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**

SIERRA CLUB'S MOTION TO INTERVENE, PROTEST, AND COMMENTS

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In the above-captioned docket, Corpus Christi Liquefaction, LLC, a wholly owned subsidiary of Cheniere Energy, Inc. and hereinafter referred to as "Cheniere", requests authorization to export 203 billion cubic feet per year, or 0.56 billion cubic feet per day (bcf/d), of natural gas as liquefied natural gas (LNG) from a natural gas liquefaction and LNG export terminal located in Sabine Pass, Louisiana. Sierra Club hereby moves to intervene in this docket, protests this proposal, and offers related comments.

Cheniere fails to acknowledge many of the project's harmful effects while failing to support Cheniere's assertions of purported benefit. The proposed export project will cause extensive environmental harm, impacting the environment around the export site, inducing harmful natural gas production, and likely increasing global greenhouse gas emissions. DOE/FE cannot authorize exports without fairly weighing significant environmental and economic impacts of this production. *See NAACP v. Federal Power Comm'n*, 425 U.S. 662, 670 n.4 (1976). Exports will also harm the public interest by increasing domestic gas prices and causing related economic damage.

Because Sierra Club's members have a direct interest in avoiding the environmental harms Cheniere's proposal will cause and in ensuring that any exports do not adversely affect domestic consumers, Sierra Club moves to intervene in FE Docket No. 15-63-LNG and protests Cheniere's application.

I. Sierra Club Should be Granted Intervention

Sierra Club members live and work throughout the area that will be affected by the export proposal, including in the regions of Louisiana that will be affected by supporting infrastructure. Sierra Club members also live in the domestic gas fields that will likely see increased production as a result of the proposed exports. Sierra Club members everywhere will also be affected by the increased gas prices that would result from

completion of proposed LNG export facilities like the Cheniere project. As of October 2015, Sierra Club had 2,880 members in Louisiana and 629,261 members overall.[1]

To protect our members' interests, Sierra Club moves to intervene in FE Docket No. 15-63-LNG, pursuant to 10 C.F.R. § 590.303. Consistent with that rule, Sierra Club states that its rights and interests in these matters include, but are not limited to, the following:

- The environmental consequences of any gas exports from the Cheniere project, including emissions and other pollution associated with the liquefaction process, environmental damage associated with construction and operation of the facility and associated infrastructure, environmental impacts caused by shipping traffic, and the emissions associated with all phases of the process from production to combustion.
- The environmental and economic consequences of any expansion or change in natural gas production, especially in shale gas plays, as a result of increased gas exports. Members living in these regions will be affected by the damage to air, land, and water resources caused by the increasing development of these plays, and the public health risks caused by these harms.
- The economic impacts of any gas exports from the Cheniere project, whether individually or in concert with exports from other such facilities, including the consequences of price changes upon members' finances, consumer behavior generally, and industrial and electrical generating facilities whose fuel choices may be affected by price changes. Sierra Club, in particular, works to reduce U.S. and global dependence on fossil fuels, including coal, gas, and oil, and to promote clean energy and efficiency in order to protect public health and the environment. To the extent changes in gas prices increase the use and production of coal and oil, Sierra Club's interests in this proceeding are directly implicated.
- The public disclosure, in National Environmental Protection Act and other documents, of all environmental, cultural, social, and economic consequences of Cheniere's proposal, and of all alternatives to that proposal.

In short, Sierra Club's members have vital economic, aesthetic, spiritual, personal, and professional interests in the expansion project.

The Club has demonstrated the vitality of these interests in many ways. Sierra Club runs national advocacy and organizing campaigns dedicated to reducing American dependence on fossil fuels, including natural gas, and to protecting public health. These campaigns, including its Beyond Coal campaign and its Beyond Natural Gas campaign,

[1] Attached Declaration of Yolanda Andersen at ¶ 7, attached as Exhibit 1.

are dedicated towards promoting a swift transition away from fossil fuels and to reducing the impacts of any remaining natural gas extraction.

Thus, although 10 C.F.R. § 590.303 states no particular standard for intervention, Sierra Club has interests in these proceedings that would be sufficient to support intervention on any standard. DOE has consistently found that these interests are sufficient to warrant intervention in other LNG export proceedings. Accordingly, this motion to intervene must be granted.[2]

II. Service

Pursuant to 10 C.F.R. § 590.303, Sierra Club identifies the following persons for service of correspondence and communications regarding this Application.

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III. Sierra Club Protests this Application Because It Is Not In the Public Interest and Is Not Supported by Adequate Environmental and Economic Analysis

Section 3 of the Natural Gas Act provides that DOE/FE cannot authorize exports unless it finds the exports to be in the public interest. 15 U.S.C. § 717b. DOE/FE must consider environmental factors in the course of this public interest analysis. *NAACP*, 425 U.S. at 670 n.4; *Jordan Cove, L.P.*, DOE/FE Order 3413, 6, 7 (March 24, 2014). Accordingly, DOE/FE cannot proceed with Cheniere's application without fully evaluating the environmental impacts of Cheniere's proposal.

Cheniere's application is silent as to important environmental impacts of the proposal. As we explain below, the proposal will cause many types of significant environmental harm, and these harms must be considered as part of DOE/FE's public interest analysis. First, the construction and operation of the liquefaction facilities, export terminal, and related pipelines will directly impact local water quality, habitats, and air quality. Second, the project will induce additional natural gas production in the United States,

[2] If any other party opposes this motion, we respectfully request leave to reply. *Cf.* 10 C.F.R. §§ 590.302, 590.310 (allowing for procedural motions and briefing in these cases).

primarily hydraulic fracturing (fracking) of unconventional gas sources, thus causing the myriad environmental harms associated with such production. Third, the project will increase domestic gas prices, likely causing an increase in coal-fired electricity generation and thus increasing emissions of greenhouse gases, conventional, and toxic air pollutants. Fourth, it is likely that LNG exports will also compete against wind, solar, and other clean renewable energy sources that would have lower environmental impacts.

Moreover, the proposal will have adverse economic impacts as a result of increasing gas prices, lost jobs, and increased coal-fired electricity generation. Communities where increased gas production occurs will likely suffer from the "resource curse" and end up worse off than they would have been otherwise. LNG exports will result in net domestic job losses and economic harm to most Americans.

For these reasons, and the reasons set forth below and in the comments incorporated herein by reference, Sierra Club files this protest, pursuant to 10 C.F.R. § 590.304.

A. Legal Standards

DOE/FE has significant substantive and procedural obligations to fulfill before it can authorize Cheniere's export application. Here, we discuss some of these obligations created by the Natural Gas Act, National Environmental Policy Act, and the Endangered Species Act, before explaining why these obligations preclude Cheniere's request for authorization.

1. Natural Gas Act

Pursuant to the Natural Gas Act and subsequent delegation orders, DOE/FE must determine whether Cheniere's proposal to export LNG to nations which have not signed a free trade agreement (FTA) with the United States is in the public interest.[3] Courts, DOE/FE, and the Federal Energy Regulatory Commission (FERC) all agree that the "public interest" at issue in this provision is wide ranging, including environmental impacts as well as economic impacts.

Section 3 of the 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

[3] The Natural Gas Act separately provides that DOE/FE must approve exports to nations that have signed a free trade agreement requiring national treatment for trade in natural gas "without modification or delay." 15 U.S.C. § 717b(c).

> [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).[4]

Courts interpreting this provision have long held that the "public interest" encompasses the environment. Although the public interest inquiry is rooted in the Natural Gas Act's "fundamental purpose [of] assur[ing] the public a reliable supply of gas at reasonable prices," *United Gas Pipe Line Co v. McCombs*, 442 U.S. 529 (1979), the Natural Gas Act also grants DOE/FE "authority to consider conservation, environmental, and antitrust questions." *NAACP v. Federal Power Comm'n*, 425 U.S. 662, 670 n.4 (1976) (citing 15 U.S.C. § 717b as an example of a public interest provision); *see also id.* at 670 n.6 (explaining that the public interest includes environmental considerations). Subsequent cases have confirmed *NAACP*'s holding that the purposes of the Natural Gas Act include environmental issues. *Pub. Utilities Comm'n of State of Cal. v. F.E.R.C.*, 900 F.2d 269, 281 (D.C. Cir. 1990). In interpreting an analogous public interest provision applicable to hydroelectric power and dams, the Supreme Court has explained that the public interest determination "can be made only after an exploration of all issues relevant to the 'public interest,' including future power demand and supply, alternate sources of power, the public interest in preserving reaches of wild rivers and wilderness areas, the preservation of anadromous fish for commercial and recreational purposes, and the protection of wildlife." *Udall v. Fed. Power Comm'n*, 387 U.S. 428, 450 (1967) (interpreting § 7(b) of the Federal Water Power Act of 1920, as amended by the Federal Power Act, 49 Stat. 842, 16 U.S.C. § 800(b)). Other courts have applied *Udall*'s holding to the Natural Gas Act. *See, e.g.*, *N. Natural Gas Co. v. Fed. Power Comm'n*, 399 F.2d 953, 973 (D.C. Cir. 1968) (interpreting section 7 of the Natural Gas Act).[5]

DOE cannot presume that the economic benefits of exports, if any, outweigh exports' environmental harms. Although DOE/FE has adopted a rebuttable presumption that the purely economic impacts of exports are consistent with the public interest, DOE cannot extend this presumption to environmental impacts. DOE has an affirmative obligation to investigate environmental impacts on its own; DOE cannot simply rely on information provided by project proponents or opponents. Approving an application to export

[4] The statute vests authority in the "Federal Power Commission," which has been dissolved. DOE/FE has been delegated the former Federal Power Commission's authority to authorize natural gas exports. Department of Energy Redelegation Order No. 00-002.04E (Apr. 29, 2011). *See also* Executive Orders 12038 & 10485 (vesting any executive authority to allow construction of export facility in the Federal Power Commission and its successors).

[5] Further support for the inclusion of environmental factors in the public interest analysis is provided by NEPA, which declares that all federal agencies must seek to protect the environment and avoid "undesirable and unintended consequences." 42 U.S.C. § 4331(b)(3).

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 NAACP v. Federal Power Commission*, 425 U.S. 662, 670 n.4, n.6 (1976). Notably, *Panhandle Producers and Royalty Owners Ass'n v. Economic Regulatory Administration*, 822 F.2d 1105, 1111 (D.C. Cir. 1987) held that DOE guidance permissibly adopted two narrow, specific, and rebuttable economic presumptions: "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.

More broadly, DOE must not rely on its outdated *import* guidance in evaluating the present *export* proposal. This thirty year old guidance does not reflect current understanding of the environmental impacts of gas production and consumption, nor does its reasoning apply to exports. In 1984, DOE published *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. 6,684 (Feb. 22, 1984). The primary issue confronted by these guidelines was whether to directly regulate prices at which gas could be imported from Canada.[6] DOE/FE determined that, if U.S. buyers were willing to pay market rates for imported gas, this would generally demonstrate a need for that gas.[7] This reasoning underlying this guidance does not apply to exports. First, the question before DOE/FE here is not to regulate the prices at which gas can be exported, but rather, whether to allow exports at all. A foreign purchaser's willingness to outbid domestic purchasers does not demonstrate that the U.S. does not "need" that gas. Similarly, international gas markets and a foreign purchaser's willingness to pay for U.S. exports do not account for the environmental impacts of those exports. As we explain below, LNG exports have extensive environmental impacts, all of which have severe costs, but these costs are externalized by existing markets. Moreover, these costs are generally borne by the US public, whereas the benefits accrue to a small subset of US citizens and to the foreign purchasers of LNG. Accordingly, international gas markets are a wildly inappropriate indicator of the impacts of exports on the public interest.

[6] 49 Fed. Reg. at 6,684-85.
[7] *Id.*

2. National Environmental Policy Act

NEPA requires federal agencies to consider and disclose the "environmental impacts" of proposed agency actions. 42 U.S.C. § 4332(C)(i). Agencies must "carefully consider [ ] detailed information concerning significant environmental impacts" and NEPA "guarantees that the relevant information will be made available" to the public. *Dep't of Transp. v. Public Citizen*, 541 U.S. 752, 768 (2004) (quoting *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989)). DOE/FE's NEPA obligations are informed by general regulations promulgated by the Council on Environmental Quality and by additional agency-specific regulations promulgated by DOE. *See* 10 C.F.R. § 1021.103 (DOE regulation adopting CEQ NEPA regulations in full). These regulations implement NEPA via procedures that "insure that environmental information is available to public officials and citizens *before* decisions are made and *before* actions are taken." 40 C.F.R. § 1500.1(b) (emphases added). Agencies must "integrate the NEPA process with other planning at the earliest possible time to insure that planning and decisions reflect environmental values." 40 C.F.R. § 1501.2. "It is DOE's policy to follow the letter and spirit of NEPA; comply fully with the [CEQ] Regulations and apply the NEPA review process early in the planning stages for DOE proposals." 10 C.F.R. § 1021.100. In particular, while an EIS is being prepared "DOE *shall take no action* concerning the proposal that is the subject of the EIS" until the EIS is complete and a formal Record of Decision has been issued. 10 C.F.R. § 1021.211 (emphasis added). More generally, prior to completion of NEPA review, CEQ directs agencies to avoid actions that would tend to "limit the choice of reasonable alternatives," or "tend[] to determine subsequent development." 40 C.F.R. § 1506.1.

For purposes of the intersection of NEPA and the NGA, the NGA designated the former Federal Power Commission as the "lead agency" for NEPA purposes. 15 U.S.C. § 717n. The lead agency prepares NEPA documents for an action that falls within the jurisdiction of multiple federal agencies. FERC has since generally filled that role, preparing the NEPA documents for LNG export and import decisions. *See* 10 C.F.R. § 1021.342 (providing for interagency cooperation). Whichever agency plays the lead NEPA role, however, DOE's ultimate NEPA obligations are the same: DOE may not move forward until the full scope of the action *it* is considering – here, the approval of LNG export – has been properly considered. Thus, if the NEPA analysis that another agency prepares is inadequate to fully inform DOE/FE's decision or discharge DOE/FE's NEPA obligations, DOE/FE must prepare a separate EIS.[8]

[8] *See Sabine Pass LNG*, FERC Dkt. CP11-72-001, 140 FERC ¶ 61,076 P 32 (July 26, 2012) ("DOE has separate statutory responsibilities with respect to authorizing the export of LNG from Sabine Pass; thus it has an independent legal obligation to comply with NEPA."), DOE/FE Dkt. 10-111-LNG, Order 2961-A, 27 (Aug. 7, 2012) (DOE/FE recognizes that it is "responsible for conducting an independent review" of FERC's analysis and determining whether "the record needs to be supplemented in order for DOE/FE to meets its statutory responsibilities under section 3 of the NGA and under NEPA.").

NEPA requires preparation of an "environmental impact statement" (EIS) where, as here, the proposed major federal action would "significantly affect[] the quality of the human environment." 42 U.S.C. § 4332(C). An EIS must describe:

> i. the environmental impact of the proposed action,
>
> ii. any adverse environmental effects which cannot be avoided should the proposal be implemented,
>
> iii. alternatives to the proposed action,
>
> iv. the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
>
> v. any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

42 U.S.C. § 4332(C). The alternatives analysis "is the heart of the environmental impact statement." 40 C.F.R. § 1502.14. Here, the proposed action is to export LNG from a to be constructed facility; DOE/FE must consider alternatives to this action. DOE/FE must take care not to define the project purpose so narrowly as to prevent the consideration of a reasonable range of alternatives. *See, e.g.*, *Simmons v. U.S. Army Corps of Eng'rs*, 120 F.3d 664, 666 (7th Cir. 1997). If it did otherwise, it would lack "a clear basis for choice among options by the decisionmaker and the public." *See* 40 C.F.R. § 1502.14.

An EIS must also describe the direct and indirect effects and the cumulative impacts of a proposed action. 40 C.F.R §§ 1502.16, 1508.7, 1508.8; *N. Plains Resource Council v. Surface Transp. Bd.*, 668 F.3d 1067, 1072-73 (9th Cir. 2011). These terms are distinct from one another: Direct effects are "caused by the action and occur at the same time and place." 40 C.F.R. § 1508.8(a). Indirect effects are also "caused by the action" but:

> are later in time or farther removed in distance, 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). Cumulative impacts, finally, 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. The EIS must give each of these categories of effect fair emphasis.

B. Relationship Between DOE/FE's Other LNG Export Analyses and DOE/FE's NEPA and NGA Obligations Here

LNG exports have the potential to significantly alter the American energy landscape, and represent a significant policy shift. As Sierra Club has repeatedly argued, DOE's existing guidance and practice are ill-suited to meeting DOE's statutory obligation of determining whether LNG exports are consistent with the public interest, and the appropriate course of action would be for DOE to promulgate new regulations or guidance defining the process by which DOE will consider applications to export LNG.[9] This revision to DOE policy should be accompanied by a programmatic EIS evaluating the environmental impacts of LNG exports. Such a programmatic EIS would allow DOE/FE and the public to understand these proposals' relationship and their cumulative environmental and economic impacts, thus improving DOE/FE's ability to make informed decisions on export terminal applications and allowing DOE/FE, the public, and industry to identify prudent alternatives to serve the public interest and minimize environmental impacts.

To date, DOE has not responded to Sierra Club's petition for rulemaking regarding LNG exports. DOE has, however, commissioned two groups of studies regarding the general effects of LNG exports. In 2012, DOE released the two part "LNG Export Study," which consisted of the Energy Information Administration ("EIA") report titled "Effect of Increased Natural Gas Exports on Domestic Energy Markets," ("EIA Export Study")[10] and the NERA Economic Consulting report titled "Macroeconomic Impacts of LNG Exports from the United States" ("NERA Study"). At DOE's request, EIA updated its export study in October 2014 ("Updated Export Study").[11] In 2014, DOE released an "Addendum to Environmental Review Documents Concerning Exports of Natural Gas from the United States,"[12] together with three supporting reports from the National Energy Technology Laboratory. DOE accepted public comments on the NERA Study and the 2014

[9] *See* Sierra Club *et al.*, Petition for Rulemaking Regarding Natural Gas Export Policy (Apr. 8, 2013), attached as Exhibit 2.
[10] *See* http://energy.gov/fe/services/natural-gas-regulation/lng-export-study.
[11] *See* http://www.eia.gov/analysis/requests/fe/ and attached as Exhibit 3.
[12] *See* http://energy.gov/fe/draft-addendum-environmental-review-documents-concerning-exports-natural-gas-united-states.

Environmental documents. While these studies provide important information, they are not a substitute for formal rulemaking or NEPA review (programmatic or otherwise). Notably, DOE did not open new dockets for these proceedings. These studies do not reach any binding conclusions here or have any precedential effect.

Instead of proceeding with programmatic treatment of these issues, DOE has determined to adjudicate each export application individually. Yet even if DOE reviews Cheniere's application in an individual docket, this does not change the scope of the required analysis or of the materials DOE must review. Accordingly, DOE's review must incorporate the following.

First, DOE must include in this docket the general reports on LNG exports discussed above. These reports, and the comments thereon, should more generally be included in the dockets for all future LNG export applications. We raise this issue because, in soliciting comments on the NERA Study and 2014 environmental reports, DOE strangely stated that the reports and comments thereon would "be included in the dockets of"[13] various subsets of the pending export applications: 15, 25, and 13 enumerated dockets for the NERA study, greenhouse gas lifecycle analysis, and general environmental addendum, respectively. Although it has been nearly three years since the NERA report was released, DOE has not revisited its list of 15 dockets or included the NERA materials in any subsequently opened dockets. We therefore incorporate our comments on the NERA Study and the 2014 environmental materials into this protest by reference.

Second, DOE must reject Cheniere's request for a categorical exclusion, Application at 4—indeed, doe cannot approve Cheniere's application without a full EIS. NEPA requires an EIS where a proposed major federal action would "significantly affect[] the quality of the human environment." 42 U.S.C. § 4332(C). If there is even a "substantial question" as to the severity of impacts, an EIS must be prepared. *See 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/FE has categorically determined, by regulation, that "[a]pprovals or disapprovals of authorizations to import or export natural gas . . . involving major operational changes (such as a major increase in the quantity of liquefied natural gas imported or exported)" will "normally require [an] EIS." 10 C.F.R. Part 1021, Appendix D, D9. Thus, a full EIS, rather than an abbreviated Environmental Assessment, is required here.

Third, the EIS and Natural Gas Act analysis must consider upstream impacts, including induced gas production and changes to U.S. energy markets. DOE's environmental addendum wrongly concluded that NEPA did not require consideration of exports' effects on induced production. Sierra Club explained the errors in this conclusion in our

[13] *See* http://www.energy.gov/fe/life-cycle-greenhouse-gas-perspective-exporting-liquefied-natural-gas-united-states.

comment on the environmental addendum, and as with all our arguments contained in those comments, we incorporate that argument here by reference. In addition, below, we provide further discussion regarding the ability to foresee impacts of induced gas production.

Because the environmental impacts of induced gas production, and similar indirect effects, must be included in the NEPA and Natural Gas Act analyses, DOE must consider alternatives that would lessen these impacts. The NGA public interest analysis requires an "exploration of all issues relevant to the 'public interest'," an inquiry which the Supreme Court held in *Udall* must be wide-ranging. In that case, which concerned hydropower, the regulatory agency was required to consider, for instance, "alternate sources of power," the state of the power market generally, and options to mitigate impacts on wildlife. 387 U.S. at 450. Under NEPA, the alternatives analysis is "the heart of the environmental impact statement," designed to offer "clear basis for choice among options by the decisionmaker and the public." 40 C.F.R. § 1502.14. Crucially, the alternatives must include "reasonable alternatives not within the jurisdiction of the lead agency," and must include "appropriate mitigation measures not already included in the proposed action or alternatives." *Id.* Here, alternatives that could lessen the indirect environmental effects include:

1. Whether export from other locations would better serve the public interest by mitigating or better distributing economic or environmental impacts;

2. Whether limitations on the sources of exported gas – e.g., limiting export from particular plays, formations, or regions – would help to mitigate environmental and economic impacts;

3. Whether conditioning export on the presence of an adequate regulatory framework, including the fulfillment of the recommendations for safe production made by the DOE's Shale Gas Subcommittee, would better serve the public interest by ensuring that the production increases associated with export will not increase poorly regulated unconventional gas production;

4. Whether to delay, deny, or condition exports based upon their effect on the U.S. utility market (including changes in air pollution emissions associated with the impacts of increased export demand on fuel choice);

5. Whether to require exporters to certify that any unconventional gas produced as a result of their proposal (or shipped through their facilities) has been produced in accordance with all relevant environmental laws and according to a set of best production practices (such as that discussed by the DOE's Shale Gas Subcommittee);

6. Whether to permit exports only if the export facilities are designed and operated so as to minimize their environmental impacts;

Fourth, DOE must consider the cumulative impact of all pending and completed export applications. The public, after all, will not experience each proposed terminal as an individual project: It will experience them cumulatively, through the gas and electricity prices that they will raise and the environmental damage that they will cause. All analysts and observers have agreed, for example, that higher volumes of exports will cause greater gas price increases. Indeed, several models indicate that prices increase non-linearly with export volumes. That is, going from 4 to 6 bcf/d in exports, for example, may impact domestic prices more than going from 0 to 2 bcf/d.[14]

DOE/FE cannot shirk the obligation to consider the full volume of proposed exports by asserting that it is uncertain whether these exports will occur. Here, DOE/FE cannot rule out as speculative the possibility of all proposed exports occurring. We note that EPA has repeatedly and explicitly argued that NEPA review of proposed export projects include "the context of the larger energy market, including existing export capacity *and export capacity under application to the Department of Energy*."[15]

If DOE/FE looks—wrongly—only at the range of exports it deems likely to occur, DOE/FE must not underestimate this likelihood. In particular, although Sierra Club has repeatedly explained that the NERA study underestimates the likely market for U.S. LNG exports, DOE/FE's recent conditional authorizations have not addressed many of Sierra Club's arguments.[16] NERA concluded that exports would only occur when the spread between US gas prices and prices in potential foreign markets exceeded the cost of

[14] Robert Brooks, *Using GPCM to Model LNG Exports from the US Gulf Coast* (2012), available at http://www.rbac.com/press/LNG%20Exports%20from%20the%20US.pdf, attached as Exhibit 4. One reason prices may increase this way is that domestic gas consumers differ in their ability to reduce gas consumption. *Id.* at 7. As export volumes increase, increasing numbers of inflexible domestic consumers are forced to compete with exports, further driving up prices. When export volumes are lower, by contrast, price-sensitive domestic consumers can respond to price increases by reducing their consumption, freeing gas supplies for exports and limiting price impacts. The Brooks study, which estimates low price-sensitivity, predicts significantly higher price increases than the EIA Export study. *Id.* at 5, 7. Similarly, in a report by Deloitte MarketPoint that considered multiple export volumes, Deloitte predicted that doubling exports will more than double price impacts thereof. Deloitte MarketPoint, *Analysis of Economic Impact of LNG Exports from the United States*, at 3, 24, attached as Exhibit 5(originally filed as Appendix F to Excelerate Liquefaction Solutions I, LLC, *Application for Long-Term, Multi-Contract Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Countries*, DOE/FE Dkt. 12-146-LNG (Oct. 5, 2012)).

[15] *See, e.g.,* EPA, Scoping Comments – The Jordan Cove Energy Project LP, FERC Dkts. PF12-7 and PF12-17, at 3 (Oct. 29, 2012) (emphasis added), attached as Exhibit 6. *See also* EPA, Scoping Comments – Cove Point Liquefaction Project, FERC Dkt. PF12-16-000, at 2 (Nov. 15, 2012), attached as Exhibit 7; EPA, Scoping Comments – The Oregon LNG Export Project and Washington Expansion Project, FERC Dkts. PF12-18 and PF12-20, at 3 (Dec. 26, 2012), attached as Exhibit 8.

[16] *See, e.g.*, Jordan Cove, DOE Order 3413.

liquefying, transporting, and regassifying US produced gas. But NERA overstates these transaction costs and ignores the ways in which "take-or-pay" contracts distort this market.

As to transaction costs, proposed West Coast terminals will have significantly lower costs for export to Asia than will the Gulf Coast facilities NERA considered. The proponents of the proposed Jordan Cove Energy Project explained that its transportation costs to Japan were significantly lower than those assumed by the NERA Study. Although Jordan Cove Energy Project would face higher facility construction and thus liquefaction costs than Gulf Coast facilities, Jordan Cove asserts that, in aggregate, its total processing and transportation costs will be $0.44/MMBtu lower than the estimates used by NERA.[17] Accordingly, insofar as the cost of processing and transporting LNG sets the ceiling on price increases resulting from exports, that ceiling could be $0.44/MMBtu higher than the NERA Study estimates. $0.44/MMBtu represents roughly 5 to 10% of NERA's predicted 2035 wellhead gas prices, meaning NERA may have significantly underestimated the price range within which exports will occur.[18] Although Sierra Club raised this argument in its initial and reply comments on the NERA study,[19] DOE/FE has not addressed it in its export conditional authorizations.[20]

As to contract structure, previous export applicants have adopted "take or pay" liquefaction services arrangements, wherein would-be importers will be required to pay a fee to reserve terminal capacity, regardless of whether that capacity is actually used to liquefy and export gas.[21] The "pay" provision constitutes a sunk cost that will effectively raise the price ceiling under which exports will occur. For example, if the cost to liquefy, transport, and regassify gas is $4/MMBtu, but an importer has entered a "take or pay" contract reserving terminal capacity but requiring payment of $1.50/MMBtu[22] for unused capacity, the importer will have an incentive to import gas so long as the spread between US and foreign prices exceeds $2.50/MMBtu, whereas NERA predicts that no exports will occur once the price spread falls below $4/MMBtu. Exports may continue to occur – and domestic prices may therefore continue to rise – even where NERA predicts

[17] Comment of Jordan Cove Energy Project on NERA study, at 2 (Jan. 24, 2013), available at http://www.fossil.energy.gov/programs/gasregulation/authorizations/export_study/Joan_Darby01_24_13.pdf, attached as Exhibit 9.

[18] Macroeconomic Impacts of LNG Exports from the United States ("NERA Study"), at 50.

[19] Sierra Club Initial comments on NERA Economic Consulting's study ("Initial NERA Comment"), at 12-13, Sierra Club Reply comments on the NERA Economic Consulting's study, ("Reply NERA Comment") at 11-12; *see also* Jordan Cove, DOE/FE Order 3413, at 116 (summarizing this argument).

[20] *See, e.g.,* Jordan Cove, DOE/FE Order 3413, at 116, 122-123.

[21] *See Sabine Pass* DOE Order No. 2961, at 4 (May 20, 2011); Cheniere Energy April 2011 Marketing Materials, *available at* http://tinyurl.com/cqpp2h8 (last visited Sept. 3, 2014) and attached as Exhibit 10, at 14.

[22] Within the $1.40 to $1.75/MMBtu range of "capacity fees" contemplated by Sabine Pass's parent company, Cheniere Energy April 2011 Marketing Materials at 14.

that exports will cease.[23] Again, in its recent conditional authorizations, DOE/FE has ignored this aspect of Sierra Club's argument. Sierra Club does not contend that contracts will "lock up natural gas for export" such that exports will occur regardless of market conditions in the US or abroad.[24] Instead, Sierra Club has shown that market forces and the industry structure will likely cause exports to occur in certain conditions where NERA concluded that exports would not, such that the overall volume of exports is likely to be higher than NERA forecasts. Thus, DOE/FE's cumulative impact analysis must not be limited to the volumes of exports the NERA study predicts, both because DOE/FE's statutory obligations prevent DOE/FE from excluding proposed projects from the cumulative effects analysis on the assumption that those projects are economically unlikely to occur, and because NERA understates the range of projects that are likely to occur. We further note that EIA's most recent Annual Energy Outlook forecasts 9.6 bcf/d of US LNG exports by 2029.[25]

C. DOE Must Reject Cheniere's Request for use of a NEPA Categorical Exclusion

Cheniere argues that DOE can forgo detailed NEPA review of this application because it falls within the scope of the categorical exclusion codified at 10 C.F.R. Part 1021, Subpart D, Appendix B, B5.7, which applies to "[a]pprovals or disapprovals of new authorizations or amendments of existing authorizations to import or export natural gas under Section 3 of the NGA that involve minor operational changes (such as changes in natural gas throughput, transportation, and storage operations) but not new construction." *See* Application at 4.

An increase in exports of 203 bcf/y—nearly one percent of U.S. dry gas production, and a 25 percent increase over the previously approved exports—is not a "minor" change, and therefore outside the scope of this categorical exclusion. 10 C.F.R. Part 1021, Subpart D, Appendix D, D9 (EIS normally required for "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)"). This increase also does require some "new construction," as some piping, etc., was changed pursuant to FERC letter orders since DOE's previous review of exports from these facilities. More broadly, CEQ regulations preclude use of a categorical exclusion here, where it is clear that the scale of the project's indirect effects may be significant. *See* 40 C.F.R. § 1508.4 (agency cannot apply categorical exclusion where circumstances show that the action "may have a significant environmental effect."),

[23] *See* NERA Study, at 37-46.
[24] Jordan Cove, DOE Order 3413, at 118.
[25] *See, e.g.* EIA, 2014 Annual Energy Outlook, MT-22 (May 7, 2014) (predicting an increase of net exports of 3.5 trillion cubic feet per year, or 9.6 bcf/d, by 2029), available at http://www.eia.gov/forecasts/aeo/pdf/0383(2014).pdf.

D. Cheniere's Proposal Will Have Numerous Harmful Environmental and Other Effects and Is Contrary to The Public Interest

LNG exports will have wide ranging effects on the public and environment. Gas exported as LNG must come from somewhere. The only options are an increase in domestic supply to match this new demand or a decrease in other domestic consumption to free up gas that would otherwise be used elsewhere, both of which have significant environmental impacts. The US will likely see a combination of both, as explained in the EIA's LNG Export Study and numerous other analyses. These analyses uniformly agree that the predominant effect will be an increase in supply, provided by gas producers increasing their output in response to exports' demand. The extra demand created by exports will also cause increases in domestic gas prices, which will cause some domestic consumers to reduce their consumption.

Thus, the proposed project will impact the environment on many levels:

- At and near the terminal site, as a result of construction and operation of the liquefaction and export facilities.
- In the regions where gas production increases in response to exports.
- Nationwide, as higher gas prices increase utilization of other fuels.
- Globally, as greenhouse gas emissions increase as a result of increased gas production and combustion.

Each level of impacts carries environmental cost—which have significant economic impact—as well as more traditional economic impacts. For example, increases in domestic gas prices will limit real wage growth, eliminate jobs in manufacturing and other domestic industries, disrupt communities, and regressively transfer wealth from working class families to large corporations. Available evidence indicates that even when these environmental and intra-US distributional effects are ignored (although they must not be), LNG exports will likely have a negative impact on GDP and other measures of aggregate welfare.[26] Each of these adverse impacts requires additional consideration in the NEPA process and in DOE/FE's ongoing review of the economic impacts of gas exports. Even the evidence of adverse impacts available now, however, greatly overwhelms Cheniere's assertion that its proposal will provide public benefits.

DOE/FE cannot rely on its prior authorization of exports from other terminals to demonstrate that the current application is in the public interest. Prior decisions by DOE/FE are not binding and the agency retains an independent duty to determine whether an application is, in fact, in the public interest. *See* 10 C.F.R. § 590.404.

[26] *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); *see also* Wallace Tyner, Initial Comment on NERA Study (Jan. 14, 2013) (summarizing the results of the above study), attached as Exhibit 11.

1. Induced Gas Production

Severe environmental impacts will result from increased gas production. Cheniere, the EIA, NERA, essentially every other LNG export applicant, and other informed commenters all agree that LNG exports will induce additional production in the United States. EIA, for example, anticipates that production will increase by roughly 63% of the amount of demand created by exports.[27] DOE has recognized the climate impacts of this additional production can be assessed without knowing where this production will occur. Even where DOE determines that analysis of environmental impacts requires predictions regarding the location of additional production, available tools allow DOE to predict where increased production will occur. NEPA and the NGA therefore require DOE/FE to consider the effects of this additional production.

a. Cheniere's Proposal Will Induce Additional U.S. Gas Production

LNG exports represent a new source of gas demand, composed of both the volume of gas exported as well as with the gas necessary for the operation of export facilities.

EIA and private modelers agree that the exports at issue in this application will cause an increase in domestic gas production equivalent to "about 61% to 84% of the increase in natural gas demand from LNG exports." Updated Export Study at 12. EIA further predicts that "Increased natural gas production from shale gas resources provides about 72%" of the total supply increase. *Id.* at 16.

While DOE has previously stated that it is uncertain where additional production induced by exports would occur, DOE has not acknowledged—much less discussed—the models that have been developed to provide precisely this kind of prediction.

As Sierra Club explained in comments on the DOE Addendum, EIA's National Energy Modeling System[28] and Deloitte Marketpoint's world gas model[29] are sophisticated tools that can predict where this additional production is most likely to occur. Indeed, EIA has *already provided* region-specific predictions of increases in gas production *in response to DOE's own request*, both in connection with the 2012 EIA Export Study and the 2014 Updated Export Study.[30]

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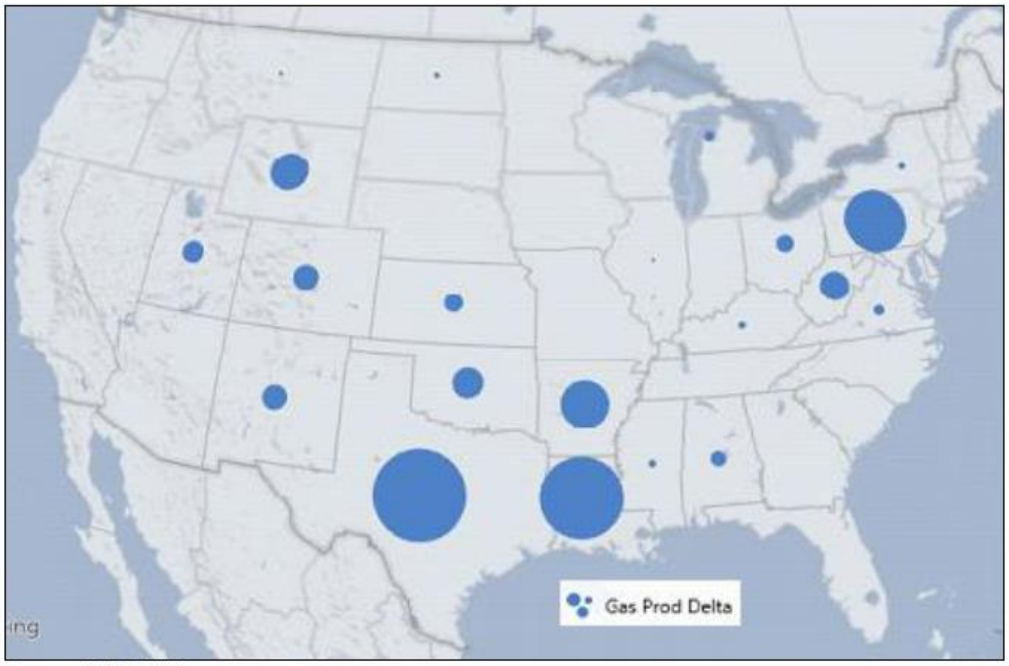
[27] EIA Export Study at 6, 10.
[28] *See* Sierra Club, et al., Comments on DOE Environmental Addendum, page 6, and Exhibits 1 – 3 thereto.
[29] *Id.* at 7 and Exhibit 4 thereto.
[30] *See* http://www.eia.gov/oiaf/aeo/tablebrowser/#release=FE2014&subject=0-FE2014&table=72-FE2014&region=0-0&cases=refaeo-d062614a,ref12-d080214a,ref16-d080214a,ref20-d080214a,ref20p-d100614a

Another report, by ICF, has already published forecasts of state-specific increases in gas production in response to exports.[31] The ICF State Level Impact study uses a detailed model of new production in response to exports. That report's map of predicted production increases in response to the particular LNG export scenario used by the authors is provided below.[32] This same tool could likely be used to predict where production would increase in response to Cheniere's particular project. Alternatively, the general export scenario already conducted by this study provides a basis for evaluating the cumulative impacts of proposed export projects.

Figure 1: ICF Forecast of Natural Gas Production Changes Caused by LNG Exports, 2025



Source: ICF GMM

Note: The map above shows the relative natural gas production changes in the ICF Base Case in 2025 (relative to the Zero LNG Exports Case).

We offer no opinion at this time about the strengths or weaknesses of these private models relative to EIA's. We simply note that multiple tools exist which allow predictions of how and where production will respond to exports.

b. Harms Caused by Induced Gas Production

This additional gas production would have significant environmental impacts. Natural gas production is a significant air pollution source, can disrupt ecosystems and watersheds, leads to industrialization of entire landscapes, and presents challenging

[31] *See* U.S. LNG Exports: State-Level Impacts on Energy Markets and the Economy (November 13, 2013), available at http://www.api.org/~/media/Files/Policy/LNG-Exports/API-State-Level-LNG-Export-Report-by-ICF.pdf, and attached as Exhibit 12.
[32] *Id.* at 15.

waste disposal issues. As we have explained in our prior comments incorporated herein by reference, DOE must consider these harms as part of the NEPA and Natural Gas Act assessments.

DOE has understated the air pollution emissions caused by natural gas production. As we explained in our comments on the DOE environmental materials, while DOE estimates, on the basis of emission factors and component counts, that gas production has a methane leak rate of 1.3 to 1.4%, numerous peer reviewed studies that have measured methane in the atmosphere indicate that the actual leak rate is more likely to be 3%.[33] Since the DOE environmental materials were 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] Emissions of methane are generally correlated with emissions of volatile organic chemicals (VOC) and other pollutants, as we explain below.

Of particular concern for the Cheniere project are ozone impacts of induced gas production, especially because the majority of production induced by the Cheniere project is likely to occur in nearby shale gas plays and exacerbate existing unhealthy ozone levels in the region. Oil and gas production is a significant source of VOC and nitrogen oxides (NO_x), which lead to ozone formation. Numerous areas of the country with heavy concentrations of drilling are now suffering from serious ozone problems.[35] For example, the Alamo Area Council of Governments recently concluded that increasing oil and gas production in the Eagle Ford shale would increase 8-hour ozone design values at regional air quality monitors by 0.5 to 0.7 parts per billion.[36] This report explained that in light of these increases, "If the EPA lowers the 8-hour ozone standard, it will be difficult for the San Antonio-New Braunfels MSA to meet that lower attainment threshold."[37] On October 1, 2015, EPA did in fact finalize a rule lowering the ozone standard from 75 to 70 parts per billion.[38]

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[33] Sierra Club, et al., Comments on DOE Export Life Cycle Analysis, at 7.

[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, attached as Exhibit 13(see pages 22 to 23 of "Just Accepted" manuscript)

[35] See Sierra Club Comment on Environmental Addendum, at 16 – 19.

[36] Alamo Area Council of Governments, *Development of the Extended June 2006 Photochemical Modeling Episode: Technical Report* (October 2013), available at https://www.aacog.com/DocumentCenter/View/19262 and attached as Exhibit 14.

[37] *Id*. at v. *See also* Ahmadi, Mahdi and Kuruvilla John, *An evaluation of the spatio-temporal characteristics of meteorologically-adjusted ozone trends in North Texas*, Air Quality Technical Meeting NCTCOG: Arlington, TX (Apr. 17, 2014) (modeling recent history Barnett Shale gas well contribution to ozone levels in the Dallas/Fort Worth area), *available at* http://www.nctcog.org/trans/committees/aqtc/041714/Item.4.pdf and attached as Exhibit 15.

[38] U.S. EPA, *National Ambient Air Quality Standards for Ozone*, available at http://www3.epa.gov/airquality/ozonepollution/pdfs/20151001fr.pdf and attached as Exhibit 16.

As we have discussed above, EIA indicates that 84% of the gas demand created by the Cheniere proposal could come from new production. Because total demand equals the volume of exports plus gas consumed in the liquefaction process (which EIA predicts to add 10% to total demand), Cheniere's proposal represents 223 bcf/year of new demand, and could cause 188 bcf/year of new production.

A significant fraction of the gas produced will leak during the gas lifecycle. Here, we provides estimates emissions associated with production induced by Cheniere under multiple leak rates, including a 1% leak rate (which is included as a truly conservative case to reflect successful air pollution controls far more extensive than those which EPA has promulgated), the 1.4% figure used in the NETL GHG lifecycle study, and the 3.0% leak rate provided by the Miller *et al.* PNAS study.[39] We emphasize, however, that even the 3.0% leak rate is likely to be conservative. In the 17 months since the NETL reports were released, numerous additional peer-reviewed studies have been published that provide further indication that the actual amount of natural gas emitted during the gas lifecycle exceeds NETL's estimate.[40] DOE must acknowledge this additional science.

For any given leak rate and volume of production, EPA conversion factors allow us to estimate the emissions of individual pollutants included in the 'leaks.'[41] Here, we estimate for methane, VOC, and HAP.

Table 1: Emissions Associated with Production of 474 bcf/y of Natural Gas

[39] Sierra Club, et al., Comments on DOE Export Life Cycle Analysis, at 9.

[40] Schneising, O, et al. (2014) Remote sensing of fugitive methane emissions from oil and gas production in North American tight geologic formations. Earth's Future. dx.doi.org/10.1002/2014EF000265, and attached as Exhibit 17. Lavoie et al. (2015). Aircraft-based measurements of point source methane emissions in the Barnett Shale Basin. ES&T. dx.doi.org/10.1021/acs.est.5b00410, attached as Exhibit 18. Lyon et al. (2015). Constructing a spatially resolved methane emission inventory for the Barnett Shale region. ES&T. dx.doi.org/10.1021/es506359c, attached as Exhibit 19. Marchese et al. (2015). Methane emissions from United States natural gas gathering and processing. ES&T. dx.doi.org/10.1021/acs.est.5b02275, attached as Exhibit 20. McKain et al. (2015). Methane emissions from natural gas infrastructure and use in the urban region of Boston, Massachusetts. PNAS. dx.doi.org/10.1073/pnas.1416261112, attached as Exhibit 21. Zimmerle et al. (2015). Methane emissions from the natural gas transmission and storage system in the United States. ES&T. dx.doi.org/10.1021/acs.est.5b01669, Exhibit 22.

[41] EPA, Oil and Natural Gas Sector: Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution, Background Technical Support Document for the Proposed Rules, at 2-4 (July 2011) ("2011 TSD"), at Table 4.2. EPA calculated average composition factors for gas from well completions. EPA's conversions are: 0.0208 tons of methane per mcf of gas; 0.1459 lb VOC per lb methane; and 0.0106 lb HAP per lb methane. These estimates, which are based on a range of national data, provide a beginning point for quantitative work, although greater precision could be provided using forecasts of the distribution of production likely to be induced by the Cheiere project and emission rates particular to those plays.

Leak Rate	Methane (tons)	VOC (tons)	HAP (tons)
1%	39,104	5,705	415
1.40%	54,746	7,987	580
3.00%	117,312	17,116	1,244

Thus, Cheniere's proposal would be responsible for thousands of tons of increased air pollution. For perspective, these emissions are far above the thresholds for "major" source permitting under the Clean Air Act, which are generally just tens of tons of pollution; for greenhouse gases, the threshold is generally 75,000 tons of carbon dioxide equivalent (note that the table above expresses methane as tons of methane, rather than tons of carbon dioxide equivalent). Cheniere would thus greatly increase air pollution in the regions from which it draws its gas, imperiling public health and the global climate.

NETL provides another method of estimating these impacts, illustrated by NETL's bottom-up estimate of NOx emissions.[42] 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.[43] Using NETL's assumption of a combined cycle power plant efficiency of 46% and EIA's estimate of a natural gas heat content of 1025 British thermal units per cubic foot,[44] NETL indicates that production and transmission of natural gas emits 87 metric tons of NOx per bcf of gas. Thus, once DOE/FE determined the amount of additional production that would occur in the nearby Haynesville, Barnett, and Eagle Ford Shale Plays, 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.

2. Environmental Impacts of Increased Domestic Gas Prices

Just as all observers agree that exports will increase gas production, all observers agree that exports will increase domestic gas prices. As we explain elsewhere, the EIA and NERA studies, and materials submitted in connection with this application, all understate the likely price increase that would result from proposed LNG exports.

[42] NETL, Life Cycle Analysis of Natural Gas Extraction and Power Generation, DOE/NETL-2014/1646, at 52-54 (May 29, 2014).
[43] *Id.*at Figure 4-19, "Life Cycle NOx Emissions for Natural Gas Power Using Domestic Natural Gas Mix."
[44] http://www.eia.gov/tools/faqs/faq.cfm?id=45&t=8

These price increases will, in turn, likely increase greenhouse gas emissions from the U.S. electricity sector, as some U.S. generators shift from natural gas to coal. We discussed this effect in our comment on DOE's materials regarding the environmental effects of LNG exports.[45]

3. Environmental Impacts of End User Consumption of LNG

As we explain in our incorporated comment regarding DOE's environmental addendum and life cycle analysis, end user combustion of exported LNG will emit extensive greenhouse gases, and these emissions will only partially be offset by displacement other fossil fuel combustion. DOE must consider:

- The fact that NETL underestimates the amount of methane emitted per unit of gas production, as indicated by the weight of peer reviewed literature
- The fact that NETL underestimates the global warming impact of each ton of methane emitted, by using a global warming potential other than the one recommended by the IPCC
- The fact that a significant fraction of gas exported from the US will not be used to "displace" other fossil fuels, but will instead displace renewables or conservation
- The international policy of affording greater weight to emissions a country has regulatory authority over, under the United Nations Framework Convention on Climate Change.

In addition, DOE must consider not only the need to halt emissions growth but the need to produce severe global reductions in greenhouse gas emissions in the next two decades. This factor is particularly important because the NETL report concluded that using US-sourced LNG in lieu in coal has a relatively small climate benefit—as a percentage, much less than U.S. and international emission reduction targets. However, if new infrastructure is constructed to replace coal with LNG, this infrastructure will "lock in" emissions at that rate for decades. Accordingly, DOE must not simply measure emissions against the status quo—it must measure them against the trajectories adopted as climate targets, both by U.S. policy and by international agreements to which the U.S. is a party.

4. Economic Impacts

As we have shown, LNG exports will have significant adverse environmental impacts, which must be weighed against any potential economic benefits in DOE's Natural Gas Act public interest analysis. The potential economic benefits, however, are overstated. Indeed, available evidence indicates that even from a purely economic perspective

[45] Sierra Club, et al., Comments on DOE Export Life Cycle Analysis at 4-5.

(ignoring, inappropriately, economic impact of environmental harm), the project is contrary to the public interest. Based on a sober assessment of likely economic impacts, rather than balancing environmental harm against economic benefit, DOE will find both environmental and economic factors indicating that the application is contrary to the public interest and must be denied.

To determine consistency with the public interest, DOE cannot look at price impacts in isolation: DOE must look at the effect given price increases will have on the public (together with the other aspects of the public interest inquiry). Available evidence, including the NERA study DOE commissioned, indicates that the exports Cheniere proposes will decrease wages and make most US families worse off. Cheniere's pending application provides minimal discussion of these issues. As we have explained in comments on the NERA study, the project will likely cause net economic harm even if environmental impacts are excluded from consideration. When environmental impacts (and their economic effects) are considered in addition to these purely economic harms, as they must be, it is clear that the project is contrary to the public interest.

Cheniere does not acknowledge, much less discuss, the economic harms exports will cause. Domestic gas price increases that will result from exports will have far-reaching effects on the U.S. economy. Consumers will face higher total gas bills despite reducing their consumption of gas. Employment and wages in energy-intensive industries such as manufacturing will decline because of reduced gas prices. Even in regions where export spurs additional gas production, temporary growth in jobs will likely lead to long-term economic decline, as these regions suffer from the "resource curse" and boom-bust cycle that plagues extractive economies. The result will be decreases in real wage growth for the overwhelming majority of Americans who do not own (directly or indirectly) stock in gas producing companies, as well as decreases in nationwide employment.[46] As with environmental effects, DOE/FE cannot approve the pending application without thoroughly considering these impacts. If DOE/FE were to make a decision on the available evidence, DOE/FE would have to conclude that these impacts render exports contrary to the public interest.

Perhaps the most immediate and dramatic economic effect of exports will be job losses in energy intensive industries, such as manufacturing. Research on the effects of LNG export in Australia, which has already accumulated experience with gas exports, demonstrates the adverse effects exports can have on domestic industry.[47] The NERA study indicates that similar adverse effects are likely to occur in the U.S., despite the fact that the NERA study was not designed to capture these effects. Specifically, NERA

[46] EIA Export Study, at 6, 14; NERA Study, at 8-9.

[47] National Institute of Economic and Industry Research, "Large scale export of East Coast Australia natural gas: Unintended consequences." A report to the Australian Industry Group and the Plastics and Chemicals Industries Association, October 2012, attached as Exhibit 23 (full document), Exhibit 24(summary).

predicts declines in wage income for each of its export scenarios, and changes in wage growth can be translated into losses of job equivalents (as NERA has done using the same model elsewhere). According to NERA, exports will cause these industries to suffer job losses in the tens to hundreds of thousands.[48]

Even gas producing regions will likely be worse off in the long term, despite short-term job growth as a result of increases in gas production. "Resource curse" effects are well documented in the economic literature. One of the most comprehensive surveys, by Professors Freudenburg and Wilson, of economic studies of "mining" communities (including oil and gas communities) concludes that the long-term economic outcomes are "consistently and significantly negative."[49] Headwaters Economics performed a similar study in 2009, documenting this trend in western U.S counties which focused on resource extraction rather than more durable economic growth strategies. The Headwaters study looked at the performance of "energy-focusing" regions compared to comparable counties over the decades since 1970.[50] It concludes that "counties that have focused on energy development are underperforming economically compared to peer counties that have little or no energy development."[51] A third study, by Amanda Weinstein and Professor Mark Partridge of Ohio State University, found this general trend to apply specifically to communities where shale gas extraction is occurring.[52] Using Bureau of Economics Analysis statistics, the Ohio study directly compared employment and income in counties in Pennsylvania with significant Marcellus drilling and without significant drilling, and before after the boom started.

Communities where resource extraction occurs will suffer further harms not captured by these examinations of job statistics. Raw numbers of jobs or job-equivalents fail to capture the continuity or quality of jobs, but as we explain elsewhere, the gas production jobs that exports will create are typically short-term jobs, whereas the manufacturing and energy-intensive industry jobs it will eliminate are typically stable and long-term.[53]

These adverse effects on rate payers, employees in energy intensive industries, and communities where production occurs mean that exports will have grave distributional

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[48] Sierra Club Initial NERA Comments, at 8, Ex. 5 thereto (Synapse Report) at 5.
[49] W.R. Freudenburg & L.J. Wilson, *Mining the Data: Analyzing the Economic Implications of Mining for Nonmetropolitan Regions*, 72 Sociological Inquiry 549 (2002) at 549, attached to Initial Sierra Club NERA comments as Exhibit 13.
[50] Headwaters Economics, *Fossil Fuel Extraction as a County Economic Development Strategy: Are Energy-Focusing Counties Benefiting?* (revised July 2009), attached to Initial Sierra Club NERA comments as Exhibit 14.
[51] *Id.* at 2.
[52] Amanda Weinstein and Mark D. Partridge, *The Economic Value of Shale Natural Gas in Ohio*, OHIO STATE UNIVERSITY, Swank Program in Rural-Urban Policy Summary and Report (December 2010) ("Ohio Study"), attached as to Initial Sierra Club NERA comments as Exhibit 16.
[53] Sierra Club Initial NERA Comment at 20-21.

effects, as they harm wage-earning households and reduce employment while providing benefit to the relatively few shareholders in gas industries.[54] The NERA study attempts to downplay this fact by arguing that benefits realized by gas production companies are realized by "consumers" generally, because "[c]onsumers own all production processes and industries by virtue of owning stock in them."[55] As Sierra Club explained, however, only about half of American families own any stock at all, and only a small subset of stock owners own stocks in the gas production companies that will benefit from exports.[56] Moreover, the NERA study wrongly assumes that gas production and liquefaction service companies are American owned, but as Sierra Club explained in its comments on the NERA study, this assumption is incorrect.[57] Thus, in describing who will economically benefit from exports, NERA overstates both the extent to which benefits will accrue to most Americans and the extent to which benefits will accrue to Americans at all. In the Freeport Conditional Authorization, DOE/FE refused to examine this issue, assuming that foreign investment in gas production would cause a dollar-for-dollar displacement of domestic investment in other industries. Order 3282 at 93. DOE/FE did not identify any evidence of this, nor any analysis of its implications. Of course, as the NERA study indicates, exports will have winners and losers. It may be that, because foreign investors already own shares of gas companies, this has freed up American investment money for other industries, but the NERA study provides no indication that those other industries will receive the same benefits the foreign owners of gas companies will receive as a result of exports. For all these reasons, most Americans will not share in the benefits of LNG exports.

Because LNG exports will cause all Americans to pay higher energy rates, they will cause many Americans to lose their jobs, and they will benefit only a few Americans, who are generally already wealthy and who own shares of companies in a few industries, it is clear that most Americans will be worse off with LNG exports than they would be without them. DOE/FE's Freeport Conditional Authorization refused to acknowledge this evidence, concluding that this evidence was not "sufficiently compelling" to demonstrate that the harmful distributional effects of exports outweigh the minimal GDP growth forecast by NERA. Order 3282 at 75. DOE/FE's only explanation as to the purported deficiency in this evidence was that "None of the commenters [making distributional arguments] has performed a quantitative analysis of the distributional consequences of authorizing LNG exports at the household level." *Id.* In light of the aggregate job data, ratepayer effects, and shareholder data provided by the Sierra Club, there is no apparent reason why a household-level study is necessary.

[54] *See, e.g.,* Sierra Club Initial NERA Comments, at 10.
[55] NERA Study, at 55 n.22.
[56] Sierra Club Initial NERA Comment, Ex. 5, 9-10.
[57] Foreign investment in wells. http://bridgemi.com/2013/06/canadian-firm-plans-fracking-campaign-that-could-require-4-billion-gallons-of-michigan-water/, attached as Exhibit 25.

The Obama Administration has repeatedly emphasized the need to avoid regressive policies that transfer wealth from the middle classes to the wealthy.[58] The President recently explained that "Our economic success has never come from the top down; it comes from the middle out. It comes from the bottom up."[59] Similarly, the President has warned against short-sighted management of wealth. As he explained in the 2009 State of the Union address, the nation erred when "too often short-term gains were prized over long-term prosperity, where we failed to look beyond the next payment, the next quarter, or the next election."[60] DOE/FE must not allow a "surplus [to] bec[o]me an excuse to transfer wealth to the wealthy instead of an opportunity to invest in our future."[61] Thus, LNG exports are at odds with fundamental aspects of executive policy.

Before granting Cheniere's or any other would-be exporter's application, DOE/FE must analyze exports' implications for the economy not just on a macroeconomic scale, but also at local and regional levels; it must consider the effects of increasing U.S. dependence on resource exports on gasfield communities, domestic industry, and the environment; and it must consider counterfactuals, allowing it to evaluate whether the national would be better off without LNG export, or with lower export volumes.[62]

In summary, the NGA's "public interest" test requires DOE/FE to determine whether the country would be better off with Cheniere's proposal than without it. Information in the record demonstrates that exports will transfer wealth from the many to the few.

a. GDP Impacts

The NERA Study's broad conclusion that the US would be better off with exports, or that the net effect of exports is positive, rests almost entirely on a forecast of net GDP growth as a result of exports. DOE/FE rested on this conclusion in refusing to consider distributional effects in the Freeport Conditional Authorization. Order 3282 at 75. Even on this narrow issue, however, the NERA Study's conclusion is contradicted by other available studies, such as the comprehensive model of LNG exports' impacts conducted recently by Purdue University economists Kemal Sarica and Wallace E. Tyner.[63] The Tyner study found that exports would cause a net reduction in GDP, and acknowledged that its methodology, like NERA's, excluded numerous other factors that would further drive down GDP.

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[58] *See, e.g.,* State of the Union Address (January 24, 2012), attached as Exhibit 26, available at http://www.whitehouse.gov/the-press-office/2012/01/24/remarks-president-state-union-address

[59] Remarks by the President at the Daimler Detroit Diesel Plant, Redford, MI (Dec. 10, 2012), attached to Initial Sierra Club NERA comments as Exhibit 8.

[60] State of the Union Address (Feb. 24, 2009), attached to Initial Sierra Club NERA comments as Exhibit 9.

[61] *Id.*

[62] *See* Sierra Club Initial NERA Comments; *see also* Sierra Club Reply NERA Comment.

[63] *See* Kemal Sarica & Wallace E. Tyner, *Economic and Environmental Impacts of Increased US Exports of Natural Gas* (Purdue Univ., Working Paper, 2013), attached as Exhibit 27.

Among these excluded factors are the environmental impacts of gas production, and of the failure to regulate it. These impacts must be factored into assessment of exports' net and distributional impacts. In terms of net impacts, the economic cost of environmental harm, such as the cost of increased air emissions, erodes (if not entirely erases) the net benefit NERA purports to find. Although DOE/FE cannot limit its consideration of environmental impacts to those that are easily monetizable, DOE/FE must, at a minimum, apply available tools to estimate the economic impacts of environmental harms.

Thus, even putting aside the serious distributional concerns identified in the previous section, and the environmental and other effects that can be difficult to monetize, exports' costs are likely to outweigh their benefits. DOE/FE therefore cannot use the NERA Study's prediction of an increase in GDP as evidence that exports will in fact be consistent with the public interest.

E. DOE/FE Cannot Rationally Approve Cheniere's Export Plan On the Record Before It

The NGA, and subsequent DOE delegation orders and regulations, charge DOE/FE with determining whether or not a gas export application is in the public interest. *See, e.g.* 15 U.S.C. § 717b(a). DOE/FE must make this decision on the record before it. This means that, regardless of DOE/FE's decision to presume, initially, that an application should be granted, this presumption does not, and cannot, absolve DOE/FE of its duty to make its *own* determination. *Panhandle Producers and Royalty Owners Ass'n*, 822 F.2d at 1110-11. Simply put, "the *agency* must examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made." *Motor Vehicle Mfrs. Ass'n of the United States v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (emphasis supplied). DOE/FE cannot rationally find for Cheniere on the record in this case.

As we have demonstrated, record support for Cheniere's claimed benefits is extraordinarily thin. Cheniere has submitted no detailed studies or information demonstrating the specific benefits expected from its proposed LNG exports, instead relying on the EIA and ICF studies.

Sierra Club, on the other hand, has shown that the gas and electricity price increases associated with exports will add billions of dollars in costs to consumers. These costs will propagate through the economy, retarding growth. We have also shown that the economic benefits, if any, associated with gas production increases may actually do long-term damage to the U.S. economy by plunging large regions of the country into a boom-and-bust extractive cycle. Further, we have shown that gas extraction and export have major environmental (and, hence, additional economic) costs, which Cheniere has failed to even acknowledge.

On this record, DOE/FE cannot approve export. Were it to do so, it would be violating basic norms of agency record rulemaking, as well as its own rules. *See, e.g.*, 5 U.S.C. § 706; 10 C.F.R. § 590.404 (requiring DOE/FE to base its final opinion "solely on the official record of the proceeding" and to impose terms "as may be required by the public interest" after record review).

F. If DOE/FE Does Move Forward, It Must Impose Rigorous Monitoring Conditions

If DOE/FE nonetheless approves Cheniere's application, it must recognize its continuing duty to protect the public interest, as it explained in its earlier *Sabine Pass* decision. This duty is of crucial importance in the context of LNG export, where circumstances are rapidly changing. DOE/FE therefore announced its intention to monitor environmental, economic, and other relevant considerations. *Sabine Pass* at 31-33. Such a monitoring provision must be imposed here, as well, but must be significantly expanded.

Specifically, although *Sabine Pass* announces an intention to monitor many different considerations, it most clearly states that the agency will act if there is a "reduction in the supply of natural gas needed to meet essential domestic needs." *Id.* at 32. This consideration is undoubtedly of great importance, but it is not the only way in which changing circumstances could imperil the public interest.

On the contrary, as we have demonstrated at length in these comments, there is strong evidence that the public interest will be impaired by gas exports. These impairments include (1) regional and national economic dislocations and disruptions caused by natural gas extraction, including by the industry's boom-and-bust cycle, (2) national increases in gas and electricity prices and resulting shifts to more polluting fuels, (3) and environmental impacts of many sorts. Any one of these categories of interests could be impaired by gas export. DOE/FE must therefore state that it will monitor each of these areas, providing specific monitoring terms and thresholds which will trigger agency actions of various types, ranging from further study through reductions in export volume or changes in timing to a revocation of DOE/FE's approval.[64]

If DOE/FE fails to include such provisions in any final approval, it will fail to fulfill its "continuing duty to protect the public interest," *id.* at 31, and so violate the Natural Gas Act. Because neither Cheniere nor DOE/FE have described or proposed such terms, Sierra Club protests this application to the extent that DOE/FE fails to develop adequate monitoring terms of the sort we have described.

[64] Providing a clear monitoring plan of this sort will also benefit Cheiere, which will be better able to determine when and how DOE/FE may act, improving the company's ability to plan its actions and investments.

IV. Conclusion

Sierra Club therefore moves to intervene, offers the above comments, and protests Cheniere's export proposal for the reasons described above. Cheniere's application is not consistent with the public interest and must be denied.

Respectfully submitted,

Nathan Matthews
Sierra Club Environmental Law Program
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San Francisco, CA 94105

UNITED STATES OF AMERICA
DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY

IN THE MATTER OF	)	
	)	
Sabine Pass Liquefaction, LLC	)	**FE DOCKET NO. 15-063-LNG**
	)	

CERTIFIED STATEMENT OF AUTHORIZED REPRESENTATIVE

Pursuant to C.F.R. § 590.103(b), I, Nathan Matthews, hereby certify that I am a duly authorized representative of the Sierra Club, and that I am authorized to sign and file with the Department of Energy, Office of Fossil Energy, on behalf of the Sierra Club, the foregoing documents and in the above captioned proceeding.

Dated at San Francisco, CA, this 26th day of October, 2015.

_____

Nathan Matthews
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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. 15-063-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 October 26, 2015.

Dated at San Francisco, CA, this 26th day of October, 2015.

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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. 15-063-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
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Subscribed and sworn to before me this 26th day of October, 2015.

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