RECEIVED
By Docket Room at 2:19 pm, Jan 07, 2013

From: [redacted]
To: LNGStudy
Subject: 2012 LNG Export Study
Date: Monday, January 07, 2013 2:17:58 PM

Re: 2012 LNG Export Study

As a resident of a state that may be seriously impacted by policies related to exportation of natural gas, I am particularly concerned that such policies should be based on unbiased analyses of scientifically validated information. In my opinion, the recent report (Macroeconomic Impacts of LNG Exports from the United States) commissioned by the Department of Energy fails to meet this standard. Viewing it from the perspectives both of a citizen concerned about societal costs and of an engineering professional concerned about standards for scientific validity, I find several shortcomings in the report.

First, the report did not consider the broad societal costs of the required infrastructure including pipelines, liquefaction facilities, and shipping terminals. Among these costs are: (i)regional variations in loss of income from negative impacts on other industries such as tourism and commercial fishing; (ii)long-term economic losses suffered by families whose properties are taken through eminent domain; (iii)costs to maintain air quality for public health and to limit greenhouse gases in the face of well-recognized leaks of methane from these facilities; (iv)costs of remediating other environmental damages, such as stormwater runoff in construction areas and along pipelines; and (v) additional preparedness costs for emergency responders due to the presence of pipelines and other hazardous facilities. Furthermore, the benefits of (mainly temporary) construction jobs should be weighed against the longlasting impacts on quality of life for people in affected areas. This latter assessment cannot be evaluated via a purely economic model.

One of the major conclusions in the report may be the most cogent argument against permitting LNG exports. Page 2 of the Executive Summary states: "LNG exports will cause shifts in industrial output and employment and in sources of income. Overall, both TOTAL LABOR COMPENSATION and income from investment are projected to DECLINE, and INCOME TO OWNERS of natural gas resources will INCREASE." (emphasis added) In other words, the economic benefits may be predicted to exceed the costs but they will accrue to the owners of natural gas resources, not to workers.

My other concerns stem from my 30+ years of experience utilizing mathematical models in engineering research. I am not an economist and will depend on economic modelers to address the adequacy of economic relationships in the model used in this report. I do have considerable experience using mathematical models for prediction and am concerned that the economic model in this report has not been verified and validated, preferably through the process of peer review. I have searched extensively, and unsuccessfully, for any publications which describe the appropriate validation of the model. By way of comparison, the predictions of weather models are validated every day against the actual weather; in contrast, the consulting company, NERA, presents only limited evaluation of the predictions of this economic model based on the simpler model used in the EIA report of

January, 2012. NERA would likely claim that the model contains proprietary information which it does not wish to make public through the validation process; however, in the scientific realm of mathematical modeling, this approach is not acceptable. In my experience (as a reviewer of manuscripts for many scientific journals) no reputable, peer-reviewed, scientific journal would accept for publication a paper based on a model that was not verifiable and validated. In my opinion, predictions based on the model in this new study do not have sufficient scientific validity to be accepted.

The preceding critique is exemplified by the observation that the uniformity of the qualitative conclusions from the simulation studies is highly counterintuitive. That is, for every studied scenario the conclusion may be paraphrased as "a little exporting is good, and more is better". To an experienced modeler, finding such an invariant result across different scenarios suggests a problem with the model which has (perhaps unintentionally) biased the simulation results. Examples of such problems are: (i) the forms and parameters of the equations used in the model may not be valid for some of the extrapolations being simulated; (ii) some assumptions may be inappropriately limiting the flexibility of the model to address certain situations; (iii) the overall model may be too simplistic to capture the nuances of some scenarios. If I were peer-reviewing this study, I would need to see the detailed equations, parameter values, and assumptions in the model in order to examine them for such effects. I also would ask the authors to demonstrate that the model is capable of producing a different qualitative result. I would ask them to describe a scenario for which the expected result is different, then to simulate that scenario and show that the model actually predicts this different result. Furthermore, the explanation offered for these results is that influences from global markets will buffer domestic price increases for natural gas. This explanation requires the reader to believe that there is a high degree of quantitative precision in the model; however, such precision has not been validated.

Finally, some of the assumptions in this report are suspect even to a non-economist. For example, the report "generally assumes that aggregate employment rates remain the same in all cases" (page 5) and that job losses in some fields are completely compensated by job gains in fields related to producing and exporting natural gas. At the least, this assumption needs to be supported by documentary evidence. Even if this assumption is correct, such a result requires appropriate retraining of workers. What are the costs of retraining and who would bear them? I believe that energy economists would likely find other troubling assumptions if they were to examine the entire study material.

Eugene Bruce, Ph. D.
Professor Emeritus, University of Kentucky
[redacted]
Medford, OR 97501