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UNITED STATES OF AMERICA
DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY

IN THE MATTER OF	**)**	
	)	
Sabine Pass Liquefaction, LLC	**)**	**FE DOCKET NO. 15-63-LNG**

Request for Rehearing

Pursuant to Section 19(a) of the Natural Gas Act, 15 U.S.C. § 717r(a), and 10 C.F.R. § 590.501, the Sierra Club hereby requests rehearing of the Department of Energy Office of Fossil Energy's "Final Opinion and Order Granting Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Sabine Pass LNG Terminal Located in Cameron Parish, Louisiana, to Non-Free Trade Agreement Nations" ("Order"), DOE/FE Order No. 3792, issued March 11, 2016, in the above-captioned matter, as well as the Department's Finding of No Significant Impact published that same day.

Sierra Club asks that these actions be withdrawn and pending further inquiry into the environmental impacts of the proposed exports, or in the alternative, that the order be withdrawn and the underlying application be denied.

All communications regarding this request should be addressed to and served upon Nathan Matthews, Staff Attorney, and Kathleen Krust, Managing Paralegal, at Sierra Club, 85 2nd St., Second Floor, San Francisco, California 94105.

I. Statement of the Issues

A. DOE Has An Independent Obligation To Assess Environmental Impacts, and the Natural Gas Act Neither Permits Nor Compels a Presumption that A Project With Adverse Environmental Impacts Is Consistent With The Public Interest

Section 3 of the Natural Gas Act provides:

> [N]o person shall export any natural gas from the United States to a foreign country or import any natural gas from a foreign country without first having secured an order of [DOE/FE] authorizing it do so. [DOE/FE] shall issue such order upon application unless, after opportunity for hearing, it finds that the proposed exportation or importation will not be consistent with the public interest.

15 U.S.C. § 717b(a).

DOE errs in concluding that "*This provision* creates a rebuttable presumption that a proposed export of natural gas is in the public interest," and that "DOE/FE *must* grant such an application unless opponents of the application overcome that presumption by making an affirmative showing of inconsistency with the public interest." 3792 at 13 (emphases added). These interpretations are inappropriate in the environmental context.

For environmental impacts, DOE has an affirmative obligation to investigate impacts on its own; DOE cannot simply rely on information provided by project proponents or opponents. Approving an application to export liquefied natural gas is a major action with the potential to "significantly affect[] the quality of the human environment," and as such, the National Environmental Policy Act ("NEPA") requires DOE to affirmatively investigate the impacts of exports. 42 U.S.C. § 4332(C). The environmental impacts revealed by DOE's NEPA inquiry must be weighed in the Natural Gas Act public interest analysis, because the "public interest" protected by the Natural Gas Act includes the public's environmental interests. *See Nat'l Ass'n for the Advancement of Colored People v. Federal Power Commission*, 425 U.S. 662, 670 n.4, n.6 (1976).

DOE has not provided a reasoned basis for presuming that a project that has adverse environmental impacts (such as this one) will nonetheless be in the public interest. The only court case DOE cites did not hold that any such presumption was compelled by the statutory text. *Panhandle Producers and Royalty Owners Ass'n v. Economic Regulatory Administration*, 822 F.2d 1105, 1111 (D.C. Cir. 1987). Instead of interpreting the statute, *Panhandle Producers* interpreted DOE policy guidance. This guidance, in turn, articulated the narrow proposition that an *import* project with flexible terms will not have *market* impacts inconsistent with the public

interest. *Id.* (interpreting *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. 6684-01 (Feb. 22, 1984)). As summarized by *Panhandle Producers*, these guidelines created two specific rebuttable presumptions regarding natural gas imports: "that if the contract terms are flexible enough the gas will be delivered only if it is competitive; and that if the imported gas is competitive it will fill a [domestic] need." *Panhandle Producers*, 822 F.2d at 1111. *Panhandle Producers* determined that these presumptions were a permissible interpretation of the statute, but did not reach the question of whether any presumptions regarding imports or exports were compelled by the Natural Gas Act. *Id.* Even the two presumptions articulated by the policy guidance were "highly flexible," rebuttable, and did not preclude assertion of other factors. *Id.* at 1113.

The import policy guidance's presumptions have no bearing on the question of whether the environmental impacts of exports demonstrate inconsistency with the public interest.[1] Even if the import policy statement purported to adopt such a presumption, DOE/FE would be prohibited from blindly relying on it: *Panhandle Producers* explicitly stated the import policy guidance, which was not subject to notice and comment rulemaking, does not bind DOE/FE. *Id.* at 1110 (citing *Brock v. Cathedral Bluffs Shale Oil Co.*, 796 F.2d 533, 539 (D.C. Cir. 1986)).

DOE therefore cannot base its decision to authorize the project on a presumption of consistency with the public interest. As we explain below, Sierra Club has provided evidence and argument that does, in fact, "affirmative[ly] show[]" that the application is "inconsisten[t] with the public interest." Order 3792 at 14. But even if DOE were to determine that Sierra Club had not made this showing, DOE could not rest on a perceived failure by "opponents of the application overcome [the] presumption" of consistency with the public interest. 3792 at 14. Instead, pursuant to both NEPA and Natural Gas Act section 3, DOE must undertake its own inquiry, using the tools at its disposal (such as the National Energy Modeling System), to take a hard look at the environmental impacts of the project and determine whether these impacts are consistent with the public interest.

B. DOE Violated NEPA by Approving the Project Without an EIS Considering the Indirect and Cumulative Effects of LNG Exports

DOE/FE has obligations under NEPA that are distinct from DOE/FE's Natural Gas Act obligations. NEPA requires federal agencies to consider and disclose the "environmental impacts" of proposed agency action, and prescribes a particular set of procedures to be used to effectuate this process. 42 U.S.C. § 4332(C)(i).

[1] Separate from environmental impacts, we note that exports differ from imports in key ways: while a domestic buyer's willingness to pay international rates for foreign gas demonstrates a domestic need for the gas, DOE has not offered any basis for presuming that a foreign buyer's willingness to pay international rates for domestic gas demonstrates that there is not a domestic need for the gas.

Here, DOE/FE purports to meet its NEPA obligations by adopting the Environmental Assessment prepared by the Federal Energy Regulatory Commission ("FERC"). Order 3792 at 11-12. CEQ regulations permit such adoption only where DOE/FE independently ensures that the adopted statement satisfies DOE/FE's NEPA obligations regarding the proposed DOE/FE action. 40 C.F.R. § 1506.3(c). As we explain below, FERC's EA fails to take a hard look at DOE/FE's proposed authorization of exports. The EA also fails to support the determination that the project's impacts will be less than significant; accordingly, a full Environmental Impact Statement was required. Because DOE/FE failed to cure the deficiencies in the EA or to supplement the EA to address the effects of DOE/FE action, DOE/FE's approval of the application violates NEPA.

1. The Environmental Addendum and NETL Reports Are Not A Substitute for NEPA Review

As a threshold NEPA issue, the Environmental Addendum, and the three NETL reports DOE/FE released alongside it, are not a substitute for NEPA review. Putting aside deficiencies in the scope and content of these documents, as a procedural matter, these documents cannot fulfill DOE's NEPA obligations. These documents contradict one another and therefore fail to inform the public of DOE's actual conclusions; the documents do not specify the impacts of this particular project; and the documents therefore failed to adequately inform the public and provide a basis for public comment.

As summarized by one circuit court:

> By requiring the consideration of environmental factors in the course of agency decisionmaking on major federal actions, NEPA serves two purposes: First, it ensures that the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts. Second, it guarantees that the relevant information will be made available to the larger audience that may also play a role in both the decisionmaking process and the implementation of that decision. In other words, by requiring agencies to take a "hard look" at how the choices before them affect the environment, and then to place their data and conclusions before the public, NEPA upon democratic processes to ensure—as the first appellate court to construe the statute in detail put it—that "the most intelligent, optimally beneficial decision will ultimately be made."

Oregon Natural Desert Ass'n v. Bureau of Land Mgmt., 625 F.3d 1092, 1099-100 (9th Cir. 2010) (internal citations and some internal quotation marks removed).

Clear presentation of agency conclusions is essential to NEPA's purpose. Here, however, the Environmental Addendum, NETL reports, EA, and Order 3792 fail to present DOE's conclusions, and in fact contradict each other in many regards. Most glaringly, these documents reach differing conclusions as to whether exports will increase domestic gas production. The EA re-adopts FERC's prior conclusion that this export project will not foreseeably lead to increases in domestic gas production, 2014 EA at 5. DOE adopted this EA without reservation, but DOE expresses a contrary view regarding the relationship between exports and production elsewhere. DOE's analysis of the economic impacts relies on EIA's conclusion that production will increase to supply exports, reducing the potential for exports to compete with domestic gas consumers. Order 3792 at 113 ("the United States market would adjust to [the export-created] increased demand through increases in gas production," mitigating the potential for domestic price increases). Similarly, DOE's the Environmental Addendum adopts EIA's conclusion that exporting LNG will increase domestic production of natural gas.[2] Separate from the question of whether exports will induce gas production, the documents DOE relies upon also contradict one another on other issues. As Sierra Club explained in comments on the Addendum and NETL reports, these reports reach different conclusions regarding the potency of methane as a greenhouse gas and the amount of air pollution emitted by natural gas production.

While NEPA permits an EA to incorporate supporting materials by reference, the EA here was released months before the Addendum or NETL reports, and does not refer to them. As such, there is no document that explains DOE's ultimate conclusions regarding issues on which individual documents disagree. NEPA requires more than a mere presentation of data—it requires agencies to present their interpretation and synthesis of that data, and this presentation must be made within the procedural framework that provides for public notice and comment prior to final agency decisionmaking.

Separate from the problems relating to inconsistencies in this data and DOE/FE's failure to present this information in accordance with the process required by NEPA, these additional materials cannot substitute for NEPA analysis because they provide not discussion of the impacts caused by Sabine Pass's particular project.

2. DOE/FE Violated NEPA By Authorizing Exports Without Taking A Hard Look at Effects of Induced Gas Production

Order 3792 at 113: "the United States market would adjust to this increased demand through increases in production, and plan for its delivery utilizing the significant production and storage infrastructure that exists."

[2] Environmental Addendum at 1, 4-5.

DOE acknowledges that "a decision by DOE/FE to authorize exports to non-FTA nations could accelerate" the development "of natural gas resources in the United States." Order 3792 at 176. In the incorporated Environmental Addendum, DOE more candidly states that "DOE believes," as it must, that exporting LNG from the U.S. will induce additional natural gas production.[3]

Order 3792 at 83 "more natural gas is likely to be produced domestically if LNG exports are authorized than if they are prohibited."

This belief that production will rise in response to exports is central to DOE's economic and other public interest findings: if production did not increase in response to LNG exports, then the gas exported would, ultimately, have to come from reductions in existing domestic demand or an increase in natural gas imports, both of which would lead to much more severe price increases and which would undermine DOE's conclusion that there was not a domestic need for the gas exported. The Environmental Addendum summarizes EIA's January 2012 predictions on the domestic energy market's response to exports: "across all cases, an average of 63 percent of increased export volumes would be accounted for by increased domestic production. Of that 63 percent, EIA projected that 93 percent would come from unconventional sources (72 percent shale gas, 13 percent tight gas, and 8 percent coalbed methane [CBM]) (EIA 2012)."[4] The link between exports and additional gas production is simple: exports expand the demand for natural gas, which will provide an incentive and outlet for additional gas production.

This type of market effect falls squarely within the purview of NEPA's indirect and cumulative effects analyses. Indirect effects are "caused by the action" but

> are later in time or farther removed in distance [than direct effects], but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effect on air and water and other natural systems, including ecosystems.

40 C.F.R. § 1508.8(b). NEPA must also take a hard look at cumulative impacts. Cumulative impacts are not causally related to the action. Instead, they are:

> the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.

[3] DOE Addendum at 1.
[4] DOE Addendum at 5.

> Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

40 C.F.R. § 1508.7. Numerous courts have held that market-based effects such as increased gas production (marketed supply) in response to the demand created by exports are indirect and cumulative effects within the meaning of these regulations. *See, e.g.*, *High Country Conservation Advocates v. United States Forest Serv.*, ___ F. Supp. ___, No. 13-CV-01723-RBJ, 2014 WL 2922751, *14 (D. Colo. June 27, 2014) (NEPA review of project that would provide roads enabling additional coal mining must consider effects of increased coal combustion); *Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 549-50 (8th Cir. 2003) (environmental effects of increased coal consumption due to construction of a new rail line to reach coal mines was reasonably foreseeable and required evaluation under NEPA).

Nonetheless, despite this plain connection between the demand created by exports and an increase in domestic production (i.e., marketed supply), DOE wrongly determined that "NEPA does not require the review to include induced upstream natural gas production." Order 3792 at 173. DOE offered two arguments for this exclusion, both resting on claims of uncertainty: DOE claims that it is uncertain whether, if authorized, exports would in fact occur, *id.*, and that, even if exports do occur, there would be "fundamental uncertainty as to where any additional production would occur and in what quantity," *id.* at 174. Both of these arguments are contrary to the applicable law and the facts in the record here.

a) Exporting LNG Is Not A Speculative or Unforeseeable Consequence of An Export Authorization

DOE's initial argument for excluding induced production from NEPA review is that it is unforeseeable whether authorizing exports will cause exports to occur. DOE states that "[r]eceiving 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," and that "there is uncertainty as to the aggregate quantity of natural gas that ultimately may be exported to non-FTA countries." Order 3792 at 174.[5] DOE's approach violates NEPA, because while lack of foreseeability can narrow the scope of the indirect and cumulative effects inquiries, unforeseeability cannot provide a basis for excluding the direct effects of the action.

DOE is authorizing export of 0.56 bcf/d natural gas. Exporting 0.56 bcf/d of gas is not an effect of the proposed action: it is the action itself. As such, it would be nonsensical to require further certainty as to whether exports will occur before evaluating the effects that exports (if they do occur) will have. Of course, in every context in which a federal agency authorized

[5] *Accord* Environmental Addendum at 1 ("Fundamental uncertainties constrain the ability to predict what, if any, domestic natural gas production would be induced by granting any specific authorization or authorizations to export LNG to non-FTA countries.").

private action, there will be some uncertainty as to whether that private action will occur. NEPA regulations regarding foreseeability pertain only to the indirect and cumulative effects assessments.[6] Exports, however, are the action itself, or at minimum a direct effect of the action, and not an indirect or cumulative effect. DOE has not identified any authority allowing an agency to avoid discussion of the effects of a proposed action on the ground that it was uncertain whether the action itself would be undertaken.

Even if DOE wrongly determines that it is appropriate to impose some foreseeability inquiry regarding whether exports will occur, the proposed exports are plainly foreseeable for purposes of NEPA. DOE states that "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." 3792 at 174 (emphases added). DOE purports to "illustrate" the uncertainty regarding exports by stating that "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." *Id*.. DOE does not explain, however, how these observations have any relevance to DOE's current NEPA obligations.

NEPA review is not limited to events that are 'guaranteed' to occur. Courts discussing the obligation to consider indirect effects have held that reasonable foreseeability extends far beyond the events that are most likely, or even likely, to occur. *See, e.g.*, *Davis v. Coleman*, 521 F.2d 661, 676 (9th Cir. 1975), *Sierra Club v. Watkins*, 808 F. Supp. 852, 868 (D.D.C. 1991). Courts routinely require NEPA analysis of even effects that acknowledged to be unlikely to occur. For example, courts have required consideration of the possibility of a terrorist attack on a proposed project, explaining that "in considering the policy goals of NEPA and the rule of reasonableness that governs its application, the possibility of terrorist attack is not so 'remote and highly speculative' as to be beyond NEPA's requirements." *San Luis Obispo Mothers for Peace v. Nuclear Regulatory Comm'n*, 449 F.3d 1016, 1031 (9th Cir. 2006). An agency may only exclude analysis of an event and its consequences from NEPA review when the event "is so 'remote and speculative' as to reduce the effective probability of its occurrence to zero." *New York v. Nuclear Regulatory Comm'n*, 681 F.3d 471, 482 (D.C. Cir. 2012). Thus, the fact that DOE is not absolutely certain that the approved exports will occur is not a basis for excluding the effects of exports from NEPA review. Here, the actions Sabine Pass has taken—entering contracts for the entire volume of proposed exports, expending considerable resources is planning the project and securing necessary permits, etc.—demonstrate that the exports for which Sabine Pass seeks authorization are anything but remote and speculative.

Similarly, authorities interpreting the obligation to discuss "cumulative effects" explain that uncertainty is only a ground for excluding an effect from NEPA review when the effect is so uncertain that it is not susceptible to "meaningful discussion" at the time of the analysis. *Habitat*

[6] 40 C.F.R. §§ 1508.7, 1508.8(b).

Educ. Ctr. v. U.S. Forest Serv., 609 F.3d 897, 902 (7th Cir. 2010). Sabine Pass's proposed LNG exports, of course, are a specific and concrete proposal that is far removed from the type of inchoate possibility *Habitat Education Center* determined to be beyond the scope of meaningful discussion.

Thus, NEPA would require DOE to take a hard look at the consequences that would follow from exports even if DOE had determined that exports are unlikely to occur. Of course, in actual fact, DOE has reached the opposite conclusion. As Sierra Club explained in commenting on the Environmental Addendum:

> As DOE acknowledges, the Energy Information Administration's ("EIA") 2014 Annual Energy Outlook predicts that, in the "Reference case," the U.S. will become a net exporter of LNG, with net exports increasing by 9.6 bcf/d by 2030 and continuing at that rate through 2040. DOE does not criticize this forecast, nor does DOE argue that, if DOE authorizes this level of exports or more, this level of exports is not likely to occur.[7]

Although many NERA scenarios predicted lower levels of exports, the 2014 Annual Energy Outlook is significantly more recent and is prepared by an impartial federal agency rather than a private consultant with ties to extractive industry.[8] In addition, certain assumptions in the NERA study lead it to systemically underestimate the market conditions in which exports could occur, as we explained previously and reiterate below. Because DOE's actions regarding Sabine Pass bring the total volume of exports to have received final authorization to export to non-FTA countries to 15.07, well below EIA's estimate of likely total exports, it is likely that DOE's authorization here will increase the amount of gas actually exported.[9]

Insofar as DOE is concerned that it is uncertain what quantity of LNG would be exported in "aggregate" if DOE granted a number of export authorizations, that issue may narrow the scope of DOE's cumulative impacts inquiry.[10] It is irrelevant, however, to DOE's separate obligation to consider the effects of the particular proposal under consideration. Here, Sabine Pass's individual proposals to DOE are for authorization are to export 2.1 and 0.56, bcf/d from the facilities at issue here, together with another 1.38 bcf/d from proposed additional facilities, to non-FTA countries.

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[7] Gas Production Comment at 5 (footnotes omitted) (citing Environmental Addendum at 42, EIA 2014 Annual Energy Outlook, MT-22 (predicting a net increase of 3.5 trillion cubic feet per year)).
[8] *See* Sierra Club Initial Comment on NERA Study at 53-56, Sierra Club Reply Comment on NERA Study at 20.
[9] We note that no evidence in the record indicates that FTA countries present a potential market for the volume of exports forecast by EIA.
[10] As we discuss below, however, DOE's own statements demonstrate that even as to aggregate exports, uncertainty is not so great as to preclude meaningful review.

b) DOE Has Not Shown that Uncertainty Regarding Location and Manner of Induced Production Precludes Meaningful Analysis of Induced Production's Environmental Impacts

DOE's remaining argument for excluding the effects of induced gas production from NEPA review is that "There is also fundamental uncertainty as to where any additional production would occur and in what quantity," and that "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 CEQ's NEPA regulations." Order 3792 at 174. DOE has not explained why this uncertainty precludes meaningful review (and DOE has acknowledged that it does not preclude review of climate impacts), nor has DOE explained why it cannot use available tools to limit or resolve this uncertainty.

The mere existence of some uncertainty does not prevent an effect from being "reasonably foreseeable." "Reasonable forecasting and speculation is . . . implicit in NEPA, and [courts] must reject any attempt by agencies to shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as 'crystal ball inquiry.'" *Scientists' Inst. for Pub. Info., Inc. v. Atomic Energy Comm'n*, 481 F.2d 1079, 1092 (D.C. Cir. 1973). In the undertaking this "reasonable forecasting," agencies have an affirmative obligation to conduct or commission research when necessary for an understanding of the effects of proposed action. *Save Our Ecosystems v. Clark*, 747 F.2d 1240, 1248 (9th Cir. 1984) (collecting cases); *see also State of Alaska v. Andrus*, 580 F.2d 465, 473 (D.C. Cir. 1978) ("NEPA does, unquestionably, impose on agencies an affirmative obligation to seek out information concerning the environmental consequences of proposed federal actions. Indeed, this is one of NEPA's most important functions."), *vacated on other grounds in part sub nom. W. Oil & Gas Ass'n v. Alaska*, 439 U.S. 922 (1978). When information is necessary, the agency must obtain it unless "the overall costs of obtaining it are . . . exorbitant." 40 C.F.R. § 1502.22(a).

Here, available tools allow DOE to predict "where, in what quantity, and under what circumstances" exports will induce additional gas production. Nothing in the EIS or in DOE's orders explains why these tools are unavailable or inadequate. Indeed, EIA has already published predictions for how onshore gas production will increase in six specific regions in response to exports, in the supplemental materials to EIA's January 2012 export report.[11] EIA's October

[11] *See* http://www.eia.gov/oiaf/aeo/tablebrowser/#release=FE2011&subject=0-FE2011&table=72-FE2011&region=0-0&cases=rfhexrpd-d090911a,rfhexslw-d090911a,rflexrpd-d090911a,rflexslw-d090911a,ref2011fe-d020911a (last visited Dec. 15, 2014), Excel version available at http://www.eia.gov/oiaf/aeo/tablebrowser/aeo_query_server/?event=ehExcel.getFile&study=FE2011&region=0-0&cases=ref2011fe-d020911a,rflexslw-d090911a,rflexrpd-d090911a,rfhexslw-d090911a,rfhexrpd-d090911a&table=72-FE2011&yearFilter=0 and attached as **Exhibit** "FE2011-Lower_48_Natural_Gas_Production_and_Wellhead_Prices_by_Supply_Region.xls".

2014 update similarly provided region-specific forecasts.[12] DOE has not acknowledged these predictions or explained why they are insufficient to support meaningful discussion of the impacts of exports. Insofar as greater specificity is required, it is likely that EIA has already created predictions as to how production will increase in individual gas plays. The 2012 EIA Export Report is built on EIA's National Energy Modeling System, which Sierra Club has repeatedly described. Because NEMS is built on a "play-level model that projects the crude oil and natural gas supply from the lower 48,"[13] it appears that EIA must have already developed "play-level" forecasts of where production would increase in response to exports. If EIA has not already undertaken this type of modeling, or if the modeling EIA has done so far is insufficient to identify the impacts of Sabine Pass's proposed exports, NEPA requires DOE to undertake or commission such modeling.

EIA is not alone in having models that can predict where production will increase in response to exports. For example, Deloitte Marketpoint's "world gas model" is built on representations of "575 plays in the US." Deloitte Marketpoint, *Analysis of Economic Impact of LNG Exports from the United States* (2012) at 25.[14] Similarly, the consultant ICF International has estimated the extent to which LNG exports would increase gas production in each individual state.[15]

NEMS forecasts, like all forecasts, necessarily include some uncertainty. Nonetheless, DOE has already concluded that NEMS forecasts are certain enough to support meaningful discussion—including, in this proceeding, the NEMS-derived forecasts underlying EIA's LNG Export Study. Because these forecasts have been determined to be sufficient to support analysis of price impacts, they are also sufficient to support analysis of environmental impacts. *See Scientists' Inst. for Pub. Info., Inc. v. Atomic Energy Comm'n*, 481 F.2d 1079, 1097 (D.C. Cir. 1973).

The geographic information provided by NEMS and other models provides an adequate basis for discussing many of the impacts of induced gas production. Although NEMS models production at the play level, rather than at the siting of individual wells, for many impacts, the effects will be felt at the regional level, so it is unclear whether further geographic specificity would significantly improve discussion of those impacts.

For example, gas production emits ozone forming pollution, particularly volatile organic chemicals and hazardous air pollutants. Ozone is largely a regional problem, and is primarily addressed at the state or regional level in other contexts.[16] Several studies have modeled the

[12] https://www.eia.gov/oiaf/aeo/tablebrowser/ (from "Publication" drop-down menu, select "Effect of Increase LNG Exports on U.S. Energy Markets").
[13] EIA, Documentation of the Oil and Gas Supply Module, 2-2 (2011), available at http://www.eia.gov/FTPROOT/modeldoc/m063(2011).pdf.
[14] Sierra Club, et al., Comments on DOE Environmental Addendum, page 7 Exhibit 4.
[15] *See* Exhibit 12 to Sierra Club's motion to intervene and protest in this docket.
[16] *See, e.g.*, EPA, Cross-State Air Pollution Rule (CSAPR), http://www.epa.gov/crossstaterule/.

effects on changes in regional oil and gas production on nearby ozone levels—including two studies summarized in DOE's own Environmental Addendum.[17] Once DOE estimates the amount of gas production that will be added in a play or region, several tools allow DOE to predict the amount of ozone precursors that will be emitted by that regional production. For example, the National Energy Technology Laboratory provides estimates of the amount of pollution, including the ozone precursors nitrogen oxides and volatile organic chemicals, emitted per unit of natural gas at each stage of the natural gas lifecycle. National Energy Technology Laboratory, *Life Cycle Analysis of Natural Gas Extraction and Power Generation*, at 50 (May 29, 2014).

Similarly, because the Environmental Addendum already discusses the impacts of *existing* gas production on water resources at the regional level, DOE cannot argue that it would be impossible or uninformative to discuss the impacts of *additional, incremental* gas production on water at this level. Order 3792 discusses these water impacts at the regional, "shale play" level. Order 3792 at 124, recognizing, for example, that in Texas's arid Eagle Ford shale, between 3 and 6 percent of available water is used for existing shale gas production. DOE must assess how much gas production is likely to address in each of these regions, and the impact these increases would have on regional water usage. DOE similarly could have, but did not, perform a regional analysis of the impacts of wastewater disposal. At a minimum, DOE could have addressed regional disposal and treatment capacity, baseline use of that capacity, and the impact of increased gas production on wastewater disposal.

Nor does any uncertainty regarding the local, as opposed to regional, details of gas production limit DOE's ability to address the greenhouse gas impacts of induced gas production, processing, and transportation. The LCA GHG Report provided tools for estimating the volume of greenhouse gases emitted by each of the stages of the gas life cycle. LCA GHG Report at 11, Figure 6-3. DOE provided no justification for its failure to quantify these emissions, or to discuss their impacts. Even if DOE concludes that, despite the availability of NEMS and other models, it is impossible to predict where gas production induced by exports will occur, DOE has recognized that the effects of greenhouse gas emissions generally do not depend on the geographic location of the emissions, so discussion of the climate impact of gas production induced by exports does not depend on the location of that production.[18] Yet the EIS does not address the greenhouse gas emissions of induced gas production. The analysis of climate impacts contained in the Addendum and other documents falls far short of the hard look NEPA requires,

[17] Susan Kemball-Cook, *et al.*, *Ozone Impacts of Natural Gas Development in the Haynesville Shale*, 44 Envtl. Sci. & Tech. 9357, 9360-61 (2010), Bureau of Land Management, Continental Divide-Creston Natural Gas Development Project Draft EIS (Nov. 2012), ES-1, ES-3. *See also* Alamo Area Council of Governments, *Development of the Extended June 2006 Photochemical Modeling Episode* at v (October 2013), attached as Exhibit 14 to Sierra Club's Motion to Intervene and Protest in this docket.

[18] DOE, Draft Addendum to Environmental Review Documents Concerning Exports of Natural Gas from The US, 2 (May 29, 2014), *available at* http://energy.gov/sites/prod/files/2014/05/f16/Addendum_0.pdf; *see also* DOE, Final Addendum to Environmental Review Documents Concerning Exports of Natural Gas from The US, 2 (August 2014), *available at* http://energy.gov/sites/prod/files/2014/08/f18/Addendum.pdf.

as we explain below. Even for non-climate impacts, even if regional discussion proves (contrary to the available evidence) to be impossible, DOE must inform itself and the public of the aggregate impacts of Sabine Pass's proposed exports, such as the nationwide total of land that will be disrupted by induced drilling.

c) FERC's Other Reasons for Excluding Induced Production from Analysis

The EA and FERC Order offered or incorporated by reference several additional arguments as to why induced production was beyond the scope of FERC's NEPA analysis. DOE has not explicitly addressed these remaining and flawed arguments. Insofar as DOE nonetheless implicitly adopts them by virtue of its acceptance of the EIS, we briefly discuss their deficiencies here.

FERC contended that, separate from uncertainty regarding where production induced by exports would occur, it was uncertain whether exports would induce production at all, and that this separate uncertainty meant that the effects of induced production were not reasonably foreseeable. As we note above, DOE has explicitly rejected this premise. DOE has agreed that exports will induce gas production, and adopted EIA's predictions in this regard.

FERC then contended that DOE had not delegated to FERC authority to consider effects of exports per se, rather than effects of construction, siting, and operation of export facilities. This argument is flawed, but it also plainly has no applicability to the question of whether DOE must consider the effect of production induced by exports.

Finally, FERC contended that induced production was beyond the scope of NEPA analysis because FERC did not have direct regulatory authority over exports and other government entities did. This reflects a fundamental misunderstanding of NEPA. For example, the Ninth Circuit has explicitly held that NEPA requires agencies to analyze the effects of their actions even when the agency does not have permitting authority over those effects, explaining that "while it is the development's impact on jurisdictional waters that determines the scope of the [Army Corps of Engineers'] *permitting authority*, it is the impact of the permit on the environment at large that determines the Corps' NEPA responsibility." *Save Our Sonoran v. Flowers*, 408 F.3d 1113, 1122 (9th Cir. 2005) (emphasis added). Similarly, the Surface Transportation Board has been required to consider impacts railroad construction would have on coal combustion and coal mining without regard for the Board's lack of authority to directly regulate these issues. *Mid States*, 345 F.3d at 545-51; *see also N. Plains Res. Council*, 668 F.3d at 1081-82. Still other cases have required NEPA analyses of proposed casino projects to include impacts of increases in vehicle traffic the projects would induce. *See Mich. Gambling Opposition v. Kempthorne*, 525 F.3d 23, 29-30 (D.C. Cir. 2008).

3. DOE/FE Fails To Support Its Conclusions Regarding The Climate Impact of Natural Gas Production

NEPA requires DOE to address the climate impacts of induced production. At a minimum, this requires an estimate of the amount of additional greenhouse gases that would be emitted by this production and a discussion of the impact of these emissions. This impact should be discussed in the context of the U.S.'s ability to meet emission reduction targets, the social cost of greenhouse gas emissions, and any other metric DOE finds appropriate. DOE has not provided any of this analysis.

Nor can DOE now argue that Order 3792's limited discussion of climate in fact satisfies NEPA's requirements. Order 32792, drawing on NETL's "LCA GHG Report," merely provides an estimate of the lifecycle GHG emissions of U.S. LNG on a per KWh basis, and compares these emissions with the lifecycle GHG impacts of other fossil fuels that could be used in importing countries. This analysis if deficient in numerous regards. It is untethered from the action project under consideration here: it provides no discussion of the *amount* of greenhouse gases that would be emitted as a result of production attributable to Sabine Pass's projects. Even on a per unit basis, DOE underestimates the amount of greenhouse gases emitted per unit of gas production, and DOE has failed to provide a rational basis for rejecting the higher estimates provided by Sierra Club. Finally, insofar as DOE contends that additional greenhouse gas emissions from induced gas production will be offset or mitigated by reductions in use of other fossil fuels, DOE has failed to provide an adequate basis to support this contention.

a) Emission Rate of Natural Gas Production

As to the amount of greenhouse gases emitted per unit of gas production, DOE has failed to support its conclusions regarding both the tonnage of methane emitted by the production and transportation process and the impact of each pound of methane emitted. Evidence in the record demonstrates that DOE's conclusions on these issues are too low. First, DOE not provided a basis for using its estimated methane leak rate instead of the much higher leak rates estimated by other life cycle analyses NETL discusses or by the atmospheric studies summarized by Sierra Club. In Order 3792, DOE attributes a 1.2% estimate to NETL. Order 3792 at 153. This figure is too low: the "expected" "cradle-to-liquefaction" leak rates NETL provided in the LCA GHG Report, were 1.3% for conventional onshore production and 1.4% for shale gas production.[19] Although 1.2% may reflect the average of *current* gas production, which includes offshore production with lower leak rates, offshore production should not be included in the assessment of the *incremental* gas production that would be induced by exports, which EIA and NETL predict will be almost entirely onshore and unconventional.

[19] LCA GHG Report at 6. Because EIA estimates that the majority of new production that will be caused by exports will be shale gas production, the shale gas leak rate is the most appropriate of NETL's values. Given that NETL appears to estimate relatively minor methane emissions from liquefaction, Export LCA at Figure 6-3, it appears that the cradle-through-transmission leak rate and the cradle-to-liquefaction leak rates should be identical.

More fundamentally, DOE has not provided a rational basis for using any of the NETL estimates instead of the other, higher estimates summarized by NETL itself or the still higher estimates indicated by the growing body of atmospheric studies. Notably, EPA recently recognized that the 1.2% leak rate used in Order 3792 is too low. That cradle-to-liquefaction leak rate roughly corresponded with the full life-cycle leak rate implied by EPA's prior greenhouse gas inventory. *See* Final Environmental Addendum at 41 (stating that EPA's 2013 GHG Inventory Data implied a full life-cycle leak rate of 1.54%). EPA recently recognized, however, that its estimates of natural gas production-through-transmission methane emissions (equivalent to NETL's cradle-to-liquefaction estimate) were 27% too low. *Compare* EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013 page 3-70, table 3-45 (April 15, 2015) (estimating 2013 methane emissions from U.S. natural gas production, processing, transmission and storage as 4,961 kilotons)[20] *with* EPA, Draft U.S. Greenhouse Gas Inventory Report: 1990-2014, page 3-68, table 3-43 (February 2016)[21] (revising this estimate to 6,287 kilotons, at 27% increase).

More broadly, DOE has not articulated a rational basis for using the NETL's estimated leak rate instead of the higher estimates provided in two of the three other "major studies that account for the GHG emissions from upstream natural gas" that provided or implied an estimate of "leakage rates from upstream natural gas" and which NETL summarized.[22] These three studies were led by Howarth, Burnham, and Weber. All of these studies estimate much higher methane leakage than does NETL. While NETL provided a basis for disagreeing with the highest of these estimates, Howarth, nothing in the record explains why NETL's estimate is superior to Burnham and Weber. DOE argues that Burnham's estimate differs from NETL because of a difference in boundary conditions: NETL extends cradle through transmission, whereas Burnham adds the additional step of distribution. Order 3792 at 154. While DOE is correct that the studies differ in this regard, this difference does not explain the vast difference in estimates. Burnham estimated that 0.28% of methane produced was emitted during distribution.[23] Subtracting distribution out of Burnham's lifecycle estimates therefore indicates a cradle-through-transmission leak rate of 2.47% for conventional onshore gas and 1.73% for unconventional gas.[24] NETL identified a few remaining differences between the NETL and Burnham assumptions, but as Sierra Club previously explained and as DOE has not disputed, these differences do not support or explain NETL's lower ultimate conclusion.[25] As to Weber, DOE's sole comment is the confusing assertion that "We have reviewed Weber et al.'s work and

[20] https://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Main-Text.pdf, attached as **Exhibit** "US-GHG-Inventory-2015-Main-Text".
[21] http://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2016-Main-Text.pdf and attached as **Exhibit** "US-GHG-Inventory-2016-Main-Text".
[22] Unconventional Production Report at 52 and Exhibit 2-8; *see also* Sierra Club Climate Comment at 8.
[23] Burnham, et al. (2011), Supporting Information, at 2, *available at* http://pubs.acs.org/doi/suppl/10.1021/es201942m/suppl_file/es201942m_si_001.pdf
[24] *I.e.*, 0.28% lower than the values provided in Unconventional Production Report Exhibit 2-8.
[25] Climate Comment at 8.

do not see any mention of leakage rate." Order 3792 at 155. Although the cited paper does not discuss emissions in terms of leakage rate, the emissions estimates therein imply onshore leakage rates of 2.8 and 2.42% for conventional and unconventional production, respectively, *as was expressed by the NETL Unconventional Production Report itself*.[26] The derivation of this leak rate from Weber's estimates is explained by Bradbury 2013, as discussed in the NETL reports. 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.

Sierra Club further summarized five "top down" studies that estimated still higher leak rates on the basis of atmospheric measurements—generally 3% or more.[27] Order 3792 acknowledges that top-down studies generally do not match bottom-up calculations, and identifies one factor—inconsistent boundaries—that DOE contends "partly explain[s]" the differences between bottom up and top down estimates.[28] However, DOE offers no explanation as to why, for an assessment of the climate impacts of LNG exports, the boundaries used in the bottom up studies are more appropriate than the boundaries used in top down studies. Moreover, as DOE concedes, differences in boundaries cannot *fully* explain the differences between bottom up and top down studies. Studies have identified other likely explanations, all of which indicate that bottom up estimates are likely to be less accurate than top down estimates. Brandt 2014, which NETL repeatedly discusses, concludes that "official inventories," which are bottom-up, "consistently underestimate actual CH4 emissions, with [natural gas] and oil sectors as important contributors."[29] Brandt provides several likely explanations for the flaws in bottom-up inventories. Evidence indicates that there are "a small number of 'superemitters'"[30] with emissions that are much higher than anticipated by the "model[s] . . . based on engineering relationships and emission factors"[31] that inform the bottom-up estimates. In addition, Brandt notes that "there are reasons to suspect sampling bias in [emission factors]" and that "activity and device counts used in inventories are contradictory, incomplete, and of unknown representativeness."[32] Other research supports Brandt's conclusions regarding unrepresentativeness (whether due to sampling bias or other factors) of the inputs used for bottom-up estimates. For example, Sierra Club discussed how Allen 2013 sampled sites that would be expected to have some of the *lowest* emissions and found emissions equivalent to EPA and NETL's estimates of the industry-wide *average* emissions.[33] While Brandt concludes that the particular emission rates estimated by regional atmospheric studies are unlikely to be

[26] Unconventional Production Report at Exhibit 2-8.
[27] Climate Comment at 9-10.
[28] Order 3792 at 155.
[29] Brandt 2014 at 733.
[30] *Id.*
[31] Order 3357-B at 79.
[32] Brandt 2014 at 734.
[33] Climate Comment at 7-8. This research provides yet another indication that the NETL leakage rate estimate is too low. DOE has not responded to this comment.

representative of nationwide emissions, nothing in Brandt indicates that the broader top down estimates, such as Miller 2013, are *not* representative, and the 3% leak rate indicated by Miller is more than double the rate used by DOE. After the draft Environmental Addendum was released, yet another peer reviewed paper has supported this estimate. This paper, by researchers at Carnegie Mellon and the National Ocean and Atmospheric Administration, concludes that the most likely methane leak rate is between 2 and 4 percent.[34]

As a final note on emission quantities, DOE's observation "that leakage rate is not an input to NETL's life cycle model" misunderstands Sierra Club's argument.[35] Sierra Club recognizes that leakage rate is an output of, rather than an input to, NETL's model. However, the fact that NETL's model produces an output that is so inconsistent with the outputs of the other models cited by NETL and atmospheric studies cited by Sierra Club is strong evidence that there is a problem with either the inputs to NETL's model or with the model itself. [36]

Separate from the problems regarding DOE's discussion of the amount of methane and other climate pollutants emitted by natural gas production and transmission, DOE understates the impact of each ton of methane pollution. As Sierra Club explained in comments on the Environmental Addendum and related NETL reports:

> DOE errs . . . by using the IPCC estimates that do not incorporate climate-carbon cycle feedbacks. A climate carbon feedback involving changes in the properties of the land and ocean carbon cycle in response to climate change. For example, changes to ocean temperature and circulation could affect the CO2 balance between the oceans and the atmosphere. The IPCC explains that "it is likely that including the climate–carbon feedback for non-CO_2 gases as well as for CO_2 provides a better estimate of the metric value than including it only for CO_2." As DOE has properly recognized the IPCC report as reflecting the scientific consensus on methane's potency, DOE should use the estimates that the IPCC states to be more accurate. Thus, DOE should use 20-year and 100-year fossil methane global warming potentials of 87 and 36, respectively.

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34 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/es501204c, (see pages 22 to 23 of "Just Accepted" manuscript).

35 Order 3792 at 155.

36 Another DOE observation not applicable to Sierra Club's arguments is DOE's discussion of the difference between leaks and losses. In DOE's terminology, leaks are methane actually emitted to the atmosphere, whereas losses include methane that is combusted during the lifecycle prior to end use (in a flare, compressor, etc.). Order 3357-B at 78. Sierra Club's comment, and the studies Sierra Club cites (Allen, Burnham, Weber, and the various atmospheric studies), do not run afoul of this distinction, and in pertinent part, specifically concern leaks.

Sierra Club GHG Comment at 12 (footnotes omitted). DOE's response to comments regarding the Environmental Addendum and related materials did not address Sierra Club's comment on this issue. Although Order 3792 does not directly discuss the issue, or disclose *which* of the IPCC Fifth Assessment Report global warming potentials DOE used, the charts presented in the Order are taken from NETL's LCA GHG Report, which used global warming potentials that excluded climate carbon feedbacks. Using the "better" estimate of methane's global warming potential increases the 100-year GWP to 36, 20% higher than the value used in the NETL LCA GHG Report and Order 3792 (*i.e.*, 30).

We reiterate that these problems regarding DOE's discussion of the climate impacts of natural gas production in general are separate from the more fundamental NEPA violation: DOE's failure to take a hard look at the climate impacts of Sabine Pass's proposal. This hard look must include a quantification of the greenhouse gases that would be emitted by the production induced by Sabine Pass's proposed exports. We further reiterate that NETL's export lifecycle analysis, and DOE's summary thereof in the final Order, is not a substitute for NEPA review of the climate impacts of upstream production.

b) Comparison between U.S. LNG Lifecycle Greenhouse Gas Emissions and Lifecycle Emissions of Other Fossil Fuels

DOE asserts that, *if* U.S. LNG exports displace coal or other sources of natural gas, the net effect on global greenhouse gas emissions may be neutral or positive. DOE has not argued that this possibility is in any way pertinent to the question of whether the climate impact of induced production must be assessed in the NEPA process, and DOE explicitly contends that it is not relying on this discussion to satisfy any NEPA obligation.

We agree with DOE that the comparative lifecycle analysis is somewhat tangential to DOE's NEPA obligations. Greenhouse gases emitted as a result of export-induced gas production are an indirect effect of the Sabine Pass project that falls squarely within the scope of the NEPA analysis. This effect is reasonably foreseeable and capable of meaningful discussion: it is relatively certain that exports will induce significant natural gas production, and the available evidence supports informed predictions regarding the greenhouse gas emissions of this production. Export-induced increases in domestic GHG emissions will impact the U.S.'s ability to meet emission reduction targets, and thereby potentially undermine U.S. climate leadership—leadership which is crucial to encouraging other countries to make similar progress on reducing climate emissions and preventing catastrophic climate change.

On the other hand, any potentially mitigating reductions in foreign fossil fuel combustion are highly uncertain, as DOE acknowledges. Indeed, available evidence indicates that potential LNG importers are making extensive use of renewables, efficiency, and other alternatives to fossil fuels. DOE states that it compared the lifecycle impacts of generating electricity with U.S. LNG with impacts of using coal or other sources of natural gas because coal and natural gas "are

prevalent fuel sources for electric generation in non-FTA LNG-importing nations," namely China and India. Order 3792 at 184. However, the data relied upon by DOE show that renewable electricity generation capacity is far more "prevalent" than generation with natural gas in these countries.[37] Indeed, where researches have actually considered the question of whether LNG is likely to compete with renewables, they have found that such competition is likely. *See, e.g.*, Jurgen Weiss, et al., *LNG and Renewable Power: Risk and Opportunity in a Changing World* (Jan 15, 2016).[38]

4. DOE Violated NEPA by Excluding from Its Analysis The Environmental Impacts of Changes in Electricity Generation, Including Increases in Greenhouse Gas Emissions, Caused by Domestic Gas Price Increases

DOE further erred by refusing to consider indirect and cumulative effects on emissions from electricity generation. EIA's January 2012 LNG Export Study provided detailed forecasts of the way gas consumers would respond to LNG exports. A key finding of this study was that electricity producers are particularly price sensitive and would respond to export-driven gas price increases by switching to coal fired power generation. EIA modeled the effect this shift would have on nationwide greenhouse gas emissions. Because this effect has, in fact, already been foreseen by EIA and discussed in detail, it is plainly a reasonably foreseeable consequence of Sabine Pass's proposed exports, which required discussion in the EIS.

EIA's October 2014 update showed that exports would be likely to increase electric sector GHG emissions even under an "accelerated coal retirement" scenario, which EIA included as a proxy for increased regulation of coal-fired power plants. EIA Updated Export Study at 5. The study found that in this scenario, exports would cause a smaller—but still significant—increase in coal use, and a correspondingly greater increase in natural gas production. *Id.* Table B2.

DOE nonetheless approved the project without taking a hard look at this impact that NEPA requires. DOE's justification for this omission is that federal rules (new and proposed) limit "the extent to which the U.S. coal fleet would compensate for reduced use of natural gas."[39] DOE has not, however, provided any estimate of the *extent* to which these new or proposed rules would in fact limit this switching. Given the complete absence of any explanation of the extent to which these rules will prevent this modeled impact, it is arbitrary for DOE to conclude that this impact may be ignored entirely. On the other hand, if these rules *do* limit gas-to-coal switching

[37] https://www.eia.gov/beta/international/analysis.cfm?iso=CHN, attached as **Exhibit** "China_International_Analysis_US"; https://www.eia.gov/beta/international/analysis.cfm?iso=IND, attached as **Exhibit** "India_International_Analysis_US".
[38] http://www.brattle.com/system/publications/pdfs/000/005/249/original/LNG_and_Renewable_Power_-_Risk_and_Opportunity_in_a_Changing_World.pdf, attached as **Exhibit** "LNG_and_Renewable_Power".
[39] Order 3357-B at 90.

in response to exports, DOE's statement that the rules would limit the extent to which coal would compensate for reduced gas use puts the cart before the horse: if coal is unavailable, it is unclear whether there will be any reduced use of natural gas at all. That is, EIA predicted that the electricity generation sector would reduce its natural gas in large part use *because* this sector had the flexibility to switch to coal. Removing that flexibility does not mean that the electricity generation sector will simply reduce its demand by the same amount but seek other replacements. Instead, limiting the fuel switching ability of the electricity sector decreases the price sensitivity of this sector, and thus shifts the entire domestic demand curve for natural gas upward. This elevated demand curve will therefore intersect the supply curve at a different point than the ones predicted in EIA's forecasts, meaning that both gas prices and gas production will increase in response to exports at a higher level than EIA predicted. DOE cannot contend that EIA's predictions regarding price and supply impacts remain valid in one context—such as assessing the price impacts of exports—but not in another—such as assessing exports' impacts on electricity generation and associated emissions. *See Scientists' Inst. for Pub. Info., Inc. v. Atomic Energy Comm'n*, 481 F.2d 1079, 1097 (D.C. Cir. 1973) (forecasts sufficient to support analysis economic impacts are also sufficient to support analysis of environmental impacts).

We further note that although DOE contends that "a substantial portion" of the emissions increase projected by EIA comes from the liquefaction process, DOE has not quantified this portion. Analysis of the EIA data indicates that the majority of the projected emissions increase is due to sources other than the liquefaction process. Moreover, liquefaction emissions also require DOE attention. DOE implies that liquefaction emissions can be ignored because they are captured in the LNG lifecycle analysis, but as we explain in the preceding section, that analysis is itself deficient. In particular, emissions from the liquefaction process are relatively certain, whereas potentially avoided emissions from displacement of other fossil fuel consumption abroad are much more speculative.

5. DOE Failed to Assess Cumulative Impacts of Numerous Approved and Pending LNG Export Approvals

For the reasons explained above, Sabine Pass's proposal and DOE's approval will induce additional gas production, and the environmental impacts of this production are reasonably foreseeable indirect effects of the proposal. NEPA requires DOE to consider these impacts, as well as the cumulative impacts of drilling induced by all other pending and foreseeable export proposals. Cumulative impacts are impacts that are not causally related to the action but that are:

> the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

40 C.F.R. § 1508.7.

DOE's order does not distinguish between indirect and cumulative impacts. Insofar as DOE contends that induced production due to approved and proposed export projects is outside the scope of the cumulative impacts analysis because it is not reasonably foreseeable, DOE is mistaken for the reasons explained in the preceding section.

DOE and FERC are considering export proposals from many operators, which cumulatively propose to export 50.6 bcf/d of LNG from the Lower-48 to non-Free-Trade Agreement countries when operating at maximum capacity.[40] This is the equivalent of roughly 56% of 2015 total domestic gas production.[41]

6. DOE/FE Violated NEPA By Relying on an Environmental Assessment, Rather than An Environmental Impact Statement, and By Failing to Support The Conclusion That Exports Will Not Have Significant Environmental Impacts

DOE violated NEPA by approving the exports of an additional 0.56 bcf/d on the basis of an Environmental Assessment, rather than a full Environmental Impact statement. DOE regulations provide that "Approvals or disapprovals of authorizations to import or export natural gas under section 3 of the Natural Gas Act involving major operational changes (such as a major increase in the quantity of liquefied natural gas imported or exported)" normally require a complete Environmental Impact Statement. 10 C.F.R. Part 1021, Subpart D, Appendix D, D9. Order 3792 fails to discuss this regulation. DOE has not explained how a 25% increase in operations, exporting an additional 0.56 bcf/d, is not a "major increase in the quantity of liquefied natural gas exported." Nor has DOE argued why, in light of this "major increase," there is reason to depart from DOE's own guideline requiring an EIS here.

More broadly, NEPA requires a full EIS whenever there is a "substantial question" as to whether a proposed project will have significant impacts. Klamath Siskiyou Wildlands Ctr. v. Boody, 468 F.3d 549, 561-62 (9th Cir. 2006) (holding that the "substantial question" test sets a "low standard" for plaintiffs to meet). DOE can only avoid a full EIS where DOE can determine with confidence that the impacts will not be significant. Here, where DOE has argued that many of the indirect effects of exports are difficult to foresee, DOE's own argument indicates that careful analysis is required; DOE has provided no basis for definitively concluding that these impacts will *not* be significant.

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[40] "Summary of LNG Export Applications as of March 18, 2016" *available at* http://energy.gov/fe/downloads/summary-lng-export-applications-lower-48-states and attached as **Exhibit** "Summary_of_LNG_Export_Applications".

[41] EIA, Natural Gas Withdrawals and Production, https://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_FGW_mmcf_a.htm (estimating 2015 production at 32,963 billion cubic feet)

C. DOE Violated the Natural Gas Act by Failing to Adequately Weigh Environmental Impacts In the Public Interest Analysis

Separate from these NEPA violations, DOE violated the Natural Gas Act by giving insufficient consideration to environmental impacts in balancing effects on the public interest.

In discussing the non-climate impacts of additional gas production, DOE acknowledges that gas production has harmful impacts, but nonetheless declines to weigh these impacts in its assessment. Order 3792 at 176-177. Engaging in another apples-to-oranges comparison, DOE contends that prohibiting exports "would cause the Unites States to forego entirely the economic and international benefits identified [in Order 3792], but would have little more than a modest, incremental impact on the environmental issues identified by intervenors." *Id.* at 179. Of course, the purported "economic and international benefits" are themselves "modest" and "incremental." For example, there is no suggestion that the Sabine Pass project will, itself, "solve" the U.S. trade deficit. Similarly, the purported economic benefit is a "marginal" increase in income for limited sectors of the economy. Sierra Club agrees that domestic gas production will continue to cause environmental harm regardless of whether exports are approved. Sierra Club's contention has consistently been that the *marginal* increases in the harms caused by gas production caused by exports are, themselves, sufficient to outweigh any possible benefits of the project and thus demonstrate inconsistency with the public interest. DOE has refused to quantify, weigh, or otherwise meaningfully assess the magnitude of these marginal harms.

DOE separately contends that the harmful environmental impacts of natural gas production are best addressed "directly—through federal, state, or local regulation, or through self-imposed industry guidelines where appropriate" rather than by DOE action. Order 3792 at 176. DOE's "belie[f]" that the *consequences* of exports, including the consequences of induced gas production, would be better addressed by other entities does not change the fact that DOE's order here will cause these consequences to occur. Absent some showing that these consequences would, in fact, be fully and definitely eliminated by other entities' actions, DOE must weigh those consequences in the public interest analysis. Even if regulations or other efforts to reduce these harms *were* reasonably certain, there is no suggestion that such regulations could or would *fully* mitigate the environmental impacts of additional gas production. As such, DOE would be required to weigh any remaining, unmitigated environmental impacts against the purported benefits of the project. DOE has not undertaken any such analysis.

Although DOE provides a somewhat more extensive discussion of climate impacts, this analysis is also deficient. This discussion violated the Natural Gas Act, however, because it relied on unsupported assumptions regarding these impacts and failed to place them in proper context. DOE's discussion of climate impacts focuses on the life cycle analysis. As we explained above, DOE understates the greenhouse gas emissions of U.S. natural gas production. This error extends to the estimate of the overall life cycle impact of U.S. LNG.

Separate from this error, DOE entirely excludes climate impacts from its public interest weighing, based solely on the possibility that emissions associated with production, export, and consumption of U.S. LNG will be offset by displacement of combustion of other fossil fuels and avoidance of associated emissions. As we explained in our comments on the Environmental Addendum and NETL studies, this is an improper frame for assessing climate impacts. The inappropriateness of relying on extra-territorial reductions to offset increases in domestic emissions in this context is demonstrated by the United Nations Framework Convention on Climate Change, which requires reporting of emissions within a nation's borders. This reporting convention reflects the fact that nations can better measure and control emissions in their borders than they can emissions upstream and downstream for products they consume. In addition, this demonstrates a need for DOE to quantify the domestic emissions increase that would be caused by exports even if DOE found a reasonable basis for concluding that these emissions would be offset internationally: the U.S. must report its territorial emissions, and count these emissions when measuring progress toward emission targets. DOE must assess whether LNG exports would jeopardize the U.S.'s ability to reach these targets, and thereby frustrate international efforts to address climate change, even if DOE concludes that emissions from LNG export would not more directly increase global greenhouse gas emissions. DOE has not responded to this argument. Even within DOE's frame, DOE has not attempted to model the extent to which Sabine Pass's proposed LNG exports will, in fact, displace other fossil fuels.

The available evidence indicates that, even if DOE choses to look at potential displacement of foreign fuel use, it is inappropriate to compare the lifecycle of U.S. LNG solely to coal and other sources of gas. In arguing that the comparison with coal and natural gas is appropriate, DOE first cites China. EIA states that China's 2013 generation capacity was composed of 63% coal and 4% natural gas.[42] This same report identifies renewables hydroelectric, wind, and solar as a combined 29% of capacity. Therefore, insofar as DOE used "prevalence" of generation capacity as providing the basis for comparison with LNG, DOE has not provided any reason for failing to compare LNG with renewables. Similarly, renewables are more prevalent than natural gas electric generation capacity in India.[43]

II. Conclusion

[42] Although Order 3792 discusses China's 2012 generation capacity, the provided link now leads to an analysis of 2013 capacity.
[43] https://www.eia.gov/beta/international/analysis.cfm?iso=IND

Based on the foregoing, Sierra Club respectfully requests that DOE grant this request for rehearing.

Respectfully submitted,

/s/ Nathan Matthews

Nathan Matthews
Sierra Club
85 2nd St., Second Floor
San Francisco, CA 94105
(415) 977-5695
Nathan.matthews@sierraclub.org

UNITED STATES OF AMERICA
DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY

IN THE MATTER OF	)	
	)	
Sabine Pass Liquefaction, LLC	)	**FE DOCKET NO. 15-63-LNG**
	)	

CERTIFICATE OF SERVICE

I hereby certify that I caused the above documents to be served on the applicant and all others parties in this docket, in accordance with 10 C.F.R. § 590.017, on April 11, 2016.

Dated at San Francisco, CA, this 11th day of April, 2016.

Nathan Matthews
Staff Attorney
Sierra Club Environmental Law Program
85 2nd St., Second Floor
San Francisco, CA 94105
Telephone: (415) 977-5695
Email: nathan.matthews@sierraclub.org

UNITED STATES OF AMERICA
DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY

IN THE MATTER OF	)	
	)	
Sabine Pass Liquefaction, LLC	)	**FE DOCKET NO. 15-63-LNG**
	)	

VERIFICATION

SAN FRANCISCO	§
	§
CALIFORNIA	§

Pursuant to C.F.R. §590.103(b), Nathan Matthews, being duly sworn, affirms that he is authorized to execute this verification, that he has read the foregoing document, and that facts stated herein are true and correct to the best of his knowledge, information, and belief.

Nathan Matthews
Staff Attorney
Sierra Club Environmental Law Program
85 2nd St., Second Floor
San Francisco, CA 94105
Telephone: (415) 977-5695
Email: nathan.matthews@sierraclub.org

Subscribed and sworn to before me this 11th day of April, 2016.

Notary Public

NICOLE M. RIDER
Commission # 2067751
Notary Public - California
San Francisco County
My Comm. Expires May 10, 2018

My commission expires: May 10th, 2018