

ORAL ARGUMENT NOT YET SCHEDULED

No. 16-1253

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

SIERRA CLUB,

Petitioner,

v.

UNITED STATES DEPARTMENT OF ENERGY,

Respondent,

AMERICAN PETROLEUM INSTITUTE, LLC, ET AL.,

Intervenors for Respondent.

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

PROOF REPLY BRIEF OF PETITIONER SIERRA CLUB

Dated: March 17, 2017.

Nathan Matthews
Sanjay Narayan
Sierra Club Environmental Law Program
2101 Webster Street, Suite 1300
Oakland, CA 94612
(415) 977-5695 (tel)
(510) 208-3140 (fax)
nathan.matthews@sierraclub.org
Counsel for Petitioner Sierra Club

TABLE OF CONTENTS

TABLE OF CONTENTS.....	i
TABLE OF AUTHORITIES.....	iii
GLOSSARY OF ABBREVIATIONS	vi
STATUTES AND REGULATIONS.....	xi
SUMMARY	1
ARGUMENT	4
I. NEPA	4
<i>A. DOE Failed to Consider the Cumulative Effects of Its Export Authorizations.....</i>	<i>8</i>
<i>B. Upstream Effects of Induced Gas Production and Coal Use ..</i>	<i>10</i>
1. <i>Indirect Upstream Effects Are Foreseeable and Within the Scope of NEPA Review</i>	<i>13</i>
2. <i>DOE Can Reasonably Foresee the Extent of Upstream Impacts</i>	<i>16</i>
<i>i. DOE Can Foresee the Amount and Region of Export-Induced Gas Production.....</i>	<i>17</i>
<i>ii. DOE Failed to Take a Hard Look Ozone Impacts of Export-Induced Gas Production.....</i>	<i>21</i>
<i>iii. DOE Failed to Take a Hard Look at Export-Induced Impacts on Water Resources.....</i>	<i>23</i>
<i>iv. DOE Can Foresee Air Pollution Impacts of Increased Coal Use.....</i>	<i>25</i>
<i>v. DOE Failed to Adequately Assess Upstream Greenhouse Gas Emissions</i>	<i>26</i>

3. *Predicting the Extent of Impacts Would Not Be Exorbitantly Costly*..... 27

4. *DOE’s Shallow Analysis of Upstream Impact Cannot Be Upheld Under the ‘Rule of Reason’* 29

C. *Downstream Effects*..... 32

II. Natural Gas Act **35**

A. *The Agency’s Conclusory Treatment of Distributional Effects Is Not Sufficient* 35

B. *The Agency’s Comparative Analysis is Arbitrary and Capricious* 36

CONCLUSION..... **37**

CERTIFICATE OF COMPLIANCE WITH WORD LIMITATION . **39**

CERTIFICATE OF SERVICE **40**

TABLE OF AUTHORITIES

Cases

<i>*Amerijet Int’l, Inc. v. Pistole</i> , 753 F.3d 1343 (D.C. Cir. 2014)	35, 36
<i>Baltimore Gas & Elec. Co. v. Nat. Res. Def. Council</i> , 462 U.S. 87 (1983)	26
<i>Cf. Sierra Club v. FERC</i> , 827 F.3d 36, 46 (D.C. Cir. 2016)	14
<i>Citizens Against Burlington v. Busey.</i> , 938 F.2d 190 (D.C. Cir. 1991)...	31
<i>Citizens Against Rails-to-Trails v. Surface Transp. Bd.</i> , 267 F.3d 1144 (D.C. Cir. 2001)	32
<i>City of Shoreacres v. Waterworth</i> , 420 F.3d 440 (5th Cir. 2005)	4, 9, 12
<i>Coalition on Sensible Transp., Inc., et al v. Elizabeth Dole, et al.</i> , 826 F.2d 60 (D.C. Cir. 1987)	31
<i>Dep’t of Transp. v. Pub. Citizen</i> , 541 U.S. 752 (2004).....	30
<i>Hughes River Watershed Conservancy v. Glickman</i> , 81 F.3d 437 (4th Cir. 1996).....	33
<i>Mayo Found. v. Surface Transp. Bd.</i> , 472 F.3d 545 (8th Cir. 2003)	28
<i>Nat. Res. Def. Council v. Morton</i> , 458 F.2d 827 (D.C. Cir. 1972)	4, 22
<i>Neighbors of Cuddy Mountain v. U.S. Forest Serv.</i> , 137 F.3d 1372 (9th Cir. 1998).....	5, 28
<i>Robertson v. Methow Valley Citizen Council</i> , 490 U.S. 332 (1989)	5, 21
<i>*Scientists’ Inst. for Pub. Info. v. Atomic Energy Comm’n</i> , 481 F.2d 1079 (D.C. Cir. 1973)	4, 12, 16
<i>Tourus Records v. Drug Enf’t Admin.</i> , 259 F.3d 731 (D.C. Cir. 2001) ...	36
<i>Western Watersheds Project v. Bureau of Land Mgmt.</i> , 721 F.3d 1264 (10th Cir. 2013)	30, 31

Statutes

42 U.S.C. § 4331(b)(3).....	4
-----------------------------	---

Other Authorities

EIA, Effect of Increased Levels of Liquefied Natural Gas Exports on U.S. Energy Markets (Oct. 29, 2014) (“2014 Export Study”).....	vi, 12
--	--------

EIA, Effect of Increased Natural Gas Exports on Domestic Energy Markets (January 2012) (“2012 Export Study”)	vi, 1, 10, 11, 15, 35
--	-----------------------

Regulations

40 C.F.R. § 1502.16(a)-(b).....	5
---------------------------------	---

40 C.F.R. § 1502.22	16, 28
---------------------------	--------

40 C.F.R. § 1502.22(a)	28, 30
------------------------------	--------

40 C.F.R. § 1502.22(b)(4).....	30
--------------------------------	----

40 C.F.R. § 1508.7	4, 9, 25
--------------------------	----------

40 C.F.R. § 1508.8	4
--------------------------	---

40 C.F.R. § 1508.8(b)	15
-----------------------------	----

Administrative Orders

DOE, Order 3638, DOE/FE Docket No. 12-97-LNG, <i>Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Proposed Corpus Christi Liquefaction Project to be Located in Corpus Christi, Texas, to Non-Free Trade Agreement Nations</i> (May 12, 2015) (“Authorization Order”)	2, 5, 6, 8, 9, 10, 11, 13, 15, 17, 24, 25, 32, 33, 36, 37
--	---

DOE, Order 3638-A, DOE/FE Docket No. 12-97-LNG, *Opinion and Order Denying Request for Rehearing of Order Granting Long-term, Multi Contract Authorization to Export Liquefied Natural Gas by Vessel from the Proposed Corpus Christi Liquefaction Project to be Located in Corpus Christi, Texas, to Non-Free Trade Agreement Nations* (May 26, 2016) (“Rehearing Order”)..... 6, 9, 13, 14, 20, 25

*Authorities chiefly relied upon are marked with an asterisk.

GLOSSARY OF ABBREVIATIONS

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

2012 Export Study	U.S. Energy Information Administration, Effect of Increased Natural Gas Exports on Domestic Energy Markets (January 2012)
2014 Export Study	U.S. Energy Information Administration, Effect of Increased Levels of Liquefied Natural Gas Exports on U.S. Energy Markets (Oct. 29, 2014)
Addendum	U.S. Department of Energy, Final Addendum to Environmental Review Documents Concerning Exports of Natural Gas from the United States (Aug. 15, 2014)
Application	Cheniere Marketing, LLC, DOE/FE Dkt. 12-97-LNG, Application For Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Countries

Authorization Order	U.S. Department of Energy, Order 3638, DOE/FE Dkt. 12-97-LNG, <i>Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas By Vessel from the Proposed Corpus Christi Liquefaction Project to be Located in Corpus Christi, Texas, to Non-Free Trade Agreement Nations</i> (May 12, 2015)
bcf/d	billion cubic feet per day
bcf/y	billion cubic feet per year
Btu	British thermal units
CAMx	Comprehensive Air-quality Model with extensions
CEQ Greenhouse Gas Guidance	Council on Environmental Quality, Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions (Aug. 1, 2016)
Climate Action Plan	Executive Office of the President, The President's Climate Action Plan (June 2013)
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
DOE	Department of Energy
DOE/FE	Department of Energy/Office of Fossil Energy

Domestic Life Cycle Report	National Energy Technology Laboratory, Life Cycle Analysis of Natural Gas Extraction and Power Generation (May 29, 2014)
EA	Environmental Assessment
EIA	Energy Information Administration
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FTA	free trade agreement
FERC	Federal Energy Regulatory Commission
Global Life Cycle Report	National Energy Tech. Lab., Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States (May 29, 2014)
GHG	greenhouse gas
GWP	global warming potential
JA	Joint Appendix
LCA GHG Report	National Energy Tech. Lab., Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States (May 29, 2014) (cited in this brief as “Global Life Cycle Report”)
LNG	liquefied natural gas

MJ	megajoule
MMBtu	million British thermal units
MWh	megawatt hour
NEMS	National Energy Modeling System
NEPA	National Environmental Policy Act
NERA Study	National Economic Research Associates, Macroeconomic Impacts of LNG Exports from the United States (Dec. 3, 2012)
NETL	National Energy Technology Laboratory
NO _x	nitrogen oxides
P or PP	The internal paragraph number or numbers within a FERC order.
Rehearing Request	Sierra Club, Request for Rehearing, DOE/FE Dkt. 12-97-LNG (June 11, 2015)
Rehearing Order	U.S. Department of Energy, Order 3638-A, DOE/FE Dkt. 12-97-LNG, <i>Opinion and Order Denying Request for Rehearing of Order Granting Long-term, Multi Contract Authorization to Export Liquefied Natural Gas by Vessel from the Proposed Corpus Christi Liquefaction Project to be Located in Corpus Christi, Texas, to Non-Free Trade Agreement Nations</i> (May 26, 2016)
Scf	standard cubic foot

Unconventional
Production Report

National Energy Tech. Lab., *Environmental
Impacts of Unconventional Natural Gas
Development and Production* (May 29, 2014)

VOC

volatile organic chemicals

STATUTES AND REGULATIONS

Except for those in the Addendum, applicable statutes and regulations are contained in the Briefs for the Petitioner, the Respondent and Respondent-Intervenors Cheniere Marketing, Corpus Christi Liquefaction, LLC and American Petroleum Institute.

SUMMARY

This appeal challenges the Department of Energy’s authorization of liquefied natural-gas exports from the Corpus Christi, Texas, terminal. The Department acknowledges that as a result of this authorization, and its past and potential future authorization of similar proposals, it is reasonably foreseeable that cumulative U.S. LNG exports will amount to 3,500 billion cubic feet per year (“bcf/y”) in coming years, Answering Brief for Respondent (“DOE Br.”) at 39, more than 16% of annual onshore gas production. Addendum at 43, JA____; EIA, Annual Energy Outlook 2014 at D-15 (April 2014), JA____.¹

Abundant record evidence establishes—without meaningful contradiction—that the consequences of such exports would be an increase in domestic gas prices, a significant increase in U.S. natural-gas production, and a shift in the U.S. electric sector from gas to coal. 2012 Export Study at 6, JA____. DOE violated both the National Environmental Policy Act and the Natural Gas Act by failing to take a hard look at these “upstream” impacts or to explain how DOE’s

¹ This brief also employs the short forms introduced in Sierra Club’s Opening Brief.

conclusion that exports would have “little more than a modest, incremental impact on the environmental issues” surrounding natural-gas production comports with this evidence. Authorization Order at 197, JA____. *See* Part I, *below*. Because cumulative exports amounting to 3,500 bcf/y were foreseeable, DOE was required to address the increased gas production and coal use that would result from this level of exports. Instead of taking that hard look at foreseeable effects, DOE dismissed analysis of those impacts as “speculative” because ultimate export levels were “fundamentally uncertain.” Part I.A-B, *below*.

In its brief, DOE argues that it satisfied NEPA by providing a “qualitative” analysis of these impacts (a rationale that departs from that offered in its decision documents). Part I.B.1, *below*.

Uncontroverted record evidence demonstrates, however, that DOE could provide reasonable predictions regarding these impacts far beyond DOE’s mere acknowledgement that exports “might” contribute to some significant impacts somewhere. At a minimum, the Department has the capacity to make regional predictions as to the consequences of its decision. Part I.B.2, *below*. DOE offers no facts or evidence indicating that the cost of providing such predictions would have been exorbitant,

and DOE provides nothing to support its assertion that doing so would be unduly burdensome. Part I.B.3, *below*. NEPA’s “rule of reason” does not condone DOE’s decision to provide only an equivocal acknowledgement of these impacts (which, despite the Agency’s re-characterization as a ‘qualitative analysis,’ lacks any discussion that could fairly be termed ‘analysis’). Part I.B.4 *below*.

DOE’s analysis of effects “downstream” of the export terminal—the emissions from ocean transport, regasification, and combustion of exported gas—was also arbitrary. DOE provided an incomplete and therefore misleading study by comparing life-cycle emissions of using U.S. LNG with emissions of using coal or other sources of natural-gas in overseas markets. DOE agreed that U.S. LNG exports will also compete with renewable energy, but provided no analysis or comparison regarding renewables. Part I.C, *below*.

Finally, DOE failed to reasonably complete its Natural Gas Act public interest assessment by failing to support its conclusion that the cumulative effects of exports would be modest or to provide a rational comparison of benefits and harms. Part II, *below*.

ARGUMENT

I. NEPA

NEPA requires agencies to take a ‘hard look’ at the effects of proposed actions. Agencies must investigate all “reasonably foreseeable” impacts, 40 C.F.R. §§ 1508.7, 1508.8, which are those “sufficiently likely to occur that a person of ordinary prudence would take [them] into account.” *City of Shoreacres v. Waterworth*, 420 F.3d 440, 453 (5th Cir. 2005). An Environmental Impact Statement must analyze and disclose direct, indirect, and cumulative impacts, 40 C.F.R. §§ 1508.7, 1508.8, including both intended and unintended consequences of agency action. 42 U.S.C. § 4331(b)(3). Because NEPA’s goal is “to predict the environmental effects of proposed action before the action is taken and those effects [are] fully known,” this analysis necessarily involves “[r]easonable forecasting and speculation.” *Scientists’ Inst. for Pub. Info. v. Atomic Energy Comm’n*, 481 F.2d 1079, 1092 (D.C. Cir. 1973).

Ultimately, the EIS must present “information sufficient to permit a reasoned choice of alternatives so far as environmental aspects are concerned,” including the choice between acting and taking no action at all. *Nat. Res. Def. Council v. Morton*, 458 F.2d 827, 836 (D.C. Cir. 1972).

This requires more than merely acknowledging that an action may have some adverse impacts: the EIS must examine and disclose the “significance” of impacts, 40 C.F.R. § 1502.16(a)-(b), providing “detailed information” sufficient to “evaluate the severity” of impacts. *Robertson v. Methow Valley Citizen Council*, 490 U.S. 332, 349, 352 (1989).

“General statements about ‘possible’ effects and ‘some risk’ do not constitute a ‘hard look’ absent a justification regarding why more definitive information could not be provided.” *Neighbors of Cuddy Mountain v. U.S. Forest Serv.*, 137 F.3d 1372, 1379-80 (9th Cir. 1998).

Here, the EIS, Addendum, and Global Life Cycle Report (even if DOE could rely on them) all fall far short of NEPA’s requirements. None of the environmental review documents acknowledge the basic fact that DOE’s authorization of exports has the potential to cause fundamental changes in the American energy landscape, including a sizeable increase in domestic gas production and associated environmental harms. Instead, DOE asserts, without supporting analysis, that exports would have “little more than a modest, incremental impact on the environmental issues” surrounding natural-gas production.

Authorization Order at 197, JA____. In reaching this conclusion, DOE

repeatedly branded exports' impacts on gas production and coal use as uncertain, and DOE consistently asserted that any export-induced changes in these industries would not have "foreseeable" environmental effects. EIS at 4-212, JA____; Addendum at 2, JA____; Authorization Order at 192-194, JA____-____; Rehearing Order at 17, 20, JA____, ____.

Although DOE now argues that the Addendum illustrated "the potential scale of impacts" that would be caused by exports, DOE Br. 40, the Addendum only discussed the impacts of existing gas production, without providing any discussion of the extent to which additional export-induced production would aggravate these harms. In DOE's own words, the environmental review documents did "not attempt to identify or characterize the incremental environmental impacts that would result from LNG exports." Authorization Order at 193-4, JA____-____.

The Department's brief seeks to revise this express refusal to "identify or characterize" environmental impacts, *id.*, as a "qualitative" assessment. DOE Br. 37. But DOE did not just fail to "quantify" the upstream environmental impacts of exports, *id.* at 38; it failed to address these effects in any meaningful way. The Addendum merely

acknowledges that increased gas production “may” increase ozone levels and “may” frustrate some areas’ efforts to reduce pollution to safe levels. Addendum at 27-28, JA____ - _____. It provides no analysis of those effects—no discussion of their likelihood, magnitude, location, or consequences for public health. The Addendum’s discussion of other effects of increased natural-gas production is even less informative. *See, e.g.,* Addendum at 19, JA____ (stating that “[w]ater resources are important in all parts of the United States,” and noting that “[w]ater quality may be impacted” by natural gas production, but refusing to address “specific impacts to water resources ... even on a regional level.”).

Uncontroverted record evidence demonstrates that reasonably foreseeable exports would be likely to significantly increase U.S. gas production. The record, like common sense, indicates that such an increase would significantly impact U.S. efforts to reduce the gas sector’s emissions of methane and other pollutants, *see* Opening Br. 45-47, yet DOE did not even acknowledge these potential conflicts. Record evidence indicates that exports will also increase U.S. coal use, and corresponding emissions, but rather than discuss the impact of exports

on efforts to reduce these emissions, DOE asserted without analysis that the Clean Power Plan would prevent exports from having this effect.

Nor did DOE take a hard look at impacts occurring “downstream” of the export terminal, resulting from transportation, regasification, and combustion of exported natural gas. Sierra Club does not challenge DOE’s decision to structure analysis of these impacts around comparisons between the greenhouse gases emitted by foreign use of U.S. LNG and emissions from other energy sources. But having decided to use such a comparison, DOE could not present an incomplete picture of the energy sources that exported LNG may displace. DOE admitted that exported gas would also compete with renewables, and the record demonstrates that renewables were prevalent in likely import markets. Authorization Order at 202-03, JA____-_____.

A. DOE Failed to Consider the Cumulative Effects of Its Export Authorizations.

DOE’s brief accepts that its NEPA obligations extend not just to the exports authorized in the order under review, but also to the cumulative effects of the ‘additional applications for similar export authority’

pending before, or already authorized, by the Department. DOE Br. 39. Yet DOE's refused to analyze the "incremental impact of" *any* foreseeable export volume. 40 C.F.R. § 1508.7. DOE provided no discussion of the impacts that would result from 3500 bcf/y of exports, or any other foreseeable quantity. Instead, DOE stated that the "incremental environmental impacts" of LNG exports "are not reasonably foreseeable" because there was "uncertainty as to the aggregate quantity of natural gas that ultimately may be exported." Authorization Order at 193-94, JA____-____; *see also* Rehearing Order at 18, JA____; Addendum at 1, JA____; DOE Br. 41 (asserting "fundamental uncertainties" regarding foreign demand for U.S. LNG).

Reasonable foreseeability, however, does not require certainty, or even "reasonable certainty," a term that does not appear in the NEPA regulations or caselaw). DOE Br. 37. An effect is reasonably foreseeable if it is "sufficiently likely to occur that a person of ordinary prudence would take it into account in reaching a decision." *Waterworth*, 420 F.3d at 453. Here, DOE, in the record, reasonably foresaw 3,500 bcf/y of exports. At a minimum, DOE was thus required to take (and capable of taking) a hard look at the consequences that would follow from that

level of exports.

DOE claims it “discussed” such impacts “qualitatively.” DOE Br. 40. But as set forth below, its Addendum provided no material that would allow the public to understand the impacts of its decision; in its words, it refused to “identify or characterize” the impact of the exports it was authorizing. Authorization Order at 193-94, JA____-____. Neither the law nor the record supports that refusal.

B. Upstream Effects of Induced Gas Production and Coal Use

“DOE believes” that if LNG exports occur, “export volumes would be offset by some combination of increased domestic production of natural gas (principally from unconventional sources), decreased domestic consumption of natural gas, and an adjustment to the U.S. net trade balance in natural gas with Canada and Mexico.” Addendum at 1, JA____. Evidence in the record uniformly predicts that out of these effects, an increase in gas production will predominate. *Id.* at 2 n.2, 5, JA____, ____ (summarizing 2012 Export Study at 6, JA____). While DOE’s brief states only that exports “could” or “might” increase domestic gas production, DOE Br. 17, 30, 38, DOE provides no explanation for these qualifiers, and no theory of how exports could

occur *without* causing an incremental increase in natural-gas production. Given the reasonable foreseeability of that increase, DOE was required to “identify or characterize” its impact—something the agency refused to do. Authorization Order at 193-94, JA____-____.

Studies and models in the record also uniformly conclude that exports will shift existing gas consumers in the utility sector toward increased coal use. *E.g.*, 2012 Export Study at 12, JA____. DOE has argued that these predictions of increased coal use do not account for recent regulations. Authorization Order at 199-200, JA____-____. Yet despite those regulations, DOE relied on the 2012 Export Study’s price forecasts, which concluded that exports’ effect on the price and supply of natural-gas would be mitigated by electric utilities’ ability to curtail their natural-gas demand. DOE confirmed that the Study was “fundamentally sound” on this point, and stated that it had “seen no developments that would disturb” the Study’s conclusions.

Authorization Order at 190-91, JA____-____. DOE cannot adopt the Study’s prediction that utilities will shift from gas to coal in one part of its Order (to estimate the price impact of exports), and simultaneously reject that prediction in another (when asked to assess the

environmental impacts of exports). *Scientists' Inst. for Pub. Info.*, 481 F.2d at 1097.²

Nor did DOE articulate a basis for concluding that studies in the record failed to account for the Clean Power Plan and other regulations. Although EIA's 2014 Export Study predated the Clean Power Plan, this study presented an "accelerated coal retirement" scenario that was specifically developed to serve "as a proxy for possible future policies to mitigate greenhouse gas emissions" from power-plants. Annual Energy Outlook 2014 at IF-35, JA____. EIA predicted that, even in this scenario, natural-gas exports would increase coal use. 2014 Export Study Table B5, JA____. DOE offers no explanation as to why the effects of the actual Clean Power Plan are likely to be meaningfully

² Cheniere suggests that the Department could deem the Study's conclusions "fundamentally sound," even while dismissing those conclusions as too speculative to be "reasonably foreseeable." Cheniere Br. 25-26 (arguing that "fundamentally sound" forecasts do not "establish reasonable foreseeability"). That argument elevates reasonable foreseeability to virtual certainty, and has no basis in the law or common sense. By basing its economic assessment on the Export Study, DOE necessarily found that the Study's forecasts were sufficiently robust to meaningfully inform the central decision before it: whether exports would be in the public interest. Its simultaneous insistence on dismissing it as too speculative to even "take into account," *Waterworth*, 420 F.3d at 453, for NEPA purposes, was fundamentally arbitrary.

different than the effects of EIA's proxy; on the contrary, it denies "any deficiency" in the EIA's modeling regarding coal. DOE Br. 50.

1. Indirect Upstream Effects Are Foreseeable and Within the Scope of NEPA Review

Before this Court, DOE argues that it satisfied NEPA by providing a "qualitative" analysis of environmental effects caused by export-induced gas production, and by considering the greenhouse gas impacts of export-induced coal use. *E.g.*, DOE Br. 37-38. DOE does not defend the two rationales it offered in the Authorization and Rehearing Orders—which claimed to exclude these effects from NEPA review entirely. In those orders, DOE argued, first, that NEPA did not require analysis of these effects because the effects were entirely unforeseeable.

Authorization Order at 193, JA____; Rehearing Order at 17-18, JA____-____. Here, DOE concedes that the nature of these effects is foreseeable, even though DOE wrongly contends that their extent is not. DOE Br. 37.

Second, the orders argued that effects of gas production and coal use were outside "the scope of NEPA review" because the "causal relationship" between these effects and DOE's action was not

“reasonably close” or “proximate.” Rehearing Order at 21, 24, JA____, _____. DOE’s brief does not argue that, even if these effects could be foreseen, they are not “caused” by DOE’s action. *Cf. Sierra Club v. FERC*, 827 F.3d 36, 46 (D.C. Cir. 2016) (FERC not required to consider effects on energy markets because of DOE’s exclusive authority); *e.g.*, DOE Br. 36 (“DOE acknowledged that LNG exports will contribute to both ‘upstream’ ... and ‘downstream’ emissions”). It argues, instead, that the absence of a “close” connection rendered NEPA analysis, in its opinion, so uncertain that it was unlikely to be “useful,” and therefore excused its failure to address indirect impacts beyond the vague generalities offered in its Addendum and Life Cycle Analyses (*e.g.*, exports “might” cause ozone pollution, in some unspecified area, to some unspecified extent. Addendum at 27, JA____). *Id.* at 34-35 (citations omitted). *See also* Cheniere Br. 24 (arguing that because further analysis would require speculation, NEPA does not require such analysis).

But—as DOE acknowledges—NEPA requires “reasonable forecasting” of indirect effects. DOE Br. 4, 41 (citations omitted). Such effects are, by definition “later in time or farther removed in distance,”

such as “induced changes in the pattern of land use,” and other “growth inducing” and “economic” effects; NEPA’s regulations require inclusion of such effects, so long as they are “reasonably foreseeable.” 40 C.F.R. § 1508.8(b). Here, the indirect effects of the Department’s decision are not only foreseeable—they were foreseen by the analyses within the agency’s administrative record. *See, e.g.*, 2012 Export Study at 10-11, JA____-____. And there is no study or analysis in the record concluding that exports could be approved without affecting natural gas production and use.

In predicting the economic benefits of its decision, moreover, DOE demonstrated its ability to accommodate precisely the sorts of uncertainties that it characterizes as insurmountable obstacles to disclosure of that decision’s environmental disadvantages. To estimate the economic effects of exports, NERA initially found that it was reasonable to model 63 different scenarios, reflecting different economic and regulatory possibilities. NERA Study at 45-46, JA____-____. See Authorization Order at 123-24 (noting that scenarios accommodate various regulatory and economic possibilities), JA____-____. Preliminary analysis showed that most of those different scenarios had

similar impacts on domestic natural gas production and use, so that only 13 scenarios required detailed analysis. *Id.* DOE offers no reason why a parallel approach would be infeasible to address environmental impacts. Indeed, as set forth below, the record demonstrates that environmental impacts are entirely amenable to reasonable forecasting.

2. DOE Can Reasonably Foresee the Extent of Upstream Impacts

DOE defends its decision not to “identify or characterize” exports’ impacts by arguing that any additional analysis would have been “highly uncertain,” and that details beyond what DOE provided could not be reasonably foreseen. DOE Br. 30, 36. Mere assertions of uncertainty are not a basis for shirking NEPA responsibilities. *Scientists’ Inst. for Pub. Info.*, 481 F.2d at 1092. Because NEPA requires “reasonable forecasting,” *id.*, an agency arguing that information regarding foreseeable effects is not available must explain what, specifically, prevents the agency from providing thorough analysis. 40 C.F.R. § 1502.22. Here, abundant evidence in the record demonstrates that DOE had tools to forecast every link in the causal chain connecting reasonably foreseeable exports to the environmental effects of export-

induced gas production and coal use, in a more meaningful fashion than the empty generalities the Department provided.

i. DOE Can Foresee the Amount and Region of Export-Induced Gas Production

The record contains multiple studies predicting the extent to which natural-gas production will increase in response to various levels of exports. DOE characterized the 2012 Export Study as “fundamentally sound.” DOE has not identified any flaws in EIA’s underlying model or methodology, and DOE determined that EIA’s predictions were reliable enough to provide the basis for DOE’s economic analysis. Authorization Order at 190-91, JA____-____.

Nonetheless, DOE now states that it “cannot predict, with any reasonable certainty, the extent to which LNG export authorizations will add to increased production.” DOE Br. 37. The only justification for this statement offered in the record is DOE’s assertion of uncertainty regarding the quantity of exports that will actually occur. Addendum at 1, JA____; Authorization Order at 193-94, JA____-____. As explained above, however, NEPA requires DOE to address the effects of “reasonably foreseeable” cumulative exports—which DOE admits are

3,500 bcf/y—not the effects of exports that DOE determines to be “reasonably certain” to occur. Although “DOE did not attempt to quantify the marginal additional increase in natural gas development” or coal use that would result from 3,500 bcf/y of LNG exports, DOE Br. 37, nowhere in the record did DOE argue that it was unable to do so.

EIA’s “fundamentally sound” models can also predict *where*, at the level of gas ‘plays,’ increased production will occur. DOE observes that such predictions require it to ascertain “price elasticity” DOE Br. 43. The record demonstrates, however, that EIA already uses precisely such a model. EIA’s National Energy Modeling System (“NEMS”) incorporates “a play-level model” to predict how natural-gas production will “respon[d]” to changes in the market price for gas. EIA, Documentation of the Oil and Gas Supply Module, 2-1, 2-3 (2011), JA____, _____. The modeling used to produce EIA’s Export Study already predicted where, on a broad, regional level, export-induced production would occur. *See* Opening Br. 17-18 (describing NEMS modeling underlying Export Study) *See also id.* at 20-21 & n.9. The record illustrates that EIA’s underlying tools are capable of providing more granular results, predicting increases in individual plays. *See, e.g.,*

Annual Energy Outlook 2015 at 19-22, JA____ - ____ (discussing forecasts for the Marcellus, Haynesville, Eagle Ford, and Utica shale gas plays).

Private models relied upon by intervenors to tout exports' benefits have similar capabilities.³ Those models provide a record demonstration of DOE's ability to make play-level predictions as to the likely effects of the exports it has authorized at the Corpus Christi facility, both individually and cumulatively with DOE's other export authorizations. See Deloitte Marketpoint, Analysis of the Economic Impact of LNG Exports from the United States at 14, JA____ (quantitatively estimating how a single export facility in Texas would increase production in the Haynesville and Eagle Ford Shales, three other individual gas plays, and other aggregated gas sources). Those models also demonstrate the feasibility of using that information to provide meaningful

³ Deloitte Marketpoint, Made in America at 1-2, JA____ - ____.
("Deloitte's forecasts are built on a "disaggregated representation[] of North America" used to "project[] production-based resource volumes and cost ... in each market area."); ICF International, U.S. LNG Exports: Impacts on Energy Markets and the Economy at 18 (May 15, 2013), JA____ (ICF's model "consider[s] the interaction between supply and demand" in order to predict "[g]as production changes in various North American basins caused by shifts in natural gas prices.").

environmental information, e.g. likely ozone impacts.

Nothing in the record challenges these models' ability to predict play-level impacts. DOE acknowledged that "the size of the shale plays makes them more reliable units for generating projections from economic models than smaller units such as counties." Rehearing Order at 19, JA____. DOE did not dispute that available tools could predict, at the play-level, how production would increase in response to a given level of exports.

DOE contends only that it could not predict where increased production would occur "at the wellhead or local level." DOE Br. 43; Rehearing Order at 17, JA____. But nothing in its brief or the record demonstrates that such precise, well-by-well prediction is necessary to NEPA's required environmental disclosures. Play-level predictions enable DOE to analyze the extent of export-induced gas production's region impacts on ozone and water, as explained *infra*. Even if DOE had simply disclosed predictions of the amount and region of production increases, this would have provided important information regarding the scale of impacts that is otherwise absent from the EIS or Addendum. For example, if cumulatively foreseeable exports would lead

to a 20% increase in natural-gas production in the Eagle Ford Shale, disclosing this information provides critical context about the extent to which the impacts described in the Addendum are likely to increase in that region.

ii. DOE Failed to Take a Hard Look Ozone Impacts of Export-Induced Gas Production

DOE contends that it took a hard look at ozone impacts by acknowledging that “emissions from increased natural gas development might ‘create new or expanded ... non-attainment areas’ not meeting national ambient air quality standards for ozone,” and hinder ozone-reduction efforts in existing non-attainment areas. DOE Br. 38 (quoting Addendum at 27, JA____) & 61. These scant acknowledgments entirely fail to “evaluate the severity” of impacts. *Robertson*, 490 U.S. at 349, 352. They do not reflect the amount of gas production that will foreseeably result from the level of exports at issue here. DOE provides no indication of whether export-induced production will be enough to cause such impacts, where these impacts might occur, or how severe they might be. Absent such details, DOE’s analysis cannot support an

informed choice regarding the DOE's export authorization. *Morton*, 458 F.2d at 836.

As set forth above, the record amply demonstrates DOE's ability to model the areas in which natural gas production is likely to increase as a result of the authorized exports, based on regional or "play" level predictions as to likely increases in natural gas production.⁴ Such regional information is sufficient to provide meaningful assessment of ozone-related impacts. The Addendum summarized two studies that modeled how anticipated play-level increases in gas production would affect regional ozone levels; Sierra Club's comments identified a third. Opening Br. 52-53; Addendum at 28-29, JA____-____ (describing "CAMx" modeling). Nothing in the record calls these studies' methodology or reliability into question.⁵ The record demonstrates that

⁴ The NETL reports—which DOE commissioned specifically to address the impacts of exports—provide detailed estimates of the amount of emissions from each stage of the well-to-terminal life cycle. Opening Br. 67-68.

⁵ DOE claims that the EIS "respond[ed]" to these studies. DOE Br. 46. The cited portions of the EIS simply assert that FERC could not predict the amount or location of additional gas production, without specifically addressing the capabilities of these models or, indeed, *any* available analytic tool.

DOE could have predicted the extent to which 3,500 bcf/y of exports would increase production in individual gas plays, and how these increases would affect ozone levels throughout the country.

Rather than merely acknowledging that exports might increase gas production and that this might significantly impact ozone (as DOE's Addendum does), DOE could have disclosed the identity and number of air quality regions that would suffer increased ozone levels, the severity of these increases, and whether these increases would cause or exacerbate violations of EPA's air quality standards. For example, DOE could have predicted what effect the increases in production in the Barnett and Haynesville shale gas plays surrounding Dallas would have on ozone levels there, the effect of increases in the Haynesville and Eagle Ford on Houston, or the effect of increases in the Marcellus on Pittsburgh. See Addendum at 6, JA____ (map of shale plays).

iii. DOE Failed to Take a Hard Look at Export-Induced Impacts on Water Resources

Forecasts of play-level gas production increases also enable DOE to estimate regional impacts to water resources. The record includes estimates of the amounts of water consumed and wastewater produced,

per unit of natural-gas production, broken down by type of gas production, reflecting differences between major shale plays. Domestic Life Cycle Report at 55, JA____. DOE does not dispute that this information, combined with play-level predictions of production increases, would enable DOE to predict regional changes in water consumption and wastewater production associated with export-induced natural-gas production. DOE Br. 44-45. Instead, DOE argues that such predictions would not provide meaningful information, because regional estimates do not enable DOE to predict impacts to “specific water bodies.” *Id.* at 30. But this purported inability to pinpoint a specific water body does not excuse DOE’s failure to assess which regional areas would be affected by its decision (the Addendum’s discussion of water-related impacts is disconnected from any identified export proposal, and so provides no insight into such decision-specific effects). Indeed, the only discussion of the scale of water impacts that DOE *did* provide was a play-level assessment of the water consumed by existing gas production (but not addressing the new production induced by DOE’s export authorizations). Authorization Order at 150, JA____; Addendum at 12, JA____. DOE offers no plausible reason for its failure to

undertake a similar regional analysis for the “incremental impact” of export-induced gas production. 40 C.F.R. § 1508.7.

iv. DOE Can Foresee Air Pollution Impacts of Increased Coal Use

DOE provided no discussion or analysis of the impact of non-greenhouse gas air pollution emitted by export-induced coal consumption. Instead, DOE simply claimed that, in light of recent EPA regulations, any increase in coal production was unlikely. Authorization Order at 199-200, JA____-____; Rehearing Order at 24, JA____. DOE’s brief argues that it lacks the ability to “model impacts” of such increased coal production, without undue “uncertainty.” DOE Br. 49. But the record indicates that DOE can reasonably foresee, at a regional level, the likely results of its export authorizations on coal use. DOE’s NEMS allows the Department to draw regional conclusions. The agency’s brief does not dispute that such regional projections would provide meaningful information as to ozone- and other air-pollution; it asserts only that “regulatory changes ... may or may not take effect,” and suggests that this excuses it from undertaking any further analysis. DOE. Br. 49. But as explained above, DOE has demonstrated

its ability to accommodate the possible effects of regulation by other agencies. *See* Section I.B.1, *above*.

v. DOE Failed to Adequately Assess Upstream Greenhouse Gas Emissions

DOE did not estimate the amount of greenhouse gases that would be emitted by export-induced gas production or coal use resulting from the Corpus Christi project or the 3,500 bcf/y of cumulative exports that DOE acknowledges are foreseeable. DOE argues that it considered emissions from the terminal, induced gas production, and induced coal use in, respectively, the EIS, Addendum, and 2012 Export Study. DOE Br. 50-52. The Addendum, however, only discusses greenhouse gas emissions generally, without reference to any particular volume of exports or export-induced gas production. The 2012 Export Study similarly does not address the volumes of exports that DOE argues are foreseeable here. Thus, nothing in the record demonstrates that DOE informed itself of and “consider[ed]” the effects of domestic greenhouse gas emissions. *Baltimore Gas & Elec. Co. v. Nat. Res. Def. Council*, 462 U.S. 87, 96 (1983). Nowhere—not in the EIS, the Addendum, the Global Life Cycle Report, nor anywhere else—did DOE answer the basic

question of the amount of additional greenhouse gases which could be emitted in the U.S. as a result of the individual or cumulative exports. This impact on domestic emissions is significant, and requires attention, *in addition to* discussion of the net effects on global emissions. Comment on Global Life Cycle Report at 12-14, JA____-____; Rehearing Request at 14, 20-21, JA____, ____-____. The U.S. had, at the time of DOE's decision, adopted numerous emission reduction targets and commitments. Opening Br. 34-37. These commitments do not enable the U.S. to claim that domestic emission increases are offset by displacement of other emissions abroad; that exports may frustrate these commitments is significant, and required analysis under NEPA. Comment on Global Life Cycle Report at 14, JA____ (summarizing IPCC, Guidelines for National Greenhouse Gas Inventories, p. 8.4, JA____).

3. Predicting the Extent of Impacts Would Not Be Exorbitantly Costly

As explained above, the record identifies numerous tools and models capable of providing information about the extent and severity of upstream impacts. DOE does not dispute the validity of these tools and

has failed to show that it lacks the information necessary to use them here. DOE argues that predicting the play-level impacts of exports would be a “heavy” and “unrealistic burden.” DOE Br. 27, 44. Like “reasonable certainty,” this is not a term found in NEPA regulations or caselaw. NEPA requires DOE to provide information essential to analysis of foreseeable impacts unless DOE demonstrates that the cost of doing so would be “exorbitant.” 40 C.F.R. § 1502.22(a)⁶; *Neighbors of Cuddy Mountain*, 137 F.3d at 1380 (agency bears the burden of showing that detailed information could not be provided). DOE offers no facts or evidence regarding the cost, time, or other burden that would be imposed by such modeling. Other agencies have not found NEMS modeling to be exorbitantly expensive even when it is used *solely* to address environmental impacts, unlike here, where DOE already used NEMS to model economic impacts. *Mayo Found. v. Surface Transp. Bd.*, 472 F.3d 545, 555 (8th Cir. 2003).

⁶ Respondents argue that this regulation only applies “[w]hen an agency is evaluating reasonably foreseeable significant adverse effects on the human environment.” DOE Br. 47-48 (quoting 40 C.F.R. § 1502.22). But DOE’s brief does not dispute that the effects at issue here are reasonably foreseeable. DOE Br. 36 (“DOE acknowledged that the Cheniere authorization ... might accelerate natural gas development” and disclosed “nature” of resulting effects).

Nor does DOE identify any evidence suggesting it would be exorbitantly expensive to evaluate the likely extent of impacts on regional ozone levels. DOE suggests that it would be difficult to “examine separately the environmental impacts of natural gas production in every producing region in the country.” DOE Br. 44. No evidence in the record indicates that nationwide analysis is infeasible.⁷ Moreover, the record suggests that, if DOE had actually analyzed regional production impacts, DOE would have likely found that production increases would be concentrated in only a few regions. Opening Br. 14-15. The burden of using the “CAMx” model to forecast ozone impacts of additional production in the most affected regions would not be exorbitant. Addendum at 28, JA____ (summarizing Bureau of Land Management use of CAMx in this manner for NEPA analysis).

4. DOE’s Shallow Analysis of Upstream Impact Cannot Be Upheld Under the ‘Rule of Reason’

DOE argues that “even if DOE ‘could have provided a more rigorous

⁷ EPA has utilized CAMx to comprehensively model regional ozone impacts throughout the nation. EPA, *Regulatory Impact Analysis for the Federal Implementation Plans*, 60-61 (June 2011), <https://www3.epa.gov/crossstaterule/pdfs/FinalRIA.pdf>.

quantitative evaluation, ... it does not follow that [DOE's] qualitative analysis was arbitrary and capricious,” and that NEPA’s “rule of reason” condones DOE’s decision to omit foreseeable information regarding the extent of impacts. DOE Br. 42 (quoting *Western Watersheds Project v. Bureau of Land Mgmt.*, 721 F.3d 1264, 1277 (10th Cir. 2013)), 44 (quoting *Dep’t of Transp. v. Pub. Citizen*, 541 U.S. 752,767 (2004)). As set forth above, DOE’s so-called qualitative analysis is woefully inadequate, and not lawful under any existing precedent.

No case has held that where an agency acknowledges that effects could be significant, DOE Br. 30, 52, the agency may omit available, reasonably foreseeable analysis of extent and severity. Where information “relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives ... the agency *shall* include the information in the environmental impact statement” unless the costs of obtaining it are “exorbitant.” 40 C.F.R. § 1502.22(a) (emphasis added). Even where information regarding the extent of impacts cannot be obtained, the agency must attempt to evaluate those impacts with available tools. *Id.* § 1502.22(b)(4).

In light of these obligations, courts have upheld agency omission of

practicable analysis only where the agency provided other analysis sufficient to determine the extent of impacts. For example, *Western Watersheds Project* concerned the Bureau of Land Management's analysis of whether its actions would lead to livestock populations in excess of the "carrying capacity" of the federal lands at issue. 721 F.3d at 1277. The Bureau was able to definitively conclude, on the basis of a qualitative analysis, that its action would not have this effect. *Id.* Similarly, in *Coalition on Sensible Transportation v. Dole*, this Court held that where an agency demonstrated that impacts would not be significant, NEPA did not require further detail. *Coalition on Sensible Transp., Inc., et al v. Elizabeth Dole, et al.*, 826 F.2d 60, 66-67 (D.C. Cir. 1987). In *Citizens Against Burlington v. Busey*, the Federal Aviation Administration conducted an extensive quantitative analysis, using accepted scientific methods, of the noise impacts of changes at an airport. *Citizens Against Burlington v. Busey*, 938 F.2d 190, 200 (D.C. Cir. 1991). Because the agency had already provided a hard look at the extent of noise impacts, this Court held that the agency's decision not to provide additional analysis was consistent with the rule of reason. *Id.* at 201. Here, in contrast, DOE admits that it "did not attempt to identify

or characterize the incremental environmental impacts that would result from LNG exports,” Authorization Order at 193-94, JA____-____, despite DOE’s determination that these “effects could be significant,” DOE Br. 30.

Nor is this case like *Public Citizen*, which held that environmental information would not be “useful” to decisionmaking because the statute at issue did not provide authority to consider such information. 541 U.S. at 770; *Citizens Against Rails-to-Trails v. Surface Transp. Bd.*, 267 F.3d 1144 (D.C. Cir. 2001) (“The touchstone of whether NEPA applies is discretion.”). DOE has not identified a single case in which an agency, in determining whether or not to take an action, permissibly determined that it would not be “useful” to provide otherwise absent analysis of the foreseeable extent and severity of the effects of that very action, whether the effects were direct, indirect, or cumulative.

C. Downstream Effects

All exported LNG will be transported by ocean-going tanker, regasified, and burned. Each of these “downstream” processes will emit foreseeable quantities of greenhouse gas. Global Life Cycle Report at 10, JA____. Rather than provide an estimate of the likely aggregate amount

of these emissions, DOE chose to address downstream impacts by comparing the emissions from U.S. LNG with those that would result from generating an equivalent amount of energy from other sources. *Id.* Although Sierra Club does not challenge DOE's decision to use this comparative method of analysis, the particulars of DOE's approach here resulted an incomplete and misleading picture.⁸ *Hughes River Watershed Conservancy v. Glickman*, 81 F.3d 437, 446 (4th Cir. 1996) (holding that EIS violated NEPA by estimating gross, rather than net, economic benefit).

DOE violated NEPA by only comparing the emissions of U.S. LNG to the emissions of coal or other sources of natural-gas, while omitting a similar comparison to renewables. Authorization Order at 202, JA____. DOE argues that these asymmetrical comparisons are apt because it locally available natural gas is the "same commodity" as exported LNG, and because coal is the "predominant" fuel in India and China. DOE Br. 52-53. DOE's Order acknowledges, however, that U.S. LNG will also compete with renewables, *id.*, and record evidence demonstrates that

⁸ Sierra Club's rehearing request identified DOE's flawed treatment of downstream greenhouse gas emissions as a NEPA violation. Rehearing Request at 14, JA____. *Contra* Cheniere Br. 28.

renewables are more prevalent than natural-gas in many likely import markets. *See, e.g.*, EIA, India Analysis Brief at 19, JA____. Because emissions from renewables are *much* lower than emissions from LNG, it is likely that if even a small fraction of exported LNG displaces renewables, the net impact will be an increase in global greenhouse gas emissions. Opening Br. 76, Comment on Global Life Cycle Report at 2-3, JA____-____.

DOE provided no analysis whatsoever of the effects of displacement of wind or solar power. DOE has never argued that it lacks the information or tools necessary to provide a comparison analogous to those DOE provided for coal or natural-gas. As Sierra Club's comments explained, providing estimates of the life-cycle emissions of renewables would allow DOE to examine the net impact of exports in different possible scenarios and disclose, for example, the level of renewable displacement that would cause exports to increase global emissions. *Id.* The record demonstrates that it is reasonably foreseeable that some U.S. LNG will displace renewable energy. DOE failed to provide any analysis of the consequences of this displacement, and therefore failed to provide a hard look at downstream impacts.

II. Natural Gas Act

A. *The Agency's Conclusory Treatment of Distributional Effects Is Not Sufficient*

The agency's record demonstrates that DOE's decision to authorize exports will, in purely economic terms, harm most members of the American public by raising their gas and electricity prices, as well as causing a net job loss. 2012 Export Study at 6, JA____; *See* Opening Br. 75-76. The benefits, on the other hand, will primarily accrue only to natural gas companies and their shareholders. DOE does not dispute that these distributional consequences are relevant to its public interest determination. DOE Br. 57. It argues that by stating that it did not "see sufficiently compelling evidence" of distributional concerns, it sufficiently addressed the issue. *Id.* at 56-57 (citation omitted).

But that conclusory statement could only suffice if premised upon some analysis and explanation. "[A]n agency must explain 'why it chose to do what it did'; merely 'conclusory statements will not do.'" *Amerijet Int'l, Inc. v. Pistole*, 753 F.3d 1343, 1350 (D.C. Cir. 2014) (citations omitted). Here, the agency offered "not a statement of reasoning, but of conclusion." *Id.* at 1350-51 (citation omitted). DOE undertook no discussion of the evidence in the record, nor any explanation as to why

enriching a small subset of companies and investors would justify inflicting harm upon the majority of the public. The words ‘sufficiently’ and ‘compelling’, by themselves, provide no insight into how the agency weighed the evidence, or understood and applied its statutory obligation to protect the public interest. *See Tourus Records v. Drug Enf’t Admin.*, 259 F.3d 731, 737 (D.C. Cir. 2001) (rejecting bare agency assertion that claim “is not adequately supported”). An agency “must say more” to survive arbitrary and capricious review. *Amerijet Int’l*, 753 F.3d at 1350-52.

B. The Agency’s Comparative Analysis is Arbitrary and Capricious

DOE explained its conclusion that the environmental harms of its decision were outweighed by the authorization’s economic benefits as follows: a denial of Cheniere’s application would forego the “entire[ty]” of the “economic and international benefits,” while preventing only an “increment[]” of the environmental harms. Authorization Order at 197, JA____. But whether an “incremental” portion of the harms is less than the “entire[ty]” of the benefits necessarily depends on the magnitude of the harms. If the harms are large enough, a small portion of them may

well outweigh the whole of any given benefit. DOE's rationale, consequently, can only be upheld if the agency has made some estimate of the magnitude of its action's environmental harms—something it refused to do here. *See* Authorization Order at 193-94, JA____ - ____ (refusing to “identify or characterize the incremental environmental impacts” of exports). That estimate need not precisely quantify or monetize the harms, or take the form of a formal cost-benefit analysis. *See* DOE Br. 58. But having rested its decision on a comparative rationale, DOE was obligated to offer some measurement sufficient to understand the agency's comparison—and it did not.

CONCLUSION

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

Dated March 17, 2017.

/s/ Nathan Matthews

Nathan Matthews

Sanjay Narayan

Sierra Club Environmental Law Program

2101 Webster Street, Suite 1300

Oakland, CA 94612

(415) 977-5695 (tel)

(510) 208-3140 (fax)

Email: nathan.matthews@sierraclub.org

Counsel for Petitioner Sierra Club

CERTIFICATE OF COMPLIANCE WITH WORD LIMITATION

Counsel hereby certifies that, in accordance with Federal Rule of Appellate Procedure 32(a)(7)(C), the foregoing Proof Reply Brief of Petitioner Sierra Club contains 6,972 words, as counted by counsel's Microsoft Word processing program.

Dated: March 17, 2017.

/s/ Nathan Matthews

Nathan Matthews

Sanjay Narayan

Sierra Club Environmental Law Program

2101 Webster Street, Suite 1300

Oakland, CA 94612

(415) 977-5695 (tel)

(510) 208-3140 (fax)

Email: nathan.matthews@sierraclub.org

Counsel for Petitioner Sierra Club

CERTIFICATE OF SERVICE

I hereby certify that on this 17th day of March, 2017, I electronically filed the foregoing with the Clerk of the Court using the CM/ECF system, which will send notice of such filing to all registered CM/ECF users.

/s/ Nathan Matthews

Nathan Matthews