ORAL ARGUMENT NOT YET SCHEDULED

No. 16-1253

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB,

Petitioner,

v.

UNITED STATES DEPARTMENT OF ENERGY,

Respondent,

AMERICAN PETROLEUM INSTITUTE, LLC, ET AL.,

Intervenors for Respondent.

On Petition for Review of Orders of the Department of Energy 3638 (May 12, 2015) and 3638-A (May 26, 2016)

PROOF OPENING BRIEF OF PETITIONER SIERRA CLUB

Dated: November 30, 2016.

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CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES

A. Parties

1. Petitioner

Sierra Club

2. Respondent

United States Department of Energy

3. Intervenors

American Petroleum Institute
Cheniere Marketing, LLC
Corpus Christi Liquefaction, LLC

B. Rulings Under Review

1. U.S. Department of Energy, Order 3638, DOE/FE Docket No. 12-97-LNG, *Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Proposed Corpus Christi Liquefaction Project to be Located in Corpus Christi, Texas, to Non-Free Trade Agreement Nations* (May 12, 2015); and

2. U.S. Department of Energy, Order 3638-A, DOE/FE Docket No. 12-97-LNG, *Opinion and Order Denying Request for Rehearing of Order Granting Long-term, Multi Contract Authorization to Export Liquefied Natural Gas by Vessel from the Proposed Corpus Christi Liquefaction Project to be Located in Corpus Christi, Texas, to Non-Free Trade Agreement Nations* (May 26, 2016).

C. Statement of Related Cases

Pursuant to Circuit Rule 28(a)(1)(C), the undersigned states that some of the issues raised in this case are similar to the issues raised in the following pending cases:

1. *Sierra Club v. Dept. of Energy*, D.C. Circuit Case No. 15-1489, concerning the Department of Energy's authorization of liquefied natural gas exports from the Freeport, Texas, facility, raises NEPA and Natural Gas Act issues similar to those here. Final briefs in that case were filed July 5, 2016, but that case has not yet been set for argument.
2. *Sierra Club v. Dept. of Energy*, D.C. Circuit Case No. 16-1186, concerning the Department of Energy's authorization of liquefied natural gas exports from the Cove Point, Maryland, facility, raises NEPA and Natural Gas Act issues similar to those here. At the time of this filing, briefing in No. 16-1186 is underway, and the case has not been argued.
3. *Sierra Club v. Dept. of Energy*, D.C. Circuit Case No. 16-1252, concerning the Department of Energy's authorization of exports from the Sabine Pass, Louisiana, facility. The Respondent-

Intervenor project applicants in that petition and this one are all subsidiaries of Cheniere Energy, Inc., and the Department of Energy Orders denying rehearing in the that proceeding and this one were issued on the same day and share much of the same language. Many of the issues in the two cases are similar, although the underlying records differ. For example, No. 16-1252 involves an Environmental Assessment, whereas this case involves an Environmental Impact Statement. The Court has granted the parties' motion to have these cases briefed simultaneously.

RULE 26.1 DISCLOSURE STATEMENT

Pursuant to Rule 26.1 of the Federal Rules of Appellate Procedure and Circuit Rule 26.1, Petitioner Sierra Club respectfully submits the following disclosures:

Sierra Club has no parent companies and no publicly held company has a 10% or greater ownership interest in Sierra Club.

Sierra Club, a corporation organized and existing under the laws of the State of California, is a national nonprofit organization dedicated to the protection and enjoyment of the environment.

TABLE OF CONTENTS

CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES i

RULE 26.1 DISCLOSURE STATEMENT iv

TABLE OF CONTENTS v

TABLE OF AUTHORITIES viii

GLOSSARY OF ABBREVIATIONS xiii

JURISDICTION 1

ISSUES FOR REVIEW 1

STATUTES AND REGULATIONS 3

STATEMENT OF THE CASE 4

I. Introduction 4

II. Legal Framework 8

A. Natural Gas Act 8

B. National Environmental Policy Act 10

III. Natural Gas Exports 14

A. The Energy Information Administration's Models and Forecasts 16

B. Cheniere's Corpus Christi Export Application 23

C. DOE's "Environmental Addendum" 25

D. Review and Authorization of Cheniere's Proposal 28

IV. U.S. Climate Policy 31

SUMMARY OF ARGUMENT 33

STANDING **35**

ARGUMENT **36**

I. Standard of Review **36**

II. NEPA **37**

A. DOE's Authorization Will Have Foreseeable Indirect Environmental Impacts *37*

1. Exports Are Foreseeable 40

2. Environmental Impacts of Export-Induced Gas Production Are Foreseeable 43

i. Climate Impacts of Gas Production 45

ii. Both Gas Production and Environmental Impacts Can Be Foreseen At Regional Scales 47

iii. Local Impacts Cannot Be Excluded from NEPA Review 54

B. Exports Will Foreseeably Increase U.S. Coal Use *55*

C. Exports Will Have Foreseeable Impacts "Downstream" of the Export Terminal *60*

D. Public Citizen Does Not Condone Excluding Increased Gas Production and Coal Use from DOE's NEPA Review *63*

E. The Addendum and Related Reports Do Not Substitute for an Environmental Impact Statement *67*

III. Natural Gas Act **72**

A. DOE Ignored Unequal Distribution of Exports' Impacts *72*

B. Because DOE Provided No Evaluation of Severity of Environmental Impacts, It Had No Basis for Concluding Exports' Benefits Outweighed Environmental Harms *75*

CONCLUSION **77**

CERTIFICATE OF COMPLIANCE WITH WORD LIMITATION .78

CERTIFICATE OF SERVICE 79

TABLE OF AUTHORITIES

Cases

Anderson v. Evans,
371 F.3d 475 (9th Cir. 2004) 72

Baltimore Gas & Elec. Co. v. Natural Res. Def. Council,
462 U.S. 87 (1983) 13

Barnes v. U.S. Dep't of Transp.,
655 F.3d 1124 (9th Cir. 2011) 38

Blue Ridge Envtl. Def. League v. Nuclear Regulatory Comm'n,
716 F.3d 183 (D.C. Cir. 2013) 42

Cal. Wilderness Coal. v. DOE,
631 F.3d 1072 (9th Cir. 2011) 55

Calvert Cliffs' Coordinating Comm., Inc. v. U.S. Atomic Energy Comm'n,
449 F.2d 1109 (D.C. Cir. 1971) 65

Citizens Against Rails-to-Trails v. Surface Transp. Bd.,
267 F.3d 1144 (D.C. Cir. 2001) 64

City of Davis v. Coleman,
521 F.2d 661 (9th Cir. 1975) 41, 66

* *Del. Riverkeeper Network v. FERC*,
753 F.3d 1304 (D.C. Cir. 2014) 7, 12, 36, 41, 42

Delaware Dep't of Nat. Res. & Envtl. Control v. EPA,
785 F.3d 1 (D.C. Cir. 2015) 66

Department of Transportation v. Public Citizen,
541 U.S. 752 (2004) 34, 63, 64

Esch v. Yeutter,
876 F.2d 976 (D.C. Cir. 1989) 17

Found. on Econ. Trends v. Heckler,
756 F.2d 143 (D.C. Cir. 1985) 10

Friends of the Earth, Inc. v. Laidlaw Envtl. Servs. (TOC),
528 U.S. 167 (2000) 35

Gas Appliance Mfrs. Ass'n, Inc. v. DOE,
998 F.2d 1041 (D.C. Cir. 1993) 37

Kent Cty., Delaware Levy Court v. EPA,
963 F.2d 391 (D.C. Cir. 1992) 17

Mayo Found. V. Surface Transp. Bd.,
472 F.3d 545 (8th Cir. 2006) 50, 59

* *Mid States Coal. For Progress v. Surface Transp. Bd.*,
345 F.3d 520 (8th Cir. 2003) 38, 43, 54, 55, 61, 65

Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.,
463 U.S. 29 (1983) 36, 75

Myersville Citizens for a Rural Cmty., Inc. v. FERC,
783 F.3d 1301 (D.C. Cir. 2015) 9, 64

N. Air Cargo v. U.S. Postal Serv.,
674 F.3d 852 (D.C. Cir. 2012) 67

N. Dakota v. EPA,
136 S. Ct. 999 (2016) 32, 57

NAACP v. Fed. Power Comm'n,
425 U.S. 662 (1976) 9, 64

O'Reilly v. Army Corps of Eng'rs,
477 F.3d 225 (5th Cir. 2007) 66

Save Our Sonoran, Inc. v. Flowers,
408 F.3d 1113 (9th Cir. 2005) 66

* *Scientists' Inst. for Pub. Info. v. Atomic Energy Comm'n*,
481 F.2d 1079 (D.C. Cir. 1973) 55, 56, 61

Sierra Club v. Army Corps of Eng'rs,
803 F.3d 31 (D.C. Cir. 2015) 66

* *Sierra Club v. FERC*,
827 F.3d 36 (D.C. Cir. 2016) ("*Freeport*") 10, 13, 30, 37, 40, 41, 64, 66

Sierra Club v. FERC,
No. 15-1133, 2016 WL 6915537 (D.C. Cir. Nov. 4, 2016) ("*Corpus Christi*") 29

Sierra Club v. Marsh,
769 F.2d 868 (1st Cir. 1985) 39

WildEarth Guardians v. Jewell,
738 F.3d 298 (D.C. Cir. 2013) 36

Statutes

* 15 U.S.C. § 717b(a) 9, 72

15 U.S.C. § 717b(c) 9

15 U.S.C. § 717b(e)(1) 9

15 U.S.C. § 717r(a) 1

15 U.S.C. § 717r(b) 1, 36

42 U.S.C. § 4332(C) 70

Other Authorities

* EIA, Effect of Increased Levels of Liquefied Natural Gas Exports on U.S. Energy Markets (Oct. 29, 2014) ("2014 Export Study") . 17, 19, 20, 41, 54, 56, 57, 58, 63

* EIA, Effect of Increased Natural Gas Exports on Domestic Energy Markets (January 2012) ("2012 Export Study") 4, 15, 16, 17, 19, 20, 73

Merriam Webster Unabridged Dictionary (online ed. 2016).....72

S. Rep. No. 91-296 (1969), *reprinted in* 1969 U.S.C.C.A.N. 2751 11

Regulations

40 C.F.R § 1501.5 13

40 C.F.R § 1501.6 13

40 C.F.R. § 1502.14 .....69, 70

40 C.F.R. § 1502.16(c).....70

* 40 C.F.R. § 1502.22.....69

* 40 C.F.R. § 1502.22(a) 12, 50, 53

* 40 C.F.R. § 1502.22(b) 12

40 C.F.R. § 1506.3 13

40 C.F.R. § 1506.3(c).....13

* 40 C.F.R. § 1508.7.....11, 12

* 40 C.F.R. § 1508.8(b) 5, 11, 37, 38

40 C.F.R. § 1508.25 13

Administrative Orders

Corpus Christi Liquefaction, LLC, 149 FERC ¶ 61,283 (Dec. 30, 2014) 29

DOE, Order 3638, DOE/FE Docket No. 12-97-LNG, *Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Proposed Corpus Christi Liquefaction Project to be Located in Corpus Christi, Texas, to Non-Free Trade Agreement Nations* (May 12, 2015) ("Authorization Order") 5, 6, 8, 9, 12, 25, 26, 30, 39, 40, 41, 42, 43, 44, 46, 48, 50, 51, 56, 57, 60, 61, 64, 67, 68, 75, 76, 77

DOE, Order 3638-A, DOE/FE Docket No. 12-97-LNG, *Opinion and Order Denying Request for Rehearing of Order Granting Long-term, Multi Contract Authorization to Export Liquefied Natural Gas by Vessel from the Proposed Corpus Christi Liquefaction Project to be Located in Corpus Christi, Texas, to Non-Free Trade Agreement Nations* (May 26, 2016) ("Rehearing Order").. 17, 30, 40, 44, 45, 46, 47, 48, 50, 53, 56, 58, 63, 65, 66, 71, 74

Federal Register Notices

76 Fed. Reg. 48,208 (Aug. 8, 2011)..... 51

79 Fed. Reg. 32,258 (June 4, 2014) 25

79 Fed. Reg. 34,830 (June 19, 2014) 32

79 Fed. Reg. 48,132 (Aug. 15, 2014)..... 13

80 Fed. Reg. 18,557 (Apr. 7, 2015) 14

80 Fed. Reg. 28,256 (May 18, 2015) 30, 67

*Authorities chiefly relied upon are marked with an asterisk.

GLOSSARY OF ABBREVIATIONS

Pursuant to Circuit Rule 28(a)(3), the following is a glossary of acronyms and abbreviations used in this brief. For the convenience of the Court, this glossary also includes acronyms and abbreviations used in the cited portions of the Joint Appendix but not appearing in this brief:

2012 Export Study	U.S. Energy Information Administration, Effect of Increased Natural Gas Exports on Domestic Energy Markets (January 2012)
2014 Export Study	U.S. Energy Information Administration, Effect of Increased Levels of Liquefied Natural Gas Exports on U.S. Energy Markets (Oct. 29, 2014)
Addendum	U.S. Department of Energy, Final Addendum to Environmental Review Documents Concerning Exports of Natural Gas from the United States (Aug. 15, 2014)
Application	Cheniere Marketing, LLC, DOE/FE Dkt. 12-97-LNG, Application For Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Countries
Authorization Order	U.S. Department of Energy, Order 3638, DOE/FE Dkt. 12-97-LNG, *Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas By Vessel from the Proposed Corpus Christi Liquefaction Project to be*

	Located in Corpus Christi, Texas, to Non-Free Trade Agreement Nations (May 12, 2015)
bcf/d	billion cubic feet per day
bcf/y	billion cubic feet per year
Btu	British thermal units
CAMx	Comprehensive Air-quality Model with extensions
CEQ Greenhouse Gas Guidance	Council on Environmental Quality, Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions (Aug. 1, 2016)
Climate Action Plan	Executive Office of the President, The President's Climate Action Plan (June 2013)
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
DOE	Department of Energy
DOE/FE	Department of Energy/Office of Fossil Energy
Domestic Life Cycle Report	National Energy Technology Laboratory, Life Cycle Analysis of Natural Gas Extraction and Power Generation (May 29, 2014)
EA	Environmental Assessment
EIA	Energy Information Administration

EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FTA	free trade agreement
FERC	Federal Energy Regulatory Commission
Global Life Cycle Report	National Energy Tech. Lab., Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States (May 29, 2014)
GHG	greenhouse gas
GWP	global warming potential
JA	Joint Appendix
LCA GHG Report	National Energy Tech. Lab., Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States (May 29, 2014) (cited in this brief as "Global Life Cycle Report")
LNG	liquefied natural gas
MJ	megajoule
MMBtu	million British thermal units
MWh	megawatt hour
NEMS	National Energy Modeling System
NEPA	National Environmental Policy Act

NERA Study	National Economic Research Associates, Macroeconomic Impacts of LNG Exports from the United States (Dec. 3, 2012)
NETL	National Energy Technology Laboratory
NO_x	nitrogen oxides
P or PP	The internal paragraph number or numbers within a FERC order.
Rehearing Request	Sierra Club, Request for Rehearing, DOE/FE Dkt. 12-97-LNG (June 11, 2015)
Rehearing Order	U.S. Department of Energy, Order 3638-A, DOE/FE Dkt. 12-97-LNG, *Opinion and Order Denying Request for Rehearing of Order Granting Long-term, Multi Contract Authorization to Export Liquefied Natural Gas by Vessel from the Proposed Corpus Christi Liquefaction Project to be Located in Corpus Christi, Texas, to Non-Free Trade Agreement Nations* (May 26, 2016)
Scf	standard cubic foot
Unconventional Production Report	National Energy Tech. Lab., *Environmental Impacts of Unconventional Natural Gas Development and Production* (May 29, 2014)
VOC	volatile organic chemicals

JURISDICTION

This petition seeks review of two Department of Energy ("DOE") orders: Order 3638 (May 12, 2015) ("Authorization Order"), Joint Appendix ("JA")____, authorizing exports under the Natural Gas Act under 15 U.S.C. § 717b(a), and Order 3638-A (May 26, 2016) ("Rehearing Order"), JA____, denying Sierra Club's request for rehearing of the same under 15 U.S.C. § 717r(a). The petition was timely filed on July 25, 2016. This Court has jurisdiction under 15 U.S.C. § 717r(b).

ISSUES FOR REVIEW

Sierra Club challenges the Department of Energy's ("DOE") decision to permit Cheniere Marketing, LLC, and Corpus Christi Liquefaction, LLC (together, "Cheniere") to export 767 billion cubic feet per year ("bcf/y") of natural gas—more than three percent of annual U.S. gas production—for twenty years.

(1) Where DOE's authorization rested on modeling that predicted that exports would cause increases in gas

production and coal consumption, did DOE violate the National Environmental Policy Act ("NEPA"), 42 U.S.C. § 4332, by relying on an "environmental impact statement" that provided no analysis of these effects?

(2) If DOE can rely on documents other than the environmental impact statement in meeting its NEPA obligations, do the other materials included in the record here provide the "hard look" NEPA requires, where DOE acknowledges that these materials did not "attempt to identify or characterize the incremental environmental impacts that would result from [liquefied natural gas] exports" and were "not intended to be an alternatives analysis" or "comprehensive evaluation?"

(3) In evaluating impacts on the "public interest" for purposes of the Natural Gas Act, 15 U.S.C. § 717b(a), did DOE act arbitrarily by:

a. Failing to account for unequal distribution of impacts, as exports will increase households' energy bills and

decrease wages while producing benefits concentrated in the gas industry?

b. Concluding that, although the exports would have adverse environmental impacts, these impacts were outweighed by non-environmental benefits, where DOE quantified the benefits but failed to meaningfully analyze the severity of environmental harms?

STATUTES AND REGULATIONS

Pertinent statutes and regulations are reproduced in an addendum.

STATEMENT OF THE CASE

I. Introduction

Sierra Club challenges DOE's approval of Cheniere's application for permission to export liquefied natural gas ("LNG") from a facility in Corpus Christi, Texas. This case and parallel case No. 16-1252 are the third and fourth cases pending before this court challenging such DOE action. In each, DOE violated NEPA and the Natural Gas Act by failing to adequately consider indirect effects, including the environmental effects of export-induced natural gas production, domestic coal consumption, and global greenhouse gas emissions. *Supra* pages ii-iii.

Here, as in the other three cases, DOE's approval rests on the premise that LNG exports will cause increases in domestic natural gas production. The Energy Information Administration ("EIA")—asked by DOE to assess the effect of LNG exports generally on the domestic market—concluded that the additional demand created by exports will raise U.S. gas prices, increase natural gas production, and cause electric utilities to replace some of their gas consumption with coal. EIA, Effect of Increased Natural Gas Exports on Domestic Energy Markets (January 2012) ("2012 Export Study") at App. A, 6, JA____, ____. DOE

accepted EIA's study as "fundamentally sound," and relied on it in approving Cheniere's applications. DOE/FE Order 3638 at 191 (May 12, 2015) ("Authorization Order"), JA____.

Despite this conclusion—and despite the absence of any analysis in the record that might suggest otherwise—DOE refused to analyze the environmental effects of the natural gas production that would result from Cheniere's exports, in isolation or in conjunction with the many other export authorizations pending before, or approved by, the Agency. 40 C.F.R. § 1508.8(b) (requiring analysis of "indirect effects."). DOE adopted an Environmental Impact Statement ("EIS") prepared by the Federal Energy Regulatory Commission ("FERC") that provided no discussion of these impacts whatsoever. Separate from this NEPA review, DOE produced an "Addendum to Environmental Review Documents Concerning Exports of Natural Gas from the United States" ("Addendum"), JA____, which recognized that, in general, gas production causes a range of environmental harms, including emissions of greenhouse gases and ozone-forming air pollutants. Yet this Addendum did "not attempt to identify or characterize the [above] incremental environmental impacts that would result from LNG

exports." Authorization Order at 193-194, JA____-____. The Addendum did not, for example, discuss the amount or impact of additional air pollution that would be emitted by export-driven increases in gas production.

The EIS also failed to analyze the increase in domestic coal use predicted by EIA and the effects caused by exports once ships leave the port: the effects of transporting, regasifying, and burning LNG. DOE produced a separate "life cycle" assessment of the greenhouse gases emitted by generating electricity overseas, comparing use of U.S.-sourced LNG with coal or other sources of gas. Nat'l Energy Tech. Lab., Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States (May 29, 2014), JA____ ("Global Life Cycle Report"). Like the Addendum, however, this comparison did not analyze the consequences of Cheniere's proposed exports. For example, DOE acknowledged that Cheniere's exports would compete with renewables and conservation in overseas energy markets, but DOE provided no discussion of the effects of such competition.

DOE sought to justify its refusal to analyze the impacts of increased exports by asserting that these impacts are not "reasonably

foreseeable" within the meaning of NEPA's implementing regulations. But the record demonstrates that these impacts are foreseeable, as shown by DOE's own studies, and that DOE has the tools necessary to provide this analysis. Indeed, in the Addendum and other documents, DOE summarized many of these tools, found no fault with them, yet failed to employ them. Exports cumulatively authorized by DOE threaten to radically transform the domestic natural gas market: by refusing to undertake the "reasonable forecasting" required to disclose the effects of that transformation, DOE violated NEPA. *Del. Riverkeeper Network v. FERC*, 753 F.3d 1304, 1310 (D.C. Cir. 2014) (quotation omitted).

In addition to failing to provide the analysis required by NEPA, DOE's assessment of whether, for purposes of the Natural Gas Act, exports were consistent with the "public interest" was arbitrary and capricious. The record demonstrates that exports will raise domestic gas prices and depress real wages, causing economic harm to the vast majority of the public. DOE concluded that because of profits generated by increased gas production and, secondarily, selling the gas to foreign buyers—benefits accruing to very narrow group—exports would produce

a net benefit. But this conclusion ignored unfair distribution of these impacts, failing to reasonably fulfill the statutory mandate to assess the *public* interest. DOE's treatment of environmental impacts was also arbitrary. DOE recognized that export-driven increases in gas production would have adverse environmental effects, but concluded that these impacts were outweighed by the "economic and international [benefits]" of exports. Authorization Order at 197, JA____. Because DOE failed to even attempt to "identify or characterize" the environmental impacts of exports, however, the record did not provide a basis for DOE to conclude that those harms would be outweighed by other benefits.

II. **Legal Framework**

A. Natural Gas Act

Under Section 3 of the Natural Gas Act, exporting natural gas from the United States requires federal authorization, which can be

granted only if DOE finds "that the proposed exportation" will be consistent with the "public interest." 15 U.S.C. § 717b(a).[1]

DOE has interpreted this "public interest" provision to encompass: "(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." Authorization Order at 14, JA____. Both courts and DOE have recognized that "other factors" include environmental impacts. *Id.* at 13-14, JA____-____; *NAACP v. Fed. Power Comm'n*, 425 U.S. 662, 669-70, 670 n.6 (1976); *Myersville Citizens for a Rural Cmty., Inc. v. FERC*, 783 F.3d 1301, 1307 (D.C. Cir. 2015).

The Natural Gas Act also regulates "the siting, construction, expansion, or operation" of LNG infrastructure. 15 U.S.C. § 717b(e)(1).

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[1] A provision not at issue here requires automatic approval where "a free trade agreement requir[es] national treatment for trade in natural gas." 15 U.S.C. § 717b(c). Nothing in the record here indicates that countries meeting this criterion are likely to be significant importers of U.S. LNG.

DOE has delegated this authority to the FERC. *Sierra Club v. FERC, 827 F.3d 36, 41 (D.C. Cir. 2016) ("Freeport").*

B. National Environmental Policy Act

NEPA aims to protect the environment by requiring agencies to look before they leap: "'all agencies of the federal government' [must] prepare a detailed environmental analysis for 'major Federal actions significantly affecting the quality of the human environment.'" *Found. on Econ. Trends v. Heckler*, 756 F.2d 143, 146-47 (D.C. Cir. 1985) (quoting 42 U.S.C. § 4332(C)). That analysis, "known as an Environmental Impact Statement," ("EIS") must "include such considerations as 'the environmental impact of the proposed action,' 'any adverse environmental effects which cannot be avoided should the proposal be implemented,' and 'alternatives to the proposed action.'" *Id.* Where an agency believes that a proposed action will have no significant impact, and thus decides to forego a full impact statement, the agency must prepare an "environmental assessment" with "sufficient evidence and analysis" to support that determination. *Id.* (quoting 40 C.F.R. § 1508.9(1)).

NEPA reflects a particular Congressional concern with "unplanned and often unforeseen consequences" of federal agency action. S. Rep. No. 91-296, at 79 (1969), *reprinted in* 1969 U.S.C.C.A.N. 2751. NEPA regulations require agencies to look beyond the immediate, near-term impacts of a proposed action and affirmatively investigate "indirect effects" when assessing an action's likely impact. 40 C.F.R. § 1508.8(b). Indirect effects are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable:" examples include "growth inducing effects and other effects related to induced changes … and related effects on air and water and other natural systems." *Id.* Moreover, an agency cannot focus narrowly on the single action under consideration, but must also examine the "cumulative effects" of its proposed action: "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." 40 C.F.R. § 1508.7. NEPA thereby assures that agencies consider effects that result from

"individually minor but collectively significant actions taking place over a period of time." *Id.*

In assessing these impacts, agencies must undertake "reasonable forecasting and speculation." *Del. Riverkeeper*, 753 F.3d at 1310. Uncertainty is inherent in such predictions; indeed, DOE recognizes that forecasts must necessarily accommodate uncertainty. Authorization Order at 182-183, JA____-____. Where information is essential to the agency's assessment, the agency must include it in the EIS unless "the overall costs of obtaining it are … exorbitant." 40 C.F.R. § 1502.22(a). Where "the means to obtain" information relevant to a project's impacts "are not known," the agency must nonetheless make a best effort to evaluate the impacts "based upon theoretical approaches or research methods generally accepted in the scientific community." *Id.* § 1502.22(b).

All of these procedural requirements have "twin aims": to ensure that the agency's decisions are fully informed, by placing "'upon an agency the obligation to consider every significant aspect of the environmental impact of a proposed action'"; and to facilitate public participation by ensuring "that the agency will inform the public that it

has indeed considered environmental concerns in its decisionmaking." *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council*, 462 U.S. 87, 97 (1983) (citation omitted).

NEPA directs agencies to consider not only the effects of their own actions, but also the effects of "connected" actions, including actions taken by other entities. 40 C.F.R. § 1508.25. Agencies can facilitate this coordinated analysis by cooperating in the production of a single document. 40 C.F.R §§ 1501.5, 1501.6, 1506.3. For LNG projects, Congress has designated FERC as the lead NEPA agency for coordinated review. *Freeport*, 827 F.3d at 41. Although NEPA regulations permit DOE to adopt a NEPA analysis prepared by FERC, DOE can only do so after independently ensuring that that document satisfies DOE's NEPA obligations. 40 C.F.R. § 1506.3(c).[2]

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[2] Prior to reviewing the applications here, DOE abandoned its practice of issuing conditional approvals prior to NEPA review. 79 Fed. Reg. 48,132 (Aug. 15, 2014).

III. Natural Gas Exports

United States natural gas production increased substantially over the past decade. This is due in large part to the use of "hydraulic fracturing" in horizontally drilled wells. *See* 80 Fed. Reg. 18,557, 18,559 (Apr. 7, 2015) (noting that as a result of these developments United States' natural gas production has reached its highest level in 30 years). A decade ago, before this practice was widespread, natural gas occurring in shale formations, or shale "plays," could not be economically extracted, and shale provided a negligible share of U.S. gas production. Addendum at 5, JA___. By 2012, however, use of hydraulic fracturing and horizontal drilling had allowed shale-derived gas to grow to more than 40% of U.S. gas production. *Id.* Shale is expected to be the source of essentially all future U.S. gas production growth. *Id.* at 6, JA____.

Shale gas development also changed the geography of gas production. The overwhelming majority of shale gas is produced in just five shale plays: the Marcellus, Haynesville, Fayetteville, Barnett, and

Eagle Ford. EIA, Market Digest: Natural Gas (2013-2014), at fig. 2 (Jan. 16, 2014) (charting major plays' production over time),[3] National Energy Tech. Lab., *Environmental Impacts of Unconventional Natural Gas Development and Production* (May 29, 2014) ("Unconventional Production Report") at 10, JA____ (until 2011, first four of these plays accounted for 75% of shale gas production). Six states—Texas, Louisiana, Pennsylvania, Arkansas, Oklahoma, and Colorado—produce over 92% of U.S. shale gas. Unconventional Production Report at 11, JA____. *See also* Addendum at 6, JA____ (map of shale plays).

The growth in gas supply has outpaced demand in the United States, and prices have therefore remained low. This situation persists in part because North America historically lacked the industrial facilities required to liquefy gas for overseas export. 2012 Export Study at 3, JA____. Low natural gas prices in the United States have, consequently, contrasted sharply with high prices abroad. In 2012, natural gas "prices span[ned] a range from ... $4 per MMbtu[4] in the

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[3] https://www.eia.gov/naturalgas/review/production/2013/.
[4] Million British thermal units, a measure of energy capacity.

United States" to "$16 per MMbtu in Asian markets." *Id.* U.S. natural gas prices have since fallen to even lower levels. *See, e.g.*, Annual Energy Outlook 2016 Early Release at 7 (May 17, 2016), JA____.

Stretching from 2010 through the present day, numerous companies have proposed to export LNG, seeking to capitalize on this disparity between U.S. and global gas prices. At the time DOE approved the applications at issue here, DOE had received applications amounting to 14,600 bcf/y of exports to non-free trade agreement nations, equivalent to nearly half of *all* natural gas produced in the United States. DOE, Long Term Applications Received by DOE/FE to Export Domestically Produced LNG from the Lower-48 States (as of April 14, 2015);[5] Addendum at 5, JA____.

A. The Energy Information Administration's Models and Forecasts

Faced with this deluge of export applications, DOE asked the Energy Information Administration ("EIA") to predict how U.S. energy markets would respond to exports. EIA published its initial response to

[5] http://energy.gov/sites/prod/files/2015/04/f22/Summary%20of%20LNG%20Export%20Applications.pdf.

DOE's request in 2012. 2012 Export Study, JA____. EIA published an updated study, considering higher export volumes—assumed to primarily occur in Texas and Louisiana—in October 2014. EIA, Effect of Increased Levels of Liquefied Natural Gas Exports on U.S. Energy Markets, at 9 (Oct. 29, 2014), JA_____ ("2014 Export Study") (assuming that most exports would occur in the "West South Central Census division");[6] *see also* U.S Census Bureau, Census Regions and Divisions of the United States.[7]

EIA developed these studies using its core analytic tool, the National Energy Modeling System. This system "projects the production, imports, conversion, consumption, and prices of energy," and is used "to project the energy, economic, environmental, and

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[6] In this litigation, DOE included the 2014 Export Study in the index to the administrative record. DOE appears to have abandoned a position taken in a footnote in the Rehearing Order, which asserted asserts that this Study "is not a part of the administrative record in this proceeding," Rehearing Order at 45-46, n.167, JA____-____. It would be arbitrary for DOE to ignore this study, which was prepared at DOE's request and published prior to issuance of the EIS. *Kent Cty., Delaware Levy Court v. EPA*, 963 F.2d 391, 396 (D.C. Cir. 1992), *Esch v. Yeutter*, 876 F.2d 976, 991 (D.C. Cir. 1989).

[7] http://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf

security impacts on the United States of alternative energy policies and different assumptions about energy markets." EIA, The National Energy Modeling System: An Overview, 1 (2009), JA____. The system incorporates "a play-level model" of onshore natural gas supply. EIA, Documentation of the Oil and Gas Supply Module, 2-3 (2011), JA____.

EIA's export studies also relied on EIA's "Annual Energy Outlook," which "presents long-term annual projections of energy supply, demand, and prices" over a range of scenarios, or "cases," chosen to account for uncertainty (*e.g.*, high or low economic growth) and for different policy choices (*e.g.*, presence or absence of regulations that accelerate retirement of coal or nuclear power plants). EIA, Annual Energy Outlook 2014 at ii (April 2014), JA____. The Annual Energy Outlook also models the global demand for U.S. LNG exports. EIA, Assumptions to Annual Energy Outlook 2013 at 140 (May 2013), JA____.

In response to DOE's inquiry, EIA modeled how domestic energy markets—represented by the Annual Energy Outlook cases—would respond to various levels of LNG exports. In EIA's 2012 study, EIA compared the effects of zero, "low," and "high" export volumes

(specifically 2,190, and 4,380 bcf/y) from hypothetical facilities in Texas and Louisiana. 2012 Export Study at 1-2, JA____-____. The 2014 study used the 2014 Outlook's predicted export levels as baselines—3,500 bcf/y in the reference case[8]—and addressed the incremental impact of increasing exports to 4,380, 5,840, or 7,300 bcf/y. 2014 Export Study at 13, JA____.

Both studies reached the same fundamental conclusions. "Increased natural gas exports lead to increased natural gas prices" within the United States, and domestic gas markets "balance in response … largely through increased natural gas production." 2012 Export Study at 6, JA____, *accord* 2014 Export Study at 12, JA____. Specifically, EIA predicted approximately between 61 and 84% of export volumes would be met by additional gas production, and that most (over 70%) of this additional production would be derived from shale gas. 2012 Export Study at 10-11, JA_____-____, 2014 Export Study at 12, JA____.

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[8] These baseline exports cannot occur absent DOE approvals under review by this Court.

EIA concluded that "most of the remainder" of export-created demand (*i.e.*, the 16 to 39% not met by increased production) would be satisfied by reduced gas consumption in the electric sector in response to higher gas prices, primarily by utilities shifting generation to coal. 2012 Export Study at 12, 18 JA____, _____, 2014 Export Study at 12, Table B2, JA___, ____. EIA explained that this shift would increase U.S. emissions of carbon dioxide, and provided quantitative estimates of this increase in each export scenario. 2012 Export Study at 19, JA____, 2014 Export Study at 12, JA____. EIA only accounted for liquefaction facility and power-plant emissions, without addressing greenhouse gases emitted by the predicted increases in natural gas production.

The 2014 Export Study, in addition to considering higher export volumes, added a case not included in the 2012 Export Study: "Accelerated Coal and Nuclear Retirement." 2014 Export Study at 5, JA_____. EIA developed this case as "a proxy for possible future policies to mitigate greenhouse gas emissions" from power-plants. Annual Energy Outlook 2014 at IF35, JA____. EIA predicted that even if such policies were adopted, increasing exports would lead to increased coal use. 2014 Export Study at Table B2, JA____. For both studies, EIA

released supplemental modeling results online. As Sierra Club explained, these supplemental materials predict "for how onshore gas production will increase in six specific regions in response to exports." Sierra Club, Rehearing Request at 9 (June 11, 2015), JA____.[9]

The record contains numerous other studies by private modelers, all of which affirm EIA's fundamental predictions: that the U.S. energy market will primarily respond to increased exports by increasing gas production, and that most of this increase will be shale gas. ICF International, U.S. LNG Exports: State-Level Impacts on Energy Markets and the Economy at 7, 14-15 (November 13, 2013), JA_____, ____-____ (evaluating 1,460 bcf/y of exports and concluding that 67% of export-induced incremental gas production would occur in Texas, Louisiana, and Pennsylvania); Deloitte Marketpoint, Analysis of the Economic Impact of LNG Exports from the United States, at 8, 14, JA____, ____.

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[9] These materials, although part of the record, are more easily viewed online. https://www.eia.gov/forecasts/aeo/data/browser/#/?id=72-FE2011 and https://www.eia.gov/forecasts/aeo/data/browser/#/?id=72-FE2014.

After publication of EIA's 2012 Export Study, DOE hired NERA Economic Consulting to predict the macroeconomic impacts of LNG exports. NERA addressed how these changes EIA predicted would affect the U.S. economy. NERA concluded that exports would produce significant benefits for the companies that produce and export natural gas, and for their shareholders. NERA Economic Consulting, Macroeconomic Impacts of LNG Exports from the United States (Dec. 3, 2012) ("NERA Study") at 2, JA____. On the other hand, these benefits would be largely offset by harm to American manufacturers, particularly in energy-intensive industries; by a decrease in "real wages" in all industries other than the gas sector; and by increased gas prices for all U.S. consumers. *Id.* at 2, 7, JA____, ____. Thus, while NERA predicted that exporting 4,380 bcf/y of gas in 2030 would cause a 0.05%, or $11.4 billion, increase in 2030 gross domestic product, this small net increase masked a $45 billion decrease in nationwide labor and investment income. *Id.* at 8, 188, JA____, ____. As Sierra Club explained in comments on this study, that decrease in labor income is the equivalent to net loss of 292,000 jobs. Synapse Energy Economics,

Will LNG Exports Benefit the United States Economy? at 5 (Jan. 23, 2013), JA____.

B. Cheniere's Corpus Christi Export Application

On August 31, 2012, Cheniere applied for authorization to export 767 bcf/y of natural gas from its proposed Corpus Christi, Texas, facility to non-Free Trade Agreement Nations. Application at 1, JA____. That Application stated that "[e]xporting LNG will create broad economic impacts and spur additional exploration [and] drilling" and that "the capacity to export from the" Corpus Christi facility would provide "stimulus to the oil and natural gas industry." *Id.* at 39-41, JA____-____.

The Application further argues that although the Corpus Christi facility could, in principle, source gas from "virtually any point on the U.S. interstate pipeline system through direct delivery or by displacement," the Eagle Ford shale gas play, situated "approximately 75 miles" from terminal site in South Texas, represented both the "most proximate potential source of physical natural gas supply" available for export from the terminal. Application at 11, JA____. The Application similarly identified the Eagle Ford Shale as the likely site of export-induced increases in gas production. *Id.* at 40, JA____.

The Application supports these assertions with two consultants' reports. One argued that natural gas supply in Texas and near the proposed Corpus Christi terminal was abundant and underutilized, and that "without markets for" this gas, much of it "would remain unproduced." Application at Exhibit C (Advanced Resources International, Inc., *U.S. Natural Gas Resources and Productive Capacity: Mid-2012* (Aug. 23, 2012), at 39, JA____). The second stated, in Cheniere's words, that the largest economic benefit of the projects will be "indirect benefits due to enhanced natural gas exploration and production," and claims that more than 90 percent of activity would occur in Texas. Application at 7, JA____ (summarizing report by The Perryman Group). The Application explains that Cheniere "will bear the responsibility for sourcing," *i.e.*, purchasing, "gas supplies for delivery to the [Corpus Christi] Terminal." *Id.* at 11, JA____.

Cheniere supplemented this Application on May 20, 2014, submitting an update to the NERA Study that Cheniere had commissioned. Supplement to Application of Cheniere Marketing, LLC (May 20, 2014), JA____. In this supplement, Cheniere reiterated its contention that "LNG exports would encourage additional natural gas

development," spurring "investments in natural gas production and infrastructure required to facilitate exports." *Id.* at 11, 15, JA____, ____. Cheniere summarized the updated NERA study as "reinforc[ing] NERA's prior findings." *Id.* at 3, JA____. DOE, in reviewing Cheniere's application, quoted Cheniere's summary but did not otherwise discuss or rely upon this update. Authorization Order at 16, JA____.

C. DOE's "Environmental Addendum"

After these applications were filed, but prior to NEPA review, DOE published a "Draft Addendum to Environmental Review Documents Concerning Exports of Natural Gas from the United States," together with three reports by the National Energy Technology Laboratory. 79 Fed. Reg. 32,258 (June 4, 2014). DOE invited public comment on the draft and one of the accompanying reports, *id.*, and finalized the Addendum on August 15, 2014. Addendum, JA_____.

DOE explained that the Addendum was intended to "provide additional information to the public regarding the potential environmental impacts of unconventional natural gas production activities." *Id.* at 3, JA____. However, the Addendum did not, in DOE's

words, "attempt to identify or characterize the incremental environmental impacts that would result from LNG exports." Authorization Order at 193-194, JA____. Neither the Addendum nor the accompanying reports address the impact of any particular export proposal, or any specific volume of exports; they provide general analysis untethered from specific agency action. DOE explicitly stated that the Addendum and related reports were not part of DOE's NEPA review of Cheniere's application. Addendum at 3, JA____; Authorization Order at 183, JA____ (reports "do[] not fulfill any NEPA requirements in this proceeding, nor has DOE/FE made any suggestion to that effect.").

Nonetheless, the Addendum recognizes that natural gas production in general has many harmful environmental impacts. Natural gas is mostly methane, a greenhouse gas many times more potent than carbon dioxide. Addendum at 21-22, JA_____-_____. During extraction, processing, and transportation of natural gas, some of that methane escapes into the atmosphere. *Id.* These activities also emit other air pollutants, including other greenhouse gases, nitrogen oxides, and volatile organic chemicals. *Id.* at 20, 23, JA____, ____. Those

emissions make natural gas production the primary contributor to ozone problems in some areas. *Id.* at 28, JA____.

Natural gas drilling and related infrastructure further impact landscapes and fragment habitat. *See, e.g., id.* at 56-65, JA____-____. Shale gas extraction also threatens water resources, as each well requires millions of gallons of water and produces voluminous wastewater that is difficult to manage. *Id.* at 10-18, JA____-____.

In conjunction with the draft Addendum, DOE released three National Energy Technology Laboratory reports. DOE principally relies on the Global Life Cycle Report, JA____, which estimated the amount of greenhouse gases emitted by generating electricity in Asia or Europe using various fossil fuel sources, including U.S. LNG, natural gas from other sources, or coal. This report considers the entire "life cycle" of gas, from well to end use, and for LNG, divides effects into those that occur 'upstream' of the export terminal (production, processing, and transportation) and downstream (relating to tanker transport, regasification, and end use). *Id.* at 3, 10, JA____, ____.

D. Review and Authorization of Cheniere's Proposal

After DOE published the Addendum, FERC released its EIS for the Corpus Christi liquefaction facility. DOE acted as a cooperating agency in development of the EIS. EIS at ES-1, JA____.

The EIS provided no analysis of the effects of additional natural gas production that will be induced by exports from the Corpus Christi facility, or by exports generally, explicitly stating that these effects were outside the scope of NEPA review. EIS at 4-212, JA____. The EIS made various assertions in support of this exclusion. First, it asserts that "no specific shale-gas play has been identified as a source of natural gas" for the Corpus Christi terminal. *Id.* The EIS made no attempt to reconcile this assertion with the EIS's statement that "as proposed, the natural gas feedstock for Cheniere's Terminal would be sourced from the south Texas region," such that it would be infeasible to require Cheniere to use alternative facility sites in Louisiana. *Id.* at 3-7, 3-12, JA____, ____. The EIS further asserts that gas production is outside FERC's control, subject to regulation by local government, and not "directly related to the Project." *Id.* at 4-212, JA____. The EIS concludes that "environmental analysis of increased natural gas production would be

too speculative for inclusion in the final EIS, because the impact cannot be described with sufficient specificity to make its consideration useful to reasoned decisionmakers." *Id.* The EIS states that FERC "agree[d] with DOE that the use of the [Addendum], in NEPA, for a specific project and anticipated project induced upstream impacts is not appropriate." *Id.*

The EIS similarly concluded that analysis of end use of exported LNG would be speculative. *Id.* The EIS was completely silent regarding effects of export-induced increases in coal use, providing no response to Sierra Club's comment on this issue. *Id.* at I-123, JA____.

After finalizing the EIS, FERC granted Cheniere's application to construct and operate the Corpus Christi terminal. 149 FERC ¶ 61,283 (Dec. 30, 2014), JA____. Sierra Club petitioned this Court for review. The Court denied this petition in a per curiam order, stating that "'the Commission's NEPA analysis did not have to address the indirect effects of the anticipated export of natural gas … because the Department of Energy, not the Commission, has sole authority to license the export of any natural gas.'" *Sierra Club v. FERC*, No. 15-1133, 2016 WL 6915537 (D.C. Cir. Nov. 4, 2016) (quoting *Freeport*, 827

F.3d at 47). *Freeport* held that "challenges to the environmental analysis of the export activities themselves must be raised in a petition for review from the Department's decision to authorize exports," but "express[ed] no opinion on whether … the Commission's environmental analysis would have been adequate to satisfy the Department of Energy's own independent NEPA obligation in authorizing Freeport to export natural gas." *Freeport*, 827 F.3d at 45-46. Similarly, the per curiam affirmation of FERC's authorization of the Corpus Christi terminal provides no basis for concluding that the EIS satisfied DOE's NEPA obligations here.

DOE, for its part, adopted FERC's EIS in full. DOE, Record of Decision, 80 Fed. Reg. 28,256, 28,257 (May 18, 2015), JA____. DOE simultaneously approved Cheniere's export application. Authorization Order, JA____. Sierra Club requested rehearing of DOE's authorization. DOE denied this request. DOE/FE Order 3638-A (May 26, 2016) ("Rehearing Order"), JA____. Sierra Club filed this petition for review.

IV. U.S. Climate Policy

The rush to export LNG from the United States has coincided with development of federal plans and commitments to combat climate change by reducing greenhouse gas emissions. Climate change will have "far-reaching consequences and real economic costs." Executive Office of the President, The President's Climate Action Plan at 4-5 (June 2013) ("Climate Action Plan"), JA____-____. Accordingly, the President "put[] forward a broad-based plan to cut the … pollution that causes climate change and affects public health." *Id.* Part of this plan reiterated previous international commitments to reduce U.S. greenhouse gas emissions, relative to 2005, by at least 17% by 2020, 42% by 2030, and 83% by 2050. United States Framework Convention on Climate Change, Annex I at 7-8 (June 7, 2011), JA____-____.

The Environmental Protection Agency ("EPA") has begun to implement the Climate Action Plan by working to reduce greenhouse gas emissions from the electric sector, principally coal-fired power plants. In 2014, EPA proposed rules to limit carbon dioxide emissions from new and existing power plants. These rules rely, in part, on switching from coal to low-priced natural gas. *See e.g.,* 79 Fed. Reg.

34,830, 34,862 (June 19, 2014). EPA estimated that the existing source rule, known as the "Clean Power Plan," would reduce emissions by 415 million tons of carbon dioxide equivalent per year. EPA, *Regulatory Impact Analysis for the Clean Power Plan Final Rule* at ES-6 (Oct. 23, 2015).[10] EPA finalized the rule on October 23, 2015, 80 Fed. Reg. 64,662, but implementation of the rule has been stayed pending litigation. *N. Dakota v. EPA,* 136 S. Ct. 999 (2016).

Even if the Clean Power Plan takes effect, achieving climate goals will require changes outside the electric sector. The Climate Action Plan stated that "[c]urbing emissions of methane is critical to [the nation's] overall effort to address global climate change," and identified "oil and gas development" as one of the "sectors in which methane emissions can be reduced." Climate Action Plan at 10, JA____. On January 14, 2015, the President stated a concrete goal for methane reduction: "to cut methane emissions from the oil and gas sector by 40-45 percent from 2012 levels by 2025." White House, *Fact Sheet: Administration Takes*

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[10] https://www.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf.

Steps Forward on Climate Action Plan by Announcing Actions to Cut Methane Emissions (Jan 15, 2015), JA____. The President also recognized that "ultimately, if we're going to prevent large parts of this Earth from becoming not only inhospitable but uninhabitable in our lifetimes, we're going to have to keep some fossil fuels in the ground rather than burn them and release more dangerous pollution into the sky." Statement by the President on the Keystone XL Pipeline at 4 (Nov. 6, 2015).[11]

SUMMARY OF ARGUMENT

DOE violated NEPA by adopting an EIS that provided no analysis of numerous indirect and cumulative impacts of Cheniere's proposed exports. The record does not support DOE's conclusion that these impacts were not reasonably foreseeable. Part II.A. DOE cannot evade analysis of these impacts by arguing that DOE cannot "guarantee" that proposed exports will actually occur. Part II.A.1. Increasing exports will

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[11] https://www.whitehouse.gov/the-press-office/2015/11/06/statement-president-keystone-xl-pipeline.

increase U.S. gas production, processing, and pipeline transportation. The record demonstrates that the impacts of these activities can be foreseen and meaningfully discussed. Part II.A.2. Exports will also foreseeably increase U.S. coal use, Part II.B, and cause foreseeable impacts in importing markets, when exported gas is used, Part II.C.

Because DOE purported to consider these impacts in its Natural Gas Act evaluation of the public interest, *Department of Transportation v. Public Citizen*, 541 U.S. 752 (2004) does not condone DOE's decision to exclude these impacts from NEPA review. Part II.D.

The Addendum and related reports do not take a hard look at the consequences of DOE's approval or denial of Cheniere's applications, and are not a substitute for NEPA review. Part II.E.

Finally, DOE's assessment of the public interest, pursuant to Natural Gas Act, was arbitrary and capricious. Analysis of the *public* interest requires discussion of how the impacts of exports will be unevenly distributed among the public, consideration DOE admits it did not provide. Part III.A. Because DOE provided no analysis of the magnitude or weight of environmental harm, DOE had no basis for

concluding that this harm would be outweighed by exports' purported benefits. Part III.B.

STANDING

Sierra Club is a national environmental organization whose members live, work, and recreate in the vicinity of the Corpus Christi LNG terminal. Declaration of Alvin Baker ¶¶ 2-3, 6-9 (Nov. 29, 2016), Declaration of Nancy Devlin ¶¶ 6-11 (Nov. 28, 2016), Declaration of Margaret Di Clemente ¶¶ 6-11 (Nov. 28, 2016), Declaration of Carrie Meyer ¶¶ 3, 6-12 (Nov. 29, 2016). Operation of these facilities depends, on the DOE order challenged here. If Cheniere cannot export LNG to non-Free Trade Agreement countries, or if the volume of exports is curtailed, this will limit vessel traffic, vessel loading, and operation of liquefaction equipment at the facility, which in turn will reduce air, noise, and light pollution and other injuries to Sierra Club members. Baker Decl. ¶¶ 6-7, Devlin Decl. ¶¶ 7, 10-11; Robertson Decl. ¶¶ 10-12; *Friends of the Earth, Inc. v. Laidlaw Envtl. Servs. (TOC)*, 528 U.S. 167, 183 (2000).

These injuries "follow[] from [DOE's] inadequate" NEPA analysis, including the failure to adequately consider indirect impacts relating to

gas consumption and electricity production. *WildEarth Guardians v. Jewell*, 738 F.3d 298, 307 (D.C. Cir. 2013). A decision by this Court vacating DOE's order for failure to comply with NEPA would redress these injuries "regardless [of] whether the [NEPA violation] relates to local or global environmental impacts." *Id.*

ARGUMENT

I. Standard of Review

Under the Natural Gas Act, 15 U.S.C. § 717r(b), DOE's decision "will be set aside as arbitrary and capricious if it is not the product of reasoned decisionmaking." *Del. Riverkeeper*, 753 F.3d at 1313. The court must determine whether the agency has "examine[d] the relevant data and articulate[d] a satisfactory explanation for its action including a rational connection between the facts found and the choices made." *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (internal quotation marks omitted). While this Court will accord deference to DOE's "relevant or scientific expertise," "[t]he technical complexity of the analysis does not relieve the agency of the burden to consider all relevant factors and to identify the stepping

stones to its final decision." *Gas Appliance Mfrs. Ass'n, Inc. v. DOE*, 998 F.2d 1041, 1046 (D.C. Cir. 1993).

II. **NEPA**

A. DOE's Authorization Will Have Foreseeable Indirect Environmental Impacts

Uncontroverted record evidence demonstrates that Cheniere's proposed exports—and exports cumulatively—will induce growth in domestic gas production and in domestic coal use. Once exported, LNG will be regasified and then burned, primarily for electricity generation. DOE violated NEPA by refusing to analyze and disclose the effects of these foreseeable consequences, instead concluding that these effects could be entirely omitted from NEPA review.

NEPA requires agencies to consider and disclose the "indirect effects" of their actions, 40 C.F.R. § 1508.8(b). Indirect effects are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." *Id.* An effect is reasonably foreseeable if it is "sufficiently likely to occur that a person of ordinary prudence would take it into account in reaching a decision." *Freeport,* 827 F.3d at 47 (quotations omitted). Indirect effects

encompass both "growth inducing" and "economic" effects, including "induced changes in the pattern of land use, population density or growth rate." 40 C.F.R. § 1508.8(b). The indirect effects inquiry is therefore wide-ranging. For example, the Council on Environmental Quality has explained that when agency action "involves fossil fuel extraction," the indirect effects include "impacts associated with the end-use of the fossil fuel." Council on Environmental Quality, Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions, 16 n.42 (Aug. 1, 2016) ("CEQ Greenhouse Gas Guidance"). Where a new runway will foreseeably induce additional air traffic, the agency must assess the impacts of that traffic. *Barnes v. U.S. Dep't of Transp.*, 655 F.3d 1124, 1138-39 (9th Cir. 2011). Where a railway would reduce the cost of delivered coal, the agency must address the foreseeable possibility of an increase in coal consumption, and the effects thereof. *Mid States Coal. For Progress v. Surface Transp. Bd.,* 345 F.3d 520, 549-50 (8th Cir. 2003). And in approving a port and causeway providing access to a previously isolated island, the agency was required to consider the effects of foreseeably induced "industrial

development" thereon. *Sierra Club v. Marsh*, 769 F.2d 868, 877-79 (1st Cir. 1985).

Here, the record establishes that natural gas exports—both those authorized by DOE here, and cumulatively—will have important indirect effects. The exported gas must come from somewhere. DOE and Cheniere agree that, as a factual matter, U.S. energy markets will primarily respond to the authorized exports by increasing domestic natural gas production. The models DOE relied upon also predict that exports will increase domestic coal use; some U.S. power generators will switch from gas to coal to avoid higher gas prices. Nonetheless, DOE approved Cheniere's exports on the basis of an EIS that provided *no* analysis of additional gas production, nor analysis of coal use or impacts of end use of exported LNG. EIS at 4-212, JA____.

DOE contends that NEPA does not require analysis of the effects of export-induced gas production because these effects are not reasonably foreseeable. Authorization Order at 192-194, JA____-____. This contention rests on two principal pillars. First, DOE claims "uncertainty as to the aggregate quantity of natural gas that ultimately may be exported." *Id.* at 194, JA____. And second, DOE argues that it

cannot foresee the environmental impacts that would result from additional gas production, because "nearly all" these impacts "are local in nature," *id.*, but that it is "fundamentally uncertain how natural gas production at the local level will respond to price changes at the national level." Rehearing Order at 18-19, JA____-____. For the reasons set forth below, neither rationale reasonably supports DOE's refusal to consider the production-related impacts of its decision.

1. Exports Are Foreseeable

DOE first argues that the "incremental environmental impacts" of "LNG exports" are "not reasonably foreseeable" because DOE cannot "guarantee" that authorized exports will actually occur, such that "there is uncertainty as to the aggregate quantity of natural gas that may ultimately be exported." Authorization Order at 194, JA____. Reasonable foreseeability, however, does not require certainty or guarantees. *Freeport,* 828 F.3d at 47. "[R]easonable forecasting and speculation is ... implicit in NEPA," and this Court "must reject [DOE's] attempt ... to shirk [its] responsibilities under NEPA by labeling any and all discussion of future environmental effects as 'crystal ball

inquiry.'" *Del. Riverkeeper*, 753 F.3d at 1310 (internal quotation omitted).

Any uncertainty over the "aggregate quantity of natural gas that ultimately may be exported" cannot excuse DOE's failure to analyze the indirect effects of the particular exports DOE authorized here. Authorization Order at 194, JA____. "[A] person of ordinary prudence," in reviewing Cheniere's applications to export 767 bcf/y of natural gas, "would take … into account" the consequences that would flow from 767 bcf/y of exports. *Freeport*, 828 F.3d at 47. NEPA does not permit DOE to argue that the action actually authorized is itself unforeseeable. *See City of Davis v. Coleman*, 521 F.2d 661, 677 (9th Cir. 1975) ("The argument that the principal object of a federal project does not result from federal action contains its own refutation.").

Even as to cumulative effects, DOE has already demonstrated that it believes cumulative exports of up to 7,300 bcf/y are "sufficiently likely to occur" as to warrant consideration in DOE's review of export applications, as demonstrated by DOE's request that EIA analyze this level of exports. 2014 Export Study, App. A, JA_____. DOE is correct

that this level of exports is not guaranteed, and it may even be that this level of exports is unlikely (although DOE has not argued this in the record), but an effect may be "reasonably foreseeable … even if the probability of such an occurrence is low." *Blue Ridge Envtl. Def. League v. Nuclear Regulatory Comm'n*, 716 F.3d 183, 188 (D.C. Cir. 2013). Insofar as the ultimate level of cumulative exports is uncertain, the Export Studies demonstrate an appropriate response to this uncertainty: providing analyses for different levels of potential exports. DOE could not, however, ignore the issue entirely. *Del. Riverkeeper*, 753 F.3d at 1310.

Moreover, the record demonstrates that high volumes of exports are likely. The Authorization Order recognized that DOE had cumulatively authorized non-Free Trade Agreement exports amounting to 3,143 bcf/y (which omits the subsequent authorization of 503.3 bcf/y at issue in D.C. Cir. Case 16-1252). Authorization Order at 206, JA____. A year prior, the Addendum specifically endorsed EIA's 2014 "reference case" prediction of global demand for U.S. LNG exports of 3,500 bcf/y. Addendum at 43, JA___. And DOE noted that EIA's 2015 projections "continue to show market conditions that will accommodate increased

exports of natural gas." Authorization Order at 190, JA____; *see* Annual Energy Outlook 2015 at ES-4, JA____ (predicting that LNG export volumes could reach 10,300 bcf/y, with 3,400 bcf/y in the updated reference case). Any of these export volumes would represent a dramatic share of total U.S. gas production, which was 24,100 bcf in 2012. Addendum at 5, JA____.

By claiming that "aggregate" volumes of exports were so uncertain as to justify DOE's failure to provide any NEPA analysis of exports' effects whatsoever, DOE effectively determined that *no* exports were reasonably foreseeable. This determination is squarely refuted by the record. NEPA requires DOE to take a hard look at the consequences that would flow from foreseeable export volumes.[12]

2. Environmental Impacts of Export-Induced Gas Production Are Foreseeable

The second pillar of DOE's unforeseeability conclusion is an asserted mismatch between the scale at which DOE can evaluate effects

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[12] Even if, counterfactually, the record supported a determination that DOE could not foresee the extent of exports, NEPA would still require analysis of the foreseeable nature of exports' effects. *Mid States*, 345 F.3d at 549.

on gas supply and the scale at which the environmental effects of gas production, processing, and transportation are felt. DOE does not dispute that if LNG exports occur, they will cause foreseeable increases in U.S. gas production, processing, and transportation. Authorization Order at 192-194, JA____-____. However, DOE argues that it cannot reasonably foresee the environmental impacts of these activities. DOE asserts, without discussing any particulars regarding environmental impacts or available assessment tools, that "nearly all" of pertinent environmental impacts "are local in nature," Authorization Order at 194, JA____, occurring "at the wellhead or local level," but that it is "fundamentally uncertain how natural gas production at the local level will respond to price changes at the national level." Rehearing Order at 17, 19, JA____, ____.

Consideration of those particulars and NEPA's requirements, however, reveals that DOE can reasonably foresee the environmental impacts of export-induced production. DOE admits that analysis of greenhouse gas emissions of gas production, *etc.*, does not require predicting where those activities will occur, Addendum at 2, JA_____, and the record demonstrates that DOE has tools to estimate these

emissions. Many other impacts, such as ozone, can be discussed at regional scales, and DOE has not disputed that available tools enable DOE to predict where, at the regional or play level, additional gas production will occur. *Cf.* Rehearing Order at 19-20, JA____-____. Finally, even for local impacts, DOE violated NEPA by approving the project on the basis of an EIS that failed to even discuss the nature of these impacts.

i. Climate Impacts of Gas Production

The EIS provides no analysis whatsoever of the climate impacts of export-induced gas production and related activity, concluding that these effects are outside the scope of review. EIS at 4-212, JA____. Yet nowhere in the record did DOE dispute that it could reasonably foresee, for any given level of exports, the amount of greenhouse gases that would be emitted by the additional natural gas production, processing, and transportation that would be caused by Cheniere's exports, or by foreseeable cumulative exports. NEPA requires this analysis.

Without addressing climate or greenhouse gases specifically, the Authorization Order categorically stated that the "the environmental impacts resulting from production activity induced by LNG exports"

could not be foreseen "without knowing where, in what quantity, and under what circumstances additional gas production will arise." Authorization Order at 194, JA____. DOE admits, however, that unlike other impacts, greenhouse gas emissions and climate change do not occur at "a local or regional level." Addendum at 2, JA____. The record plainly demonstrates that DOE can estimate the amount of greenhouse gases that would be emitted by any volume of natural gas production, processing, and transmission. National Energy Technology Laboratory, Life Cycle Analysis of Natural Gas Extraction and Power Generation (May 29, 2014) ("Domestic Life Cycle Report") at 34, JA____.[13]

Nor has DOE shown that "uncertainty" as to the "quantity" of additional production renders climate impacts unforeseeable. EIA's studies predict the quantity of additional production that is likely to

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[13] The Domestic and Global Life Cycle Reports demonstrate an available methodology, but they rely on flawed inputs, resulting in estimates that are too low. DOE has conceded multiple such flaws. Authorization Order at 161, JA____, Rehearing Order at 34-35, JA____. Sierra Club contends that the best available science contradicts other input assumptions. *See* Authorization Order at 180-181, JA____ (recognizing line of peer-reviewed studies estimating significantly higher methane emissions than estimates DOE used).

occur for various export volumes and scenarios. DOE has not disputed these estimates. The only barrier DOE identifies to reasonably forecasting the quantity of export-induced production is DOE's flawed argument that the very exports the agency is authorizing are themselves unforeseeable.

DOE has the tools to foresee the amount of additional gas production that will be induced by Cheniere's exports, and the amount of greenhouse gases that will be emitted by this production. DOE can similarly foresee the greenhouse gas impacts of cumulative exports. DOE's adoption of an EIS that excluded these impacts violated NEPA.

ii. Both Gas Production and Environmental Impacts Can Be Foreseen At Regional Scales

The record contradicts DOE's assertion that all non-climate impacts can only be meaningfully discussed "at the wellhead or local level." Rehearing Order at 19, JA____. Cheniere's exports will cause foreseeable additional gas production, especially in the Eagle Ford Shale and other Texas gas plays, and DOE has the tools to model how individual and cumulative exports will increase production in individual gas plays. These play-level forecasts of production increases are sufficient to support meaningful discussion of numerous environmental

impacts, including effects on regional ozone levels, water resources, and habitat fragmentation.

DOE does not and could not dispute that evidence in the record and available tools enable DOE to predict where, at the play level, the additional gas production induced by Cheniere's exports will occur. *Cf.* Rehearing Order at 19-20, JA____-____ (arguing that such predictions are not useful). DOE recognized Cheniere's claims that the Eagle Ford Shale was the most likely source of gas supply, and that Cheniere's exports would produce indirect economic benefits—which primarily arise from increased gas production—occurring primarily in Texas. Authorization Order at 21-22, 33-35, JA____-____, ____-____. DOE rejected Sierra Club's challenge to Cheniere's economic analysis. *Id.* at 187-188, JA____-____.

Similarly, the EIS, which DOE adopted without qualification, assumed that "the natural gas feedstock for Cheniere's Terminal would be sourced from the south Texas region," and relied on this assumption in rejecting alternatives that would have located export infrastructure in Louisiana. EIS at 3-7, 3-12, JA____, ____.

More broadly, numerous models enable DOE to predict gas production in individual gas plays throughout the U.S. will balance in response to exports. EIA's National Energy Modeling System incorporates "a play-level model" to predict how natural-gas production will "respon[d]" to changes in the market price for gas. EIA, Documentation of the Oil and Gas Supply Module, 2-1, 2-3 (2011), JA____, ____. EIA already uses this model to predict future production in individual gas plays: for example, the 2015 Annual Energy Outlook referred to EIA's specific predictions for the Marcellus, Haynesville, Eagle Ford, and Utica plays. Annual Energy Outlook 2015 at 19-20, JA____-____. Non-government modelers confirm the feasibility of such play-level predictions. Deloitte Marketpoint, Analysis of the Economic Impact of LNG Exports from the United States, at 8, 14, JA____, ____ (estimating future gas production for individual shale plays); ICF International, U.S. LNG Exports: Impacts on Energy Markets and the Economy at 18, JA____ (explaining that ICF's model predicts production in individual basins); ICF International, U.S. LNG Exports: State-Level Impacts on Energy Markets and the Economy at 15, JA_____ (predicting exports' impact on gas production in every state).

The Authorization and Rehearing Orders do not dispute that EIA's tools can foresee how export-induced gas production will likely be divided among the nation's gas plays (both shale gas and otherwise). *See* Rehearing Order at 19-20, JA____-____. Nor does any evidence in the record indicate that the cost of doing so would be "exorbitant." 40 C.F.R. §1502.22(a). Indeed, here, much of the foundational modeling work has likely already been done in preparing EIA's export studies. *Cf. Mayo Found. v. Surface Transp. Bd.*, 472 F.3d 545, 555 (8th Cir. 2006) (agency used National Energy Modeling System for sole purpose of preparing "national and regional level[]" NEPA analysis of induced coal use).

Instead, DOE argues that play-level forecasts of gas production are too coarse to meaningfully inform discussion of environmental effects. Rehearing Order at 19-20, JA____-____. The record flatly contradicts DOE's assertion. DOE already determined that it was appropriate to discuss impacts on water supply at the play level, illustrating the effect of existing gas production on water in various shale plays. Authorization Order at 150, JA____. For example, DOE recognizes that in Texas's arid Eagle Ford shale, between 3 and 6% of

available water is used for existing shale gas production. *Id*. DOE could reasonably foresee how exports would influence these totals. Similarly, the Addendum concludes that impacts on landscapes and habitat can *only* be properly analyzed at the "ecosystem or regional scale." Addendum at 62, JA____.

Most importantly, play-level forecasts of gas production increases enable DOE to reasonably foresee impacts on regional ozone levels. Ground-level ozone is formed by the interaction of volatile organic chemicals and nitrogen oxides, and has serious impacts on human health and the environment. Addendum at 25, JA____. EPA has explained that ozone formation and impacts often occur "on a regional scale (*i.e.*, thousands of kilometers)." 76 Fed. Reg. 48,208, 48,222 (Aug. 8, 2011). Nationwide, volatile organic chemical "emissions from oil & gas operations [are] about 2.7 million tons per year," representing "about 21 percent" of the national total. Addendum at 20, JA____. In some regions, gas production is the primary contributor to ozone levels that violate EPA's national ambient air quality standards. *Id.* at 28, JA____.

Here, record evidence indicates that the additional Eagle Ford Shale gas production likely to be induced by Cheniere's exports will contribute to harmful ozone levels in, *inter alia*, the San Antonio region. The Alamo Area Council of Governments modeled the effects of low, medium, and high levels of oil and gas production Eagle Ford Shale on ozone levels in the San Antonio-New Braunfels Metropolitan Statistical Area. Alamo Area Council of Governments, *Development of the Extended June 2006 Photochemical Modeling Episode: Technical Report* (October 2013), JA____. This study concluded that moving from low to high Eagle Ford Shale production levels would increase regional ozone levels by 0.5 to 0.7 parts per billion, and that these increases would make it "difficult" for the region to meet EPA's recently-revised ozone air quality standard. *Id.* at v, JA____. Although Sierra Club's comment on the EIS submitted and discussed this study, neither FERC nor DOE addressed it. *See* EIS at I-117, I-122, JA____, _____.

DOE has, however, endorsed similar studies. The Addendum favorably summarized two other studies that the Comprehensive Air-quality Model with extensions ("CAMx"), also used in the Alamo study, to predict how an increase in gas production in an individual gas play

will affect ozone levels in neighboring regions. One study used this tool to predict that increasing gas development in the Haynesville Shale would significantly impact ozone throughout east Texas/west Louisiana region. Addendum at 28-29, JA____-____ (summarizing Susan Kemball-Cook, *et al.*, *Ozone Impacts of Natural Gas Development in the Haynesville Shale*, 44 Envtl. Sci. & Tech. 9357, 9360-61 (2010) JA____-____). The Bureau of Land Management has performed a similar analysis, modeling how gas development on federal land would affect ozone in surrounding regions. *Id.* (citing Bureau of Land Management, Continental Divide-Creston Natural Gas Development Project Draft EIS (Nov. 2012), JA_____).

These studies squarely refute DOE's unsupported assertion that play-level forecasts of increased gas production do not enable DOE to assess ozone impacts. Rehearing Order at 20 at 82, JA____. DOE has not shown that the cost of modeling or otherwise analyzing ozone impacts would be "exorbitant." 40 C.F.R. § 1502.22(a). EPA demonstrated that it was feasible to model the impact a new rule regarding major sources of air pollution would have on individual ozone regions nationwide. EPA, *Regulatory Impact Analysis for the Federal*

Implementation Plans to Reduce Interstate Transport at 60-61 (June 2011).[14] Here, modeling the effects of export-induced production is likely to be simplified by the fact that the majority of that production will stem from shale gas, 2014 Export Study at 12, JA____, and that shale gas production is concentrated in just a few plays and states. Unconventional Production Report at 10-11, JA____-____.

iii. Local Impacts Cannot Be Excluded from NEPA Review

Finally, NEPA does not permit DOE to entirely ignore effects—including "local" effects—even if the location and other details regarding the effects cannot be foreseen. DOE does not dispute that the nature of these effects is reasonably foreseeable. DOE therefore could not "simply ignore" these effects in its NEPA analysis. *Mid States,* 345 F.3d at 549-50. This Court has held that where agency action would lead to creation of nuclear waste, NEPA required analysis of the impacts of storing that waste, despite uncertainty of where and how that waste would be stored. *Scientists' Inst. for Pub. Info. v. Atomic*

[14] https://www3.epa.gov/crossstaterule/pdfs/FinalRIA.pdf.

Energy Comm'n, 481 F.2d 1079, 1097 (D.C. Cir. 1973). Similarly, in *California Wilderness Coalition v. DOE*, the Ninth Circuit rejected DOE's conclusion that DOE's designation of electric transmission corridors would not have any reasonably foreseeable effects requiring NEPA analysis. The court explained that "although the effects of" DOE's designation "may be uncertain and difficult to quantify, the potential consequences of such effects are significant enough to undermine DOE's conclusory" assertion that DOE was not required to provide a NEPA analysis of these effects. *Cal. Wilderness Coal. v. DOE*, 631 F.3d 1072, 1097 (9th Cir. 2011). *See also Mid States,* 345 F.3d at 549-50 (holding that where action would foreseeably increase availability and use of coal, the agency's NEPA analysis could not ignore "the construction of additional [coal-fired] power plants" that may result merely because agency did not "know where those plants will be built, and how much coal these new unnamed power plants would use.").

B. Exports Will Foreseeably Increase U.S. Coal Use

To the extent that export volumes are not met with additional gas production, they will primarily be met by existing gas supplies made

available when utilities switch from gas to coal in response to increased gas prices. 2014 Export Study at 18, JA____. DOE's reliance on an EIS that provided no analysis of this effect violated NEPA.

DOE implicitly disputes EIA's prediction that LNG exports will foreseeably increase coal use, claiming that the 2012 Export Study's predictions "out of date" because they did not account for recent regulations applicable to coal fired power plants. Rehearing Order at 24, JA____. This argument is arbitrary for three reasons. First, DOE cannot argue that the 2012 Export Study is unreliable while simultaneously relying on it. Although this Study did not consider "EPA's Mercury and Air Toxics Standard and its Transport Rule" or proposed rules power-plant greenhouse gas emissions, Authorization Order at 199-200, JA____-____ (footnotes omitted), DOE relied on it in assessing the price impacts of exports, *id.* at 193-194, JA____-____, concluding that ultimately, the 2012 Export Study was "fundamentally sound," *id.* at 195, JA____. *See Scientists' Inst. for Pub. Info.*, 481 F.2d at 1097 (holding that where agency "believes its cost-benefit forecasts are accurate enough for use in convincing Congress to fund the program … parallel environmental forecasts would be accurate enough for use in

planning how to cope with and minimize the detrimental environmental effects.").

Second, DOE could not ignore the fact that EPA's greenhouse gas rules may not take effect. When DOE issued the Authorization Order, these rules were merely proposed. *See id.* at 199-200, JA____-____. When DOE issued the Rehearing Order, the Clean Power Plan was final, but had been stayed pending legal challenge. *See N. Dakota*, 136 S. Ct. 999. Implementation of these rules is therefore uncertain. Elsewhere, where DOE recognized that multiple future regulatory contexts were foreseeable, DOE responded by considering multiple possible scenarios. Authorization Order at 124, JA____ (explaining that high and low recovery scenarios "capture" possible "changes in environmental regulation" that would influence gas supply and production).

Finally, DOE improperly failed to consider EIA's analysis of the effect of these rules, which predicted that increasing LNG exports will increase coal use even with these regulations. Specifically, the 2014 Export Study included an "accelerated coal retirement" scenario, 2014 Export Study at 5, JA____, designed to serve "as a proxy for possible

future policies to mitigate greenhouse gas emissions" from power-plants. Annual Energy Outlook 2014 at IF-35, JA____. The other, non-greenhouse gas regulations DOE cites are also included in the 2014 Export Study's cases. *Id.* at LR-3, JA____. The 2014 Export Study predicted that increased LNG exports would increase coal use even in the accelerated coal retirement scenario. 2014 Export Study Table B5, JA____. DOE's sole discussion of the 2014 Export Study is the flat assertion—presented in a footnote without any supporting reasoning—that it does not "support[] Sierra Club's arguments." Rehearing Order at 45-45 n.167, JA____-____. This cursory dismissal was arbitrary.

Thus, evidence in the record uniformly indicates that increasing exports will foreseeably increase U.S. coal use. This additional coal use will have serious environmental impacts. Evidence in the record indicates that where exports cause gas-to-coal switching, the increase in greenhouse gas emissions will be more than six times higher than where exports cause new gas production, although DOE failed to present—much less consider—this analysis. *See* Domestic Life Cycle Report at 47, JA____ (difference between generating one megawatt-hour of fleet baseload electricity with gas and coal is 636 kilograms of carbon

dioxide equivalent); Global Life Cycle Report at 11, JA___ (well-to-terminal emissions for gas sufficient to generate one megawatt-hour are 100 kilograms of carbon dioxide equivalent). The record demonstrates that DOE can also address export-induced coal use's emissions of other, non-greenhouse-gas pollutants. EIA's National Energy Modeling System predicts both the amount by which exports are likely to increase coal use and where, on a regional basis, that additional coal use is likely to occur. The National Energy Modeling System: An Overview at 6, 45, 72, JA____, _____, _____. In preparing the Export Studies, EIA already produced region-specific estimates of changes in coal use.[15]

Other agencies have used modeling tools to predict both how agency action will affect coal use in individual regions across the country and the resulting impacts on air quality. *See Mayo Found.*, 472 F.3d at 555 (explaining that EIA's modeling tools "not only forecast[] coal supply and demand but also quantif[y] environmental impacts" of coal use); EPA, *Regulatory Impact Analysis Federal Implementation Plans to Reduce Interstate Transport* at 60-61.

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[15] *See supra* note 9.

The record demonstrates that increasing exports will foreseeably increase U.S. coal use, with foreseeable environmental impacts. NEPA required analysis of these impacts.

C. Exports Will Have Foreseeable Impacts "Downstream" of the Export Terminal

Authorizing exports will also enable numerous activities "downstream" of the terminal: tanker transport, regasification, and combustion of exported LNG by end users (predominantly for generation of electric power). *See* Authorization Order at 160-162, JA____-____. The Global Life Cycle Report demonstrates that DOE has the tools to estimate the greenhouse gases that will be emitted by each of these downstream activities. The EIS, however, provided no analysis of these emissions.

DOE recognizes that energy markets in importing countries will respond to LNG exports in a variety of ways. Some use of LNG will constitute an increase in energy consumption. *Id.* at 202-203, JA___-____. The remainder will displace other energy sources, including coal, other sources of natural gas, and renewables. *Id.* DOE contends that it is impossible to "model" the net greenhouse gas impact of downstream

emissions (or exports generally) because of DOE cannot model the extent to which U.S. LNG will displace each of these "fuel sources." *Id.* at 208, JA____. Uncertainty as to the proportion of U.S. LNG that will displace conservation, coal, renewables, and gas does not, however, mean that these effects—or downstream effects as a whole—are unforeseeable. *Scientists' Inst. for Pub. Info.*, 481 F.2d at 1097. Indeed, the Global Life Cycle Report provides an example of how these effects can be discussed: DOE can compare U.S. LNG's emissions with the emissions from each of these alternative energy sources, even if DOE cannot foresee the extent to which U.S. LNG will displace any individual alternative. *Mid States,* 345 F.3d at 549-50.

Although the Global Life Cycle Report provides an illustrative example, it does not substitute for NEPA analysis. The Report only provided comparisons for coal and other sources of natural gas, despite DOE's acknowledgement that U.S. LNG would also compete with conservation and renewables. Authorization Order at 202-203, JA____. DOE contends that it selected coal and natural gas for comparison because these are "prevalent fuel sources for electric generation in non-FTA LNG-importing nations." *Id.* at 203, JA____. NEPA, however,

requires DOE to analyze all foreseeable impacts, not merely the most prevalent ones.[16] DOE does not and cannot conclude that coal and natural gas will be the *only* energy sources displaced by U.S. LNG.

Analysis of downstream impacts must be also tethered to Cheniere's proposals, and to cumulatively foreseeable export volumes. By ignoring these, Global Life Cycle Report failed to inform decisionmakers and the public of the scale of potential impacts. The 3,500 bcf/d of exports EIA predicts, for example, would generate nearly 500 million megawatt hours of electricity per year.[17] DOE can reasonably foresee that if even a small percentage of these exports displace conservation or low-emitting renewable sources of energy, the net result will be millions of tons per year of additional greenhouse gas emissions. *See* Global Life Cycle Report at 10, JA____. *Cf.* 2014 Export

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[16] Insofar as prevalence is relevant, the record evidence DOE cites demonstrates that renewables are equally, if not more, prevalent than gas in likely import markets. *See, e.g.*, EIA, India Analysis Brief (last updated June 26, 2014), JA____ (identifying India's 2014 installed capacity mix at 59% coal, 16% hydroelectric, 13% "other renewables," and 9% natural gas).

[17] Domestic Life Cycle Report at 18, 30, JA____, _____ (converting cubic feet to MMbtu to megawatt hours indicates that one billion cubic feet of natural gas generates 139,700 megawatt-hours).

Study at 9, JA____ (accounting for uncertainty by analyzing effects that would result from a range of potential cases).

D. *Public Citizen* Does Not Condone Excluding Increased Gas Production and Coal Use from DOE's NEPA Review

DOE further argues that *Department of Transportation v. Public Citizen*, 541 U.S. 752 (2004) justifies excluding export-induced gas production and coal use from NEPA review. Rehearing Order at 15-21, JA____-____. Although the Rehearing Order quotes various phrases from *Public Citizen*, the Order does not address their context or the legal tests actually applied by the Court. Here, where DOE purported to actually consider the environmental impacts of increased gas production in deciding whether exports would be consistent with the public interest, *Public Citizen* does not condone DOE's decision to exclude these impacts from NEPA review.

Public Citizen held that an agency's NEPA obligations are limited by the "rule of reason," reflecting NEPA's purpose of informing agency decisionmaking. 541 U.S. at 767. In that case, because the agency had "no authority" and "no ability" to prevent the entry of Mexican trucks into the United States, NEPA did not require evaluation of such entry's

consequences because the agency would not be able to act on such an evaluation. *Id.* at 767-70. Similarly, where agency action is purely "ministerial," such that the "agency does not have sufficient discretion to affect the outcome of its actions, … the information that NEPA provides can have no affect on the agency's actions." *Citizens Against Rails-to-Trails v. Surface Transp. Bd.*, 267 F.3d 1144, 1151 (D.C. Cir. 2001).

This Court has already determined that DOE "maintains exclusive authority over the export of natural gas as a commodity," and that issues regarding exports' indirect effects are "exclusively within the Department of Energy's wheelhouse." *Freeport*, 827 F.3d at 40, 46. In exercising this authority and making the required Natural Gas Act public interest assessment, DOE purported to weigh the impacts of gas production. Authorization Order at 11-13, 183-184, 195-197, JA____-____, ____-____, ____-____. The Natural Gas Act requires this broad view, as the statute's "public interest" standard encompasses environmental impacts and effects on natural gas supplies. *NAACP*, 425 U.S. at 670 n.6, *Myersville Citizens*, 783 F.3d at 1307. Because DOE contends that it considered the environmental impacts of export-

induced gas production in reaching its decision, DOE cannot contend that NEPA analysis of these issues could not aid in decisionmaking. The key fact underlying *Public Citizen* is absent here.

Without acknowledging *Public Citizen*'s facts or reasoning, DOE simply asserted that the connection between DOE's approval and increased gas production and coal use is not "proximate," and that these effects are better addressed by entities with direct regulatory authority over these activities: state regulators, EPA, and the Department of Interior. Rehearing Order at 21, 24, JA____, _____. NEPA does not permit DOE to rely on regulation by other agencies as a reason to forego analysis. *Calvert Cliffs' Coordinating Comm., Inc. v. U.S. Atomic Energy Comm'n*, 449 F.2d 1109, 1122-23 (D.C. Cir. 1971). DOE plays a different role than other federal or state agencies. Although EPA, for example, must ensure that gas production complies with applicable air pollution standards, DOE must assess the environmental impact that will result from export-induced production despite those standards, so that DOE can consider this impact in determining whether to approve exports. *Id.* at 1123. *See also Mid States*, 345 F.3d at 550 (holding that Surface Transportation Board must consider indirect air pollution from induced

coal combustion because pollution could increase notwithstanding Clean Air Act limits); *Delaware Dep't of Nat. Res. & Envtl. Control v. EPA*, 785 F.3d 1, 15-16 (D.C. Cir. 2015) ("Administrative law does not permit" EPA "to excuse its inadequate responses by passing the entire issue off onto a different agency."). Absent a statute vesting exclusive authority in another federal agency, *Freeport*, 827 F.3d at 46, DOE's lack of direct regulatory authority over these issues is irrelevant. *Sierra Club v. Army Corps of Eng'rs*, 803 F.3d 31, 40 n.3 (D.C. Cir. 2015) (Corps of Engineers could not limit its NEPA analysis for Clean Water Act permit to effects in jurisdictional waters), *Save Our Sonoran, Inc. v. Flowers*, 408 F.3d 1113, 1122 (9th Cir. 2005) (distinguishing *Public Citizen*); *see also O'Reilly v. Army Corps of Eng'rs*, 477 F.3d 225, 234 (5th Cir. 2007), *City of Davis*, 521 F.2d at 675, 677.

The Rehearing Order's remaining assertions regarding the nature of the causal relationship amount to flawed arguments about reasonable foreseeability. DOE cannot argue that the effects of increased gas production and coal use are so "attenuated" as to not be "proximate" or "reasonably close," Rehearing Order at 21, 23-24 JA____, ____-____, when they are reasonably foreseeable, when they have in fact

been foreseen by DOE and every other informed observer, and when, as to increased gas production, the effect is not only a consequence but an explicitly stated *purpose* of the proposed action. Application at 39-41, JA____-____.

E. The Addendum and Related Reports Do Not Substitute for an Environmental Impact Statement

The Addendum, National Energy Technology Laboratory Reports, and other materials in the record do not cure the deficiencies in the EIS. DOE concedes that these materials were not prepared pursuant to NEPA, and although DOE claims that it "considered" the Addendum, DOE did not argue that these materials played a role in meeting DOE's NEPA obligations. Record of Decision, 80 Fed. Reg. at 28,258, JA____; Authorization Order at 147, JA____ (Addendum "not required by NEPA"), *id.* at 183, JA____ (Global Life Cycle Report "does not fulfill any NEPA requirements"). If this Court agrees that the EIS is deficient, DOE cannot now argue that these materials satisfy NEPA's requirements. *N. Air Cargo v. U.S. Postal Serv.*, 674 F.3d 852, 860 (D.C. Cir. 2012) ("[A]gency action … can be upheld only on the basis of a contemporaneous justification by the agency itself.").

In any event, these materials fail to provide the analysis NEPA requires. Most fundamentally, these materials make no reference to the action under review: Cheniere's proposed exports. The Addendum is not only untethered from this specific proposal; it makes no "attempt to identify or characterize the incremental environmental impacts that would result from LNG exports" whatsoever. Authorization Order at 193-194, JA____-____. As a result, the Addendum fails to meaningfully analyze the environmental impacts of export-induced gas production.

The mere acknowledgement that increased gas production "may" increase ozone levels and "may" frustrate some areas' efforts to reduce pollution to safe levels, for example, falls far short of the hard look NEPA requires. Addendum at 27-28, JA____-____. The Addendum provides no analysis of these effects—no discussion of their likelihood, magnitude, or consequences for public health. The record demonstrates that DOE could have, however, discussed which, and how many, air quality regions would suffer increased ozone levels, the potential severity of these increases, and whether these increases would cause or exacerbate violations of EPA's air quality standards. For example, DOE could have discussed the extent to which export-induced gas production

in the Eagle Ford Shale would impact ozone levels in San Antonio and Houston, *see supra* page 52, the effect of increases in the Barnett and Haynesville shale gas plays on air quality near Dallas, or the effect of increases in the Marcellus on air quality in Pittsburgh. *See* Addendum at 6, JA____ (map of shale plays). DOE has not shown that such analysis would be impossible or exorbitantly expensive, 40 C.F.R. § 1502.22, and such analysis would plainly provide important information to decisionmakers and the public.

Similarly, the Global Life Cycle Report does not discuss Cheniere's proposal or potential cumulative export volumes, and even its abstract analysis only considers a subset of the climate consequences of exports: the Report provides no discussion of some foreseeable impacts upstream of export terminals (*e.g.*, gas-to-coal switching) and downstream (*e.g.*, displacement of energy sources other than gas and coal). Thus, nothing in the record "sharply defin[es]" the impacts of Cheniere's proposed exports or provides a "clear basis" for determining whether to approve or reject the proposal. 40 C.F.R. § 1502.14.

The Addendum and reports also fail to provide the discussion of context NEPA requires. To ensure that consideration of impacts is

informed and effective, NEPA regulations require more than simple recitation of the physical impacts of a proposal. An EIS must, for example, provide a searching discussion of alternatives, including explorations of ways in which the agency, by acting differently, could mitigate those impacts. 42 U.S.C. § 4332(C), 40 C.F.R. § 1502.14. As DOE concedes, the Addendum does not provide this discussion. Addendum at 106, JA____; *cf. e.g.,* Sierra Club Protest at 14-15 (Dec. 26, 2012) at JA____-____ (suggesting alternatives that could mitigate indirect impacts).

An EIS must also explore whether, by approving the action, the agency will cause effects that conflict with policies or plans for protection of the environment. 40 C.F.R. § 1502.16(c); *see* CEQ Greenhouse Gas Guidance at 29 (interpreting this regulation as encompassing greenhouse gas emission reduction policies). Here, the EIS, Addendum and Reports fail to discuss the impact of exports on U.S. climate policies. The U.S. has adopted vital targets for reducing national greenhouse gas emissions. Climate Action Plan at 4, JA____. Natural gas exports will interfere with achievement of those targets, by increasing gas production and coal use. The record demonstrates that if

all export volumes are met by new production (an assumption that understates impacts), the 3,500 bcf/y of likely exports predicted by EIA will increase U.S. greenhouse gas emissions by more than 88.4 million tons of carbon dioxide equivalent per year. *See* Addendum at 5, JA____; note 17 *supra* (explaining conversion from bcf to megawatt-hours); Global Life Cycle Report at 11, JA____ (estimating 164 kilograms of carbon dioxide equivalent emitted domestically per megawatt-hour-equivalent of gas exported), *but see* Rehearing Order at 34-35, JA____-____ (agreeing that Global Life Cycle estimate is too low). This amounts to more than 20% of the expected benefit of the nation's largest emission-reduction effort to date, the Clean Power Plan. EPA, *Regulatory Impact Analysis for the Clean Power Plan Final Rule* at ES-6.

Although DOE has prepared many pages of analysis, verbosity does not ensure a hard look. Because the Addendum and related reports are untethered from Cheniere's proposed exports, and from cumulatively foreseeable exports, these materials fail to fulfill an EIS's essential function of informing decisionmakers and the public of the consequences of the proposed action and ensuring that these

consequences are meaningfully considered. *Anderson v. Evans*, 371 F.3d 475, 494 (9th Cir. 2004).

III. Natural Gas Act

In addition to violating NEPA, DOE acted arbitrarily in determining that Cheniere's proposed exports would be consistent with the public interest for purposes of 15 U.S.C. § 717b(a).

A. DOE Ignored Unequal Distribution of Exports' Impacts

The Natural Gas Act requires assessment of the "public" interest, 15 U.S.C. § 717b(a); that is, the interest "of … all or most of the people" in the United States. *Public*, Merriam-Webster Unabridged Dictionary (online ed. 2016).[18] The President has repeatedly recognized that federal policymakers must consider impacts on the middle class, and that the government must not allow a "surplus [to] bec[o]me an excuse to transfer wealth to the wealthy instead of an opportunity to invest in our future." *See* Sierra Club Protest at 69, JA____ (quoting President Barack Obama, State of the Union Address (Feb. 24, 2009), JA____).

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[18] http://www.merriam-webster.com/dictionary/public.

Here, however, the record demonstrates that in purely economic terms, the benefits of exports will be enjoyed by a minority of Americans, and that exports will make most members of the American public worse off. Exports will raise the gas and electricity prices paid by all Americans. 2012 Export Study at 6, JA____. Exports will also harm manufacturing and other industries, leading to a net loss in wage income equivalent to hundreds of thousands of lost jobs. Synapse Energy Economics, *Will LNG Exports Benefit the United States Economy?* at 5, JA____ (interpreting NERA Study's conclusions). On the other hand, the economic benefits of exports will principally accrue only to those who own shares of natural gas companies, providing no benefit to the half of the population that owns no stock at all (including indirect holdings in retirement accounts). *Id.* at 9, JA____. All told, gross economic harms—the only economic impacts of exports most Americans will experience—will in some cases be four times the net economic benefit of exports. NERA Study at 188, JA____.

The updated NERA study submitted by Cheniere does not call this analysis into question. The updated study acknowledges that exports will create "winners and losers," but asserts that, in the abstract, where

policies create net economic growth, decreases in labor income and increases in energy prices are likely to be offset by "gains from investment and resource ownership." NERA Economic Consulting, Updated Macroeconomic Impacts of LNG Exports from the United States at 66-67 (Feb. 20, 2014), JA____-____. However, as with the initial study, NERA provided no analysis of how many households directly or indirectly own such investments.

DOE agrees that "the distributional consequences of an authorizing decision" may be so negative as to demonstrate inconsistency with the public interest despite "net positive benefits to the U.S. economy as a whole." Rehearing Order at 45, JA____ (quotation omitted). However, DOE concluded that it did "not see sufficiently compelling evidence" that this was the case here. *Id.* This is because DOE refused to look. *See* NERA Study at 211, JA____ ("[t]his study addresses only the net economic effects of natural gas price changes and improved export revenues, not their distribution.").

Evidence in the record—principally analyses DOE itself commissioned and relied upon—demonstrates that exports will have significant and unfair distributional impacts. Nothing in the record

disputes or calls into question Sierra Club's showing that the small net economic benefit provided by exports masks much larger and regressive income redistribution. DOE's casual dismissal of this issue was arbitrary and capricious.

B. Because DOE Provided No Evaluation of Severity of Environmental Impacts, It Had No Basis for Concluding Exports' Benefits Outweighed Environmental Harms

Although DOE recognized that exports would have adverse environmental impacts, and that environmental impacts must be considered in the public interest analysis, DOE concluded that exports would provide benefits that outweighed these environmental costs. Because DOE did not "attempt to identify or characterize the incremental environmental impacts" of exports, Authorization Order at 193-194, JA____-____, this conclusion was inherently arbitrary: DOE cannot rationally conclude that benefits outweigh costs while admitting that DOE has provided no information on what the costs weigh. *Motor Vehicle Mfrs. Ass'n of U.S*, 463 U.S. at 52.

DOE explained its conclusion with the following:

> A decision to prohibit exports of natural gas would cause the United States to forego *entirely* the economic and international benefits discussed

> herein, but would have little more than a *modest, incremental* impact on the environmental issues identified by … Sierra Club.

Authorization Order at 197, JA____ (emphases added). DOE provides no explanation as to how it determined that the environmental impacts of denial would be "modest" and "incremental." Prohibiting exports would, tautologically, *entirely* prevent the environmental impacts caused by export-induced increases in gas production. The only plausible interpretation of DOE's statement is that DOE is referring to an incremental impact on the harm caused by all natural gas production, whether induced by export or otherwise. But a modest impact on such a large issue can, in absolute terms, matter a great deal. Conversely, exports will only provide a "modest, incremental" increase in the economic benefits provided by overall gas production. The NERA study concluded that even 4,380 bcf/y of exports would increase gross domestic product by only 0.05%. NERA Study at 188, JA____.

Implicit in the Natural Gas Act's requirement to consider environmental factors in the public interest analysis is a requirement to provide some analysis of the significance of environmental effects of proposed exports. Here, where DOE did not "identify or characterize the

incremental environmental impacts" of exports, DOE's conclusion that these impacts would be outweighed by other benefits was arbitrary and capricious. Authorization Order at 193-194, JA____-____.

CONCLUSION

For the reasons set forth above, Sierra Club respectfully requests that DOE's Authorization Order and Rehearing Order be vacated and remanded.

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CERTIFICATE OF COMPLIANCE WITH WORD LIMITATION

Counsel hereby certifies that, in accordance with Federal Rule of Appellate Procedure 32(a)(7)(C), the foregoing Proof Opening Brief of Petitioner Sierra Club contains 13,665 words, as counted by counsel's Microsoft Word processing program.

Dated: November 30, 2016.

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CERTIFICATE OF SERVICE

I hereby certify that on this 30th day of November, 2016, I electronically filed the foregoing with the Clerk of the Court using the CM/ECF system, which will send notice of such filing to all registered CM/ECF users.

/s/ Nathan Matthews
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