



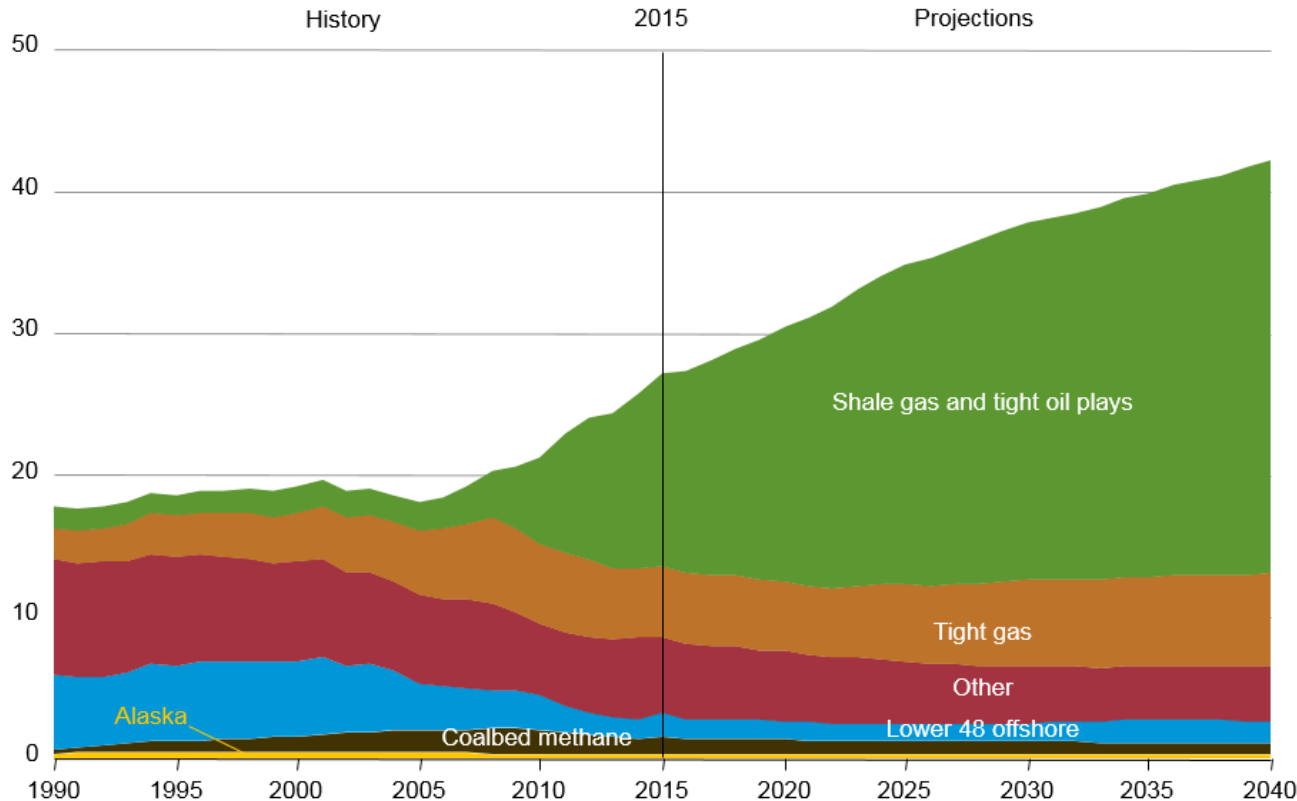
US LNG Exports and Their Impact on the Natural Gas Supply Balance in Eastern Europe

Barry Worthington, Executive Director, United States Energy Association
4th Ukrainian Gas Forum
Kiev, Ukraine
11-12 October 2018

US Natural Gas Domestic Production and Reserves

Figure MT-46. U.S. dry natural gas production by source in the Reference case, 1990–2040

trillion cubic feet

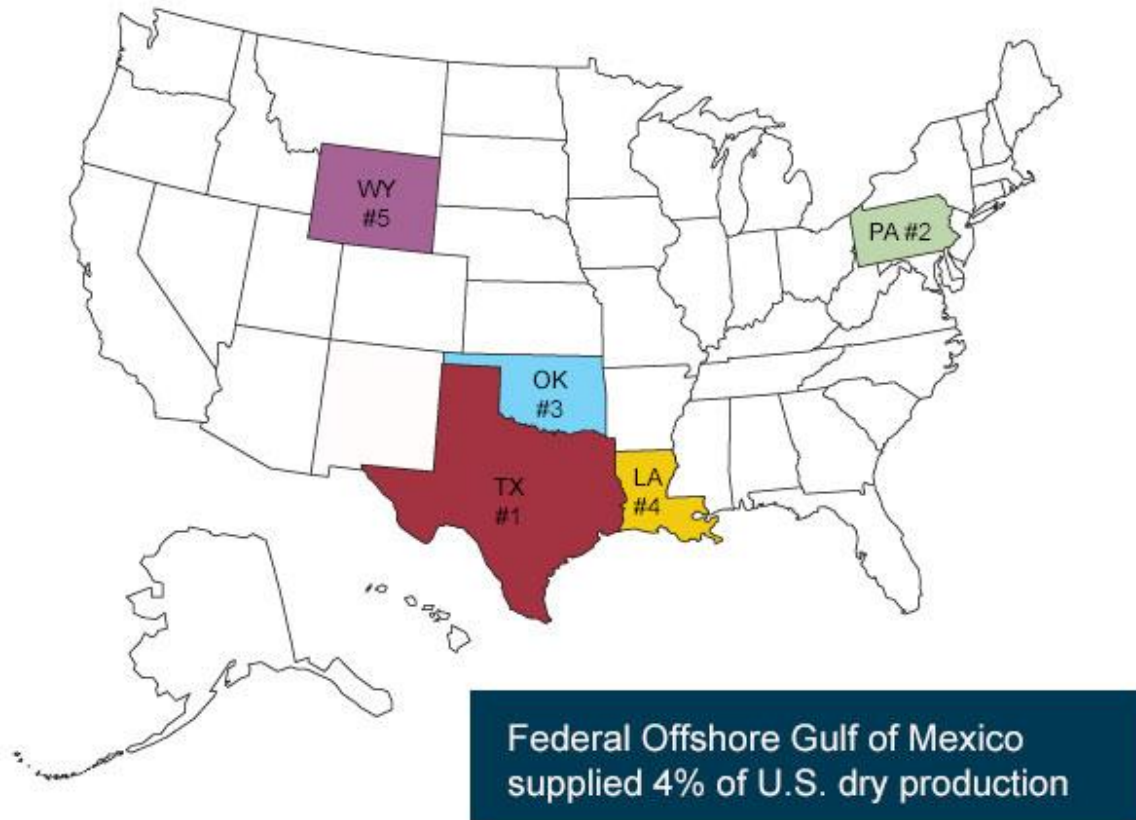


Source: U.S. Energy Information Administration, [Annual Energy Outlook 2016 Reference case, September 2016](#)



US Natural Gas Domestic Production and Reserves

Top dry natural gas producing states, 2016

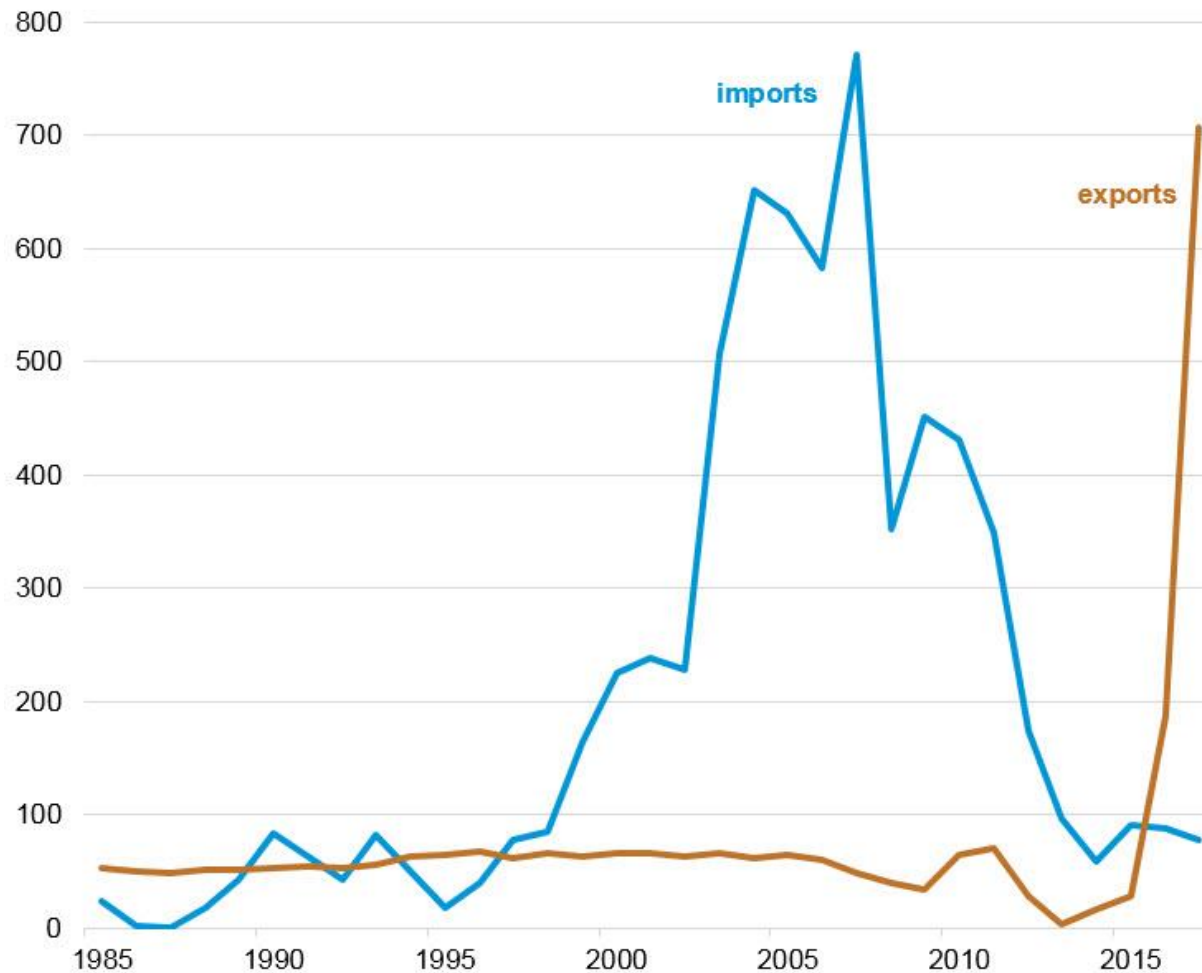


Source: U.S. Energy Information Administration, *Natural Gas Annual*, September 2017



US LNG Export Capacity: 1985-2017

U.S. LNG imports and exports, 1985–2017
billion cubic feet

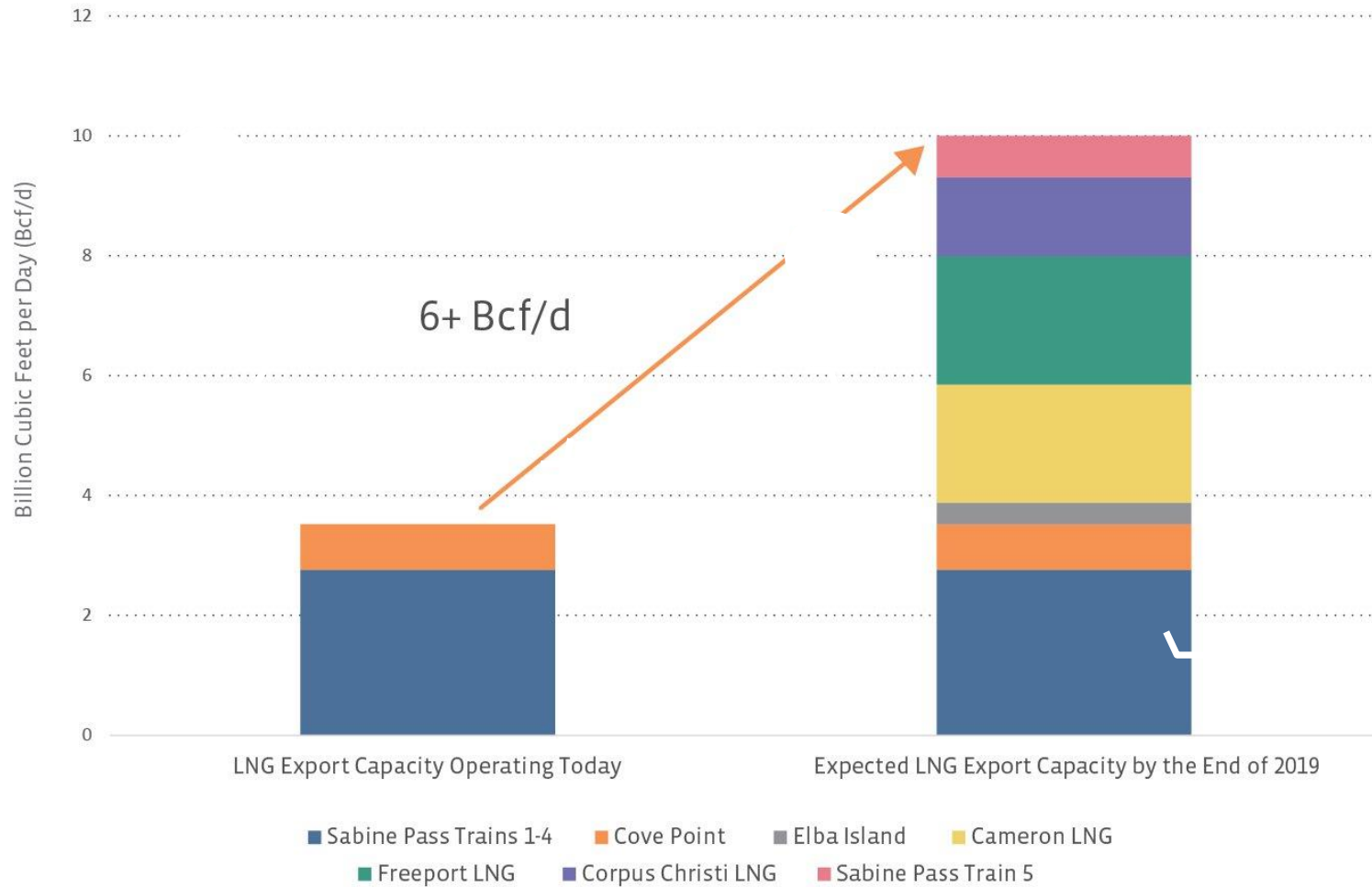


Source: U.S. Energy Information Administration, *Natural Gas Monthly*, May 2018



US LNG Export Capacity: 2018-2019

US LNG Export Capacity to Nearly Triple By the End of 2019



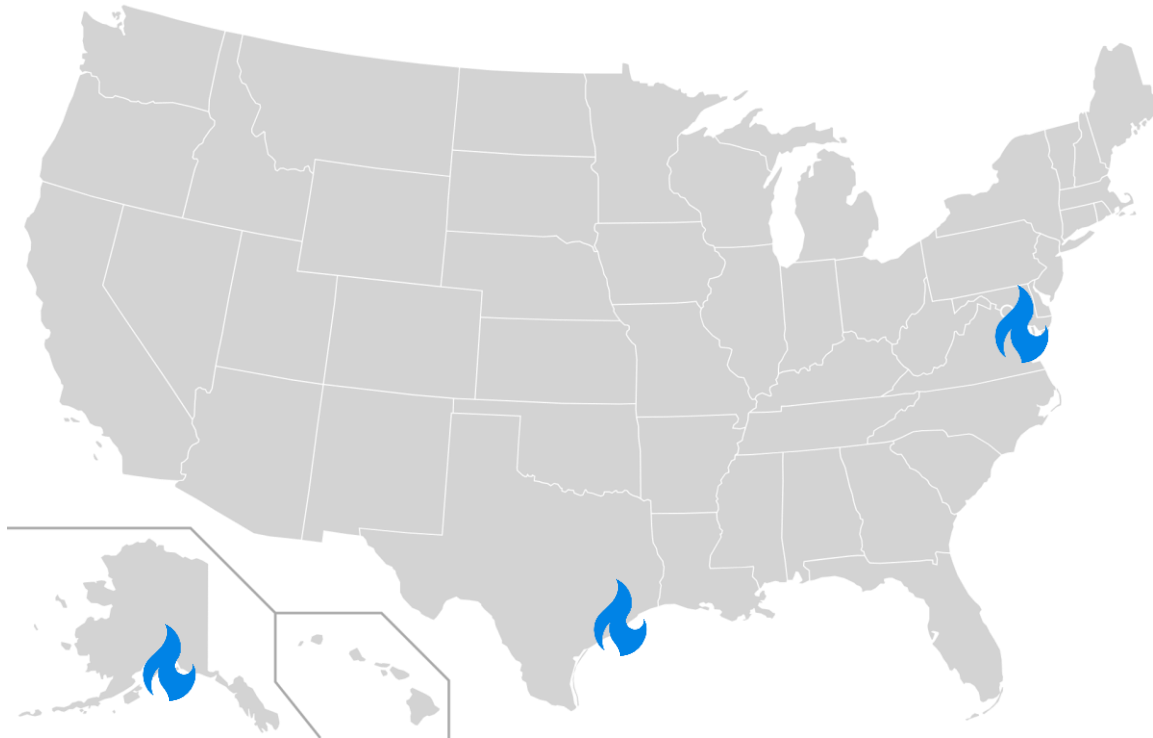
Note: Capacity represents peak nameplate capacity.

Source: Energy Information Administration

US Liquification Facilities: Existing and Under Construction

Project name	Train	Baseload nameplate capacity per Train		Peak nameplate capacity per Train		Project status	In-service date	Date of first commercial delivery	Location (U.S. state)
		Bcf/d	Mtpa	Bcf/d	Mtpa				
Sabine Pass	Train 1	0.59	4.50	0.69	5.24	Commercial operation	Feb-16	May-16	LA
Sabine Pass	Train 2	0.59	4.50	0.69	5.24	Commercial operation	Aug-16	Sep-16	LA
Sabine Pass	Train 3	0.59	4.50	0.69	5.24	Commercial operation	Jan-17	Mar-17	LA
Sabine Pass	Train 4	0.59	4.50	0.69	5.24	Commercial operation	Aug-17	Oct-17	LA
Sabine Pass	Train 5	0.59	4.50	0.69	5.24	Under construction	Nov-18		LA
Cove Point	Train 1	0.69	5.25	0.76	5.75	Commercial operation	Feb-18	Mar-18	MD
Elba Island	Trains 1-6	0.20	1.50	0.22	1.64	Under construction	4Q2018		GA
Elba Island	Trains 7-10	0.13	1.00	0.14	1.09	Under construction	May-19		GA
Corpus Christi	Train 1	0.60	4.52	0.66	5.00	Under construction	Nov-18		TX
Corpus Christi	Train 2	0.60	4.52	0.66	5.00	Under construction	Apr-19		TX
Cameron	Train 1	0.59	4.50	0.66	4.99	Under construction	Dec-18		LA
Cameron	Train 2	0.59	4.50	0.66	4.99	Under construction	Apr-19		LA
Cameron	Train 3	0.59	4.50	0.66	4.99	Under construction	Aug-19		LA
Freeport	Train 1	0.66	5.00	0.71	5.42	Under construction	2Q2019		TX
Freeport	Train 2	0.66	5.00	0.71	5.42	Under construction	4Q2019		TX
Freeport	Train 3	0.66	5.00	0.71	5.42	Under construction	May-20		TX

Operating US LNG Export Terminals



Export Terminals

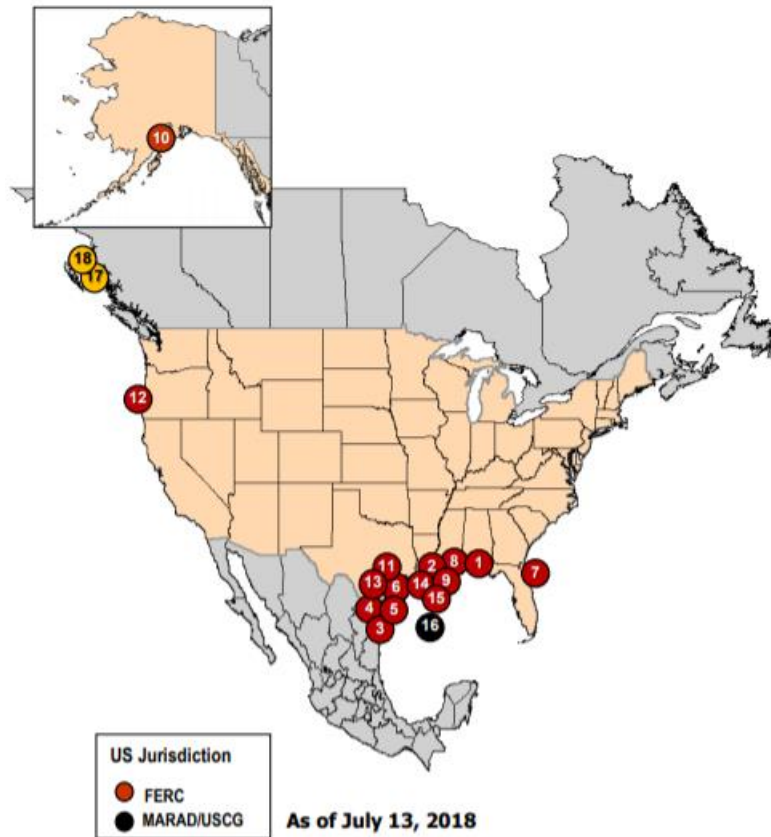
U.S.

- B. Cove Point, MD: 0.82 Bcfd (Dominion–Cove Point LNG) (CP13-113)
- G. Sabine, LA: 2.8 Bcfd (Cheniere/Sabine Pass LNG – Trains 1, 2, 3 & 4)
- Q. Kenai, AK: 0.2 Bcfd (ConocoPhillips)

Source: Federal Energy Regulatory Commission (FERC)

Proposed North American LNG Export Terminals

North American LNG Export Terminals *Proposed*



PROPOSED TO FERC

Pending Applications:

1. Pascagoula, MS: 1.5 Bcfd (Gulf LNG Liquefaction) (CP15-521)
2. Cameron Parish, LA: 1.41 Bcfd (Venture Global Calcasieu Pass) (CP15-550)
3. Brownsville, TX: 0.55 Bcfd (Texas LNG Brownsville) (CP16-116)
4. Brownsville, TX: 3.6 Bcfd (Rio Grande LNG – NextDecade) (CP16-454)
5. Brownsville, TX: 0.9 Bcfd (Annova LNG Brownsville) (CP16-480)
6. Port Arthur, TX: 1.86 Bcfd (Port Arthur LNG) (CP17-20)
7. Jacksonville, FL: 0.132 Bcfd (Eagle LNG Partners) (CP17-41)
8. Plaquemines Parish, LA: 3.40 Bcfd (Venture Global LNG) (CP17-66)
9. Calcasieu Parish, LA: 4.0 Bcfd (Driftwood LNG) (CP17-117)
10. Nikiski, AK: 2.63 Bcfd (Alaska Gasline) (CP17-178)
11. Freeport, TX: 0.72 Bcfd (Freeport LNG Dev) (CP17-470)
12. Coos Bay, OR: 1.08 Bcfd (Jordan Cove) (CP17-494)
13. Corpus Christi, TX: 1.86 Bcfd (Cheniere – Corpus Christi LNG) (CP18-512)

Projects in Pre-filing:

14. Cameron Parish, LA: 1.18 Bcfd (Commonwealth, LNG) (PF17-8)
15. LaFourche Parish, LA: 0.65 Bcfd (Port Fourchon LNG) (PF17-9)

PROPOSED TO U.S.-MARAD/COAST GUARD

16. Gulf of Mexico: 1.8 Bcfd (Delfin LNG)

PROPOSED CANADIAN SITES

17. Kitimat, BC: 1.28 Bcfd (Apache Canada Ltd.)
18. Douglas Island, BC: 0.23 Bcfd (BC LNG Export Cooperative)

Source: Federal Energy Regulatory Commission (FERC)

US LNG Export Permitting Process

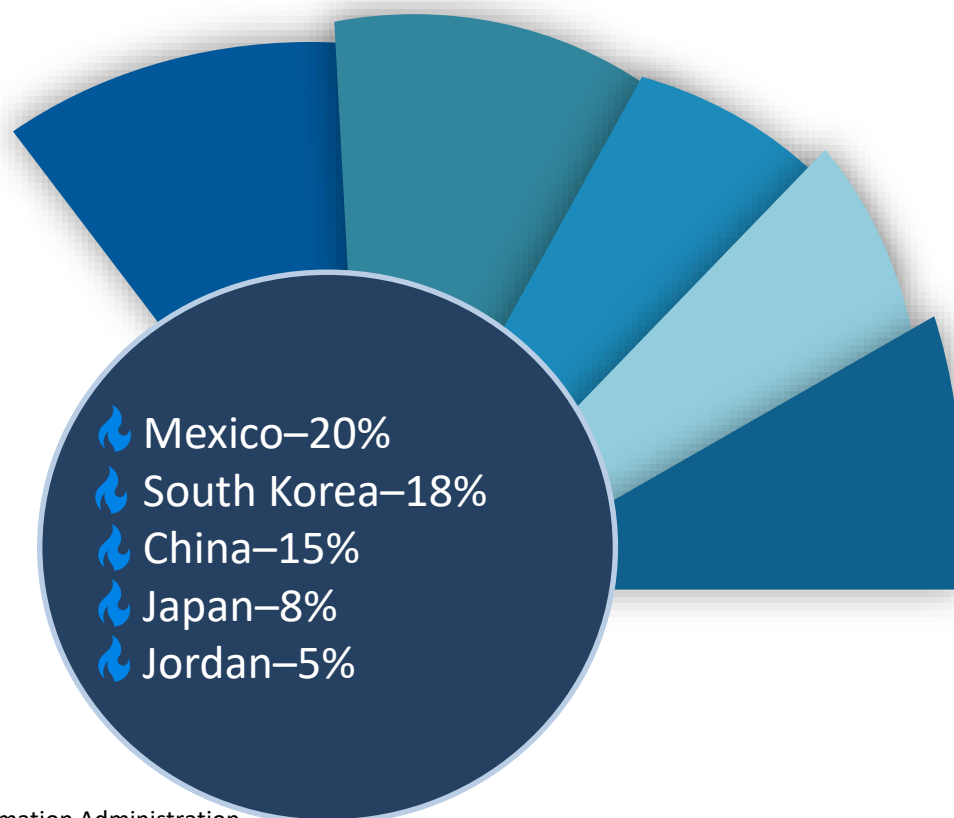


“The **Federal Energy Regulatory Commission (FERC)** has jurisdiction under the Natural Gas Act over the siting, construction, and operation of onshore LNG export terminals. For offshore LNG export terminals, this authority resides with the **Maritime Administration (MARAD)** in the **U.S. Department of Transportation (DOT)**.”

“The **Department of Energy's (DOE)** authority to regulate the export of natural gas arises under section 3 of the Natural Gas Act (NGA), 15 U.S.C. * 717b. This authority is vested in the Secretary of Energy and has been delegated to the Assistant Secretary for Fossil Energy.”

US LNG Net Importers

In 2017, the U.S. exported about **708 Bcf of LNG to 28 countries**, more than in any previous year. The top five destination countries and their shares of total U.S. LNG exports in 2017 were:



US LNG Exports to Europe

US LNG
Export
Capacity by
end of 2019:
9.6 Bcf/d

EIA Forecast

European
LNG Import
Capacity by
end of 2019:
70 bcm

IEA Forecast



US LNG Import Countries



The United States is strongly committed to providing Europe with access to strategic, diverse, and reliable energy supplies. **Exports of U.S. LNG can be part of Europe's solution to diversifying its energy supply. U.S. LNG exports not only serve to increase the volumes of LNG available globally, but help to diversify fuel types, fuel sources, and delivery routes of natural gas supplies in Europe and elsewhere."**

*Steven E. Winberg, Assistant Secretary for Fossil Energy, U.S. Department of Energy
Senate Testimony, September 13, 2018*

USEA Eastern Europe Natural Gas Partnership



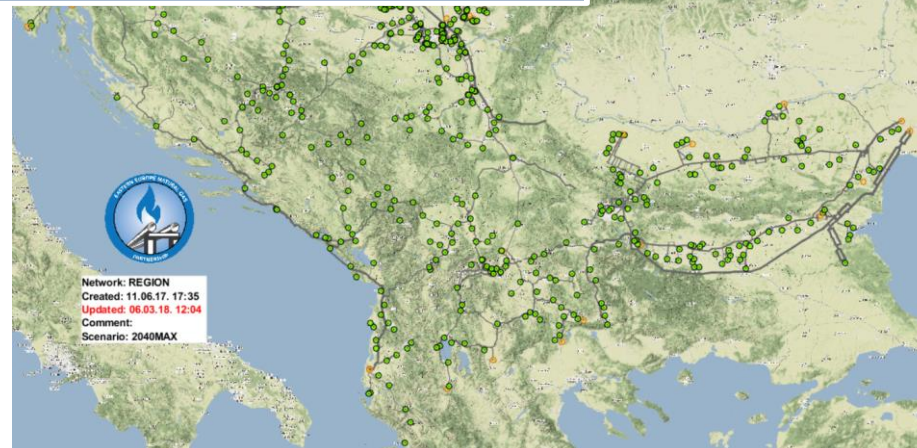
*The long-term objective of the EE-NGP is to enable the creation of a **regional gas market** with the potential for US LNG gas supplies.*

Regional LNG Challenge:

"Most EU Member States in Central and South-Eastern Europe do not have LNG regasification terminals and can rarely access LNG supplies through the EU's collective natural gas distribution network. This inadequate gas interconnection infrastructure between European Union Member States represents a major obstacle preventing LNG from diversifying supply across the EU."

Steven E. Winberg, Assistant Secretary for Fossil Energy
U.S. Department of Energy
Senate Testimony
September 13, 2018

USEA EE-NGP MAX2040 Regional Planning Model

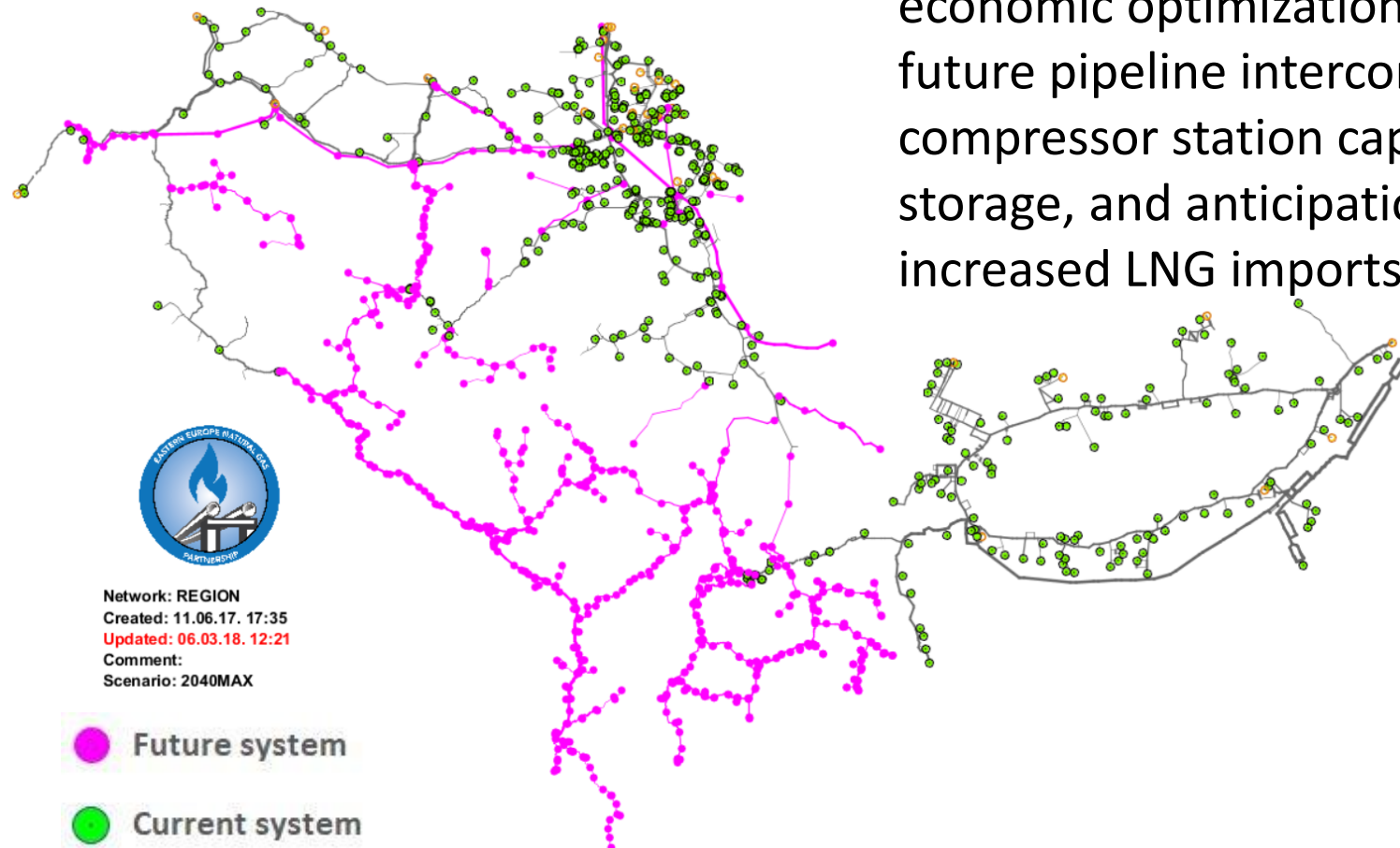


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USEA Eastern Europe Natural Gas Partnership

USEA is implementing its **EE-NGP MAX2040 Model** to perform hydraulic optimization studies of the future network before turning to economic optimization, including: future pipeline interconnections, compressor station capacity, storage, and anticipation of increased LNG imports.



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