Status Report and Preliminary Results: The Economic Impacts of U.S. LNG Exports

Presented to: The American Petroleum Institute

Presented by: Harry Vidas Vice President

February 22, 2013
**Disclaimer**

**Warranties and Representations.** ICF endeavors to provide information and projections consistent with standard practices in a professional manner. ICF **MAKES NO WARRANTIES, HOWEVER, EXPRESS OR IMPLIED (INCLUDING WITHOUT LIMITATION ANY WARRANTIES OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), AS TO THIS PRESENTATION.** Specifically but without limitation, ICF makes no warranty or guarantee regarding the accuracy of any forecasts, estimates, or analyses, or that such work products will be accepted by any legal or regulatory body.

**Waivers.** Those viewing this presentation hereby waive any claim at any time, whether now or in the future, against ICF, its officers, directors, employees or agents arising out of or in connection with this presentation. **In no event whatsoever shall ICF, its officers, directors, employees, or agents be liable to those viewing this presentation.**
The study is estimating the total economic impacts of three LNG export scenarios relative to a zero LNG export baseline.

Total LNG Exports – Three Cases
Two-step methodology:

- **Gas Market Model**: Determines natural gas and liquids supply and pricing for each LNG export case.

- **Input-Output Model**: Determines economic impacts associated with the change in natural gas and liquids supply and pricing for each case.
 Incremental Gas Production Will Increase US Liquids Production, Providing Added Olefin Feedstocks

Liquids include: Condensate/crude oil, ethane (100% of production assumed to go into ethylene production), propane (25% of production assumed to go into propylene production), butane, pentanes+

© 2013 ICF International. All rights reserved.
Overall GDP Impact of LNG Exports is Very Positive

Change in Total Economic Impacts

Middle Case 2035 GDP Impact ME=1.9: $57 billion; cumulative 2015-2035 impact: $723 billion

Multiplier Effect at 1.9
Multiplier Effect at 1.3
Direct and Indirect GDP Additions
Manufacturing Jobs are Increased by LNG Exports

Changes in Direct, Indirect and Induced Employment by Sector (2035)

Note: D&I signifies Direct and Indirect
Total Employment Increases by 150,000 to 650,000 (with full multiplier effect)

Total Changes in Employment Impacts

- Multiplier Effect = 1.9
- Multiplier Effect = 1.3
- Direct and Indirect Job Effects

Middle Case: Average jobs impact for 2015-2035 ME=1.9
Total jobs=213,000; Manufacturing jobs=24,000
Price Impacts: ICF Analysis

Henry Hub Prices (2010$/MMBtu)

<table>
<thead>
<tr>
<th>Average Price Changes relative to Zero Export Case</th>
<th>ICF Base Case</th>
<th>Middle Exports Case</th>
<th>High Exports Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Gas Price at Henry Hub ($2010’s per MMBtu)</td>
<td>$ 0.31</td>
<td>$ 0.57</td>
<td>$ 0.98</td>
</tr>
<tr>
<td>Average Price Delta weighted average by consumption</td>
<td>$ 0.26</td>
<td>$ 0.48</td>
<td>$ 0.86</td>
</tr>
</tbody>
</table>

© 2013 ICF International. All rights reserved.
Conclusion

- **Volume Impacts:** Dry gas production increases between 3.1-12.3 Bcf/d for LNG export cases, resulting in between 138,000-555,000 barrels/day in additional liquids production.

- **Economic Impacts:** LNG exports result in direct and indirect annual GDP additions of $20b-$60b in 2035.

- **Employment Impacts:** By 2035, LNG exports result in between 28,000-116,000 direct and indirect annual job additions, as well as up to 120,000-540,000 in annual induced employment. Direct and indirect employment gains are concentrated in the oil and gas, construction, and manufacturing sectors, while induced employment is concentrated in services (i.e., consumer spending-oriented) sectors.

- **Price Impacts:** LNG exports result in Henry Hub natural gas price increases of $0.35/MMBtu in the ICF Base Case to over $1.30/MMBtu in the High Exports Case in 2035. Consumer price increases are lower.