeled a wide range of possible future supply and demand conditions, thereby reducing the dependence of its results on the accuracy of the AEO 2011 Reference Case. The AEO 2011 High Shale EUR case, for example, is represented in the table above showing EIA's AEO 2011 assumption of no new LNG exports. The AEO 2011 High Shale EUR case projected natural gas consumption growth that was even greater than the AEO 2013 Reference Case and domestic natural gas production growth that was less than the AEO 2013 Reference Case. Using the AEO 2011 High Shale EUR as a baseline, NERA modeled LNG exports across a range of international market conditions and found positive economic

benefits to the U.S. economy in all cases where LNG exports were economically viable.¹⁵⁷ The inclusion of the AEO 2011 High Shale EUR case in NERA's analysis reinforces our conclusion that there is no reason to believe that using AEO 2013 Reference Case projections would have altered the central conclusion of the LNG Export Study.

Further, as reflected in the comments submitted by Lake Charles Exports¹⁵⁸ and Secretary Abraham,¹⁵⁹ Dow does not substantiate its claim that \$95 billion of new investment in the manufacturing sector has led (or will lead) to an increase of 6 Bcf/d in incremental domestic consumption of natural gas by 2020. In making these estimates, Dow includes many projects that merely have been announced or that are under consideration with start dates far into the future. Dow provides no information as to when or whether these projects will be constructed or will begin operations.

b. Significance of Prior FTA Authorizations

Dow argues that the 28 Bcf/d of exports authorized to FTA countries (as of the date of Dow's comment) shows that the LNG Export Study underestimated future demand for natural gas.¹⁶⁰ However, the volume of authorized exports to FTA countries is by no means a reliable predictor of the number and capacity of LNG export facilities that will ultimately be financed, constructed, and placed in operation.¹⁶¹ Indeed, while many of the FTA authorizations have

¹⁵⁷ NERA study at 6.

¹⁵⁸ Reply Comments of Lake Charles Exports, LLC at 12-13.

¹⁵⁹ Reply Comments of Secretary Spencer Abraham at 8.

¹⁶⁰ As of the date of this Order, DOE/FE has authorized the export of 37.02 Bcf/d of natural gas to FTA countries.

¹⁶¹ As America's Natural Gas Alliance explains, when domestic gas supply was forecast to be insufficient to meet domestic demand, many LNG import facilities were proposed, but few were constructed. Specifically, from 2000 through 2010, over 40 applications to build new LNG import facilities were submitted to federal agencies, but only eight new facilities were built. The increase in domestic natural gas production had reduced the need for imported LNG. Further, of those import facilities constructed, public records show their use has declined. In 2004, the United States imported 244 cargoes of LNG at the four terminals existing at that time. By comparison, in 2012, only 64 cargoes were imported at seven of the 12 terminals then in existence. Five of the 12 existing terminals did not receive any cargoes in 2012. *See*

http://www.marad.dot.gov/ports_landing_page/deepwater_port_licensing/deepwater_port_licensing.htm;

been in place for several years, DOE/FE is not aware of any application in which a liquefaction facility was planned with the sole purpose of exporting LNG to FTA countries. Therefore, we are not persuaded that the current FTA authorizations undermine the assumptions of the LNG Export Study.

We note also that applicants typically request both FTA and non-FTA export authorizations for the entire output capacity of their proposed export facilities. Thus, as we explained above, the FTA and non-FTA authorizations are not additive. Citizens Against LNG contends that the NERA study failed to consider the full potential volume of exports of 31.41 Bcf/d to FTA nations and 24.80 Bcf/d to non-FTA nations, but this argument is incorrect insofar as Citizens Against LNG is claiming that FTA and non-FTA authorization volumes must be added to calculate demand caused by LNG exports. Nevertheless, it bears mention that NERA did remove export constraints in its model for several of the cases evaluated. NERA found that, at the price required in the United States to free up 55 Bcf/d for export, there would be zero global demand for U.S. exports under any combination of domestic and international supply and demand conditions evaluated. Thus, the 55 Bcf/d case was found to be infeasible and was not included in the macroeconomic analysis.

<http://www.ferc.gov/industries/gas/indus-act/lng.asp>; *Natural Gas Imports and Exports Fourth Quarter Report 2004*, DOE/FE-0485, Office of Natural Gas Regulatory Activities, Office of Fossil Energy, U.S. Department of Energy; *Natural Gas Imports and Exports Fourth Quarter Report 2012*, DOE/FE-0563, Office of Natural Gas Regulatory Activities, Office of Fossil Energy, U.S. Department of Energy; http://www.fe.doe.gov/programs/gasregulation/publications/LNG_2012_rev.pdf.

B. Distributional Impacts

1. GDP Versus Welfare

a. Comments

Several commenters, including Sierra Club, allege that the NERA study overstated the likely macroeconomic benefits from LNG exports. The National Resources Defense Council (NRDC), Sierra Club, and Clean Ocean Action, among others, maintain that NERA incorrectly conflated growth in GDP with growth in welfare. By concluding that LNG exports would create a net benefit to the economy, NERA also allegedly relied too much on the fact that exports would increase GDP and failed to give adequate weight to projected natural gas price increases and to deleterious socio-economic, sectoral, and regional impacts on consumers, households, and the middle class, including wage-earners.

A number of other commenters, including American Petroleum Institute, Paul Eikelboom, Gary Lambert, and Helen Rice, however, assert that LNG exports will create jobs and boost the economy. For example, American Petroleum Institute states that a report by ICF International shows that LNG exports will result in a net gain in employment in the United States and that the job impacts of LNG exports will grow larger as export volumes rise.

b. DOE/FE Analysis

The NERA study presented the macroeconomic impacts of LNG exports using the different statistical measures noted above—price, welfare, GDP, aggregate consumption, aggregate investment, natural gas export revenues, sectoral output, and wages and other household incomes. NERA did not confuse the concepts of welfare growth and GDP growth. The study clearly shows that NERA distinguished these concepts and separately examined the

macroeconomic impacts of LNG exports using both measures.¹⁶² Welfare is a term of art in economics that measures the well-being of consumers and reflects changes in the value placed on consumption and leisure by individuals. NERA calculated welfare in the study as the “equivalent variation,” which measures the amount of money that, if taken away from the average household, would make the household no better off with LNG exports than without.¹⁶³ GDP, as NERA explained, is “another economic metric that is often used to evaluate the effectiveness of a policy by measuring the level of total economic activity in the economy.”¹⁶⁴ NERA thus acknowledged the distinction between GDP and welfare, yet used both metrics, among others, to ensure that its conclusions were robust across various measures.

2. Sectoral Impacts

a. Comments

Numerous commenters debate whether LNG exports will impact the domestic EITE sectors disproportionately, at too high of a cost to the U.S. economy to justify exporting LNG. Specifically, Dow, the Fertilizer Institute, Alcoa, and other commenters assert that higher natural gas prices caused by the demand for LNG exports will make it difficult for U.S. manufacturing to compete in global markets, reversing the gains these industries have made in recent years due to low domestic gas prices. According to these commenters, LNG exports will lead to lost jobs and lower wages in the EITE sectors—such as the chemical, fertilizer, and primary metal manufacturing sectors. These commenters, together with the Aluminum Association, the American Iron and Steel Institute, and others, contend that EITE jobs tend to be high-paying, highly-skilled, and of strategic national importance, whereas they allege that jobs created due to

¹⁶² NERA study at 6.

¹⁶³ *Id.*

¹⁶⁴ *Id.* at 56.

LNG exports will be short-lived and potentially of lower value to the U.S. economy. In this regard, Alcoa, Representative Markey, and IECA, among others, charge that NERA failed to analyze the unique tradeoffs between the domestic natural gas industry—which obviously stands to benefit from LNG exports—and EITE industries, which they argue will feel the brunt of higher gas prices and price volatility brought on by LNG exports.

In addition, Dow argues that the NERA model should have addressed industry-specific impacts. Dow submits that NERA erred by positing that the impact of expanded natural gas exports will affect the chemical, paper, and plastic industries in the same ways. It contends that the single bundled sector represented in the NERA model as the energy intensive sector is actually comprised of five sectors, and that NERA mistakenly assumed that average behavior from the EITE sector is representative of each of the five sectors:

By bundling these industries, NERA applies the same labor, capital, fuel, and other material inputs in the same way across industries. Such an aggregation mutes the true impact to the industries, especially the chemical products industry. The chemical products subsector varies significantly from the other four industries in terms of value added to the economy (GDP) and energy consumption by fuel source¹⁶⁵

According to Dow, the chemical industry is composed of dozens of different business models with different inputs and outputs. Consequently, Dow contends that “[s]hoe horning the chemical industry into an aggregated EIS [energy intensive sector] is not appropriate for studying the impact of LNG exports on the economy.”¹⁶⁶

More broadly, Dow maintains that NERA gave significant weight to a narrow economic benefit from LNG exports, but did not consider the greater economic value (the “value-added multiplier effect”) when natural gas is used in the United States to manufacture finished goods

¹⁶⁵ Initial Comments of Dow Chem. Co. at 27.

¹⁶⁶ *Id.* at 28.

for export, instead of being exported as LNG. Similarly, the Fertilizer Institute offers a study prepared at its request by Charles Rivers Associates to support its claim that NERA underestimated the economic value of the fertilizer industry to the broader economy. Dow also contends that “take-or-pay” contracts used in the international trade of LNG will cause export activities to continue even if not economically warranted, thereby prolonging higher domestic gas prices.¹⁶⁷

Senator Wyden, Representative Markey, Dow, and others contend that NERA misinterpreted a government-prepared 2009 Interagency Report that evaluated the effects of proposed greenhouse gas cap-and-trade legislation on EITE industries. According to these commenters, the findings in the Interagency Report led Congress to conclude that it was unacceptable to raise energy prices on EITE manufacturers because of the adverse employment implications across the economy. These commenters charge that the NERA study, while borrowing heavily from the Waxman-Markey congressional debate, did not address the predictions of adverse employment impacts. Dow cites statistics from the Bureau of Economic Analysis indicating that, in 2011, total employment in the oil and gas industry was 171,000 while the chemical industry employed 785,000, the plastic and rubber industry employed 635,000, and the paper industry employed 388,000.¹⁶⁸ In addition, the Fertilizer Institute claims that the NERA study should have assumed that the fertilizer industry directly supported 7,565 jobs while the NERA study states that there were 3,920 jobs directly supported by the fertilizer industry.

On the other hand, a number of commenters, including ExxonMobil, American Petroleum Institute, the Energy Policy Research Foundation, Inc., and General Electric Oil &

¹⁶⁷ *Id.* at 16-17.

¹⁶⁸ *Id.* at 28 (Dow table citing figures from the U.S. Bureau of Economic Analysis, *Gross Domestic Product by Industry Data*).

Gas, dispute these arguments. They specifically challenge the notion that an LNG export industry cannot co-exist with a growing domestic manufacturing base, and that EITE industries should be given priority, whether directly or indirectly, over the LNG industry.

ExxonMobil supports NERA's conclusion that exports will yield net economic benefits to the United States, and states that, in fact, NERA understated those benefits because (among other reasons) NERA did not factor in the greater supply of natural gas liquids (NGLs) that will be produced in conjunction with increased natural gas production due to exports. The Institute for 21st Century Energy (an affiliate of the U.S. Chamber of Commerce) and the American Petroleum Institute, among others, note that additional production of NGLs will benefit chemical companies with U.S. plants because NGLs, such as ethane, are critical feedstock in chemical manufacturing processes. These commenters state that an increase in the supply of NGLs will exert downward price pressure on the cost of manufactured goods that use NGLs as a feedstock, thereby at least in part offsetting for those industries (primarily EITE industries) any increases in domestic natural gas prices associated with LNG exports.

ExxonMobil, American Petroleum Institute, Shell Oil Company, and many other commenters emphasize the size and productivity of the U.S. natural gas resource base, stating that there is an abundance of natural gas to support both LNG export demand and continued growth in the EITE industries. According to ExxonMobil, Western Energy Alliance, Energy Policy Research Foundation, Inc., and others, the vast supply of natural gas in the United States will continue to support current gains in domestic manufacturing, even as LNG exports take place. They state that LNG exports will both sustain and increase domestic production of natural gas, which, in turn, will provide EITE industries with a greater supply of natural gas at more stable prices, allowing them to stay globally competitive. According to these commenters,

opponents of LNG exports are incorrect in speculating that natural gas used for export otherwise would be used for domestic manufacturing when, in fact, the natural gas likely would not be extracted if there is not increased demand created by LNG exports.

Further, 110 members of the U.S. Congress,¹⁶⁹ ExxonMobil, and others maintain that there would be serious consequences to hindering the export of LNG. If exports are prohibited or constrained, they believe the United States will lose economic benefits that other countries will capture as those countries begin extracting their shale gas resources and competing in the global LNG export market. Numerous commenters, including ExxonMobil, the National Association of Manufacturers, and the Energy Policy Research Foundation, Inc., similarly assert that it would not be in the public interest for DOE to limit LNG exports, in contravention of U.S. free trade principles. As noted above, these commenters state that restricting exports of natural gas would subsidize domestic manufacturing at the expense of the larger U.S. economy. They contend that the U.S. Government should not suppress trade in one industry to benefit other industries.

b. DOE/FE Analysis

With respect to the argument that natural gas confers greater value on the U.S. economy when used in manufacturing than when produced for export, we observe that more natural gas is likely to be produced domestically if LNG exports are authorized than if they are prohibited. There is no one-for-one trade-off between gas used in manufacturing and gas diverted for export. Although commenters are correct that such a trade-off may exist at the margin, this competition between the demand for natural gas for domestic consumption and the demand for natural gas for export is captured in the N_{ew} ERA model. The model projected that under the majority of

¹⁶⁹ 110 members of the U.S. House of Representatives filed a single set of comments in support of LNG exports.

scenarios examined, no exports would occur, thereby indicating that, for those scenarios, the gas was of greater value to domestic consumers than to foreign ones. On the other hand, in supply and demand conditions where exports were projected to occur and were not prohibited or limited, the model found that greater economic value was being placed on the LNG by foreign markets and, at the same time, greater economic benefits, both in terms of welfare and GDP accrued to the U.S. economy due to those exports.

NERA grouped the U.S. economy into a workable number of supply and demand sectors as appropriate for a macroeconomic model of this nature. NERA divided the EITE industries into five categories: paper and pulp manufacturing, chemical manufacturing, glass manufacturing, cement manufacturing, and primary metal manufacturing, including iron, steel and aluminum. NERA projected that the overall impact across these categories will be relatively muted, with no individual industry experiencing a dramatic negative impact:

Serious competitive impacts are likely to be confined to narrow segments of industry. About 10% of U.S. manufacturing, measured by value of shipments, has both energy expenditures greater than 5% of the value of its output and serious exposure to foreign competition. Employment in industries with these characteristics is about one-half of one percent of total U.S. employment. LNG exports are not likely to affect the overall level of employment in the U.S. There will be some shifts in the number of workers across industries, with those industries associated with natural gas production and exports attracting workers away from other industries. In no scenario is the shift in employment out of any industry projected to be larger than normal rates of turnover of employees in those industries.¹⁷⁰

¹⁷⁰ NERA study at 2.

Some commenters contend that NERA grouped the EITE industries too broadly and assert that greater economic harms could have been identified by focusing more narrowly on the most gas-dependent industries. While we take these concerns seriously, ultimately we are guided by the principle that the public interest requires us to look to the impacts to the U.S. economy as a whole, without privileging the commercial interests of any industry over another. Similarly, with respect to the argument that some industries derive greater economic value from natural gas than others, we continue to be guided by the long-standing principle established in our Policy Guidelines that resource allocation decisions of this nature are better left to the market, rather than the Department, to resolve.

The Fertilizer Institute charges that the industry-specific employment data used by NERA is erroneous. The Fertilizer Institute claims that NERA underestimated employment directly supported by the nitrogen fertilizer industry and should have used a figure of 7,565 positions. However, NERA drew industry-specific employment data from the U.S. Census Bureau's Economic Census for 2007, which remains the most recent Economic Census data available. In estimating 3,920 positions directly supported by the nitrogen fertilizer industry, NERA selected a figure that is reasonably supported by an authoritative source.¹⁷¹

With respect to the Interagency Report prepared for the Waxman-Markey bill, we note that NERA used that report solely as a means of identifying industry segments that would be most acutely affected by higher energy costs, not as a way of determining the magnitude of such impacts. Therefore, although we acknowledge that the Interagency Report was prepared in a different context, we find nothing unreasonable in NERA's use of the Interagency Report.

¹⁷¹ *Id.* at 69.

3. Household and Distributional Impacts

a. Comments

Several commenters maintain that, for most citizens, the macroeconomic benefits of LNG exports, if any, will be minimal. These commenters contend that the main beneficiaries of LNG exports will be a narrow band of the population, chiefly wealthy individuals in the natural gas industry, foreign investors, and those holding stock or having retirement plans invested in natural gas companies.

Other commenters assert that a majority of Americans will experience negative economic impacts, such as higher gas and electric bills, due to LNG exports. Senator Wyden, Dow, and Sierra Club, among others, contend that the NERA study examined impacts on the labor market in terms of wages but failed to consider employment levels in terms of job equivalents or employment income. According to Clean Ocean Action, Dow, and Sierra Club, NERA also incorrectly assumed full employment and overestimated the positive job impacts associated with LNG exports. Dow, among others, charge that the NERA study failed to adequately consider the cost of LNG exports in terms of lost jobs in the manufacturing sector and the cost of retraining workers for the LNG industry.

Several commenters support the LNG Export Study and argue that the macroeconomic impacts of LNG exports favor the public interest. ExxonMobil, the Center for Liquefied Natural Gas, and others, including several applicants for LNG export authorizations, submit that the NERA study is comprehensive and rigorous and that LNG exports are in the public interest. ExxonMobil supports NERA's conclusion that exports will yield net economic benefits but asserts that the study understates the potential employment benefits from LNG exports. ExxonMobil argues that, because the NERA model assumed full employment, it did not identify

the positive impact LNG exports would have on jobs. ExxonMobil observes that the economy is far from full employment, with forecasts prepared by the Congressional Budget Office in 2012 showing the unemployment rate above a full employment level through most of this decade. By exporting LNG, ExxonMobil argues, the U.S. economy can reach full employment faster than it can without exports. ExxonMobil also contends that the lingering effects of the recession mean that capital is underutilized today; and that, where there is significant slack in the economy, there is no necessary trade-off between jobs in one sector versus another.

b. DOE/FE Analysis

NERA examined three components of household income directly affected by natural gas exports: income from wages, income from capital holdings (stocks, etc.), and income from resource ownership (royalties, rents, etc.). The NERA study projected that for the economy as a whole, increases in resource income earned in the natural gas production process more than offset reductions in wage and capital income earned from all other activities outside of the natural gas production process. The NERA study acknowledged, however, that exports would be accompanied by a shifting of income sources, and stated that some segments of the economy are likely not to participate in the benefits of LNG exports but are likely to face increased energy costs.

DOE believes that the public interest generally favors authorizing proposals to export natural gas that have been shown to lead to net benefits to the U.S. economy. While there may be circumstances in which the distributional consequences of an authorizing decision could be shown to be so negative as to outweigh net positive benefits to the U.S. economy as a whole, we do not see sufficiently compelling evidence that those circumstances are present here. None of the commenters advancing this argument has performed a quantitative analysis of the

distributional consequences of authorizing LNG exports at the household level. Given the finding in the LNG Export Study that exports will benefit the economy as a whole, and absent stronger record evidence on the distributional consequences of authorizing the exports proposed by FLEX (as modified herein), we cannot say that those exports are inconsistent with the public interest on these grounds.

4. Regional Impacts

a. Comments

Many commenters addressed the issue of negative and positive regional impacts potentially associated with LNG exports. Commenters including Alice Zinnes, Keith Schue, Jannette Barth, APGA, Alex Bomstein, and Sierra Club assert that shale gas production associated with increasing LNG exports will trap local communities in a “boom-and-bust” cycle associated with extractive natural gas drilling. In a phenomenon they refer to as the “resource curse,” they argue that natural gas production will cause long-term economic damage to local communities, leaving the communities poorer once the gas resource is depleted. Jennifer Davis, Dina DeWald, Andrew Goff, and others agree that shale gas development and production will have a negative impact on local industries that are incompatible with extraction-related activities, such as agriculture and tourism. Numerous commenters, including Hope Punnett, Robert M. Ross, the Environmental Working Group, Citizens Against LNG, and Sierra Club, enumerate specific ways in which they allege local communities near shale gas production areas or pipelines could be adversely affected if LNG exports lead to increased natural gas production. They cite increased noise, property devaluation, degradation of infrastructure, environmental and public health issues, and safety risks, among other issues.

Many other commenters seek to rebut these concerns by identifying the positive regional benefits associated with LNG exports, both in regions where shale development and production occur, and the regions in which LNG export terminals may be located. FLEX, the Independent Petroleum Association of America, and scores of local, state, and federal political leaders—including 110 Members of the U.S. House of Representatives and several U.S. Senators¹⁷²—cite regional economic benefits associated with each LNG project, including the potential for thousands of new jobs, substantial direct and indirect business income, and millions of dollars in new tax revenue. Further, U.S. Representative Charles W. Boustany, Jr., 14 members of the Ohio House of Representatives, and numerous other commenters assert that authorizing exports of LNG will help to sustain natural gas exploration and production efforts, which will mitigate any local “boom-bust” cycle.

Finally, several other commenters, including Southern LNG Company, L.L.C., and Gulf LNG, assert that any general consideration of regional impacts is outside the scope of the NERA study and is most appropriately considered by DOE/FE in reviewing individual export applications.

b. DOE/FE Analysis

We agree with the commenters who contend that a general consideration of regional impacts is outside of the scope of the LNG Export Study, and that regional impacts are appropriately considered by DOE/FE on a case-by-case basis during the review of each LNG export application. The case-specific issue of regional impacts is discussed *infra* at Section IX.B.1 (FLEX’s Application).

¹⁷² U.S. Senators James Inhofe, Lisa Murkowski, David Vitter, Mary Landrieu, Heidi Heitkamp, and John Cornyn submitted comments generally supporting LNG exports.

C. Estimates of Domestic Natural Gas Supplies

1. Comments

Several commenters assert that, in addition to underestimating the demand for domestically produced natural gas, the NERA study overestimated future domestic supplies of natural gas. Representative Markey, for example, argues that current projections provide for only 20 to 40 years of domestic natural gas supplies but NERA did not adequately consider these projections. Senator Wyden, the Fertilizer Institute, and others maintain that the NERA study purports to treat the United States and Canada as a single North American market, but its assumptions ignore the potential effect of Canadian LNG exports to international markets.¹⁷³ These commenters are largely concerned that NERA has overestimated domestic supplies and that having lower supplies than estimated will exacerbate the likely price increases due to exports.

Contrary to these arguments, many commenters, such as American Petroleum Institute and Shell, argue that the United States has abundant domestic natural gas reserves. Center for LNG and Cheniere Energy argue that EIA and NERA underestimated the domestic natural gas resource base and, therefore likely overestimated the price impacts of LNG exports.

Dow, however, is concerned about certain indirect impacts that could arise if domestic supplies are exported. It asserts that domestic gas production would be unable to keep up with the demand required to meet unlimited LNG exports and that one-third of new shale gas production will be required to replace a decline in conventional gas production. Dow maintains that, as a consequence, gas production will have to ramp up significantly and this development

¹⁷³In his comments, Senator Wyden stated that Canada's National Energy Board has approved two LNG export projects in British Columbia and is considering a third. According to Senator Wyden, these projects could begin in 2014 and result in LNG exports totaling 9 Bcf/d. DOE/FE notes that, earlier this year, Canada approved the third LNG export project mentioned by Senator Wyden—the Royal Dutch Shell Plc project.

will mean that gas supply will be diverted away from domestic industrial and other sectors of the economy:

There would need to be rapid deployment of new drilling rigs, increased steel pipe manufacturing and an expanded work force throughout the value chain to be able to service such unprecedented growth in [natural gas] production. With an already well-documented skills shortage in the labor market, basic supply and demand economics will prevail and drive labor prices higher, which would in turn have a chilling impact on investment in the manufacturing sector.¹⁷⁴

Other commenters take a somewhat longer view of the potential indirect impacts of LNG exports on domestic energy supplies. These commenters contend that, to become energy independent, the United States must preserve its supply of finite domestic energy resources, not export them. They argue that authorizing LNG exports will hasten the depletion of this country's natural gas resource base, the size of which is uncertain. Moreover, they assert, investment in LNG exports will take away from potential investment in renewable energy supplies, which will compound this country's dependency on fossil fuels.

Some commenters, such as Dow, IECA, and Citizens Against LNG, maintain that the NERA study does not address significant policy changes that could impact domestic natural gas supply. These comments are focused in two areas: availability of energy production tax credits and uncertainty surrounding future environmental regulation regarding hydraulic fracturing. Specifically, Dow points to the possible elimination of energy production tax credits and states that elimination of this tax credit could result in a 5 percent decline in natural gas production and the loss of nearly 60,000 barrels per day of oil production. Dow, along with Jannette Barth, IECA and Citizens Against LNG, argue that potential state and federal environmental regulations pertaining to hydraulic fracturing should have been considered by NERA. These commenters assert that these potential additional regulatory costs and could lower supply,

¹⁷⁴ Initial Comments of Dow Chem. Co. at 16.

increase demand, and raise prices of natural gas.

2. DOE/FE Analysis

a. Measures of Supply

Before turning to a consideration of the specific comments, it is important to clarify the various measures of supply used by commenters. DOE/FE notes that, by three measures of supply, there are adequate natural gas resources to meet demand associated with FLEX's requested authorization, as modified herein by DOE/FE. Because these supply estimates have changed over time, however, DOE/FE will continue to monitor them to inform future decisions. These estimates include:

i) AEO natural gas estimates of production, price, and other domestic industry fundamentals. As shown in Table 4 above, the Reference Case projection of dry natural gas production in 2035 increased significantly (by 13.8 Bcf/d) in AEO 2013 compared with AEO 2011, while projections of domestic natural gas consumption in 2035 also increased in AEO 2013 compared with AEO 2011 (by 6.0 Bcf/d). Even with higher production and consumption, the 2035 projected natural gas market price in the Reference Case declined from \$7.07/MM Btu (2009\$) in AEO 2011 to \$6.32/MM Btu (2011\$) in AEO 2013. Further, as Table 4 shows, the AEO 2013 Reference Case has many similarities with the AEO 2011 High EUR case in which shale gas resources produced per well are 50% higher than in the AEO 2011 Reference Case. The implication of the latest EIA projections is that a greater quantity of natural gas is projected to be available at a lower cost than estimated just two years ago.

ii) Proved reserves of natural gas. Proved reserves of natural gas have been increasing. Proved reserves are those volumes of oil and natural gas that geologic and engineering data demonstrate with reasonable certainty to be recoverable in future years from

known reservoirs under existing economic and operating conditions. The R/P ratio measures the number of years of production (P) that proved reserves (R) represent at current production rates. Typically industry maintains proved reserves at about 10 years of production, but as the table below demonstrates, reserves have increased from 9.2 years of production in 2000 to 13.7 years of production in 2010, the latest year statistics are available. Of particular note is that, since 2000, proved reserves have increased 72 percent to 304,625 Bcf, while production has increased only 16 percent, demonstrating the growing supply of natural gas available under existing economic and operating conditions.

Table 5: U.S. Dry Natural Gas Proved Reserves¹⁷⁵

Year	Proved Reserves (R)		U.S. Dry Natural Gas Estimated Production (P)		R/P Ratio - Years
	(Bcf)	Percent change versus year 2000	(Bcf)	Percent change versus year 2000	
2000	177,427	--	19,219	--	9.2
2005	204,385	15	18,458	-4	11.1
2010	304,625	72	22,239	16	13.7

iii) Technically recoverable resources (TRR). Technically recoverable resources have also increased significantly. Technically recoverable resources are resources in accumulations producible using current recovery technology but without reference to economic profitability. They include both proved reserves and unproved resources.¹⁷⁶

¹⁷⁵ EIA, *U.S. Dry Natural Gas Proved Reserves* (Aug. 2, 2012), available at http://www.eia.gov/dnav/ng/ng_enr_dry_dcunus_a.htm (additional calculations conducted to produce percentage change and R/P ratios).

¹⁷⁶ Unproved resources are generally less well known and therefore less precisely quantifiable than proved reserves, and their eventual recovery is less assured.

DOE/FE notes that EIA's natural gas TRR estimates have varied from below 2,000 Tcf in AEO 2010 to more than 2,500 Tcf in AEO 2011 and 2,335 Tcf in AEO 2013.¹⁷⁷ These TRR estimates include proved and unproved TRR shale gas resources, which have fluctuated in recent AEOs, as the EIA continues to monitor and estimate this resource base. For example, in AEO 2010, unproved shale gas TRR was estimated at 347 Tcf, which increased to 827 Tcf in AEO 2011, and was revised to 543 Tcf in AEO 2013.

b. Supply Impacts

While the AEO 2011 TRR estimates were higher than the AEO 2013 estimates, we do not agree that NERA employed overly optimistic projections of domestic gas supply. The EIA and NERA studies conclude that for the period of the analysis, the United States is projected to have ample supplies of natural gas resources that can meet domestic needs for natural gas and the LNG export market. Additionally, most projections of domestic natural gas resources extend beyond 20 to 40 years. While not all TRR is currently economical to produce, it is instructive to note that EIA's recent estimate of TRR equates to over 90 years of natural gas supply at the 2012 domestic consumption level of 25.63 Tcf. Moreover, given the supply projections under each of the above measures, we find that granting the requested authorization is unlikely to affect adversely the availability of natural gas supplies to domestic consumers such as would negate the net economic benefits to the United States.

We further find that, given these estimates of supply, the projected price increases and increased price volatility that could develop in response to a grant of the requested LNG export authorization are not likely to negate the net economic benefits of the exports. This issue is

¹⁷⁷ See U.S. Energy Information Administration, *Assumptions to the Annual Energy Outlook 2013* (May 2013), Table 9.2. Technically recoverable U.S. natural gas resources as of January 1, 2011, at 121, available at: [http://www.eia.gov/forecasts/aeo/assumptions/pdf/0554\(2013\).pdf](http://www.eia.gov/forecasts/aeo/assumptions/pdf/0554(2013).pdf).

further discussed below. With regard to the adequacy of supply, however, it bears noting that while Dow contends that U.S. natural gas production would not be able to meet unlimited LNG exports and domestic demand, the NERA study supports a different conclusion. The NERA study included scenarios in which LNG exports were unconstrained. In these cases, LNG exports from the United States compete with LNG exports from all other international natural gas sources. Should the U.S. resource base be less robust and more expensive than anticipated, U.S. LNG exports would be less competitive in the world market, thereby resulting in lower export levels, and, in some instances, no exports, from the United States. By way of example, NERA modeled a number of Low EUR scenarios, which had U.S. resources that were less robust and more expensive than other cases. In these Low EUR scenarios, U.S. wellhead natural gas prices were driven up by higher production costs to meet domestic demand, and in those cases prices increased to a level that choked off demand for exports so that LNG exports were limited or disappeared, leaving the available natural gas for domestic use. In other unconstrained cases evaluated with the High EUR scenarios, domestic natural gas production was able to keep up with the demand required to meet the unconstrained LNG export scenario. In this case, the EIA scenarios reflect the changes that would occur in the domestic market and reflect the limitations, as modeled in the NEMS model, of domestic natural gas production and consumption by different sectors of the economy. In all of these cases, the supply and price response to LNG exports did not negate the net economic benefit to the economy from the exports.

c. Supply Impacts Related to Alternative Energy Sources

To the degree that natural gas prices may increase, alternative sources of energy will become more attractive to consumers and investors. Accordingly, in nearly every year in which natural gas exports were reflected in the EIA study, electricity from renewable energy resources

increased compared to the no export case. Therefore, we do not agree with the suggestion that LNG exports would diminish investment in renewable energy.

d. Supply Impacts Related to Canadian LNG Exports

DOE/FE also disagrees with the argument that the NERA study erred in its treatment of potential Canadian LNG exports to international markets. Although DOE/FE did not ask NERA to evaluate potential LNG exports from Canada, we note that LNG exports from Canada would compete with U.S. exports, thereby most likely reducing U.S. exports. Therefore, treating U.S. and Canadian LNG exports as those from a single market is a reasonable assumption, and would be consistent with the unconstrained LNG export cases evaluated by NERA, with the price impact more or less in line with the cases evaluated by NERA. DOE/FE would expect that benefits estimated to accrue to the United States from U.S. LNG exports likely would be similar to the benefits that would accrue to Canada resulting from Canadian LNG exports.

The LNG Export Study did not evaluate the steps to become energy independent, as that was not part of the criteria evaluated. However, the NERA study concluded that the United States has ample supplies of natural gas resources that can both meet domestic needs for natural gas *and* allow for participation in the LNG export market, without a significant impact on supplies or prices for the period of the analysis under the assumptions made.

e. Supply Impacts Related to Tax Law and Environmental Policy

NERA stated that the NewERA macroeconomic model includes a simple tax representation in which indirect taxes are included in the output values and not explicitly modeled.¹⁷⁸ NERA thus assumed no changes specific to existing law governing production tax credits. EIA did the same. On the other hand, at DOE/FE direction, NERA and EIA accounted

¹⁷⁸ NERA study at 110.

for potential variability in domestic natural gas supply such as would occur due to changes in environmental regulation and other factors, including changes to production tax credits. They did so by incorporating the High EUR and Low EUR scenarios into their model.¹⁷⁹

We find that it was reasonable for EIA and NERA to use the High EUR and Low EUR cases to capture a range of factors that may impact domestic natural gas supply. We further find that, given the range of scenarios studied, the decision not to specifically model the possible revocation of production tax credits or changes to environmental regulation does not lessen the reliability of the EIA or NERA studies. As a practical matter, EIA and NERA were required to establish certain key assumptions as a foundation for their studies. They reasonably evaluated alternative scenarios that would capture possible changes that would affect natural gas supplies.

D. Modeling the LNG Export Business

1. Comments

Some commenters complain that NERA failed to capture accurately the business model being employed by those involved in the business of LNG exports. Sierra Club states that NERA erroneously modeled the fossil fuel industry by assuming a zero-profit condition. Some commenters, including NRDC, maintain that NERA failed to consider that LNG exports will take place pursuant to long-term, *e.g.*, 25-year, contracts containing take-or-pay provisions, rather than contracts containing flexible or market-sensitive pricing provisions. IECA makes a similar argument in its reply comments. According to these commenters, the take-or-pay provisions in long-term contracts will inhibit the free flow of price signals. The commenters argue that NERA incorrectly assumed that: (1) exports of LNG from the United States would cease if the gap in prices between domestic and foreign supplies is closed; and (2) a foreign

¹⁷⁹ *Id.* at 25.

country will cease purchases of U.S.-sourced LNG if the country gains access to less expensive supplies. These commenters maintain that take-or-pay provisions in long-term contracts will have the effect of driving LNG exports even under circumstances when it would be more economical for the same natural gas to be sold in the domestic market. In this regard, Dow criticizes NERA's assertion that the global market for natural gas will limit how high U.S. natural gas prices can rise as a result of export activity because importing nations will not purchase U.S. supplies if U.S. wellhead prices rise above the cost of competing supplies. Dow contends that this arbitrage phenomenon may occur in competitive markets but does not make sense in the global LNG market due to the broad use of long term take-or-pay contracts.

Additionally, several commenters, including Representative Markey, NRDC, Sierra Club, Citizens Against LNG, and Alcoa, charge that NERA incorrectly assumed that the financing of investments in natural gas supplies for export and in the LNG export projects that will be used for export operations would originate from U.S. sources. These commenters assert that, in fact, a substantial portion of the investment is being made by foreign entities and these foreign entities, not domestic corporations, will reap the benefits of export activity in the form of royalties, tolling fees, income, and tax proceeds from the resale of LNG overseas. Contrary to these arguments, FLEX and Lake Charles Exports argue that foreign financing of LNG export projects is beneficial. These commenters argue that foreign direct investment in the U.S. LNG industry frees up domestic capital for other investments. These commenters conclude that, as a result, NERA's results likely underestimate the benefits to the U.S. economy that will result from LNG exports.

Another commenter, Save Our Supplies, contends that the structure of international markets for natural gas and LNG and the high cost of building international LNG export

infrastructure will give a cost advantage to U.S. LNG exports. This cost advantage, coupled with greater international demand than projected by NERA, allegedly will exacerbate the projected price increases within the United States due to LNG exports. More generally, Save Our Supplies claims that NERA made a series of incorrect assumptions concerning the structure of international natural gas markets. These include erroneously assuming that international natural gas markets are competitive. Save Our Supplies identifies the following three considerations: (1) the international market is not perfectly competitive because there are barriers to entry, trade, and foreign investment due in part to the participation of state-sponsored enterprises; (2) there is an international oligopoly in oil that, because of a link between the international price of oil and the international price of natural gas in certain markets, makes it impossible for the international market in natural gas to be perfectly competitive; and (3) NERA erroneously assumed that natural gas is a “perfect substitute” for oil in all circumstances.¹⁸⁰ Based on these comments, Save Our Supplies challenges the NERA study for allegedly assuming that Qatari and Russian suppliers of natural gas will cut their prices to compete with the lower priced supplies available from the United States. Save Our Supplies argues that such price competition will not be significant and, therefore, that there will be greater demand for U.S.-exported LNG. According to some commenters, NERA’s asserted underestimate of international demand for natural gas was also exacerbated by its failure to account for the construction of natural gas infrastructure on a global basis. According to these commenters, NERA appears to underestimate both the supply cost of international LNG projects and the magnitude and trajectory of global LNG demand. NERA also appears to underestimate U.S. natural gas demand and potentially the elasticity of the U.S. natural gas supply curve.

¹⁸⁰ Initial Comments of Save Our Supplies at 34, 41.

A number of commenters take an opposing position by arguing that the domestic natural gas resource base is sufficient to meet both the domestic and international demand for U.S. natural gas. Center for LNG, Cheniere, and others go further by arguing that EIA and NERA underestimated the size of the resource base, and therefore overestimated the potential domestic price impacts of LNG exports. Dominion Cove Point, America's Natural Gas Alliance, and others argue that the international market will constrain the total volume of natural gas exported from the United States.

Several commenters, including Sierra Club and Dow, argue that NERA overestimated LNG transaction costs (*e.g.*, costs of liquefaction, transportation, and insurance). Sierra Club argues that NERA overstated the transportation costs associated with the export of U.S. gas by assuming all LNG would be exported from the Gulf Coast. Sierra Club states that several export terminals are planned for the West Coast, where it will be less expensive to transport gas to the Asian market than it would be from the Gulf Coast. Dow states that NERA's estimate of transportation and insurance costs for shipping LNG to Asia would be on the order of \$2.60/Mcf. Dow claims that official trade statistics published by the U.S. Census Bureau, however, establish that these costs would be closer to \$0.50/Mcf. Commenters such as Dow and Sierra Club state that had NERA properly accounted for LNG transaction costs, the foreseeable volumes of LNG exports would have exceeded those predicted by NERA, thereby intensifying the impact of LNG exports on U.S. natural gas prices. For this reason Sierra Club and Dow argue that NERA's projected price ceiling on domestic natural gas is too low. In addition, numerous individual members of the Sierra Club contend that NERA appears to have misrepresented the amount of natural gas used by LNG terminals in the liquefaction process, which understates the demand associated with exports.

2. DOE/FE Analysis

As explained below, we find that the NERA study reflects an accurate understanding of the contractual terms and market environment affecting the fossil fuel industry and, more narrowly, provides a plausible future scenario of international trade in LNG with U.S. exports. It is DOE/FE's view also that NERA's conclusions of the impact of LNG exports would not have materially changed with alternative international market assumptions. In this regard, we note that NERA included one scenario in which LNG exports reached 23 Bcf/d, with a positive impact on the U.S. economy. We find as follows:

a. Zero Profit Condition

Sierra Club's charge that NERA erroneously modeled the fossil fuel industry by assuming a zero-profit condition appears to reflect a misunderstanding of the term "zero-profit" as used by NERA. The "zero-profit condition" assumed in the NERA study does not mean that firms in the natural gas industry will not make a "profit" as that word is ordinarily used. Rather, the zero-profit condition means only that firms will not make a profit above the risk-adjusted cost of capital. The assumption of a zero-profit condition is another way of saying that the model assumes a competitive market for natural gas, because in competitive markets new firms can enter and drive any profits above a risk-adjusted cost of capital down to zero. The assumption of a competitive market for natural gas production in the United States is valid given that natural gas wellhead prices have been deregulated for over thirty years.¹⁸¹ Moreover, Sierra Club and other commenters have not provided any evidence to suggest a lack of competition in the market for U.S. natural gas production.

¹⁸¹ Natural Gas Policy Act of 1978, 15 U.S.C. § 3301, *et seq.* (establishing a policy for phasing out the regulation of wellhead prices).

b. Contract Terms

We disagree with the contention that NERA erred in the assumptions it used to model the export contracts that will be used by authorization holders. NERA assumed that these contracts will include payments to the exporting facility in the form of a tolling charge that is fixed based on the total export capacity reserved under the tolling agreement plus 115% of the Henry Hub price for each unit of gas that is liquefied. These assumptions correspond closely with the 20-year tolling agreement filed publicly with DOE by Sabine Pass on April 2, 2013. In that filing, the tolling agreement carries a tolling fee (or “reservation charge”) with a per unit liquefaction charge of 115% of the Henry Hub price.¹⁸²

Because there is neither a throughput obligation nor a fixed commodity price in the commercial arrangements assumed by NERA (or in the publicly filed Sabine Pass contract), the supplies of natural gas or LNG subject to the contracts are not locked up for the export market. Instead, as NERA has properly assumed for purposes of its model, foreign and U.S. purchasers will compete for domestically produced supplies and, if the domestic price rises, the owners of the gas (in most cases, either the authorization holder or the foreign purchasers that are party to the export-related contracts) will have an incentive to sell the gas into the domestic market rather than the international market.

Commenters criticizing NERA’s model on these assumptions have not submitted evidence to support their position that contracts will lock up natural gas for export. Moreover, we find it unlikely that a broad cross-section of commercial parties would lock themselves permanently into arrangements whereby LNG will be exported from the United States even when it is uneconomical to do so. Even contracts entered improvidently may be amended when

¹⁸² *Sabine Pass Liquefaction LLC*, LNG Sale and Purchase Agreement with Centrica PLC, FE Docket No. 13-42-LNG, at 51-52 (Apr. 2, 2013).

there is a possibility for mutual benefit in doing so, as there would be in a case where domestic gas prices exceed netback prices.

c. Foreign Direct Investment

As described above, several commenters charge that the NERA study incorrectly assumed that the financing of investments in natural gas supplies for export and in LNG liquefaction and export facilities would come from domestic sources. An examination of the NERA study indicates that claim is not valid as to natural gas supplies. Early in the study, NERA noted as follows:

Net benefits to the U.S. economy could be larger if U.S. businesses were to take more of a merchant role. Based on business models now being proposed, this study assumes that foreign purchasers take title to LNG when it is loaded at a United States port, so that any profits that could be made by transporting and selling in importing countries accrue to foreign entities. In the cases where exports are constrained to maximum permitted levels, this business model sacrifices additional value from LNG exports that could accrue to the United States.¹⁸³

On the other hand, the commenters are correct to the extent they argue that the NERA study assumed that the financing for the liquefaction and export facilities associated with LNG exports would come solely from domestic sources. The NERA study indicates that the timing of macroeconomic effects could be affected as a consequence:

In this report it is assumed that all of the investment in liquefaction facilities and in increased natural gas drilling and extraction come from domestic sources. Macroeconomic effects could be different if these facilities and activities were financed by foreign direct investment (“FDI”) that was additional to baseline capital flows into the U.S. FDI would largely affect the timing of macroeconomic effects, but quantifying these differences would require consideration of additional scenarios in which the business model was varied.¹⁸⁴

¹⁸³ NERA study at 6-7.

¹⁸⁴ *Id.* at 211.

In the above statement, NERA has indicated that the timing of the impacts of LNG exports could change due to FDI. On the other hand, NERA has not stated that the nature of the impacts will change and no commenter has introduced evidence that FDI will produce negative economic benefits. Indeed, Lake Charles Exports explains why FDI may enhance the economic benefits to the United States:

NERA thus acknowledged the possibility that investment necessary for LNG exports may come from foreign sources. The NERA model's assumption of domestic investment explicitly fails to capture the macroeconomic benefits that will result from the injection of any foreign investment into natural gas production and infrastructure.

The United States has the leading economy in the world in part because the US is the leading destination of international flows of capital. Each dollar of new foreign investment capital into the US results in an equivalent increase in US GDP. The main positive components of GDP are private consumption, investment, government expenditures, and exports. Any foreign direct investment stemming from the development of a US LNG industry would not decrease domestic capital investment, but would merely free up such domestic capital for other investments. Therefore the total amount of investment in the US would increase, dollar-for-dollar, with foreign investment, increasing US GDP by the same amount. If that foreign investment earns a return and, after taxation by US local, state and federal governments, some of that return is repatriated, this reflects a small countervailing outflow (which seems to be what, for example, Representative Markey is focusing on). Nonetheless, foreign direct investment remains a major net contributor to the US economy. The 2012 LNG Export Study's simplifying assumption regarding the source of investment in LNG production infrastructure fails to capture the benefits of any capital provided from foreign sources and thus understates the impact of such investment on US GDP.¹⁸⁵

Accordingly, while FDI may be used to finance purchases of natural gas for export as LNG and the construction of LNG liquefaction and export facilities, we are not persuaded that the inflow of foreign capital for these purposes would be inconsistent with the public interest or would lessen the net economic benefits projected in the LNG Export Study.

¹⁸⁵ Reply Comments of Lake Charles Exports at 31 (citations omitted).

d. International Natural Gas Markets

We are not persuaded by Save Our Supplies' claim that a projected cost advantage to exports of LNG from the United States as opposed to exports from other gas producing nations will necessarily exacerbate projected price increases within the United States due to LNG exports. This argument assumes that LNG will be available for export at a landed price overseas that is competitive with the international price set by foreign competitors. But NERA concluded that in many cases, the world natural gas market would not accept the full amount of exports assumed in the EIA scenarios at prices high enough to cover the U.S. wellhead domestic prices calculated by the EIA. Alternatively, foreign competitors supplying natural gas and LNG in international markets may match or, possibly, undercut the landed price of LNG exported from the United States.

With respect to the competitiveness of global LNG markets, NERA assumed that the production decisions of the world's dominant producer, Qatar, would be fixed no matter what the level of U.S. exports and that, generally, "there is a competitive market with exogenously determined export limits chosen by each exporting region and determined by their liquefaction capacity."¹⁸⁶ NERA described these assumptions as a "a middle ground between assuming that the dominant producer will limit exports sufficiently to maintain the current premium apparent in the prices paid in regions like Japan and Korea, or that dominant exporters will remove production constraints because with U.S. entry their market shares fall to levels that do not justify propping up prices for the entire market."¹⁸⁷ We find this to be a reasonable simplifying assumption and note further that even imperfectly competitive markets are not static. The arrival

¹⁸⁶ NERA study at 34.

¹⁸⁷ *Id.* at 34-35.

of new entrants, such as U.S.-based LNG exporters, may well have a disruptive impact on markets where competition may presently be constrained.

Finally, we note that NERA also modeled a “supply shock” case that assumed key LNG exporting regions did not increase their exports above current levels. NERA found positive economic benefits to the United States in each supply shock scenario in which the United States exports LNG. These results strengthen our conclusion that the prospect of non-competitive behavior in global LNG markets is unlikely to have a material impact on the central conclusions of the LNG Export Study.

e. Estimates of LNG Transaction Costs

We disagree with the comments from Sierra Club and Dow arguing that NERA overestimated LNG transaction costs, including liquefaction, transportation, insurance, and the like. NERA based its liquefaction, shipping costs and regasification costs on a review of publicly available literature, including the International Group of LNG Importers 2010 LNG Industry report and other sources referenced in the NERA study.¹⁸⁸

With respect to transportation costs, Dow states that NERA’s estimate of shipping cost to Asia was on the order of \$2.60/Mcf, while statistics presented by Dow claim these to be \$0.50/Mcf. In presenting this figure, Dow relies on trade statistics reported by the U.S. Census Bureau based on the average cost of insurance and freight expenses associated with U.S. *imports* of LNG in 2010 and 2011. As NERA points out, however, LNG transportation costs in large measure are a function of the distance traveled. Therefore, data on LNG imports, which largely travel shorter distances,¹⁸⁹ do not furnish a reliable basis for drawing inferences regarding

¹⁸⁸ *Id.* at 84-90.

¹⁸⁹ DOE/FE statistics show that the majority of LNG imports to the United States for 2010 and 2011 came from Atlantic Basin/North African sources. More than one-third of U.S. LNG imports in 2010 and 2011 came from

transportation costs for LNG exports to Asia. Further, NERA provided a detailed description of the assumed transportation cost buildup, which is based on a daily charter rate of \$65,000, and other reasonable assumptions.¹⁹⁰ Dow does not provide evidence challenging the accuracy of the information used by NERA or NERA's method of calculating transportation costs. Nor does Dow provide other evidence of daily charter rates.

As for the cost of natural gas consumed in the liquefaction process, NERA's model assumes a consumption level equal to 9 percent of the natural gas feedstock, a cost that is included in the NERA model. NERA based this assumption on publicly available information of liquefaction costs. Similarly, EIA assumed that 10 percent of feedstock was consumed in the liquefaction process.

Therefore, we find that NERA's cost build-up is appropriate and that the estimated costs for delivering LNG to end users considered in the NERA study are reasonable.

E. Cost of Environmental Externalities

1. Comments

Sierra Club, along with Delaware Riverkeeper Network,¹⁹¹ Jannette Barth, NRDC, Dow, and Save Our Supplies, among others, maintain that LNG exports will increase demand for natural gas, thereby increasing negative environmental and economic consequences associated with natural gas production. These commenters assert that NERA failed to consider the cost of environmental externalities that would follow such exports. The externalities identified by these commenters include:

Trinidad and Tobago, and none came from East Asia. See DOE/FE 2010 LNG Import Annual Report and DOE/FE 2011 LNG Import Annual Report, available at <http://fossil.energy.gov/programs/gasregulation/publications/>.

¹⁹⁰ NERA study at 87.

¹⁹¹ Delaware Riverkeeper Network filed comments on behalf of itself and more than 80 other organizations.

- Environmental costs associated with producing more natural gas to support LNG exports, including the costs, risks, and impacts associated with hydraulic fracturing and drilling to produce natural gas;
- Opportunity costs associated with the construction of natural gas production, transport, and export facilities, including the costs of investing in shale gas infrastructure to support LNG exports, as opposed to investing in renewable or sustainable energy infrastructure;
- Costs and implications associated with eminent domain necessary to build new pipelines to transport natural gas; and
- Potential for switching from natural gas-fired electric generation to coal-fired generation, if higher domestic prices cause domestic electric generation to favor coal-fired generation at the margins.

2. DOE/FE Analysis

As explained herein, the authorization granted by this Order is conditioned (among other things) on the satisfactory completion of the environmental review of FLEX's proposed modifications to the Freeport Terminal under NEPA in FERC Docket No. CP12-509 and on issuance by DOE/FE of a finding of no significant impact or a record of decision pursuant to NEPA.¹⁹²

As further explained below, persons wishing to raise questions regarding the environmental review of the present Application are responsible for doing so within the FERC proceedings. Insofar as a participant in the FERC proceeding actively raises concerns over the scope or substance of environmental review but is unsuccessful in securing that agency's consideration of its stated interests, DOE/FE reserves the right to address the stated interests within this proceeding. However, absent a showing of good cause for a failure of interested persons to participate in the FERC environmental review proceeding, DOE/FE may dismiss such claims if raised out of time in this proceeding.

¹⁹² See 10 C.F.R. § 590.402 (authorizing DOE/FE to issue a conditional order prior to issuance of a final opinion and order).

F. Prices and Volatility

1. Natural Gas Price Volatility

a. Comments

Several commenters, such as Huntsman Corporation, address potential natural gas price volatility associated with LNG exports. Janette Barth, Dow, Sierra Club, and Save Our Supplies, among others, state that NERA did not account for price volatility. Sierra Club points to the results of the LNG Export Study, which project higher domestic natural gas price impacts when exports phase in rapidly. Additionally, Sierra Club argues that, pending the pace of DOE/FE approvals, demand for domestic natural gas may increase more rapidly than production, leading to periods of scarcity and price spikes. Sierra Club also contends that there is little evidence that domestic natural gas price volatility will be reduced by LNG exports.

America's Natural Gas Alliance argues that there is no evidence that LNG exports will increase volatility. According to the Alliance, LNG exports will lead to increased investment in domestic gas production, which will help protect against price volatility. American Petroleum Institute contends that the NERA and Brookings studies project natural gas prices to remain in a narrow, low range through 2030 in all scenarios. Further, American Petroleum Institute points out that, in October 2009, a Dow representative testified before the Senate Energy and Natural Resources Committee that the U.S. chemical industry could operate successfully if natural gas prices remain in the \$6-8 MMBtu range. American Petroleum Institute asserts that recent studies projecting natural gas prices—even with high, unconstrained levels of LNG export—do not forecast natural gas prices higher than that range. Several commenters, including America's Natural Gas Alliance and American Petroleum Institute, further assert that the market will have significant advanced notice of LNG export facilities. As a result, natural gas producers will be able to adjust supply to meet anticipated increases in demand. American Petroleum Institute also

argues that, because the facilities and liquefaction trains at each facility will be built in sequence, a market buffer will be created where supply will grow incrementally and supply shocks will not be created in the market. Additionally, Lake Charles Exports argues that Dow's analysis of domestic natural gas exports is incorrect, and the additional investment in domestic natural gas reserve development associated with increases in LNG exports will insulate the United States from natural gas price volatility.

The Bipartisan Policy Center, through its own analysis, forecasts that LNG exports are unlikely to result in large domestic price impacts. The Bipartisan Policy Center states that the results of its analysis indicate that LNG exports are likely to have only modest impacts on domestic natural gas price, and that LNG export levels will adjust as domestic prices rise or fall.

b. DOE/FE Analysis

Natural gas price volatility can be measured in terms of short term changes—daily or monthly volatility—or over longer periods. Short term volatility is largely determined by weather patterns, localized service outages, and other factors that appear unlikely to be affected substantially by DOE export authorization decisions. Moreover, NERA's study was a long-term analysis covering a 20-year period that correctly did not focus on short term shocks or volatility.

To the extent commenters are concerned about the risk of large upward price spikes sustained over longer periods, such as those that occurred in 2005 and 2008, we do not agree that LNG exports will necessarily exacerbate this risk. First, as noted above, when domestic wholesale gas prices rise above the LNG netback price, LNG export demand is likely to diminish, if not disappear altogether. Therefore, under some international market conditions, LNG export facilities are likely to make natural gas demand in the United States more price-elastic and less conducive to sustained upward spikes. Second, in light of our findings regarding

domestic natural gas reserves explained above, we see no reason why LNG exports would interfere with the market's supply response to increased prices. In any capital intensive industry, investments are made based on observed and anticipated market signals. In natural gas markets, if prices or expected prices rise above the level required to provide an attractive return on investment for new reserves and production, industry will make that investment to capture the anticipated profit. These investments spur development of reserves and production and increase availability of natural gas, exerting downward pressure on prices. This is part of the normal business cycle that has been captured in EIA's supply curves and, consequently, in NERA's analysis. On balance, we are not persuaded that LNG exports will substantially increase the volatility of domestic natural gas prices.

2. Linking the Domestic Price of Natural Gas to World Prices

a. Comments

Several commenters, including APGA, Dow, and IECA, argue that LNG exports could link domestic natural gas prices to the price of natural gas in the world market, and that this could exacerbate the potential increase in domestic natural gas prices as well as increase price volatility. A number of other commenters, however, contend that domestic prices would not become linked to world prices. Citing the importance of the domestic natural gas price in determining the level of exports, the Bipartisan Policy Center and Southern LNG Company argue that domestic natural gas prices will remain independent of international prices.

In its reply comments, Dow expands on its argument that domestic natural gas prices will become linked to international prices. Dow argues that exports to Asia, where natural gas prices are "oil-indexed," will invariably lead to increases in domestic price. Dow also argues that it is incorrect to assume liquefaction, transportation and regasification costs will act as a buffer

against world prices, pointing to the experience in Australia in which LNG exports resulted in a tripling of domestic natural gas prices. In reply comments, American Petroleum Institute and several LNG export applicants argue that natural gas prices will not rise to global prices because the market will limit the amount of U.S. natural gas that will be exported, since liquefaction, transportation and regasification costs act as a cushion. These commenters argue that if this cushion disappears and the U.S. export price rises to the global LNG price, market forces will bring U.S. exports to a halt. Several LNG export applicants also contend that the availability of bi-directional terminals will serve to limit domestic price increases.

b. DOE/FE Analysis

The NERA study examined whether LNG exports from the United States will cause domestic prices to rise to the level of international prices and found that such a result is unlikely. NERA asserts that there will always be a difference between the international LNG price and the U.S. market price. That difference will be represented by the cost of inland transportation, liquefaction, shipping, and regasification. NERA's model assumes competition among different suppliers such that Asian buyers would have no incentive to buy natural gas from the United States if the delivered price after liquefaction and transportation is higher than the alternative delivered LNG price from other sources. DOE/FE agrees that a competitive market would behave in this manner and U.S. natural gas prices would be lower than international LNG prices in such a market by at least the costs previously described. Further, the introduction of LNG exported from the United States into the international market would tend to exert downward pressure on the prevailing higher delivered price for LNG in those foreign markets and could weaken the "oil-indexed" pricing terms.

In addition, all proposed LNG exports from the United States in applications DOE/FE has

received to date would be pursuant to long-term contracts. To the extent that these contracts supply end-users in foreign markets, these exports represent a base-load demand for U.S. natural gas. As a base load, the United States market would adjust to this increased demand through increases in production, and plan for its delivery utilizing the significant production and storage infrastructure that exists. On average, prices would rise to levels that provide incentives for full marginal cost recovery for the incremental production of natural gas needed to meet this demand.

Hence we agree with those commenters, such as the Bipartisan Policy Center, that maintain that LNG exports from the United States will have difficulty competing with LNG exports from other countries unless domestic U.S. natural gas can be produced much cheaper. They point out that the international supply of natural gas is growing, and the mobility of that supply is increasing as other countries develop their own LNG export capabilities. Further, there is no evidence before us that demonstrates that the prices of natural gas or LNG in the international market are more volatile than the prices in the U.S. domestic market.

G. Integrity of the LNG Export Study

1. Comments

Several commenters, such as Clean Ocean Action and Sierra Club, argue that DOE/FE cannot rely on the NERA report unless DOE/FE discloses more details about the process by which DOE/FE selected NERA to conduct the study, DOE/FE's funding mechanism for paying NERA, and DOE/FE's involvement (if any) in guiding the study or reviewing drafts of the study prior to publication. In addition to Sierra Club, commenters Eugene Bruce, Ellen Osuna, Dow, and IECA assert that DOE/FE cannot rely on the study because NERA has not disclosed all technical details of its proprietary N_{ew} ERA model to the public. According to Sierra Club, DOE/FE "has refused to make [all of] this information available for review during the public

comment period.”¹⁹³ Further, Sierra Club, Save Our Supplies and several other commenters argue that, due to this alleged lack of transparency, DOE/FE should conduct a new study of the potential cumulative impacts of granting LNG export licenses for shipment to non-FTA countries. Sierra Club and other commenters also contend that NERA and/or NERA’s Vice President (and the principal author of the NERA study) Mr. David Montgomery may be biased in favor of LNG exports, which they argue necessitates a new study by a different contractor.

2. DOE/FE Analysis

DOE has evaluated all submissions in this proceeding on their own merits, including the LNG Export Study and the arguments and analyses submitted by commenters. NERA conducted the study within DOE/FE’s requested parameters (which are included as Appendix F to the NERA study) and provided detailed information regarding its assumptions, model design and methodology, and results. This information is set forth at length in the NERA study and is discussed in Section VI.B.2 and 5 of this Order. As evidenced by the number of detailed comments received, including additional studies offered by several of the commenters, NERA’s explanation of its modeling design, methodology, and results has provided a sufficient basis both for the public to provide meaningful comments and for the Department to evaluate NERA’s conclusions.

H. Peer Review

1. Comments

Dow, along with Eugene Bruce, IECA, and others, charge that the NERA study is invalid because NERA failed to validate its proprietary N_{ew}ERA model by means of technical peer review. These commenters argue that technical peer review is required by the Office of

¹⁹³ Reply Comments of Sierra Club at 20.

Management and Budget's (OMB) guidance entitled, "Final Information Quality Bulletin for Peer Review" (OMB Bulletin).¹⁹⁴ The OMB Bulletin establishes that "important scientific information shall be peer reviewed by qualified scientists before it is disseminated by the Federal government." Dow asserts that the NERA study should be considered "highly influential scientific information," subject to the highest standards outlined in the OMB Bulletin, and/or subject to internal DOE peer review guidelines. Due in part to these concerns, several commenters, including Sierra Club and Save Our Supplies, urge that DOE/FE commission a new study by another independent contractor.

Cameron LNG, LCC, in its reply comments, counters that the OMB Bulletin does not apply to adjudications or permit proceedings such as this one. Cameron LNG therefore asserts that the public comment period held by DOE/FE on the LNG Export Study is more than adequate for DOE/FE to obtain constructive review of both the EIA and NERA studies.

2. DOE/FE Analysis

The OMB Bulletin establishes a framework for independent, expert review of influential scientific information before the information is publicly disseminated. It defines "scientific information" as "factual inputs, data, models, analyses, technical information, or scientific assessments based on the behavioral and social sciences, public health and medical sciences, life and earth sciences, engineering, or physical sciences."¹⁹⁵ "Scientific information" does not include opinions where the presentation makes it clear the information is "opinion rather than fact or the agency's views."¹⁹⁶ Further, the OMB Bulletin, while applicable to rulemakings, provides that "official disseminations that arise in adjudications and permit proceedings" are

¹⁹⁴ Final Information Quality Bulletin for Peer Review, 70 Fed. Reg. 2664 (Jan. 14, 2005).

¹⁹⁵ *Id.* at 2675.

¹⁹⁶ *Id.*

exempt from peer review, unless “the agency determines that peer review is practical and appropriate”¹⁹⁷

We have considered commenters’ request for peer review in light of the OMB Bulletin. Because this proceeding is an adjudication, peer review is not required unless DOE/FE determines that such review is appropriate. After consideration, we find that peer review is not required because the conclusions reached in the LNG Export Study are in the nature of expert opinion, not scientific fact, and also because the principal purpose of peer review of government-sourced documents—ensuring the government is well-informed by independently produced expert analyses—was accomplished in this proceeding.

Both the EIA and NERA studies use market assumptions to project a range of possible future results. No claim is made by the authors of either study that the studies contain scientific fact. To the contrary, both studies caution the reader on the limits to their economic projections. The EIA study states: “The projections in this report are not statements of what *will* happen but of what *might* happen, given the assumptions and methodologies used.”¹⁹⁸ Similarly, the NERA study was developed around assumptions of future scenarios and repeatedly acknowledges the uncertainties that could shift the results within the range of likely outcomes.¹⁹⁹

Further, the procedures followed by DOE/FE in this proceeding have allowed numerous commenting parties and third-party experts to offer differing analyses. The comments included several expert studies critiquing the LNG Export Study. For example, Professor Wallace Tyner of Purdue University, submitted results from a study that shows different results from NERA’s. Sierra Club submitted a study by Synapse Energy Economics, Inc., that examined NERA’s study

¹⁹⁷ *Id.* at 2677.

¹⁹⁸ EIA study at ii.

¹⁹⁹ *See, e.g.*, NERA study at 25-26.

and pointed out alleged “problems and omissions” in NERA’s analysis.²⁰⁰ Conversely, Southern LNG Company, Gulf LNG, and Jordan Cove Energy Project each submitted a study by Navigant that concluded that NERA’s analyses were sound.²⁰¹

DOE/FE has carefully weighed these competing analyses and viewpoints, and has conducted its own internal review of the LNG Export Study. In so doing, DOE/FE has recognized that its ultimate decision on the pending export applications would benefit from a public exchange of judgments and expert opinions.²⁰² The major purpose motivating the OMB Bulletin—to ensure that the government is well-informed by independent, expert analysis—was accomplished in this proceeding without the need for peer review.

I. Procedural Arguments

1. Comments

Several commenters, including Sierra Club, Senator Wyden, NRDC, and others argue that the current public interest standard, which focuses on meeting the nation’s “essential domestic needs” for natural gas, is too narrow and that DOE/FE must undertake a rulemaking to establish criteria for making such a determination under the NGA. Similarly, Sierra Club, Alcoa, IECA, and CarbonX Energy Company, Inc., argue that DOE/FE should articulate, in the context of a separate rulemaking proceeding, the framework it will use in making its public interest determinations for individual export applications. Dow makes a related comment, stating that each of the individual LNG export dockets contains an insufficient record on which to base a public interest determination on the cumulative impact of LNG exports, and therefore DOE/FE is

²⁰⁰ Synapse Energy Economics, Inc., *Will LNG Exports Benefit the United States Economy?* (Jan. 23, 2013), at 1, submitted with Initial Comments of Sierra Club.

²⁰¹ *See, e.g.*, Navigant Consulting, Inc. and Navigant Economics, Analysis of the Department of Energy’s LNG Export Study (Jan. 24, 2013), App. A of Initial Comments of Gulf LNG.

²⁰² *See* 77 Fed. Reg. at 73,628 (“The LNG Export Study and the comments that DOE/FE receives ... will help to inform our determination of the public interest in each case.”)

required to conduct a notice and comment rulemaking before it decides on any of the pending LNG export applications.

Dow, Sierra Club, Save Our Supplies, and other commenters contend that DOE/FE should conduct a public hearing regarding the applicable public interest standard in light of the cumulative impacts of LNG exports. Additionally, several commenters request that DOE/FE reopen the dockets of LNG export applicants to solicit additional public comment. Commenter Mary Altmann argues that DOE/FE should invite public comment on individual LNG applications before approving exports. IECA argues that many commenters could not reasonably have been expected to intervene in individual license proceedings at the time license applications were filed, since they had no way of anticipating that more than 20 applications would eventually be filed. IECA argues that DOE/FE, therefore, has no alternative other than to allow every interested party to intervene in each proceeding. Along these same lines, CarbonX requests that its comment on the LNG export study be incorporated into the dockets for each pending LNG export applications.

Several commenters raise issues associated with their ability to comment on economic studies conducted by third parties and whether DOE/FE may rely on such studies in making a determination. Regarding DOE/FE's request for public comment in the NOA, Sierra Club, IECA, and others argue that DOE/FE narrowly instructed parties to address only the EIA and NERA studies. Proponents of this argument assert that DOE/FE cannot assess whether it is in the public interest to issue additional LNG export permits by addressing only one aspect of the public interest analysis (*i.e.*, potential impacts on energy costs). Similarly, Sierra Club, IECA, CarbonX, and others, assert that citations to third-party studies in the record do not discharge DOE/FE's responsibility to evaluate the public interest because the studies are based on

undisclosed proprietary data and models with limited information regarding their development and age.

Other commenters argue that DOE/FE should act now to decide each pending export application. These commenters contend additional administrative process is neither necessary nor appropriate as DOE/FE has already provided the “opportunity for hearing” required under NGA section 3(a) to make its public interest determination. Commenters such as ExxonMobil and the Center for Liquefied Natural Gas argue that the initial and reply comments submitted in response to the LNG Export Study do not change the NGA statutory and regulatory requirements that place the burden of proof on opponents to demonstrate, with sufficient evidence, that each application is inconsistent with the public interest. These commenters argue that the record before DOE/FE regarding each individual application is sufficient for DOE/FE to determine whether LNG exports have been shown to be inconsistent with the public interest.

2. DOE/FE Analysis

Fundamentally, all of the above requests for procedural relief challenge the adequacy of the opportunity that we have given to the public to participate in this proceeding and the adequacy of the record developed to support our decision in this proceeding.

With respect to opportunity for public participation, we find that the public has been given ample opportunity to participate in this proceeding, as well as the other pending LNG export proceedings. Within this proceeding, FLEX’s Notice of Application, published in the Federal Register on February 13, 2012, contained a detailed description of FLEX’s Application, and invited the public to submit protests, motions to intervene, notices of intervention, and comments.²⁰³ As required by DOE regulations, similar notices of application have been

²⁰³ 77 Fed. Reg. at 7568-69.

published in the Federal Register in each of the other non-FTA export application proceedings. Additionally, in December 2012, DOE/FE published the NOA in the Federal Register.²⁰⁴ As explained above, the NOA described the content and purpose of the EIA and NERA studies, invited the public to submit initial and reply comments, and stated that these comments will be part of the record in each individual docket proceeding.²⁰⁵ DOE/FE thus has taken appropriate and necessary steps by offering the public multiple opportunities to participate in the non-FTA LNG export proceedings.

We also find the record is adequate to support the action we are taking in this Order. DOE/FE has reviewed all of the submissions made in this proceeding. Moreover, this Order sets out the reasons that support each of the determinations contained herein. Consequently, we do not find it is necessary or appropriate to delay issuance of this Order to augment the record, either through a rulemaking or public hearing. In this regard, we note that DOE/FE retains broad discretion to decide what procedures to use in fulfilling its statutory responsibilities under the NGA,²⁰⁶ and our view is that the record is sufficient to support the actions that we are taking. The requests for additional procedures summarized above are denied.

IX. DISCUSSION AND CONCLUSIONS

A. Motions to Intervene

Late-filed motions to intervene. As discussed above, America's Energy Advantage and IECA each filed a motion to intervene and comment out of time in this proceeding. The motions were filed more than 17 months after the April 13, 2012 deadline established in the Notice of Application.

²⁰⁴ 77 Fed. Reg. at 73,627.

²⁰⁵ *Id.* at 73,628.

²⁰⁶ *See, e.g., Process Gas Consumers v. FERC*, 930 F.2d 926, 929 (D.C. Cir. 1991).

After reviewing both motions and FLEX's responses in opposition,²⁰⁷ DOE/FE finds that neither America's Energy Advantage nor IECA has established good cause to grant the motions to intervene more than 17 months out of time. This proceeding was publicly noticed in the Federal Register, and interested parties were given 60 days from the date of the notice in which to file motions to intervene and/or comments. DOE/FE provided a 60-day notice period in recognition of the need to afford the public sufficient time to consider the import of this proceeding.

DOE/FE further notes that IECA filed comments in the Lake Charles Exports proceeding (FE Docket No. 11-59-LNG) in August 2011, which undermines its position that it did not see the need to file comments in this proceeding until September 2013. IECA also filed initial and reply comments in response to the LNG Export Study in January and February 2013, respectively—in which it stated that “many ... parties could not reasonably have been expected to intervene in individual [export] proceedings at the time [export] applications were filed, since they had no way of anticipating that more than 20 applications would be filed”²⁰⁸ This is substantially the same argument that IECA makes in its current motion to justify its late filing,²⁰⁹ yet it waited nearly seven months *after* filing those reply comments—until September 2013—to move to intervene and comment in this proceeding.

Likewise, in the current motion, IECA “urges development of public interest criteria that will establish objective, comprehensive standards for reviewing and approving all LNG export

²⁰⁷ DOE/FE notes that American Petroleum Institute also filed a letter in this proceeding opposing America's Energy Advantage's and IECA's motions to intervene and comment. We have not considered this letter, however, as American Petroleum Institute is not a party to this proceeding.

²⁰⁸ Reply Comments of the Industrial Energy Consumers of America (Feb. 25, 2013), at 14.

²⁰⁹ See IECA Consolidated Mot. at 2-3.

applications, including that of FLEX”²¹⁰ In its reply comments on the LNG Export Study filed in February 2013, IECA similarly urged DOE/FE to “develop[] a clearer set of procedures, and make[] a commitment to develop a proposed set of generic policies and rules for determining how many [export authorizations] to issue and the factors to be considered”²¹¹ DOE/FE has responded to those comments in this Order. *See supra* Section VIII.I.1-2. Both IECA’s lengthy delay in filing its current motion, and the fact that it had already developed and submitted many (if not all) of its current arguments in comments considered in this proceeding, undercut IECA’s claim that DOE/FE has good cause to accept its motion at this late date.

Further, although America’s Energy Advantage did not submit comments in response to the Notice of Availability of the LNG Export Study, its late-filed motion to intervene and comment in this proceeding raises the same arguments as IECA’s comments in the LNG Export Study, and therefore DOE/FE effectively has considered and responded to those comments in this Order, as well.

In the *Sabine Pass* proceeding, we observed that, at some point, the opportunity for interested persons to intervene in a proceeding must end to ensure that the resolution of the proceeding is not unduly delayed, and that existing parties are not prejudiced, merely because intervening developments have sparked some new interest in the proceeding.²¹² In the absence of good cause for overriding these considerations, a motion to intervene filed 17 months after the deadline is not a close question. For these reasons, we will deny both late-filed motions to intervene and comment.

²¹⁰ *Id.* at 5.

²¹¹ IECA Reply Comments at 14.

²¹² *Sabine Pass Liquefaction, LLC*, Procedural Order on Late-Filed Proceedings, FE Docket No. 10-111-LNG, at 5 (Mar. 25, 2011).

Timely filed motions to intervene. As discussed above, GCELC, APGA, and Sierra Club filed timely motions to intervene and protests. FLEX opposed each motion, arguing that the movants' stated concerns do not amount to a specific claim of interest in the FLEX Application (as opposed to a general opposition to domestic natural gas production and the exportation of LNG), and therefore none of them have met the standard for intervention under DOE regulations, 10 C.F.R. § 590.303(b) and (c).

We do not agree with FLEX. The evidence presented by FLEX and the three movants, as well as the breadth of the LNG Export Study, indicate that the economic consequences of granting the Application could be far-reaching and could affect the interests of the movants and their members. This fact alone is good cause to permit their intervention. In addition, the movants each raise a number of environmental issues that, as discussed herein, we intend to address at a later date. The movants' intervention is thus warranted to preserve their right for review of those environmental issues when appropriate. For these reasons, the three pending motions to intervene are granted.

To avoid repetition, the following discussion focuses on arguments and evidence presented by these intervenors to the extent that DOE/FE has not already addressed the same or substantially similar arguments in its response to comments on the LNG Export Study (Section VIII *supra*).

B. FLEX's Application

In its Application, FLEX introduced evidence projecting a future supply of domestic natural gas sufficient to support both the proposed export authorization and domestic natural gas demand. This evidence included, but is not limited to, projections contained in the Deloitte Report issued in 2011, EIA data from AEO 2011, estimates contained in the MIT Report issued in 2011, estimates by the Potential Gas Committee of the Colorado School of Mines in 2011, and

estimates by IHS CERA, Inc. in 2010. Drawing from the Deloitte Report—which assumed that LNG in a volume equivalent to 6 Bcf/d of natural gas would be exported—FLEX concluded that the magnitude of LNG exports may be substantial on their own, but are not significant relative to the U.S. resource base or total U.S. demand. Citing the Deloitte Report, FLEX also asserted that potential price impacts from LNG exports in the range of 6 Bcf/d of natural gas likely would be small. Additionally, based on the analysis of economic benefits in the Altos Report, which FLEX presented in *Freeport I* and relies on here, FLEX produced evidence that significant economic benefits at the local, regional, national, and international levels are likely to occur if the Application is granted.

As summarized above, Sierra Club challenged the reliability of the Altos Report’s economic projections, and specifically the “IMPLAN-based” model upon which it was allegedly based.²¹³ Sierra Club and other intervenors argued that the proposed exports would not yield economic benefits but, in fact, would materially increase natural gas prices and result in other deleterious economic and societal impacts. We have considered the comments and protests presented in opposition to the Application and, for the reasons discussed below, find that those comments and protests do not overcome the rebuttable presumption that the proposed volume of LNG exports, as modified herein, are consistent with the public interest.

1. Regional Impacts

FLEX claims that the Liquefaction Project will create economic benefits including (but not limited to) direct and indirect job creation, an enhanced tax base, and an increase in overall economic activity. FLEX asserts that these benefits will accrue largely to the Gulf Coast region surrounding the Liquefaction Project (including the gas producing region near the Eagle Ford

²¹³ *Id.* at 45.

shale in South Texas), with a multiplier effect that will create improvements across the entire U.S. economy. Sierra Club challenges FLEX's claimed regional benefits, focusing principally on the durability of economic benefits in producing regions. Sierra Club specifically asserts that any "boom" in economic activity will be followed by a bust, and that the prospect of such an event demonstrates that a grant of the requested authorization is inconsistent with the public interest.

Sierra Club challenges the IMPLAN-based model that it claims is the basis of FLEX's Altos Report. It asserts that, if the Altos Report's analysis of economic benefits is to be used at all, only the job-creation estimates of one study analyzed (the Considine study) should be used—which estimates that nationwide induced gas production would create approximately 17,000 jobs instead of 21,000 jobs.

Sierra Club also points to the Weinstein study to critique the claims related to employment supported by Marcellus Shale production activities. Sierra Club maintains that the Weinstein study shows that there are no significant differences in income and employment in counties in Pennsylvania with drilling operations versus counties without such operations. The Weinstein study compares employment and income growth rates between the counties with and without drilling operations for the period before the drilling boom (2001 to 2005) and a period during the drilling boom (2005 to 2009). According to Sierra Club, the Weinstein study shows that employment in counties without drilling operations grew at a 5.3 percent rate before the drilling boom while employment in counties with drilling operations grew at a 1.4 percent rate during the same period. According to Sierra Club, during the subsequent drilling boom years employment declined by 0.4 percent rate in non-drilling counties, whereas in drilling counties, employment declined at a slightly faster 0.6 percent rate. Sierra Club argues that the fact that the

growth rate declined at a slightly faster rate in counties with drilling operations belies the notion that the boom in drilling produces a significant number of jobs.

DOE/FE does not agree with the conclusions Sierra Club appears to draw from the Weinstein study. Sierra Club acknowledges that the finding that employment declined at a 0.2 percent faster rate in counties with drilling operations during the boom years “turns out to be too small to be statistically significant.”²¹⁴ The small difference in the employment changes could be the consequence of factors unrelated to natural gas production activities.

Additionally, the data from the Weinstein study presented by Sierra Club show that the growth rate for income in the counties with drilling operations increased substantially from 12.8 percent in the 2001-2005 period to 18.2 percent in the 2005-2009 period. By comparison, in the non-drilling counties, income growth increased from 12.6% in the 2001-2005 period to 13.6%, a substantially smaller amount. Sierra Club speculates that the large increase in the income growth rate for counties with drilling operations, when considered alongside the slight decline in the growth rate for jobs in the same counties, shows that the increased incomes likely went to landowners as lease payments for oil production and to some high-income or out-of-state workers but not to local communities in the producing regions. Nevertheless, even taking the findings of the Weinstein study relating to employment and income as Sierra Club presents them, we do not see substantial evidence of negative regional economic impacts from natural gas drilling operations, much less from the LNG exports proposed by FLEX.

Sierra Club also contends more broadly that extractive industries suffer from boom-bust cycles and therefore provide little lasting benefit to local communities. To the extent Sierra Club is claiming that the exports proposed by FLEX will physically exhaust existing resources, we

²¹⁴ Sierra Club Mot. at 13.

refer to Section VIII.C in which we conclude that record evidence indicates that there will be substantial supply into the foreseeable future. To the extent that the “bust” cycles Sierra Club envisions are brought on by price declines that render existing resources uneconomic to produce, we do not see compelling evidence that the exports will exacerbate this risk. If anything, it seems more likely that FLEX’s ability to export to non-FTA countries will deepen and diversify the market for U.S.-produced natural gas, making the potential for a precipitous price-driven downturn in production activities less likely, not more likely.

2. Price Impacts

As discussed above, the LNG Export Study projected the economic impacts of LNG exports in a range of scenarios, including scenarios that were near to and exceeded the 6.37 Bcf/d previously authorized by DOE/FE plus the 0.4 Bcf/d volume of exports proposed in the current Application. The LNG Export Study concluded that LNG exports at these levels (*e.g.*, 6 Bcf/d of natural gas and higher) would result in higher U.S. natural gas prices, but that these price changes would remain in a relatively narrow range across the scenarios studied. NERA’s analysis indicates that, after five years of increasing LNG exports, wellhead natural gas price increases could range from \$0.22 to \$1.11 (2010\$/Mcf) depending on the market-determined level of exports. However, even with these estimated price increases, NERA found that the United States would experience net economic benefits from increased LNG exports in all cases studied. *See supra* Section VI.B.1, 8.

Both APGA and Sierra Club contend that FLEX relied on outdated EIA data in this proceeding, and that DOE/FE instead should rely on the January 2012 EIA study that formed the first part of the LNG Export Study. They further argue that DOE/FE should rely on price estimates contained in the AEO 2012 Early Release Overview. We disagree. As explained in

detail in Section VIII.A, the LNG Export Study was based on AEO 2011 estimates, which were the most recent, final projections available at the time. Further, the AEO 2012 and AEO 2013 projections would not have yielded a materially different result. Accordingly, we reject the intervenors' arguments and find that, as to the impact of these LNG exports on domestic gas prices, intervenors have not overcome the statutory presumption that the requested authorization is consistent with the public interest.

3. Conditional Authorization

Sierra Club contends that DOE/FE may not lawfully issue a conditional authorization until a full EIS has been issued, on the theory that a conditional authorization may “‘limit the choice of reasonable alternatives,’ or ... ‘determine subsequent development.’”²¹⁵ We disagree with Sierra Club's contention. As we have explained, we are attaching a condition to this export authorization ordering that FLEX's authorization is contingent on both its satisfactory completion of the environmental review process and its on-going compliance with any and all preventative and mitigative measures imposed at the Freeport Terminal by federal or state agencies. When the environmental review is complete, DOE/FE will reconsider its public interest determination in light of the information gathered as part of that review. This procedure will not foreclose the choice of reasonable alternatives or influence subsequent development.

C. Significance of the LNG Export Study

For the reasons discussed above, DOE/FE commissioned the LNG Export Study and invited the submission of responsive comments. DOE/FE has analyzed this material and determined that the LNG Export Study provides substantial support for conditionally granting FLEX's Application in this proceeding. The conclusion of the LNG Export Study is that the

²¹⁵ Sierra Club Mot. at 54 (quoting 40 C.F.R. § 1506.1).

United States will experience net economic benefits from issuance of authorizations to export domestically produced LNG. We have evaluated the initial and reply comments submitted in response to the LNG Export Study. Various commenters have criticized the data used as inputs to the LNG Export Study and numerous aspects of the models, assumptions, and design of the Study. As discussed above, however, we find that the LNG Export Study is fundamentally sound and supports the proposition that the proposed authorization will not be inconsistent with the public interest.

D. Benefits of International Trade

We have not limited our review to the contents of the LNG Export Study but have considered a wide range of other information. For example, the National Export Initiative, established by Executive Order, sets an Administration goal to “improve conditions that directly affect the private sector’s ability to export” and to “enhance and coordinate Federal efforts to facilitate the creation of jobs in the United States through the promotion of exports.”²¹⁶

We have also considered the international consequences of our decision. We 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. Also, we note that to the extent U.S. exports can counteract concentration within global LNG markets, thereby diversifying international supply options and improving energy security for many of this country’s allies and trading partners, authorizing U.S. exports may advance the public interest for reasons that are distinct from and additional to the economic benefits identified in the LNG Export Study.

²¹⁶ NEI, 75 Fed. Reg. at 12,433.

E. Other Considerations

Our decision is not premised on an uncritical acceptance of the general conclusion of the LNG Export Study of net economic benefits from LNG exports. Both the LNG Export Study and many public comments identify significant uncertainties and even potential negative impacts from LNG exports. The economic impacts of higher natural gas prices and potential increases in gas price volatility are two of the factors that we view most seriously. Yet we also have taken into account factors that could mitigate such impacts, such as the current oversupply situation and data indicating that the natural gas industry would increase natural gas supply in response to increasing exports. Further, we agree with FLEX's observation 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. *See supra* Section VII.D.2. On balance, we find that the potential negative impacts of FLEX's proposed exports are outweighed by the likely net economic benefits and by other non-economic or indirect benefits.

More generally, DOE/FE continues to subscribe to the principle set forth in our 1984 Policy Guidelines²¹⁷ 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.²¹⁸ Given

²¹⁷ 49 Fed. Reg. at 6684.

²¹⁸ We understand that some commenters, including Jayanta Sinha, President of GAIL Global, Inc., would like DOE to clarify the circumstances under which the agency would exercise its authority to revoke (in whole or in part) previously issued LNG export authorizations. We cannot precisely identify all the circumstances under which such action would be taken. We reiterate our observation in *Sabine Pass* that: "In the event of any unforeseen developments of such significant consequence as to put the public interest at risk, DOE/FE is fully authorized to take

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

F. Conclusion

We have reviewed the evidence in the record and have not found adequate basis to conclude that FLEX's export of LNG to non-FTA countries will be inconsistent with the public interest. For that reason, we are authorizing FLEX's proposed exports to non-FTA countries subject to the limitations and conditions described in this Order.

We have considered the cumulative impacts of past authorizations in our decision. In this case, we do not find that opponents of the Application have overcome the statutory presumption that the proposed export authorization is consistent with the public interest. By conditionally authorizing exports of LNG in a volume equivalent to 0.4 Bcf/d of natural gas (146 Bcf/yr) in this proceeding, DOE/FE will have cumulatively authorized non-FTA exports totaling 6.77 Bcf/d of natural gas, or 2.471 Tcf/yr, for the one final and four conditional export authorizations granted to date—Sabine Pass (2.2 Bcf/d), Freeport I (1.4 Bcf/d), Lake Charles Exports (2.0 Bcf/d), Dominion Cove Point (0.77 Bcf/d), and the current authorization—Freeport II (0.4 Bcf/d). We note that this total export volume only moderately exceeds the 6 Bcf/d volume evaluated by NERA in its “low” export cases.²¹⁹ DOE/FE will continue taking a measured approach in reviewing the other pending applications to export domestically produced LNG. 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

action as necessary to protect the public interest. Specifically, DOE/FE is authorized by section 3(a) of the Natural Gas Act ... to make a supplemental order as necessary or appropriate to protect the public interest. Additionally, DOE is authorized by section 16 of the Natural Gas Act ‘to perform any and all acts and to prescribe, issue, make, amend, and rescind such orders, rules, and regulations as it may find necessary or appropriate’ to carry out its responsibilities.” *Sabine Pass*, Order No. 2961, at 33 n.45 (quoting 15 U.S.C. § 717o).

²¹⁹ See *supra* at Section VI.B.3. NERA's three “low” cases—Low/Slow, Low/Rapid, and Low/Slowest—were set at 6 Bcf/d of natural gas, with each having different rates for the phase-in of new exports. NERA study at 26.

gas supply and demand fundamentals. In keeping with the performance of its statutory responsibilities, DOE/FE will attach appropriate and necessary terms and conditions to authorizations to ensure that the authorizations are utilized in a timely manner and that authorizations are not issued except where the applicant can show that there are or will be facilities capable of handling the proposed export volumes and existing and forecast supplies that support that action. Other conditions will be applied as necessary.

The reasons in support of proceeding cautiously are several: (1) the 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 a 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, as previously stated, to attach terms and conditions to the authorization in this proceeding and to succeeding LNG export authorizations as are necessary for protection of the public interest.

We emphasize that the conditional authorization announced in this Order applies only to the exports proposed by FLEX in this proceeding. In connection with the LNG Export Study, DOE received numerous comments relating to the total volume of LNG exports to non-FTA countries that might ultimately be authorized, as well as comments relating to the timing and

sequencing of possible future authorizations.²²⁰ All comments related to the LNG Export Study will become part of any export proceeding for which the LNG Export Study is used to inform DOE's public interest determination. Because we are acting only on the Application before us and make no decisions regarding future cases, comments relating to the total volume of LNG exports ultimately authorized or the timing or sequencing of possible future authorizations need not be decided in this proceeding.

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. The reasons for each term or condition are explained below. FLEX must abide by each term and condition or face rescission of its authorization or other appropriate sanction.

A. Term of the Authorization

FLEX has requested a 25-year term for the authorization commencing from the date export operations begin. However, because the NERA study contains projections over a 20-year period beginning from the date of first export,²²¹ we believe that caution recommends limiting this conditional authorization to no longer than a 20-year term beginning from the date of first export. In imposing this condition, we are mindful that LNG export facilities are capital intensive and that, to obtain financing for such projects, there must be a reasonable expectation that the

²²⁰ Several commenters, including Susan Sakmar, Leny Mathews, Alcoa Energy, IECA, and Citizens Against LNG, advocate against unlimited LNG exports. These and other commenters urge DOE/FE to limit the total volume of LNG to be exported, assert that DOE/FE should issue a policy detailing its plan for granting LNG export licenses and for monitoring cumulative impacts, and propose that DOE/FE "phase in" the approval of LNG export projects to minimize potential price impacts. Although DOE/FE is not taking any of these actions at this time, it is monitoring the LNG export landscape as it evolves, as explained above. Because these comments are now part of the record in each individual docket proceeding, *see* 77 Fed. Reg. at 73,629, DOE/FE will consider them in the course of reviewing each application and the cumulative impact of prior authorizations.

²²¹ NERA study at 5 ("Results are reported in 5-year intervals starting in 2015. These calendar years should not be interpreted literally but represent intervals after exports begin. Thus if the U.S. does not begin LNG exports until 2016 or later, one year should be added to the dates for each year that exports commence after 2015.").

authorization will continue for a term sufficient to support repayment. We find that a 20-year term is likely sufficient to achieve this result. It is also consistent with the 20-year term authorized by DOE/FE in the final and conditional non-FTA export authorizations issued to date.²²²

B. Commencement of Operations Within Seven Years

FLEX requested this conditional authorization to commence on the earlier of the date of first export or eight years from the date of the issuance of this Order. Consistent with the final and conditional non-FTA authorizations granted to date,²²³ DOE/FE will add a condition that FLEX 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 operations.

C. Transfer, Assignment, or Change in Control

DOE/FE's natural gas import/export 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.²²⁴ As a condition of the similar authorization issued to Sabine Pass in Order No. 2961, DOE/FE found that the requirement for prior approval by the Assistant Secretary under its regulations applies to any change of effective control of the authorization holder either through asset sale or stock transfer or by other means. This condition was deemed necessary to ensure that, prior to any transfer or change in control,

²²² *Sabine Pass*, DOE/FE Order No. 2961-A, at 29; *Freeport LNG*, DOE/FE Order No. 3282, at 122; *Lake Charles Exports*, DOE/FE Order No. 3324, at 135; *Dominion Cove Point*, DOE/FE Order No. 3331, at 144-45.

²²³ *Sabine Pass*, DOE/FE Order No. 2961-A, at 33; *Freeport LNG*, DOE/FE Order No. 3282, at 122; *Lake Charles Exports*, DOE/FE Order No. 3324, at 128; *Dominion Cove Point*, DOE/FE Order No. 3331, at 145.

²²⁴ 10 C.F.R. § 590.405.

DOE/FE will be given an adequate opportunity to assess the public interest impacts of such a transfer or change.

To clarify its interpretation of its regulations, DOE/FE will construe a change of 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. A rebuttable presumption that control exists will arise from the ownership or the power to vote, directly or indirectly, 10 percent or more of the voting securities of such entity.

D. Agency Rights

As described above, FLEX requests authorization to export LNG on its own behalf or as agent for other entities. DOE/FE previously addressed the issue of agency rights in Order No. 2913,²²⁵ which granted FLEX authority to export LNG to FTA countries. In that order, DOE/FE approved a proposal by FLEX to register each LNG title holder for whom FLEX sought to export LNG as agent. DOE/FE found that this proposal was an acceptable alternative to the non-binding policy adopted by DOE/FE in *Dow Chemical*, which established that the title for all LNG authorized for export must be held by the authorization holder at the point of export.²²⁶ We find that the same policy considerations that supported DOE/FE's acceptance of the alternative registration proposal in Order No. 2913 apply here as well. DOE/FE reiterated its policy on

²²⁵ *Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC*, DOE/FE Order No. 2913, Order Granting Long-Term Authorization to Export Liquefied Natural Gas from Freeport LNG Terminal to Free Trade Nations (Feb. 10, 2011).

²²⁶ *Dow Chem. Co.*, DOE/FE Order No. 2859, at 7-8, *discussed in Freeport LNG*, DOE/FE Order No. 2913, at 7-8.

Agency Rights procedures in *Gulf Coast LNG Export, LLC*.²²⁷ In *Gulf Coast*, DOE/FE confirmed 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.²²⁸

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

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

DOE/FE's regulations require applicants to supply transaction-specific factual information "to the extent practicable."²²⁹ Additionally, DOE/FE regulations allow confidential treatment of the information supplied in support of or in opposition to an application if the submitting party requests such treatment, shows why the information should be exempted from public disclosure, and DOE/FE determines it will be afforded confidential treatment in accordance with 10 C.F.R. § 1004.11.²³⁰

DOE/FE will require that FLEX file or cause to be filed with DOE/FE any relevant long-term commercial agreements, including LTAs, pursuant to which FLEX exports LNG on its own behalf or as agent for a Registrant. We note that FLEX has complied with this requirement in connection with its LTAs executed with Osaka Gas Company, Ltd., Chubu Electric Power

²²⁷ *Gulf Coast LNG Export, LLC*, DOE/FE Order No. 3163, Order Granting Long-Term Multi-Contract Authority to Export LNG by Vessel from the Proposed Brownsville Terminal to Free Trade Agreement Nations (Oct. 16, 2012).

²²⁸ *See id.* at 7-8.

²²⁹ 10 C.F.R. § 590.202(b).

²³⁰ *Id.* § 590.202(e).

Company, Inc., BP Energy Company, SK E&S LNG, LLC, and Toshiba Corporation, as stated in its letters filed with DOE/FE on April 12, 2013, and October 25, 2013. *See supra* Sections IV.A.3 and IV.C.

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). By way of example and without limitation, a “relevant long-term commercial agreement” would include an agreement with a minimum term of two years (such as a LTA), an agreement to provide gas processing or liquefaction services at the Freeport Terminal, a long-term sales contract involving natural gas or LNG stored or liquefied at the Freeport Terminal, or an agreement to provide export services from the Freeport Terminal.

In addition, DOE/FE finds that section 590.202(c) of DOE/FE’s regulations²³¹ requires that FLEX file, or cause to be filed, all long-term contracts associated with the long-term supply of natural gas to the Freeport Terminal, whether signed by FLEX or the Registrant, within 30 days of their execution.

DOE/FE recognizes that some information in FLEX’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 Freeport Terminal, may be commercially sensitive. DOE/FE therefore will provide FLEX the option to file or cause to be filed either unredacted contracts, or in the alternative (A) FLEX 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

²³¹ *Id.* § 590.202(c).

contract(s) including, but not limited to, the parties to each contract, contract term, quantity, any take or pay or equivalent provisions/conditions, destinations, re-sale provisions, and other relevant provisions; and (B) the filing must demonstrate why the redacted information should be exempted from public disclosure.

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.

F. Export Quantity

We are not granting the Application in the full export quantity requested in the Application, and instead will grant the requested authorization only to the extent of the liquefaction capacity of the Liquefaction Project. As explained in Section IV.B, FLEX currently seeks export authorization in a volume equivalent to 1.4 Bcf/d (511 Bcf/yr) of natural gas in addition to the same amount already conditionally authorized by DOE/FE in *Freeport I* (Order No. 3282), for a total combined export volume of 2.8 Bcf/d of natural gas. As stated above, however, FLEX has notified FERC that the Liquefaction Project will have a liquefaction capacity of 1.8 Bcf/d of natural gas—not the 2.8 Bcf/d requested in total. There is no basis for authorizing exports in excess of the maximum liquefaction capacity of a planned facility. Consequently, this Order will authorize the export of LNG up to the equivalent of 0.4 Bcf/d (146 Bcf/yr) of natural gas, which represents the marginal difference between FLEX's conditional authorization of 1.4 Bcf/d in *Freeport I* and the Project's planned liquefaction capacity of 1.8 Bcf/d.

G. Combined FTA and Non-FTA Export Authorization Volume

As stated above, FLEX is currently authorized to export LNG to: (1) FTA countries, in an amount equivalent to approximately 2.8 Bcf/d (1022 Bcf/yr) of natural gas as authorized in DOE/FE Order No. 2913 and DOE/FE Order No. 3066 (each authorizing exports of 1.4 Bcf/d, or 511 Bcf/yr of natural gas), and (2) non-FTA countries, in an amount equivalent to approximately 1.4 Bcf/d (511 Bcf/yr) of natural gas as conditionally authorized in DOE/FE Order No. 3282.

In this proceeding, FLEX seeks authorization to export a volume equivalent to an additional 1.4 Bcf/d of natural gas to non-FTA countries under NGA section 3(a). For the reasons explained above, the authorization issued in this Order will be limited to exports of 0.4 Bcf/d (146 Bcf/yr) of natural gas to non-FTA nations. Because the source of LNG proposed for export for all four of FLEX's export authorizations is from the same facility (Freeport Terminal), FLEX may not treat the volumes authorized for export in these proceedings as additive to one another.

H. Environmental Review

As explained above, DOE/FE intends to complete its NEPA review as a cooperating agency in FERC's review of the Liquefaction Project. The authorization issued in this Order will be conditioned on FLEX's satisfactory completion of the environmental review process.²³²

Accordingly, this conditional Order makes preliminary findings and indicates to the parties DOE/FE's determination at this time on all but the environmental issues in this proceeding. All parties are advised that the issues addressed herein regarding the export of natural gas will be reexamined at the time of DOE/FE's review of the FERC environmental analysis. Inasmuch as DOE/FE is a cooperating agency in the FERC environmental review,

²³² 10 C.F.R. § 590.402 (authorizing DOE/FE to issue a conditional order prior to issuance of a final opinion and order).

persons wishing to raise questions regarding the environmental review of the present Application are responsible for doing so within the FERC proceedings. As explained in the *Sabine Pass* orders, DOE/FE's participation as a cooperating agency in the FERC proceeding is intended to avoid duplication of effort by agencies with overlapping environmental review responsibilities, to achieve early coordination among agencies, and to concentrate public participation in a single forum.²³³

Insofar as a participant in the FERC proceeding actively raises concerns over the scope or substance of environmental review but is unsuccessful in securing that agency's consideration of its stated interests, DOE/FE reserves the right to address the stated interests within this proceeding. However, absent a showing of good cause for a failure of interested persons to participate in the FERC environmental review proceeding, DOE/FE may dismiss such claims if raised out of time in this proceeding.

XI. FINDINGS

On the basis of the findings and conclusions set forth above, we find that it has not been shown that a grant of the requested authorization will be inconsistent with the public interest, and we further find that the Application should be granted subject to the terms and conditions set forth herein.

XII. ORDER

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

A. FLEX is authorized to export domestically produced LNG by vessel from the Freeport LNG Terminal on Quintana Island, Texas, up to the equivalent of 146 Bcf/yr of natural

²³³ *Sabine Pass*, DOE/FE Order No. 2961, at 40-41; *Sabine Pass Liquefaction, LLC*, DOE/FE Order No. 2961-B, Opinion and Order Denying Request for Rehearing of Order Denying Motion for Late Intervention, Dismissing Request for Rehearing of Order No. 2961-A, and Dismissing Motion for a Stay Pendente Lite, at 4 (Jan. 25, 2013).

gas for a term of 20 years to commence on the earlier of the date of first export or seven years from the date that this Order is issued. FLEX is authorized to export this LNG on its own behalf or 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. FLEX must commence export operations using the planned liquefaction facilities no later than seven years from the date of issuance of this Order.

C. The LNG export quantity authorized in this Order is equivalent to 146 Bcf/yr of natural gas. This quantity is not additive to FLEX's FTA authorizations in DOE/FE Order Nos. 2913 and 3066 or the conditional non-FTA authorization in DOE/FE Order No. 3282.

D. This LNG may be exported to any country with which the United States does not have an FTA requiring the 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 United States law or policy.

E. FLEX shall ensure that all transactions authorized by this Order are permitted and lawful under United States laws and policies, including the rules, regulations, orders, policies, and other determinations of the Office of Foreign Assets Control of the United States Department of the Treasury and FERC. Failure to comply with this requirement could result in rescission of this authorization and/or other civil or criminal remedies.

F. The authorization granted by this Order is conditioned on FLEX's satisfactory completion of the environmental review process under NEPA in FERC Docket No. CP12-509 and on issuance by DOE/FE of a finding of no significant impact or a record of decision pursuant to NEPA. Additionally, the authorization is conditioned on FLEX's on-going compliance with

any and all preventative and mitigative measures at the Freeport LNG Terminal imposed by federal or state agencies.

G. (i) FLEX shall file, or cause others to file, with the Office of Oil and Gas Global Security and Supply a non-redacted copy of all executed long-term contracts associated with the long-term export of LNG on its own behalf or as agent for other entities from the Freeport LNG Terminal. The non-redacted copies may be filed under seal and must be filed within 30 days of their execution. Additionally, if FLEX has filed the contracts described in the preceding sentence under seal or subject to a claim of confidentiality or privilege, within 30 days of their execution, FLEX shall also file, or cause others to file, for public posting either: i) a redacted version of the contracts described in the preceding sentence, or ii) major provisions of the contracts. In these filings, FLEX shall state why the redacted or non-disclosed information should be exempted from public disclosure.

(ii) FLEX shall file, or cause others to file, with the Office of Oil and Gas Global Security and Supply a non-redacted copy of all executed long-term contracts associated with the long-term supply of natural gas to the Freeport LNG Terminal. The non-redacted copies may be filed under seal and must be filed within 30 days of their execution. Additionally, if FLEX has filed the contracts described in the preceding sentence under seal or subject to a claim of confidentiality or privilege, within 30 days of their execution, FLEX shall also file, or cause others to file, for public posting either: i) a redacted version of the contracts described in the preceding sentence, or ii) major provisions of the contracts. In these filings, FLEX shall state why the redacted or non-disclosed information should be exempted from public disclosure.

H. FLEX, or others for whom FLEX acts as agent, shall include the following provision in any agreement or other contract for the sale or transfer of LNG exported 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 D of DOE Order No. 3357, issued November 15, 2013, in FE Docket No. 11-161-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 Freeport LNG Expansion, L.P.; FLNG Liquefaction, LLC; FLNG Liquefaction 2, LLC; and/or FLNG Liquefaction 3, LLC (collectively, FLEX) that identifies the country of destination, upon delivery, into which the exported LNG was actually delivered, and to include in any resale contract for such LNG the necessary conditions to insure that FLEX is made aware of all such actual destination countries.”

I. FLEX is permitted to use its authorization in order to export LNG as agent for other entities, after registering the other parties with DOE/FE. Registration materials shall include an acknowledgement and agreement by the Registrant to supply FLEX with all information necessary to permit FLEX 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; (4) within 30 days of execution, a copy of any long-term contracts not previously filed with DOE/FE, described in Ordering Paragraph (G) of this Order.

J. Each registration submitted pursuant to this Order shall have current information on file with DOE/FE. Any changes in company name, contact information, change in term 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. As a condition of this authorization, FLEX shall ensure that all persons required by this Order to register with DOE/FE have done so. Any failure by FLEX to ensure that all such persons or entities are registered with DOE/FE shall be grounds for rescinding in whole or in part the authorization.

L. Within two weeks after the first export of domestically produced LNG occurs from the Freeport LNG Terminal on Quintana Island, Texas, FLEX shall provide written notification of the date that the first export of LNG authorized in Ordering Paragraph A above occurred.

M. FLEX shall file with the Office of Oil and Gas Global Security and Supply, on a semi-annual basis, written reports describing the progress of the proposed Liquefaction Project. The reports shall be filed on or by April 1 and October 1 of each year, and shall include information on the progress of the Liquefaction Project, the date the liquefaction facility is expected to be operational, and the status of the long-term contracts associated with the long-term export of LNG and any long-term supply contracts.

N. Prior to any change in control of the authorization holder, FLEX must obtain the approval of the Assistant Secretary for Fossil Energy. For purposes of this Ordering Paragraph, a “change of control” shall include any change, directly or indirectly, of the power to direct the management or policies of FLEX, 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.

O. Monthly Reports: With respect to the LNG exports authorized by this Order, FLEX shall file with the Office of Oil and Gas Global Security and Supply, within 30 days following the last day of each calendar month, a report 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) of destination into which the exported LNG was actually delivered; (6) the name of the supplier/seller; (7) the volume in 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 shall be made to U.S. Department of Energy (FE-34), Office of Fossil Energy, Office of Oil and Gas Global Security and Supply, P.O. Box 44375, Washington, D.C. 20026-4375, Attention: Natural Gas Reports. Alternatively, reports may be e-mailed to ngreports@hq.doe.gov or may be faxed to Natural Gas Reports at (202) 586-6050.

Q. The Amendment and Supplement to FLEX’s Application submitted by FLEX on September 19, 2013, seeking to include FLNG Liquefaction 2 and FLNG Liquefaction 3 as additional applicants in this docket, is granted.

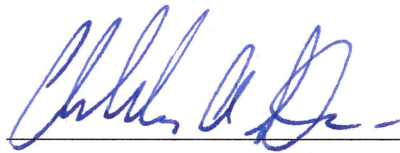
R. Following the convention used by the applicants, the above Order, including Ordering Paragraphs A through Q, uses the term “FLEX” to refer to Freeport LNG Expansion, L.P.; FLNG Liquefaction, LLC; FLNG Liquefaction 2, LLC; and FLNG Liquefaction 3, LLC, collectively. DOE/FE, however, is issuing a single conditional authorization in this Order to be managed jointly by these four entities. Therefore, all obligations arising under this conditional authorization apply equally to Freeport LNG Expansion, L.P.; FLNG Liquefaction, LLC; FLNG Liquefaction 2, LLC; and FLNG Liquefaction 3, LLC.

S. The motions to intervene submitted in this proceeding by GCELC, APGA, and Sierra Club are granted.

T. The motion to reply filed by Sierra Club on May 30, 2012, is granted.

U. The late-filed motions to intervene filed by America’s Energy Advantage, Inc., on September 18, 2013, and by IECA on September 19, 2013, are denied.

Issued in Washington, D.C., November 15, 2013.



Christopher A. Smith
Assistant Secretary for Fossil Energy (Acting)