Impacts of Market Uncertainties on Liquefied Natural Gas (LNG) Exports from the United States

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Outline

- Incentives for LNG exports from the United States
- Policy background and debate
- How we assess the benefits-costs of LNG exports
- Some key results from our recent study on LNG exports
U.S. Natural Gas Production Forecast

- Natural gas production increases by 39% from 2012 through 2040
- But U.S. natural gas consumption is forecasted to grow by less than 15% from 2012 to 2040
- Shale gas increases by 105% from 2012 through 2040
- Shale gas accounts for 50% of the natural gas production by 2040

Shale gas production will become the major source of natural gas in the U.S.

Source: EIA/AEO 2013
Cost of LNG from Different Sources

- Oil-based pricing for LNG imports into EU and Japan indicates large potential profits
- U.S. market provides unique opportunity to overseas buyers
  - Diversify supply
  - Get gas at gas prices
- Rivals see it too
  - Canadian (BC) LNG
  - Russian gas by pipeline or LNG
  - Other Pacific and Middle East LNG

Large profit opportunities have created competition to supply LNG to the Asian markets
Exports to Most Countries Must Be Approved by DOE

- Under the Natural Gas Act
  - Exports to countries with a Free Trade Agreement (FTA) covering natural gas must be approved “without delay”
    - Includes Canada, some Latin American and Caribbean countries, and South Korea
  - Exports to countries without a FTA must be approved by DOE unless found to be contrary to the public interest

DOE approval for LNG exports to non-FTA countries is the first step, followed by FERC approvals
Support for LNG Exports

- Concern about glut of natural gas production in U.S. without export outlet
- Comparative advantage in the production of natural gas
- Improved terms of trade and trade deficit
- Local economic benefits of terminal construction
- Geopolitical implications
- WTO obligations and consistency with US complaint on Chinese rare earth materials
Opposition to LNG Exports

- Environmental concern: Continued use of fossil fuels
- Equity: Allocation of benefits
- Energy intensive industry (EIS) wants to keep natural gas in the U.S.
  - Industrial Renaissance: need low natural gas prices to fuel renaissance
  - Higher gas prices means higher peak hour electricity affecting industry input costs

- Local Gas Distribution Companies
  - Concerned about natural gas prices paid by consumers
Study Approach to Estimate Benefits-Costs of LNG Export

7 Export Levels
(i) No exports
(ii) Different export levels
(ii) No export constraint

3 International Outlooks
(i) IEO 2013
(ii) Demand shock: Increased global demand
(iii) Supply and demand shock: Increased global demand and reduced supply

Global Natural Gas Model
A 12-region model of world natural gas supply and demand with and capacity constraints on LNG and pipeline exports

LNG Exports

N_{ew}ERA Model
A dynamic general equilibrium model of the U.S. economy with 5 energy sectors 7 industrial sectors

U.S. Exports and Wellhead Prices

Macroeconomic Impacts
(welfare, GDP, income components, sectoral impacts)

3 US Resource Outlooks
(i) AEO 2013 REF
(ii) AEO 2013 HOGR
(ii) AEO 2013 LOGR
Moderate Natural Gas Price Impacts
LNG Exports vs. Average Wellhead Price for 2028

2028 LNG Exports (Trillion Cu. Ft.)

2028 LNG Exports (Billion Cu. Ft. a Day)

LOGR: Low Oil and Gas Resource
REF: Reference
HOGR: High Oil and Gas Resource

Note: Colored dots represent different international outlook
Red: International Reference, Blue: Demand shock, Yellow: Supply & Demand shock
Moderate Natural Gas Prices Impacts
LNG Exports vs. Availability of Natural Gas Resources for 2028

High levels of LNG exports occur only with prices below today’s levels
Wellhead gas prices above current levels choke off exports
LNG Exports Improve U.S. GDP

There is no single optimum level of LNG exports
More LNG exports result in greater economic benefits
Market determined level is optimal for the market conditions that cause it
LNG Exports are Satisfied by New Production

Natural gas will not be taken away from U.S. manufacturing or residential consumers to support LNG exports
LNG Exports Unlikely to Harm U.S. Manufacturing Growth

Industrial growth remains virtually unchanged with LNG exports
Comparison Between Full (Gas-on-Gas) and Restricted (Oil Index) Pricing

Full market competition will result in lower market prices and lower LNG Exports

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Conclusions

- Across all scenarios, the U.S. is projected to gain net economic benefits from allowing LNG exports.
- Net economic benefits increase as the level of LNG exports increased.
- Natural gas price increases are modest and well within historical variation.
- LNG exports have repercussion on the economy.
- Minimal decreases in the growth of the manufacturing sector.
- Benefits from trade in LNG exceeds costs.
Thank you!

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