

**Testimony before the House Committee on Oversight and Government Reform
Subcommittee Chairman on Energy Policy, Health Care, and Entitlements on "Economic
Impact of LNG Exports from the US"**

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Good morning Chairman Lankford, Ranking Member Speier, and members of the Subcommittee. Thank you for inviting me to testify this afternoon. My name is Tom Choi and I am the national gas practice leader for Deloitte MarketPoint LLC, a wholly owned subsidiary of Deloitte LLP.

Deloitte MarketPoint has worked for a number of clients across different industries to help them better understand energy markets. In particular, we have helped LNG (liquefied natural gas) companies seeking objective and in-depth economic analysis of global gas and LNG markets. We used our World Gas Model to project the impacts of various assumed volumes of US LNG exports. The key results from the model and our analysis form the basis for my comments this afternoon.

The World Gas Model (WGM) is a model of global gas markets based on economic fundamentals. It has been used by leading energy companies and institutions for over 20 years to help them understand markets and make better decisions. The model computes prices and

quantities based on rigorous adherence to established microeconomic theories. It includes disaggregated representations of natural gas supply and demand in North America and global markets, including their linkages through LNG trade or export pipelines.

Vital to this analysis, the WGM represents natural gas producer decisions regarding when and how much gas to develop given a producer's resource endowments and anticipated forward prices. The supply-demand dynamic is particularly important in analyzing the impact of demand changes, including LNG exports. Without proper representation of market dynamics, the answer will likely under-estimate the producer response and result in a misalignment of supply and demand causing over-estimation of the price impact. It would be tantamount to assuming the market will be surprised or unprepared for the volume of exports and, having failed to sufficiently expand supply, the market would then have to in effect, ration fixed supplies to meet export volumes, as well as domestic demand.

Our findings show that the projected price impact to the US is minimal. Abundant North American gas resources coupled with the market's demonstrated ability to respond to market changes mitigate the price impact of exports. The impact of 6 Bcfd of US LNG exports on US citygate prices is projected to be only \$0.15/MMBtu (million British thermal units) on average from 2016 through 2030. The price impact is a little greater at the Henry Hub and other locations in the Gulf of Mexico region, where most of the proposed LNG export terminals are planned to be built, and a little less in distant downstream markets, such as Chicago and New York. Although the Henry Hub is the world's most liquid gas trading point, focusing on just Henry Hub prices will likely overestimate the US price impact.

Since there is some debate on what the price impact might be, an examination of the fundamental economic assumptions might be helpful.

The price impact will be largely determined by market dynamics and North American

natural gas resources. In analyzing the impact of LNG exports on domestic prices, I think it is important to separate the timing issue, that is, how quickly new supplies can be brought on line, from the resource depletion issue, that is, how increased demand affects future production costs which drive future prices. The combination of both factors will influence the price impact.

If gas productive capacity lags behind demand, then the price impact will be determined by the tightness of the supply-demand balance at each point in time. On the other hand, if export volumes can be properly anticipated and productive capacity made available when needed, then the price impact likely will be determined by how increased demand affects resource depletion and future production costs.

Even without LNG exports, US natural gas demand will likely experience robust growth over the coming decades. Can supply keep pace with demand growth including potential LNG exports?

If history is any indicator, the answer appears to be yes. Indeed, the past several years have demonstrated how dynamic the US gas market is. US dry gas production has increased by over 10 Bcfd from 2008 to 2012, a four year time span which is less than the time required for the first proposed US LNG export terminal to go from the application phase to ultimate construction. Given the public DOE and FERC approval processes and long construction lead time, suppliers have plenty of notice and time to make necessary supplies available.

If supplies can be developed in time for LNG exports, then the price impact will be determined by the how the incremental demand affects the rate of resource depletion and future production costs. Furthermore, it is not just the cost of production of fields feeding directly into LNG export terminals, but rather the entire North American gas market, which is highly interconnected.

With regards to the potential impact of LNG exports, the absolute price is not the driving factor but rather the shape of the aggregate supply curve which determines the price impact. The massive domestic shale gas resources have essentially flattened the US supply curve. Given that there is a large quantity of domestic gas available at similar production costs, the export of LNG is not projected to increase the price of domestic gas very much because it is unlikely to have a large impact on the incremental production cost.

Global markets can determine the economically viable volume of LNG exports.

As prices in the US firm and prices in export markets soften, the margins between the US and global markets will narrow. Our study found that the impact on natural gas prices will likely be greater in importing countries than in the US. Furthermore, as in any commodity market, there are a number of competitors vying to enter the market and other gas suppliers are likely to capture LNG markets if the US exports are delayed or restricted. Hence, global gas markets will likely limit the volume of economically viable US LNG exports even in the absence of policy restrictions.

US LNG exports are unlikely to cause US prices to rise to levels of importing regions. Just because US markets are connected to import markets does not mean that US prices will rise to the level of import countries. The cost of LNG liquefaction, shipping, and regasification provides a large price wedge between prices in the US and import markets. Or stated differently, the price of natural gas in foreign markets needs to be about twice the current US price in order for LNG exports to be economically viable. Exports will only occur if wide price spreads persist, implying that sectors of the US economy that compete in global markets will not likely see their gas price advantage significantly diminish as a result of LNG exports. If large price spreads between markets begin to narrow, the economic quantity of US LNG exported would likely be reduced.

In summary, if sufficient natural gas supplies can be developed by the time LNG export terminals come into operations, then the price impact in the US will be determined by how the increase in demand changes the future cost of natural gas production. Given how dynamic the North American gas market is and the abundance of US gas supplies available at similar cost levels, our model projects modest price impacts at our assumed export volumes.

Thank you for this opportunity.

I look forward to addressing your questions.

Committee on Oversight and Government Reform
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Required by House Rule XI, Clause 2(g)(5)

Name: Tom Choi

1. Please list any federal grants or contracts (including subgrants or subcontracts) you have received since October 1, 2010. Include the source and amount of each grant or contract.

None

2. Please list any entity you are testifying on behalf of and briefly describe your relationship with these entities.

I am testifying on behalf of Deloitte MarketPoint LLC. I am the National Gas Practice lead for Deloitte MarketPoint LLC.

3. Please list any federal grants or contracts (including subgrants or subcontracts) received since October 1, 2010, by the entity(ies) you listed above. Include the source and amount of each grant or contract.

None.

I certify that the above information is true and correct.

Signature:

Tom Choi

Date:

3/18/13

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Tom Choi is the natural gas market leader for Deloitte Market Point LLC, a wholly owned subsidiary of Deloitte LLP. Tom is an international energy economist, having led projects for leading energy companies around the world. During his 25-year career in management consulting, he has assisted senior management in client organizations make strategic decisions in face of risk and uncertainty. He helped develop the World Gas Model (WGM), an economic model of the global gas market. Tom is the author of a number of publications and has been widely quoted. He holds a M.S. degree in Engineering-Economic Systems from Stanford University and B.A. degree in Economics from University of California, Los Angeles.



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