



May 29, 2015

*By U.S. Post, eComment, and eFiling.*

Ms. Kimberly D. Bose,  
Secretary  
Federal Energy Regulatory Commission  
888 First Street NE, Room 1A  
Washington, DC 20426

**RE: Comments on Environmental Impact Statement for Trunkline Gas Company, LLC, Trunkline LNG Export, LLC, Trunkline LNG Company, LLC, and Trunkline LNG Company, LLC, Docket Nos. CP14-119, CP14-120, CP14-122, Issued April 10, 2015.**

Sierra Club submits these comments concerning the Draft Environmental Impact Statement (the “draft EIS” or “DEIS”) prepared by the Federal Energy Regulatory Commission (“FERC”) for the Trunkline Gas Company, LLC, Trunkline LNG Export, LLC, Trunkline LNG Company, LLC, and Trunkline LNG Company LLC (collectively, “Lake Charles”) proposed Liquefaction and Pipeline Project (the “Project”). The Commenters reserve the right to rely on all public comments submitted, request a written response to comments, and request written notification when any action is taken on this draft EIS (such as a final EIS, supplemental EIS, programmatic EIS, etc.).

These comments supplement and incorporate by reference the Sierra Club’s Motion to Intervene, Protest, and Comment, dated April 24, 2014.

## **I. Introduction**

Sierra Club described the background of this project, and the Commission’s National Environmental Policy Act (“NEPA”) obligations regarding environmental review, in our April 24, 2014 protest. We incorporate that discussion herein by reference.

FERC’s draft EIS fails to take the hard look that the National Environmental Policy Act (“NEPA”) requires. Examples of the draft EIS’s deficiencies include: inadequately describing the effect of air pollution emitted by the project; failing to discuss many indirect effects of the project, including effects of induced gas production, increased coal consumption in response to higher gas prices, and the effects of end users’ consumption of liquid natural gas (“LNG”). FERC must revise its draft EIS to provide accurate, consistent, and complete data and analyses, so that FERC and other agencies relying on this information can take a hard look at the potential impacts of the proposed Project.

## II. Background

Lake Charles proposes to construct its “Lake Charles Liquefaction Project” for the purpose of liquefying and exporting approximately 15 million metric tons per annum (“mtpa”) or two billion cubic feet per day (“Bcf/d”) of domestic natural gas to foreign countries. The Liquefaction Project includes:

- three liquefaction trains with a capacity of 5.48 mtpa each;
- a power generation plant, including gas turbine generators, transformers and related electrical infrastructure;
- storage and administrative buildings and fuel gas, firewater and safety systems; and
- a LNG line and vapor tie-ins and minor modifications to Trunkline’s existing Lake Charles Terminal, an LNG import facility.

The new facility would be located on a 240-acre site directly north of Trunkline’s existing LNG import facility in Calcasieu Parish, LA.<sup>1</sup> The new export facility would utilize the marine facilities at the existing import terminal.<sup>2</sup> Trunkline also proposes to construct a transfer line (approx. 2700 feet long) and a feed gas line (approx. 1400 feet long) linking the existing import terminal to the proposed liquefaction facility<sup>3</sup>. Gas to be liquefied and exported will be delivered to the import terminal via an existing pipeline currently used to send out re-gasified LNG from the import terminal.<sup>4</sup>

Approximately 1522.2 acres would be affected by construction of the terminal.<sup>5</sup> Lake Charles estimates that operation of the terminal will impact 453.5 acres,<sup>6</sup> and operation of the pipeline will impact 743.5 acres.<sup>7</sup> Construction of these projects would have extensive air quality impacts, impacts on wetlands, and other environmental harms. In total, the Project will have a permanent footprint of 285.9 acres, including permanent impacts to 251.4 acres of wetlands.<sup>8</sup>

If allowed to proceed, Trunkline expects to begin construction in 2015 in order to meet a proposed 2019 in-service date.

## III. Legal Standards.

### A. 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

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<sup>1</sup> *Supplemental Data Submission* (Aug. 30, 2012) at 1.

<sup>2</sup> *Lake Charles Liquefaction Project DRAFT Resource Report 1* (“Draft Resource Report”) at 1-2.

<sup>3</sup> *Supplemental Data Submission* (Aug. 30, 2012) at 1.

<sup>4</sup> *Id.*

<sup>5</sup> DEIS Table 2.3-1.

<sup>6</sup> DEIS Table 2.3-1.

<sup>7</sup> DEIS Table 2.3-2.

<sup>8</sup> DEIS Table 4.4-1.

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)). Federal regulations require agencies to “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.

NEPA is “a procedural statute that demands that the decision to go forward with a federal project which significantly affects the environment be an environmentally conscious one.” *Holy Cross v. U.S. Army Corps of Engineers*, 455 F. Supp. 2d 532, 540 (E.D. La. 2006), quoting *Sabine River Auth. v. United States Dep’t of Interior*, 951 F.2d 669, 676 (5th Cir.1992). In the Fifth Circuit, the following factors are generally considered by courts in evaluating an EIS: “(1) whether the agency, in good faith and objectively, has taken a hard look at the environmental consequence of the proposed action and alternatives, (2) whether the EIS contains detail sufficient to allow parties, besides the preparing agency, to understand and consider the relevant environmental influences, and (3) whether the alternatives are sufficient to permit a reasoned selection therefrom.” *Holy Cross Neighborhood Ass’n v. U.S. Army Corps of Engineers* 2011 WL 4015694, \*6 (E.D. La. 2011), citing *Sierra Club v. Froehlke*, 816 F.2d 205, 213 (5th Cir. 1987). 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. An agency “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. NEPA requires that where “several actions have a cumulative . . . environmental effect, this consequence must be considered in an EIS.” *City of Tenakee Springs v. Clough*, 915 F.2d 1308, 1312 (9th Cir.1990). The EIS must give each of these categories of effect fair emphasis.

Agencies may also prepare “programmatic” EISs, which address “a group of concerted actions to implement a specific policy or plan; [or] systematic and connected agency decisions allocating agency resources to implement a specific statutory program or executive directive.” 40 C.F.R. § 1508.17(b)(3); *see also* 10 C.F.R. § 1021.330 (DOE regulations discussing programmatic EISs).

## **B. Natural Gas Act**

Section 3 of the Natural Gas Act requires FERC to determine whether the siting, construction, and operation of Lake Charles’ proposed terminal facilities are “consistent with the public interest.” 15 U.S.C. § 717b(a). FERC’s review of Lake Charles’ pipeline application requires an analogous public interest determination. *Id.* § 717f(c). FERC must consider environmental factors in the course of this public interest analysis. Accordingly, FERC cannot proceed with Lake Charles’ application without fully evaluating the environmental impacts of Lake Charles’ proposal. NEPA provides the congressionally mandated procedure for assessment of these impacts.

## **IV. Project Purpose and Alternatives**

The alternatives analysis is “the heart of the environmental impact statement,” designed to offer a “clear basis for choice among options by the decision maker and the public.” 40 C.F.R. § 1502.14. Fundamentally, an agency must “to the *fullest* extent possible . . . consider alternatives to its action which would reduce environmental damage.” *Calvert Cliffs’ Coordinating Comm. v. U. S. Atomic Energy Comm’n*, 449 F.2d 1109, 1128 (D.C. Cir. 1971) (emphasis in original). Absent this comparative analysis, decision makers and the public can neither assess environmental trade-offs nor avoid environmental harms. *See id.* at 1114 (NEPA’s alternatives requirement “seeks to ensure that each agency decision maker has before him and takes into proper account all possible approaches to a particular project (including total abandonment of the project) which would alter the environmental impact and the cost-benefit balance” and “allows those removed from the initial process to evaluate and balance the factors on their own”). The alternatives must include “reasonable alternatives not within the jurisdiction of the lead agency,” as well as “appropriate mitigation measures not already included in the

proposed action or alternatives.” 40 C.F.R. § 1502.14. Because alternatives are so central to decision-making and mitigation, “the existence of a viable but unexamined alternative renders an environmental impact statement inadequate.” *Oregon Natural Desert Ass’n v. Bureau of Land Mgmt.*, 625 F.3d 1092, 1100 (9th Cir. 2010) (internal alterations and citations omitted).

The alternatives analysis, in turn, is informed in part by the purpose and need of the project. Alternatives are measured, in part, by their ability to satisfy the project purpose and need. Here, FERC improperly relies upon an implicit statement of purpose and need that is unlawfully narrow. FERC then improperly rejects several alternatives that could potentially have lower environmental impacts than would construction and modification of this terminal. Finally, FERC’s discussion of the no action alternative is deficient, as it fails to adequately characterize the range of harms that would likely be avoided under that alternative.

### **A. The DEIS Implicitly Relies Upon An Unlawfully Narrow Definition of Project Purpose**

In Section 1.1, “Project Purpose and Need,” Lake Charles LNG and Trunkline state the purpose of the project “is to transport and liquefy domestic natural gas into LNG for export to foreign markets.”<sup>9</sup> Yet the DEIS treats the project purpose as a shifting goalpost, rejecting some alternatives as inconsistent with goals not included in this statement of purpose while ignoring those additional goals when discussing environmental impacts. This implicit and inconsistent treatment of project purpose violates NEPA’s requirement to inform the public and FERC’s obligation to provide a rational basis for its decision-making.

While Section 3.1 simply describes that the project purpose “is to prepare natural gas for export to foreign markets,”<sup>10</sup> in Section 3.2 the DEIS implicitly narrows this purpose in at least two ways, rejecting alternatives as inconsistent with the purposes of:

- Liquefy and export *at least 2 bcf/d of gas* in addition to LNG exports contracted by other projects, as opposed to providing a facility for the export of gas generally
- “[a project compatible with Lake Charles LNG’s contractual agreements”<sup>11</sup>

NEPA requires a clear statement of the project purpose, and the purpose of this statement is to inform the alternatives analysis.<sup>12</sup> Accordingly, the DEIS violates NEPA by rejecting alternatives as inconsistent with purposes that were not articulated in Section 1.1.

FERC cannot, however, simply add these additional purposes to Section 1.1, because the result would be an overly narrow statement that would unreasonably limit the range of alternatives. Where an agency thoughtlessly adopts a private party’s narrow goals as the overall purpose and need, the agency “necessarily consider[s] an unreasonably narrow range of alternatives,” and thus necessarily violates NEPA. *See Nat’l Parks & Conservation Ass’n v. BLM*, 606 F.3d 1058, 1072 (9th Cir. 2009). When preparing an EIS, it is the agency, not the project

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<sup>9</sup> DEIS 3-4.

<sup>10</sup> DEIS 3-1.

<sup>11</sup> DEIS 3-5.

<sup>12</sup> 40 C.F.R. § 1502.13.

proponent, that “bears the responsibility for defining at the outset the objectives of an action.” *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 195-96 (D.C. Cir. 1991). To be sure, agencies may not ignore private applicants’ objectives; an agency may pursue both private and public goals.<sup>13</sup> However, these two objectives are not “mutually exclusive or conflicting;” they simply “instruct agencies to take responsibility for defining the objectives of an action and then provide legitimate consideration to alternatives that fall between the obvious extremes.” *Colorado Env’tl. Coalition*, 185 F.3d at 1175. The mere fact that private parties have contracted for exports cannot provide a basis for defining the purpose and need of the project so narrowly as to avoid full consideration<sup>14</sup> of alternatives that might partially frustrate those contracts.<sup>15</sup> FERC must take a hard look at whether environmental impacts could be lessened by alternatives that would provide most, but not all, of the volume of gas Lake Charles proposes, or that would involve a delay that is minor when measured against the multi-decade potential initial life of the project.

## B. System Alternatives

The DEIS discusses use of alternate terminal sites as “system alternatives.” Although the DEIS enumerates many such alternatives, it fails to support its basis for rejecting several alternatives that would use existing terminal sites.

As acknowledged by the DEIS, converting an existing LNG import terminal to export—i.e., development of a “brownfield” site—generally has lower environmental impacts than does development of a “greenfield” site. Yet FERC improperly rejects various brownfield alternatives without acknowledging whether these alternatives would have lower environmental impacts. For example, the Cameron LNG alternative is a brownfield site, but this is rejected solely on the basis that Cameron is “contracted to multiple customers”, whereas Lake Charles LNG’s is contracted to only one.<sup>16</sup> Additionally, the DEIS rejects the Freeport LNG alternative as inconsistent with Lake Charles’ contracted schedule,<sup>17</sup> but as we explain above, the fact that a project could not export gas on the specific date Lake Charles has contracted for is not a valid reason for excluding an alternative from full analysis. Freeport has additionally filed a request with FERC for initiation of the PF process for the construction of a fourth gas liquefaction train, so the capacity issue, which was part of the basis the Freeport alternative was rejected, should no longer be a concern and should no longer factor into why this alternative was excluded.

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<sup>13</sup> *Colorado Env’tl. Coalition v. Dombeck*, 185 F.3d 1162, 1175 (10th Cir. 1999) (“Agencies ... are precluded from completely ignoring a private applicant’s objectives.”); *Citizens Against Burlington*, 938 F.2d at 196 (“[T]he agency should take into account the needs and goals of the parties involved in the application.”)

<sup>14</sup> *I.e.*, a broader consideration than the cursory discussion included in the system alternatives section.

<sup>15</sup> Commenters do not dispute that frustration of those contracts is one of the many factors that might weigh in FERC’s choice among alternatives; rather, we argue that these contracts cannot circumvent or abridge the alternatives analysis.

<sup>16</sup> DEIS 3-7.

<sup>17</sup> DEIS 3-7.

## C. No Action Alternative

The discussion of the no-action alternative, and the related discussion of energy alternatives, rests on erroneous assumptions that lead the DEIS to understate the range of environmental impacts that would be avoided if the no action alternative was selected.

The DEIS generally assumes that if the U.S. does not export LNG, would-be buyers of U.S. LNG will consume an equivalent amount of other fossil fuels instead.<sup>18</sup> As explained in our comments on DOE's materials regarding the environmental impacts of U.S. LNG exports, U.S. LNG will displace renewables and conservation as well as other fossil fuels, and even to the extent that U.S. LNG does displace other fossil fuels, U.S. LNG will in many cases have a greater total climate impact. Accordingly, the no action alternative will almost certainly lead to lower levels of total greenhouse gas emissions than would any of the action alternatives. We further note that FERC must be consistent in its scope of environmental review: it cannot argue (mistakenly) that the no action alternative fails to deliver environmental benefits that would occur in downstream markets, while refusing to consider adverse environmental impacts in downstream markets, such as additional combustion emissions.

The DEIS's discussion of the no action alternative is also deficient because it appears to assume that, if the Lake Charles Project is disapproved, another domestic export project would take its place, such that approving the Lake Charles Project will not increase the overall level of U.S. LNG exports. FERC cannot assume that denying this project would merely lead to construction of a similar project at another site, or that the construction and operation of some number of LNG facilities is inevitable—especially because all potential substitute projects would also require FERC and DOE approval. FERC's analysis must consider the possibility that if it authorizes the project, this will increase the number of export facilities constructed and the amount of LNG that is produced and exported, thereby increasing total environmental impacts. FERC shirks its responsibility to take a hard look at the effects of the proposed project by assuming that denying the project would merely displace, rather than avoid, the impacts of LNG exports.

## V. NEPA Review Unlawfully Refused to Consider Indirect Effects Relating to Gas Production and Use

FERC violated NEPA and the Natural Gas Act by failing to consider indirect effects of the project caused by impacts to gas markets. These effects include increases in domestic gas production, domestic gas users shifting from gas to coal, and increased foreign use of natural gas.

NEPA requires a hard look at the indirect effects of proposed actions. Indirect effects are those effects "caused by the action and [that] are later in time or farther removed in distance [than direct effects], but [that] are still reasonably foreseeable." 40 C.F.R. § 1508.8(b). Indirect effects include "growth inducing effects," *id.*, and effects outside the scope of the agency's

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<sup>18</sup> E.g., DEIS 3-2, stating that a no-action alternative "could require that potential end users make different arrangements to obtain natural gas service, use other fossil fuel energy sources (e.g., coal or fuel oil), or possibly use traditional long-term energy sources (e.g., nuclear power) and/or renewable energy sources (e.g., solar power) to compensate for the lack of natural gas that would otherwise be supplied by the Lake Charles Liquefaction Project."



regulatory authority. See *Mich. Gambling Opposition v. Kempthorne*, 525 F.3d 23, 29-30 (D.C. Cir. 2008); *TOMAC v. Norton*, 240 F. Supp. 2d 45, 50-52 (D.D.C. 2003) *aff'd sub nom. TOMAC - Taxpayers of Mich. Against Casinos v. Norton*, 433 F.3d 852, 851-52 (D.C. Cir. 2006).

Basic economic principles teach that connecting the United States' isolated natural gas market with overseas gas demand will have several effects. "Upstream" of the terminal in the gas supply chain, the terminal will significantly increase demand for U.S. gas, which will drive up prices in the domestic market. Higher domestic prices will, in turn, cause both an increase in domestic gas production and a shift by some domestic gas users to other fuels. The fact that price increases will impact the demand side of the market is "self-evident." *Airlines for America v. Transp. Security Admin.*, \_\_\_ F.3d \_\_\_, \_\_\_, Docket 14-1143, Slip. Op. 3-4 (D.C. Cir. Mar. 10, 2015) (quoting *Sierra Club v. EPA*, 292 F. 3d 895, 900 (D.C. Cir. 2002)). Here, in describing the purpose and need of the Projects, the Applicants themselves argue that the Project "create[s] a significant number of jobs as a direct result of continued domestic natural gas development and production."<sup>19</sup>

Conversely, "downstream" of the terminal, exporting LNG will increase the supply of LNG available on international markets and lead to increases in global gas use. Nations that import LNG from the U.S. will likely increase their overall energy use, and some of this increase will come at the expense of renewables and investments in efficiency and conservation.

Courts considering other energy infrastructure projects have held that the potential for this type of market impact is facially apparent, and that these types of effects must be considered in the NEPA analysis. *Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 548-49 (8th Cir. 2003), see also *N. Plains Resource Council v. Surface Transp. Bd.*, 668 F.3d 1067, 1081-82 (9th Cir. 2011). The Council on Environmental Quality recently reiterated that NEPA requires consideration of effects "upstream" and "downstream" of proposed projects, such as the effects of consuming coal produced by development of a coal mine.<sup>20</sup>

Here, despite the self-evident nature of these impacts, FERC unlawfully concludes that any effects related to impacts on gas production or use are not indirect effects of the Project that must be evaluated under NEPA. FERC's stated bases for excluding these effects are contrary to the available factual record and FERC's legal obligations.

## **VI. Indirect Effects of Induced Gas Production, Gas Price Increases, and End Use of LNG.**

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. As explained in the Energy Information Administration's January 2012 LNG Export Study and in numerous subsequent analyses, the US

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<sup>19</sup> Revised Resource Report 1 at 1-3 (June. 2013).

<sup>20</sup> Council on Environmental Quality, Revised Draft Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews, 79 Fed. Reg. 77802, 77826 (Dec. 24, 2014).



will likely see a combination of both.<sup>21</sup> Furthermore, The Energy Information Administration continues to predict that liquefied natural gas exports will lead to increased gas production. The Energy Information Administration's primary publication is the Annual Energy Outlook. The Annual Energy Outlook 2015, published April 14, 2015, repeatedly discusses the impacts exports will have on domestic gas prices, production, and fossil fuel use.<sup>22</sup> The predominant effect will be an increase in supply as gas producers increase output in response to new demand. The extra demand will also cause increases in domestic gas prices, which will cause some domestic consumers (primarily in the electricity generating sector) to reduce their consumption (according to EIA, primarily but not exclusively by switching to coal). Both this increase in production and this shift in the power sector will have environmental impacts. Additional environmental impacts will result from the consumption of exported LNG by end users. These environmental impacts are all indirect effects that must be included in the NEPA analysis. The draft EIS is deficient because it improperly excludes effects relating to gas production and domestic power production from analysis, and because the analysis of impacts relating to end use of US LNG is incomplete.

#### **A. Environmental Impacts of Induced Gas Production**

The additional demand for US natural gas that will be created by Lake Charles' proposal will induce an increase in domestic gas production, with a general agreement that roughly 63% of exported gas will come from new production.<sup>23</sup> Moreover, available tools also allow FERC to predict where increased production will occur with a level of specificity sufficient to support meaningful analysis of the environmental impacts of this production—and for many impacts, such as greenhouse gas emissions, geographic specificity is not needed at all.

Lake Charles, DOE, 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.

Analysis of the impact of LNG exports uniformly conclude that most of the gas exported will come from gas production that would not otherwise occur. This conclusion has been reached by:

- The Energy Information Administration ("EIA").<sup>24</sup>
- DOE, which recently reiterated its agreement with EIA forecasts on this issue.<sup>25</sup>
- NERA Economic Consulting.<sup>26</sup>

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<sup>21</sup>DOE/FE has commissioned a two part study of the economic impacts of LNG exports. Energy Information Administration, *Effect of Increased Natural Gas Exports on Domestic Energy Markets*, (2012) ("EIA Export Study"), attached as Exhibit 1; NERA Study, Exhibit 2. Sierra Club and others submitted extensive comments on these studies. Sierra Club Initial NERA Comment, attached as Exhibit 3; Synapse Analysis of NERA Study, attached as Exhibit 4; Sierra Club Reply NERA Comment, attached as Exhibit 5.

<sup>22</sup> U.S. Energy Information Administration, Annual Energy Outlook 2015 (Apr. 2015) at 6, 21-22, 24, *available online at* [http://www.eia.gov/forecasts/aeo/pdf/0383\(2015\).pdf](http://www.eia.gov/forecasts/aeo/pdf/0383(2015).pdf), attached as Exhibit 6.

<sup>23</sup> EIA Export Study, *supra* n.21, at 10.

<sup>24</sup>EIA, *Effect of Increased Natural Gas Exports on Domestic Energy Markets* (2012), attached as Exhibit 7.

<sup>25</sup> DOE, Addendum to Environmental Review Documents Concerning Exports of Natural Gas from The United States (June 4, 2014).

<sup>26</sup> NERA Economic Consulting, *Macroeconomic Impacts of LNG Exports from the United States* (2012).

- Deloitte Marketpoint.<sup>27</sup>
- ICF International.<sup>28</sup> (“ICF’s original modeling showed that for each of the three export cases, the majority of the incremental LNG exports (79%-88%) are offset by increased domestic natural gas production.”)
- The Brookings Institution.<sup>29</sup> (“much of the gas for export will come from new production, rather than the displacement of consumption in other sectors.”)

The logic underlying these predictions is straightforward. LNG exports represent a significant new source of gas demand. According to basic economic principles, adding a new source of demand will generally spur increases in supply. EIA, Deloitte, and others have used available information about the natural gas supply curve and the elasticity of existing sources of gas demand to model the extent to which production will increase in response to given levels of exports. These predictions of increased production are both robust and uncontroverted, except insofar as some studies predict *greater* increases in production than does EIA. No forecast or other evidence in the record predicts that production would not increase in response to exports. Nor does the DEIS identify or offer any explanation as to how exports could occur without causing an increase in production.

EIA predicts that U.S. LNG exports will induce domestic production equivalent to “about 60 to 70 percent” of the demand created by export projects (*i.e.*, the volume of gas exported together with the gas necessary for the operation of export facilities), with EIA putting the specific estimate for its reference cases at 63%.<sup>30</sup> The EIA further predicts that “about three quarters of this increased production [will come] from shale sources,” with the remainder derived from other production types.<sup>31</sup> As noted, DOE’s Addendum to Environmental Review Documents Concerning Exports of Natural Gas from The United States recently reiterated DOE’s endorsement of these predictions. Lake Charles proposes to export 2 bcf/d of natural gas, or 730 bcf/year.

The majority of this additional production is likely to occur in the Gulf Coast region and surrounding states. The DEIS notes that “other LNG export projects could be developed in the Gulf Coast region or elsewhere in the United States” and “expansions of similar scope and magnitude... would likely result in environmental impacts of comparable significance.”<sup>32</sup> The DEIS rejects several “system alternatives” involving use of other terminals in Louisiana on the ground that these alternatives have incompatible timeframes, the environmental impacts are considered comparable to the proposed project, additional facilities would require significant additional construction, and that pipeline transportation of this gas to these alternative locations

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<sup>27</sup> Deloitte Marketpoint, *Made in America: The Economic Impact of LNG Exports from the United States* (2011), attached as Exhibit 8; *see also* Deloitte, *Natural Gas Models*, attached as Exhibit 9.

<sup>28</sup> ICF International, “U.S. LNG Exports: Impacts on Energy Markets and the Economy” (May 2013), attached as Exhibit 10.

<sup>29</sup> Charles Ebinger et. al., “Liquid Markets: Assessing the case for U.S. Exports of Liquefied Natural Gas,” Brookings Institution (May 2012) available at [http://www.brookings.edu/~media/research/files/papers/2012/1/natural%20gas%20ebinger/natural\\_gas\\_ebinger.pdf](http://www.brookings.edu/~media/research/files/papers/2012/1/natural%20gas%20ebinger/natural_gas_ebinger.pdf) and attached as Exhibit 11.

<sup>30</sup> From the EIA Export Study, *supra* n.21, at 6, 10.

<sup>31</sup> EIA Study at 6.

<sup>32</sup> DEIS 3-2.

would entail additional environmental impacts.<sup>33</sup> We acknowledge that production supplying the project and production induced by the project are two distinct concepts, and the two will not perfectly overlap. Some of the induced production may occur outside the Gulf Coast region, with the Lake Charles project consuming nearby gas that would otherwise be sent to other states. Nonetheless, the two are likely to be highly correlated. In the absence of more sophisticated models of where additional production will occur, the former would provide a reasonably geographic proxy for the latter.

More sophisticated models are, however, available. As Sierra Club explained in comments on the DOE Addendum and in exhibit 2 of our prior protest in this docket, EIA's National Energy Modeling System<sup>34</sup> and Deloitte Marketpoint's world gas model are sophisticated tools that can predict where this additional production is most likely to occur.<sup>35</sup> Another report, by ICF, has already published forecasts of state-specific increases in gas production in response to exports.<sup>36</sup> 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.<sup>37</sup> This same tool could likely be used to predict where production would increase in response to the Lake Charles project. Alternatively, the general export scenario already conducted by this study provides a basis for evaluating the cumulative impacts of proposed export projects.

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<sup>33</sup> DEIS ES-11.

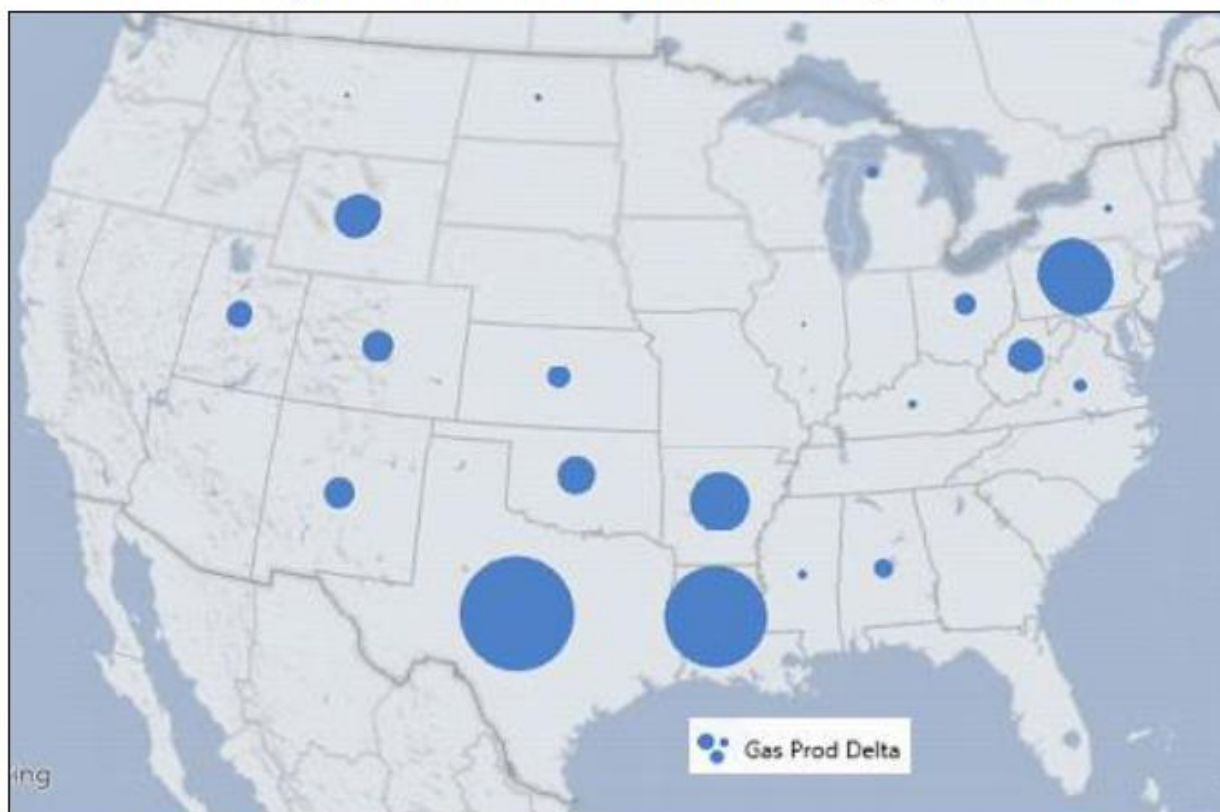
<sup>34</sup> See Sierra Club, et al., Comments on DOE Environmental Addendum, page 6, and exhibits 1 – 3 thereto.

<sup>35</sup> *Id.* at 7 and exhibit 4 thereto.

<sup>36</sup> 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.

<sup>37</sup> *Id.* at 15.

**Exhibit 3-4: Map of Relative Natural Gas Production Changes by State in 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. This additional natural gas production—from both conventional and unconventional sources—will have significant environmental impacts. These impacts are generally discussed in DOE's addendum to environmental review and related documents, and in the comments Sierra Club submitted thereon. While those documents consider LNG exports generally, here, in the context of an individual export application, further analysis can and must be undertaken.

For example, production induced by the Lake Charles project will cause significant air pollution. DOE provides a summary of this pollution, but understates the likely volume of emissions, because DOE relies on "bottom-up" estimates of emissions that are significantly lower than estimates based on atmospheric measurements of methane and other pollutants.<sup>38</sup> Since the DOE environmental materials were released, yet another peer reviewed study using atmospheric measurements to estimate natural gas production emissions has been published, providing still further evidence that the actual methane leak rate from U.S. gas production is significantly higher than DOE and EPA have acknowledged. This paper, by researchers at

<sup>38</sup> Sierra Club, et al., Comments on DOE Export LCA, at 7.

Carnegie Mellon and the National Ocean and Atmospheric Administration, concludes that the most likely methane leak rate is between 2 and 4 percent.<sup>39</sup>

As we explain above, the Lake Charles project will likely induce 730 bcf/year of production that would not otherwise occur. Estimates of the gas production leak rate allow us to estimate the air emissions impacts of 730 bcf/year of production. These leak rates, and EPA conversion factors between the typical volumes of methane, VOC, and HAP in natural gas,<sup>40</sup> make it possible to estimate the potential impact of increasing gas production in the way that LNG export would require. We note that these conversion factors are derived from national inventories, and it may be possible to provide estimates particular to the Texas and Gulf Coast regions where production induced by Lake Charles is most likely to occur, but these estimates provide a useful starting point for analysis.

The table below uses these conversion factors to calculate the emissions associated with producing 730 bcf/year of new gas demand, the likely inducement specifically attributable to the present Lake Charles LNG Project. While we contend that the leak rate is most likely to be in the neighborhood of 3%, we calculate for emissions a 1% leak rate (included as a conservative case), DOE's estimated leak of 1.4%,<sup>41</sup> the 2.4% rate used in EPA's previous inventory, the 3% leak rate reflected by general atmospheric studies, and the higher leak rates the NOAA studies suggest in studies of particular plays. We provide results for methane, VOC, and HAP.<sup>42</sup>

**Table 1: Annual Emissions Associated with Production of 730 bcf of Natural Gas**

Leak Rate	Methane (tons)	VOC (tons)	HAP (tons)
1%	151,840	22,153	1,610
1.40%	212,576	31,015	2,253
2.40%	364,416	53,168	3,863
3.00%	455,520	66,460	4,829
4.80%	728,832	106,337	7,726
9%	1,366,560	199,381	14,486

Thus, the production induced by Lake Charles' proposal, alone, would be responsible for hundreds of thousands of tons of air pollution annually. Notably, the threshold for major source permitting under the Clean Air Act is generally just tens of tons of pollution; for greenhouse gases, it is generally 75,000 tons of carbon dioxide equivalent. Lake Charles would thus greatly

<sup>39</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>40</sup> 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"), attached as Exhibit 13, at Table 4.2. EPA calculated average composition factors for gas from well completions. These estimates, which are based on a range of national data are robust, but necessarily imprecise for particular fields and points along the line from wellhead to LNG terminal. Nonetheless, they provide a beginning point for quantitative work. 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.

<sup>41</sup> DOE estimates the leak rate of 1.3% for conventional production and 1.4% for shale gas. Because EIA predicts that overwhelming majority of new production induced by exports will be from shale, the rounded weighted average leak rate is 1.4%.

<sup>42</sup> These figures were calculated by multiplying the relevant EPA conversion factors to generate tonnages of the relevant pollutants. These results are approximations: Although we reported the arithmetic results of this calculation, of course only the first few significant figures of each value should be the focus.

increase air pollution in the regions from which it draws its gas, imperiling public health and the global climate.

## VII. Indirect Effects on U.S. Electricity Generation

As we explained in our comment on DOE's materials regarding the environmental effects of LNG exports, a foreseeable effect of exports will be increases in greenhouse gas emissions from the U.S. electricity generation sector.<sup>43</sup>

The project will further increase air pollution by increasing the amount of coal used for domestic electricity production. The EIA Export Study predicts that exports, by causing natural gas prices to rise, will drive more electricity generation to coal than to renewable energy. According to the EIA, the power sector will "primarily" respond to higher natural gas prices by shifting to coal-fired generation, and only secondarily to renewable sources.<sup>44</sup> Under EIA's reference case predictions regarding U.S. exports, decreases in consumption total roughly a third of the supply to be exported.<sup>45</sup> EIA predicts that "most of the decrease in natural gas consumption occurs in the electric power sector," and that "Most of the tradeoff in electric generators' natural gas use is between natural gas and coal."<sup>46</sup> Specifically, EIA predicts that 72 percent of the decrease in gas-fired electricity production will be replaced by coal-fired production, with increased liquid fuel consumption, increased renewable generation, and decreases in total consumption making up the remainder (8, 9, and 11 percent, respectively).<sup>47</sup>

The shift from gas-fired to coal-fired electricity generation will increase emissions of both traditional air pollutants and greenhouse gases. Gas-fired power plants generate less than a third of the nitrogen oxides and one percent of the sulfur oxides that coal-fired plants generate.<sup>48</sup> Thus, the EIA Export Study demonstrates that exports will harm the local environment by increasing coal use.<sup>49</sup>

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<sup>43</sup> Sierra Club, et al., Comments on DOE Export LCA at 4-5.

<sup>44</sup> EIA Export Study, *supra* n.21, at 6; *see also id.* at 17 ("[H]igher natural gas prices lead electric generators to burn more coal and less natural gas.").

<sup>45</sup> Sierra Club contends that EIA's estimates as to the extent to which exported gas will be supplied by induced production and reduced consumption are sufficiently robust to be used in NEPA analysis. If FERC wrongly concludes that either of these estimates are too uncertain, however, FERC cannot escape the fact that the vast majority of gas supplied for exports must come from either new production or decreased consumption. As such, there can be no justification for excluding both effects from FERC's analysis.

<sup>46</sup> EIA Export Study, *supra* n.21, at 12. According to the EIA, the power sector will "primarily" respond to higher natural gas prices by shifting to coal-fired generation, and only secondarily to renewable sources. *Id.* at 6; *see also id.* at 17 ("[H]igher natural gas prices lead electric generators to burn more coal and less natural gas.").

<sup>47</sup> *Id.* at 18.

<sup>48</sup> EPA, Air Emissions, <http://www.epa.gov/cleanenergy/energy-and-you/affect/air-emissions.html> (last visited Dec. 12, 2012), attached as Exhibit 13.

<sup>49</sup> The NERA report did not examine shifts within the domestic power sector in detail, and the NERA study authors acknowledge that EIA uses a more sophisticated model that is better able to predict electricity sector responses to gas prices. The NERA report explains that "EIA's NEMS model has a detailed bottom-up representation of the electricity sector, while the electricity sector in the NERA model is a nested CES function with limited technologies. This means that NEMS allows for switching from natural gas-based generation to other technology types easily, while the possibility of switching out of natural gas is more limited and controlled in the NERA model." NERA Study, *supra* n.21, at 207 (appx. D, figs. 176-78 and accompanying text). Thus, although the NERA study predicts a



Coal-fired plants also release roughly twice the carbon dioxide combustion emissions as gas-fired plants, although some of this combustion advantage is offset by the greenhouse gas emissions resulting from gas production. Accordingly, the price increase and corresponding shift to coal-fired power generation risks increasing greenhouse gas pollution. The *EIA Export Study* concluded that under every scenario modeled, exports would produce a significant increase in domestic greenhouse gas emissions, as illustrated by the table below.

**Table 2: Cumulative CO<sub>2</sub> Emissions from 2015 to 2035 With Various Export Scenarios<sup>50</sup>**

Case	no added exports	low/slow	low/rapid	high/slow	high/rapid
<b>Reference</b>					
Cumulative carbon dioxide emissions	125,056	125,699	125,707	126,038	126,283
Change from baseline		643	651	982	1,227
Percentage change from baseline		0.5%	0.5%	0.8%	1.0%
<b>High Shale EUR</b>					
Cumulative carbon dioxide emissions	124,230	124,888	124,883	125,531	125,817
Change from baseline		658	653	1,301	1,587
Percentage change from baseline		0.5%	0.5%	1.0%	1.3%
<b>Low Shale EUR</b>					
Cumulative carbon dioxide emissions	125,162	125,606	125,556	125,497	125,670
Change from baseline		444	394	335	508
Percentage change from baseline		0.4%	0.3%	0.3%	0.4%
<b>High Economic Growth</b>					
Cumulative carbon dioxide emissions	131,675	131,862	132,016	131,957	132,095
Change from baseline		187	341	282	420
Percentage change from baseline		0.1%	0.3%	0.2%	0.3%

Source: U.S. Energy Information Administration, National Energy Modeling System, with emissions related to natural gas assumed to be consumed in the liquefaction process included.

The fact that gas exports will tend to favor coal as a fuel for domestic electrical generation has particularly important implications for national emissions control efforts. EPA has proposed carbon pollution standards for electricity generating units which set emissions levels based upon the performance of natural gas combined-cycle plants.<sup>51</sup> EPA anticipates no notable compliance costs for the rule because it expects utilities to react to low gas prices, among other factors, by avoiding constructing expensive coal-fired plants.<sup>52</sup> If LNG exports move forward, however, gas prices will increase, making it more difficult and expensive to capture

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smaller electricity sector response to gas prices than did the EIA, *id.*, FERC should rely on the more sophisticated EIA predictions.

<sup>50</sup> From the *EIA Export Study*, *supra* n.21, at 19.

<sup>51</sup> Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 Fed. Reg. 22,392 (Apr. 13, 2012).

<sup>52</sup> See *id.* at 22,430.

combustion-side carbon pollution reductions from fossil-fuel fired power plants because it will no longer be necessary to avoid constructing coal-fired plants. This interference with national efforts to control global warming, which endangers public health and welfare,<sup>53</sup> is not in the public interest.

## **VIII. Conclusion**

For the above reasons, the EIS is deficient. FERC must address these deficiencies. When the environmental impacts of the project are properly considered, it is clear that the project is contrary to the public interest, and must be denied.

Respectfully submitted,



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<sup>53</sup> See Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009).