



U.S. Perspective on Shale Gas Development and Natural Gas Import/Export Regulatory Process

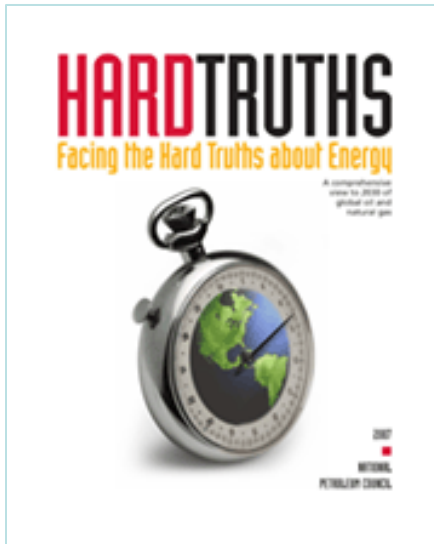


Presentation to:
APERC Annual Conference 2013

Sally Kornfeld
Team Leader –
International Oil and Gas Activities
Office of Fossil Energy

February 26, 2013





“North American and U.S. natural gas production is likely to lag projected demand growth over the study time frame, requiring significant growth in LNG imports....

Forecasts range from 2.5 percent of U.S. supply to 16 to 18 percent by 2030.”

- *National Petroleum Council, 2007*



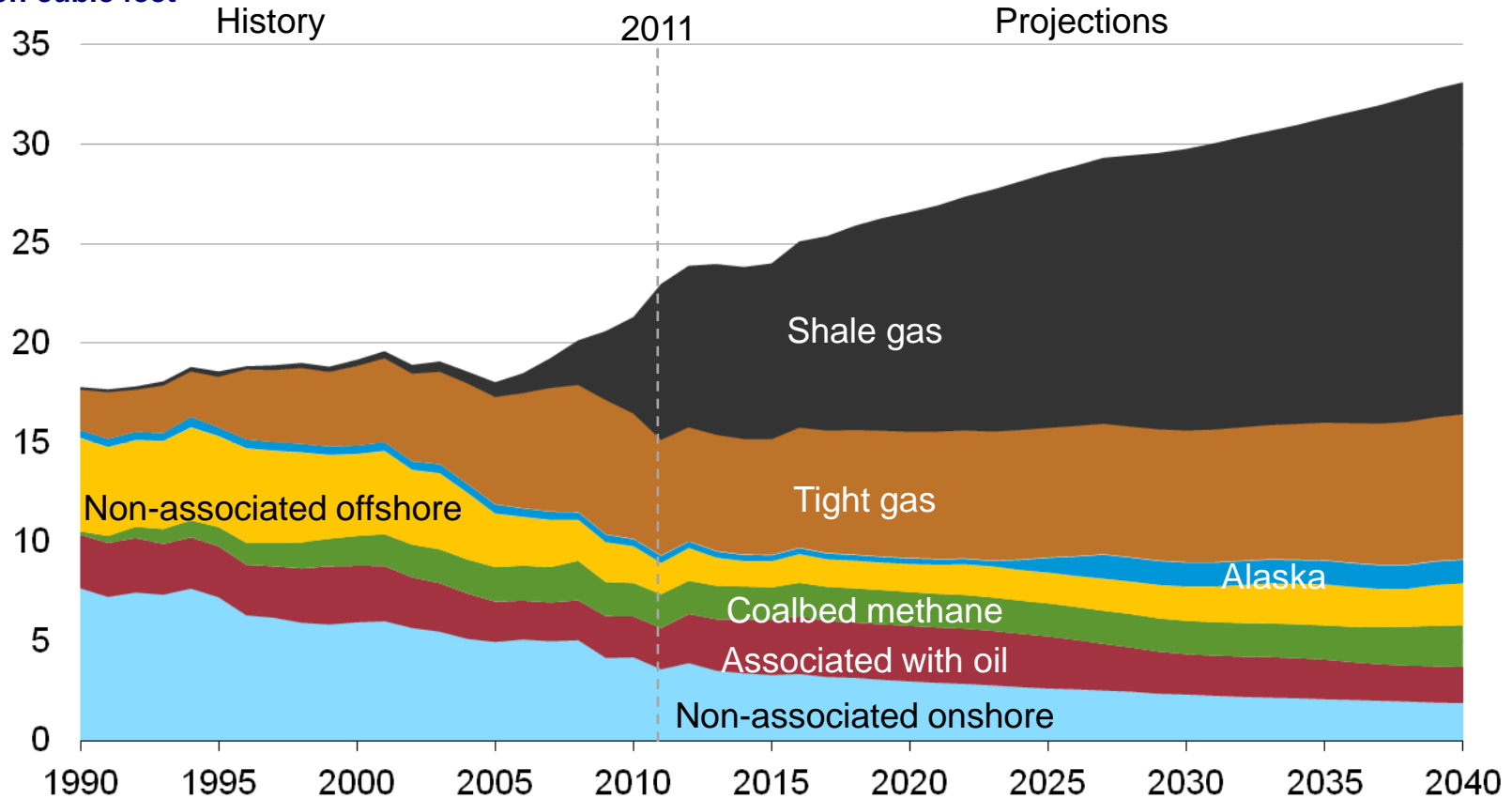
“As a result of drilling technology advances and the emergence of the recent ‘game changing’ shale gas plays, the gap between U.S. demand and production is closing rapidly and likely to reduce greatly the future need for LNG imports.”

- *National Petroleum Council, 2011*

Shale gas offsets declines in other U.S. production sources

U.S. dry natural gas production

trillion cubic feet



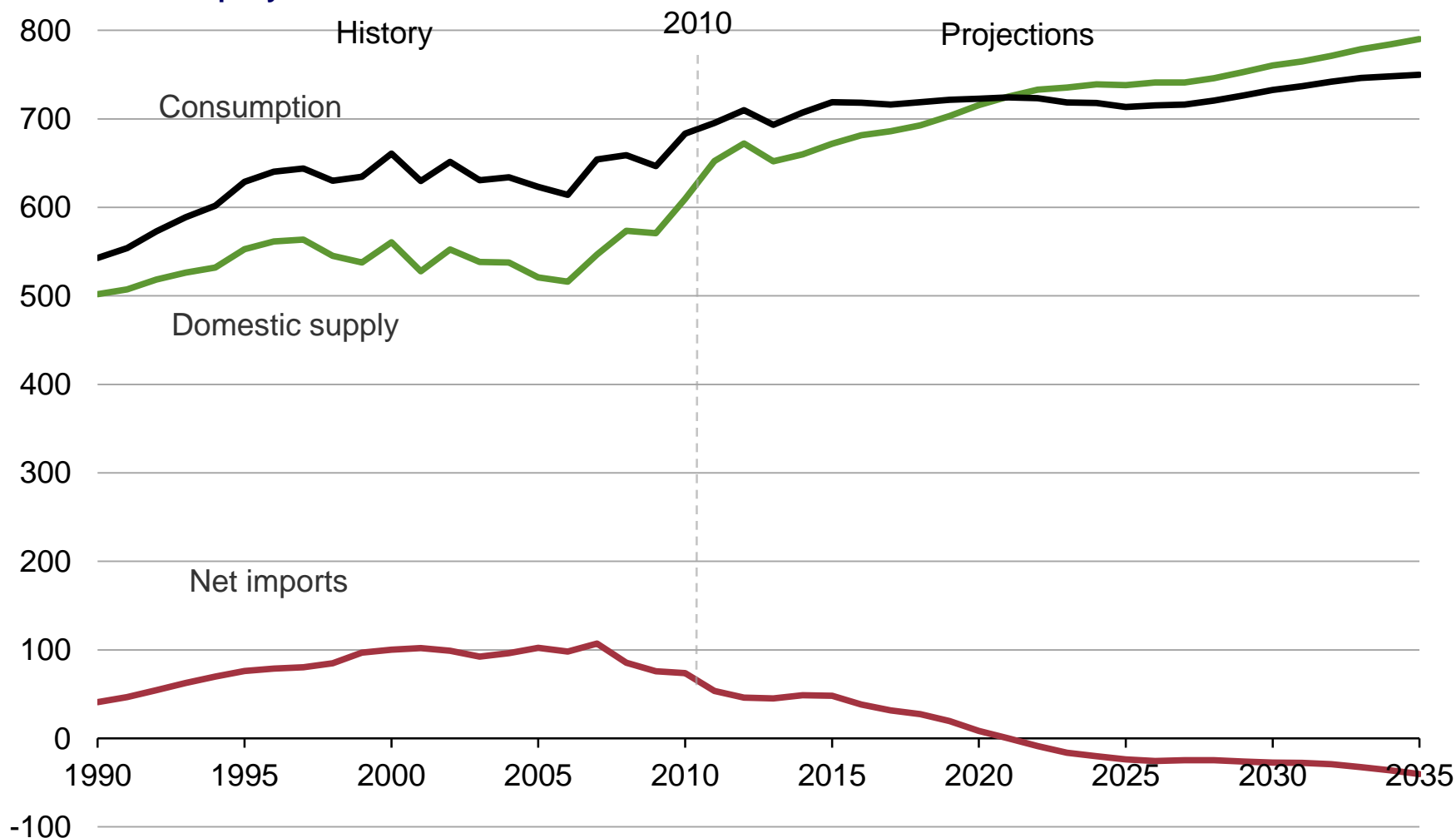
➤ Source: EIA, Annual Energy Outlook 2013 Early Release

Energy Security: U.S. Becomes Self-sufficient in Natural Gas

Oil and
Natural Gas

U.S. dry gas

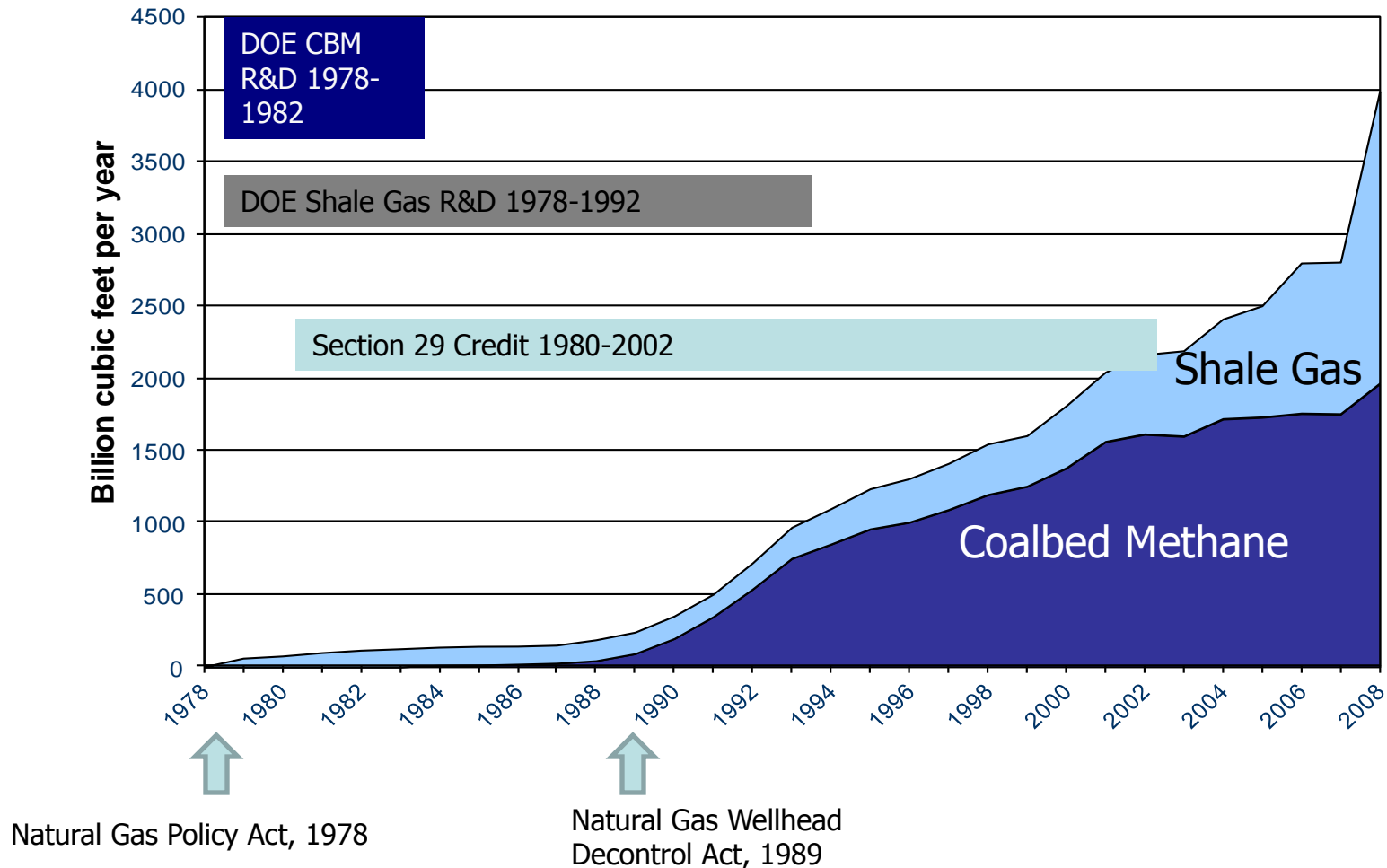
billion cubic meters per year



➤ **Source: EIA, Annual Energy Outlook 2012 Early Release**

Deregulation, Tax Incentives and Government R&D Facilitated Unconventional Gas

Oil and
Natural Gas



Factors in U.S. Shale Gas Success



- **Favorable Geology**
- **Technology – Including U.S. Government R&D**
- **Infrastructure – Gas Treatment & Extensive Pipelines**
- **Developed domestic industry: trained personnel & Equipment**
- **Ease in Leasing**
- **Stable & Transparent Regulatory/Taxes/Fiscal Terms**
- **Developed Gas Markets: Residential, Power Generation, Industrial users.**
- **Market gas pricing.**



Factors in Global Shale Gas Development



Access to:

- Resources,
- Gas Treatment,
- Pipelines, and
- Markets

Regulatory Certainty:

- Investment Climate (Huge Capital Required),
- Transparent leasing, and
- Clear regulations, applied equally

Availability or Ability/Willingness to Import Expertise:

- Equipment
- People (Visa support)

Great Potential, BUT:

In infancy – shale geology not yet proven

You never know if it is economic until drilled!!

U.S. LNG Export Evaluation: Statutory Authority and Standard of Review



- **Statutory Authority for the commodity import and export is under section 3 of the Natural Gas Act, 15 USC 717b and section 301 of the DOE Organization Act.**
 - **The Federal Energy Regulatory Commission reviews applications to site, construct, and operate LNG import and export terminals under section 3 of the Natural Gas Act.**
- **Standard of Review**
 - ***Free Trade Agreement (FTA) Countries and LNG Imports***
 - **By law, deemed to be consistent with the public interest**
 - **Authorization must be granted without modification or delay**
 - ***Exports to non-Free Trade Agreement Countries***
 - **Authorization must be granted unless after opportunity for hearing, proposed export found to *not be consistent with the public interest***
 - **Authorization may be issued with terms and conditions as the Secretary may find necessary or appropriate**

Non-Free Trade Agreement Countries: Public Interest Determination Evaluation Criteria



- **Criteria considered for evaluating Public Interest Determinations**
 - Domestic need for the natural gas proposed for export
 - Adequacy of domestic natural gas supply
 - U.S. energy security
 - Economic considerations, to include impact on U.S. economy (GDP); consumers; and industry, including impact on domestic natural gas prices; U.S. balance of trade
 - Job creation
 - International considerations
 - Environmental considerations
 - Other issues raised by commenters and/or interveners deemed relevant to the proceeding can be factored into the analysis
- **Criteria are non-Statutory**
 - Evolved from policy guidelines published in the Federal Register, as supplemented and refined by subsequent agency adjudication
 - Publicly transparent – described in DOE Federal Register Notice of application

Key Information Evaluated by DOE



For a Specific Application:

- **Information Evaluated by DOE**
 - Application, including any supporting reports and analyses
 - All public comments, protests, and interventions
 - Applicant responses to protests and interventions
 - Other information entered into the record of the proceeding
- **In reaching a decision, DOE will base its decision *on evidence of record and arguments of the participants.***

U.S. LNG Export Evaluation: Evaluation of Cumulative Impact



DOE commissioned a two-part 2012 LNG Export Study:

- **Taken together, the two-part study addresses the impacts of additional natural gas exports on:**
 - **Domestic energy consumption, production, and prices, as well as the impact on other domestic energy sectors; and**
 - **U.S. macroeconomic impacts, including GDP, job creation, and balance of trade**
- 1. *DOE's Energy Information Administration (EIA)* in which 16 hypothetical export cases were prepared.**
- 2. *NERA Economic Consulting (NERA)*: used the same 16 cases, added additional international scenarios for global natural gas supply and demand, International Reference Case, Demand Shock Case, Supply/Demand Shock Case, cases with no constraints on LNG exports, other than whether they were economic in the international market under the various U.S. and international cases,**
 - **A total of 63 scenarios, when the global and U.S. scenarios were combined.**



NERA Results

- In many cases, global markets would not accept the full amount of exports assumed in the EIA scenarios at export prices high enough to cover the U.S. wellhead domestic prices calculated
- The U.S. would gain net economic benefits as LNG exports increased.
- Benefits from export expansion more than outweigh the losses from reduced capital and wage income to U.S. consumers
- “The largest price increases that would be observed after 5 more years of potentially growing exports could range from \$0.22 to \$1.11 (2010\$/Mcf).”
- Total labor compensation and income from investment are projected to decline, and income to owners of natural gas resources will increase.
- Peak natural gas export levels, specified by DOE/FE for the EIA Study, and resulting price increases are not likely
- Even with unlimited exports, there would be net economic benefits to the U.S.
- LNG Study website: <http://www.fe.doe.gov/programs/gasregulation/LNGStudy.html>
- *DOE takes no position on the findings of the study at this time.*

DOE Decision Process – Path Forward



2012 LNG Export Study was released for public comments:

- 45 day initial comment period closed on January 24, 2013
 - Comments requested on the results and conclusions of EIA and NERA analyses of factors evaluated.
- 30 day reply comment period closed on February 25, 2013.
 - Reply comments on matters specifically addressed in initial comments, not to introduce new issues not previously raised in initial comments.
- **All comments will be reviewed on a consolidated basis. *DOE will make no final decisions in the pending proceedings until it has evaluated the study and comments.***
- **The study and comments will help to inform DOE in its determination of the public interest in each proceeding**
- **Decisions will be issued on a case-by-case basis.**
- ***There is no statutory or regulatory timeline for issuance of decisions. DOE will process the pending applications without undue delay.***

Questions?



U.S. DEPARTMENT OF
ENERGY

Oil and
Natural Gas

DOE Commissioned EIA to Perform a Cumulative Impact of Exports Analysis



- **DOE/FE provided four scenarios of export-related increases in natural gas demand to be considered to frame possible outcomes:**
 - 6 billion cubic feet per day (Bcf/d), phased in at a rate of 1 Bcf/d per year (low/slow scenario),
 - 6 Bcf/d phased in at a rate of 3 Bcf/d per year (low/rapid scenario),
 - 12 Bcf/d phased in at a rate of 1 Bcf/d per year (high/slow scenario), &
 - 12 Bcf/d phased in at a rate of 3 Bcf/d per year (high/rapid scenario).

- **Four EIA AEO Cases used:**
 - *AEO2011* Reference case,
 - High Shale Estimated Ultimate Recovery (EUR) case,
 - Low Shale EUR case, and
 - High Economic Growth case .

- **In total, 16 hypothetical export cases were prepared.**



EIA Summary of Results (Excerpts from Report)

- **Increased natural gas exports lead to increased natural gas prices.**
- **Natural gas markets in the United States balance in response to increased natural gas exports mainly through increased natural gas production.**
- **Most of the remaining portion is supplied by fuel switching away from natural gas that would have been consumed domestically if not for the higher prices. Increased efficiency and conservation in all sectors provide some additional demand reduction.**
- **Even while consuming less, on average, consumers will see an increase in their natural gas and electricity expenditures.**

The cases present various potential export scenarios within a wide range of probabilities.

Note: At the time DOE/FE commissioned the EIA study, only three applications totaling 5.6 Bcf/d had been submitted to DOE.

Applications to Export Domestically Produced Lower-48 States LNG as of January 11, 2013, 1 of 2



Company	Quantity	FTA	Non-FTA
Sabine Pass Liquefaction LLC	2.2 Bcf/d	Approved	Approved
Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC	1.4 Bcf/d	Approved	Under DOE Review
Lake Charles Exports, LLC	2.0 Bcf/d	Approved	Under DOE Review
Carib Energy (USA) LLC	0.03 Bcf/d: FTA 0.01 Bcf/d: non-FTA	Approved	Under DOE Review
Dominion Cove Point LNG, L.P.	1.0 Bcf/d	Approved	Under DOE Review
Jordan Cove Energy Project, L.P.	1.2 Bcf/d: FTA 0.8 Bcf/d: non-FTA	Approved	Under DOE Review
Cameron LNG, LLC	1.7 Bcf/d	Approved	Under DOE Review
Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC	1.4 Bcf/d	Approved	Under DOE Review
Gulf Coast LNG Export, LLC	2.8 Bcf/d	Approved	Under DOE Review
Gulf LNG Liquefaction Company, LLC	1.5 Bcf/d	Approved	Under DOE Review
LNG Development Company, LLC (d/b/a Oregon LNG)	1.25 Bcf/d	Approved	Under DOE Review
SP Power Solutions, Inc.	0.07 Bcf/d	Approved	n/a

Applications to Export Domestically Produced Lower-48 States LNG as of January 11, 2013, 2 of 2



Company	Quantity	FTA	Non-FTA
Southern LNG Company, LLC	0.5 Bcf/d	Approved	Under DOE Review
Excelerate Liquefaction Solutions I, LLC	1.38 Bcf/d	Approved	Under DOE Review
Golden Pass Products, LLC	2.6 Bcf/d	Approved	Under DOE Review
Cheniere Marketing, LLC	2.1 Bcf/d	Approved	Under DOE Review
Main Pass Energy Hub, LLC	3.22 Bcf/d	Approved	n/a
CE FLNG, LLC	1.07 Bcf/d	Approved	Under DOE Review
Waller LNG Services, LLC	0.16 Bcf/d	Approved	n/a
Pangea LNG (North America) Holdings, LLC	1.09 Bcf/d	Pending Approval	Under DOE Review
Magnolia LNG, LLC	0.54 Bcf/d	Pending Approval	n/a
Trunkline LNG Export, LLC	2.0 Bcf/d	Pending Approval	n/a
Gasfin Development USA, LLC	0.2 Bcf/d	Pending Approval	n/a
Total of Applications Received (FTA and non-FTA are not additive)		31.41 Bcf/d	24.80 Bcf/d