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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. 13-30-LNG**  
 ) **FE DOCKET NO. 13-42-LNG**  
 ) **FE DOCKET NO. 13-121-LNG**  
 ) **(Consolidated)**

**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. 3669, issued June 26, 2015.

Sierra Club asks that these actions be withdrawn and pending further inquiry into the environmental impacts of the proposed exports, or in the alternative, that the order be withdrawn and the underlying application be denied.

Sierra Club additionally moves for a stay of the Order pending resolution of this motion, pursuant to Section 19(c) of the Natural Gas Act, 15 U.S.C. § 717r(c), and 10 C.F.R. § 590.502

All communications regarding this motion should be addressed to and served upon Nathan Matthews, Staff Attorney, and Natalie Spiegel, Legal Assistant, at Sierra Club, 85 2<sup>nd</sup> St., Second Floor, San Francisco, California 94105.

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## **I. Statement of the Issues and Argument**

### **A. DOE Has An Independent Obligation To Assess Environmental Impacts Under NEPA, 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/FE 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.” Order 3669 at 16 (emphases added). These interpretations are inappropriate in the environmental context.

For environmental impacts, DOE/FE has an affirmative obligation to investigate impacts on its own; DOE/FE 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/FE to affirmatively investigate the impacts of exports. 42 U.S.C. § 4332(C). The environmental impacts revealed by DOE/FE’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/FE 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/FE 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/FE 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.<sup>1</sup> 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, affirmatively show that the application is “inconsistent with the public interest.” Order 3669 at 15. 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. Order 3669 at 16. 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 Direct, 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).

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<sup>1</sup> 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 (“EA”) prepared by the Federal Energy Regulatory Commission (“FERC”). Order 3669 at 14. 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. Because DOE/FE failed to cure the deficiencies in the EA or to supplement the EA to address the effects of this particular 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 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 decision making 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 decision making 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 3669 fail to present DOE’s

conclusions in a coherent manner, rather, they simply list facts which are not necessarily pertinent to the specific project. The environmental addendum cannot satisfy the purposes of NEPA because it does not give a “detailed statement...on...the environmental impact of the *proposed action*.” 42 U.S.C. § 4332(C)(i) (emphasis added). And the documents DOE relies upon contradict one another. 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.

Separate from the problems relating to inconsistencies in this data and DOE’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 no discussion of the impacts caused by Sabine Pass Liquefaction’s (“SPL”) particular project.

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

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 3669 at 300. In the incorporated Environmental Addendum, DOE more candidly states that “DOE/FE believes,” as it must, that exporting LNG from the U.S. will “increase[] domestic production of natural gas (principally from unconventional sources).”<sup>2</sup> Similarly, in the related proceeding regarding exports from the Cameron, Louisiana project, DOE stated that “more natural gas is likely to be produced domestically if LNG exports are authorized than if they are prohibited.” DOE Order 3391, at 88 (Sept. 10, 2014).

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).”<sup>3</sup> 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

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<sup>2</sup> Environmental Addendum at 1.

<sup>3</sup> Environmental Addendum at 5

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. 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.*, 52 F. Supp. 3d 1174, 1196 (D. Colo. 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 3669 at 198. 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 199. 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 3669 at 198.<sup>4</sup> 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 503.3 billion cubic feet per year (bcf/yr) or nearly 1.4 billion cubic feet per day (bcf/d) of natural gas. Order 3669 at 2. Exporting 1.4 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 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.<sup>5</sup> 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.” Order 3669 at 198 (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.* at 198-99. DOE does not explain, however, how these observations have any relevance to DOE’s current NEPA obligations or to exports.

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 effects acknowledged to be unlikely to occur. For example, courts have required consideration of the possibility of a terrorist attack on a proposed

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<sup>4</sup> *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.”).

<sup>5</sup> 40 C.F.R. §§ 1508.7, 1508.8(b).



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 SPL has taken—expending considerable resources, planning the project and securing necessary permits, etc.—demonstrate that the exports for which SPL 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 Educ. Ctr. v. U.S. Forest Serv.*, 609 F.3d 897, 902 (7th Cir. 2010). SPL proposed LNG exports, of course, are a specific and concrete proposal that is far removed from the type of inchoate possibility of another possible timber lease from *Habitat Education Center*, which that court 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.<sup>6</sup>

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.<sup>7</sup> In addition, certain assumptions in the LNG Export 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 SPL

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<sup>6</sup> 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)).

<sup>7</sup> See Sierra Club Initial Comment on LNG Export Study at 53-56, Sierra Club Reply Comment on LNG Export Study at 20.

bring the total volume of exports to have received final authorization to export to non-FTA countries to 9.99 Bcf/d, below EIA's estimate of likely total exports, it is likely that DOE's authorization here will increase the amount of gas actually exported.<sup>8</sup>

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.<sup>9</sup> It is irrelevant, however, to DOE's separate obligation to consider the effects of the particular proposal under consideration. Here, SPL's authorization allows them to export 1.38 bcf/d to non-FTA countries.

***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 3669 at 199. 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 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*,

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<sup>8</sup> We note that no evidence in the record indicates that FTA countries present a potential market for the volume of exports forecast by EIA. For the total volume of exports to have received final authorization, *see* DOE Order 3669 at 211.

<sup>9</sup> 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.

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 EA 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.<sup>10</sup> 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,”<sup>11</sup> 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 SPL’s proposed exports, NEPA requires DOE to undertake or commission such modeling.

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

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<sup>10</sup> See <http://www.eia.gov/oiaf/aeo/tablebrowser/#release=FE2011&subject=0-FE2011&table=72-FE2011&region=0-0&cases=rflexrpd-d090911a,rflexslw-d090911a,rflexrpd-d090911a,rflexslw-d090911a,ref2011fe-d020911a> (last visited June 2, 2015), 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,rflexslw-d090911a,rflexrpd-d090911a&table=72-FE2011&yearFilter=0](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,rflexslw-d090911a,rflexrpd-d090911a&table=72-FE2011&yearFilter=0)

<sup>11</sup> EIA, Documentation of the Oil and Gas Supply Module, 2-2 (2011), available at [http://www.eia.gov/FTP/ROOT/modeldoc/m063\(2011\).pdf](http://www.eia.gov/FTP/ROOT/modeldoc/m063(2011).pdf)

other contexts.<sup>12</sup> 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. NETL provides a method of estimating these impacts, illustrated by NETL's bottom-up estimate of NOx emissions.<sup>13</sup> NETL estimates that the cradle to transmission NOx emissions for natural gas used in combined cycle power plants are roughly 0.6 kilograms of NOx per megawatt hour generated, with roughly 0.5 kilograms specifically from production rather than transport.<sup>14</sup> Using NETL's assumption of a combined cycle power plant efficiency of 46% and EIA's estimate of a natural gas heat content of 1028 British thermal units per cubic foot,<sup>15</sup> NETL indicates that production and transmission of natural gas emits 87 metric tons of NOx per bcf of gas. Thus, once DOE determined the amount of additional production that would occur in the nearby Eagle Ford Shale play, for example, DOE could estimate the amount of VOC and NOx emissions that would be emitted by this production in these regions. This emissions estimate would provide a basis for meaningful discussion regarding impacts on regional ozone levels.

Numerous other impacts are amenable to regional discussion, especially because, as DOE recognizes, the harm caused by these impacts occurs primarily as a result of the cumulative impacts of multiple wells throughout a region, rather than as a result of individual wells. This discussion can be informed by EIA's modeling of the type, in addition to region, of additional production. For example, EIA has already predicted that 63% of demand created exports, on average, will be supplied by new production, and that 72% of this new production will come from shale gas.<sup>16</sup> Once DOE has estimated the share of this production that will be added in a region, such as a particular shale play, DOE can estimate the number of wells required, using NETL's estimates of expected ultimate recovery for different well types (e.g., 3 to 3.5 bcf per well for the 72% of production that comes from shale wells). This information provides a basis for estimating the water demand export-induced production will place on the region (either using DOE's estimates of the national average of water use<sup>17</sup> or, when available, region-specific information regarding water consumption), and thus the region's ability to tolerate this additional water demand. Similarly, DOE can use the estimate of the number of additional shale wells that will be required in each region to estimate the total acreage that will be directly or indirectly disturbed by this additional production, using data regarding the number of wells per pad and size of each well pad.

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<sup>12</sup> See, e.g., EPA, Cross-State Air Pollution Rule (CSAPR), <http://www.epa.gov/crossstaterule/>.

<sup>13</sup> NETL Gas LCA at 52-54.

<sup>14</sup> *Id.* at Figure 4-19, "Life Cycle NOx Emissions for Natural Gas Power Using Domestic Natural Gas Mix."

<sup>15</sup> "Frequently Asked Questions: Average Heat Content of Natural Gas," <http://www.eia.gov/tools/faqs/faq.cfm?id=45&t=8> (last visited June 2, 2015).

<sup>16</sup> See LNG Export Study – Related Documents, available at <http://energy.gov/fe/services/natural-gasregulation/lng-export-study> (EIA 2012 Study), at 10, 11.

<sup>17</sup> Environmental Addendum at 10-12.

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 can nonetheless meaningfully discuss some of the environmental impacts of induced production. In particular, as DOE has recognized, 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.<sup>18</sup> Yet the EA 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, 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 SPL's proposed exports, such as the nationwide total of land that will be disrupted by induced drilling.

***c) DOE's Other Reason for Excluding Induced Production From Analysis***

DOE contends that induced production is beyond the scope of NEPA analysis because DOE does not have direct regulatory authority over emissions and other effects of the induced production. Order 3669 at 201. DOE would rely on "environmental regulators" such as EPA to "impose requirements on natural gas production" rather than considering the impacts of induced production when considering the NEPA analysis and the balance of the public interest. *Id.* 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). Contending that other agencies will fix and mitigate the environmental harms caused by induced natural gas production and that NEPA analysis of the harms is not necessary is contrary to the purpose of NEPA.

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<sup>18</sup> 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](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>.

### **3. DOE Failed To Support Its Conclusions Regarding The Climate Impact of Natural Gas Production**

DOE has failed to take a hard look at the climate impacts of the production that would be induced by proposed exports. Although Order 3669 includes some discussion of climate impacts, DOE explicitly contends that this discussion is separate from, and plays no part in, the NEPA analysis. Order 3669 at 198-200. Of the two reasons DOE provides for excluding effects of induced production from NEPA analysis, one, uncertainty as to where production will occur, is plainly inapplicable to climate impacts. As DOE acknowledges, climate impacts are global, rather than occurring “on a local or regional level.”<sup>19</sup> DOE’s other justification for limiting the NEPA inquiry, uncertainty as to whether exports will occur, is flawed for the reasons stated above. Accordingly, there is no lawful basis for DOE’s failure to take a hard look, as part of the NEPA analysis, of the climate impacts of SPL’s proposed LNG exports, including the climate impacts of additional/induced 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 3669 limited discussion of climate impacts satisfies NEPA’s requirements. Order 3669, 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. Order 3669 at 205-09. This analysis is deficient in numerous regards. It is untethered from the actual 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 SPL’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

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<sup>19</sup> Environmental Addendum at 2.

demonstrates that DOE's conclusions on these issues are too low. First, DOE has 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 3669, DOE attributes a "cradle-through-transmission leakage rate" of 1.2% to NETL. Order 3669 at 181. This figure is lower than the "expected" "cradle-to-liquefaction" leak rates NETL provided in the Export LCA, which were 1.3% for conventional onshore production and 1.4% for shale gas production.<sup>20</sup> 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.

NETL determined that "there [were] five major studies that account for the GHG emissions from upstream natural gas" and that three of these studies either provided or implied an estimate of "leakage rates from upstream natural gas."<sup>21</sup> 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. Order 3669 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. 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.<sup>22</sup> 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.<sup>23</sup> 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.<sup>24</sup> As to Weber, DOE's sole comment is the confusing assertion that "We have reviewed Weber et al.'s work and do not see any mention of leakage rate." Order 3669 at 183. Although the cited paper does not discuss emissions in terms of leakage rate, the emissions estimates therein imply a leakage rate, *as was expressed by the NETL Unconventional Production Report itself*.<sup>25</sup> The derivation of this leak rate from Weber's estimates is explained by Bradbury 2013, as discussed in the NETL reports.<sup>26</sup> Because NETL already determined that

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<sup>20</sup> Export LCA 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.

<sup>21</sup> NETL, "Environmental Impacts of Unconventional Natural Gas Development and Production" (May 29, 2014) ("Unconventional Production Report"); *see also* Sierra Club Comment on LNG Export Study at 8 (July 24, 2014).

<sup>22</sup> 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](http://pubs.acs.org/doi/suppl/10.1021/es201942m/suppl_file/es201942m_si_001.pdf)

<sup>23</sup> *I.e.*, 0.28% lower than the values provided in Unconventional Production Report Exhibit 2-8.

<sup>24</sup> Sierra Club Comment on LNG Export Study at 8.

<sup>25</sup> Unconventional Production Report at Exhibit 2-8.

<sup>26</sup> And *available at* [http://www.wri.org/sites/default/files/clearing\\_the\\_air\\_full\\_version.pdf](http://www.wri.org/sites/default/files/clearing_the_air_full_version.pdf)

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.<sup>27</sup> Order 3669 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. Order 3669 at 183. 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 CH<sub>4</sub> emissions, with [natural gas] and oil sectors as important contributors.”<sup>28</sup> Brandt provides several likely explanations for the flaws in bottom-up inventories. Evidence indicates that there are “a small number of ‘superemitters’”<sup>29</sup> with emissions that are much higher than anticipated by the “model[s] . . . based on engineering relationships and emission factors”<sup>30</sup> 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.”<sup>31</sup> 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.<sup>32</sup> While Brandt concludes that the particular emission rates estimated by regional atmospheric studies are unlikely to be 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 supported this estimate. This paper, by researchers at Carnegie

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<sup>27</sup> Sierra Club Comment on LNG Export Study at 9-10.

<sup>28</sup> Brandt, et al., “Methane Leaks from North American Natural Gas Systems,” 2014 at 733 *available at* <http://www.novim.org/images/pdf/ScienceMethane.02.14.14.pdf>.

<sup>29</sup> *Id.*

<sup>30</sup> Order 3669 at 183.

<sup>31</sup> Brandt 2014 at 734.

<sup>32</sup> Sierra Club Comment on LNG Export Study 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.



Mellon and the National Ocean and Atmospheric Administration, concludes that the most likely methane leak rate is between 2 and 4 percent.<sup>33</sup>

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. Order 3669 at 183. 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.<sup>34</sup>

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 CO<sub>2</sub> balance between the oceans and the atmosphere. The IPCC explains that "it is likely that including the climate-carbon feedback for non-CO<sub>2</sub> gases as well as for CO<sub>2</sub> provides a better estimate of the metric value than including it only for CO<sub>2</sub>." 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.

Sierra Club Climate Comment at 12 (footnotes omitted). Neither Order 3669 nor DOE's response to comments regarding the Environmental Addendum and related materials addressed Sierra Club's comment on this issue. Using the "better" estimate of methane's global warming

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<sup>33</sup> 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)

<sup>34</sup> 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 3669 at 181. 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.

potential increases the 100-year GWP by 20% relative to the value used in the NETL Export LCA and Order 3669 (*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 SPL's proposal. This hard look must include a quantification of the greenhouse gases that would be emitted by the production induced by SPL'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 tangential to DOE's NEPA obligations. Greenhouse gases emitted as a result of export-induced gas production are an indirect effect of the SPL's 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. 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.

**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 SPL's proposed exports, which required discussion in the EA.

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." Order 3669 at 204. 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 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 use in large part *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. Order 3668 at 204. 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, SPL'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 41.95 bcf/d of LNG from the Lower-48 when operating at maximum capacity.<sup>35</sup> This is the equivalent of roughly 47% of current total domestic gas production.<sup>36</sup> After approving SPL's application, DOE has approved 9.99 bcf/d of LNG to non-FTA countries.<sup>37</sup>

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

As the public interest analysis stands now, DOE considers the uncertain upstream economic benefits of induced natural gas production but refuses to consider the environmental harms which would occur as a result of induced natural gas production. DOE is casting widely for benefits while entirely ignoring environmental harms in its public interest analysis.

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<sup>35</sup> "Summary of LNG Export Applications" available at <http://energy.gov/fe/downloads/summary-lng-export-applications-lower-48-states>

<sup>36</sup> Energy Information Administration, Monthly Natural Gas Gross Production Report (May 29, 2015) (daily production is ~90 bcf).

<sup>37</sup> DOE Order 3669 at 211.

## 1. DOE Failed to Weigh Economic Impacts Properly

To begin with, a benefit SPL is claiming is its “supporting [of] the exploration and production chain...for natural gas extraction” SPL Application Docket No. 10-111-LNG at 8 (Sep. 7, 2010) (the public interest discussion from this application was incorporated in full into SPL’s current applications. SPL Application Docket No. 13-121-LNG at 6 (Sep. 10, 2013)). SPL would like to have the best of both worlds by claiming responsibility for the benefits of upstream gas production but ignoring and accepting no responsibility for upstream environmental harms. Next, the LNG Export Study, upon which DOE relies, disregards the impacts felt by people outside the natural gas industry and relies too heavily on a possible slight increase in GDP to conclude that authorizing exports is within the public interest. Finally, the economic harms which could result from LNG exports are great—an increase in domestic natural gas prices costing the consumer billions of dollars per year.

### a) *Economic Benefits Asserted by DOE Are Uncertain*

DOE and SPL’s reliance on the LNG Export Study completed by NERA disregards the impacts felt by people outside the natural gas industry and relies too heavily on a possible slight increase in GDP to conclude that authorizing exports is within the public interest. The LNG Export Study concludes that LNG exports’ primary effect will be to transfer wealth from the majority of Americans to the small minority of wealthy corporations that will own natural gas resources or LNG export infrastructure.<sup>38</sup> The purported “net benefit” of this transfer, in NERA’s view, is an increase in GDP that is equivalent to an increase of between 0.03% and 0.1% and NERA acknowledges that “total worker compensation declines.”<sup>39</sup> NERA writes: “there are costs to consumers of higher energy prices and lower consumption and producers incur higher costs to supply the additional natural gas for export,” and it relies on wealth being transferred to natural gas companies to offset these losses.<sup>40</sup> Thus, taken at face value, the LNG Export Study shows that exports will be contrary to the *public* interest (even if not contrary to the private gas exporters’ interests), by any reasonable interpretation of the term.

DOE must not, however, take the LNG Export Study on its own terms. Even on the narrow issue of net GDP impacts, the LNG Export Study’s conclusion is contradicted by the only other available comprehensive model of LNG exports’ impacts, conducted recently by Purdue University economists Kemal Sarica and Wallace E. Tyner.<sup>41</sup> This independent study provides

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<sup>38</sup> See 2012 LNG Export Study, 77 Fed. Reg. 73,627 (Dec. 11, 2012), available at [http://energy.gov/sites/prod/files/2013/04/f0/fr\\_notice\\_two\\_part\\_study.pdf](http://energy.gov/sites/prod/files/2013/04/f0/fr_notice_two_part_study.pdf) (Federal Register Notice of Availability of the LNG Export Study); LNG Export Study – Related Documents, available at <http://energy.gov/fe/downloads/lng-export-study-related-documents> (EIA Analysis (Study - Part 1) & (NERA Economic Consulting Analysis (Study - Part 2))).

<sup>39</sup> NERA Economic Consulting Analysis at 77.

<sup>40</sup> *Id.* at 6.

<sup>41</sup> See Kemal Sarica & Wallace E. Tyner, Economic and Environmental Impacts of Increased US Exports of Natural Gas (Purdue Univ., Working Paper, 2013) (available from the authors) [hereinafter Purdue Study].

credible evidence undermining the LNG Export Study's sole finding of a public benefit. More broadly, the LNG Export Study's focus on net GDP impacts is too narrow in scope, and the LNG Export Study contains numerous errors, as we explained in our initial comments on the study.<sup>42</sup> The Natural Gas Act public interest inquiry must consider numerous issues ignored by NERA, including the way that increased gas production necessary to supply exports will cause harmful environmental impacts and disrupt communities where gas production occurs. These effects have economic aspects that could have been, but were not, included in the macroeconomic study. While the LNG Export Study includes economic benefits from increased drilling, it did not consider the environmental harms. However, looking at a national scale for economic benefits and only a local scale for economic environmental harms means that the net benefits of LNG export are overestimated.

On a more technical level, NERA understates the potential volume of exports and domestic gas price increases. These price increases will merely transfer wealth from ordinary Americans and domestic businesses to the relatively few owners of natural gas companies and to foreign investors. Consideration of these additional impacts reinforces the Purdue Study's conclusion that the likely net effect of LNG exports will be a *decrease* in United States GDP, rather than the slight increase NERA predicts.

In summary, LNG exports will have many effects that are not considered by the LNG Export Study but are contrary to the public interest. The record contains abundant information demonstrating that these impacts will be significant. DOE cannot move forward without considering them.

#### ***b) Economic Harms Are Great***

Exporting domestic natural gas will increase gas demand and so will increase domestic gas prices. DOE and FERC are considering export proposals from many operators, which cumulatively propose to export 41.95 bcf/d of LNG from the Lower-48 when operating at maximum capacity.<sup>43</sup> This is the equivalent of roughly 47% of current total domestic gas production.<sup>44</sup> DOE retains discretion and should consider the cumulative impacts of the proposals for export to non-FTA countries. After approving SPL's application and Cheniere Corpus Christi's application, DOE has approved 9.99 bcf/d of LNG to non-FTA countries. Order 3669 at 211. Price impacts can be reasonably expected to be commensurately greater.

The EIA has recently released an updated analysis of the impacts high export volumes would have – though even the EIA report considers a maximum of 20 bcf/d in exports, which

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<sup>42</sup> Sierra Club Comments on LNG/NERA Export Study (January 24, 2013).

<sup>43</sup> "Summary of LNG Export Applications" available at <http://energy.gov/fe/downloads/summary-lng-export-applications-lower-48-states>

<sup>44</sup> Energy Information Administration, Monthly Natural Gas Gross Production Report (May 29, 2015) (daily production is ~90 bcf).

still falls short of the volume DOE has been asked to approve.<sup>45</sup> Even at the EIA’s maximum level, though, price increases are striking.

EIA considered several combinations of conditions, based on both LNG export rates and economic circumstances. It considered a “low” export case of 12 bcf/d, phased in at a rate of 2 bcf/d each year starting in 2015, and a “high” case of 20 bcf/d, again phased at the same rate.<sup>46</sup> It considered the effects of these exports in the context of the EIA’s AEO 2014 reference case, and predicted changes to average natural gas prices received by producers. Gas prices are expected to increase “4% (12 bcf/d) to 11% (20 bcf/d) more than their base projection over the 2015-40 period.”<sup>47</sup> And if the reference case was too optimistic about the domestic oil and natural gas supply prospects, the Low Oil and Gas Resource Case predicts price increases of 10% (12 bcf/d) to 18% (20 bcf/d).<sup>48</sup> Prices paid by consumers under the AEO Reference Case are expected to increase 2% to 5% in the respective scenarios.<sup>49</sup> These percentage increases are very large in absolute terms. In the low/slow scenario, gas and electricity bills increase by \$9 billion *per year*, and this increase grows to \$18 billion *per year* with the higher amount of exports.<sup>50</sup>

In short, whatever economic benefits gas exports create also come with multi-billion dollar annual costs to U.S. consumers. These costs are large even with export levels of about 12 bcf/d, which is a level equivalent to just over a quarter of the total volume of exports already proposed. Natural gas is used for home heating, industrial feedstocks, and electricity generation, among other purposes. Gas price increases are, as a result, felt across the economy, and in many different sectors. As power prices rise, so do the prices of consumer goods and other services, and employment may, in turn, fall as it becomes more expensive to run businesses.<sup>51</sup> SPL’s proposal would benefit a small subset of citizens (mostly those in the oil and gas sector) while penalizing millions more. These cost increases appear even if only a few export terminals are permitted, and grow steadily more severe as more terminals are added. DOE must consider the full range of possible increases, but even at low levels, these price increases are not consistent with the public interest, because they outweigh the limited, and uncertain, benefits of short-term increases in gas production. DOE must, therefore, deny SPL’s application for this reason.

## **2. DOE Failed to Weigh Environmental Impacts Properly**

Separate from NEPA violations and its failure to adequately weigh the economic impacts, DOE violated the Natural Gas Act by giving insufficient consideration to environmental impacts in balancing effects on the public interest.

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<sup>45</sup> EIA, “Effect of Increased Natural Gas Exports on Domestic Energy Markets” (October 2014).

<sup>46</sup> *Id.* at 12.

<sup>47</sup> *Id.*

<sup>48</sup> *Id.* at 14.

<sup>49</sup> *Id.* at 12.

<sup>50</sup> *Id.* at 21-22.

<sup>51</sup> One of the consequences of these increased costs may be a drop-off in U.S. exports, offsetting SPL’s claimed improvements to the U.S. balance of trade. DOE must investigate this possible harm to 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 3669 at 201-02. Engaging in another apples-to-oranges comparison, DOE contends that prohibiting exports “would cause the United States to forego entirely the economic and international [benefits] discussed herein, but would have little more than a modest, incremental impact on the environmental issues identified by APGA and Sierra Club.” *Id.* at 202. Of course, the purported “economic and international [benefits]” are themselves “modest” and “incremental.” For example, there is no suggestion that the SPL’s 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 other policy tools are better suited to addressing the harmful environmental impacts of natural gas production. Order 3669 at 201-02. This falls short of DOE’s obligation to assess impacts to the public interest. All available evidence indicates that exports will increase gas production and attendant environmental harms. DOE must weigh whether these harms will outweigh the likely benefits of exports. DOE cannot rely on the fact that other entities could act to reduce these harms. 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 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 SPL's proposed LNG exports will, in fact, displace other fossil fuels. Because SPL is a specific proposal, for a definite amount of gas, modeling the effect of SPL's exports presents a simpler problem than the abstract problem of modeling the effects of U.S. LNG exports in general. DOE has not shown that modeling the impacts of providing Japan and India with this additional supply of LNG would be unreasonably burdensome or speculative.

The available evidence indicates that, even if DOE chooses 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, where DOE states that 2012 generation capacity was composed of 66% coal and 3% natural gas. DOE provides no basis for comparing U.S. LNG against these two particular fuels rather than the aggregate greenhouse gas intensity of China's generation fleet. An even more appropriate comparison would be to compare U.S. LNG with the average greenhouse gas intensity of the additional capacity that China is expected to add. The same EIA source that DOE cites for the composition of China's current fleet predicts the composition of China's 2040 fleet as well.<sup>52</sup> Because of the massive growth anticipated in China, it is reasonable to assume that U.S. LNG would be more likely to compete against these sources of new capacity rather than existing sources. This added capacity, however, is more than 50% renewables. Thus, the greenhouse gas intensity of the aggregate anticipated growth in Chinese capacity is significantly lower than DOE's estimate of the greenhouse gas intensity of U.S. LNG, even under a 100-year GWP.

For Japan, EIA provides generation, rather than capacity data. The material cited by DOE does not forecast future Japanese generation, but it is likely that this information is available, and as noted above, DOE has an affirmative obligation to seek out information regarding the environmental impacts of the proposed project. IEA data relied upon by EIA,<sup>53</sup> however,

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<sup>52</sup> EIA, "China Analysis Brief," <http://www.eia.gov/countries/cab.cfm?fips=CH> (comparing 2012 and projected 2040 electricity capacity by fuel).

<sup>53</sup> International Energy Agency, *Japan – Overview* (August 2014), <http://www.iea.org/media/countries/slt/JapanOnepagerAugust2014.pdf>

provides information regarding Japan’s current generation mix, and indicates that the greenhouse gas intensity of Japan’s aggregate mix is very near NETL’s estimate of the intensity of U.S. LNG. Correcting any of the errors in NETL’s assessment, therefore, would likely lead to the conclusion that U.S. LNG has higher lifecycle emissions than the energy U.S. LNG would likely displace in Japan.

#### **D. DOE Failed to Comply with the Endangered Species Act and the National Historic Preservation Act**

According to the Environmental Assessment made by FERC and adopted by DOE, FERC complied with section 7 of the Endangered Species Act (ESA) and section 106 of the National Historic Preservation Act (NHPA).<sup>54</sup> However, as has been discussed previously, the EA covered only the site-specific impacts rather than the impacts from induced upstream natural gas production.

Pursuant to the Endangered Species Act’s (ESA) directive that all agencies “shall seek to conserve endangered species,” 16 U.S.C. § 1531(c)(1), DOE must ensure that the its approval of the SPL project “is not likely to jeopardize the continued existence of any endangered species . . . or result in the destruction or adverse modification of [critical] habitat of such species.” 16 U.S.C. § 1536(a)(2). “Each Federal agency shall review its actions at the earliest possible time to determine whether any action may affect listed species or critical habitat.” 50 C.F.R. § 402.14(a); see also 16 U.S.C. § 1536(a)(2).

This determination must be wide-ranging, because SPL export proposal will increase gas production activities throughout the South, and nationally. Thus, DOE must consider not just the effects of the project at the Corpus Christi site (as it has already done), but also the effects of increased gas production across the full region the plant affects.

Similarly, DOE must also fulfill its obligations under the National Historic Preservation Act (NHPA) to “take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register.” 16 U.S.C. § 470f; *see also Pit River Tribe v. U.S. Forest Serv.*, 469 F.3d 768, 787 (9th Cir. 2006) (discussing the requirements of the NHPA). Because “the preservation of this irreplaceable heritage is in the public interest,” 16 U.S.C. § 470(b)(4), it behooves DOE to proceed with caution.

DOE must, therefore, initiate the NHPA section 106 consultation and analysis process in order to “identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties.” 36 C.F.R. §

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<sup>54</sup> Federal Energy Regulatory Comm’n, Environmental Assessment for the Sabine Pass Liquefaction Expansion Project and Cheniere Creole Trail Pipeline Expansion Project, Docket Nos. CP13-552-000 and CP13-553-000, at 22-23 (Dec. 2014).

800.1(a). NHPA regulations make clear that the scope of a proper analysis is defined by the project's area of potential effects, *see* 36 C.F.R. § 800.4, which in turn is defined as “the geographic area . . . within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties,” 36 C.F.R. § 800.16(d). This area is “influenced by the scale and nature of an undertaking,” *Id.* The area of potential effects should sweep quite broadly here because, as in the ESA and NEPA contexts, the reach of SPL's proposal extends to the entire area in which it will increase gas production. Thus, to approve SPL's proposal, DOE must first understand and mitigate its impacts on any historic properties which it may affect. *See also* DOE Policy P.141.1 (May 2001) (providing that DOE will fully comply with the NHPA and many other cultural resources preservation statutes).

### **E. DOE Should Stay Its Authorization Pending Resolution of this Motion for Rehearing and Any Judicial Appeal**

DOE regulations provide that “The filing of an application for rehearing does not operate as a stay of the Assistant Secretary's order, unless specifically ordered by the Assistant Secretary.” 10 C.F.R. § 590.502. Sierra Club therefore requests an immediate order specifically staying DOE's authorization.

DOE regulations do not provide a standard regarding issuance of stays of DOE orders. DOE should therefore apply the general four-factor test used for stays of agency or judicial orders. *See, e.g., Wash. Met. Area Transit Comm'n v. Holiday Tours, Inc.*, 559 F.2d 841, 842 n.1 (D.C. Cir. 1977) (citing *Virginia Petroleum Jobbers Association v. FPC*, 259 F.2d 921 (1958)). These factors are “(1) the movant's showing of a substantial likelihood of success on the merits, (2) irreparable harm to the movant, (3) substantial harm to the nonmovant, and (4) public interest.” *Davis v. Pension Ben. Guar. Corp.*, 571 F.3d 1288, 1291 (D.C. Cir. 2009), *see also id.* at 1292 (discussing *Wash. Met. Area Transit Comm'n*).

Here, Sierra Club is likely to succeed on the merits. Induced production is no less foreseeable than numerous other indirect effects that circuit courts have required agencies to consider under NEPA.

Second, authorization of export will produce immediate and irreparable environmental impacts. As other companies have asserted in their applications for export authorization submitted to DOE, natural gas producers are likely begin to increase their production in anticipation of export, so that the additional production is available for export when construction of the liquefaction facilities is completed and the terminal is ready to commence operation. *See, e.g.,* Freeport LNG, Application for Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Countries, DOE Docket 11-161-LNG, at 20 (Dec. 19, 2011).

Third, a stay would not substantially harm other parties to the proceeding. Expansion of the LNG export facility is a multi-year process. In light of DOE's obligation to respond to a

request for rehearing within 30 days, resolution of the Sierra Club's challenge need only impose only a few additional months of delay. When measured against the broader timeframe for the project, this delay will impose a minimal hardship.

Fourth, the public interest warrants a stay. Export of LNG would represent a major shift in the United States' energy policy and marketplace. It serves the public interest to ensure that the ramifications of this sea change are fully understood before the nation commits to LNG export. Conversely, it would be contrary to the public interest to allow SPL to embark on this departure from prior policy while these issues are still being resolved.

Accordingly, each of the traditional stay factors supports issuance of a stay in this case. DOE should stay Order 3669 pending resolution of this motion for rehearing and any judicial appeal of DOE's decision thereon.

## **II. Conclusion**

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

Respectfully submitted,

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UNITED STATES OF AMERICA  
DEPARTMENT OF ENERGY  
OFFICE OF FOSSIL ENERGY

IN THE MATTER OF )  
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Sabine Pass Liquefaction, LLC ) FE DOCKET NO. 13-30-LNG  
 ) FE DOCKET NO. 13-42-LNG  
 ) FE Docket NO. 13-121-LNG  
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**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 July 27, 2015.

Dated at San Francisco, CA, this 27th day of July, 2015.



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