

**From:** [Ellen Medlin](#)  
**To:** [LNGStudy](#)  
**Subject:** Reply Comment of Sierra Club et al. on DOE LNG Export Study  
**Date:** Monday, February 25, 2013 2:30:49 PM  
**Attachments:** [Ex. 1 - Strategy for US NG Exports - Levi.pdf](#)  
[Ex. 3 - DOE FOIA response 1.pdf](#)  
[Ex. 2 - DOE FOIA submitted.pdf](#)  
[Ex. 4 - FOIA Appeal Letter filed.pdf](#)  
[NERA Reply Comments FINAL.pdf](#)

---

February 25, 2013

Please find attached a reply to initial comments on the DOE's LNG Export Study, submitted on behalf of the Sierra Club and a coalition of nonprofit organizations. The four exhibits to the reply comments are also attached.

We are submitting these comments and exhibits electronically, a procedure confirmed as acceptable by Larine Moore at DOE/FE today.

Thank you for confirming receipt of these comments and the exhibits.

Sincerely,  
Ellen Medlin

--

Ellen Medlin  
Associate Attorney  
Sierra Club Environmental Law Program  
85 2nd St., 2nd Floor  
San Francisco, CA 94105  
[415.977.5646](tel:415.977.5646)



February 25, 2013

U.S. Department of Energy (FE-34)  
Office of Natural Gas Regulatory Activities  
Office of Fossil Energy  
Forrestal Building, Room 3E-042  
Independence Ave SW, Washington, DC 20585  
LNGStudy@hq.doe.gov

Dear Secretary Chu:

We thank you and the Department of Energy's Office of Fossil Energy ("DOE/FE") for accepting these comments in reply to the initial comments submitted regarding on NERA Economic Consulting's study (the "NERA Study") of the macroeconomic impacts of liquefied natural gas ("LNG") export on the U.S. economy. We submit these reply comments on behalf the Sierra Club, including its Colorado, Kansas, Michigan, Oregon, Pennsylvania, Texas, and Wyoming Chapters; and on behalf of Catskill Citizens for Safe Energy, Center for Biological Diversity, Clean Air Council, Columbia Riverkeeper, Delaware Riverkeeper, Lower Susquehanna Riverkeeper, Shenandoah Riverkeeper, and Upper Green River Alliance.<sup>1</sup>

Having reviewed the initial comments other individuals and organizations submitted on the NERA Study, we stand by and reiterate the concerns raised in the Sierra Club's initial comment. The NERA Study concludes that LNG exports' primary effect will be to transfer wealth from the majority of Americans to the small minority of wealthy corporations that will own natural gas resources or LNG export infrastructure. The purported "net benefit" of this transfer, in NERA's view, is an increase in GDP that even NERA acknowledges is slight. Thus, taken at face value, the NERA Study shows that exports will be *contrary* to the public interest, by any reasonable interpretation of the term.

---

<sup>1</sup> We have submitted these comments and exhibits electronically, a procedure confirmed as acceptable by Larine Moore at DOE/FE today.

DOE/FE must not, however, take the NERA Study on its own terms. Even on the narrow issue of net GDP impacts, the NERA Study's conclusion is contradicted by the only other available comprehensive model of LNG exports' impacts, conducted recently by Purdue University economists Kemal Sarica and Wallace E. Tyner.<sup>2</sup> This independent study provides credible evidence undermining the NERA Study's sole finding of a public benefit. More broadly, the NERA Study's focus on net GDP impacts is too narrow in scope, and the NERA Study contains numerous errors, as we explained in our initial filing. The Natural Gas Act public interest inquiry must consider numerous issues ignored by NERA, including the way that increased gas production necessary to supply exports will cause harmful environmental impacts and disrupt communities where gas production occurs. These effects have economic aspects that could have been, but were not, included in the macroeconomic study. On a more technical level, NERA understates the potential volume of exports and domestic gas price increases. These price increases will merely transfer wealth from ordinary Americans and domestic businesses to the relatively few owners of natural gas companies and to foreign investors. Consideration of these additional impacts reinforces the Purdue Study's conclusion that the likely net effect of LNG exports will be a *decrease* in United States GDP, rather than the slight increase NERA predicts.

Nor may DOE/FE sidestep its public interest review obligations on the basis of free trade arguments advanced by other commenters. DOE/FE has a statutory obligation to consider the public interest; trade concerns, if they are considered at all, must be evaluated within this context and balanced against other aspects of the public interest. Moreover, export proponents have not shown that denying export applications would be inconsistent with the U.S.'s obligations under the General Agreement on Tariffs and Trade (GATT) or with underlying free trade principles. GATT recognizes countries' authority to restrict trade when necessary to protect human health or the environment or to conserve exhaustible natural resources. DOE/FE cannot conclude that free trade concerns weigh in favor of exports without exploring the extent to which these provisions apply here.

Finally, we reiterate our concerns regarding DOE/FE's process, both with the NERA Study itself and with respect to export authorization more generally. We previously explained the reasons why NERA's objectivity is suspect, and

---

<sup>2</sup> See Kemal Sarica & Wallace E. Tyner, *Economic and Environmental Impacts of Increased US Exports of Natural Gas* (Purdue Univ., Working Paper, 2013) (available from the authors) [hereinafter Purdue Study].

DOE/FE still has not provided important information regarding the process by which NERA was selected or work was assigned. Nor has DOE/FE provided the details of NERA's NewERA model or other information necessary to allow external validation of the NERA Study's assessment. As to DOE/FE's own process, DOE/FE has provided inadequate information regarding how it will evaluate the public interest in individual applications, or the steps DOE/FE will take to monitor the impacts of exports if and when exports to non-free trade agreement countries are authorized. Failing to provide this information during the period for public comment on the NERA Study frustrates the purposes of FOIA, the Natural Gas Act, and general principles of administrative law, because withholding of this information limits the public's ability to assess and comment on the relevant documents.

In summary, LNG exports will have many effects that are not considered by the NERA report but are contrary to the public interest. The record contains abundant information demonstrating that these impacts will be significant, as we explain in further detail below.<sup>3</sup> DOE/FE cannot move forward without considering them.

### **I. DOE/FE Cannot Approve Applications without Considering The Environment, Employment/Job Losses, and Other Aspects of The Public Interest Not Examined by The NERA Study**

Several commenters request that, now that the NERA Study is complete, DOE/FE immediately approve pending export applications without additional process.<sup>4</sup> DOE/FE must reject these requests. As DOE/FE has acknowledged elsewhere and as Sierra Club has explained in other filings, the scope of the public interest inquiry extends beyond the macroeconomic factors discussed by the NERA

---

<sup>3</sup> The Center for Liquefied Natural Gas asserts that DOE has already decided that there is no evidence about exports being contrary to the public interest. Comment of Center for Liquefied Natural Gas at 4. This is obviously incorrect. The Center for Liquefied Natural Gas quotes two-year old DOE/FE statements, in an order conditionally authorizing exports from Sabine Pass LNG, where DOE/FE explained that in the record before it in that case at that time, there was insufficient evidence to indicate that the exports proposed there would be contrary to the public interest. DOE/FE is now facing a vastly different factual record and an order of magnitude more proposed exports. As such, these statements have no bearing here.

<sup>4</sup> See, e.g., Comment of Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC.

Study.<sup>5</sup> Among other things, DOE/FE must consider proposed exports' impacts on the environment, employment, and communities in which production will occur.

### A. Environmental Impacts

Exports will induce additional gas production. EIA and most other commenters predict that between 60 and 70% of the volume of gas exported will be sourced from production that would not have otherwise occurred; EIA's best estimate is that 63% of exported gas will be from induced production.<sup>6</sup> DOE/FE must reject the American Petroleum Institute's nonsensical argument that DOE/FE may ignore the effects of this production "because natural gas development using hydraulic fracturing is occurring and will continue to occur across the country regardless of whether a single additional export authorization is ever granted."<sup>7</sup> We agree that *some* production increases are likely to occur regardless of whether exports are approved, but this is irrelevant to DOE/FE's obligation to consider the effects of the *additional* or marginal increase in production that will result from exports. Indeed, American Petroleum Institute itself argues that exports will increase production.<sup>8</sup> American Petroleum Institute offers no explanation as to why it believes DOE should consider production increases in the context of jobs but not in the context of environmental impacts.

As Sierra Club's initial comment explained, the additional production that exports will induce will have significant environmental impacts.<sup>9</sup> These impacts will be particularly severe if that production is conducted in accordance with current industry practice and lax regulatory frameworks. The Secretary of Energy Advisory Board (SEAB)'s subcommittee on shale gas identified a number of gaps in existing regulations and industry practice, and few, if any, of these gaps have been filled.<sup>10</sup>

---

<sup>5</sup> *Accord* Comment of the American Public Gas Association at 7, Comment of Dow Chemical Company at 2.

<sup>6</sup> EIA Study at 10.

<sup>7</sup> Comment of American Petroleum Institute at 22-23.

<sup>8</sup> *Id.* at 5.

<sup>9</sup> Comment of Sierra Club at 29-52.

<sup>10</sup> Comment of Sierra Club at Ex. 56 (DOE, Shale Gas Production Subcommittee First 90-Day Report (2012)).

The environmental impacts of gas production, and of the failure to regulate it, 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. For example, under the USREF\_SD\_LR scenario, NERA predicts 2.19 tcf/y of exports in 2035, with a \$2 billion GDP increase relative to the baseline.<sup>11</sup> Using EIA estimates of the share of exports that will result from induced production (63%) and EPA's current estimate of the leak rate for gas production (2.4%), the Sierra Club estimated that 2.19 tcf/y of exports will release an additional 689,000 tons of methane into the atmosphere each year.<sup>12</sup> Using a conservative global warming potential for methane of 25 and EPA's social cost of carbon price of \$25/ton, the social cost of the production-side methane emissions alone will be \$430,625,000,<sup>13</sup> displacing more than 20% of the GDP increase NERA predicts under this scenario. Liquefaction and processing of natural gas further adds to greenhouse gas emissions. Other environmental impacts also impose monetizable costs, which must be added to any calculation of net impacts and thus further erase the claimed benefit. Moreover, as we explain below, the Purdue Study indicates that NERA has overstated the likely GDP benefit, such that even if environmental costs are excluded from consideration, the net GDP impact of exports would be negative. If those studies are correct, acknowledging environmental impacts makes a bad deal even worse.

Environmental impacts also aggravate the distributional inequity predicted by the NERA study. Environmental costs are borne by the public at large. Providing a market for increased gas production therefore effectively transfers wealth from the public, which suffers environmental harm as a result of increased production, to the production companies, which realize profits from this production. This effective wealth transfer must be considered in addition to the purely monetary wealth transfer identified by NERA.

---

<sup>11</sup> Compare NERA Study at 179 with Comment of Sierra Club, Ex. 56 at 186.

<sup>12</sup> See Comment of Sierra Club at 31-32 for methodology.

<sup>13</sup> I.e., (25)(25)(\$689,000). For more background on these estimates, see Comment of Sierra Club at 33-34.

In light of gas production's environmental impacts, even some export proponents have argued that the environmental impacts of gas production must be reduced before exports occur. Notably, a report by Michael Levi of the Brookings Institution concludes that the benefits of gas exports outweigh the risks and costs *if* "proper steps are taken to protect the environment."<sup>14</sup> Levi concludes that "environmental risks arising from natural gas production would . . . rise due to new production for exports," and that safe management of these risks would not happen without further action.<sup>15</sup> Levi recommended that, for a start, the environmental practices recommended by the SEAB should be required prior to exports.<sup>16</sup> In this proceeding, the Bipartisan Policy Center explicitly endorses Levi's argument, arguing that exports will be in the public interest only if environmental impacts are addressed.<sup>17</sup> Numerous other commenters, however, cite Levi's study for the purported conclusion that exports will be in the public interest without acknowledging Levi's qualification that environmental impacts must be addressed first.<sup>18</sup> Sierra Club disagrees with Levi's conclusion that exports will be in the public interest provided that gas production is more carefully regulated. At a minimum, however, DOE/FE must reject any implication that Levi's report indicates that exports would further the public interest even if production occurs under the status quo.

Moreover, although regulations that limit gas production's environmental impacts may increase the cost of production and thus gas prices, such price increases have a markedly different impact on the public interest than price increases caused by demand for exports. What the public "buys" when it experiences a price increase attributable to environmental regulation is increased environmental protection that would otherwise have been caused by production of the gas being used. Regulation also avoids emergency cleanup, public health care, and emergency costs resulting from environmental harm related to drilling, ultimately saving public tax dollars. In contrast, when prices increase because of exports, the public doesn't receive anything in exchange for paying increased prices. Indeed, whereas higher prices resulting from less environmentally destructive practices lessen the environmental impacts borne by the public,

---

<sup>14</sup> Michael Levi, *A Strategy For U.S. Natural Gas Exports*, at 6 (June 2012), available at [http://www.hamiltonproject.org/files/downloads\\_and\\_links/06\\_exports\\_levi.pdf](http://www.hamiltonproject.org/files/downloads_and_links/06_exports_levi.pdf) and attached here as exhibit 1.

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

<sup>16</sup> *Id.* at 21.

<sup>17</sup> Comment of Bipartisan Policy Center at 2.

<sup>18</sup> *See, e.g.*, Comment of American Petroleum Institute at 15.

higher prices resulting from competition with exports increase the environmental harm the public suffers, by stimulating increases in overall production and consumption and thus increases in environmental impacts such as emissions of greenhouse gases and traditional air pollutants. Similarly, when the public pays for price increases in response to purely domestic demand growth, the public “buys” the benefits of a strong manufacturing industry, but when prices increase because of export, the public receives no analogous benefit.

Thus, DOE/FE must consider the environmental impacts of exports, including the effects of induced gas production and of liquefaction, in its assessment of the public interest. DOE/FE must consider the alternative of withholding approval of export authorizations until additional regulation—such as that recommended by the SEAB—is in place to ameliorate these impacts.<sup>19</sup> Even under such an alternative, however, DOE/FE would need to consider the effects of remaining environmental impacts, which, though diminished, would still weigh against the public interest.

## **B. Employment and Job Losses**

LNG export proponents and opponents generally agree that exports will have significant effects on domestic employment and that employment effects are a key component of the public interest, but that the NERA Study did not directly consider this issue.

There is an apparent consensus among informed observers that if exports are approved, there will be additional jobs in the fields of gas production and terminal construction, but that the resulting increase in gas prices will eliminate

---

<sup>19</sup> Contrary to American Petroleum Institute’s contention, DOE/FE plainly has authority to deny export applications on the basis of environmental impacts. Comment of American Petroleum Institute at 23. American Petroleum Institute rests on *Department of Transportation v. Public Citizen*, 541 U.S. 751 (2004). *Public Citizen* held that “where an agency has *no ability* to prevent a certain effect due to its limited statutory authority over the relevant actions, the agency cannot be considered a legally relevant ‘cause’ of the effect,” and that the effect could be excluded from NEPA analysis. *Id.* at 770 (emphasis added). There, where the agency had “no discretion to prevent the entry of Mexican trucks, its [environmental assessment] did not need to consider the environmental effects arising from the entry.” *Id.* Here, DOE/FE unquestionably has the authority and duty to consider environmental impacts in its public interest analysis, the authority to deny export authorization on the basis of environmental impacts, and thereby to prevent the environmental harms associated with induced production. Accordingly, *Public Citizen* does not support American Petroleum Institute’s argument.



jobs in other industries, such as manufacturing, that are highly energy dependent. The NERA Study acknowledges both of these effects.<sup>20</sup> NERA did not, however, provide a sufficient analysis of their absolute or relative magnitudes. As the Synapse Report provided by Sierra Club explained, because of the NewERA model's assumption of full employment, "the potential economic impact that is of the greatest interest to many policymakers, namely the effects of increased LNG exports on jobs, cannot be meaningfully studied with NERA's model."<sup>21</sup> Numerous export proponents also criticize the NERA Study's assumption of full employment.<sup>22</sup> Accordingly, DOE/FE cannot approve the pending export applications without conducting a study capable of examining the job creation or destruction impacts of LNG exports.

If DOE/FE were to make a decision on the available evidence, DOE/FE would have to conclude that LNG exports will cause a severe net *decrease* in domestic jobs. As Sierra Club explained in its initial comment, although the NERA Study did not directly assess job impacts, it attempted to predict impacts on aggregate labor income, and these predictions can be used to evaluate gain or loss in "job equivalents."<sup>23</sup> Considering the increase in labor income in sectors benefited by exports (gas production and terminal construction) and the decrease in labor income in other sectors, NERA predicted a loss of labor income equivalent to 36,000 to 270,000 jobs per year.<sup>24</sup> This is the only economy-wide discussion of job impacts in the record, and it provides a strong indication that exports would be contrary to the public interest.

Although many export applicants have provided studies purporting to show job growth, none of these studies attempts to account for decrease in employment in the industries that will be negatively affected by increased gas prices. For example, in its initial comments, Golden Pass Products disputes the NERA Study's conclusion that "'higher energy costs do create a small drag on economic output in the U.S. so that total worker compensation declines.'"<sup>25</sup> Golden Pass Products' basis for disputing this conclusion is the contention that its own export proposal would generate "tens of thousands of direct and indirect jobs across the U.S." as a result of construction and operation of the needed export facility and

---

<sup>20</sup> NERA Study at 60-61, 65.

<sup>21</sup> Comment of Sierra Club at Ex. 5, 15.

<sup>22</sup> See, e.g., Comments of Cameron LNG at 12, Cheniere Energy at 5, ExxonMobil at 2.

<sup>23</sup> Comment of Sierra Club at 8, Ex. 5, 4-5.

<sup>24</sup> *Id.*

<sup>25</sup> Comment of Golden Pass Products at 3 (quoting NERA Study at 77).

production of the gas required for export.<sup>26</sup> But Golden Pass Products and the economic study it relies on are completely silent as to the countervailing effects of jobs lost in other industries as a result of increased gas prices. Accordingly, the study Golden Pass Products submitted provides no basis for DOE/FE to conclude that exports will result in net job growth. As Sierra Club has explained in the individual dockets for other pending export applications, all of the studies applicants have submitted regarding employment impacts suffer this defect.<sup>27</sup>

Finally, DOE/FE must reject the various assertions that jobs in terminal and liquefaction facility construction provide a substitute for lost manufacturing jobs.<sup>28</sup> It is possible that, from the perspective of an individual employee, the two may be comparable on a short term basis,<sup>29</sup> but it is extraordinarily unlikely that the number of facility construction jobs created will equal the number of manufacturing jobs lost. This is especially true over the 20-year lifetime of the export authorizations requested, because facility construction jobs are by nature temporary and will span only the beginning few years of the exports.

The NERA Study's failure to consider job impacts is a glaring gap in the public interest analysis, and DOE/FE must address this gap before approving any of the pending export applications. The best evidence in the existing record regarding net job impacts, however, is Sierra Club's application of NERA's own "job equivalent" methodology to the NERA Study's labor income forecasts, and this evidence strongly indicates that the volumes of exports considered by the NERA study will cost between 36,000 and 270,000 jobs annually.

### **C. Resource Extraction Hurts, Rather than Benefits, The Communities in which It Occurs**

On a macroeconomic level, exports will increase output of the gas production industry while reducing output of many manufacturing and other energy intensive industries. Similarly, in terms of aggregate employment figures, exports will create some jobs in gas extraction but eliminate jobs in other industries. It is therefore understandable for the NERA Study and many

---

<sup>26</sup> *Id.* at 4.

<sup>27</sup> The job creation arguments submitted by export applicants suffer numerous additional flaws, as Sierra Club has explained in the individual dockets.

<sup>28</sup> See, e.g., Comment of American Petroleum Institute at 5-6.

<sup>29</sup> Of course, even a shift between comparable jobs could have a net adverse effect on the public interest, due to the social and economic costs of displacing workers.

commenters to approach the public interest analysis by examining whether the benefits realized by increased gas production outweigh the costs felt by other industries, whether these costs and benefits are measured in industry profits or jobs supported.

On a community level, however, it would be inappropriate for DOE/FE to conduct a simplistic comparison of the “benefits” of increased production and the harms of reduced energy intensive industry. Empirical evidence indicates that in the long term, resource extraction hurts, rather than helps, the communities in which it occurs.<sup>30</sup> Many individuals living in communities currently experiencing America’s shale gas boom submitted initial comments on the NERA Study testifying to the degradation their communities have experienced as a result of shale gas extraction. DOE/FE must ensure that the infrastructure costs, population declines, and other symptoms of the “resource curse” that often affects these communities are accounted for in whatever framework DOE/FE ultimately uses to assess the public interest. The NERA Study is not up to this task.

## **II. Price Impacts**

Turning to questions the NERA Study purports to answer, the effects of LNG exports on domestic gas prices are a key aspect of the Natural Gas Act’s public interest inquiry. Sierra Club previously explained that the NERA Study understates the potential magnitude of these increases, and comments from other entities support Sierra Club’s argument on this point. Industry commenters further support the conclusion that exports, if approved, are likely to ramp up quickly, risking domestic price spikes.

### **A. LNG Exports Will Raise Domestic Gas Prices Without Providing Corresponding Social or Environmental Benefits**

As a threshold issue, all available evidence indicates that exports will increase gas prices. DOE/FE therefore must reject assertions by some export proponents, such as the American Exploration and Production Council, that the demand created by exports is necessary to avoid a decline in production that would lead

---

<sup>30</sup> Comment of Sierra Club at 13-25.

to even greater price increases.<sup>31</sup> No study or modeling submitted by export applicants supports this argument. Instead, every model and forecast that compares future worlds with and without U.S. LNG exports concludes that U.S. gas prices will be higher with exports, and that prices will increase as export volumes increase. Indeed, even the American Exploration and Production Council apparently endorses the NERA Study's price forecasts—which predict that exports will increase prices relative to a baseline future without exports—on the page prior to the group's assertion that exports will lower prices.

## **B. The NERA Study Overstates Potential Market Limits on Exports, and Thus Underestimates The Potential Ceiling on Domestic Price Increases**

The NERA Study concludes price increases will be self-limiting because exports will only make economic sense when regasified U.S. LNG can be had in receiving markets for less than the cost of alternative supplies. In other words, the spread between prices in the U.S. and receiving markets must be greater than the cost of liquefying, transporting, and re-gasifying LNG. Thus, the NERA Study concludes that there will be a market ceiling on the extent to which exports can cause domestic gas prices to rise: exports should drive U.S. prices above the highest price in a receiving market minus the price of transporting gas to that market. The NERA Study explains that at present, the highest priced markets are Japan and Korea, and that the total costs to deliver gas to Asian markets are \$6.89/MMBtu to China and India and \$6.64/MMBtu to Korea and Japan.<sup>32</sup>

For reasons Sierra Club previously explained, the NERA Study's projected ceiling on domestic prices is too low. First, NERA overstates transportation costs. The NERA Study assumes that all U.S. export terminals will be in the Gulf Coast, and estimates transportation costs accordingly. Two facilities, however, have been proposed for the West Coast. One of these, proposed by Jordan Cove Energy Project, filed comments explaining 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

---

<sup>31</sup> Comment of American Exploration and Production Council at 2.

<sup>32</sup> NERA Study at 90, Figure 62 (figures here exclude the "Regas to city gate pipeline cost").

lower than the estimates used by NERA.<sup>33</sup> 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.<sup>34</sup>

Another factor that causes the NERA Study to underestimate the potential volume of exports, and thus the magnitude of price increases, is the failure to acknowledge the effects of "take or pay" contracts. Under these contracts, importers agree to pay a fee to reserve terminal capacity regardless of whether that capacity is actually used to liquefy and export gas. These contracts are generally for the full term of the export authorization, *i.e.*, 20 years. Various foreign commenters state that they have already entered these long-term contracts with export applicants.<sup>35</sup> Accordingly, these importers have already sunk a portion of the cost of liquefaction, and could minimize or disregard this cost when deciding whether to import gas once facilities enter operation.

### **C. Exports Will Likely Increase Domestic Gas Price Volatility**

Numerous commenters have argued that exports will decrease gas price volatility, but the available evidence indicates that, if anything, exports may lead to an increase in volatility as a surge in exports ramps up quickly.

There is reason to think that exports will *increase* domestic gas price volatility in the short term. Both EIA and the NERA Study found the highest increases in domestic gas prices in scenarios in which exports were phased in rapidly. Numerous export proponents have argued that it is imperative that the U.S. move quickly to establish exports before other sources of gas come online.<sup>36</sup> These other competitive sources of gas could be expanded LNG export operations from other countries such as Australia or Canada, development of additional international pipeline capacity, or development of unconventional gas reserves in countries that would otherwise seek to import US LNG. In light of these statements about the need and intention to proceed quickly, it is quite

---

<sup>33</sup> Comment of Jordan Cove Energy Project at 2.

<sup>34</sup> NERA Study at 50.

<sup>35</sup> Comment of Japan Gas Assoc. (explaining that Japanese firms already have a take-or-pay agreement with Freeport LNG and are close to concluding a similar agreement with Dominion).

<sup>36</sup> Comment of Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC.

possible that exports will ramp up as quickly as DOE/FE allows. If this happens, demand may increase more rapidly than production, leading to periods of increased scarcity and price spikes, as the EIA predicts.<sup>37</sup>

On the other hand, there is little evidence, if any, that exports will meaningfully reduce volatility. Export applicants have argued that increasing stable gas demand resulting from exports will induce domestic production and provide for a broader, less volatile market.<sup>38</sup> The Institute for 21st Century Energy, for example, argues that gas prices were particularly volatile when Congress limited consumption of gas by industrial and electricity generating users, and that volatility was reduced once these sectors began consuming gas.<sup>39</sup> Even if exports do not occur, however, these sectors will present exactly the type of demand growth that exports would provide. Gas prices are already expected to rise due to increasing consumption in the industrial and electricity sectors, and allowing exports would drive prices up further. Accordingly, to the extent that exports might marginally reduce volatility, they would do so by resulting in higher, if slightly more stable, gas prices.

Fundamentally, even if exports reduce volatility, this effect is almost certain to be less important than overall increases in price. Any reduction in volatility will be the result of raising prices to eliminate troughs. On the available record, DOE/FE cannot conclude that any such effect will meaningfully benefit the public interest.

#### **D. Use of Updated Annual Energy Outlook Demand and Supply Forecasts**

As Sierra Club and many others noted in the initial comments, the NERA Study used outdated predictions of domestic natural gas demand, relying on the EIA's 2011 Annual Energy Outlook instead of the 2012 data available at the time NERA undertook the study or the early release 2013 forecast. Greater baseline demand generally entails greater price increases for any given level of exports. Other commenters counter that, although more recent Annual Energy Outlooks forecast higher domestic demand, they also forecast baseline higher domestic production, which would generally tend to lower the price increase caused by any given volume of exports.

---

<sup>37</sup> *Accord*, Comment of Dow Chemical Corp. at 5, 16.

<sup>38</sup> *See, e.g.*, Comment of Center for Liquefied Natural Gas, 15.

<sup>39</sup> Comment of Institute for 21st Century Energy, 2-3.

In light of the significant changes between the 2011 and 2013 Annual Energy Outlooks, DOE/FE should revisit the price impacts analysis. We recognize that new data and forecasts will regularly be released, such that there are limits to DOE/FE's ability to always use the *most* current information. In light of the importance of this issue and the availability of newer data during the period in which the NERA Study was conducted, however, NERA's decision to rely on the 2011 Annual Energy Outlook is unreasonable.

#### **E. Conclusion Regarding Price Impacts**

As we explain above and in prior comments, LNG exports will increase domestic gas prices, and the price increases rise with export volumes. The NERA Study overestimates the costs of moving gas to foreign markets and disregards the long-term nature of export agreements, leading NERA to understate potential export volumes. NERA therefore underestimates potential domestic gas price increases. The following section discusses the effects increased prices will have on the domestic economy.

### **III. Macroeconomic Impacts**

The NERA Study's conclusions regarding macroeconomic impacts are stark: exports will decrease household incomes for the majority of Americans, effectively transferring wealth from low and middle class families to gas production companies and owners of liquefaction infrastructure. These deleterious effects are corroborated by the Purdue Study, which found similar impacts. Notwithstanding these distributional effects, the NERA Study concluded that exports would be a net benefit to the U.S. because the benefits realized by gas companies would create a slight overall increase in GDP. This conclusion is undermined by the Purdue Study, which concludes that exports will cause a net decrease in GDP.

As explained in Sierra Club's initial comment, the distributional effects of LNG exports are resoundingly contrary to the public interest; there are multiple reasons to doubt the NERA Study's conclusion regarding aggregate GDP impacts; and even if NERA were correct about effects on the overall GDP, an increase in GDP does not itself demonstrate furtherance of the public interest. These arguments are generally supported by the initial comments submitted by other parties.

## **A. Exports Will Transfer Wealth from Middle and Low Income Families to Gas Production and Exporting Companies**

The NERA Study concluded that Americans who do not own stock in companies involved in gas production or LNG export—*i.e.*, the overwhelming majority of Americans—will be made worse off by exports. None of the initial comments on the NERA Study call this conclusion into question. This regressive redistribution of wealth is highly detrimental to the public interest.

In an apparent attempt to minimize the impact of this effect, the NERA Study argues that the 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.”<sup>40</sup> 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.<sup>41</sup>

Moreover, many of the economic benefits of exports will not accrue to U.S. residents. Sierra Club’s initial comment demonstrated extensive foreign investment in U.S. liquefaction capacity.<sup>42</sup> Japan’s Osaka Gas and Chubu Electric utilities provide additional evidence on this point, expressing their belief that foreign investors (presumably including these companies) will make significant additional investments in U.S. liquefaction facilities.<sup>43</sup> A result of these investments will be that, contrary to the NERA Study’s assumptions, a share of the profits realized by liquefaction operators will accrue to foreign investors.<sup>44</sup> Moreover, while Sierra Club’s initial comment only discussed foreign ownership in the context of liquefaction and terminal facilities, other commenters demonstrate that foreign entities are also investing directly in natural gas production. India’s GMR Energy Limited notes that Indian companies have already taken stakes in production of Marcellus and Eagle Ford Shales.<sup>45</sup> Foreign investment rebuts the NERA Study’s assumption that profits from gas production will accrue solely to U.S. consumers.

---

<sup>40</sup> NERA Study at 55 n.22.

<sup>41</sup> Comment of Sierra Club at Ex. 5, 9-10.

<sup>42</sup> *Id.*

<sup>43</sup> Comment of Chubu Electric Power Co.

<sup>44</sup> *See* Comment of Sierra Club at Ex. 5, 9.

<sup>45</sup> Comment of GMR Energy Limited.



## **B. The NERA Study Understates Exports' Effects on Domestic Industry and Is Overly Optimistic about Changes in Gross Domestic Product**

Contrary to the NERA Study's conclusions, it is unlikely that LNG exports will increase GDP.

Although the NERA Study concludes that LNG exports will slightly increase GDP, this conclusion is contradicted by the recent independent Purdue Study.<sup>46</sup> Purdue's Prof. Tyner submitted a summary of this study as an initial comment, and Sierra Club discussed this work previously. The Purdue Study concludes that aggregate effects on GDP will be negative, although the two studies agree that in absolute terms, effects will be small. The Purdue Study explains that its results differ from the NERA Study's because the former predicts larger price increases as a result of exports, and thus larger declines in energy intensive sectors.<sup>47</sup> The Purdue Study is built on publicly available models and was conducted by independent researchers, making it every bit as credible as the NERA Study. Accordingly, DOE/FE cannot simply credit the NERA Study's conclusion that exports will provide a slight increase in GDP as a basis for concluding that exports are in the public interest.

Furthermore, both the NERA and Purdue Studies ignore many effects that will lower overall GDP. The Purdue Study acknowledges this omission, explaining that both its analysis and the analysis used in the NERA Study understate the impacts on energy intensive industries such as manufacturing, because these domestic industries' success depends not just on their energy costs, but also on the relative difference between what domestic industry must pay for gas and energy and what foreign competitors pay. Because LNG exports will likely simultaneously raise domestic energy costs while lowering foreign costs, exports will inhibit domestic industry's ability to compete in a global marketplace. Nor does either analysis account for the environmental harms, "resource curse" effects, or other issues described in part I, above.

We also reiterate our concerns—shared by Congressman Markey, Dow Chemical, and other commenters—about the NERA Study's modeling (or lack thereof) of effects on other industries.<sup>48</sup> Sector-specific modeling of exports'

---

<sup>46</sup> See *supra* n.2.

<sup>47</sup> Purdue Study, *supra* n.2, at 4.

<sup>48</sup> Comment of Sierra Club, Ex. 5, 5-6.

impacts can be reasonably obtained, but the NERA Study does not provide this analysis. The NERA Study asserts that adversely affected industries are not “high value-added,” but does not support this assertion by modeling the systemic impacts of impacts to these industries. The NERA Study further assumes that industries in which energy expenditures constitute less than 5% of total costs will not be significantly adversely affected by exports,<sup>49</sup> but it appears that other industries may likely be affected.

In light of these concerns, this is another area in which DOE/FE should seek to ground its public interest analysis in empirical work, including case studies. As Alcoa suggests in its comments, Australia’s recent experience with LNG export can provide a useful starting point for analysis. Alcoa states that domestic gas prices in Western Australia, which currently exports LNG, are at least double U.S. prices, despite extensive Australian natural gas resources.<sup>50</sup> We encourage DOE/FE to investigate the Australian experience with LNG export for calibration of, or in addition to, use of economic models and forecasting, before deciding whether to approve LNG export proposals.

#### **IV. Trade**

Numerous commenters invoke the United States’ obligations under the General Agreement on Tariffs and Trade (GATT), as well as an underlying commitment to free trade principles, as grounds for approving LNG exports. DOE/FE’s statutory obligation is to determine whether exports are in the public interest, and trade considerations, assuming they apply at all, are merely one factor DOE/FE can consider in this analysis. Insofar as trade issues are pertinent, we note that commenters have overstated the extent to which denying export applications would conflict with trade policy. Even if there is a conflict, however, free trade arguments at most factor into, and do not displace, the public interest inquiry required by the Natural Gas Act.

The GATT preserves the United States’ authority to restrict LNG exports in these circumstances. Specifically, the GATT states:

---

<sup>49</sup> See, e.g., NERA Study at 68.

<sup>50</sup> Comment of Alcoa, 2, 4

[N]othing in this Agreement shall be construed to prevent the adoption or enforcement . . . of measures: . . . (b) necessary to protect human, animal or plant life or health; [or] . . . (g) relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption.<sup>51</sup>

As explained above and in prior comments, exports will cause significant harm to human health and the environment. Under the Natural Gas Act, DOE/FE can and should deny export applications on this ground. In light of GATT's explicit recognition of signatories' power to restrict exports in these circumstances, DOE/FE must reject the assertion that denying export authorizations would violate the United States' GATT obligations.

Even if denying applications could potentially brush against free trade principles, this would be at most just one factor to consider in the public interest analysis. Congress has commanded DOE/FE to evaluate proposals for exports to countries lacking a bilateral free trade agreement on a case by case basis. If DOE/FE were to categorically determine that all exports to WTO nations were consistent with the public interest DOE/FE would, among other errors, disregard the Congressional command to engage in case-by-case inquiry and thereby fail to give effect to the terms of the governing statute. Under the existing statutory framework DOE/FE can, at most, attempt to assess on a case-by-case basis whether the benefits of adherence to free trade principles in that particular case, together with other factors furthering the public interest, outweigh the effects that will be contrary to the public interest.

## **V. DOE/FE Process**

Finally, we have a number of concerns regarding the process by which DOE/FE has addressed the question of whether to authorize LNG exports, as well as the process DOE/FE will use going forward.

As the above concerns amply demonstrate, in making its public interest determinations regarding individual export proposals, DOE/FE must confront a

---

<sup>51</sup> General Agreement on Tariffs and Trade, Oct. 30, 1947, 61 Stat. A-11, 55 U.N.T.S. 194 at Art. XX.

wide range of issues addressed inadequately, if at all, by the NERA Study. We join with other commenters, including Dow Chemical Corporation, in requesting that DOE/FE explicitly articulate the framework it will use in making these determinations. Development of this framework would most sensibly take place in the context of a separate rulemaking.

Similarly, we remind DOE/FE that it must consider the cumulative environmental, economic, and other impacts of LNG exports; DOE/FE cannot consider individual applications in isolation. Regarding environmental impacts, the best way to consider these impacts is through preparation of a programmatic environmental impact statement (EIS), pursuant to the National Environmental Policy Act, 42 U.S.C § 4332(c). Whether conducted under the auspices of a programmatic EIS or otherwise, DOE/FE cannot approve any individual application until it has considered the cumulative impacts of all foreseeable applications. Although export proponents have argued that only a subset of proposed export projects are likely to be constructed, DOE/FE may not decline to consider the impacts of all pending proposals on that basis. Moreover, DOE/FE must recognize that the mere existence of a proposal or authorization of exports has immediate effects on energy markets and dependent industries, as other players adjust their expectations regarding the potential for exports. DOE/FE must acknowledge that authorization of a proposal has important effects even if that authorization is not put to use.

DOE/FE should also articulate the standards it will use in retaining jurisdiction over exports after they are approved. In the Sabine Pass proceeding, DOE/FE stated that it would continue to exercise jurisdiction over the approved exports, and would revisit the authorization if subsequent events demonstrated that exports had become contrary to the public interest.<sup>52</sup> If DOE/FE wrongly concludes that exports are in the public interest now, DOE/FE should nonetheless provide examples of the types and severity of circumstances that would cause DOE/FE to revisit this determination and revoke approval.<sup>53</sup>

---

<sup>52</sup> DOE/FE Order No. 2961 at 31-33.

<sup>53</sup> DOE/FE's ongoing supervisory authority is not a substitute for making a proper initial public interest evaluation. DOE/FE must reject the Center for Liquefied Natural Gas's apparent suggestion that DOE/FE approve the pending applications now without attempting to predict their consequences, with the plan of taking action once adverse impacts manifest themselves. Comment of Center for Liquefied Natural Gas, 6. The Center for Liquefied Natural Gas asserts that "The role of the regulator is . . . not to be a predictor of future events," and that DOE should not "predict future events," presumably meaning price increases and effects on the American

Finally, we reiterate our concerns about the lack of transparency regarding DOE/FE's selection of NERA, as well as the quality of the NERA Study itself. As Sierra Club previously explained, NERA in general, and study author Dr. Montgomery in particular, have a history of activities that raises serious questions about their objectivity. These questions are made even more pertinent by the dearth of information regarding DOE/FE's solicitation and selection of NERA and the modeling and data used by NERA in generating this study, including information regarding the underlying NewERA model. DOE/FE has refused to make this information available for review during the public comment period.<sup>54</sup> For a study of this importance, however, DOE should have provided this information in order to support full public participation and rigorous peer review, and to inspire public trust in the study's conclusions.

## **VI. Conclusion**

Exports will cause severe environmental harms, eliminate more jobs than they create, disrupt communities with the boom/bust cycle of resource production, redistribute wealth from the lower and middle classes to wealthy owners of gas production companies, and have broad effects on the output of various sectors of the American economy. The NERA Study disregards nearly all of these considerations in concluding that exports will be a "net benefit" to the United States. DOE/FE's review of the public interest cannot be so constrained. Initial comments on the NERA Study submitted by other parties only reinforce the arguments advanced in Sierra Club's initial comment.

On the record before it, DOE/FE cannot conclude that any of the pending export applications would be in the public interest. DOE/FE must begin a transparent process that will acknowledge and evaluate all of the proposed LNG exports' impacts on the public interest.

---

economy, "during the authorization proceeding for projects with lifespans in excess of twenty (20) years each." *Id.* The Center for Liquefied Natural Gas's assertion that regulators should not predict impacts in the domains they regulate, including the impacts of that regulation, severely misunderstands the role of a regulator. Common sense and general principles of administrative law are that when such predictions are available, the agency must seek them out and use them to inform its actions.

<sup>54</sup> Sierra Club, *Freedom of Information Act Request Re: LNG Export Studies* (Jan. 22, 2013), attached as exhibit 2; DOE Interim Response to HQ-2013-00423-F (Jan. 24, 2013), attached as exhibit 3; Sierra Club, *Freedom of Information Appeal, re: HQ-2013-00423-F* (Feb. 22, 2013), attached as exhibit 4.

Sincerely,

/s/ Nathan Matthews

Nathan Matthews

Ellen Medlin

Craig Holt Segall

Attorneys, Sierra Club Environmental Law Program

Please send all correspondence to:

Sierra Club

50 F St NW, Eighth Floor

Washington, DC, 20001

(202)-548-4597

[Craig.Segall@sierraclub.org](mailto:Craig.Segall@sierraclub.org)

## A Strategy for U.S. Natural Gas Exports

Michael Levi



## MISSION STATEMENT

The Hamilton Project seeks to advance America's promise of opportunity, prosperity, and growth.

We believe that today's increasingly competitive global economy demands public policy ideas commensurate with the challenges of the 21st Century. The Project's economic strategy reflects a judgment that long-term prosperity is best achieved by fostering economic growth and broad participation in that growth, by enhancing individual economic security, and by embracing a role for effective government in making needed public investments.

Our strategy calls for combining public investment, a secure social safety net, and fiscal discipline. In that framework, the Project puts forward innovative proposals from leading economic thinkers — based on credible evidence and experience, not ideology or doctrine — to introduce new and effective policy options into the national debate.

The Project is named after Alexander Hamilton, the nation's first Treasury Secretary, who laid the foundation for the modern American economy. Hamilton stood for sound fiscal policy, believed that broad-based opportunity for advancement would drive American economic growth, and recognized that “prudent aids and encouragements on the part of government” are necessary to enhance and guide market forces. The guiding principles of the Project remain consistent with these views.







# A Strategy for U.S. Natural Gas Exports

Michael Levi

*Council on Foreign Relations*

**JUNE 2012**

NOTE: This discussion paper is a proposal from the author. As emphasized in The Hamilton Project's original strategy paper, the Project was designed in part to provide a forum for leading thinkers across the nation to put forward innovative and potentially important economic policy ideas that share the Project's broad goals of promoting economic growth, broad-based participation in growth, and economic security. The authors are invited to express their own ideas in discussion papers, whether or not the Project's staff or advisory council agrees with the specific proposals. This discussion paper is offered in that spirit.

**BROOKINGS**

# Abstract

A surge in low-cost U.S. natural gas production has prompted a flurry of proposals to export liquefied natural gas (LNG). A string of permit applications are now pending at the Department of Energy (DOE), and more can be expected; lawmakers are also debating the wisdom of allowing LNG exports. This paper proposes a framework for assessing the merits of allowing LNG exports along six dimensions: macroeconomic (including output, jobs, and balance of trade), distributional, oil security, climate change, foreign and trade policy, and local environment. Evaluating the possibility of exports along all six dimensions, it finds that the likely benefits of allowing exports outweigh the costs of explicitly constraining them, provided that appropriate environmental protections are in place. It thus proposes that the DOE and the Federal Energy Regulatory Commission (FERC) approve applications to export natural gas. It also proposes steps that the United States should take to leverage potential exports in order to promote its broader trade and foreign policy agendas.

# Table of Contents

ABSTRACT	2
CHAPTER 1: INTRODUCTION	5
CHAPTER 2: NATURAL GAS MARKETS IN THE UNITED STATES AND BEYOND	7
CHAPTER 3: THE PROBLEM AND POTENTIAL OF LNG EXPORTS	10
CHAPTER 4: COSTS AND BENEFITS OF LNG EXPORTS	12
CHAPTER 5: NATURAL GAS EXPORT POLICY RECOMMENDATIONS	22
CHAPTER 6: QUESTIONS AND CONCERNS	24
CHAPTER 7: CONCLUSIONS	27
AUTHOR AND ACKNOWLEDGMENTS	28
ENDNOTES	29
REFERENCES	30



---

# Chapter 1: Introduction

---

U.S. natural gas production is booming. Five years ago, most experts assumed that U.S. natural gas output was in terminal decline; today, most believe the opposite. As recently as 2009, the U.S. Department of Energy was projecting indefinite dependence on imported natural gas along with rising prices for decades to come (EIA 2009a). By 2010, after breakthroughs in extracting natural gas from shale, conventional wisdom had flipped. Large-scale gas imports now seem unlikely, and abundant domestic supplies look like they will hold prices in check (EIA 2010a).

The market has signaled its endorsement of this development by hammering natural gas prices. U.S. benchmark natural gas dipped below \$2 for a thousand cubic feet in early 2012, and as of mid-April 2012, delivery of the same amount in March 2015 could be assured for \$4.43. Wellhead prices, meanwhile, fell to levels unseen since 1995.<sup>1</sup>

But the world looks different from overseas. In Europe, a thousand cubic feet of gas sold on the spot market for about \$11 as of March 2012, and in East Asia, the price was north of \$15 (Platts 2012). These prices are all the more striking since it costs roughly \$4 to liquefy and ship a thousand cubic feet of natural gas from the United States to Europe, and only about \$2 more to send it to Asia (Morse et al. 2012).

Yet the United States does not export natural gas to those markets. Many have thus argued that it is leaving money on the table. The potential profits from exports have prompted several companies to apply for permits to export liquefied natural gas (LNG) without restriction. In March 2011, the U.S. Department of Energy (DOE) approved the first such permit, for Cheniere Energy, and in April 2012, the Federal Energy Regulatory Committee (FERC) approved Cheniere's Sabine Pass, Louisiana facility. As of May 2012, another eight projects had applied to the DOE for similar permits, and four more had applied for permits to export LNG to countries with which the United States has free trade agreements (DOE 2012). The DOE has signaled that it will begin making decisions on these applications after receiving the results of a contractor study on the possible impacts of LNG exports in late summer 2012. The DOE can be expected to solicit input from several agencies, including the Departments of State and Commerce, the Environmental Protection Agency, and the Office of the U.S. Trade Representative, as well as from the National Economic Council, the National

Security Council, and the Council on Environmental Quality in making its ultimate decisions.

Indeed, if currently anticipated price differences hold up, and fully free trade in natural gas is allowed, several developers will likely attempt to build LNG export terminals. A wide range of analysts have claimed that as many as six billion cubic feet of daily exports by the end of the decade is plausible. That trade could expand U.S. gas production substantially and, in principle, net U.S. producers, exporters, and their suppliers north of \$10 billion a year.<sup>2</sup> Gas exports could help narrow the U.S. current account deficit, shake up geopolitics, and give the United States new leverage in trade negotiations. This has led many people to advocate for a U.S. policy that allows—or even encourages—natural gas exports.

But there is also great wariness in many quarters about the prospect of allowing exports of natural gas. Americans usually support exports, but natural gas, along with other energy commodities, has recently received special scrutiny. Some fear that allowing exports would dangerously drive up domestic natural gas prices while making the U.S. gas market more volatile. Others would prefer that domestic gas be directed toward boosting manufacturing at home, replacing coal-fired power plants, or taking the place of oil as the ultimate fuel for American cars and trucks. Still more oppose natural gas exports because those exports would result in greater U.S. natural gas production, potentially leading to social and environmental disruption. All of these parties oppose natural gas exports, or at least seek significant constraints. Some are driven by broad visions of the national interest to conclude that natural gas exports would have negative consequences that are not captured by simple economic logic. Others are motivated by more self-interested concerns, particularly the desire to secure cheap energy inputs for their industries.

There is also skepticism in some quarters over whether LNG exports, even if allowed, will ever get off the ground. Yet with a large docket of export applications pending, policymakers will have no choice but to step into this controversy. In this paper, I elaborate a framework for policymakers to use in deciding whether to allow LNG exports (a decision for regulators) or whether to take steps to constrain them (a decision for both regulators and lawmakers). This framework should focus on evaluating six questions:

1. What broad economic gains and losses might allowing LNG exports deliver?
2. How might exports affect energy bills for people of limited economic means?
3. Would LNG exports undermine U.S. energy security by preventing the United States from using more natural gas in its cars and trucks?
4. Would exports help or hurt the fight against climate change?
5. How would different U.S. decisions on exports affect U.S. foreign policy, including broad U.S. access to global markets in particular?
6. Would allowing exports lead to more U.S. natural gas production—and if production increases, what would the consequences be for the local environment?

This paper addresses these questions and argues that the benefits from allowing natural gas exports outweigh the commonly cited risks and costs, assuming that proper steps are taken to protect the environment.

The potential direct economic gains from LNG exports are significant but they are also smaller than many assume. Export terminal construction might employ as many as 8,000 people at different points over the next several years, but these jobs will be temporary. Expanding natural gas production in order to supply export markets could potentially support roughly 25,000 jobs in the natural gas industry, and perhaps 40,000 along the supply chain, but most of these positions would not materialize for at least five more years, and can thus be reasonably expected to be mostly offset by lower employment elsewhere. Profits from greater gas production and export activities could reach several billion dollars each year, while losses to other gas dependent industries would likely be at least an order of magnitude smaller. Indeed, the resurgent petrochemicals industry, which many have assumed would suffer from gas exports, would be more likely to benefit instead from modest export volumes.

Moreover, allowing LNG exports would have benefits for U.S. leverage in trade diplomacy, potentially delivering wider economic benefits. Conversely, placing curbs on U.S. LNG exports could undermine U.S. access to exports from other markets (including to Chinese rare earth metals, which are essential to many segments of the U.S. clean energy industry), and could potentially result in broader trade conflicts, leading to wider U.S. economic harm.

To be certain, changes in world gas markets could reduce opportunities for LNG exports, and thus any benefits from allowing them. But that would not change the fact that those benefits outweigh the costs of explicitly and directly constraining exports through government action.

What about the commonly claimed costs of *allowing* exports? This paper will show that integrating U.S. markets with global ones is as likely to tamp volatility as it is to increase it; that the gains to energy-intensive manufacturing from constraining natural gas exports would be much smaller than the economic opportunities that would be lost; that allowing natural gas exports would likely curb rather than increase global greenhouse-gas emissions; and that whether natural gas will be used to replace oil in U.S. cars and trucks depends little on whether exports are allowed. But the paper also offers warnings on two fronts. Natural gas exports would slightly raise U.S. natural gas prices, with disproportionate consequences for low-income consumers. (Increased tax revenues due to exports should be used to mitigate that effect insofar as possible.) Local environmental risks arising from natural gas production would also rise due to new production for exports. This can, in principle, be safely managed, but that is not inevitable; the prospect of exports should lead industry and regulators to redouble their efforts. This last factor is particularly important: as the controversy over the Keystone XL pipeline demonstrated, export-oriented resource extraction may be particularly vulnerable to local and environmental opposition; if allowing LNG exports were to lead to a backlash against natural gas production in general, the economic fallout could be vast. Conversely, if prudent regulation of natural gas extraction in the public interest raises natural gas prices and, as a result, makes some exports uneconomic, that should be accepted as a desirable outcome.

In light of this analysis, I propose that the United States allow LNG exports. In conjunction with this, the U.S. should take other steps to mitigate potential downsides and leverage these exports to its advantage.

The United States should approve applications to export LNG from the United States, several of which are currently pending, and more of which can be expected in the future. This does not mean that the U.S. government should encourage exports *per se*; it should simply allow them to occur if properly regulated markets steer the economy in that direction.

U.S. law distinguishes between LNG exports to countries with which the United States has relevant free trade agreements (FTAs), which are fast tracked for approval, and exports to other countries, which face more rigorous review and must be judged to be consistent with the U.S. national interest. Some have argued that this distinction should be abolished, since it interferes with free trade. The United States should maintain the distinction, which can give it leverage in trade negotiations without entailing any economic costs.

U.S. natural gas exports can also provide a platform for more effective U.S. foreign and trade policy. To that end, the United States should use foreign access to U.S. gas exports as leverage in trade negotiations, and actively seek to steer global gas trade toward greater transparency and market-based pricing.

## Chapter 2: Natural Gas Markets in the United States and Beyond

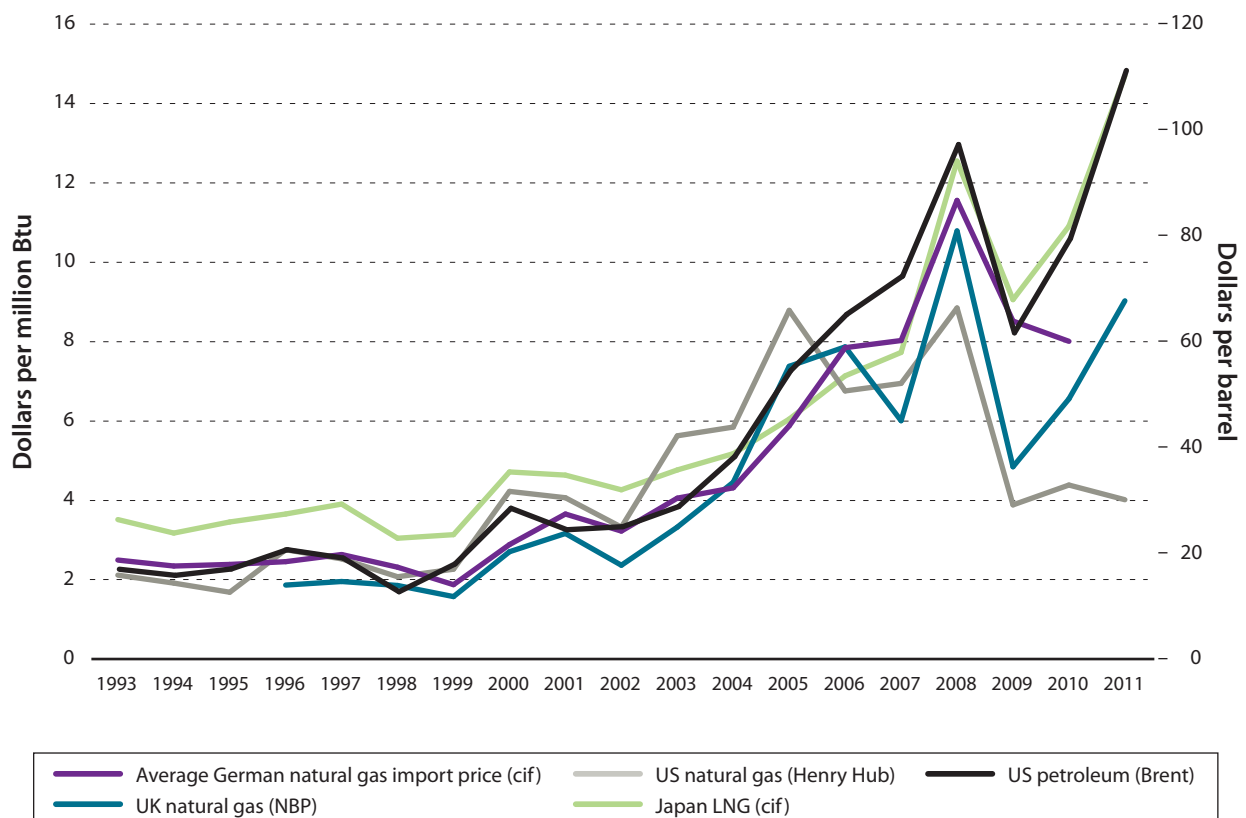
Any strategy toward U.S. LNG exports must be grounded in an understanding of the often odd workings of the world market for natural gas. (Readers who are familiar with natural gas markets, or who are willing to take on faith that global prices will continue to diverge, can skip to Chapter 3.) The market is dominated by state-owned or state-controlled firms in countries like Russia, Qatar, China, and Korea that make decisions regarding production and consumption based only in part on economics. Overland trade in natural gas is constrained by pipeline geography and capacity, which again gives governments a strong role in shaping outcomes. Seaborne trade in LNG requires large up-front capital investments—a fact that tends to encourage firms to enter long-term contracts that spread risk (Joskow 1987) but also add rigidity to markets.

It also gives government-backed firms another edge due to their access to stable sources of long-term capital. Trade is largely regionalized, a result mainly of the high cost of shipping gas over long distances. Political concerns often motivate an opposition to transparency among major players, who seek to gain informational edges in bargaining, further steering global markets away from the economic ideal.

North America is an exception to this pattern. During the 1970s and 1980s, the U.S. market for natural gas was progressively deregulated. Robust pipeline networks, hub services, and futures markets developed. In 1994, the North American Free Trade Agreement (NAFTA) cemented a liberalized gas market across the continent.

FIGURE 1.

### Select Prices of Natural Gas, LNG, and Brent Crude Oil, 1993–2011



Source: BP (2011); ENI (2012); EIA (2012f; 2012g); World Bank (2012).

Note: cif represents sum of cost, insurance and freight (average).

Yet despite extraordinary differences between U.S., European, and Asian gas markets, spot prices in all three have largely tracked each other for twenty years—and all three have also tracked the price of oil (Figure 1). While Figure 1 primarily shows spot prices, most natural gas trade in Europe and Asia does not occur on spot markets. Economists generally believe, however, that spot and contract prices cannot diverge much over the medium and long run, since those bound by contracts will insist on renegotiating. This intuition is reinforced by comparing U.K. spot prices and German import prices (which are dominated by contracts) in Figure 1.

The historical relationships between the three markets, however, appear to have broken down around 2009. U.S. natural gas output is on the rise as a result of breakthroughs in shale gas production. Total U.S. natural gas production rose from 23.5 trillion cubic feet in 2006 to 28.6 trillion cubic feet in 2011, equivalent to 78 billion cubic feet each day (EIA 2012b). This flood of production has depressed natural gas prices in the United States. Yet, since exports from the United States to Europe and Asia are generally not allowed, overseas prices have not followed.

It is this difference in prices that has sparked interest in U.S. LNG exports: before prices in the three markets blew wide apart, there was no economic incentive for anyone to build an LNG export facility in the United States. If a situation resembling the historical relationship returns, opportunities for exports will vanish.

Economists expect prices for commodities in a competitive environment to converge with the marginal cost of supplying them over the medium term. For natural gas this could mean ample low-priced competition from traditional suppliers within a few years, making U.S. LNG exports uneconomic. Several Middle Eastern producers have marginal costs of production close to zero (excluding shipping), either because natural gas is easy to extract or because it is a byproduct of oil production. Russian and Caspian gas generally costs more than Middle Eastern gas to produce, but, given sufficient pipeline infrastructure, delivering it could be much cheaper than shipping LNG.

Yet there is good reason to believe that prices will not converge any time soon. Global natural gas production is highly concentrated, and strategic producers, including Qatar and Russia, appear to restrain production for export; they would rather sell less gas at higher prices than more gas at lower ones. This restraint is not necessarily explicit: by simply insisting on linking gas prices to oil prices, they implicitly constrain supply by throttling demand. In addition, directing marginal production to subsidized domestic markets can keep export prices high.

Insofar as global natural gas supply and transport are constrained in part by noneconomic factors, prices will be determined by competition in consuming countries between natural gas and substitutes.<sup>3</sup> Prices should settle at levels that make gas competitive at the margin with other fuels and technologies than can be used instead. Consumers will not buy natural gas if producers raise prices so high that they would be better off using other fuels or technologies instead; if, however, natural gas is a better deal than the next best option, consumers will buy it.

This framework allows us to better assess whether prices in the three major regional gas markets might converge, and, hence, what the environment for potential U.S. exports might be. Indeed there are several possible ways (not mutually exclusive) for prices in the three big natural gas markets to return to similar levels. Examining them, however, reinforces the real possibility that prices will continue to diverge for the indefinite future.

The first way that prices could converge is through U.S. LNG exports, which could ultimately bring the various prices together, net of transport costs (including an indeterminate risk premium paid to investors in risky LNG projects). Indeed initial natural gas exports themselves will tend to shrink opportunities for subsequent exports. A recent DOE study projects that with moderate U.S. gas resources and twelve billion cubic feet a day of exports, U.S. benchmark prices would rise to more than \$8 per thousand cubic feet by the middle of the next decade (EIA 2012c). When combined with the cost of moving natural gas from the United States to overseas markets, there is a strong chance that some exports would be unprofitable at that price. The same analysis found that if U.S. resources were lower than anticipated, prices could reach \$14 per thousand cubic feet by 2020, making exports undoubtedly uneconomic at the margin. All that said, assuming U.S. LNG exports at the outset of this analysis would make no sense, since their very existence depends on the particular export policy that is adopted.

The second way that prices could converge is through a return of the historically tight link between oil and natural gas prices in the U.S. market. Until recently, high oil prices drove many U.S. manufacturers to substitute natural gas for distillate or residual fuel oil in their operations, while high natural gas prices did the reverse. As a result, natural gas prices followed oil prices up and down. The same thing occurred in Europe and Asia. Since oil prices were the same in all three markets, natural gas prices converged, too.

Today, though, there is very little switchable capacity left in U.S. industry: as of 2006, U.S. manufacturers only had enough switchable oil-based capacity to accommodate an additional



200 million cubic feet of daily natural gas consumption, a figure that has probably fallen since (EIA 2010b; author's calculations). Even if all nonswitchable capacity that currently uses fuel oil were retired and replaced with gas-based facilities (which would require sustained natural gas prices far below oil prices to offset the costs of new equipment), this would absorb less than one billion cubic feet of daily natural gas demand, around one percent of total U.S. production.

Natural gas and oil prices could also become re-linked in the United States through the robust use of natural gas in transportation. This could be more significant: displacing the equivalent of 150,000 barrels a day of refined petroleum products each year (about one percent of U.S. consumption and thus a reasonable prospect within a decade) could absorb the equivalent of about one billion cubic feet of incremental daily natural gas production.<sup>4</sup> But the link would be different from before: because the equipment needed to utilize natural gas to power cars and trucks is more costly than the equipment needed for oil, a big difference between oil and natural gas prices—as much as \$6-7 per thousand cubic feet—would remain.<sup>5</sup>

The third way for natural gas prices in the three major international markets to converge is for them to all become linked to some new index other than oil. The most likely common anchor point is coal prices. Rising natural gas production is largely being directed toward displacing coal-fired power generation in the United States, and there is still enormous room for that to expand. Europe also uses limited amounts of oil in industry (IEA 2011), so natural gas may end up competing directly with coal there, too, so long as European climate policy or energy security policy do not squeeze both out simultaneously (a nontrivial possibility). Such a situation would tend to drive U.S. and European natural gas prices to similar levels. Because Europe and Asia share large swing LNG suppliers (most notably Qatar), Asian prices could follow.

The biggest barrier to developments along these lines may be institutional. Natural gas is currently sold to European and Asian customers on contracts that are largely tied to spot oil prices, with at most a small part of price tied to spot natural gas prices. This is in large part because no highly liquid spot markets for natural gas exist in either region. (Spot markets for oil, in contrast, are highly liquid and transparent.) Part of this, especially in Europe, is due to constraints in transnational pipeline networks that segment the market, which in turn are a result of European politics. Another part of it, in both regions, stems from the insistence of big suppliers on so-called “destination requirements,” which prohibit buyers from reselling contracted cargoes on the spot market. The concentrated nature of the European and Asian natural gas markets has further enhanced the stability of such arrangements. Finally, there is a chicken-and-egg problem in expanding spot markets: the early movers put themselves at the mercy of idiosyncratic price movements and potential market manipulation, both of which are far less likely to occur once spot markets have eventually grown. The entire scheme has been sustainable in large part because oil-indexed natural gas prices have largely tracked spot market natural gas prices. But, if the two diverge for a sustained period, the pressure to abandon oil indexation could become large.

No sober analyst should confidently claim to be able to perfectly predict the future of global natural gas markets. The best one can say is that prices in the three regional markets could continue to diverge for the indefinite future, but that new developments could lead them to converge even absent U.S. exports. The lesson for those crafting policy toward U.S. LNG exports is that any strategy should be robust to the different possible courses.

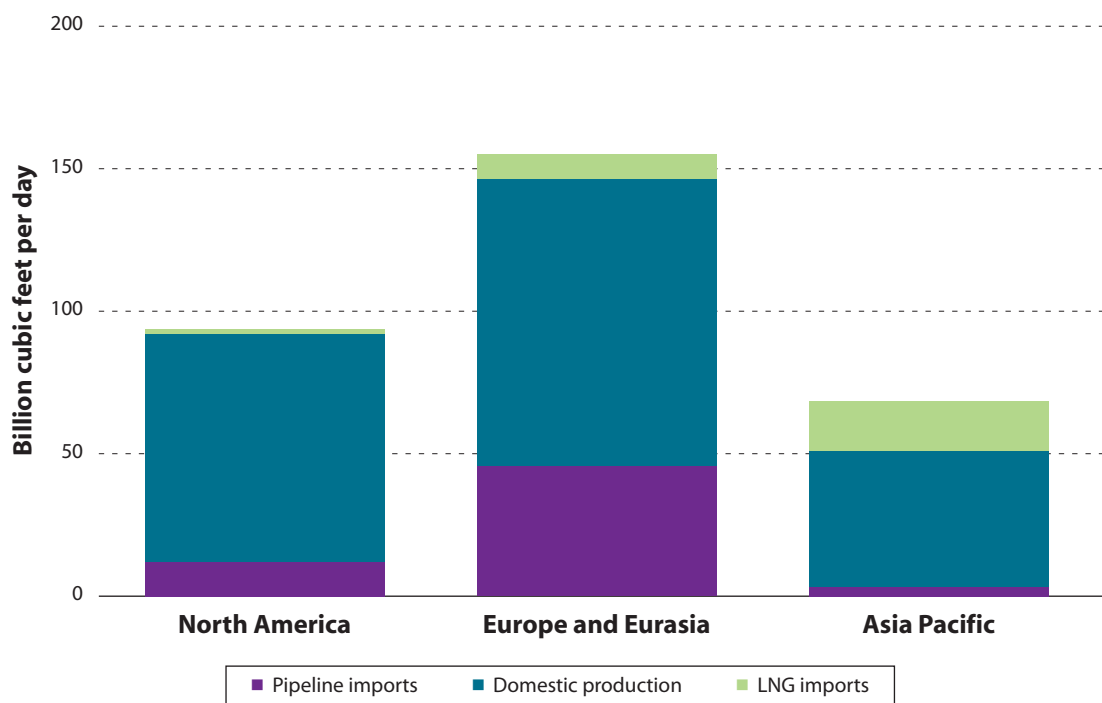
# Chapter 3: The Problem and Potential of LNG Exports

There is a real possibility that prices in the United States, Europe, and Asia will continue to diverge, creating opportunities for U.S. LNG exports. Yet exporting natural gas overseas is not a straightforward endeavor. Gas must be liquefied before it can be transported in specially built ships and then regasified at its destination. Building liquefaction facilities in particular can cost as much as \$4 billion for each billion cubic feet of daily export capacity—several times the cost of building an import terminal of similar scale (Ratner et al. 2011). Investment on this scale can be risky: if natural gas price spreads collapse, multibillion-dollar investments can quickly become worthless. Adding to the dangers involved in building any terminal is regulatory risk associated with safety and security concerns.

Anticipating demand for LNG imports prior to the shale gas boom, several companies began to develop LNG import terminals. With the change in market conditions, most have applied for and received permits from the DOE to export LNG to countries with which the United States has applicable Free Trade Agreements (FTAs). These permits are essentially automatic.<sup>6</sup> The approved facilities, once fully built, could process 10.9 billion cubic feet of exports each day, and, as of May 2012, applications for another 2.8 billion cubic feet of daily exports were pending (DOE 2012).

However, no major LNG importer other than South Korea has an applicable FTA with the United States (Ratner et al. 2011). Would-be exporters have thus sought approval to export

FIGURE 2.  
Regional Natural Gas Consumption by Type, 2010



Source: BP (2011).  
Note: Natural gas consumption by region as of 2010. Figures for pipeline and LNG volumes include intraregional trade.

without restriction. Cheniere Energy's Sabine Pass Facility has received DOE and Federal Energy Regulatory Commission (FERC) approval for 2.2 billion cubic feet of daily LNG exports to non-FTA countries, and applications totaling another 10.3 billion cubic feet per day are under review. These combined applications involve total volumes similar to current U.S. LNG *import* capacity (Guegel 2010). Exports from the first facilities would start no earlier than 2015.

It is far from clear that all or even most of this export volume would be used even if it were approved. A recent MIT study looked at nine scenarios for U.S. and world natural gas markets; none of them led to the emergence of significant U.S. natural gas exports, in large part because other lower cost producers undercut prices offered by the United States in distant markets (MIT 2011). Other forces, discussed in Chapter 2, could also lead global natural gas prices to converge even without U.S. exports, removing opportunities for economically attractive U.S. LNG sales.

Indeed, most analysts anticipate that less LNG will be exported than currently pending permits would allow, even

if all of those were approved. (They also expect to see more permit applications, since the plans behind many of the pending ones are expected to eventually fizzle.) For example, Citigroup analysts foresee up to 5 billion cubic feet a day of LNG exports by the end of the decade, barring regulatory barriers (Morse et al. 2012). UK gas producer BG has projected up to six billion cubic feet a day by then (Gismatullin 2012), the same volume that Deloitte (2011) analysts have focused their modeling on. Given this consistent view among market analysts on the maximum likely volume of LNG exports from the United States, the main analysis in this paper focuses on the possibility of up to six billion cubic feet of daily exports. This is approximately half the capacity currently awaiting approval and almost ten percent of current U.S. natural gas production. I consider the possibility of significantly greater or lesser exports in Chapter 6; the qualitative conclusions do not change, though the specific costs and benefits of allowing LNG exports do. To provide some context, Figure 2 shows natural gas consumption and LNG trade by region.

# Chapter 4: Costs and Benefits of LNG Exports

Having been presented with a large docket of applications to ship LNG abroad, U.S. policy-makers are now faced with a simple question: should they approve large-scale exports of U.S. natural gas? Theory says yes: liberalized trade is desirable, since it delivers economic gains to all parties. Real-world complications, though, make the answer less straightforward.

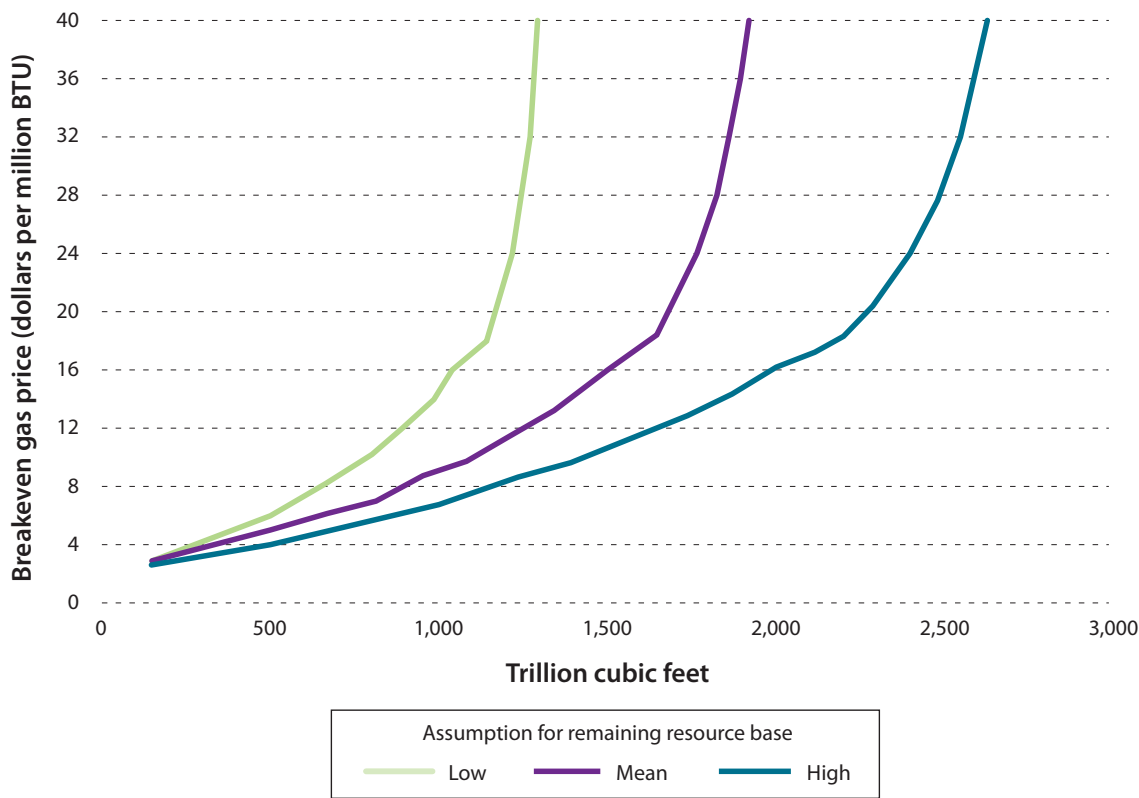
In this chapter, I put forward a framework for thinking about whether or not to approve U.S. LNG exports, centered around six questions:

1. What macroeconomic consequences would natural gas exports have?

- 2. What would the distributional impacts of natural gas exports be?
- 3. Would natural gas exports undermine U.S. oil security?
- 4. What impact would natural gas exports have on climate change?
- 5. What foreign policy consequences might natural gas exports entail?
- 6. What would the local environmental consequences of gas exports be?

The case for approving exports is strong only if the macroeconomic, climate, and foreign-policy benefits outweigh those distributional, oil security, and environmental downsides that cannot be effectively mitigated.

FIGURE 3.  
Possible Shapes for the U.S. Natural Gas Supply Curve



Source: MIT (2011). Reprinted with permission of the MIT Energy Initiative.

## ASSUMPTIONS AND LIKELY CONTRACT STRUCTURES

Allowing natural gas exports has the potential to help the U.S. economy by increasing U.S. economic output and, most likely, by narrowing the U.S. current account deficit, if actual exports occur. Yet the expected impact would be relatively small in the context of the overall U.S. economy. Exports would produce short-term employment gains but would have minimal impact on long-term employment.

To estimate the gains from trade in natural gas, one needs to estimate the long-run impacts of exports on U.S. natural gas prices. An increment of approximately 10 to 20 cents per thousand cubic feet for every billion cubic feet a day of exports is consistent with most published projections for the impact of gas exports (Pickering 2010; EIA 2012c). These projections reflect a broad range of possible shapes for the natural gas supply curve that are consistent with evidence from drilling done to date and current understanding of shale gas deposits. Deloitte (2011) is an outlier in projecting substantially smaller price impacts; I consider that possibility in detail in Chapter 6. Figure 3 shows several possibilities for the long-run U.S. supply curve.

One also needs to know how natural gas exports would affect domestic natural gas production and consumption. The Energy Information Administration (EIA) has projected that U.S. natural gas exports would draw roughly 20 percent from existing natural gas production and 80 percent from new production incentivized by access to export markets (EIA 2012c). The 20 percent drawn from existing production would come at the expense of power and industrial consumption in roughly equal amounts. These estimates are mostly insensitive to detailed assumptions about natural gas availability; they depend mainly on cost assumptions for well-understood applications of natural gas, including in power generation and industry. In any case, as I show below, they do not affect the net cost-benefit analysis here.

Estimating the specific economic benefits to the United States of natural gas exports also requires some assumptions about the prices that those exports will fetch. The prices at which natural gas currently sells in Europe and Asia provide a crude upper bound, but there are three large complications with assuming these prices. Overseas prices could fall substantially if the oil-linked pricing schemes currently used were substantially abandoned or modified; this would squeeze U.S. gains. Rising U.S. exports should also put downward pressure on overseas natural gas prices, eroding the potential gains from trade as exports expand. Perhaps most importantly, even if overseas natural gas prices were to hold up, the division of the surplus (the difference between prevailing U.S. and overseas prices) between the United States and gas-importing

countries will depend on the arrangements that are used to price any exported natural gas.

Contracts concluded by Cheniere Energy, the only company that had received a permit to export LNG to non-FTA countries as of May 2012, provide some insight into how that pie might be divided. These contracts price exported natural gas at 115 percent of the Henry Hub spot price (the main U.S. benchmark), in addition to a fixed liquefaction fee of \$2.25-\$3/MMBtu; the 15 percent markup reflects the cost of natural gas used to fuel the liquefaction facility (SEC 2012; ICIS Heren 2012). (This price is “free on board” i.e. exclusive of shipping and regasification costs.) This pricing arrangement appears attractive to Cheniere because the arrangement keeps Cheniere’s exposure to unexpected changes in U.S. or overseas natural gas prices minimal, which allows the company to secure financing. Its main source of risk is the credibility of its counterparties, something that it has likely insured (at least partially) against.

Most other sellers outside the United States have chosen to price their LNG differently. The Asian market, which may hold the greatest prospects for U.S. exporters, is particularly instructive. Asian LNG prices are tied to the price of oil, a pattern that prevails not only for traditional state-controlled suppliers, but for market-based producers, too. In particular, Australian companies, rather than rejecting the use of oil-linked prices, have followed it. So long as Australian production costs stay below Asian sales prices (net of transport costs), this approach will remain attractive there.

But there is good reason to expect that most U.S. exporters will follow a path similar to the one beaten by Cheniere. Would-be U.S. exporters who contract at Asian prices would be taking at least five risks: one tied to uncertainty over U.S. natural gas prices, another tied to uncertainty over overseas prices, a third associated with the unpredictable cost of LNG transport, a fourth tied to counterparty risk, and a fifth related to U.S. regulatory risk. Most companies that want to succeed prefer to take as few risks (ideally one) at a time as possible, and those considering extending financing to these companies tend to prefer that they minimize the number of sources of risk, too. All of this weighs in favor of U.S. exporters selling their natural gas at U.S. prices plus some fixed markup (including a charge for liquefaction services), thus eliminating most but not all sources of risk that they face.

Why expect different outcomes in the United States and Australia? Australia is a relatively small country in a large LNG market, which makes it safer for its customers to take prices from the broader market rather than to be exposed to potentially quirky domestic Australian prices. The U.S. situation is the opposite. Australian LNG business also tends to be vertically integrated, with natural gas producers

participating in exports, too. Pricing exports off of foreign markets, rather than domestic ones, diversifies their exposure to changing prices. The U.S. market, in contrast, is currently far more vertically segmented, largely by an accident of history: U.S. LNG terminal owners originally planned to import gas, not export it, and hence had no reason to link up with U.S. gas producers. If more U.S. gas producers began to take ownership stakes in export terminal operators, one might see a partial move to different pricing structures evolve, for similar reasons to those that have driven Australian decisions. But this does not seem to be occurring yet on a significant scale.

Most of my calculations will thus assume a similar pricing approach to that adopted by Cheniere. Cheniere (2011) marketing materials estimate a fixed liquefaction cost of \$1.75 per thousand cubic feet; I thus assume a markup of \$1 per thousand cubic feet to reconcile this estimate with contracts that have been signed so far. (Other assumptions about the likely markup are also possible, though a zero markup beyond liquefaction costs, including profit, would probably not make business sense.) I will also examine what would happen if a substantial fraction of U.S. exporters ultimately contracted at overseas prices instead of U.S. prices.

I also assume a U.S. natural gas price of \$5 per thousand cubic feet, exclusive of the domestic price impact of any exports. This is consistent with a wide range of opinions on where U.S. natural gas prices will likely settle: it is widely believed that a large part of the U.S. natural gas resource base is profitable to produce around this price.

## MACROECONOMIC CONSEQUENCES

### *Gains from trade*

Current U.S. gas prices are determined by U.S. supply and demand. If exports from the United States are allowed, the U.S. price will rise and the United States will produce more gas. The gains from trade are then the extra money earned by U.S. producers on what they would have sold anyway, minus the extra amount that U.S. consumers pay and what they lose from consuming less (for example, because they produce less steel), plus the net economic gain from the new production.

Consider first one billion cubic feet of daily LNG trade. Roughly 200 million cubic feet of natural gas will shift from the domestic market to exports. Producers will make \$80 million to \$90 million off these sales.<sup>7</sup> At the same time, higher prices will spur lower domestic natural gas consumption in power generation and industry, which will offset that amount by approximately \$4 million to \$7 million. Roughly 800 million cubic feet a day of new production will also find its way to export markets, delivering an additional surplus of approximately \$300 million to \$320 million. The net annual value to the U.S. economy of allowing a billion cubic feet a day

of natural gas exports would thus be approximately \$380 to \$400 million. (The ranges in these estimates are due primarily to the fact that the impact of exports on domestic prices is uncertain.)

For a full six billion cubic feet a day of exports, using the same approach and assumptions as above, the estimated surplus for the U.S. economy would be \$2.7 billion to \$3.2 billion each year. The gains from selling gas overseas rather than at home would be approximately \$700 million to \$1 billion; the gains from new gas production would be roughly \$2.3 billion to \$2.8 billion; and the losses from lower domestic consumption would be approximately \$300 million to \$500 million. The precise numbers here depend on the sources of exported gas (displaced consumption or increased production), but the fact that the net economic impact is positive does not.

Additional gains would be realized because natural gas exports would exploit existing LNG infrastructure (i.e. some parts of existing import terminals) that would otherwise go unused and thus be worthless. These gains should approximately equal the value of the utilized LNG terminals (not including the value of their regasification facilities, which are not useful for exports), which are typically on the order of \$1 billion for each billion cubic feet a day of capacity. Spread over a notional fifteen-year use period, this would add approximately \$70 million a year for each billion cubic feet a day of exports. This brings the total estimated surplus from six billion cubic feet a day of exports to \$3.1 billion to \$3.7 billion.

How confident can we be in these figures? The largest remaining uncertainty is the price that U.S. producers fetch for their output. If U.S. gas were sold at domestic prices plus the cost of liquefaction services with no markup beyond normal profits (an extreme unlikely to be realized intentionally in practice, but a possibility if exporters underestimate their costs and thus misprice their services in long-term contracts), gains from trade would be far lower. Still, they would be positive.

On the other extreme, U.S. producers might fetch much higher prices. Imagine that half of U.S. LNG exports were sold on contracts tied to overseas prices rather than to the U.S. spot market, and assume that those overseas prices averaged \$12 per thousand cubic feet over the long term, near the current European forward price. Assume further, as assumed earlier, that liquefaction, transport, and regasification collectively cost \$5 for a thousand cubic feet of gas. Then the net surplus from six billion cubic feet a day of LNG exports would be approximately \$3.9 billion to \$4.1 billion, which is similar to the figure calculated above. (The two figures are similar because as U.S. exports expand, domestic prices rise, and margins in contracts that are based on overseas prices thus erode.) That surplus would increase by \$1.1 billion for every one-dollar increase in the overseas natural gas price.



### Current account balance

The impact of LNG exports on the U.S. current account balance depends again on how gas exports are priced. Superficially, using the same assumptions as above, six billion cubic feet a day of exports would yield export revenues of about \$20 billion. This is equal to about 5 percent of the 2010 and 2011 current account deficits (BEA 2012). The actual impact of exports on the current account balance would be smaller (perhaps much smaller), since without changes in individual behavior, increased U.S. output would lead to increased U.S. consumption, part of which would be consumption of imports. Moreover, increased gas exports would reduce exports of other goods by raising the cost of producing gas-intensive products, and by diverting people and (to a lesser extent) capital from other productive activities.

### Employment impacts

Building new LNG export facilities would create a substantial number of temporary construction jobs. Cheniere estimates that its 2.2 billion cubic feet per day facility will take roughly two years to build and support roughly 3,000 jobs at its peak (Oil & Gas Monitor). Scaling this up suggests that allowing LNG exports could lead to as many as 8,000 temporary construction jobs if enough capacity for six billion cubic feet of daily exports was developed in the next several years.

There is no reason to believe, however, that increased LNG exports would have a significant long-term impact on broader U.S. employment levels, which are determined by more fundamental factors. Still, one can crudely estimate the impact that LNG exports would have on industries that would be directly affected.

I estimate that expanded natural gas production due to a six-billion-cubic-foot-per-day increase in exports would support approximately 25,000 jobs in the natural gas industry, along with approximately 40,000 jobs along the supply chain, in areas like steel, rig manufacturing, and elsewhere.<sup>8</sup> At the same time, employment in energy-intensive manufacturing would contract. This impact is much more difficult to quantify, since a much more elaborate model is required to know the scale of output losses in those sectors. Still, I can put a loose upper bound on the potential impact. Aldy and Pizer (2009) estimate (in the context of studying carbon pricing) that an 8 percent increase in the price of electricity would cause a 0.2 percent decrease in overall manufacturing sector employment. The U.S. EIA (2012c) projects an ultimate increase of 1 percent to 2 percent in commercial electricity prices (and a transient increase of 2 percent to 4 percent in the early 2020s) from

six billion cubic feet of daily LNG exports, which translates to a 0.025 percent to 0.050 percent decline in manufacturing employment. Total U.S. manufacturing employment in 2010 was approximately eleven million people (BEA 2011). These figures collectively suggest that higher natural gas prices due to exports could reduce manufacturing employment by between 3,000 and 6,000 jobs, primarily in energy intensive sectors like steel and cement. Impacts in these sectors would be partly offset by increased demand for their products by the natural gas industry—about one-fifth of shale gas capital expenditures, for example, go to purchasing steel, while about one-tenth are used to buy cement (IHS 2011).

These estimates should all be taken with a large grain of salt: the markets involved are complex and difficult to predict. The bottom line, though, is robust: job gains in directly affected

...the total estimated surplus from six billion cubic feet a day of exports [is] \$3.1 billion to \$3.7 billion.

markets are highly likely to be greater than job losses in markets hurt by higher natural gas prices.

Natural gas exports would also affect employment through the price level and its impact on monetary policy. Allowing LNG exports would raise prices for natural gas and products produced with it, but would lower prices for imports by strengthening the dollar. The net impact is unclear, but since the impacts of exports on consumer prices and on the trade balance are both minimal, both effects would be very small.

### Price volatility

These analyses of economic impacts have at least one important limitation. In principle, producers and consumers both anticipate volatility in natural gas supply and prices, and adjust their behavior accordingly. In practice, producers and consumers both tend to imperfectly anticipate volatility, exposing themselves and the broader economy to greater risk of harm. To the extent that allowing exports would increase volatility in domestic gas prices, the economic gains from increasing exports would be reduced.

This is not a significant risk for the foreseeable future. In order for volatility beyond North America to affect U.S. natural gas prices, there has to be a possibility that U.S. gas exports will change quickly as a result of shifts in international conditions. As long as potential U.S. exports are fully subscribed (i.e. form part of base-load U.S. demand), though, no such possibility exists. This will continue to be the case so long as natural gas prices in export markets exceed the sum of U.S. natural gas prices and transport costs (including liquefaction and regasification). Given current trends in international natural gas prices, this condition is likely to be comfortably satisfied for at least the next decade—though, as discussed in Chapter 6, it is not guaranteed.

This insulated state may eventually go away. Indeed one of the motivations behind interest in natural gas exports is the possibility of creating a more coherent global gas market in which prices in different markets partly converge. Such a market would be one in which U.S. prices become linked to

Exported natural gas is also likely to displace coal. Indeed, since allowing natural gas exports appears to primarily increase the volume of gas produced, rather than displace gas previously destined for domestic consumption, allowing natural gas exports could ultimately reduce global emissions.

global ones. Yet such a market would also bring a countervailing upside to the United States: the same arbitrage opportunities that could transmit international volatility into the U.S. market would also help absorb domestic supply and demand shocks. In the face of a sudden increase in domestic demand or decline in domestic supply, the United States could reduce exports, helping balance the market while limiting price hikes. The former might happen, for example, if a nuclear accident prompted a sudden increase in gas-fired generation, while the latter might result from extreme weather in gas drilling areas.

It is essentially impossible to predict whether full linkage between the U.S. and international markets would increase or decrease volatility in U.S. prices, particularly since such a development is likely to be at least a decade away. It thus makes little sense to alter near-term U.S. decisions regarding LNG exports based on volatility concerns.

## DISTRIBUTIONAL CONSEQUENCES

Allowing natural gas exports could have small but regressive distributional consequences. As of 2005, households with less than \$20,000 a year in income consumed an average of 8,700 kWh of electricity and 33,000 cubic feet of natural gas each year (EIA 2005a). A one-dollar rise in natural gas prices, near the upper end of likely impacts from the scenarios explored here, would cost each such household an average of \$33 each year in natural gas costs. A corresponding 0.2-cent rise in electricity rates would cost such households another \$17, for a total of \$50 each year. The average household with income in excess of \$100,000, in contrast, would see its natural gas bill rise by \$59, and its electricity bill would rise by \$31, for a total of \$90, a far smaller share of its income. The gains from trade, in contrast, would accrue mostly to shareholders and to landowners in gas-rich regions, which would fail to even the balance sheet for most lower- and middle-class consumers. The impacts on both sets of consumers would of course rise (or fall) if natural gas exports had greater (or lower) impacts on domestic natural gas prices.

These consequences, in principle, should be addressed along with other inequalities through broad-based policies (such as adjustments to the tax code) that focus on ameliorating undesirable inequality regardless of its source. In practice, though, the U.S. political system has been averse to such policies in recent years. Earmarking slightly more than half of federal revenues from higher federal corporate tax collections due to exports (estimated in Chapter 6) could make consumers with household incomes under \$40,000 whole (EIA 2005b).

A final notional option might be to levy a tax on natural gas exports and use that to assist low-income energy consumers. This would, however, be contrary to the U.S. Constitution, which asserts that “No Tax or Duty shall be laid on Articles exported from any State” (U.S. Constitution). The U.S. Supreme Court has reaffirmed this as recently as 1998 (*U.S. v. U.S. Shoe Corp.*).

## OIL SECURITY

The analysis of net economic benefits presented above ignores the potential positive externalities from substituting natural gas for oil in the transport sector, a development that might in principle be undermined by allowing natural gas exports.

Every time natural gas is used to back out a barrel of oil, the market price of crude falls, and the price paid by all U.S. consumers for oil imports drops as a result. The precise magnitude of this effect



is a subject of considerable debate, but recent U.S. regulatory impact assessments have used a value of \$12.91 for each barrel of oil displaced, or 31 cents for each gallon of gasoline, with a range of \$4.67 to \$23.40/bbl (NHTSA 2011, 647). In principle, then, it might make sense to reorient gas volumes destined for export to the domestic transport market.

Each thousand cubic feet of natural gas converted to gasoline or diesel and used in U.S. cars and trucks would deliver a positive externality of about \$1.30.<sup>9</sup> This is less than the gain from selling the same natural gas overseas, even with conservative assumptions about pricing.

The same thousand cubic feet of natural gas used in compressed natural gas (CNG) vehicles would produce an external benefit of about \$1.90 due to lower oil prices (CNG is a more energy efficient technology than gas-to-liquids), along with an estimated benefit of \$1.10 due to reduced exposure to oil price volatility (NHTSA 2011, 647), for a total external benefit of about \$3, though this would be offset in part if public spending were needed to establish CNG fueling infrastructure.<sup>10</sup> (This benefit of reduced exposure to volatile oil prices is not included in the previous estimate since the price of liquid fuels produced from natural gas will fluctuate with the price of oil.) This brings the benefits of directing natural gas into the transport sector closer into line with the benefits of allowing natural gas to be exported. The gains from allowing exports, though, are still likely to be larger than those of using the gas in cars and trucks.<sup>11</sup>

Some will likely observe that substituting natural gas for oil has the added benefit of reducing income for major oil exporters, many of whom are hostile to the United States. That is true, but displacing others' natural gas exports would do the same. Indeed many major oil exporters, like Iran and Russia, are also major natural gas exporters. That fact makes substitution of natural gas for oil an ineffective way to starve oil-exporting regimes of revenues.

In any case, barring exports would probably not push significant volumes of natural gas into the transport sector; instead, it would simply keep them in the ground. The main forces currently affecting decisions to invest in infrastructure to move natural gas into the transport sector are oil-price uncertainty, the risk associated with the large up-front capital investments required, and lack of policy promoting adoption of natural gas vehicles. For context, a one-dollar change in the price of natural gas—roughly what might eventually be expected from large-scale LNG exports—would be offset by a \$7 to \$10 dollar drop in oil prices. Actual uncertainty about future oil prices is much greater than that.

## CLIMATE CHANGE

Natural gas is a mixed blessing for climate change. By displacing coal, it reduces greenhouse-gas emissions, but by

undercutting renewable and nuclear energy and lowering energy prices, it increases greenhouse-gas emissions. It is generally agreed, though, that the main consequence of abundant gas in the U.S. energy system is displacement of coal.

A simple estimate indicates the likely scale of the impact of natural gas exports on U.S. emissions. I observed earlier that roughly 20 percent of U.S. LNG exports would be drawn from natural gas that would otherwise be used in the United States. If, for example, that exported gas was replaced 80 percent by coal and 20 percent by zero-carbon fuels and reduced energy consumption, and emissions for coal were double those for gas, the result would be approximately 2 million tons of additional U.S. greenhouse-gas emissions for each billion cubic feet of daily exports.<sup>12</sup> This is broadly consistent with estimates produced by complex models (EIA 2012c).

Natural gas, though, has the same climate consequences whether it is burned in the United States, Europe, or Asia. Exported natural gas is also likely to displace coal. Indeed, since allowing natural gas exports appears to primarily increase the volume of gas produced, rather than displace gas previously destined for domestic consumption, allowing natural gas exports could ultimately reduce global emissions. I estimate this impact as, at most, approximately 15 million tons of reduced global emissions for each billion cubic feet of daily natural gas exports. For six billion cubic feet a day of exports and a value for damages from emissions of a modest \$21 per ton of carbon dioxide—the figure used in U.S. regulatory impact assessments (Greenstone, Kopits, and Wolverton 2011)—the avoided climate damages would be \$2 billion annually. Global greenhouse-gas emissions from energy use would be reduced by 0.3 percent relative to 2008 levels. On the other hand, if exported natural gas displaced as much renewable energy and energy conservation as it did coal, the impact on non-U.S. emissions would be neutral.

Climate policy also has an important international political dimension. Global climate diplomacy tends to focus on what happens within individual countries' borders. If a U.S. decision to allow natural gas exports reduced global emissions but raised U.S. emissions—indeed the most likely outcome—the United States could, in principle, suffer diplomatically. But this is highly unlikely in practice. The export volumes examined here would raise U.S. emissions by at most approximately 0.3 percent, a trivial difference in the context of climate diplomacy, which tends to focus on changes on the order of 10 percent or more of national emissions.

## FOREIGN AND TRADE POLICY

The surge in U.S. shale gas production has already had major consequences for geopolitics. There was a widespread expectation, only a few years ago, that the United States would become a major natural gas importer. Potential suppliers, most

prominently Qatar, began to develop LNG export infrastructure in anticipation of serving the U.S. market. The U.S. shale boom, however, has quickly eliminated the prospect of significant U.S. demand for imported LNG (UPI 2011). (Some residual demand remains for logistical reasons.) With would-be suppliers to the United States looking for new markets, consumers have gained greater bargaining power. A leading indicator of this growing bargaining power has been the attempt, starting in 2011, of Germany's main natural gas importer, E.ON Ruhrgas, to renegotiate its politically charged gas contracts with Russia's Gazprom (Powell 2011). Many analysts now expect Europe to move gradually from a system of negotiated gas prices, which inevitably draws in politics, to a system where natural gas is priced transparently through markets.

Asia has not been so fortunate, and the reasons for this are not entirely clear. Asian natural gas prices are still tied closely to crude oil prices, normally through politically involved negotiations. Asian buyers still have fewer options for large-scale imports than European buyers do—key buyers, including Japan and Korea, do not have access to pipeline imports—which reduces their relative power. In addition, at the same time that European customers were gaining new leverage in 2011, Japan, the largest LNG importer in Asia, was paralyzed by the disaster at its Fukushima nuclear power plant. As that accident led to widespread nuclear shutdowns, Japan massively increased its demand for LNG to meet critical electricity needs. Japan, desperate to avoid further economic harm, was not in a position to negotiate aggressively with natural gas suppliers.

Many analysts in both the United States and Asia have speculated that U.S. entry into the Asian LNG market as a major supplier (along with others) could help create the conditions for a move toward market pricing of natural gas, or at least to a lessening of individual producers' market power and, hence, political influence. Predicting political influence is a near-impossible business, but to examine whether U.S. exports might help encourage such a transformation, it is useful to compare the potential magnitude of U.S. LNG deliveries to other important scales in the natural gas market. As of 2010, the world's top five LNG exporters were Qatar (8.2 bcf/d), Indonesia (3.3 bcf/d), Malaysia (3.3 bcf/d), Australia (2.7 bcf/d), and Nigeria (2.6 bcf/d) (IGU 2010). The top supplier to Japan was Indonesia (2.0 bcf/d), and the top supplier to Korea was Qatar (1.1 bcf/d). The spot market accounted for slightly more than a fifth of traded LNG, totaling slightly less than seven billion cubic feet a day.

All of these figures will increase in the future. EIA projections are far from definitive, but they are instructive. World natural gas production is projected to increase by 26 percent over the next decade (EIA 2011). Korean imports are expected to rise from to 4.1 billion cubic feet a day, while Japanese imports are

expected to hold fairly steady at their present level. Chinese imports, including pipeline gas, are expected to rise from a negligible amount to over nine billion cubic feet each day by the end of the decade, while daily Indian imports are expected to reach three billion cubic feet per day.

These figures suggest that U.S. LNG exports could become influential if they increased to toward the higher end of the range discussed thus far in this paper, and if exports were priced off the U.S. benchmark. The United States could potentially assume a large market share in several pivotal markets, and perhaps be dominant in one or more. This would give consumers greater leverage in their negotiations with other suppliers. At a minimum, by diversifying the pricing of their imports, it would partly insulate LNG importers from oil market fluctuations.

Potential U.S. exports might also be exploited for wider strategic gain under the right conditions. Current U.S. law makes approval of exports to markets with which the United States has free-trade agreements essentially automatic, but requires extensive review and subsequent approval for exports to others. This ought to give the United States leverage in broader trade negotiations with would-be importers. For example, Japanese officials and market participants have noticed that the recent U.S.-South Korea free-trade agreement will give South Korea special access to U.S. natural gas exports, and have inquired as to whether Japanese participation in the Trans-Pacific Partnership (TPP) trade arrangement would give them similar privileges (Interviews 2011). Regardless of whether Japanese and other policymakers are wise in wanting direct access to U.S. exports, this sort of dynamic can only strengthen the U.S. hand in international trade negotiations, which can lead to broader gains for U.S. consumers and firms.

Conversely, if the United States were to restrain LNG exports, it would almost certainly face wider trade-related problems. The consequences could be broad, affecting support for open trade in general, but they would likely have special impact on other resource-related disputes. Article XI of the General Agreement on Tariffs and Trade (GATT) prohibits sustained quantitative restrictions on energy exports unless they are related "to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption" (Selivanova 2007). U.S. policy would be the opposite: it would be made in conjunction with efforts to encourage both domestic production and consumption of natural gas.

Indeed, the United States has recently joined Europe and Japan in challenging Chinese restrictions on exports of rare earth metals—which are critical to a variety of defense, electronics, and energy technologies—at the World Trade Organization (WTO) (Palmer 2011). The arguments that the

United States would need to invoke in order to restrain LNG exports—particularly the prospects of environmental damage and harm to domestic industry—are precisely those that China would like to use to defend its own restrictions on rare earths exports; China could all but take the U.S. justification of curbs on LNG exports, change a few words, and use it in its own defense. It would likely be difficult for the United States to sustain limits to U.S. LNG exports while fighting Chinese limits on exports of rare earth metals.

Making U.S. curbs on LNG exports effective would also require actions that could precipitate significant conflict with Canada and Mexico. Even then, those curbs might be undermined. The North American natural gas market is tightly integrated. Constraints on U.S. LNG exports might thus be circumvented in a straightforward manner by sending natural gas by pipeline to Canada or Mexico before exporting it from there as LNG. In that case, the U.S. economy would suffer all the downsides of LNG exports (through higher prices and environmental risks from increased production), but would forgo most of the benefits (aside from small profits from new natural gas output).

The United States could, if it wished, attempt to block this export route: Chapter 6 of NAFTA allows the United States to require that any exports of natural gas to Canada or Mexico be consumed there so long as Washington “maintains a restriction” on exports of natural gas to some destinations outside North America (NAFTA 1993). This was written to facilitate the effective imposition of economic sanctions on specific countries, and the legality of its application in conjunction with a restrictive policy on LNG exports would be questionable. (There is no related case history upon which to base future expectations.) Independent of this legal question, the political fallout of such a move would likely be large—particularly with Canada—in the wake of the U.S. decision in early 2012 to deny a permit for the Keystone XL oil pipeline.

Even if the United States invoked its NAFTA privileges, the existence of otherwise integrated North American natural gas markets could undermine a U.S. effort to reap any benefits that might come from curbing LNG exports. Canada or Mexico could import U.S. natural gas by pipeline, consume it domestically, and export freed-up domestic natural gas as LNG. The United States would need to block pipeline exports in general to prevent this, creating severe political friction. Substantial cross-border natural gas pipeline capacity already exists, particularly between the United States and Canada: in 2011, an average of eleven billion cubic feet of natural gas

flowed across the border each day (EIA 2012d, EIA 2012e).<sup>13</sup> Much of this capacity could ultimately be used to move U.S. natural gas to Canada, freeing up Canadian natural gas for export as LNG. As of 2009, roughly four billion cubic feet a day of capacity operated from the United States to Canada, and about three billion cubic feet a day of capacity ran to Mexico (EIA 2009b). Reversing additional pipelines would require modifications (such as new pumping stations) that would need to be approved by the U.S. FERC, which considers specific environmental risks as well as broader national interest issues in doing so (U.S. Department of State 2012). Obtaining approval has typically been a routine exercise; a pair of March 2011 applications to reverse pipeline flows and send gas from the Marcellus Shale (in Pennsylvania) to Canada were approved in October of that year (FERC 2011). Yet recent conflict over the Keystone XL oil pipeline, which was once also expected to face a routine regulatory process suggests that approval of future trans-border pipelines should not be taken for granted. That said, using the independent FERC

Conversely, if the United States were to restrain LNG exports, it would almost certainly face wider trade-related problems. The consequences could be broad, affecting support for open trade in general, but they would likely have special impact on other resource-related disputes.

to block exports to Canada and Mexico, thereby extensively fragmenting previously integrated markets, would be costly, both politically and potentially economically.

Ultimately, were the United States to restrain LNG exports while not blocking pipeline exports to Canada, the net impact would be to expose the United States to the downsides of LNG exports (particularly higher prices) while denying it most of the benefits (direct profits from trade as well as leverage in trade negotiations).

## ENVIRONMENTAL IMPACTS

Shale gas production has attracted public criticism over environmental risks and local impacts. Allowing natural gas exports would expand production, which would only intensify that concern. Indeed, one need only look at the fight in 2011 over the Keystone XL pipeline, which would have transported diluted bitumen from Canada to Texas refineries in part to produce diesel fuel for sale abroad, to see that production

TABLE 1.

## Costs and Benefits of Allowing Natural Gas Exports

		Benefits	Costs
What macroeconomic consequences would natural gas exports have?	Economic Output	Estimates suggest that the U.S. economy will gain up to \$4 billion annually from exports, primarily from overseas sales of increased natural gas production.	Exports raise the cost of natural gas, resulting in less domestic gas consumption, and hence less economic output in some sectors. Estimates suggest that these losses are in the range of \$500 million annually, primarily from reduced output in energy intensive industries.
	Current Account Balance	Total export revenues could be up to \$20 billion higher each year, but the current account balance is likely to be unchanged absent more fundamental shifts in savings and consumption.	
	Employment	Exports could create up to 8,000 near-term jobs in export facility construction. In the long run, they could also support up to 60,000 jobs in natural gas production and along the supply chain.	Estimates indicate that approximately 6,000 jobs could be lost in energy intensive industries in the long run due to higher natural gas prices. In the long run as the economy returns to full employment, job gains due to LNG exports will be offset by losses elsewhere in the economy for no net impact on employment.
	Price Volatility	Allowing exports could help link U.S. natural gas markets with world markets. This provides a buffer against domestic shocks.	Linking domestic and world natural gas markets could increase U.S. exposure to overseas shocks in natural gas prices.
What would the distributional impacts of natural gas exports be?		None	Exports are projected to slightly raise the cost of domestic natural gas. This would have a disproportionate effect on lower-income households, who would face additional costs that are estimated to be around \$50 annually.
How would natural gas exports affect U.S. oil security?		None	Domestic natural gas could in principle be used as a substitute for oil. If exports are constrained, the United States would use marginally less oil in transport.
What impact would natural gas exports have on climate change?		Natural gas exports could displace dirtier coal-fired power overseas. It could also, however, lead to greater energy consumption abroad by lowering energy costs.	Higher domestic prices would marginally weaken the incentive to displace coal-fired power in the United States, but would also lower U.S. electricity demand.
What foreign policy consequences might natural gas exports entail?		U.S. exports could disrupt opaque and politically entangled natural gas markets, potentially reducing revenues to Russia, Iran, and others. Exports also give the United States new leverage in trade negotiations. Finally, allowing exports avoids creating major ruptures in NAFTA and WTO, including in the ongoing U.S. efforts to remove Chinese minerals export quotas.	None
What would the local environmental consequences of natural gas exports be?		None	Increased shale gas production can have negative environmental consequences such as water contamination and local pollution in the absence of appropriate environmental regulation.



of fossil fuels for export is a ripe target for many concerned communities and environmental advocates. Moreover, some economic simulations suggest that a large part of increased production spurred by export demand would be in the Northeast, where opposition to shale gas development has been strongest (EIA 2012c).

Traditional environmental concerns have focused primarily on potential contamination of aquifers by methane migration, fluids injected during the hydraulic fracturing (or “fracking”) process, and poor disposal of contaminated water produced from wells. Worries have also centered on the impacts to local infrastructure, particularly roads, and on large inward migration to productive areas, which has disrupted communities. These issues have become far more pronounced since 2010 as natural gas development has expanded from states that have long been home to large-scale drilling, such as Texas, Arkansas, and Oklahoma, to states without the same oil and gas culture, particularly Pennsylvania and potentially New York.

The potential economic gains from natural gas trade are small compared to the potential losses from a large-scale backlash against shale gas development. The consultancy IHS-CERA, in a study prepared for a natural gas industry group, estimated that shale gas development (including the industry itself along with its suppliers) had added \$51 billion to U.S. output in 2010, would add \$81 billion in 2015, and could contribute \$158 billion by 2035 (Bonakdarpour et al. 2011). This likely overestimates the supply side contribution of shale gas development, since it assumes that all net industry revenues represent new output,

but it also underestimates the demand side impact, since it does not account for the economic benefits of lower natural gas prices. Taking the CERA numbers at face value, six billion cubic feet of daily natural gas exports would increase the net contribution of shale gas to U.S. GDP by less than 5 percent. Shale gas production itself is far more valuable than natural gas exports.

The prospect of exports thus strongly reinforces the importance of ensuring that shale gas development proceeds in ways that gain the support of local communities and environmental skeptics. Specific measures for doing that are beyond the scope of this paper, but a long list of wise steps that should be taken can be found in a recent report of the Secretary of Energy Advisory Board Natural Gas Subcommittee, “Improving the Safety and Environmental Performance of Hydraulic Fracturing” (DOE 2011). It will be several years at the earliest until natural gas exports might commence; authorities should use the intervening time to ensure that gas development is done to the highest standard.

**OVERALL COSTS AND BENEFITS**

Table 1 summarizes the overall costs and benefits of allowing natural gas exports in six different dimensions, as discussed in this chapter. The colors in the table correspond to their net effects, with green indicating that the benefits outweigh the costs, and purple indicating the opposite. Stronger shades indicate items where the imbalance between cost and benefit is more pronounced. These considerations will all inform the policy proposal detailed in the next chapter.

---

# Chapter 5: Natural Gas Export Policy

## Recommendations

---

### **POLICY PROPOSAL: APPROVE PERMITS FOR LNG EXPORTS**

In Chapter 4, I laid out a framework for consideration of the wisdom of allowing LNG exports. An examination of these components indicates that the benefits of allowing LNG exports outweigh the risks and costs, so long as downside risks to the local environment are mitigated, as discussed previously. Allowing exports would boost the U.S. economy, create jobs, reduce greenhouse-gas emissions, and create new geopolitical leverage for the United States. In particular, the likely benefits to the U.S. economy outweigh the benefits that would be realized by trapping natural gas in the United States in the hope that it will be used to replace oil. Barring exports would also weaken the U.S. hand in international trade diplomacy, including in the ongoing fight over Chinese restrictions on minerals exports. Strongly constraining U.S. gas exports would also require substantial interference in the currently integrated North American energy market, with the potential for economically and politically damaging fallout.

The most acute risks associated with allowing natural gas exports are distributional and environmental; both could also spur a backlash against natural gas production more broadly. Both can and should be mitigated, however, with appropriate policies, as outlined earlier. The details are largely beyond the scope of this paper, but options include the many steps outlined in DOE (2011), severance taxes or impact fees that fund infrastructure and regulatory capacity, and bonding requirements for drillers that help communities recover damages from bankrupt operators (Davis 2012).

I thus propose that, to facilitate potential natural gas exports, the DOE should approve applications for LNG exports to non-FTA countries that are pending before it, barring specific concerns about individual applications that are not related to the broader wisdom of allowing LNG exports. In doing so, the DOE is required to find that allowing exports is in the “public interest.” The framework outlined in this paper provides one way of presenting such an assessment.

The FERC must also approve modifications to terminals in order for exports to be allowed (Ebinger et al. 2012). I propose that it approve any applications to operate export terminals that have been approved by the DOE, barring problems with

individual applications that are unrelated to the broader wisdom of allowing LNG exports.

Implementing these steps will not require any new staffing, funding, or action by Congress, which has already put in place the legislative framework needed to approve and monitor LNG exports. Congress need only refrain from placing new statutory restrictions on LNG exports.

### **OTHER POLICY STEPS**

#### *Leverage Exports in Trade Talks*

The prospect of further exports beyond those initially approved to non-FTA countries will be attractive to many potential importers, including Korea, Japan, India, and China. This will be the case even if the United States approves enough capacity to theoretically cover plausible export demands, since many firms that have received approval to export LNG may not actually succeed in building export facilities.

U.S. trade negotiators should use the prospect of preferential access to future exports in trade negotiations with those countries, which could create an opportunity to further increase the economic benefits to the United States of natural gas exports. In particular, the United States should make access to U.S. LNG a part of ongoing TPP negotiations with Japan, something Japan has signaled that it desires. The specific “asks” in return for preferential access should be determined by broader U.S. priorities in these negotiations. State Department diplomats should also emphasize the value of FTA access to U.S. LNG exports in their engagement with those Korean policy-makers who are skeptical of the U.S.-Korea Free Trade Agreement (KORUS).

#### *Use Exports To Create More Transparent LNG Markets*

The prospect of a more diverse LNG market—which U.S. entry as an exporter would contribute to—carries with it the prospect of introducing more transparent market-based pricing to gas trade, particularly in Asia. That would help disentangle natural gas trade from political relationships, particularly between Asian consumers and Middle Eastern suppliers, to the broader benefit of the United States. The U.S. government has limited influence over the geopolitical impact of LNG exports, but it can take several steps to improve the odds of success.

- ***Maintain a preference for exports that are likely to use market-based pricing.*** In selecting export permits to approve, the DOE should maintain a preference for applicants that foresee using transparent pricing based on U.S. (or emerging Asian) spot market prices (rather than traditional oil-linked pricing) in their contracts. Maintaining such a preference is consistent with the DOE mandate to approve only exports that are in the public interest.
- ***Support widening of the Panama Canal if necessary.*** The United States should provide any necessary support to the ongoing widening of the Panama Canal, which would lower the cost of U.S. LNG exports to Asia, and thus make them more likely and potentially more profitable. (LNG tankers departing the Gulf of Mexico or the East Coast of the United States currently need to travel all the way around South America to reach Asia, adding considerable cost to their trips and eroding potential gains from trade.) Slightly less than half of the Panama Canal Expansion Project is financed by governmental and intergovernmental institutions, including the Japan Bank for International Corporation (JBIC), the European Investment Bank (EIB), the Inter-American Development Bank (IDB), and the International Finance Corporation (IFC) (JBIC 2008). If additional public financing becomes necessary to successfully complete the project (currently an unlikely need), the United States should help ensure that financing is provided, either directly through the Export-Import Bank, or through its influence at the IDB and IFC.
- ***Lead initiatives and studies on the importance of transparent international natural gas markets.*** U.S. policymakers should also exploit available opportunities to promote transparent, market-based LNG trade. This would help the competitive position of U.S. exporters, who will likely be more transparent than many others, and leverage the new U.S. role in LNG markets for broader gain. There are no silver-bullet solutions here, but there are many opportunities to influence the political evolution of LNG trade at the margin. The DOE or State Department, for example, could fund an International Energy Agency (IEA) study of the benefits of transparent markets, and the United States could seek G8 or G20 agreement on increased transparency in LNG contracts and trade flows. U.S. diplomats, particularly in the new State Department Bureau of Energy and Natural Resources, should also maintain an active dialogue with their counterparts in Australia, the dominant LNG exporter in Asia and a potential partner in promoting transparent trade. At a minimum, this would enhance U.S. understanding of LNG market evolution; in principle, it might also reveal opportunities for focused cooperation.

---

## Chapter 6: Questions and Concerns

---

### WHAT HAPPENS IF GAS PRICES TURN OUT TO BE MORE OR LESS SENSITIVE THAN ASSUMED?

The analysis in this paper has focused on the potential for six billion cubic feet of daily natural gas exports. This is consistent with high end estimates of export potential by market analysts. It is also consistent with mainstream natural gas price projections: analysts widely expect such a volume of exports to largely close the gap between U.S. and overseas prices (net of liquefaction and transport costs).

If the current transformations under way in natural gas teach us anything, though, it is to be modest about our ability to predict the future course of energy markets. It is possible that U.S. natural gas prices could turn out to be either far more or far less sensitive to additional export demand than most assume.

If prices turned out to be far more sensitive to export demand than what was assumed in Chapter 4, the opportunity for exports would become correspondingly smaller, since the gap between U.S. and overseas prices would close quickly as export volumes rose. The potential benefits from exports would be lower as a result, but the potential downsides would fall, too. Exports would still remain attractive on balance, but their net value—economically and strategically—would be reduced.

More intriguing is the possibility that U.S. natural gas prices will turn out to be far less sensitive to export volumes than most expect. This might allow much larger quantities of exports. Deloitte (2011) projects a mere 12-cent increase in the price of a thousand cubic feet of natural gas were the United States to export six billion cubic feet of natural gas each day. Such high elasticity would likely mean that U.S. exports would rise until the gap between U.S. and overseas prices was fully closed, net of liquefaction and transport costs (including normal profits), through a combination of rising U.S. prices and falling prices overseas.

In this case, the macroeconomic benefits to the United States would be higher than those estimated above, both because of larger export volumes, and because export volumes would be sourced more from increased production than from decreased domestic use. The climate benefits might also be greater, because more natural gas would be available to displace coal overseas, and less would be drawn away from U.S. power

plants. And the geopolitical and trade policy benefits would be larger, since greater U.S. LNG exports would give U.S. exporters a more dominant position in overseas markets. On the flipside, the consumer consequences would not change: the price impact of exports would remain the same; it is only export volumes that would increase. The greatest risk from much larger exports would be to the local environment; greater exports would further reinforce the importance of ensuring that proper protections for water, air, and local communities were in place.

### WHY ASSUME THAT PRICE SPREADS BETWEEN MARKETS WILL REMAIN LARGE?

Chapter 2 discussed the possibility that prices might converge across markets absent large-scale U.S. LNG exports. Indeed, one should not assume that prices will remain sharply divergent in the different regional markets—and one should not assume that large-scale exports will materialize. This does not, however, change the bottom lines. The possibility of price convergence absent U.S. LNG exports lessens the benefits of allowing those exports, since actual U.S. exports would not occur if all markets had similar gas prices. The United States would thus miss out on gains in economic output and jobs, and not have the same impact on global geopolitics or greenhouse-gas emissions. At the same time, the possibility of price convergence absent U.S. LNG exports also reduces the costs of allowing exports, since there would be no harm to domestic industry, consumers, or the environment if no exports took place. Moreover, regardless of whether exports materialize, the United States will suffer if rejecting export permits causes fallout for its broader international trade agenda. Allowing exports remains the right policy choice, even given the possibility that no or few exports will occur.

### WHAT IMPACT WOULD GAS EXPORTS HAVE ON GOVERNMENT REVENUES?

Allowing natural gas exports would increase government revenues by raising taxable U.S. output. In addition, increased natural gas production resulting from exports would raise state revenues in places that are home to drilling. I estimated earlier that allowing six billion cubic feet of daily U.S. natural gas exports would increase net annual U.S. output by approximately \$4 billion. Assuming a 35 percent marginal tax



rate on corporate profits, this would raise approximately \$1.4 billion each year; in practice, since a part of the profits would accrue to individual property owners and workers who face lower rates, the net increase in revenues would be less. This total would, of course, be reduced if actual export volumes turned out to be lower.

Increases in state tax revenues would depend on the states in which production increased, but would total at most approximately \$400 million each year (based on the corporate tax rate for Pennsylvania, which is the highest among major gas-producing states). More significantly, increased production would also boost state revenues from severance taxes. Typical severance taxes in major producing states are on the order of 5 percent to 8 percent of sales revenues (Allegheny Conference 2009). A full six billion barrels a day of natural gas exports could thus be expected to generate increased severance tax revenues of \$1 billion to \$2 billion each year, including revenues from new production and larger revenues from existing production due to higher prices.

#### **WHAT IMPACT WOULD GAS EXPORTS HAVE ON GAS-DEPENDENT INDUSTRY?**

Cheap natural gas fuels industry in two important ways. Natural gas is extracted together with ethane, which is used as a feedstock in chemicals manufacturing. Natural gas can also be used to generate inexpensive electricity for heavy industry, such as steel production. Analysts and industry advocates have generally assumed that both industries would suffer as a result of exports.

This conclusion is likely incorrect for chemicals feedstocks. Natural gas production that results from allowing natural gas exports will lead to increased production of natural gas liquids (NGLs), including ethane, that are extracted with the gas. When natural gas is used for domestic consumption, those NGLs are removed and sold separately. If the fraction of NGLs in the gas produced is low enough, though, the NGLs may be left in the gas when it is shipped, reducing domestic ethane supplies. However, if the fraction of NGLs is high enough, at least some must be removed prior to shipping as LNG to avoid problems with liquefaction. Those separated NGLs are then available on the domestic market. Indeed, NGL production increases by between 5 and 10 percent for all twelve export scenarios explored in a recent EIA analysis of natural gas exports. This suggests that allowing natural gas exports will benefit, rather than harm, domestic chemicals manufacturers.

In contrast, energy intensive manufacturers like steel producers will likely be harmed by natural gas exports as a result of higher natural gas prices, though only by a small amount. Those damages are far more likely to hurt corporate profits than to affect decisions regarding whether to locate

plants in the United States. If natural gas exports raised domestic natural gas prices by \$1 per thousand cubic feet, that would raise the cost of producing a ton of steel using a new state-of-the-art facility by approximately \$8 (ABB 2011). That compares to typical steel prices on the order of \$800 per ton.

Further insight can be gained by following the approach used in Chapter 4 and comparing the electricity price increase due to LNG exports to that due to a carbon price. I noted earlier that the EIA (2012c) projects a long-run increase in commercial electricity prices of 1 percent to 2 percent due to six billion cubic feet of daily LNG exports. Aldy and Pizer (2009) estimate that an 8 percent increase in electricity prices would reduce glass production by 3.4 percent, paper by 3.3 percent, iron and steel by 2.7 percent, aluminum by 2 percent, and other industries' outputs by smaller amounts. This translates into output reductions of less than 1 percent in each of these energy intensive industries as a result of LNG exports. (Employment losses would be even lower.) This reduction would come primarily from lower consumption of energy-intensive goods rather than through loss of competitiveness. It is fully accounted for in the estimates of macroeconomic consequences of natural gas exports presented above.

#### **WOULD ALLOWING EXPORTS DEplete U.S. NATURAL GAS RESOURCES?**

The amount of natural gas in the ground is finite and fixed. By increasing present consumption, U.S. natural gas exports would reduce the amount of natural gas left. Some may worry that the United States could become dependent on imports at an undesirably early date if, due to excessive consumption, production began to fall sooner than it would have otherwise.

This is not a large problem. According to recent EIA (2012c) modeling, were the United States to export LNG at the highest rates discussed in this paper, it would produce as much natural gas in nineteen years as it otherwise would have in twenty. If U.S. reserves were far smaller to start with than that analysis assumes, prices would rise and the economic incentive to export would erode.

#### **WHY NOT APPROVE LNG EXPORTS BUT LIMIT THEIR QUANTITIES?**

Experts involved in discussions of LNG exports occasionally suggest that approving LNG exports in limited quantities (perhaps the five to six billion cubic feet per day that most experts project is the likely maximum in the next decade) could provide a foundation for political compromise. Limiting export volumes would limit possible domestic price increases, along with their consequences for consumers and energy-intensive industry. It would also put a cap on new shale gas development resulting from export demand, thus assuaging local environmental concerns. At the same time, limiting

LNG exports could close off opportunities for job creation at export facilities and for economic gains from new natural gas production and overseas sales. Moreover, to the steps necessary to make any limits bind would still create problems for the United States within NAFTA and the WTO.

Regardless of the balance of costs and benefits associated with approving exports in limited quantities, there are practical difficulties associated with imposing a quota on exports. Such a quota would presumably be enforced by approving only a limited number of export permit applications. But how would the DOE choose which permits to approve? A “first-come, first-served” approach would likely lead to problems down the road when one or more of the approved facilities did not pan out. (Most firms that received permits to build LNG import facilities in the 1990s and 2000s were unable to put together viable business plans and financing schemes, and thus never reached actual construction.) Indeed, such an approach would likely prompt a stampede of applications from under-qualified operations. The DOE could evaluate applications and select those that it deemed to have the most promising business prospects, but this would be fraught with risk, ranging from weak DOE capacity to do such analysis to

inevitable accusations of decisions made based on political connections rather than merit. To be certain, there is some precedent for similar feasibility evaluations in the context of utility regulation, but the uncertain and immature nature of the LNG export business would make it difficult to translate this method to the present challenge.

In principle, these problems might be partly mitigated by auctioning off export permits. Companies would be forced to carefully scrutinize their own prospects before attempting to grab part of any export allowance. Yet the courts would likely consider this tantamount to an export tax. As noted above, though, federal export taxes are unconstitutional.

In practice, to the extent that allowing exports leads to potentially worrisome rises in domestic natural gas prices, exports are likely to be self-limiting without quotas. Strong increases in domestic prices will make exports less attractive overseas. Large export volumes would also reduce overseas prices. The combination would most likely close off additional exports before U.S. prices could rise too far. In essence, export quotas would become relevant when they would have little effect anyway.

---

## Chapter 7: Conclusions

---

A revolution in U.S. natural gas production has forced policymakers to decide whether they should allow exports of LNG from the United States. They should say yes, within prudent limits, and leverage U.S. exports for broader gain. Yet the mere fact that the benefits of allowing exports would outweigh the costs does not mean that the political fight over allowing LNG exports will be tame. Operators of natural gas power plants will likely oppose exports, as will energy intensive manufacturers, though chemicals producers, if they are sufficiently enlightened, may take a more moderate stance. Most environmental advocates who are concerned with the local impacts of shale gas development will likely join in opposition, as will those who are convinced that gas should

be trapped for use in cars and trucks, and those who believe that any rise in consumer energy prices is unacceptable. The most prominent proponents of exports will likely be oil and gas companies and advocates of liberal trade, perhaps along with a broader group of foreign policy strategists that finds the prospect of disrupting relations between gas-producing and gas-consuming countries appealing, as well as supporters of renewable power who see cheap natural gas as competition (Schrag 2012). Any decision on LNG exports is likely to be controversial. Enlightened leadership and a strategy that mitigates downsides for poorer consumers and the local environment are essential to a smart strategy for constructively moving exports forward.

---

# Author

---

## Michael Levi

*David M. Rubenstein Senior Fellow for Energy and the Environment  
Director of the Program on Energy Security and Climate Change  
Council on Foreign Relations*

Michael Levi is the David M. Rubenstein Senior Fellow for Energy and the Environment at the Council on Foreign Relations (CFR) and Director of the CFR program on energy security and climate change. His work focuses on foreign and domestic policy related to climate change, energy security, nuclear weapons. Levi is the author of two books, most recently *On Nuclear Terrorism* (Harvard University Press, 2007) and is at work on two more. The first explores the recent boom in American energy, evaluating its consequences and assessing policy options for harnessing it; the second, with Elizabeth Economy, explores the causes and consequences of China's quest for natural resources. Other recent work has focused on the international political economy of clean energy innovation, global oil markets, the Canadian oil sands, and climate diplomacy. Michael is a member of the Strategic Advisory Board for NewWorld Capital LLC, a private equity firm focused on environmental opportunities, and a member of the External Advisory Board to the Princeton University Carbon Mitigation Initiative (CMI). He holds a Bachelors of Science in mathematical physics from Queen's University, an MA in physics from Princeton University and a Ph.D. in war studies from the University of London.

## Acknowledgements

The author thanks Charlie Warren for invaluable research assistance; Lucas Davis, Michael Greenstone, Adam Looney, an anonymous reviewer, and participants in a Hamilton Project workshop for valuable comments on drafts of the paper; and Blake Clayton and Billy Pizer for helpful conversations. Levi also is grateful for support from the Alfred P. Sloan Foundation for funding to support the basic research that underlies this proposal.

---

# Endnotes

---

1. Based on EIA (2012a) data for wellhead prices deflated with BLS (2012) CPI data.
2. Estimate based on \$4 gas price, \$4 for liquefaction, shipping, and regasification, and \$15 sale price. If one assumes that the full difference between U.S. and overseas prices is captured by U.S. producers, the estimated U.S. surplus is \$20 billion. Contracts already concluded make clear, however, that the surplus will be divided between buyer, seller, and middlemen (such as shippers); in addition, prices in distant markets should fall due to trade.
3. This competition is not entirely based on simple economics, since many consuming countries do not have pure market economies, but economics plays a central role.
4. Based on a simple energy equivalence calculation. If GTL were used, a substantial efficiency penalty would increase the amount of natural gas needed.
5. Imagine, for example, that natural gas was used to displace oil through conversion of gas to liquid fuels (GTL). Jaramillo et al (2008) estimate that capital and operating costs would total about \$20 per barrel of petroleum products produced. With natural gas priced at \$5/MMBtu, the gas needed to operate the GTL facility would cost roughly another \$20 per barrel of products (Jaramillo et al 2008; author's calculations). Even if all economic opportunities to convert natural gas to liquids were exploited, U.S. natural gas prices would thus remain about \$6-\$7/MMBtu below oil prices — certainly a wide enough gap to keep LNG exports attractive. A similar pattern should be expected for compressed natural gas vehicles, which are more expensive than conventional cars and trucks.
6. Most of the projects already have terminals built; one of the projects, at Jordan Cove, has not yet built an import terminal, but its backer had invested substantial effort in developing the project prior to the emergence of the U.S. natural gas glut.
7. This and all other estimates of gains and losses from exports are based on the simple assumption that the price paid to domestic gas producers is equal to their marginal cost of production, and the price paid by domestic consumers is equal to their marginal benefit from consumption.
8. To reach this estimate, I infer from the IHS (2011, pp. 15, 20) projections of shale gas output and employment from 2010 to 2030 that each increase of 1 bcf/d in natural gas production supports approximately 5,300 jobs in the oil and gas industry, and about 8,900 indirect jobs along the supply chain.
9. A thousand cubic feet of natural gas has roughly the same energy content as 0.17 barrels of oil. Assuming a typical conversion efficiency of 60 percent results in the reported figure.
10. This is based on an assumed energy penalty of 15 percent for CNG.
11. This estimate depends on the natural gas price impact of gas exports — and the cost of moving natural gas into CNG vehicles. The greater the price impact of gas exports, the larger the likely profits to the United States from exports; the same drivers of that dynamic would also imply larger costs for producing natural gas for use in cars and trucks. The cost of moving natural gas into CNG vehicles is also important to the net assessment, since it offsets the external benefit of any shift in that direction.
12. Emissions from natural gas are assumed to be 53 kgCO<sub>2</sub>/MMBtu.
13. This figure is gross, not net, since I am interested in knowing total pipeline capacity. Pipelines between the United States and Canada do not generally switch direction during the year.

---

# References

---

- ABB Inc. 2011. "Overview of energy efficiency in industry and utilities." *Trends in global energy efficiency*. Retrieved from [http://www05.abb.com/global/scot/scot316.nsf/veritydisplay/48d2bfc08d960244c1257864004caf9e/\\$file/the%20global%20report.pdf](http://www05.abb.com/global/scot/scot316.nsf/veritydisplay/48d2bfc08d960244c1257864004caf9e/$file/the%20global%20report.pdf).
- Aldy, Joseph E., and William A. Pizer. 2009. *The Competitiveness Impacts of Climate Change Mitigation Policy*. Arlington, VA: Pew Center on Global Climate Change.
- Allegheny Conference on Community Development. 2009. "Benchmarking Pennsylvania: A Summary of Severance Taxes on the Natural Gas Industry." <http://www.alleghenyconference.org/PEL/PDFs/NaturalGasSeveranceTax021009.pdf>.
- Bonakdarpour, Moshen, Bob Flanagan, Chris Holling, and John W. Larson. 2011. *The Economic and Employment Contributions of Shale Gas in the United States*, Washington, DC: IHS Global Insight Inc.
- BP. 2011. "BP Statistical Review of World Energy June 2011." Accessed May 15, 2012. Retrieved from <http://www.bp.com/sectionbodycopy.do?categoryId=7500&contentId=7068481>.
- Bureau of Economic Analysis (BEA). 2011. "Gross Domestic Product (GDP) by Industry Data." U.S. Department of Commerce Bureau of Economic Analysis (BEA). [http://www.bea.gov/industry/gdpbyind\\_data.htm](http://www.bea.gov/industry/gdpbyind_data.htm).
- Bureau of Economic Analysis (BEA). 2012. "U.S. Economy at a Glance: Perspective from the BEA Accounts." Last modified March 16, 2012. <http://www.bea.gov/newsreleases/glance.htm>.
- Bureau of Labor Statistics (BLS). 2012. "Monthly Consumer Price Index 1947-2012." Federal Reserve Bank of St. Louis. Accessed March 16, 2012. <http://research.stlouisfed.org/fred2/series/CPIAUCSL/>.
- Cheniere. 2011. *Cheniere Energy: April 2011*. (Marketing slides.) N.p.: Cheniere.
- Davis, Lucas. 2012. "Modernizing Bonding Requirements for Natural Gas Producers." The Hamilton Project, Brookings Institution, Washington, DC.
- Deloitte Center for Energy Solutions and Deloitte MarketPoint LLC. 2011. *Made in America: The Economic Impact of LNG Exports from the United States*. N.p.: Deloitte Development LLC.
- Department of Energy (DOE). 2011. *Shale Gas Production Subcommittee Second Ninety Day Report*. Washington, DC: Government Printing Office.
- Department of Energy (DOE). 2012. "Pending LNG Export Applications." Last modified May 7, 2012. <http://fossil.energy.gov/programs/gasregulation/>.
- Ebinger, Charles, Kevin Massy, and Govinda Avasarala. 2012. *Evaluating the Prospects for Increased Exports of Liquefied Natural Gas from the United States: An Interim Report*. Washington, DC: Brookings Institution.
- Energy Information Administration (EIA). 2005a. *Residential Energy Consumption Survey Table US3: Total Consumption by Fuels Used*. Washington, DC: Government Printing Office.
- Energy Information Administration (EIA). 2005b. *Residential Energy Consumption Survey*. Washington, DC: Government Printing Office.
- Energy Information Administration (EIA). 2009a. *Annual Energy Outlook 2009*. Retrieved from [http://www.eia.gov/oiaf/aeo/pdf/0383\(2009\).pdf](http://www.eia.gov/oiaf/aeo/pdf/0383(2009).pdf).
- Energy Information Administration (EIA). 2009b. "Locations of U.S. Natural Gas Import & Export Points, 2009." Retrieved from [http://www.eia.gov/pub/oil\\_gas/natural\\_gas/analysis\\_publications/ngpipeline/impex\\_list.html](http://www.eia.gov/pub/oil_gas/natural_gas/analysis_publications/ngpipeline/impex_list.html).
- Energy Information Administration (EIA). 2010a. *Annual Energy Outlook 2010*. <http://www.eia.gov/oiaf/aeo/pdf/0383%282010%29.pdf>.
- Energy Information Administration (EIA). 2010b. "Nonswitchable Minimum and Maximum Consumption, 2006." Retrieved from [http://www.eia.gov/emeu/mecs/mecs2006/pdf/Table10\\_1.pdf](http://www.eia.gov/emeu/mecs/mecs2006/pdf/Table10_1.pdf).
- Energy Information Administration (EIA). 2011. *International Energy Outlook 2011*. Washington, DC: Government Printing Office.
- Energy Information Administration (EIA). 2012a. "U.S. Natural Gas Wellhead Prices." Retrieved from <http://www.eia.gov/dnav/ng/hist/n9190us3m.htm>.
- Energy Information Administration (EIA). 2012b. "Natural Gas Gross Withdrawals and Production: Volumes in Million Cubic Feet." Last modified February 29, 2012. [http://www.eia.gov/dnav/ng/ng\\_prod\\_sum\\_dcu\\_NUS\\_a.htm](http://www.eia.gov/dnav/ng/ng_prod_sum_dcu_NUS_a.htm).
- Energy Information Administration (EIA). 2012c. *Effect of Increased Natural Gas Exports on Domestic Energy Markets*. [http://205.254.135.7/analysis/requests/fe/pdf/fe\\_lng.pdf](http://205.254.135.7/analysis/requests/fe/pdf/fe_lng.pdf).
- Energy Information Administration (EIA). 2012d. "U.S. Natural Gas Exports by Point of Exit." Last modified April 12, 2012. [http://www.eia.gov/dnav/ng/ng\\_move\\_poe2\\_a\\_EPG0\\_ENP\\_Mmcf\\_a.htm](http://www.eia.gov/dnav/ng/ng_move_poe2_a_EPG0_ENP_Mmcf_a.htm).
- Energy Information Administration (EIA). 2012e. "U.S. Natural Gas Exports by Point of Entry." Last modified April 12, 2012. [http://www.eia.gov/dnav/ng/ng\\_move\\_poe1\\_a\\_EPG0\\_IRP\\_Mmcf\\_a.htm](http://www.eia.gov/dnav/ng/ng_move_poe1_a_EPG0_IRP_Mmcf_a.htm).



- Energy Information Administration (EIA). 2012f. "2011 Brief: Brent crude oil averages over \$100 per barrel in 2011." Accessed at <http://205.254.135.7/todayinenergy/detail.cfm?id=4550>.
- Energy Information Administration (EIA). 2012g. "Short-Term Energy Outlook." Last modified May 8, 2012. Accessed at <http://205.254.135.7/forecasts/steo/report/natgas.cfm>.
- ENI. 2012. "Eni announces results for the Fourth Quarter and the Full Year 2011." Retrieved from [http://www.eni.com/en\\_IT/attachments/media/press-release/2012/02/press-release-2011-fourth-quarter-results.pdf](http://www.eni.com/en_IT/attachments/media/press-release/2012/02/press-release-2011-fourth-quarter-results.pdf).
- Federal Energy Regulatory Commission (FERC). 2011. "Order Issuing Certificates and Granting Abandonment: National Fuel Gas Supply Corporation and Tennessee Gas Pipeline Company." Retrieved from <http://www.ferc.gov/whats-new/comm-meet/2011/102011/C-1.pdf>.
- Gismatullin, Eduard. 2012. "U.S. to Supply About 9% of Global LNG Output in 2020, BG Says." *Bloomberg*, February 9, 2012.
- Greenstone, Michael, Elizabeth Kopits and Maryann Wolverton. 2011. "Estimating the Social Cost of Carbon for Use in U.S. Federal Rulemakings: A Summary and Interpretation" MIT Department of Economics Working Paper No. 11-04. Retrieved from SSRN: <http://ssrn.com/abstract=1793366>.
- Guegel, Anthony. 2010. "Shale gas destroys US LNG demand." *Upstream*. Retrieved from <http://www.upstreamonline.com/live/article212479.ece>.
- ICIS Heren. 2012. "US Cheniere Ffinalises Sabine Pass marketing with KOGAS LNG Supply Deal." ICIS Heren. Last modified January 30, 2012. <http://www.icis.com/heren/articles/2012/01/30/9527806/us-cheniere-finalises-sabine-pass-marketing-with-kogas-lng-supply.html>.
- International Energy Agency (IEA). 2011. *World Energy Outlook*. Paris: International Energy Agency.
- International Gas Union. 2010. *World LNG Report 2010*. Oslo, Norway: International Gas Union.
- Interviews. 2011. Interviews with Japanese businesspeople and government officials, Tokyo, December 2011.
- Japan Bank for International Cooperation (JBIC). 2008. "Loan for Panama Canal Expansion Project: Contributing to Japanese International Competitiveness and Stable Resource Supply." Retrieved from <http://www.jbic.go.jp/en/about/press/2008/1210-01/index.html>.
- Jaramillo, Paulina, W. Michael Griffin, and H. Scott Matthews. 2008. "Comparative Analysis of the Production Costs of Life-Cycle GHG Emissions of FT Liquid Fuels from Coal and Natural Gas." *Environmental Science & Technology* 42(20): 7559–7565.
- Joskow, Paul L. 1987. "Contract Duration and Relationship-Specific Investments: Empirical Evidence from Coal Markets." *American Economic Review*. 77(1): 168–185.
- Massachusetts Institute of Technology (MIT) Energy Initiative. 2011. *The Future of Natural Gas: An Interdisciplinary MIT Study*. Cambridge, MA: Massachusetts Institute of Technology.
- Morse, Edward L., Eric G. Lee, Daniel P. Ahn, Aakash Doshi, Seth Kleinman, and Anthony Yuen. 2012. *Energy 2020: North America, the New Middle East?*. Citi GPS: Global Perspectives and Solutions. Accessed March 20, 2012. <https://ir.citi.com/5MiFPISof8O44ipxnK6K7M10QNYVqRY4taTwXRiWZ8dshWrFeLzU9eAgMVC1P8Bt>.
- National Highway Traffic Safety Administration (NHTSA). 2011. National Center for Statistics and Analysis. *Corporate Average Fuel Economy for MY 2017-MY 2025 Passenger Cars and Light Trucks*. Washington, DC: Government Printing Office.
- North American Free Trade Agreement (NAFTA). 1993. Chapter Six: "Energy and Basic Petrochemicals."
- Oil & Gas Monitor. "Cheniere Partners Enters into Lump Sum Turnkey Contract with Bechtel." Retrieved from <http://www.oilgasmonitor.com/cheniere-partners-enters-lump-sum-turnkey-contract-bechtel/899>.
- Palmer, Doug, and Dan Durfee. 2011. "U.S., EU, Japan take on China at WTO over rare earths." Reuters. Retrieved from <http://www.reuters.com/article/2012/03/14/us-china-trade-eu-idUSBRE82D07Q20120314>.
- Pickering, Gordon. 2010. Navigant Consulting. *Market Analysis for Sabine Pass LNG Export Project*. [http://www.navigant.com/~media/Site/Insights/Energy/Cheniere\\_LNG\\_Export\\_Report\\_Energy.ashx](http://www.navigant.com/~media/Site/Insights/Energy/Cheniere_LNG_Export_Report_Energy.ashx).
- Platts. 2012. "Japan seeking US LNG, to ask for US waiver during Kuwait meeting." *Platts*. Last modified March 13, 2012. <http://www.platts.com/RSSFeedDetailedNews/RSSFeed/NaturalGas/8050013>.
- Powell, William. 2011. "E.ON Ruhrgas drops plans for contract arbitration with Gazprom." *Platts*. Retrieved from <http://www.platts.com/RSSFeedDetailedNews/RSSFeed/NaturalGas/8794750>.
- Ratner, Michael, Paul W. Parfomak, and Linda Luther. 2011. *U.S. Natural Gas Exports: New Opportunities, Uncertain Outcomes*. Washington, DC: Congressional Research Service. <http://www.fas.org/sgp/crs/misc/R42074.pdf>.
- Schrag, Daniel P. 2012. "Is Shale Gas Good for Climate Change?" *Dædalus* 141(2) pp. 72–80.

- Securities and Exchange Commission (SEC). 2012. "Form 8-K for Cheniere Energy Inc." SEC Filings for LNG. Last modified January 26, 2012. Accessed at <http://biz.yahoo.com/e/120126/lng8-k.html>.
- Selivanova, Yulia. 2007. "The WTO and Energy: WTO Rules and Agreements of Relevance to the Energy Sector." Geneva, Switzerland: International Centre for Trade and Sustainable Development.
- United Press International (UPI). 2011. "Qatar shifts gas plan as U.S. output grows." Retrieved from [http://www.upi.com/Business\\_News/Energy-Resources/2011/10/14/Qatar-shifts-gas-plan-as-US-output-grows/UPI-33401318608222](http://www.upi.com/Business_News/Energy-Resources/2011/10/14/Qatar-shifts-gas-plan-as-US-output-grows/UPI-33401318608222).
- United States Constitution. Article 1, Section 9, Clause 5.
- United States Department of State. 2012. "Applying for Presidential Permits for Border Crossing Facilities (Mexico)." Last Modified April 13, 2012. Bureau of Western Hemisphere Affairs. Retrieved from <http://www.state.gov/p/wha/rls/fs/2012/187529.htm>.
- United States v. United States Shoe Corp. 523 U.S. 360 (1998).
- World Bank. 2012. "Commodity Price Forecast Update." Retrieved from [http://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1304428586133/Price\\_Forecast.pdf](http://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1304428586133/Price_Forecast.pdf).





## ADVISORY COUNCIL

GEORGE A. AKERLOF  
Koshland Professor of Economics  
University of California at Berkeley

ROGER C. ALTMAN  
Founder & Chairman  
Evercore Partners

ALAN S. BLINDER  
Gordon S. Rentschler Memorial Professor  
of Economics & Public Affairs  
Princeton University

TIMOTHY C. COLLINS  
Senior Managing Director  
& Chief Executive Officer  
Ripplewood Holding, LLC

JONATHAN COSLET  
Senior Partner & Chief Investment Officer  
TPG Capital, L.P.

ROBERT CUMBY  
Professor of Economics  
Georgetown University

JOHN DEUTCH  
Institute Professor  
Massachusetts Institute of Technology

KAREN DYNAN  
Vice President & Co-Director  
of Economic Studies  
Senior Fellow, The Brookings Institution

CHRISTOPHER EDLEY, JR.  
Dean and Professor, Boalt School of Law  
University of California, Berkeley

BLAIR W. EFFRON  
Founding Partner  
Centerview Partners LLC

JUDY FEDER  
Professor & Former Dean  
Georgetown Public Policy Institute  
Georgetown University

ROLAND FRYER  
Robert M. Beren Professor of Economics  
Harvard University and CEO, EdLabs

MARK T. GALLOGLY  
Cofounder & Managing Principal  
Centerbridge Partners

TED GAYER  
Senior Fellow & Co-Director  
of Economic Studies  
The Brookings Institution

RICHARD GEPHARDT  
President & Chief Executive Officer  
Gephardt Group Government Affairs

ROBERT GREENSTEIN  
Executive Director  
Center on Budget and Policy Priorities

CHUCK HAGEL  
Distinguished Professor  
Georgetown University  
Former U.S. Senator

GLENN H. HUTCHINS  
Co-Founder  
Silver Lake

JIM JOHNSON  
Vice Chairman  
Perseus LLC

LAWRENCE F. KATZ  
Elisabeth Allison Professor of Economics  
Harvard University

MARK MCKINNON  
Global Vice Chair  
Hill + Knowlton Strategies

ERIC MINDICH  
Chief Executive Officer  
Eton Park Capital Management

SUZANNE NORA JOHNSON  
Former Vice Chairman  
Goldman Sachs Group, Inc.

PETER ORSZAG  
Vice Chairman of Global Banking  
Citigroup, Inc.

RICHARD PERRY  
Chief Executive Officer  
Perry Capital

PENNY PRITZKER  
Founder, Chairman & Chief Executive Officer  
PSP Capital

MEEGHAN PRUNTY  
Senior Advisor  
The Hamilton Project

ROBERT D. REISCHAUER  
President Emeritus  
The Urban Institute

ALICE M. RIVLIN  
Senior Fellow, The Brookings Institution  
Professor of Public Policy  
Georgetown University

DAVID M. RUBENSTEIN  
Co-Founder & Managing Director  
The Carlyle Group

ROBERT E. RUBIN  
Co-Chair, Council on Foreign Relations  
Former U.S. Treasury Secretary

LESLIE B. SAMUELS  
Senior Partner  
Cleary Gottlieb Steen & Hamilton LLP

SHERYL SANDBERG  
Chief Operating Officer  
Facebook

RALPH L. SCHLOSSTEIN  
President & Chief Executive Officer  
Evercore Partners

ERIC SCHMIDT  
Executive Chairman  
Google Inc.

ERIC SCHWARTZ  
76 West Holdings

THOMAS F. STEYER  
Senior Managing Member  
Farallon Capital Management

LAWRENCE SUMMERS  
Charles W. Eliot University Professor  
Harvard University

LAURA D'ANDREA TYSON  
S.K. and Angela Chan Professor of Global  
Management, Haas School of Business  
University of California, Berkeley

---

MICHAEL GREENSTONE  
Director

## Highlights

Michael Levi of the Council on Foreign Relations weighs the economic and other benefits of liquefied natural gas (LNG) exports against the costs, and argues that the upsides of allowing LNG exports outweigh the downsides, providing that the U.S. government takes steps to mitigate risks to the local environment and low-income consumers. Levi proposes that the United States should allow exports of LNG, and offers recommendations for using access to exports to advance U.S. foreign and trade policy goals.

## The Proposal

**Apply a broad framework to assess the wisdom of liquefied natural gas exports.** Federal regulators and lawmakers can determine the potential impacts of applications for natural gas exports by considering the following six questions:

- What macroeconomic consequences would natural gas exports have?
- What would the distributional impacts of natural gas exports be?
- How would natural gas exports affect U.S. oil security?
- What impact would natural gas exports have on climate change?
- What foreign policy consequences might natural gas exports entail?
- What would the local environmental consequences of natural gas exports be?

**Unlock the gains from trade created by natural gas exports.** Allowing LNG exports will allow U.S. producers and workers to extract additional natural gas and sell it overseas at higher prices, bringing economic benefits to the United States. Blocking exports could have consequences for broader U.S. access to foreign markets, damaging U.S. growth. Therefore, the Department of Energy should approve current applications to export LNG, and the Federal Energy Regulatory Commission should approve applications to build or modify export terminals.

## Benefits

Using his framework, Levi estimates that allowing exports of LNG could result in roughly \$4 billion in gains from trade annually, and bolster U.S. leverage in trade negotiations. Pushing for more transparent natural gas markets could reduce international dependence on the small group of countries that currently provide most natural gas. Finally, allowing exports of LNG would enhance ongoing U.S. efforts to promote access for U.S. firms and workers to other markets.



1775 Massachusetts Ave., NW  
Washington, DC 20036

(202) 797-6279

BROOKINGS



Printed on recycled paper.

[WWW.HAMILTONPROJECT.ORG](http://WWW.HAMILTONPROJECT.ORG)

January 22, 2013

Ingrid Kolb  
Chief FOIA Officer, Department of Energy  
FOIA Requester Service Center  
1000 Independence Avenue, SW  
Washington, DC 20585  
By email to: FOIA-central@hq.doe.gov

**RE: Freedom of Information Act Request Re: LNG Export Studies**

Dear Ms. Kolb:

Thank you in advance for promptly processing this Freedom of Information Act (FOIA) request submitted on behalf the Sierra Club, pursuant to 5 U.S.C. § 552 and DOE's FOIA regulations, 10 C.F.R. Pt. 1004. This request is focused on the study DOE recently commissioned and released from NERA Economic Consulting concerning liquefied natural gas (LNG) exports from the United States. *See* 77 Fed. Reg. 73,627 (Dec. 11, 2012).

Sierra Club requests a fee waiver and expedited processing for this request.

**I. Records Requested**

DOE is considering multiple LNG export license applications under the Natural Gas Act, 15 U.S.C. § 717b. Those decisions are at the center of a major national policy debate on the environmental and economic impacts of LNG export. As part of that consideration, DOE is seeking to evaluate whether the economic impacts of export are in the public interest, a consideration which encompasses the "macroeconomic impacts of natural gas exports on the U.S. economy." 77 Fed. Reg. at 73,268. According to DOE, it "commissioned NERA [which is an economic consulting firm] to conduct such an analysis." *Id.* This FOIA request focuses upon the NERA study which DOE commissioned.

The NERA study has been released for public comment and has been published on DOE's website.<sup>1</sup> DOE affirms that it will use the study and the comments it receives upon it "to inform our determination of the public interest in each [export license] case." 77 Fed. Reg. at 73,628. DOE seeks a first round of comments by January 24, 2013,

---

<sup>1</sup> *See* <http://fossil.energy.gov/programs/gasregulation/LNGStudy.html>

and a round of reply comments by February 25, 2013, 77 Fed. Reg. at 73,627, after which it will move forward with the export licensing process. The time available for the public to analyze the study is short, underlining the urgency of this FOIA request.

In order to better inform its nearly 600,000 members, policymakers, and the public, Sierra Club seeks information on the NERA study in time to allow it and other members of the public to file fully-informed comments during DOE's comment period.

Pursuant to 10 C.F.R. § 1004.4(b), the Sierra Club therefore requests the following records:

- (A) DOE's contract or contracts with NERA Consulting (or any other relevant person or entity) to perform this study.
- (B) All records related to DOE's selection of NERA Consulting as the contractor for this study, including, but not limited to, records identifying DOE's reasons for selecting NERA as the contractor for this study, correspondence between DOE and NERA before and after NERA was selected, and any records related to other contractors DOE considered or which applied for consideration, to perform this study.
- (C) All records related to DOE's involvement in the preparation, release, and further consideration of the study, including, but not limited to, correspondence between DOE staff<sup>2</sup> and NERA staff concerning the study; correspondence between DOE staff and staff at any other federal agency, Congressional offices, or the Executive Office of the White House concerning the study or the issues raised therein; and correspondence between DOE staff and any members of the public (including representatives of industry and the news media) concerning the study or the issues raised therein. Note that the transmittal letter NERA sent to DOE with the study refers to the final report as a "clean copy"; this request explicitly seeks any copies of the report showing edits and comments from DOE staff or any other government staff.
- (D) A complete technical description of NERA's "NewERA" model, which was used to generate the results, fully detailing that model's inputs, equations, technical assumptions, and other relevant operating parameters, sufficient to allow an

---

<sup>2</sup> "Staff," here, refers to any person employed by or associated with these entities, including appointed officials and contractors.

independent expert to fully assess the model's reliability and performance.<sup>3</sup> Please include any papers or technical reports NERA or any other entity have published describing the model.

(E) A machine-readable copy of the NewERA model, which can be run by independent experts.

Sierra Club defines "records" broadly to include all documents, email correspondence, notes, voice mail recordings, letters, computer files, and any other information bearing on Sierra Club's request.

Please produce these records as soon as they are available, on a rolling basis. DOE regulations provide that it will provide a response within 10 working days, and may only extend this period by 10 more working days under unusual circumstances. 10 C.F.R. § 1004.5.

If you have any questions or concerns about this request, please contact me immediately.

## **II. Form of Documents**

Please provide all electronic documents in machine-readable, fully-searchable files (such as .doc, .xls, and .pdf files) organized according to the individual record requests enumerated above. Please provide paper documents in well-organized mailings, where necessary. Please include an index of documents provided. *See* 5 U.S.C. § 552(a)(3)(B) ("[A]n agency shall provide the record in any form or format requested by the person if the record is readily reproducible by the agency in that form or format."). If, despite DOE's reasonable efforts, it cannot provide a particular record in this format, please provide the record in another machine-readable format, or in paper, but please contact me to work out the optimal format before doing so.

## **III. Exempt Records**

If DOI determines that any records may be withheld under FOIA's narrow exemptions, please identify each allegedly exempt record in writing, provide a brief description of that record, and explain the agency's justification for withholding it. This explanation should take the form of a *Vaughn* index, as described in *Vaughn v. Rosen*, 484 F.2d 820

---

<sup>3</sup> For an example of such a full description, see the publicly-available technical support documents for DOE's own models, posted at <http://www.eia.gov/reports/index.cfm?t=Model%20Documentation>.

(D.C. Cir 1973), and related cases. If a document includes both exempt and non-exempt information, please provide those portions of the document that are not specifically exempted from disclosure. Finally, if a document does not exist, please indicate that in your written response.

#### **IV. Fee Waiver**

Pursuant to 10 C.F.R. §§ 1004.4(e) & 1004.9(a)(8), Sierra Club hereby requests that DOE waive all fees associated with responding to this request because Sierra Club seeks this information in the public interest and will not benefit commercially from this request. If DOE does not waive the fees entirely, Sierra Club requests that it reduce them to the extent possible.

Sierra Club meets all factors in DOE's fee waiver test, as is demonstrated below. If this information is not sufficient to justify a fee waiver, please contact me for further documentation before deciding upon the waiver request.

##### **A. Public Interest Factor**

The disclosure of this information is in the "public interest because it is likely to contribute significantly to public understanding of the operations or activities of the government." *See* 10 C.F.R. § 1004.9(a)(8)(i). Sierra Club's request complies with each of the criteria DOE weighs in this determination:

##### **i. The request concerns the operations or activities of the government**

Sierra Club's request concerns a study which DOE has commissioned to assist it in its statutorily-mandated licensing process, and which DOE has disseminated in the Federal Register. Both the study and DOE's handling of matters related to it thus bear upon the operations and activities of the government. *See* 10 C.F.R. § 1004.9(a)(8)(i)(A).

##### **ii. The disclosure is "likely to contribute" to an understanding of government operations and activities**

DOE's investigation into the economic impacts of LNG export is central to the operation of DOE's Office of Fossil Energy and its Liquid Natural Gas Regulation program. And, as DOE has explained to the Administration, Congress, and the public, the NERA study

is a key factor in DOE's decisionmaking process.<sup>4</sup> DOE has refused to move forward on any LNG export licenses which it has the discretion to grant or deny until the study has been completed and reviewed. Accordingly, DOE has already placed the study in the dockets for each of its pending license processes, reaffirming that "no final decisions will be issued in the ... pending proceedings until DOE has received and evaluated the comments requested herein." 77 Fed. Reg. at 73,629.

As such, records concerning the study are of vital importance to understanding DOE's activities in the LNG export arena, and are "likely to contribute" to public understanding. *See* 10 C.F.R. § 1004.9(a)(8)(i)(B). The records Sierra Club has sought are necessary for the public to fully evaluate the study. They bear, for instance, upon how DOE selected NERA to perform the study, DOE's involvement (and the involvement of other government entities) in shaping the content of the study, and the models and other documents NERA used to reach its conclusions. These materials will allow the public to critically assess the study's provenance and conclusions, and to assess the independence and integrity of the information before DOE and DOE's own decisionmaking process. None of these materials have yet been made public. This information is thus, "likely to contribute" to the public's understanding of government activities as DOE continues to address these vital policy questions.

**iii. The information will contribute to the understanding of the general public**

This information will contribute to the understanding of the general public. *See* 10 C.F.R. § 1004.9(a)(8)(i)(C). The general public is already following LNG export matters, and the NERA study has been reported across the country, so records concerning the study will receive close and critical scrutiny from members of the public and the news media.

Sierra Club is particularly able to ensure that information will be disseminated to the general public. The Sierra Club is the nation's oldest and largest grassroots environmental organization, with nearly 600,000 members and hundreds of thousands more online activists and newsletter subscribers. Its website is highly trafficked and Sierra Club media and communications reach hundreds of thousands of people through a radio show, an extensive online information system, web videos, and news reports.

---

<sup>4</sup> *See, e.g.*, Letter from Deputy Assistant Secretary Christopher Smith to Representative Edward Markey (Feb. 24, 2012) (explaining that DOE would not take final action until the NERA study had been received and reviewed).

Sierra Club has a decades-long track record of effectively communicating with the public.

The Sierra Club's Beyond Natural Gas campaign<sup>5</sup> is a multi-million dollar effort to research, advocate, and publicize efforts to better regulate natural gas production and to reduce natural gas production and consumption (including via export) in favor of cleaner alternatives and to inform the public about the effects of natural gas. The campaign participates in dozens of proceedings annually, has a large communications budget, and communicates weekly with tens of thousands of citizens. Campaign experts and attorneys use available information to develop reports, media materials, and litigation briefs that further educate the public and decision-makers.

Sierra Club has prioritized its efforts on LNG export, and has an active communications, organizing, and litigation campaign on exports. Through that campaign, Sierra Club has built an extensive national network of public organizations and individuals interested in these issues, and it communicates with them regularly. These communications have, for instance, generated nearly 80,000 public letters on LNG exports and multiple editorials, letters to the editor, and reports.

In short, Sierra Club is uniquely well positioned to analyze and publicize the information it requests. Sierra Club will make all documents publicly available and will use them as the bases for reports and analysis of DOE's LNG programs.

**iv. The information will contribute "significantly" to public understanding of government operations or activities**

The information Sierra Club seeks will contribute "significantly" to the ongoing public conversation on LNG exports and the shale gas production needed to support them. *See* 10 C.F.R. § 1004.9(a)(8)(i)(D). None of the materials Sierra Club has requested are now widely known (if they have been made public at all), yet they are essential to evaluating the NERA study and DOE's involvement. As discussed above, these materials will allow the public and independent experts to fully assess NERA's conclusions and to provide the meaningful comments on those conclusions which DOE seeks. *See* 77 Fed. Reg. at 73,629. Without these materials, the public will not, for instance, understand how NERA was selected, the model systems and assumptions which NERA employed, or DOE's actions in the study's editing and release. Releasing this information (and doing so on a timeline which will allow the public to comment based upon these

---

<sup>5</sup> *See* <http://content.sierraclub.org/naturalgas/content/beyond-natural-gas>.



materials) will, thus, significantly enhance public understanding and participation in the process which DOE has established.

## **B. Commercial Interest Factor**

The Sierra Club is a non-profit organization, registered under sections 501(c)(3) and 501(c)(4) of the tax code. It has no commercial, trade, or profit interests in this information. Sierra Club seeks to use this information solely to inform the public and to support advocacy efforts around LNG exports. Thus, there is no relevant commercial interest here, *see* 10 C.F.R. § 1004.9(a)(8)(ii)(A), and thus the request is entirely in the public interest, 10 C.F.R. § 1004.9(a)(8)(ii)(B).

For all of the foregoing reasons, a fee waiver is warranted here.

## **V. Expedited Processing Request**

FOIA provides that each agency shall provide for expedited processing of records where there is a “compelling need.” 5 U.S.C. § 552(e)(i). Such a need exists here, so Sierra Club requests expedited processing.

According to the NERA study, export may decrease labor income for Americans in some years by as much as \$40 billion. NERA Study at 8. Export will also increase gas production, including shale gas production, which DOE’s own Shale Gas Subcommittee has determined to be inadequately regulated. These economic and environmental effects will fall upon millions of people. These effects would persist for decades, changing the daily lives of people across the country. Yet, DOE has afforded the public only a few months – over the holiday season -- to comment upon the NERA study, which it has indicated will greatly influence its decision on whether to proceed with LNG export licensing. There are now only a few days before the initial comment period closes, and only a few weeks more before the docket closes entirely. We request that DOE provide a full response to this FOIA before the docket closes. If it requires more time to provide a response, we request that DOE keep the docket open until a response has been provided and the public has been able to analyze and comment upon DOE’s response.

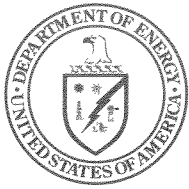
In these circumstances, there is plainly a compelling need for disclosure. If DOE does not share this information in time for it to inform public comment, it will have prevented the public from participating in a pressing policy debate. The courts have repeatedly held that such a denial is an irreparable injury, so preventing such an injury is plainly a compelling need. *See, e.g., Electronic Privacy Info. Ctr. v. Dep’t of Justice*, 416 F.

Supp. 2d 30, 41-42 (D.D.C. 2006); *Washington Post v. Dep't of Homeland Security*, 459 F. Supp. 2d 61, 74-75 (D.D.C. 2006); *Electronic Frontier Found. v. Office of the Director*, 2007 WL 4208311, \*6 (N.D. Cal. 2007); *EFF v. Office of the Director*, 542 F. Supp. 2d 1181, 1186 (N.D. Cal. 2008). DOE must not allow such harm to occur here, and so should expedite processing of this request.

## **VI. Conclusion**

Thank you for your assistance with this request. If you have any questions or concerns, please do not hesitate to contact me.

Sincerely,  
/s/ Craig Segall  
Staff Attorney  
Sierra Club Environmental Law Program  
50 F St NW, Eighth Floor  
Washington, DC, 20001  
(202)-548-4597  
Craig.Segall@sierraclub.org



**Department of Energy**  
Washington, DC 20585

January 24, 2013

Mr. Craig Segall  
Environmental Law Program  
Sierra Club  
50 F Street, NW, Eight Floor  
Washington, DC 20001

Re: HQ-2013-00423-F

Dear Mr. Segall:

This is an interim response to the request for information that you sent to the Department of Energy (DOE) under the Freedom of Information Act (FOIA), 5 U.S.C. 552. You asked for certain records related to a study recently commissioned and released from NERA Economic Consulting concerning liquefied natural gas exports from the United States including:

- (A) contract or contracts with NERA Consulting (or any other relevant person or entity;
- (B) all records related to DOE's selection of NERA Consulting;
- (C) all records related to DOE's involvement in the preparation, release, and further consideration of the study;
- (D) a complete technical description of NERA's "NewERA" model;
- (E) a machine-readable copy of the NewERA model.

A search for responsive records will be conducted of the files of the Office of Fossil Energy and the Office of Acquisition and Project Management. Upon completion of the searches and the review of any records located, you will be provided a responses from those office.

In your letter, you requested a waiver of fees associated with the processing of the request. For purposes of assessment of fees, you have been categorized under the DOE regulation at Title 10, Code of Federal Regulations (CFR), Section 1004.9(b)(4), as an "other" requester. In this category, you are entitled to two free hours of search time and 100 pages at no cost.

Pursuant to 10 CFR 1004.9(8), I have determined that a waiver is appropriate for fees that may be incurred because the subject of the request relates to a government activity, and information about the activity could lead to greater public understanding about the matter. You also have demonstrated the ability and intent of your organization to disseminate the information to the public in a form that can further understanding of the subject matter.

You also asked for expedited processing of the request. You stated that the Sierra Club seeks information on the NERA study in time to allow it and other members of the public to file fully-informed comments during DOE's comment period.

The FOIA permits agencies to expedite the processing of requests if requesters demonstrate a "compelling need." A "compelling need" is established when two criteria are met. The criteria are met when (1) failure to obtain the records quickly "could reasonably be expected to pose an imminent threat to the life or physical safety of an individual," or (2) if the "requester is primarily engaged in disseminating information" and can demonstrate that there is an "urgency to inform the public concerning actual or alleged Federal Government activity."



The reasons you have provided do not adequately address the basis for which a request may be expedited. You have not provided material that establishes that there is any threat to the life or safety of an individual that would justify expeditious processing of the request.

You have not identified yourself as a requester primarily engaged in the dissemination of information. You also have not identified an actual or alleged activity that poses any particular urgency that requires the dissemination of information in an expedited manner. In order to determine whether a requester has demonstrated an "urgency to inform," and hence a "compelling need," courts consider at least three factors: (1) whether the request concerns a matter of current exigency to the American public; (2) whether the consequences of delaying a response would compromise a significant recognized interest; and (3) whether the request concerns federal government activity. Al-Fayed v. C.I.A., 254 F. 3d 300, 310 (D.C. Cir. 2001); Associated Press v. DOE, Case No. TFA-0273 (September 11, 2008). Your request does not address factor two.

For these reasons, I am denying your request for expeditious processing. The request will be processed in accordance with provisions of the FOIA.

You may challenge the denial of expedited processing by submitting a written appeal to the Director, Office of Hearings and Appeals, at HG-1/L'Enfant Plaza Building, Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585-1615. You should submit the appeal within 30 calendar days of receipt of this determination.

The written appeal, including the envelope, must clearly indicate that a FOIA appeal is being made. The appeal must contain elements required by 10 CFR 1004.8, including a copy of this letter. Judicial review will thereafter be available in the Federal District Court either (1) in the district where you reside; (2) in the district where you have your principal place of business; (3) in the district where the DOE records are located; or (4) in the District of Columbia.

Please refer to the above referenced number in any communications with the DOE about the request. If you have questions about processing the request, please contact Ms. Pamela Gentel in the Office of Fossil Energy (FE-6) on (301) 903-1856. You may contact Ms. Joan Ogbazghi in this office (MA-90) on (202) 586-3595 with any question about this letter. Ms. Gentel and Ms. Ogbazghi also can be contacted at U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585.

I appreciate the opportunity to assist you with this matter.

Sincerely,



Alexander C. Morris  
FOIA Officer  
Office of Information Resources



February 22, 2013

Director, Office of Hearings and Appeals,  
Department of Energy,  
1000 Independence Avenue SW.,  
Washington, DC 20585

**Re: Freedom of Information Appeal, re: HQ-2013-00423-F**

Dear FOIA Appeals Officer:

This is an appeal, pursuant to 10 C.F.R. § 1004.8, of the Department of Energy (DOE)'s denial of expedited processing of a Sierra Club FOIA request filed on January 22, 2013. That request is attached to this appeal letter as exhibit 1. DOE granted a fee waiver for the request on January 24, 2013 but denied expedited processing. That denial letter is attached as exhibit 2. We appeal that denial.

**Background**

DOE's Office of Fossil Energy (DOE/FE) is considering whether to permit the export of nearly 25 billion cubic per day of natural gas as liquefied natural gas (LNG).<sup>1</sup> As part of that consideration, DOE/FE commissioned a macroeconomic study from NERA Economic Consulting, and sought public comments on that study, which it stated would guide its decision-making on the pending applications. *See* 77 Fed. Reg. 73,627 (Dec. 11, 2012). Sierra Club's FOIA request sought more information on the NERA study.

LNG export is a highly controversial issue because exporting LNG would increase the use of the controversial hydraulic fracturing ("fracking") process to support increased gas demands and would also increase U.S. gas and electricity prices. DOE/FE is charged with determining whether export is nonetheless in the public interest, *see* 15 U.S.C. § 717b, and, if so, how to condition any export authorizations. The NERA study was intended to inform this consideration and appears likely to be central to DOE/FE's decisionmaking process. In essence, the NERA study is shaping the LNG debate, both at DOE/FE and in the public sphere generally.

---

<sup>1</sup> *See* DOE/FE's summary of these applications:

[http://www.fossil.energy.gov/programs/gasregulation/reports/summary\\_lng\\_applications.pdf](http://www.fossil.energy.gov/programs/gasregulation/reports/summary_lng_applications.pdf).

Fully assessing that study thus is necessary to understand the impacts of this critical energy policy decision for the nation as a whole.

Sierra Club sought information on NERA and the study in order to ensure that its members, and the public generally, were able to fully assess this important study. Sierra Club is concerned both about the substance of the study, which was developed with a private model that has not been disclosed to the public, and the processes by which NERA was selected to perform the study and the study itself was conducted. The NERA consultancy is closely aligned with fossil fuel interests, so issues of bias in the study deserve particularly close scrutiny.

DOE has granted Sierra Club a fee waiver for this inquiry, confirming that distributing the information Sierra Club seeks is in “the public interest because it is likely to contribute significantly to the operations or activities of the government.” *See* 10 C.F.R. § 1004.9(a)(8). Its failure to actually provide this information on an expedited basis is, however, frustrating this public interest. Because DOE/FE is likely to begin acting upon LNG export applications within weeks or months after the February 25, 2013, closure of the NERA study comment period, delaying information effectively bars the public from fully participating in this critical debate.

### **Sierra Club Is Entitled to Expedited Processing**

FOIA requires agencies to provide by regulation for expedited processing. 5 U.S.C. § 552(a)(6)(E). Although DOE/FE has failed to provide such regulations, the statutory mandate for expedited processing persists, and DOE’s denial letter indicates that it will expedite processing in the case of a “compelling need” as defined by the statute. DOE Denial Letter at 1-2.

The statute defines “compelling need,” relevant here, as existing where the “requester is primarily engaged in disseminating information” and there is an “urgency to inform the public concerning actual or alleged Federal Government activity.” 5 U.S.C. § 552(a)(6)(E)(v)(II). DOE states that this determination generally requires that requestors show the “(1) request concerns a matter of current exigency to the American public; (2) whether consequences of delaying a response would compromise a significant recognized interest; and (3) whether the request concerns federal government activity.” DOE Denial Letter at 2 (citing *Al-Fayed v. CIA*, 254 F.3d 300, 310 (D.C. Cir. 2001)). Sierra Club meets all these factors.<sup>2</sup> Moreover, DOE is entitled to grant expedited processing in other circumstances, as warranted, and such processing is warranted here. Expedited processing therefore should have been granted.

#### **I. Sierra Club Is Primarily Engaged In Disseminating Information**

---

<sup>2</sup> The undersigned certifies that the statements in this letter and the original FOIA letter are true and correct to the best of my knowledge and belief. *See* 5 U.S.C. § 552(a)(6)(E)(vi).

When DOE granted Sierra Club's fee waiver request, it accepted Sierra Club explanation of why it would be able to contribute to public understanding. *See* FOIA Letter at 5-6. This same information justifies the Sierra Club's status as an entity primarily engaged in disseminating information.

As the Sierra Club explained in its FOIA letter, the Sierra Club is the nation's largest and oldest grassroots environmental organization, with millions of members and supporters. To fulfill its mission of public outreach, advocacy, and education, the Sierra Club devotes millions of dollars annually to disseminating information. As the FOIA letter explains, Sierra Club's media operation includes a radio show, an extensive network of websites and email newsletters, web videos, press releases, regular report and white paper releases, and an entire book publishing arm.

These operations include the following:

- Sierra Magazine.<sup>3</sup> Sierra is a bimonthly print and online magazine, and has a circulation of at least 600,000 to our dues-paying members, in addition to hundreds of thousands more online readers. Sierra regularly covers the work of our gas campaign, including devoting a lengthy feature article to the impacts of the drilling boom in Pennsylvania in its July/August 2012 issue.<sup>4</sup> Information on LNG export, including on the NERA study, could be distributed through Sierra.
- A book publishing company, Sierra Club Books, that publishes on matters of environmental concern, including on energy and fossil fuel development issues.<sup>5</sup>
- An extensive network of email newsletters and blogs.<sup>6</sup> One of these newsletters, the Sierra Club "Insider" is biweekly, is sent to all of our members, and recently featured an item specifically on the LNG export decision now before DOE.<sup>7</sup>
- A large web presence, including a website specifically on LNG export.<sup>8</sup> Sierra Club websites receives thousands of pageviews each month.
- A white paper publishing and distribution effort which regularly disseminates information to the public and policymakers on these issues, including a recent paper on LNG export.<sup>9</sup>

---

<sup>3</sup> *See* Sierra Magazine's website at <http://www.sierraclub.org/sierra/default.aspx>.

<sup>4</sup> <http://www.sierraclub.org/sierra/201207/pennsylvania-fracking-shale-gas-199-2.aspx>

<sup>5</sup> *See* <http://action.sierraclub.org/site/PageServer?pagename=bookshome>.

<sup>6</sup> *See* <http://action.sierraclub.org/site/PageServer?pagename=EmailCentral> (listing 12 separate publications).

<sup>7</sup> *See* [http://action.sierraclub.org/site/MessageViewer?em\\_id=283745.0](http://action.sierraclub.org/site/MessageViewer?em_id=283745.0).

<sup>8</sup> *See* <http://content.sierraclub.org/naturalgas/stop-lng-exports>

<sup>9</sup> *See* <http://www.sierraclub.org/naturalgas/downloads/LOOK-BEFORE-YOU-LEAP.pdf>.

- A communications effort that regularly writes and develops columns and news releases, and also regularly forwards email information to our millions of members and supporters, including on LNG issues.

This sort of extensive media operation by a nonprofit organization has regularly qualified nonprofits for expedited processing and, indeed, even to be deemed members of the “news media.” In *EPIC v. Dep’t of Defense*, 241 F. Supp. 2d 5 (D.D.C. 2003), for instance, the District of D.C. concluded that EPIC, a small nonprofit which had published seven books<sup>10</sup> on relevant issues and had a “biweekly electronic newsletter”), qualified as a member of the news media. *See id.* at 11-15. The court explained that this “periodical” alone qualified EPIC as a news media organization. *See id.* at 14-15. Such determinations are common. In *ACLU v. U.S. Dep’t of Justice*, 321 F. Supp. 2d 24, 30 n.5 (D.D.C. 2004), the court held that the ACLU was entitled to expedited processing, along with EPIC, and explained that any organization which “gathers information of potential interest to a segment of the public, uses its editorial skills to turn the raw material into a distinct work, and distributes that work to an audience” meets this test.

The Sierra Club unquestionably does so. Its publication operation is vastly larger than that held adequate in *EPIC*, *ACLU*, and similar cases, and has already been employed to educate the public on LNG issues. Moreover, DOE itself has determined that that publishing operation is likely to significantly contribute to public understanding. Thus, Sierra Club qualifies for expedited processing as an organization primarily engaged in public education.

## **II. This Request Concerns a Matter of Exigency to the American Public**

Sierra Club, industrial users, public gas distribution companies, and over 180,000 public commenters have raised serious concerns about LNG export in the DOE docket for the NERA study.<sup>11</sup> These concerns are well-substantiated and demonstrate that DOE’s ultimate decision on LNG export, including its assessment of the merits of the NERA study, pose an exigent and important question for the American public.

---

<sup>10</sup> An earlier case held an organization which had published a *single* book was a member of the news media. *See EPIC*, 241 F. Supp.2d at 11-12 (discussing the *National Security Archive* case).

<sup>11</sup> *See* Docket Comments, compiled at [http://www.fossil.energy.gov/programs/gasregulation/authorizations/export\\_study/export\\_study\\_initial\\_comments.html](http://www.fossil.energy.gov/programs/gasregulation/authorizations/export_study/export_study_initial_comments.html), including Sierra Club comments at [http://www.fossil.energy.gov/programs/gasregulation/authorizations/export\\_study/Sierra\\_Club01\\_24\\_13.pdf](http://www.fossil.energy.gov/programs/gasregulation/authorizations/export_study/Sierra_Club01_24_13.pdf), and comments of Dow Chemical and other industrial users at [http://www.fossil.energy.gov/programs/gasregulation/authorizations/export\\_study/peter\\_molinaro\\_em01\\_24\\_13.pdf](http://www.fossil.energy.gov/programs/gasregulation/authorizations/export_study/peter_molinaro_em01_24_13.pdf).



As Deputy Assistant DOE Secretary Chris Smith has explained, LNG export authorization is “a tremendously important decision” with significant public impacts.<sup>12</sup> These include the potential for significant gas price increases, according to the Energy Information Administration,<sup>13</sup> increased methane and carbon dioxide emissions resulting from increased production for export and from increased use of coal power in response to gas price increases,<sup>14</sup> and a multi-billion dollar shift in revenue from wage income and the industrial manufacturing sector to the owners of gas export and production efforts, as NERA itself documents.<sup>15</sup> These impacts are sharply contested, resulting in Congressional hearings and an ongoing, vigorous debate in the media, in the public square, and among policymakers.<sup>16</sup> DOE/FE’s decisions on LNG, in short, have significant implications for the nation as a whole – among the most significant of any energy policy decision likely to be made in years.

Therefore, a full analysis of the NERA study – the model on which it is based, the methods by which it was developed, how NERA was selected in the first place, and how DOE may or may not have influenced the study – is critical to this debate. DOE has explained that the study is intended to evaluate the “cumulative economic impact” of the LNG decision before it, and that NERA was commissioned specifically to study this macroeconomic question. *See* 77 Fed. Reg. at 73,628. DOE has affirmed that it will place the NERA study, and all comments upon it, in the docket in all export proceedings, *see id.* at 73,269, and will not make final decisions on export applications until it has “received and evaluated” the study and all comments upon it. *Id.* Once DOE has finished that evaluation, it intends to move forward with its export decisions, and has already established an order of precedence with which to do so.<sup>17</sup>

---

<sup>12</sup> *See* Nick Snow, Oil and Gas Journal, *US DOE to move carefully on LNG export requests*, NARUC meeting told (Feb. 5, 2013), available at <http://www.ogj.com/articles/2013/02/us-doe-to-move-carefully-on-lng-export-requests--naruc-meeting-t.html>.

<sup>13</sup> *See* EIA, *Effect of Increased Natural Gas Exports on Domestic Energy Markets* (2012), available at [http://fossil.energy.gov/programs/gasregulation/reports/fe\\_eia\\_lng.pdf](http://fossil.energy.gov/programs/gasregulation/reports/fe_eia_lng.pdf).

<sup>14</sup> *See* Sierra Club comments, cited above.

<sup>15</sup> *See* NERA Report at 8, documenting these shifts

[http://fossil.energy.gov/programs/gasregulation/reports/nera\\_lng\\_report.pdf](http://fossil.energy.gov/programs/gasregulation/reports/nera_lng_report.pdf)

<sup>16</sup> *See, e.g.,* Amelia Templeton, Oregon Public Radio, *Should the US Export Natural Gas? Wyden Leads Sharp Senate Debate* (Feb. 12, 2013), available at <http://earthfix.opb.org/energy/article/should-the-us-export-natural-gas-wyden-leads-sharp/>; Keith Johnson, Wall Street Journal, *Natural-Gas Export Fight Heats Up* (Jan. 10, 2013), available at

<http://online.wsj.com/article/SB10001424127887324081704578233920061510586.html>; Oil and Gas Journal, *Dow Chemical slaps DOE LNG-export report* (Dec. 7, 2012), available at

<http://www.ogj.com/articles/2012/12/dow-chemical-slaps-doe-lng-export-report.html>; Sean Sullivan, SNL, *Analyst: ‘War is starting’ that could destroy LNG exports* (Jan. 30, 2013), available at <http://www.snl.com/InteractiveX/Article.aspx?cdid=A-16874324-12332>.

<sup>17</sup> *See* DOE Order of Precedence,

[http://fossil.energy.gov/programs/gasregulation/publications/export\\_applications\\_order\\_of\\_precedence.pdf](http://fossil.energy.gov/programs/gasregulation/publications/export_applications_order_of_precedence.pdf).

The information Sierra Club requested is particularly important to this debate because there are serious questions about NERA's conclusions. An independent economic study by a senior economist at Purdue University, Dr. Wallace Tyner, also in the docket, casts significant doubt on NERA's findings.<sup>18</sup> Dr. Tyner's study, conducted using the same general sort of macroeconomic analysis as NERA applied, finds that LNG exports would *decrease* GDP, contrary to NERA's conclusions. It also documents significant wealth transfers away from the middle class and American industry. If Dr. Tyner and his research team are correct, DOE/FE has all the more reason to doubt NERA's results – but that determination is very difficult to make without full public disclosure of NERA's underlying modeling, which Sierra Club has requested.

In short, the materials Sierra Club requested concern a vital matter of public policy, and decisions are being made in the next weeks and months. The courts have recognized that exigency exists where information germane to a critical public debate of this sort is being withheld. In *Washington Post v. Dep't of Homeland Security*, 459 F. Supp. 2d 61, 74-75 (D.D.C. 2006) for instance, the court found the plaintiff was irreparably harmed by the government's failure to release information in response to a June FOIA request that would inform the national debate in the November election. Likewise, in *Electronic Frontier Found. v. Office of the Director*, 2007 WL 4208311, \*6 (N.D. Cal. 2007), the plaintiff sought to inform a debate about a bill then before Congress, and the Court found irreparable harm existed where late disclosures would impair participation in that debate. Similarly, in *EFF v. Office of the Director*, 542 F. Supp. 2d 1181, 1186-97 (N.D. Cal. 2008), which also concerned a Congressional debate, the Court found "irreparable harm exist[ed] where the government's delay in releasing information threatened to "render[] [the information] useless in the effort to educate the American public . . . if such information is produced after Congress [has already] amend[ed] the law." And, similarly, in *Electronic Privacy Info. Ctr. v. Dep't of Justice*, 416 F. Supp. 2d 30, 4-42 (D.D.C. 2006), the plaintiff sought to participate in an "ongoing" debate, but the court still recognized that "time is necessarily of the essence in cases like this" and concluded that delay would cause irreparable harm.

The same sort of pressing debate is underway here, but with a much finer endpoint. DOE is already about to close the comment period on the NERA study, and will likely begin processing export applications shortly. If the information Sierra Club seeks is to be useful on this front, Sierra Club must be able to share it with the public and policymakers before DOE has already finalized its decisions.

### **III. Delaying a Response Would Compromise Significant, Recognized, Interests**

The public interest inquiry which DOE is conducting includes economic and environmental interests. These interests are threatened by an inadequately informed consideration of the

---

<sup>18</sup> See Comments of Dr. Wallace Tyner, available at:

[http://www.fossil.energy.gov/programs/gasregulation/authorizations/export\\_study/30\\_Wallace\\_Tyner01\\_14\\_13.pdf](http://www.fossil.energy.gov/programs/gasregulation/authorizations/export_study/30_Wallace_Tyner01_14_13.pdf)

NERA study, so expedited processing is warranted lest withholding this information compromises these interests through the issuance of improper export decisions or an ill-informed endorsement of the NERA study.

Specifically, the Natural Gas Act grants DOE/FE “authority to consider conservation, environmental, and antitrust questions,” as well as economic 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). In interpreting an analogous public interest provision applicable to hydroelectric power, the 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).

DOE has also acknowledged the breadth of the public interest inquiry and recognized that it encompasses environmental concerns. In a recent letter to Senator Wyden, DOE wrote that “environmental considerations” are included in the analysis.<sup>19</sup> Deputy Assistant Secretary Smith has likewise testified that “[a] wide range of criteria are considered as part of DOE’s public interest review process, including . . . U.S. energy security . . . [i]mpact on the U.S. economy . . . [e]nvironmental considerations . . . [and] [o]ther issues raised by commenters and/or interveners deemed relevant to the proceeding.”<sup>20</sup> DOE rules require export applicants to provide information documenting “[t]he potential environmental impact of the project.” 10 C.F.R. § 590.202(b)(7). In a previous LNG export proceeding, DOE determined that the public interest inquiry looks to “domestic need” as well as “other considerations” that specifically included the environment.<sup>21</sup> FERC has also agreed that environmental issues are included in the public interest calculus. In FERC’s recent order approving siting, construction, and operation of LNG export facilities in Sabine Pass, Louisiana, FERC considered potential environmental impacts of the terminal as part of its public interest assessment, which is analogous to DOE/FE’s. 139 FERC ¶ 61,039, PP 29-30 (Apr. 14, 2012).<sup>22</sup>

---

<sup>19</sup> Letter from Daniel Poneman, DOE/FE to Senator Ron Wyden (Dec. 11, 2012) at 2.

<sup>20</sup> The Department of Energy’s Role in Liquefied Natural Gas Export Applications: Hearing Before the S. Comm. on Energy and Natural Resources, 112th Cong. 4 (2011) (testimony of Christopher Smith, Deputy Assistant Secretary of Oil and Gas).

<sup>21</sup> *Phillips Alaska Natural Gas Corporation and Marathon Oil Company*, 2 FE ¶ 70,317, DOE FE Order No. 1473, 1999 WL 33714706, \*22 (April 2, 1999).

<sup>22</sup> Sierra Club contends that other aspects of this order were wrongly decided, as was FERC’s subsequent denial of Sierra Club’s petition for rehearing.

These interests, in short, are both significant, and recognized – both by DOE and as a matter of law. They will be compromised, for the reasons discussed above, if DOE moves forward without providing the critical information on the NERA study to Sierra Club and the public.

#### **IV. The Request Concerns Federal Government Activity**

There is no dispute that Sierra Club meets this prong of the test because this inquiry turns on DOE's own permitting process and a study which DOE has commissioned and sought comment upon.

#### **V. Even if Sierra Club Did Not Meet This Test, DOE Should Still Grant Expedited Processing**

Although Sierra Club is clearly entitled to expedited processing as a matter of law, DOE should exercise its discretion to expedite processing in this matter regardless. As we have explained above, the NERA study, and the LNG export decision which it is intended to inform, have far-reaching implications for the American environment and economy. Deputy Assistant Secretary Smith has made clear that DOE intends to "create a transparent process that withstands public scrutiny."<sup>23</sup> If DOE is serious about this commitment, it must provide information on the NERA study to the public in order to keep the process fair, transparent, and open.

#### **Conclusion**

For all the reasons above, Sierra Club is entitled to expedited processing in this matter. Thank you for your prompt attention to this appeal. Please contact me with any questions or concerns.

Sincerely,

Craig Holt Segall  
Staff Attorney, Sierra Club  
50 F St NW, Eighth Floor  
Washington, DC, 20001  
(202)-548-4597  
Craig.Segall@sierraclub.org

---

<sup>23</sup> Nick Snow, Oil and Gas Journal, *US DOE to move carefully on LNG export requests, NARUC meeting told* (Feb. 5, 2013), available at <http://www.oj.com/articles/2013/02/us-doe-to-move-carefully-on-lng-export-requests--naruc-meeting-t.html>