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United States Senate

WASHINGTON, DC 20510

January 10, 2013

The Honorable Steven Chu
Secretary
U.S. Department of Energy
1000 Independence Avenue SW
Washington, DC 20585

Dear Secretary Chu:

After reviewing the recently released NERA Economic Consulting study¹ commissioned by the Department, I remain deeply concerned about the Department of Energy's approval process for liquefied natural gas ("LNG") export applications. The Natural Gas Act ("NGA") requires the Department to determine whether approving an application to export LNG is in the "public interest," and the Department has indicated that this report will be central to the approval process for these applications. Export applications, which are typically for 20 years or more, and the associated LNG export terminals will reshape the North American natural gas market for years to come. The shortcomings of the NERA study are numerous and render this study insufficient for the Department to use in any export determination. The NERA study would need to be updated with new EIA projections, more realistic market assumptions, regional impacts of the proposed actual export terminals, and evaluations of the actual impacts on consumers and businesses of exporting LNG.

The NERA study's most glaring shortfall is its reliance on two-year-old domestic energy market projections that diverge widely from the government's current understanding of future supply and demand. The study used the Energy Information Administration's (EIA) Annual Energy Outlook 2011 ("AEO2011") reference case, which was released in 2010, as the foundation for its own LNG study. However, on the same day the NERA study was released, the EIA issued its Annual Energy Outlook Reference Case for 2013 ("AEO2013"). There are significant differences between the two EIA AEO reference cases, including projections for gas consumption, energy prices and electric sector energy consumption that render the NERA study inaccurate in reflecting the current sector conditions necessary to inform today's decision-making. Among the most notable data differences are:

- More homes and businesses will rely on natural gas-fired electricity: U.S. net electricity generation by coal power plants in 2035 is projected to be 22.7% lower in AEO2013 than in AEO2011; a majority of this power will be replaced by natural gas-fired generation, which is 15.2% more in AEO2013 than AEO2011;
- Overall natural gas consumption will be higher: The AEO2013 predicts U.S. natural gas consumption will be 8% higher in 2035 than the AEO2011 figure used by NERA.

¹ W. David Montgomery, et al., "Macroeconomic Impacts of LNG Export from the United States," NERA Economic Consulting, December, 2012, http://www.fossil.energy.gov/programs/gasregulation/reports/nera_lng_report.pdf. Referred to hereafter as "NERA study."

- EIA assumed LNG would be imported: Perhaps the most illustrative deviation between the two sets of data is that EIA still expected the U.S. to import LNG in its AEO2011 projections adding to U.S. supplies. The AEO2013 projects there will be net exports of LNG, reducing U.S. supplies.

Even if NERA were to use the new EIA projections, the model it employed for this study has additional deficiencies that would need to be addressed before it could be relied upon to serve as a basis for the statutory findings required by the Natural Gas Act. For example:

1) The NERA study evaluates dozens of scenarios representing different market conditions, but it does not consider the significant domestic demand growth that outside experts and private industry expect to occur over the next decade. By excluding these sources of demand, NERA, like the EIA's Annual Energy Outlooks, is significantly understating demand from emerging segments of the natural gas market. Two overlooked examples are as follows:

- Natural gas is expected to become major transportation fuel: Outside experts suggest EIA has greatly underestimated the use of natural gas by the transportation sector. Citi projected that heavy trucks alone could use 3.3 Bcf/D of natural gas by 2020, displacing up to 600,000 barrels of diesel fuel every day.² The Citi estimate is more than 20 times what EIA projected in its AEO2011, which, in turn, is one-fourth of the agency's AEO2013 projection. The railroad industry is also reported to be studying a switch to natural gas-fueled locomotives, which would further drive up demand.³
- Projected industrial growth is not fully accounted for by EIA or NERA: The growth in natural gas production and low prices have attracted 100 proposed industrial projects, representing \$90 billion in investment and tens of thousands of new jobs, according to Dow Chemical. The proposed projects identified in the Dow analysis represent an estimated increase in demand of 8 Bcf/d. Dow expects near term industrial demand growth to reach 11 Bcf/d. The AEO2011 does not account for these projects, nor does the AEO2013. EIA actually projects non-electric related industrial natural gas demand to decline.⁴

2) The NERA study purports to treat the U.S. and Canada as a single North American market, but its assumptions ignore the potential effect of Canadian LNG exports. The study ignores this important market development, even though Canada's National Energy Board has already approved two LNG export projects in British Columbia. The board also is considering a third LNG export project submitted over the summer by Royal Dutch Shell. Published reports suggest these projects could result in 9 billion cubic feet per day ("Bcf/D") of exports, beginning as early as 2014.⁵

3) LNG terminals use a substantial amount of energy in the liquefaction process. This energy is largely derived from natural gas, representing an amount equivalent to as much as 10% of the amount of natural gas ultimately processed into LNG during the conversion. Both the EIA and NERA appear to have

² Ed Morse, et al., "Energy 2020: North America, the New Middle East?," *Citi*, March 20, 2012.

³ Zain Shauk, "Natural gas could be cheaper way to run a railroad," *Houston Chronicle*, October, 9, 2012, <http://www.chron.com/business/energy/article/Natural-gas-could-be-cheaper-cleaner-way-to-run-3933795.php>.

⁴ Dow Chemical, "DOE Report on LNG Exports Short Changes Manufacturing and U.S. Competitiveness," December 6, 2012, <http://www.dow.com/news/press-releases/article/?id=6138>.

⁵ Martin O'Rourke, "Canada expects to start LNG exports from late 2014; energy minister," *Platts*, September 18, 2012, <http://www.platts.com/RSSFeedDetailedNews/RSSFeed/NaturalGas/8731348>.

misrepresented the use of natural gas by LNG terminals for this purpose, which in turn understates the overall gas demand attributable to LNG exports:

- EIA understated natural gas consumption by LNG terminals: In its analysis of LNG exports released in January 2012,⁶ the EIA reduced the amount of LNG that would actually be exported under its projections by 10% to account for this additional consumption of natural gas during conversion. (NERA uses the same low and high export cases of 6 Bcf and 12 Bcf.) Under the EIA's 6 Bcf/D export case, only 5.4 Bcf/D would actually be exported; in its 12 Bcf/D case, only 10.8 Bcf/D would actually be exported. DOE export permits are for actual export quotas. Thus, actual exports at those nominal 6 Bcf/D and 12 Bcf/D levels would require adding 10% to overall natural gas demand above and beyond the export volumes. The EIA analysis subtracts the gas used for processing.
- The NERA study also underestimates LNG terminal demand: The NERA study states that 9% of the LNG produced at the terminals will be "burned off" for liquefaction,⁷ which is likely a mischaracterization of the actual gas usage for liquefaction. High value LNG would not be used to power the conversion plant. While there will be some boil off losses after LNG is produced, the larger issue is the additional natural gas demand resulting from gas consumption during the liquification conversion process and how the NERA study factors this additional demand into the full exporting lifecycle process. Gas that is used for liquefaction, regardless of its source, needs to be added to the overall demand for natural gas attributable to export volumes approved in the export permits and placed on board LNG tankers. It does not appear that the NERA study does so. The NERA study further errs by pricing the cost of the additional conversion gas at the wellhead price of natural gas despite the fact that gas used for liquefaction will need to be processed and physically transported by pipeline to the LNG terminal location at higher cost and likely impacting transportation and hub and regional prices along the way.

Although the NERA study acknowledges that some sectors of the economy will be hurt by exports, the NERA study fails to fully assess the impacts of rising natural gas prices on homeowners and businesses. The report recognizes negative consequences of LNG exports, but spends only a few paragraphs of its 230-page report actually examining them in detail. Still, they are notable:

- There is a massive wealth transfer between manufacturing and residential consumers that benefits the natural gas industry but "raises energy costs and, in the process, depresses both real wages and the return on capital in all other industries."⁸
- Labor, investment and tax income would fall \$10 billion in 2015 as a result of LNG exports; they are reduced by more than \$30 billion in 2020 and more than \$40 billion in 2025, 2030 and 2035.⁹

⁶ Energy Information Administration, "Effect of Increased Natural Gas Exports on Domestic Energy Markets," January, 2012, http://www.eia.gov/analysis/requests/fe/pdf/fe_lng.pdf.

⁷ NERA Study at 86

⁸ NERA study at 7

⁹ *Ibid.*, at 8

- “Households will be negatively affected by having to pay higher prices for the natural gas they use for heating and cooking. Domestic industries for which natural gas is a significant component of their cost structure will experience increases in their cost of production, which will adversely impact their competitive position in a global market and harm U.S. consumers who purchase their goods.”¹⁰
- “In many regions and times of the year natural gas-fired generation sets the price of electricity so that increases in natural gas prices can impact electricity prices. These price increases will also propagate through the economy and affect both household energy bills and costs for businesses.”¹¹
- With minimal analysis, the study concludes that a “narrow” group of energy-intensive, trade-exposed industries would be experience “serious competitive impacts.”¹² The study tries to downplay the economic importance of these manufacturing industries by saying they represent ½% of total U.S. employment; however, that equaled 1.2 million jobs at the end of November. Given the number of current employees and future expected growth, these impacts deserve further study.
- Regional gas prices are expected to increase with higher demand and an increase in wellhead natural gas prices, leading to a decline in U.S. consumption of natural gas.¹³

Despite these serious impacts that are acknowledged within the study, NERA has not conducted further in-depth inquiry into how these impacts will actually be felt in the economy. Appendix F of the study identifies a number of critical factors that the study simply did not consider, without which the report represents a wholly insufficient basis for approving individual export applications which will have significant national, regional and local impacts. These significant gaps in analysis are best explained by the text included in Appendix F¹⁴ itself:

- “Where Production or Export Terminals Will be Located – There are proposals for export facilities in the Mid-Atlantic, Pacific Northwest, and Canada, all of which could change basis differentials and potentially the location of additional natural gas production, with corresponding regional impacts. To analyze alternative locations of export facilities it would be necessary to repeat both the EIA and the NERA analyses with additional scenarios incorporating demand for natural gas exports in different regions.”
- “Regional Economic Impacts – Since EIA assumed that all demand for domestic production-associated LNG exports was located in the Gulf region, it was not possible in this study to examine regional impacts on either natural gas prices or economic activity. The Gulf Coast is not necessarily a representative choice given the range of locations now in different applications, so that any attempt to estimate regional impacts would be misleading without more regional specificity in the location of exports.”
- “Effects on Different Socioeconomic Groups – Changes in energy prices are often divided into ‘effects on producers’ and ‘effects on consumers.’ ... The ultimate incidence of all price changes is on individuals and households, for private businesses are owned ultimately by people. Price

¹⁰ *Ibid.*, at 13

¹¹ *Ibid.*, at 13

¹² *Ibid.*, at 12

¹³ *Ibid.*, at 35-36

¹⁴ *Ibid.*, at 210-211

changes affect not only the cost of goods and services purchased by households, but also their income from work and investments, transfers from government and the taxes they pay. More relevant indicators of the distribution of gains and losses include real disposable income by income category, real consumption expenditures by income category, and possibly other measures of distribution by socioeconomic group or geography. This study only addresses the net economic effects of natural gas price changes and improved export revenues, not their distribution.”

As the Department has acknowledged when it elected to insert the NERA study into the docket of each pending LNG export application, the Department is statutorily required to assess the impact of the individual applications as well as the total impact of proposed export volumes. The NERA study provides no insight into the regional market impacts of these applications, and very little information on the effects of proposed exports on different socioeconomic groups. As such, it is not an adequate basis upon which to approve those individual applications.

As I stated in my previous letter, I remain deeply concerned that the Department has not articulated a set of criteria or procedures that will allow it to meet its obligations under the Natural Gas Act to make the required public interest determinations. Proper, transparent mechanisms must be in place to effectively evaluate all LNG export applications – prior to their approval – to gauge whether each application is in the public interest. The inadequacies of the NERA study only underscore the need for the Department to establish those criteria and procedures in a transparent and accurate manner informed by data that most accurately reflects the world today.

Sincerely,

A handwritten signature in cursive script that reads "Ron Wyden".

Ron Wyden
United States Senator