

UNITED STATES OF AMERICA

DEPARTMENT OF ENERGY

OFFICE OF FOSSIL ENERGY

DOMINION COVE POINT LNG, LP

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FE DOCKET NO. 11-128-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 COVE POINT LNG TERMINAL IN CALVERT COUNTY, MARYLAND,
TO NON-FREE TRADE AGREEMENT NATIONS

DOE/FE ORDER NO. 3331-B

APRIL 18, 2016

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FREQUENTLY USED ACRONYMS

Bcf/d	Billion Cubic Feet per Day
Bcf/yr	Billion Cubic Feet per Year
CEQ	The Council on Environmental Quality
CH ₄	Methane
CO ₂	Carbon Dioxide
DCP	Dominion Cove Point LNG, LP
DOE	U.S. Department of Energy
EA	Environmental Assessment
EIA	U.S. Energy Information Administration
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FE	Office of Fossil Energy, U.S. Department of Energy
FERC	Federal Energy Regulatory Commission
FONSI	Finding of No Significant Impact
FTA	Free Trade Agreement
GHG	Greenhouse Gas
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LCA	Life Cycle Analysis
LNG	Liquefied Natural Gas
NEMS	National Energy Modeling System
NEPA	National Environmental Policy Act
NERA	NERA Economic Consulting
NETL	National Energy Technology Laboratory
NGA	Natural Gas Act
VOC	Volatile Organic Compound

I. INTRODUCTION

The Department of Energy's (DOE or the Department) Office of Fossil Energy (DOE/FE) has issued two related orders under the Natural Gas Act (NGA)¹—DOE/FE Order Nos. 3331² (Conditional Order) and 3331-A³ (Final Order)—which together grant the application of Dominion Cove Point LNG, LP (DCP) filed on October 3, 2011 (Application).⁴ In that Application, DCP requested long-term, multi-contract authorization to export domestically produced liquefied natural gas (LNG) by vessel to nations with which the United States has not entered into a free trade agreement requiring national treatment for trade in natural gas and with which trade is not prohibited by U.S. law or policy (non-FTA nations). As explained below, the Final Order authorizes DCP to export LNG in a volume equivalent to 281 billion cubic feet per year (Bcf/yr) of natural gas (0.77 Bcf per day (Bcf/d)),⁵ for a term of 20 years.⁶ DCP's exports will originate from liquefaction and related facilities under construction (Liquefaction Project) at

¹ NGA section 3(a), 15 U.S.C. § 717b(a).

² *Dominion Cove Point LNG, LP*, DOE/FE Order No. 3331, FE Docket No. 11-128-LNG, Order Conditionally Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Cove Point LNG Terminal in Calvert County, Maryland, to Non-Free Trade Agreement Nations (Sept. 11, 2013) [hereinafter Conditional Order].

³ *Dominion Cove Point LNG, LP*, DOE/FE Order No. 3331-A, FE Docket No. 11-128-LNG, Final Opinion & Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Cove Point LNG Terminal in Calvert County, Maryland, to Non-Free Trade Agreement Nations (May 7, 2015) [hereinafter Final Order].

⁴ Application of Dominion Cove Point LNG, LP for Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Countries, FE Docket No. 11-128-LNG (Oct. 3, 2011) [hereinafter DCP App.].

⁵ DCP originally requested authorization to export LNG in a volume equivalent to 365 Bcf/yr of natural gas (1 Bcf/d), the maximum volume that DCP contemplated exporting at that time. Subsequently, in an update to the Application, DCP informed DOE/FE that the planned liquefaction capacity of the Liquefaction Project is 281 Bcf/yr of natural gas (0.77 Bcf/d), and therefore DOE/FE authorized exports in that lower volume.

⁶ DOE/FE authorized DCP to export the LNG on its own behalf and as an agent for other entities that hold title to the LNG, after registering each such entity with DOE/FE. The Final Order contained numerous additional terms and conditions, which superseded those set forth in the Conditional Order. *See* Final Order at 100-112.

the existing Cove Point LNG Terminal (DCP Terminal), which DCP owns and operates in Lusby, Maryland.⁷

The Conditional Order, issued September 11, 2013, entered findings on all non-environmental factors, including economic impacts, international impacts, and security of the natural gas supply, among others. In reviewing the record evidence in that phase of the proceeding, DOE/FE determined that Sierra Club (as well as other intervenors and participants) had not demonstrated that DCP's proposed exports would be inconsistent with the public interest, as would be required to deny the authorization. DOE/FE therefore granted DCP's Application, but conditioned the export authorization on: (i) satisfactory completion of DCP's environmental review process under the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. § 4321 *et seq.*, then on-going before the Federal Energy Regulatory Commission (FERC); and (ii) issuance by DOE/FE of a Finding of No Significant Impact (FONSI) or a Record of Decision under NEPA.⁸

DOE/FE participated as a "cooperating agency" in FERC's NEPA review of the Liquefaction Project, as discussed below.⁹ On May 15, 2014, FERC issued its environmental assessment for the Liquefaction Project.¹⁰ The EA recommended that FERC approve the

⁷ In a separate proceeding, DOE/FE authorized DCP to export domestically produced LNG in a volume equivalent to 365 Bcf/yr (1 Bcf/d) of natural gas to any country with which the United States has, or in the future may enter into, a FTA requiring national treatment for trade in natural gas (FTA countries). *See Dominion Cove Point LNG, LP*, DOE/FE Order No. 3019, FE Docket No. 11-115-LNG, Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Cove Point LNG Terminal to Free Trade Agreement Nations (Oct. 7, 2011).

⁸ *See* Conditional Order at 139 (stating that "[w]hen the environmental review is complete, DOE/FE will reconsider its public interest determination in light of the information gathered as part of that review," and observing that, "[t]his procedure will not foreclose the choice of reasonable alternatives or influence subsequent development.").

⁹ *See* Final Order at 4 (citations omitted).

¹⁰ Federal Energy Regulatory Comm'n, Environmental Assessment for the Cove Point Liquefaction Project (Dominion Cove Point LNG, LP), Docket No. CP13-113-000, at 24 (May 2014), *available at* <http://www.ferc.gov/industries/gas/enviro/eis/2014/05-15-14-ea/ea.pdf> [hereinafter EA]; *see also* Dominion Cove Point LNG, LP; Notice of Availability of the Environmental Assessment and Draft General Conformity

Liquefaction Project and a related Pipeline Project¹¹ subject to 82 mitigating environmental conditions. On September 29, 2014, FERC issued an Order Granting Section 3 and Section 7 Authorizations, which authorized DCP to site, construct, and/or operate the Liquefaction and Pipeline Projects subject to the 79 environmental conditions contained in Appendix B of that order.¹² FERC determined that these 79 environmental conditions, not the 82 conditions recommended in the EA, were sufficient due to supplemental information provided by DCP.¹³ On November 5, 2014, after an independent review, DOE/FE adopted FERC's EA and issued a FONSI for DCP's proposed Liquefaction Project (DOE/EA-1942).¹⁴

On May 7, 2015, DOE/FE issued the Final Order (DOE/FE Order No. 3331-A), granting final authorization for DCP to export domestically produced LNG to non-FTA countries in a volume equivalent to 0.77 Bcf/d of natural gas. The Final Order was conditioned on DCP's compliance with the 79 environmental conditions adopted in the FERC Order.¹⁵ On June 8, 2015, Sierra Club timely filed a Request for Rehearing of the Final Order.¹⁶ For the reasons set forth below, DOE/FE denies Sierra Club's Request for Rehearing, and affirms the findings and conclusions in the Final Order.

Determination for the Proposed Cove Point Liquefaction Project, 79 Fed. Reg. 29,435 (May 22, 2014) [hereinafter Notice of EA].

¹¹ DCP also had sought authority from FERC under NGA section 7(c), 15 U.S.C. § 717f(c), to construct, own, and operate facilities on its Cove Point Pipeline at its existing compressor station and metering and regulating site in Fairfax County, Virginia, and at its metering and regulating site located in Loudon County, Virginia. *See* Final Order at 3.

¹² *Dominion Cove Point LNG, LP*, Order Granting Section 3 and Section 7 Authorizations, 148 FERC ¶ 61,244 (Sept. 29, 2014) [hereinafter FERC Order].

¹³ *See id.* P 107 & App. B.

¹⁴ U.S. Dep't of Energy, Finding of No Significant Impact for Cove Point Liquefaction Project Regarding Dominion Cove Point LNG, LP, Application Seeking Department of Energy Authorization to Export Liquefied Natural Gas from Dominion Cove Point LNG Terminal to Non-Free Trade Agreement Nations, DOE/EA-1942 (Nov. 5, 2014), available at <http://energy.gov/sites/prod/files/2014/11/f19/EA-1942-FONSI-2014.pdf> [hereinafter FONSI].

¹⁵ *See* Final Order at 108 (Ordering Para. H).

¹⁶ Sierra Club, Request for Rehearing, FE Docket No. 11-128-LNG, Cover Page (June 8, 2015) [hereinafter Rehearing Request].

II. PROCEDURAL BACKGROUND

A. Environmental Review Procedures

1. FERC's Environmental Assessment and Final Order

When an applicant seeks authority both to export LNG to non-FTA countries and to construct a terminal for that purpose, DOE and FERC work together to avoid duplication of effort in the environmental review required under NEPA. In such cases, FERC is the “lead agency” and DOE/FE is the “cooperating agency” within the meaning of the regulations of the Council on Environmental Quality (CEQ) that implement NEPA.¹⁷ FERC’s lead agency role was codified by section 313 of the Energy Policy Act of 2005 (Pub. L. 109-58 (Aug. 8, 2005)), which amended section 15 of the NGA (15 U.S.C. § 717n).¹⁸

The present case follows that framework.¹⁹ On June 26, 2012, FERC granted DCP’s request to commence the pre-filing review process for the proposed Liquefaction Project. Shortly thereafter, FERC issued a Notice of Intent to Prepare an Environmental Assessment of the Liquefaction and Pipeline Projects.²⁰ The pre-filing proceeding involved a public scoping process to determine the issues requiring environmental review under NEPA.²¹ In April 2013, at the completion of the pre-filing proceeding, DCP filed a formal application with FERC

¹⁷ The CEQ regulations implementing NEPA define a “cooperating agency” as “any Federal agency other than a lead agency which has jurisdiction by law or special expertise” with respect to any proposed action for which a NEPA analysis is prepared. 40 C.F.R. § 1508.5. The selection and responsibilities of a cooperating agency are described in 40 C.F.R. § 1501.6. DOE’s regulations state that it will perform its NEPA responsibilities in accordance with the CEQ regulations. 10 C.F.R. §§ 1021.101, 1021.103.

¹⁸ See 15 U.S.C. § 717n (b)(1).

¹⁹ The Conditional Order (DOE/FE Order No. 3331), as supplemented by the Final Order (DOE/FE Order No. 3331-A), provides the history of the DCP Terminal and describes the proposed Liquefaction Project. These orders also set forth the procedural history of DCP’s proceedings before DOE/FE and FERC, including arguments made by Sierra Club in each proceeding.

²⁰ *Dominion Cove Point LNG, LP*; Notice of Intent To Prepare an Environmental Assessment for the Planned Cove Point Liquefaction Project, Request for Comments on Environmental Issues, Notice of On-Site Environmental Review, and Notice of Public Scoping Meetings, 77 Fed. Reg. 59,601 (Sept. 28, 2012).

²¹ See Final Order at 21-22.

requesting authorization to site, construct, and/or operate the Liquefaction and Pipeline Projects described above.²²

FERC issued the EA for the Liquefaction Project on May 15, 2014, and received public comment on the EA for a 30-day period.²³ The EA addressed numerous environmental issues, including potential impacts on water resources, vegetation, fisheries, wildlife, federally listed species, land use, air quality, and cumulative impacts.²⁴ Based on the environmental analysis, FERC staff concluded that “the impacts associated with this Project can be sufficiently mitigated to support a finding of no significant impact and, thus, an EA is warranted.”²⁵ FERC staff recommended 82 mitigation measures for the Project, explaining that, “if DCP constructs and operates the proposed facilities in accordance with ... our mitigation measures ..., approval of this Project would not constitute a major federal action significantly affecting the quality of the human environment.”²⁶ On this basis, FERC staff recommended in the EA that FERC issue an order that contains a Finding of No Significant Impact and includes the mitigation measures (also referred to as environmental conditions) as conditions of DCP’s requested authorizations.²⁷

Thereafter, FERC issued the FERC Order authorizing DCP to site, construct, and operate the Liquefaction Project and to construct and operate the Pipeline Project, subject to 79 of the 82 mitigating environmental conditions recommended in the EA.²⁸ FERC observed that the

²² *See id.* at 22.

²³ Notice of EA, *supra* note 10. During this time period, FERC held a public comment meeting and accepted written comments on the EA from DCP, Sierra Club, and various federal and state agencies, among others. FERC Order at PP 102-04.

²⁴ *Id.* at P 102; EA at 19.

²⁵ EA at 24.

²⁶ *Id.* at 186.

²⁷ *See id.*

²⁸ FERC Order at P 107. FERC explained that it was requiring DCP to comply with 79 of the 82 mitigation measures recommended in the EA because DCP had filed supplemental information regarding its compliance with the remaining three measures.

proposed Liquefaction Project is located on, and adjacent to, the footprint of the previously-approved Cove Point LNG Terminal, which was constructed to receive imports of LNG. FERC reasoned that, because “[m]uch of the land in the area was previously disturbed during construction of the LNG terminal ... the proposed project’s environmental impacts are expected to be relatively small in number and well-defined.”²⁹ FERC further concluded that, “with the conditions required herein, the Cove Point Liquefaction Project results in minimal environmental impacts and can be constructed and operated safely,” and thus “approval of this proposal would not constitute a major federal action significantly affecting the quality of the human environment.”³⁰

In the Final Order, FERC rejected arguments that it was required under NEPA to prepare an environmental impact statement (EIS) for the Liquefaction Project, instead of an EA.³¹ FERC explained that, consistent with CEQ’s regulations, the location and intensity of DCP’s Project supported the FERC staff’s determination that an EA was appropriate.³² FERC also rejected claims that the EA was defective because it allegedly did not: (i) examine induced natural gas production associated with the Project, (ii) consider the cumulative environmental impacts from natural gas development and gathering, transportation, and distribution in areas outside of the proposed project area, and (iii) adequately analyze direct, cumulative, and indirect impacts on climate change from greenhouse gas (GHG) emissions.³³

Sierra Club and other participants in the FERC proceeding timely filed requests for rehearing of the FERC Order, and FERC denied those requests in May 2015.³⁴

²⁹ *Id.* at P 32; *see also id.* at P 276 (“The small amount of land involved in the project makes an EA adequate and appropriate to fully consider all environmental issues.”).

³⁰ *Id.* at P 281.

³¹ *Id.* at P 273.

³² *Id.* at PP 274-75.

³³ *See, e.g.*, Final Order at 24-29 (citations omitted).

³⁴ *Dominion Cove Point LNG, LP*, Order Denying Rehearing and Stay, 151 FERC ¶ 61,095 (May 4, 2015).

2. DOE's Environmental Documents and Final Order

In connection with this and other LNG export proceedings, on June 4, 2014, DOE/FE provided notice in the *Federal Register* of two separate documents that proposed to evaluate different environmental aspects of the LNG production and export chain. First, DOE/FE announced that it had conducted a review of existing literature on potential environmental aspects associated with unconventional gas production in the lower-48 states. DOE/FE published its draft report for public review and comment, entitled *Draft Addendum to Environmental Review Documents Concerning Exports of Natural Gas from the United States*.³⁵ DOE/FE received comments on the Draft Addendum and, on August 15, 2014, issued the final Addendum with its response to the public comments contained in Appendix B.³⁶

Second, DOE/FE commissioned the National Energy Technology Laboratory (NETL), a DOE applied research laboratory, to conduct an analysis estimating the life cycle greenhouse gas (GHG) emissions for LNG exported from the United States, regasified, and combusted for electric generation in Europe or Asia. The report compared the life-cycle GHG emissions of U.S.-exported LNG to other sources of natural gas available in Europe and Asia, as well as those of regionally-sourced coal. On May 29, 2014, DOE/FE published NETL's report entitled, *Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States* (referred to as the LCA GHG Report),³⁷ as well as a 200-page supporting document entitled, *Life*

³⁵ U.S. Dep't of Energy, Draft Addendum to Environmental Review Documents Concerning Exports of Natural Gas From the United States, 79 Fed. Reg. 32,258 (June 4, 2014) [hereinafter Draft Addendum]. DOE/FE announced the availability of the Draft Addendum on its website on May 29, 2014.

³⁶ U.S. Dep't of Energy, Addendum to Environmental Review Documents Concerning Exports of Natural Gas from the United States, 79 Fed. Reg. 48,132 (Aug. 15, 2014) [hereinafter Addendum].

³⁷ U.S. Dep't of Energy, Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas From the United States, 79 Fed. Reg. 32,260 (June 4, 2014). DOE/FE announced the availability of the LCA GHG Report on its website on May 29, 2014.

*Cycle Analysis of Natural Gas Extraction and Power Generation.*³⁸ DOE/FE received public comments on the LCA GHG Report and the supporting document, and provided its response to those comments in the Final Order.

On May 7, 2015, after FERC denied rehearing of the FERC Order in the DCP proceeding, DOE/FE issued its Final Opinion and Order. In the Final Order, DOE/FE: (i) independently reviewed FERC's NEPA analysis and other outstanding environmental issues, including public comments received on the Addendum and LCA GHG Report; (ii) considered the environmental information that had been developed and the related arguments of the commenters and parties, and found that it had not been demonstrated that DCP's requested authorization was inconsistent with the public interest; and (iii) granted DCP's Application subject to further conditions, including the 79 environmental conditions adopted in the FERC Order.³⁹

B. Sierra Club's Request for Rehearing of DOE's Final Order

Sierra Club filed its Rehearing Request on June 8, 2015, seeking rehearing of DOE/FE Order No. 3331-A. On June 22, 2015, DCP filed a Motion for Leave to Answer and Answer to the Motion to Stay and Request for Rehearing Filed by Sierra Club.⁴⁰ On July 9, 2015, DOE/FE issued an order granting Sierra Club's Rehearing Request for the limited purpose of further

³⁸ See U.S. Dep't of Energy, Nat'l Energy Tech. Lab., *Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States* (May 29, 2014), available at: <http://energy.gov/fe/life-cycle-greenhouse-gas-perspective-exporting-liquefied-natural-gas-united-states>; see also U.S. Dep't of Energy, Nat'l Energy Tech. Lab., *Life Cycle Analysis of Natural Gas Extraction and Power Generation* (May 29, 2014), available at: <http://energy.gov/fe/LCA-GHG-Report> (link to "NETL Natural Gas LCA Model and Analysis"). The LCA GHG Report and the supporting document are incorporated herein by reference.

³⁹ See, e.g., Final Order at 1-9.

⁴⁰ Dominion Cove Point LNG, LP, Motion for Leave to File Answer and Answer to the Motion for Stay and Request for Rehearing Filed by the Sierra Club, FE Docket No. 11-128-LNG (June 22, 2015) [hereinafter DCP Answer].

consideration.⁴¹ On July 14, 2015, DOE/FE issued an order granting DCP's Motion for Leave to Answer for the limited purpose of further consideration.⁴² We address Sierra Club's and DCP's arguments below.

III. DISCUSSION

A. The Rebuttable Presumption Derives from the Natural Gas Act

1. Sierra Club's Position

Sierra Club asserts that DOE/FE erred in finding that 3(a) of the NGA establishes a rebuttable presumption that exports of natural gas are in the public interest. Likewise, Sierra Club challenges the proposition that *Panhandle Producers & Royalty Owners Ass'n v. Economic Regulatory Administration*, 822 F.2d 1105 (D.C. Cir. 1987) (*Panhandle Producers*) recognized a statutory presumption applicable to LNG export proceedings. Instead, Sierra Club submits the presumption addressed in *Panhandle Producers* applies only to import proceedings and was derived from DOE Policy Guidelines adopted in 1984, rather than the language of the NGA.⁴³

Sierra Club further asserts that DOE cannot presume that "a project with adverse environmental impacts" is consistent with the public interest.⁴⁴ Sierra Club contends that it

⁴¹ *Dominion Cove Point LNG, LP*, Order Granting Rehearing for Further Consideration, FE Docket No. 11-128-LNG (July 9, 2015).

⁴² *Dominion Cove Point LNG, LP*, Order Granting Motion for Leave to Answer for the Purpose of Further Consideration, FE Docket No. 11-128-LNG (July 14, 2015). In this Order, DOE/FE grants DCP's Motion for Leave to Answer because the Answer is relevant to our consideration of the issues raised in Sierra Club's Rehearing Request. *See infra* at 49.

⁴³ According to Sierra Club, the U.S. Court of Appeals for the District of Columbia Circuit in *Panhandle Producers* reviewed certain presumptions regarding natural gas imports set forth in DOE's *New Policy Guidelines and Delegation Orders from Secretary of Energy to Economic Regulatory Administration and Federal Energy Regulatory Commission Relating to the Regulation of Imported Natural Gas*, 49 Fed. Reg. 6684 (Feb. 22, 1984) [hereinafter 1984 Policy Guidelines]. Sierra Club asserts that the "two specific rebuttable presumptions" arising from the 1984 Policy Guidelines are: (i) if the terms of a natural gas import contract are flexible enough, the natural gas will be delivered only if it is competitive; and (ii) if the imported gas is competitive, it will fill a domestic need. Rehearing Request at 1-2 (citing *Panhandle Producers*, 822 F.2d at 1111). Sierra Club further contends *Panhandle Producers* did not reach the question of whether any presumptions regarding imports or exports were compelled by the NGA. *Id.* at 2.

⁴⁴ Rehearing Request at 1-2 (and section heading).

provided record evidence that affirmatively demonstrates that the Liquefaction Project is inconsistent with the public interest but that—even if DOE/FE were to determine that Sierra Club had not made this showing—DOE/FE must take a “hard look” at the environmental impacts of the Project to determine whether these impacts are consistent with the public interest.⁴⁵

2. DCP’s Answer

DCP disputes Sierra Club’s assertion that, in authorizing the proposed exports, DOE/FE merely “presumed” that the Liquefaction Project is in the public interest under section 3 of the Natural Gas Act. According to DCP, DOE/FE “independently assess[ed] potential environmental impacts of the Liquefaction Project consistent with its obligations under both NEPA and NGA Section 3,” and issued the FONSI based on that analysis.⁴⁶ DCP points out that DOE/FE “specifically concluded that the environmental review” (which FERC led and DOE/FE participated in, pursuant to NEPA) “covered all reasonable foreseeable environmental impacts of the Liquefaction Project.”⁴⁷ Therefore, according to DCP, “DOE/FE did not *presume* that a project ‘with environmental impacts’ is in the public interest, [but instead] *concluded* based on its own thorough analysis that the Liquefaction Project is not inconsistent with public interest, ... as required by ... NGA section 3.”⁴⁸ Relying on the Supreme Court’s decision in *Robertson v. Methow Valley Citizens Council*, DCP further argues that “[i]f the adverse environmental effects of the proposed action are adequately identified and evaluated, the agency is not constrained by NEPA from deciding that other values outweigh the environmental costs.”⁴⁹

⁴⁵ *Id.* at 2.

⁴⁶ DCP Answer at 7.

⁴⁷ *Id.* at 7-8.

⁴⁸ *Id.* at 8 (emphasis in original).

⁴⁹ *Id.* (quoting 490 U.S. 332, 350 (1989)).

3. DOE/FE Analysis

The rebuttable presumption comes from the language of NGA section 3(a), which requires the Department to issue both export and import authorizations “*unless*, after opportunity for a hearing, it finds that the proposed exportation or importation will not be consistent with the public interest.”⁵⁰ DOE interprets these words to mean that, for the Department to deny an application, it must make an affirmative finding based on record evidence that the proposed import or export is inconsistent with the public interest. The Department refers to this as a rebuttable presumption because, absent evidence demonstrating that a proposed export or import is inconsistent with the public interest, the Department must grant the requested authorization. Sierra Club claims that the court in *Panhandle Producers* “did not reach the question of whether any presumptions regarding imports or exports were compelled by the Natural Gas Act.”⁵¹ But in fact the court stated that “§ 3 [of the NGA] requires an affirmative showing of inconsistency with the public interest to *deny* an application.”⁵²

The rebuttable presumption in section 3(a) may affect the Department’s ultimate judgment whether to grant or deny an application, but it does not affect the Department’s obligations under NEPA. NEPA places an independent obligation on the Department to present information relating to the environmental impacts that may result from its decisions and to take a “hard look” at those impacts.⁵³ The rebuttable presumption has no bearing on these independent NEPA obligations and did not affect the Department’s performance of those obligations in this proceeding.

⁵⁰ 15 U.S.C. § 717b(a) (emphasis added).

⁵¹ Rehearing Request at 2.

⁵² *Panhandle Producers*, 822 F.2d at 1111 (emphasis in original); *see also id.* at 1112 (describing the court’s earlier decision in *West Virginia Pub. Serv. Comm. v. DOE*, 681 F.2d 847, 856 (D.C. Cir. 1982), as having “explicitly found that the statute created a presumption in favor of authorization.”).

⁵³ 42 U.S.C. § 4332.

As the record demonstrates, the Department took the “hard look” at DCP’s export proposal required by NEPA. The Department participated as a cooperating agency in FERC’s environmental review, independently reviewed the EA prepared by FERC, and adopted the 79 environmental conditions imposed by FERC in the Final Order.⁵⁴ In fulfilling its responsibilities under NEPA, the Department applied no presumptions regarding the potential environmental impacts associated with DCP’s proposed exports, as the record shows. We therefore reject Sierra Club’s arguments concerning DOE/FE’s interpretation of the NGA as it relates to the rebuttable presumption.

B. DOE/FE’s Analysis of Indirect and Cumulative Environmental Impacts Satisfied the National Environmental Policy Act

1. Sierra Club’s Position

Sierra Club asserts that DOE/FE’s environmental review failed to comply with NEPA because FERC’s EA, which DOE/FE adopted, did not take a “hard look” at the indirect and cumulative impacts of LNG exports.⁵⁵ Sierra Club specifically argues that the Final Order does not distinguish between indirect and cumulative impacts.⁵⁶ Next, Sierra Club argues that DOE should have recognized that FERC’s issuance of an EA was not sufficient, and that a “full EIS” of the proposed Liquefaction Project was required to support DCP’s requested authorization.⁵⁷ According to Sierra Club, NEPA requires an EIS where a proposed major federal action would “significantly affect[] the quality of the human environment,”⁵⁸ and the “significance” of the effects is determined by both the context and intensity of the proposed action.⁵⁹ Here, Sierra

⁵⁴ See Final Order at 108 (Ordering Para. H).

⁵⁵ See Rehearing Request 2-3.

⁵⁶ Rehearing Request at 19.

⁵⁷ *Id.* at 5.

⁵⁸ *Id.* at 5 (quoting 42 U.S.C. § 4332(C)).

⁵⁹ See *id.*, citing 40 C.F.R. § 1508.27.

Club argues, an EIS should have been required because “the environmental effects [of the proposed export terminal] on the adjacent neighborhood and of the reasonably foreseeable induced production will be significant.”⁶⁰ Sierra Club asserts that it was unlawful for DOE to join in FERC’s determination that an EA and FONSI were appropriate, without addressing Sierra Club’s argument that a full EIS was required.

Sierra Club further asserts that the Environmental Addendum and the LCA GHG Report are not substitutes for NEPA review, because they contradict one another, do not specify impacts associated with DCP’s Project, and thereby fail to inform the public and provide a basis for public comment.⁶¹ Sierra Club maintains that, whether FERC did so, DOE/FE was obligated to take a hard look at the environmental impacts of natural gas production activities that would be induced by LNG exports. According to Sierra Club, induced production is a reasonably foreseeable consequence of increased demand for natural gas due to LNG exports.⁶² Sierra Club offers the National Energy Modeling System (NEMS) developed by the U.S. Energy Information Administration (EIA) as a methodology DOE/FE could have used to determine where, in what quantity, and under what circumstances exports would induce additional gas production.⁶³

Specifically, Sierra Club contends the NEMS model underlying the Department’s 2012 LNG Export Study predicted how production would respond to exports.⁶⁴ Sierra Club asserts

⁶⁰ *Id.*

⁶¹ *See* Rehearing Request at 3-4.

⁶² *See id.* at 5-6.

⁶³ *See id.* at 10.

⁶⁴ In 2011, the Department engaged the U.S. Energy Information Administration (EIA) and NERA Economic Consulting to conduct a two-part study of the economic impacts of LNG exports, collectively called the 2012 LNG Export Study. In relevant part, EIA published its study, *Effect of Increased Natural Gas Exports on Domestic Energy Markets*, in January 2012 [hereinafter EIA 2012 Study]. Using the NEMS model, EIA examined the impact of two DOE/FE-prescribed levels of assumed natural gas exports (at 6 Bcf/d and 12 Bcf/d) under numerous scenarios and cases based on EIA’s 2011 projections. Both the 2012 EIA and NERA studies are discussed in detail in the Conditional Order (§§ I, VII, VIII).

that because NEMS is built on “play-level” modeling, EIA must have already developed forecasts of where production would increase in response to exports. Sierra Club maintains that, if EIA has not already undertaken this type of modeling, or if EIA’s modeling to date is insufficient to identify the impacts of DCP’s proposed exports, NEPA requires DOE to undertake or commission such modeling.⁶⁵

Sierra Club further argues that the environmental impacts of these additional natural gas production activities include increased generation of ozone precursors (*e.g.*, volatile organic compounds (VOCs) and hazardous air pollutants) and methane releases, resulting in additional GHG emissions into the atmosphere. Sierra Club contends that, once DOE determined the amount of additional natural gas production that would occur in specific shale plays, DOE could estimate the amount of VOC and nitrogen oxide (NO_x) emissions that would be emitted by that regional production and thereby estimate impacts on regional ozone levels.”⁶⁶

Additionally, Sierra Club argues that DOE/FE’s NEPA analysis was flawed because DOE did not examine the environmental impacts of switching from natural gas to coal in the generation of electricity, which Sierra Club contends could be induced by natural gas exports.

Finally, Sierra Club argues that the Final Order does not distinguish between indirect and cumulative impacts. Sierra Club maintains that DOE/FE should have assessed the “cumulative impacts of drilling induced by all other approved and pending [non-FTA] export projects” as part of its cumulative impacts analysis.⁶⁷

⁶⁵ See Rehearing Request at 10.

⁶⁶ *Id.* at 11.

⁶⁷ *Id.* at 19.

2. DCP's Answer

DCP argues that the agencies—led by FERC with DOE/FE as a cooperating agency—prepared a thorough EA consisting of more than 200 pages, addressed the impacts associated with the Liquefaction Project, and imposed detailed mitigation measures. DCP further notes that the existing Cove Point LNG Terminal previously had been the subject of an EIS, and that the Liquefaction Project will be constructed within the Terminal's established footprint. In DCP's view, both FERC and DOE/FE properly issued FONSIIs for the Liquefaction Project, and no EIS was required.

Turning to Sierra Club's argument concerning effects of "induced" upstream natural gas production, DCP asserts that NEPA did not require preparation of either the Addendum or the LCA GHG Report, and questions why Sierra Club "criticizes DOE/FE for going *beyond* the requirements of NEPA and evaluating those potential implications of LNG exports."⁶⁸ DCP emphasizes that the Addendum addresses almost entirely localized environmental effects of unconventional gas production. DCP agrees with DOE/FE's conclusion that those environmental effects need to be carefully managed through federal, state, or local regulation or self-imposed industry guidelines, rather than by prohibiting exports of natural gas.

Likewise, DCP argues that DOE/FE adequately considered non-speculative climate change issues associated with alleged induced natural gas production. DCP asserts that the "potential GHG impact associated with the ultimate disposition of LNG exports" is highly uncertain and requires considerable speculation, yet DOE/FE attempted to gain insight into this issue by preparing the LCA GHG Report even though such a report was not required by NEPA.⁶⁹

⁶⁸ DCP Answer at 8 (emphasis in original).

⁶⁹ *Id.* at 12.

3. DOE/FE Analysis

a. FERC's Issuance of An Environmental Assessment

We disagree with Sierra Club that it was unlawful for DOE/FE to adopt the EA for the Liquefaction Project after participating as a cooperating agency in FERC's environmental review process, and for DOE/FE to issue a FONSI on the basis of the EA. In urging DOE to conduct an EIS instead of an EA for the Liquefaction Project, Sierra Club characterizes the proposed Project as a large-scale industrial facility located immediately adjacent to residential areas.⁷⁰ In fact, as the comprehensive EA explains, the primary component of the Liquefaction Project is the addition of one liquefaction train, which is a stand-alone unit containing refrigeration compressors that liquefy natural gas. This liquefaction train will be sited within the 131-acre fenced-in area that contains all of the Terminal's industrial facilities.⁷¹ The Liquefaction Project will occupy 59.5 acres within the 131-acre fenced-in area. The 131-acre fenced-in area, in turn, is located within a 1,017-acre parcel of otherwise undeveloped land owned by DCP that is held in conservation easements and serves as a buffer.⁷² No additional permanent marine facilities are required for the Project, and the estimated 85 LNG ships per year anticipated for the Liquefaction Project are substantially below the number of vessels that FERC previously authorized for LNG imports at the Terminal.⁷³

Although Sierra Club maintains that "the environmental effects on the adjacent neighborhood ... will be significant,"⁷⁴ we agree with FERC's contrary assessment following two years of agency proceedings in which DOE, other agencies, and the public participated.

⁷⁰ Rehearing Request at 4.

⁷¹ See EA 3-8.

⁷² See *id.* at 3, 5.

⁷³ See *id.* at 20.

⁷⁴ Rehearing Request at 5.

Because the footprint of the Liquefaction Project is entirely within the existing Cove Point Terminal—where much of the land has been previously disturbed by multiple prior projects—the environmental impacts are small in number and well-defined. Under applicable CEQ regulations (*e.g.*, 40 C.F.R. §§ 1501.4, 1501.7, 1508.13), FERC correctly declined to conduct an EIS for the Liquefaction Project. On this basis, DOE/FE independently reviewed and adopted the EA, and properly issued a FONSI on the basis of both the EA and the 79 mitigation measures imposed on DCP by FERC and adopted in the Final Order.

Sierra Club additionally asserts that an EIS was required to assess the environmental impacts associated with the Project’s “reasonably foreseeable induced [natural gas] production.”⁷⁵ As discussed below, however, induced natural gas production attributable to DCP’s Project is not “reasonably foreseeable” and we therefore reject this argument.

b. Induced Natural Gas Production

The CEQ regulations implementing NEPA require that agencies consider the “indirect effects” of proposed actions. “Indirect effects,” the regulations provide, “are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.”⁷⁶ Courts have articulated two principles useful in interpreting this provision. The first is that NEPA requires “a reasonably close causal relationship” between the environmental effect and the alleged cause.⁷⁷ The Supreme Court has stated that “a ‘but for’ causal relationship is insufficient to make an agency responsible for a particular effect under NEPA and the relevant regulations.”⁷⁸ Rather, in considering the strength of the causal relationship required by NEPA, the Supreme Court has “analogized . . . to the ‘familiar doctrine of proximate cause from tort

⁷⁵ *Id.*

⁷⁶ 40 C.F.R. § 1508.8(b); *see also* 10 C.F.R. § 1021.200 (adopting CEQ’s regulations for the Department).

⁷⁷ *Metropolitan Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766, 774 (1983).

⁷⁸ *Dep’t of Transp. v. Public Citizen*, 541 U.S. 752, 767 (2004) [hereinafter *Public Citizen*].

law,” instructing courts to “look to the underlying policies or legislative intent in order to draw a manageable line between those causal changes that may make an actor responsible for an effect and those that do not.”⁷⁹ The second principle is that “inherent in NEPA and its implementing regulations is a ‘rule of reason.’”⁸⁰ With respect to indirect effects, the rule of reason counsels that agencies are not required to address remote or speculative consequences, where insufficient information is available to permit meaningful consideration.⁸¹

Sierra Club claims the Department violated NEPA by failing to consider the environmental impacts of increased natural gas production that may result indirectly from authorizing DCP to export LNG to non-FTA countries. The causal relationship Sierra Club posits is an economic one. Sierra Club argues that a decision to authorize exports of natural gas from the United States to non-FTA countries may increase the price of natural gas in the United States, and therefore concludes the Department must examine the consequences of that potential price increase, including increased domestic production of natural gas and increased consumption of coal, which competes with natural gas as a fuel for electric generation. We do not read Sierra Club’s petition to argue that the Department must examine the environmental impacts of producing the very molecules of natural gas that will be exported by DCP. Rather, we understand Sierra Club to contend that the Department must examine the environmental

⁷⁹ *Id.* (quoting *Metropolitan Edison Co.*, 460 U.S. at 774 n.7).

⁸⁰ *Id.* at 767 (citation omitted).

⁸¹ *See, e.g., N. Plains Res. Council v. Surface Transp. Bd.*, 668 F.3d 1067, 1078 (9th Cir. 2011) (“Each project is different, and the agency is required to rationally explain its decision in the context of project-specific effects.”); *Hammond v Norton*, 370 F. Supp. 2d 226, 241 (D.D.C. 2005) (“The setting of the objectives and the range of alternatives to be considered by an agency are governed by a ‘rule of reason.’ All that NEPA requires is that the agency weigh all reasonable alternatives and come to a fully-informed decision.”); *Hoosier Envtl. Council v. U.S. Army Corps of Engineers*, 105 F. Supp. 2d 953, 974-975 (S.D. Ind. 2000) (upholding issuance of a permit to a casino riverboat, in part, because associated indirect effects were “tenuous and speculative” and therefore excluded from NEPA analysis under the “rule of reason”).

impacts of the economically marginal natural gas production that may be induced as a result of granting an export authorization to DCP and other similarly situated applicants.

The Department does not dispute the economic logic that authorizing exports of natural gas to non-FTA countries could, all else equal, exert upward pressure on domestic natural gas prices as foreign purchasers compete with domestic purchasers. Nor does the Department dispute that higher natural gas prices could lead to increased natural gas production at the national level, among other potential economic consequences (including decreased domestic consumption of natural gas, increased pipeline imports of natural gas from Canada, and increased use of competing resources). Indeed, EIA's 2012 Study modeled the effects that exporting natural gas at levels of 6 and 12 Bcf/d at "high" and "slow" ramp-up scenarios could have on the energy sector.⁸² EIA projected that "[u]nder Reference case conditions, about 63 percent, on average, of the increase in exports in each of the four scenarios is accounted for by increased production [of natural gas], with most of the remainder from decreased consumption [of natural gas] from 2015 to 2035."⁸³ EIA further projected that, of the increased production, over 90% would come from unconventional sources, such as shale gas, tight gas, and coalbed methane.⁸⁴

Although natural gas exports may increase domestic production *at the margin*, we reject the conclusion that the environmental impacts of such marginal production are "reasonably foreseeable" within the meaning of the CEQ's regulations and the applicable case law. To the contrary, it would be impossible to identify with any confidence the marginal production at the wellhead or local level that would be induced by DCP's exports over the period of its non-FTA

⁸² See *supra* note 64; Conditional Order at 4-5.

⁸³ 2012 EIA Study, *supra* note 64, available at http://www.energy.gov/sites/prod/files/2013/04/f0/fe_eia_lng.pdf, at 10 (Jan. 2012).

⁸⁴ *Id.* at 11; see also Final Order at 83.

authorization. Natural gas will be produced in substantial quantities across the United States regardless of how the Department rules on DCP's Application. As the Department observed in the Final Order:

There is ... fundamental uncertainty as to where any additional production would occur and in what quantity. As the Addendum illustrates, nearly all of the environmental issues presented by unconventional natural gas production are local in nature, affecting local water resources, local air quality, and local land use patterns, all under the auspices of state and local regulatory authority. As DOE explained in *Sabine Pass*, DOE/FE Order No. 2961-A, without knowing where, in what quantity, and under what circumstances additional gas production will arise, the environmental impacts resulting from production activity induced by LNG exports to non-FTA countries are not 'reasonably foreseeable' within the meaning of the CEQ's NEPA regulations.⁸⁵

Further, insofar as DCP's Application is viewed cumulatively with other similar applications to export LNG to non-FTA countries, the Department has observed that there is considerable market uncertainty regarding the aggregate quantity of exports that will ultimately materialize:

[T]here is uncertainty as to the aggregate quantity of natural gas that ultimately may be exported to non-FTA countries. Receiving a non-FTA authorization from DOE/FE does not guarantee that a particular facility would be financed and built; nor does it guarantee that, if built, market conditions would continue to favor export once the facility is operational. To illustrate the point, of the more than 40 applications to build new LNG import facilities that were submitted to federal agencies between 2000 and 2010, only eight new facilities were built and those facilities have seen declining use in the past decade.⁸⁶

Sierra Club emphasizes the potential for economic modeling tools, such as EIA's NEMS model, to render the environmental impacts of export-induced production reasonably foreseeable. But where, as here, it is fundamentally uncertain how natural gas production at the

⁸⁵ Final Order at 84 (citations omitted).

⁸⁶ *Id.* at 83-84 (citing Conditional Order at 100 n.161).

local level will respond to price changes at the national level, an environmental analysis attempting to quantify local impacts would be more misleading than informative.⁸⁷ Economic modeling results are a product of the parameters that are entered into the model. In this context, the key parameter that would be used as a modeling input is the price elasticity of natural gas production, estimated at a sufficiently local level so as to analyze how the production would impact specific natural resources and human health. But, due to the limitations of estimating geology at the local level—as well as the uncertainties of predicting local regulation, land use patterns, and the development of supporting infrastructure—estimating the price elasticity of natural gas supply at the local level is much more speculative than doing so at the national level where local idiosyncrasies are averaged out.

Sierra Club’s argument concerning “play level” modeling also does not persuade us that the environmental impacts of induced production are reasonably foreseeable. The term “plays” refers to subsurface geologic formations containing substantial quantities of natural gas and may be used in reference to shale gas⁸⁸ or tight gas.⁸⁹ The shale plays, to which we believe Sierra Club is referring, overlap and stretch for thousands of square miles below diverse surface environments.⁹⁰ While the size of the shale plays makes them more reliable units for generating projections from economic models than smaller units such as counties, their size also makes

⁸⁷ See *Mayo Found. v. Surface Transp. Bd.*, 472 F.3d 545, 555-56 (8th Cir. 2006) (rejecting Sierra Club’s argument that the Surface Transportation Board must use the NEMS model as the basis for analyzing local-level environmental impacts).

⁸⁸ Addendum at 6, Fig. 2 (Approximate Locations of Current Producing Gas Shales and Prospective Shales).

⁸⁹ See *id.* at 7, Fig. 3 (Location of Currently Active Areas for Tight Sand Development and Production).

⁹⁰ See *id.* at 54, Table 13 (Attributes of Major Shale Gas Plays in the United States) (estimating the size of seven major shale plays ranging from 5,000 square miles for the Barnett Shale to 95,000 square miles for the Marcellus Shale). Each of the active shale basins is different and has a unique set of exploration criteria and operational challenges. See *id.* at 6.

them less useful units for analyzing impacts to environmental resources such as air,⁹¹ water,⁹² or land.⁹³ An economic model that estimated induced production across each shale play would provide no information about where any incremental production would arise within those shale plays and would not render the environmental impacts of such production reasonably foreseeable in a manner that would facilitate meaningful analysis.

Such an analysis would also be without limit. Because the price elasticity of natural gas production is likely to be positive in every producing region in the country and because there is a robust interstate pipeline system in the United States, it is likely that upward pressure on natural gas prices nationally could encourage at least some additional production in every producing region in the lower-48 states. The logic of Sierra Club's argument, therefore, would compel the Department, before acting on an application to export natural gas, to undertake an environmental impact statement or environmental assessment that examines separately the environmental impacts of natural gas production in every producing region in the country. Were such a requirement law, it would impose an unreasonable and unrealistic burden on the Department's ability to act on the LNG export applications before it. And the weight of this burden would be

⁹¹ Air pollutants largely concentrate in the local area in which they are emitted. Without knowing where incremental natural gas production will occur within a particular shale play, the impacts to air quality of such production cannot be well understood. For example, with respect to ozone—the only air pollutant Sierra Club describes as amenable to regional discussion—the Addendum presents a map that overlays ozone non-attainment zones with the shale basins. *See* Addendum at 29, Fig. 8 (National Map Showing Ozone Nonattainment Areas Superimposed on Major Shale Gas Basins). The non-attainment zones appear near urban areas and bear little recognizable relationship to the subsurface geology. Without knowing where in relation to existing ozone concentrations the incremental production would occur, the play-level modeling Sierra Club urges would not enable DOE/FE to characterize the environmental and human health impacts posed by such production.

⁹² *See* Addendum at 10-19 (describing potential impacts to water quantity and quality, and concluding that “specific impacts to water resources cannot be predicted even on a regional level”).

⁹³ Given the geographic expanse of the shale plays, characterizing the land use impacts of new, incremental wells would not be possible without knowing where those new wells would be located. On this point, Sierra Club suggests that DOE/FE simply could have estimated how many wells in each play would be necessary to meet projected export demand. Absent an understanding of what land would be affected, however, an attempt to estimate the total number of wells would not have meaningfully informed our decision.

misplaced: Unlike state and local regulators, or other federal agencies such as the U.S. Environmental Protection Agency (EPA) and the U.S. Department of the Interior, the Department of Energy lacks any authority to regulate the environmental effects of natural gas production, much less to address issues identified at the local, regional, or play level.

In sum, there is no “reasonably close causal relationship” between any particular environmental impacts of induced natural gas production and the Department’s decision in this case.⁹⁴ The causal chain linking the Department’s decision to environmental impacts resulting from induced natural gas production is probabilistic and attenuated—not close and proximate as the Supreme Court has stated must be evident to bring the effects within the scope of NEPA review.

Nevertheless, even though the environmental impacts of induced natural gas production are not “reasonably foreseeable,” the Department has taken all reasonable steps to ensure that its public interest review was informed by a consideration of the general environmental impacts of natural gas production. On June 4, 2014, DOE/FE issued the draft Addendum, which, as noted above, presented a discussion of environmental issues associated with unconventional gas production in the lower-48 states based on DOE’s review of existing literature, regulations, and best management practices. The Addendum focused on the environmental impacts of unconventional natural gas production in the United States because of the projections by EIA in its 2012 Study that over 90% of incremental production resulting from exports would come from unconventional sources (i.e. shale gas, tight gas, and coalbed methane). The Addendum contained chapters separately considering water resources, air quality, greenhouse gases, induced seismicity, and land use impacts.⁹⁵ After a 45-day comment period, the Department received

⁹⁴ *Metropolitan Edison Co.*, 460 U.S. at 774.

⁹⁵ See Final Order at 48-55 (summarizing the Addendum’s findings).

40,745 comments on the Addendum in 18 separate submissions, including comments from Sierra Club and its members. On August 15, 2014, the Department issued a final version of the Addendum, with textual changes resulting from the comments and a comment response chapter addressing each discrete issue raised in the comments. Although the Department has consistently maintained that an analysis of the environmental impacts of induced natural gas production falls outside the scope of what NEPA requires, the Department nonetheless observed NEPA's procedural requirements in publishing and taking comments on the Addendum.

In its Rehearing Request, Sierra Club argues that the Addendum fails to satisfy the NEPA obligation it believes the Department has with respect to induced natural gas production. First, Sierra Club claims that the Addendum cannot be used for NEPA compliance because “the Addendum and NETL reports . . . reach different conclusions regarding [1] the potency of methane as a greenhouse gas and [2] the amount of air pollution emitted by natural gas production.”⁹⁶ On the former point, the Department's reasoning for selecting the global warming potential (GWP) for methane used in the LCA GHG Report is explained below in Section III.D.1. The claim that the Addendum reached a “different conclusion[]” than the LCA GHG Report regarding the GWP for methane⁹⁷ mischaracterizes the Addendum's objective. The Addendum did not seek to resolve scientific uncertainty regarding the heat-trapping effects of methane. Rather, the Addendum sought to explain what was known on this subject in order to inform this proceeding. To that end, the Addendum explained that it had included the carbon dioxide equivalency factor for methane used in the 2007 Intergovernmental Panel on Climate Change's (IPCC) report in Table 7 “to maintain consistency with the EPA's Inventory reports and to allow usage of EPA's estimate for total greenhouse gas emissions from all sources,” but it

⁹⁶ Rehearing Request at 4.

⁹⁷ *Id.*

also described the values from the most recent IPCC reports (then in draft) as well as those of other scholars.⁹⁸ Finally, there was no inconsistency in the conclusions regarding air pollution emissions for the reasons explained herein.

Second, Sierra Club claims that the Addendum is inadequate because it does not “consider the effects of the particular proposal under consideration.”⁹⁹ But, to the extent that DCP’s proposal leads to additional unconventional natural gas production in the United States, then surely the Addendum does inform DOE/FE’s consideration of the effects of the proposal in its description of how unconventional gas production impacts various resource areas and, where relevant, how those impacts vary geographically. The Addendum did not attempt, however, to quantify the environmental impacts associated with DCP’s proposed exports or to apportion any potential environmental impacts across the many production areas currently active across the United States. For the reasons above, we believe that the speculative nature of such an effort would have made it of dubious value to our public interest review.

c. Increased Use of Coal

Sierra Club argues that the Department must examine the possible increased use of coal in electric power generation that may result from the Department’s decision in this case. Sierra Club’s argument centers on EIA’s 2012 Study, which (according to Sierra Club) projected that the increased price of natural gas resulting from exports of LNG leads to additional use of coal because coal competes with natural gas on price as a fuel for electric power generation.¹⁰⁰

The causal relationship between the Department’s decision in this proceeding and the level of coal generation in the United States is even more attenuated than its relationship to

⁹⁸ Addendum at 87 (DOE Response), 36.

⁹⁹ Rehearing Request at 9.

¹⁰⁰ *See id.* at 18-19.

induced natural gas production. In effect, Sierra Club is arguing that any time a federal agency takes an action that will affect the supply or demand of a commodity, it must examine the impacts of producing or consuming that commodity, as well as the impacts of producing or consuming the *substitute* commodities with which it competes. What Sierra Club is proposing goes far beyond what the Supreme Court described must be a “manageable line” defining the scope of review required by NEPA.¹⁰¹

We also believe that certain assumptions underlying EIA’s projections in its 2012 Study—specifically, the estimated increase in coal consumption arising from higher natural gas prices—are now out of date. As we observed in the Final Order, EIA’s projections assume continuation of the regulations in force at the time of its analysis. EIA prepared the 2012 Study before several EPA rulemakings had been finalized. Most significantly, in the fall of 2015, EPA finalized rules that impose limits on GHG emissions from both new and existing coal-fired power plants. Effective October 23, 2015, EPA implemented a final rule that limits carbon dioxide emissions from new coal-fired electric-generating units.¹⁰² EPA also issued a final rule to take effect on Dec. 22, 2015, that is designed to limit carbon dioxide emissions from existing coal-fired electric generating units.¹⁰³

¹⁰¹ *Public Citizen.*, 541 U.S. at 767 (quotation and citation omitted).

¹⁰² U.S. Env’tl. Protection Agency, Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units; Final Rule, 80 Fed. Reg. 64,510 (Oct. 23, 2015).

¹⁰³ U.S. Env’tl. Protection Agency, Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Final Rule, 80 Fed. Reg. 64,662 (Oct. 23, 2015) (effective Dec. 22, 2015). On February 9, 2016, the U.S. Supreme Court issued a stay of the effectiveness of this rule pending disposition of the related petitions for review in the U.S. Court of Appeals for the District of Columbia Circuit. *See Chamber of Commerce, et al. v. EPA, et al.*, Order in Pending Case, 577 U.S. ____ (2016).

C. DOE/FE Complied with the Endangered Species Act and the National Historic Preservation Act

1. Sierra Club's Position

Sierra Club argues that, because the EA “covered only the site-specific impacts rather than the impacts from induced upstream natural gas production,” it fails to comply with both the Endangered Species Act (ESA) and the National Historic Preservation Act (NHPA). Addressing section 7 of the ESA, Sierra Club asserts that DOE must consider the “effects of increased gas production across the full region the [Liquefaction Project] affects” in determining whether its approval of DCP’s proposed exports may affect listed species or critical habitat.¹⁰⁴

Sierra Club states that, similarly, DOE must fulfill its obligations under the NHPA to “take into account the effect of the undertaking [*i.e.*, DCP’s proposed exports] on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register.”¹⁰⁵ Specifically, Sierra Club argues that DOE must initiate the NHPA section 106 consultation and analysis process, and that “[t]he area of potential effects [under NHPA regulations] should sweep quite broadly ... because ... the reach of DCP’s proposal extends to the entire area in which it will increase [natural] gas production.”¹⁰⁶

2. DCP's Answer

DCP states that Sierra Club is raising these ESA and NHPA challenges even though all impacts specific to the Liquefaction Project were addressed in the EA. According to DCP, the ESA and NHPA arguments are variations of Sierra Club’s arguments concerning the alleged effects of upstream natural gas production, and likewise should be rejected.¹⁰⁷

¹⁰⁴ Rehearing Request at 28 (citing, *inter alia*, 50 C.F.R. § 402.14(a)).

¹⁰⁵ *Id.* (quoting 16 U.S.C. § 470f).

¹⁰⁶ *Id.* at 29.

¹⁰⁷ DCP Answer at 11.

3. DOE/FE Analysis

As the lead agency for the purposes of coordinating all applicable Federal authorizations and for the purposes of complying with NEPA, FERC established the scope of review for the Liquefaction Project in the EA, which DOE/FE adopted in its FONSI issued in November 2014. Sierra Club does not question the completeness of FERC's analysis of the ESA and NHPA issues that fall within the scope of the EA. Both the Virginia and Maryland State Historic Preservation Offices (SHPOs) agreed with FERC's determination that the Liquefaction Project would not affect historic properties and that consultation under the NHPA was complete.¹⁰⁸ Similarly, the Chesapeake Bay Field Office and Virginia Ecological Services Field Office of the U.S. Fish and Wildlife Service agreed that the Project is not likely to adversely affect federally listed threatened or endangered species in the project area.¹⁰⁹

Instead, Sierra Club argues that DOE/FE failed to comply with Section 7 of the ESA and Section 106 of the NHPA because "the EA covered only the site-specific impacts rather than the impacts from induced upstream natural gas production."¹¹⁰ Sierra Club contends that DOE must look "nationally" to comply with the ESA and the NHPA. DOE need not repeat its arguments with respect to the appropriate scope of review over indirect effects except to observe that conducting a national consultation regarding species and historic property impacts would add greatly to the burden of acting on applications to export natural gas to non-FTA countries, and that the inability to predict at a local level the volumes of induced natural gas production would make the ESA and NHPA analyses more speculative than informative.

¹⁰⁸ EA at 93-94.

¹⁰⁹ *See id.* at 69-70.

¹¹⁰ Rehearing Request at 28.

D. The Methodology Underlying the Life Cycle Greenhouse Gas (LCA GHG) Report Was Reasonable

1. Methane Leakage Rate

a. Sierra Club's Position

Sierra Club charges that DOE/FE has not adequately justified the methane leakage rate implied by the LCA GHG Study as compared to higher leakage rates estimated by other life cycle analyses.¹¹¹ Sierra Club states that the 1.2 percent leakage rate estimate attributed to NETL in the Final Order (DOE/FE Order No. 3331-A) is lower than the “expected” cradle-to-liquefaction leakage rates provided by NETL in the LCA GHG Report—1.3 percent for conventional onshore production and 1.4 percent for shale gas production.¹¹² Sierra Club points out that, in the Addendum, NETL refers to five major studies that account for the GHG emissions from upstream natural gas, including three (Howarth, Burnham, and Weber)¹¹³ that either provide or imply an estimate of methane leakage rates. Sierra Club claims that all of these studies estimate much higher methane leakage than does NETL, and states that “[w]hile NETL provided a basis for disagreeing with the highest of these estimates, [the Howarth study], nothing in the record explains why NETL’s estimate is superior to Burnham and Weber.”¹¹⁴

According to Sierra Club, DOE/FE correctly noted in the Final Order that the boundary conditions applied in the Burnham study differed from those in the LCA GHG Report, in that NETL reviewed “cradle-through-transmission” whereas Burnham included the additional step of distribution. Sierra Club maintains that the vast difference in methane emission estimates cannot

¹¹¹ *Id.* at 14.

¹¹² *Id.* at 14.

¹¹³ See, e.g., Burnham, Andrew, *et al.* Life-cycle greenhouse gas emissions of shale gas, natural gas, coal, and petroleum. *Environmental Science & Technology* 46.2 (2011): 619-627 [hereinafter Burnham study]; Weber, Christopher L., and Christopher Clavin. Life cycle carbon footprint of shale gas: Review of evidence and implications. *Environmental science & technology* 46.11 (2012): 5688-5695 [hereinafter Weber study].

¹¹⁴ Rehearing Request at 14.

be explained by the difference in boundary conditions or by other differences between NETL and the Burnham study. According to Sierra Club, Burnham estimated that 0.28 percent of methane produced was emitted during distribution, and that subtracting this 0.28 percent from Burnham's total estimate leaves a cradle-through-transmission leak rate of 2.47 percent for conventional onshore gas and 1.73 percent for unconventional gas.¹¹⁵

Sierra Club also addresses the statement in the Final Order that the Weber study made no mention of leakage rate. Sierra Club acknowledges that the Weber study does not discuss emissions in terms of leakage rate, but contends that the emissions estimates in the Weber study imply the same leakage rate that is set out in NETL's Unconventional Production Report and asserts that this leakage rate is explained by Bradbury 2014, as discussed in the NETL reports. Sierra Club contends: "Because NETL already determined that the Weber team's conclusions could be expressed as a leakage rate estimate, DOE cannot now argue that this work has no bearing on the appropriate estimate of leakage rates or, ultimately, methane emissions."¹¹⁶

Sierra Club also argues that the Department should have modeled methane emissions using "top-down" rather than "bottom-up" studies. Sierra Club cites five top-down studies that it claims estimate higher methane leakage rates of generally 3 percent or more on the basis of atmospheric measurements. According to Sierra Club, the Final Order acknowledges that top-down studies do not generally match bottom-up calculations due to different boundaries, but Sierra Club maintains that DOE/FE did not explain why the boundaries used in bottom-up studies are more appropriate.¹¹⁷

¹¹⁵ *See id.* at 14-15.

¹¹⁶ *Id.*

¹¹⁷ *See id.*

Based on Brandt 2014 and other research,¹¹⁸ Sierra Club maintains that bottom-up estimates are likely to be inaccurate. Sierra Club states that “nothing in Brandt indicates that the broader top-down estimates, such as Miller 2013, are *not* representative, and that the 3% leakage rate indicated by Miller is more than double the rate used by DOE.”¹¹⁹ Sierra Club recognizes that leakage rate is an output of, rather than an input to, NETL’s model. But Sierra Club’s maintains that NETL’s model produces an output that is so inconsistent with the outputs of other models that there is either a problem with the inputs to NETL’s model or with the model itself.¹²⁰ According to Sierra Club, DOE/FE did not provide a rational basis for using the NETL estimates instead of a higher methane leakage rate estimated by such top-down studies.

b. DCP’s Answer

DCP counters Sierra Club’s climate impact argument by stating that much of the argument is simply another aspect of Sierra Club’s “induced production” argument, which DCP argues is neither caused by the Liquefaction Project nor a “reasonably foreseeable” effect of the Project.¹²¹ DCP asserts that the potential GHG impact associated with the ultimate disposition of LNG exports is highly uncertain and requires considerable speculation, such that any analysis able to consider the myriad factors involved would not be able to inform the public interest determination in this proceeding. DCP further maintains that the LCA GHG Report provides

¹¹⁸ See Brandt, A. R., *et al.* (2014) Methane Leaks from North American Natural Gas Systems. *Science* 343(6172), pp. 733-735 [hereinafter Brandt study]. Sierra Club also notes that, on June 19, 2014, after DOE/FE had released the draft Addendum and the LCA GHG Report, a new study by researchers at Carnegie Mellon and the National Oceanic and Atmospheric Administration was published that, Sierra Club claims, concludes that the most likely methane leakage rate is between 2 percent and 4 percent. See Rehearing Request at 16 & n.41 (citing Stefan Scheietzke *et al.*, “Natural Gas fugitive emissions rates constrained by global atmospheric methane and ethane,” *Environmental Science & Technology* (June 19, 2014), DOI: 10.1021/es50104c)). Although Sierra Club does not explain whether this study used a top-down or bottom-up modeling approach, its assertions regarding the study nevertheless are untimely. Sierra Club did not mention the study in its comments on the LCA GHG Report submitted to DOE/FE on July 21, 2014, and DOE/FE will not consider new evidence on rehearing.

¹¹⁹ Rehearing Request at 16.

¹²⁰ *Id.*

¹²¹ DCP Answer at 11.

insight into the climate issue beyond that required by NEPA, and DOE/FE's conclusions drawn from the Report are reasonable.

c. DOE/FE Analysis

The average methane leakage rate estimated in the LCA GHG Report is reasonable. Sierra Club is correct that NETL determined 1.3 percent and 1.4 percent to be the methane leakage rates for natural gas extracted using conventional extraction methods and extracted from the Marcellus Shale, respectively, as shown in Table 5-1 of the LCA GHG Report. But, as DOE/FE has explained, NETL determined that 1.2 percent is the expected "cradle-through-transmission" leakage rate for the *average* mix of domestic natural gas, which includes seven extraction sources. The contribution of the other five sources of domestic natural gas (offshore, associated, tight gas, Barnett Shale, and coal bed methane) lower the average methane leakage to 1.2 percent, below the 1.3 percent and 1.4 percent reported for actual gas extracted using conventional on-shore extraction and from the Marcellus Shale. This means that the extraction, processing, and transmission of 1 kg of natural gas¹²² in the United States releases 0.012 kg of methane to the atmosphere from the average mix of natural gas produced in the United States (excluding Alaskan production). Thus, NETL's expected value and range on methane emission rates are calculated results that capture the underlying uncertainty and variability of the natural gas system average performance. This approach results in a reasonable estimate, and we reject Sierra Club's arguments to the contrary.

We also reject Sierra Club's assertion that NETL's methane leakage rate is significantly lower than those used or calculated by other bottom-up studies. The Weber study reconciled the

¹²² As a convention to improve comparability to other studies, NETL expresses leakage rate using delivered natural gas as a denominator; that is, methane emissions per unit of delivered natural gas, not methane emissions per unit of delivered methane.

boundaries from six studies (including work by NETL and Burnham), and demonstrated that the expected values and uncertainty ranges of NETL's upstream natural gas GHG emissions closely match the results for most other studies.

We likewise reject Sierra Club's argument that DOE/FE should have used a "top-down" approach to derive a methane leakage rate.¹²³ In the Final Order, DOE/FE responded by noting that researchers are currently working to discern why top-down studies do not match bottom-up studies. DOE/FE also noted that, as research continues, scientists expect to learn more about the differences between these two types of methodologies.¹²⁴

With that caveat in mind, our judgment is that, based on the scientific studies available at the time the analysis in this proceeding was performed, bottom-up studies are a more appropriate basis for analysis of methane emissions from U.S. natural gas systems than available top-down studies. The broad boundaries of top-down measurements may capture all emissions from natural gas production facilities within a study region; however, these emissions are not always distinguishable from emissions from nearby oil production activities, or emissions from other sectors that operate in the same region such as agriculture. Further, top-down measurements capture methane emissions only at a particular place and time. Thus, in the Final Order, we discussed the role of temporal and geographical representativeness as potential reasons for the differences between top-down and bottom-up results, while at the same time noting that research into that question is continuing. The top-down studies cited by Sierra Club represent valuable

¹²³ Rehearing Request at 14-16. For purposes of this discussion, bottom-up *data* account for emissions at the device level (*e.g.*, liquid unloading equipment, compressors, etc.), and bottom-up *models* aggregate multiple processes to compose a system. In contrast, top-down *data* account for emissions from an entire system (*e.g.*, a sector or geographical region), and top-down *models* apportion system emissions to the products of the system. Currently, the bottom-up models for natural gas systems are based mostly on engineering relationships and represent long-term operating regimes, while top-down models for natural gas systems represent measurements collected for specific regions during narrow time frames. *See* Final Order at 79.

¹²⁴ *See id.*

research that advance our understanding of methane emissions, but do not form a robust basis for estimating the leakage rate from U.S. natural gas systems in the aggregate.

2. Global Warming Potential of Methane

a. Sierra Club's Position

Sierra Club claims that the LCA GHG Report erroneously “understates the impact of each ton of methane pollution”¹²⁵ and that DOE/FE should have used Global Warming Potential (GWP)¹²⁶ estimates drawn from the IPCC that include climate carbon feedbacks.¹²⁷ Sierra Club contends these estimates would have yielded a 20 percent higher GWP. According to Sierra Club, the IPCC has stated that including the climate-carbon feedback for methane and other non-carbon dioxide greenhouse gases—in which an increase in the atmospheric temperature causes a further increase in atmospheric concentration of carbon dioxide—provides a better estimate of the metric value. Sierra Club therefore argues that DOE should have used the IPCC’s 20-year and 100-year fossil methane global warming potentials of 87 and 36, respectively.¹²⁸ Without providing a calculation or citation, Sierra Club asserts that using a GWP value of 36 for methane increases the life cycle GHG emissions from the scenarios by 20 percent relative to those calculated by NETL using a GWP value of 30.¹²⁹

¹²⁵ Rehearing Request at 16.

¹²⁶ GWP is a measure of how much energy the emissions of one ton of a gas will absorb over a given period of time, relative to the emissions of one ton of carbon dioxide. The larger the GWP, the more that a given gas warms the Earth compared to carbon dioxide over that time period. The time period usually used for GWPs is 100 years. GWPs provide a common unit of measure, which allows analysts to add up emissions estimates of different gases (*e.g.*, to compile a national greenhouse gas inventory), and allows policy-makers to compare emissions-reductions opportunities across sectors and gases. *See* U.S. Env'tl. Protection Agency, *Understanding Global Warming Potentials*, <http://www.epa.gov/climatechange/ghgemissions/gwps.html> (last updated Feb. 23, 2016).

¹²⁷ Rehearing Request at 16-17.

¹²⁸ *See id.* at 17 (citing Sierra Club’s Climate Comment at 12).

¹²⁹ *See id.*

b. DOE/FE Analysis

The LCA GHG Report addresses an area of scientific study—the study of life cycle GHG emissions—that is constantly evolving. In the Report, NETL acknowledges the wide range of scenario variability, the uncertainty in the underlying modeled data, and other study limitations arising from this subject matter.¹³⁰ As explained below, NETL and DOE/FE made a reasoned evaluation of the scientific facts then-available concerning the potential impacts of U.S. LNG exports on global GHG emissions.

NETL selected the GWP values and other parameters for its LCA GHG Report in the fall of 2013. At that time, working group papers for the IPCC's Fifth Assessment Report¹³¹ were available in draft form. For the first time, those analyses produced two sets of GWP values for methane: GWP values based solely on the radiative forcing of methane and GWP values that also included an adder for climate-carbon feedbacks. Based on a perception of uncertainty underlying the climate carbon feedback adders, as well as their novelty and a lack of clear guidance from the IPCC at that time, NETL elected to use the GWP values without the climate carbon feedback adders as it had done in the past. Specifically, the LCA GHG Report uses 20- and 100-year methane GWPs of 85 and 30, respectively—as compared to the GWPs of 87 and 36 when climate carbon effects are included.¹³²

We agree with Sierra Club that using 20- and 100-year methane GWPs of 87 and 36 is most appropriate for use today and that climate carbon feedbacks should be captured in the GWP values for methane. Using these values, however, would not have materially affected the

¹³⁰ LCA GHG Report at 18 (Summary and Study Limitations).

¹³¹ IPCC, 2013: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp, doi:10.1017/CBO9781107415324.

¹³² See Final Order at 60.

conclusions of the LCA GHG Report. Contrary to Sierra Club’s suggestion, there is no one-for-one relationship between the GWP of methane and the total life-cycle GHG impact of U.S.-exported LNG because methane is not the only type of GHG emission. Natural gas energy systems release both methane and carbon dioxide. On a life cycle basis for delivered electricity, combustion at the power plant—which produces carbon dioxide emissions—accounts for the majority of GHG emissions. The following table depicts how the life cycle GHG emissions for three key scenarios in the LCA GHG Report would change depending on whether the 100-GWP for methane was 30 or 36. These changes were calculated by scaling the methane emissions in Figures 6-3 through 6-5 of the LCA GHG Report by a ratio of 36/30.

Table 1: Increase in GHG Emissions by Changing 100-year CH₄ GWP

Scenario	GHG Emissions (kg CO ₂ e/MWh)		% change
	GWP _{CH₄} = 30	GWP _{CH₄} = 36	
Natural gas power using U.S. LNG transported to Rotterdam	629	646	2.8%
Natural gas power using Russian NG transported by pipeline to Rotterdam	612	642	4.9%
Coal power using regional coal	1,089	1,090	0.1%

As this table demonstrates, using the 100-year methane GWP of 36 does not increase the 100-year GWP by 20 percent compared to NETL’s estimates based on a GWP value of 30. Rather, the estimate of GHG emissions resulting from U.S.-exported LNG increases by 2.8%, the estimate for Russian gas increases by 4.9%, and the estimate for use of regional coal increases by 0.1%. This change in the GWP estimate would not have made a material difference to the conclusions of the LCA GHG Report and does not warrant re-opening this proceeding to update the LCA GHG Report.

E. Consideration of Climate Impacts

1. Sierra Club's Position

Sierra Club claims that DOE/FE's consideration of climate impacts in its public interest analysis was based on unsupported assumptions and failed to place these impacts in the proper context. In the Final Order, DOE considered whether emissions from U.S.-exported LNG would be offset by displacement of combustion of other fossil fuels and avoidance of associated emissions. Sierra Club maintains that this approach is not the proper way to assess climate impacts and that the United States' international commitments require consideration of domestic GHG emissions without consideration of displaced foreign emissions.¹³³ In addition, Sierra Club claims that DOE/FE's analysis of climate impacts focuses on the LCA GHG analysis but does not focus on "the simpler problem" represented by DCP's specific proposal with the majority of output contracted to Japanese and Indian buyers.¹³⁴ Sierra Club asserts that this modeling effort for DCP's Liquefaction Project would not be unreasonably burdensome or speculative.

Sierra Club also maintains the available evidence does not support DOE/FE's decision to compare the lifecycle of U.S. LNG solely to coal and other sources of gas. First, Sierra Club asserts DOE provides no basis for comparing U.S. LNG against coal and natural gas used in China rather than the aggregate GHG intensity of China's generation fleet or, even more appropriately, the average GHG intensity of additional generation capacity that China is expected to add (based on EIA data). According to Sierra Club, DOE cited China's 2012 generation capacity, which was composed of 66 percent coal and 3 percent natural gas. Sierra Club maintains that it would have been reasonable to assume that U.S. LNG would be more likely to compete against sources of new capacity rather than existing sources, and states that the

¹³³ Rehearing Request at 27.

¹³⁴ *See id.*

new capacity will be more than 50 percent renewables and, therefore, will have a significantly lower GHG intensity than DOE's estimate even under a 100-year GWP.¹³⁵

Second, in the case of Japan, Sierra Club states DOE did not forecast future Japanese generation even though this information is available. Sierra Club contends DOE/FE has an obligation to seek out the environmental effects of the proposed project. However, Sierra Club states that the data of the International Energy Agency on which EIA relied indicates that the GHG intensity of Japan's aggregate mix is very near NETL's estimate of the intensity of U.S. LNG. Therefore, Sierra Club maintains that correcting any of the errors in NETL's assessment would likely lead to the conclusion that U.S. LNG has higher life-cycle emissions than the energy that U.S. LNG would likely displace in Japan.¹³⁶

2. DCP's Answer

According to DCP, Sierra Club's argument that DOE/FE should have analyzed the effects of increased coal-fired emissions (which Sierra Club asserts will result from increased natural gas prices attributable to LNG exports) is merely another effort by Sierra Club to push for speculative analysis that is far beyond the bounds of NEPA.¹³⁷ DCP asserts that DOE/FE considered and rejected this argument in the Final Order, and it should be reaffirmed here.

3. DOE/FE Analysis

The Department has thoroughly reviewed the GHG impacts of its decision. At the project level, the EA describes direct GHG emissions resulting from the construction and operation of the Cove Point LNG Terminal, including the liquefaction process.¹³⁸ The

¹³⁵ See *id.* at 27-28.

¹³⁶ See *id.* at 28.

¹³⁷ DCP Answer at 13.

¹³⁸ See, e.g., EA at 98-99, 169-71.

Addendum contains a chapter devoted to GHG emissions and includes a range of estimates from the scientific literature of the GHGs emitted by producing and transporting natural gas from unconventional resources.¹³⁹ Finally, the LCA GHG Report analyzes the life-cycle GHGs emitted from U.S.-exported LNG that is re-gasified and combusted for electric power generation in Europe or Asia. The LCA GHG Report compares the life-cycle GHGs of U.S.-exported LNG to those of LNG exported from other producing countries, pipeline gas delivered from Russia, and domestic coal burned in both Europe and Asia.¹⁴⁰

It is useful to compare the life-cycle GHG emissions of U.S.-exported LNG to other forms of generation because U.S.-exported LNG has the potential to displace other fuels and thus to avoid the emissions associated with burning those fuels.

The comparison cases used in the LCA GHG Report were well-chosen. When U.S.-exported LNG enters the marketplace, it will compete with LNG sourced from other countries. Therefore, the comparison of U.S.-sourced LNG to foreign-sourced LNG is clearly instructive. U.S.-exported LNG also will compete directly with pipeline deliveries from Russia in some markets, another form of “gas-on-gas” competition. Recognizing that the availability of U.S.-exported LNG may affect the electric power generation fuel mix in importing countries, the LCA GHG Report also compared U.S.-exported LNG to coal produced domestically in both Europe and Asia. This comparison is likewise instructive because, as the Department explained in the Final Order, coal remains a prevalent choice for electric power generation in LNG-importing countries and competes with natural gas as a source of baseload power.¹⁴¹

¹³⁹ Addendum at 33-44.

¹⁴⁰ See Final Order at 55-65.

¹⁴¹ See *id.* at 63-64.

It is important, however, to recognize the Department’s limited aims in making these comparisons. In the Final Order, the Department made clear that the comparisons to coal and foreign-sourced gas in the LCA GHG Report did not themselves answer the ultimate question of how U.S. LNG exports would affect the global GHG balance because U.S. LNG could compete with other resources as well. The Department explained that, given the prevalence of coal and natural gas as sources of electric generation in LNG-importing countries, the comparison nonetheless provided useful information. Looking at the record before it, the Department concluded only that it did “not see a reason to conclude that U.S. LNG exports will significantly exacerbate global GHG emissions.”¹⁴²

The Department also explained why it was not attempting a more precise prediction regarding global GHG impacts. The Department explained that the compounded uncertainties in estimating how the availability of U.S. LNG exports would affect the market for every potential energy source in every importing country, along with the interventions of foreign governments in those markets, would render such an analysis too speculative to inform its public interest determination.¹⁴³ In its rehearing petition, Sierra Club suggests alternative comparisons the Department could have used to approach the difficult question of how U.S. LNG exports would affect the global GHG balance. For one, Sierra Club states that the Department could have analyzed DCP’s specific LNG export proposal. Stating that the majority of DCP’s proposed output of LNG is contracted to Japanese and Indian buyers, Sierra Club suggests DOE should have focused solely on Japan and India, which Sierra Club characterizes as a “simpler problem.”¹⁴⁴ We disagree. Focusing solely on Japan and India is a “simpler problem” only

¹⁴² *Id.* at 94.

¹⁴³ *See id.* at 93.

¹⁴⁴ Rehearing Request at 27.

because it ignores that there is a global market for LNG. Even if *all* U.S.-exported LNG went to Japan and India, those exports would affect the global price of LNG, which in turn would affect energy systems in numerous countries, not only Japan and India.

Sierra Club also suggests the Department should have compared the lifecycle GHG emissions of U.S.-exported LNG to those of the average new facility in China. But Sierra Club does not explain why this would be an appropriate comparison. To the extent U.S.-exported LNG lowers the price of natural gas in a given country, that price change could affect dispatch and retirement decisions facing existing units as well as decisions of what new units to build. Moreover, even with respect to new capacity, it may not be valid to assume that natural gas would compete directly with renewables in all nations given the potential intervention of public policy and the different role these resources play in an integrated electric system.

F. DOE/FE Correctly Evaluated Economic Benefits and Impacts in Determining That DCP's Proposed Exports Are in the Public Interest

1. Sierra Club's Position

Sierra Club's economic argument is based upon the broad contention that, in granting DCP's Application, DOE considered the "upstream" economic benefits of induced natural gas production attributable to the proposed LNG exports, but refused to consider the environmental harms that allegedly would occur as a result of induced natural gas production.¹⁴⁵ Sierra Club asserts that DOE/FE is "casting widely" for economic benefits yet fails to weigh economic impacts properly, in violation of the Natural Gas Act.¹⁴⁶ Sierra Club provides the following three criticisms of DOE/FE's economic conclusions: (i) the economic model used by DCP's consultant to calculate the economic benefits and upon which DOE allegedly rests its case—

¹⁴⁵ Rehearing Request at 20.

¹⁴⁶ *Id.*

called the “IMPLAN” model—has serious flaws—namely, overestimating jobs figures and failing to consider “counterfactuals or foregone opportunities” had investors and regulators made different choices; (ii) the 2012 LNG Export Study, upon which DOE relies, disregards the economic impacts felt by people outside of the natural gas industry and relies too heavily on a possible slight increase in U.S. gross domestic product (GDP) to conclude that authorizing LNG exports is within the public interest, and (iii) approving LNG exports could cause an increase in domestic natural gas prices costing the consumer billions of dollars per year.¹⁴⁷

Sierra Club first disputes DCP’s estimates concerning the number of jobs and economic benefits associated with its LNG export proposal. According to Sierra Club, the bulk of DCP’s claimed economic benefits will result from increased domestic production of natural gas, which Sierra Club characterizes as “optimistic projections” derived from the IMPLAN economic model used by DCP’s consultant, ICF International (ICF Economic Benefits Study). Sierra Club argues that ICF’s economic modeling is not reliable because it is not based on “direct empirical research on the observed economic consequences of increased [natural] gas production in the shale gas plays.”¹⁴⁸ Sierra Club further charges that the IMPLAN model has recognized limitations as an “input-output” model giving results for individual years, rather than a “continuous model” that tracks jobs and expenditures from year to year.¹⁴⁹ Among other criticisms of the IMPLAN model, Sierra Club asserts that the model does not consider counterfactuals and foregone opportunities—*i.e.*, it fails to ask how the U.S. economy might have grown based on different economic or regulatory choices, and fails to consider how LNG exports may displace other economic activity.

¹⁴⁷ *See id.*

¹⁴⁸ *Id.* at 21.

¹⁴⁹ *Id.*

In sum, Sierra Club maintains that “a simple economic model, like IMPLAN, cannot reliably capture the consequences of transforming an entire region of the country ... into an industrial gas extraction zone.”¹⁵⁰ Sierra Club therefore argues that DOE cannot approve DCP’s Application based upon the IMPLAN modeling results, and instead must undertake an independent inquiry into the costs and benefits of DCP’s proposal to fully account for “the difficult changes inherent in the shale gas boom.”¹⁵¹ Sierra Club concludes by offering that “the better course” is “the strengthening [of] regional sectors which are not driven by boom-bust cycles.”¹⁵²

Next, Sierra Club asserts that DOE’s reliance on the 2012 LNG Export Study (specifically, the NERA study developed as the second part of the 2012 LNG Export Study, *see supra* note 64) disregards the impacts felt by people outside the natural gas industry. According to Sierra Club, the “primary effect” of exporting LNG will be to transfer wealth from the majority of Americans to the small minority of corporations that will own natural gas resources or LNG export infrastructure.¹⁵³ Sierra Club argues that the associated “slight increase in GDP” calculated by NERA is outweighed by other factors, such that the likely net effect of exporting LNG will be a decrease in U.S. GDP that is contrary to the public interest.¹⁵⁴ Indeed, Sierra Club argues that the conclusion of the 2012 LNG Export Study—that LNG exports will provide public benefits—“is contradicted by the only other available comprehensive model of LNG exports’ impacts,” an unpublished study allegedly conducted in 2013 by Purdue University

¹⁵⁰ Rehearing Request at 22.

¹⁵¹ *Id.*

¹⁵² *Id.*

¹⁵³ *Id.* at 22-23.

¹⁵⁴ *Id.*

economists Kemal Sarica and Wallace E. Tyner (Purdue Study).¹⁵⁵ According to Sierra Club, the Purdue Study concludes that the likely net effect of LNG exports will be a decrease in U.S. GDP.¹⁵⁶

Finally, Sierra Club asserts that economic harms associated with DCP's proposed exports will be significant, due to "major increases" in natural gas prices that Sierra Club draws from DCP's economic report prepared by Navigant Consulting (the Navigant Price Report).¹⁵⁷ Sierra Club discusses the various LNG export proposals pending before DOE/FE, concluding that the combined volumes of all pending non-FTA export proposals are far higher than the maximum export figure considered in DCP's economic analysis, and thus impacts to natural gas prices can be expected to be commensurately greater.¹⁵⁸ According to Sierra Club, DCP's proposed exports would benefit a small subset of citizens (mostly in the oil and gas sector) while penalizing millions of citizens through increases in natural gas prices and resulting increases in prices of consumer goods and services. For this reason, Sierra Club states that DOE/FE must deny DCP's Application as inconsistent with the public interest.

2. DCP's Answer

According to DCP, Sierra Club's economic arguments reflect its continuing disagreement with DOE/FE's policy choices. DCP maintains that the 2012 LNG Export Study commissioned by DOE/FE developed and fully supported the conclusion that the United States will experience net economic benefits from issuance of authorizations to export domestically produced LNG. DCP argues that the 2012 LNG Export Study is extensively explained and supported in DCP's

¹⁵⁵ Rehearing Request at 23 & n.50 (citing "Purdue Study" conducted by Sarica and Tyner).

¹⁵⁶ *Id.* at 23.

¹⁵⁷ *See id.* at 24.

¹⁵⁸ *Id.* at 25.

Conditional and Final Orders. In DCP's view, Sierra Club has presented no reason to question DOE/FE's established conclusions about the economic benefits of LNG exports, and no basis for the Department to alter its established course of action on rehearing.¹⁵⁹

3. DOE/FE Analysis

In the Conditional Order in this proceeding, DOE/FE exhaustively reviewed and addressed the economic evidence presented by DCP, Sierra Club's rebuttal evidence, the methodology and findings of the 2012 LNG Export Study, and the extensive public comments received on the 2012 LNG Export Study—including Sierra Club's initial and reply comments.¹⁶⁰ Additionally, in both the Conditional and Final Orders, DOE/FE reviewed the significance of the LNG Export Study and related economic considerations bearing on the public interest, including the economic impacts of higher natural gas prices, in accordance with the Natural Gas Act.¹⁶¹ Upon review of Sierra Club's Request for Rehearing, we find that Sierra Club is raising substantially the same (if not identical) economic arguments that were already presented and addressed in the Conditional and/or the Final Orders.

Specifically, in its Protest to the DCP Application, Sierra Club presented its arguments concerning the alleged deficiencies of the IMPLAN model and the increases in natural gas prices that it claims will occur due to DCP's proposed exports based on the Navigant Price Report.¹⁶² Contrary to Sierra Club's assertion, DOE/FE did address Sierra Club's arguments concerning the IMPLAN model and DCP's asserted economic benefits in the Conditional Order. There, we found that the record contains substantial evidence of regional economic benefits from a grant of

¹⁵⁹ DCP Answer at 13-14.

¹⁶⁰ *See, e.g.*, Conditional Order §§ V-IX.

¹⁶¹ *See, e.g.*, Conditional Order at 140-44; Final Order at 94-100.

¹⁶² *See, e.g.*, Conditional Order at 39-43 (Sierra Club's Protest) and 135-39 (DOE/FE's Discussion and Conclusions).

the Application.¹⁶³ Additionally, we note that the ICF Economic Benefits Study submitted by DCP is not inherently flawed simply because it is based on “a series of snapshots” of the effects of certain predicted inputs or because all of the potential counterfactuals raised by Sierra Club were not factored into the analysis.¹⁶⁴ These characteristics of an IMPLAN study—and specifically the ICF Economic Benefits Study—do not mean that the results are unreasonable. The results of the ICF Study are also confirmed on a national scale by the NERA study (discussed *supra* note 64), as discussed below.

Further, DOE/FE examined both the study that Sierra Club presented to critique the claims related to employment benefits supported by Marcellus Shale production activities (the Weinstein study) and Sierra Club’s concerns regarding the economic impacts of the shale gas “boom” in regional gas production areas.¹⁶⁵ Sierra Club nevertheless argues on rehearing that DCP must support its Application with “direct empirical research on the observed economic consequences of increased [natural] gas production in the shale gas plays.”¹⁶⁶ We disagree. Although such evidence could be informative, it is not the only type of economic analysis capable of supporting a public interest determination, nor would it provide a complete picture of the economic benefits associated with LNG exports. As noted above, DOE/FE has determined that the ICF Study provides evidence that significant economic benefits at the local, regional, national, and international levels are likely to occur if the Application is granted.¹⁶⁷ The ICF Study, together with the 2012 LNG Export Study (discussed below), provide ample evidence of

¹⁶³ *See id.* at 135-36.

¹⁶⁴ Rehearing Request at 21.

¹⁶⁵ *See* Conditional Order at 135-38.

¹⁶⁶ Rehearing Request at 21.

¹⁶⁷ *See* Conditional Order at 135.

both the economic benefits and impacts associated with DCP's proposed exports on which to base a public interest determination.

As to price impacts attributable to LNG exports, we observed in the Conditional Order in response to arguments from Sierra Club and others:

NERA's analysis indicates that, after five years of increasing LNG exports, wellhead natural gas price increases could range from \$0.22 to \$1.11 ... depending on the market-determined level of exports. However, *even with these estimated prices increases*, NERA found that the United States would experience net economic benefits from increased LNG exports in all cases studied.¹⁶⁸

To the extent Sierra Club is claiming that price impacts will be higher now based on higher cumulative LNG export levels than originally considered in DCP's Navigant Report, we note that the Final Order assesses the cumulative impacts of the six final authorizations issued at that time (then totaling 6.51 Bcf/d of natural gas) and states that this total volume is within the range of scenarios analyzed in the 2012 LNG Export Study in which NERA found that the United States would experience net economic benefits.¹⁶⁹ In each succeeding non-FTA export authorization issued since the Final Order, we have continued to make the same assessment of cumulative impacts to ensure that each authorization is in the public interest.¹⁷⁰

Sierra Club again criticizes the 2012 LNG Export Study and the conclusions that DOE/FE draws from that Study, asserting that projected U.S. GDP benefits are slight and will not accrue to the general public. DOE/FE previously recognized these aspects of the NERA

¹⁶⁸ *Id.* at 138.

¹⁶⁹ Final Order at 98-99.

¹⁷⁰ *See, e.g., Cameron LNG, LLC*, DOE/FE Order No. 3797, FE Docket No. 15-67-LNG, Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Cameron Terminal Located in Cameron and Calcasieu Parishes, Louisiana, to Non-Free Trade Agreement Nations, 25-28 (Mar. 18, 2016). Additionally, as described herein (at 20) and set forth in the Final Order, "it is far from certain that all or even most of the proposed LNG export projects will ever be realized because of the time, difficulty, and expense of commercializing, financing, and constructing LNG export terminals, as well as the uncertainties inherent in the global market demand for LNG." Final Order at 97.

findings, but ultimately determined that the net benefits to the U.S. economy from exporting LNG were in the public interest:

DOE believes that the public interest generally favors authorizing proposals to export natural gas that have been shown to lead to net benefits to the U.S. economy. While there may be circumstances in which the distributional consequences of an authorizing decision could be shown to be so negative as to outweigh net positive benefits to the U.S. economy as a whole, we do not see sufficiently compelling evidence that those circumstances are present here.¹⁷¹

To counter the 2012 LNG Export Study, Sierra Club refers to one new study from 2013, which it calls the “Purdue Study” but is actually titled a “Working Paper.”¹⁷² Sierra Club, however, did not introduce or discuss the Purdue Study in its earlier filings in this proceeding, thereby foreclosing DOE/FE from having considered it in the Conditional and Final Orders. Nor has Sierra Club provided the Purdue Study as an exhibit to its Rehearing Request.¹⁷³ By Sierra Club’s own admission, the Purdue Study is unpublished and available only from the authors.¹⁷⁴

In sum, Sierra Club’s economic arguments do not alter our conclusions in the Final Order. Although “[b]oth the [2102] LNG Export Study and many public comments identify significant uncertainties and even potential negative impacts from LNG exports,” we affirm, on balance, “that the potential negative implications of DCP’s proposed exports are outweighed by

¹⁷¹ See *id.* at 101.

¹⁷² Rehearing Request at 23 n.50.

¹⁷³ DOE/FE has the discretion to reject evidence that was available but not proffered for our consideration at the time of the Final Order. Further, we are reluctant to chase a moving target by considering new evidence discussed for the first time at the rehearing stage of this proceeding.

¹⁷⁴ Sierra Club addresses one other study to support its position concerning economic harms attributable to LNG export—a study entitled, *Effect of Increased Natural Gas Exports on Domestic Energy Markets*, commissioned by DOE in May 2014 and published by the U.S. Energy Information Administration (EIA) on October 29, 2014. See Rehearing Request at 25 & n.57 (citing 2014 EIA Study); 2014 EIA Study *available at*: <https://www.eia.gov/analysis/requests/fe/>. In requesting the study, DOE asked EIA to update its earlier study conducted as part of the 2012 LNG Export Study by examining the effects of exports of domestically produced LNG at levels from 12 to 20 Bcf/d of natural gas. Overall, the 2014 EIA Study found that exports of LNG at those levels will have a positive impact on U.S. GDP. The 2014 EIA Study is not a part of the administrative record in this proceeding, but even if it were, we would not conclude that the 2014 Study supports Sierra Club’s arguments concerning price impacts.

the likely net economic benefits and by other non-economic or indirect benefits.”¹⁷⁵ We therefore reject Sierra Club’s economic arguments.

IV. CONCLUSION

We find that it has not been shown that a grant of the requested authorization is inconsistent with the public interest. We affirm our previous finding that the Application should be granted subject to the terms and conditions set forth in the Final Order.

V. ORDER

Pursuant to sections 3 and 19 of the Natural Gas Act, and for the reasons set forth above and in Order Nos. 3331 and 3331-A, it is ordered that:

- A. Dominion Cove Point LNG, LP’s Motion for Leave to Answer Sierra Club’s Request for Rehearing is granted; and
- B. Sierra Club’s Request for Rehearing is denied.

Issued in Washington, D.C., on April 18, 2016.



Christopher A. Smith
Assistant Secretary
Office of Fossil Energy

¹⁷⁵ Final Order at 97.