

The Regulator and New LNG Facilities in the U.S.

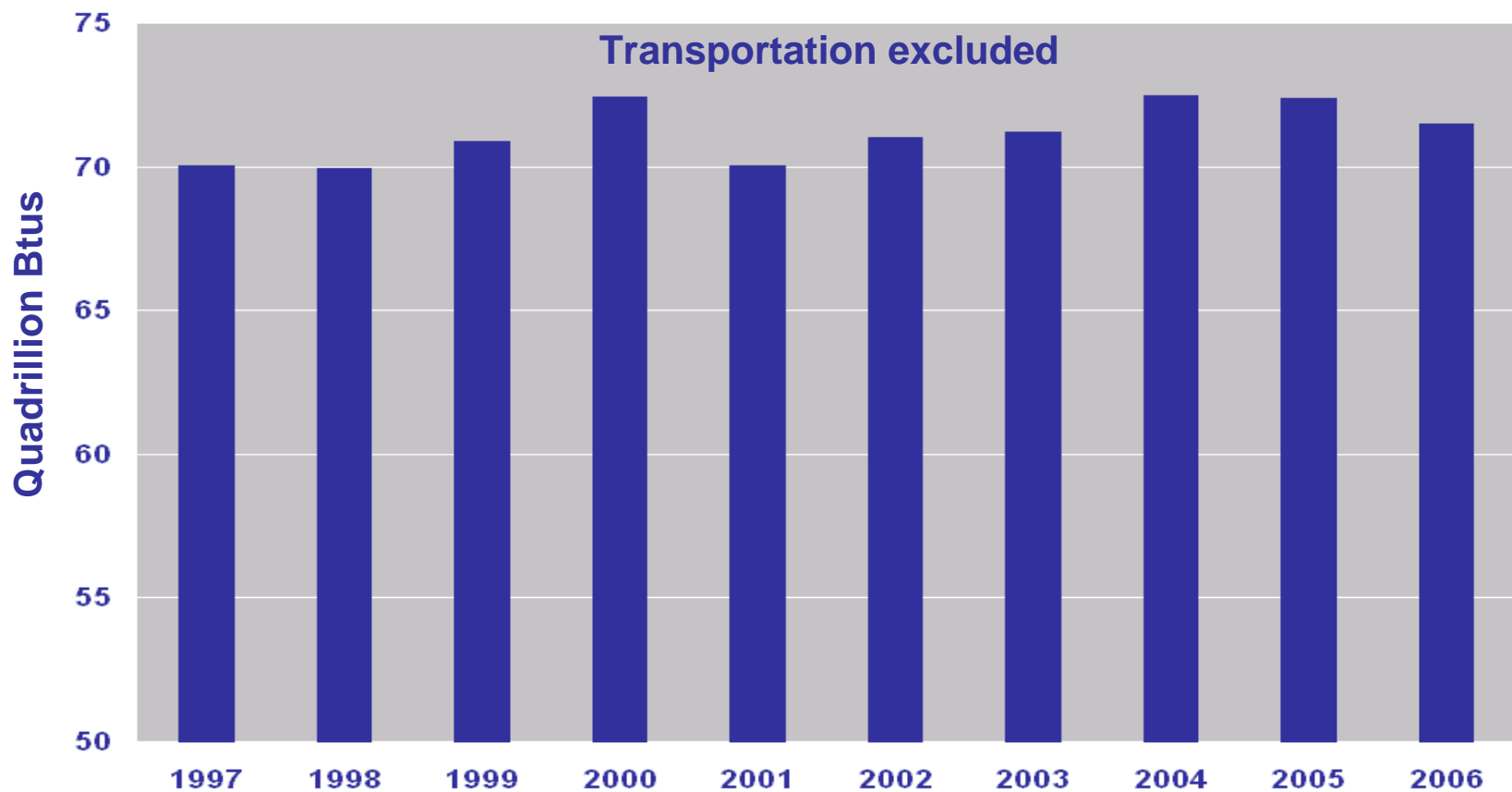


Federal Energy Regulatory Commission

J. Mark Robinson, Director
Office of Energy Projects

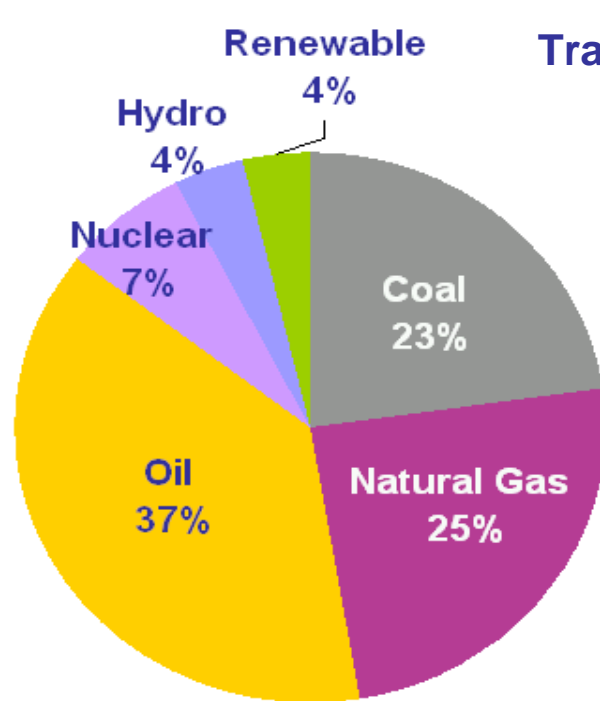
EU-US Regulators Roundtable
6 December 2007 • Athens, Greece

Total U.S. Energy Consumption has Remained Steady for the Last Ten Years

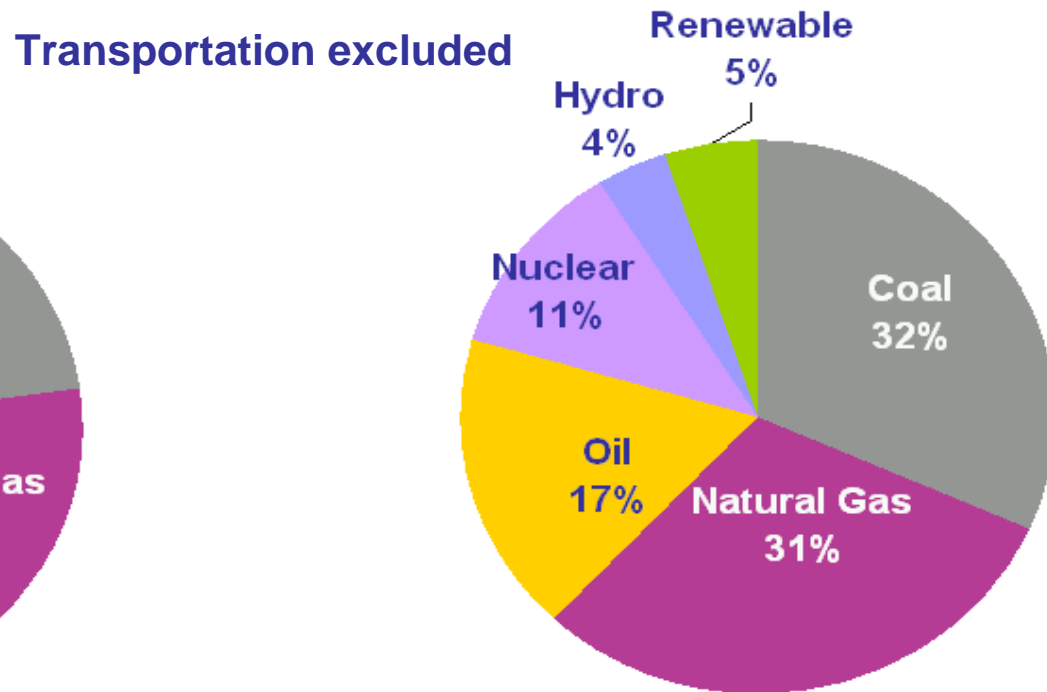


Source: Based on data from EIA Annual Energy Consumption tables T1.3 and T2.1e

The Consumption of Natural Gas and Coal Have Increased at the Expense of Oil Consumption



1997 Total Consumption
69.95 Quadrillion Btus

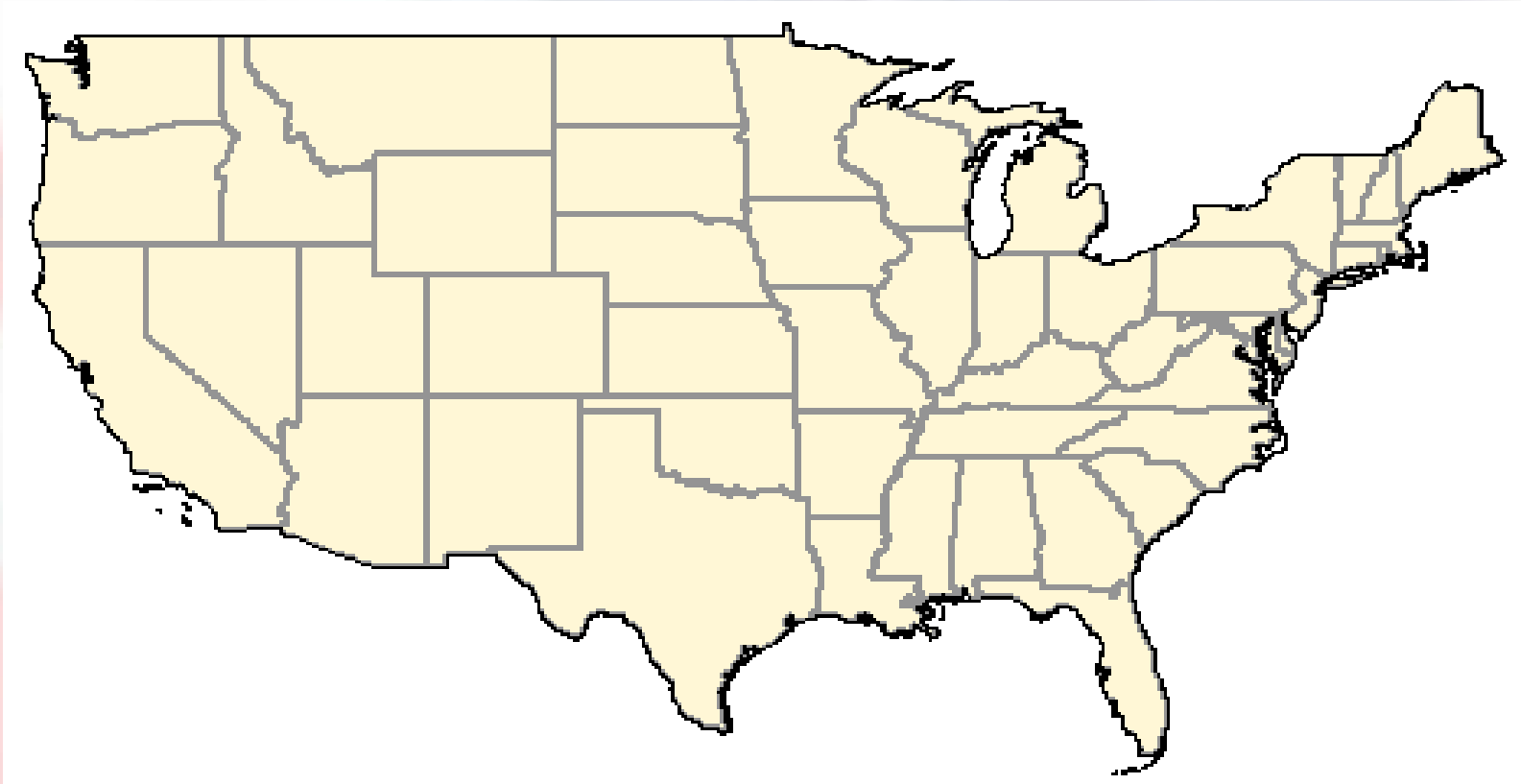


2006 Total Consumption
71.50 Quadrillion Btus

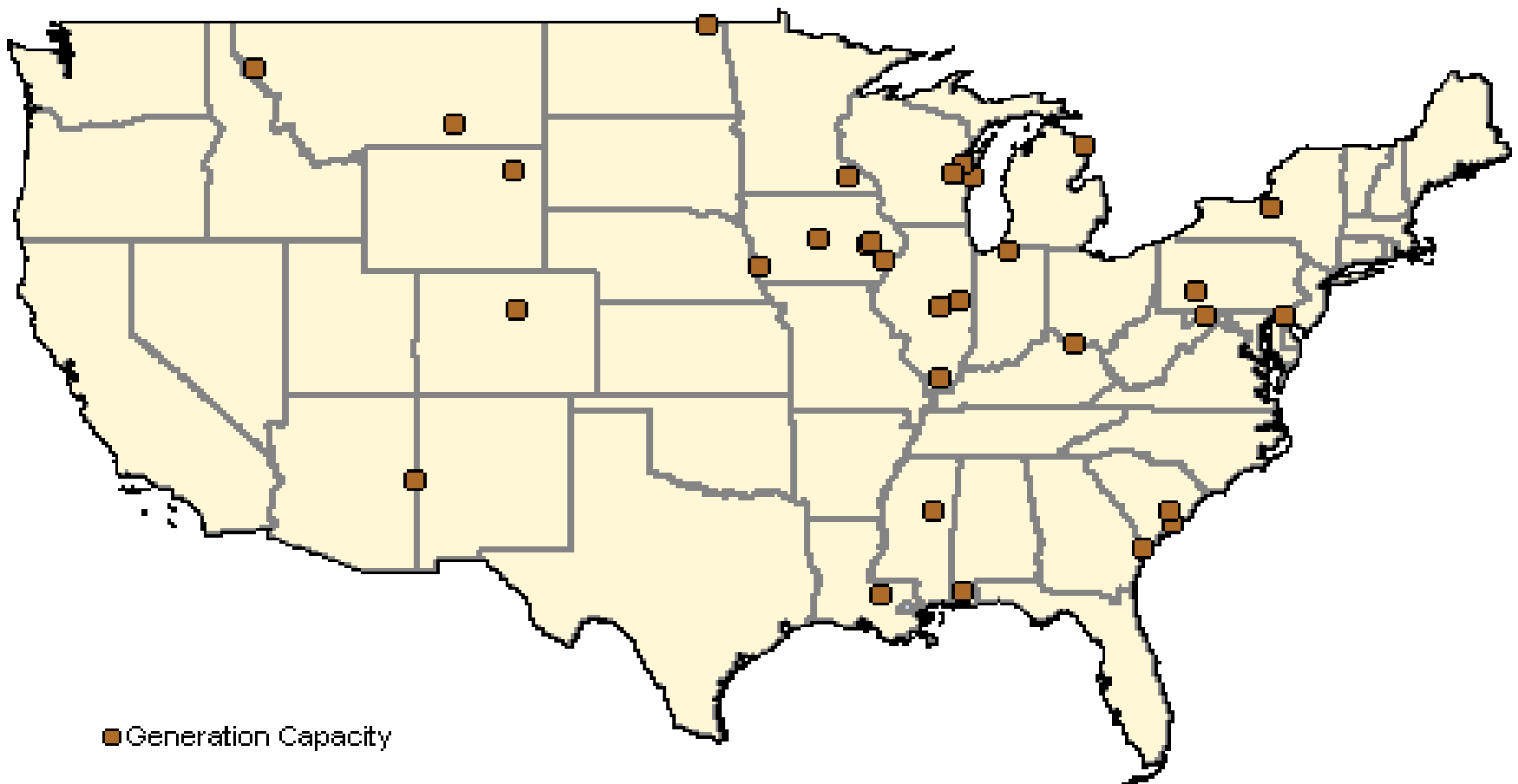
Source: Based on data from EIA Annual Energy Consumption tables T1.3 and T2.1e

No New Nuclear Generation Sites Between 1997 and 2007

No new nuclear power plant has been ordered in the U.S. for more than 25 years.

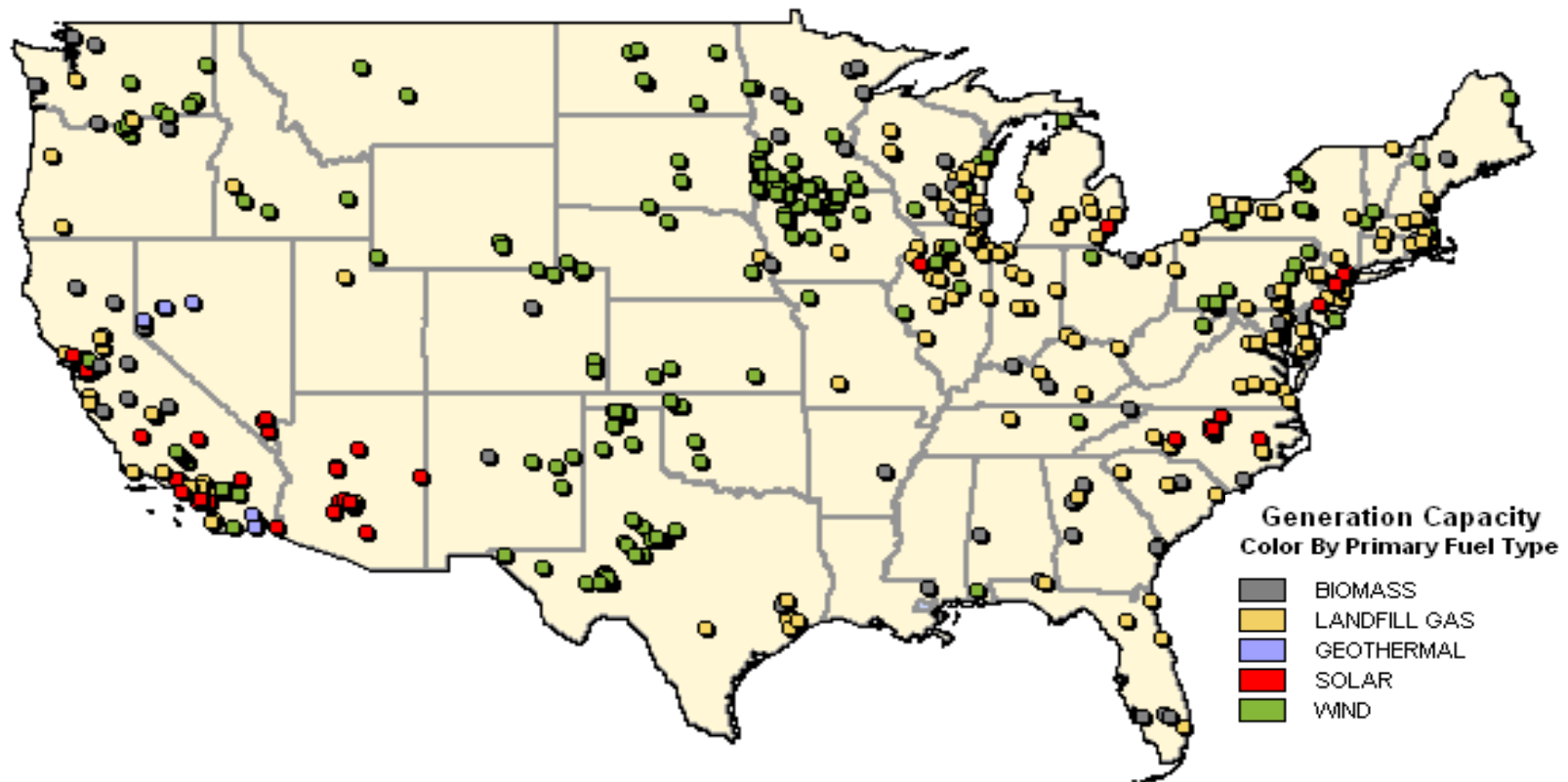


New Coal Fired Generation From 1997 to 2007 Totaled 4,782 MW

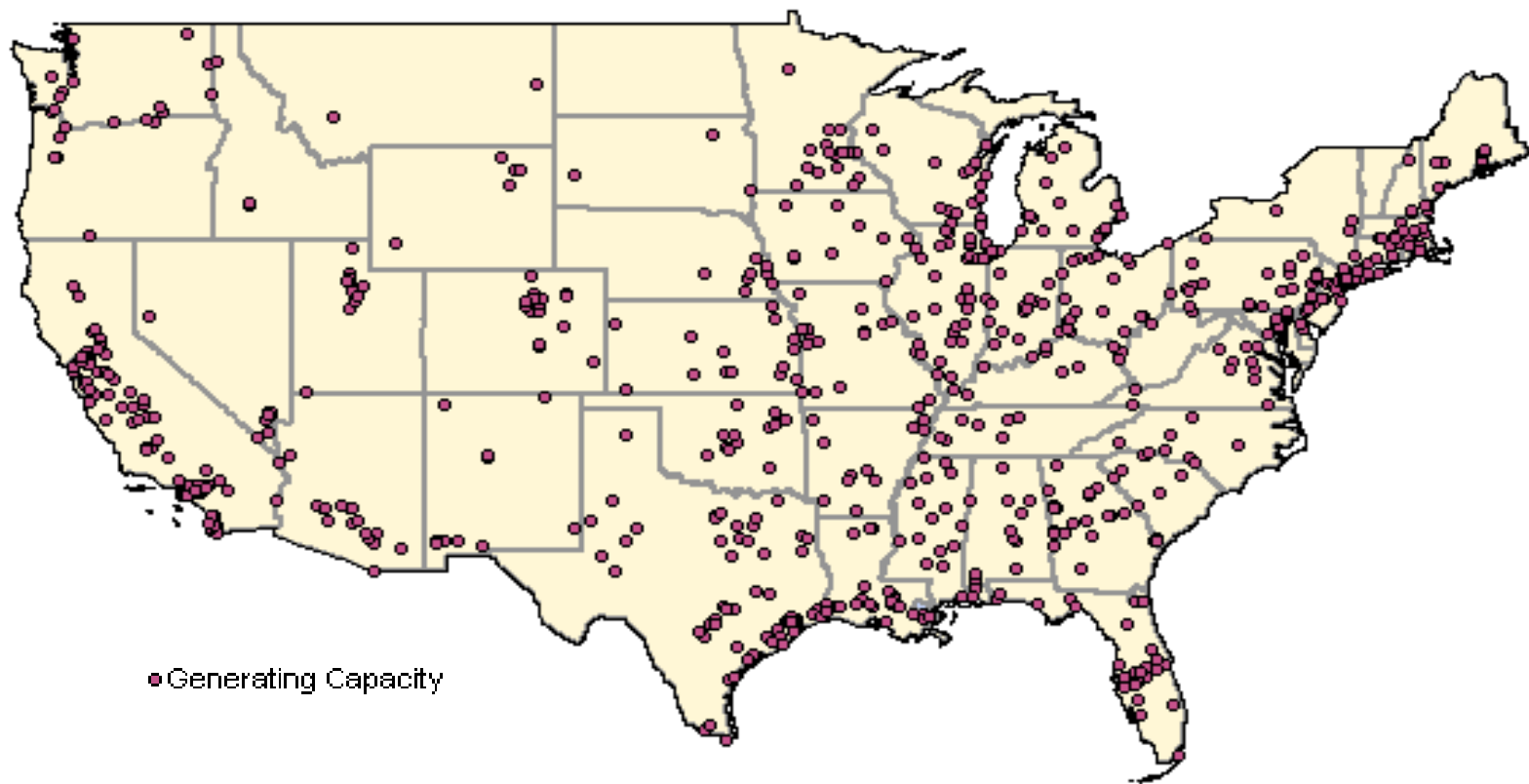


New Renewable Generation Between 1997 and 2007 Totaled 15,165 MW

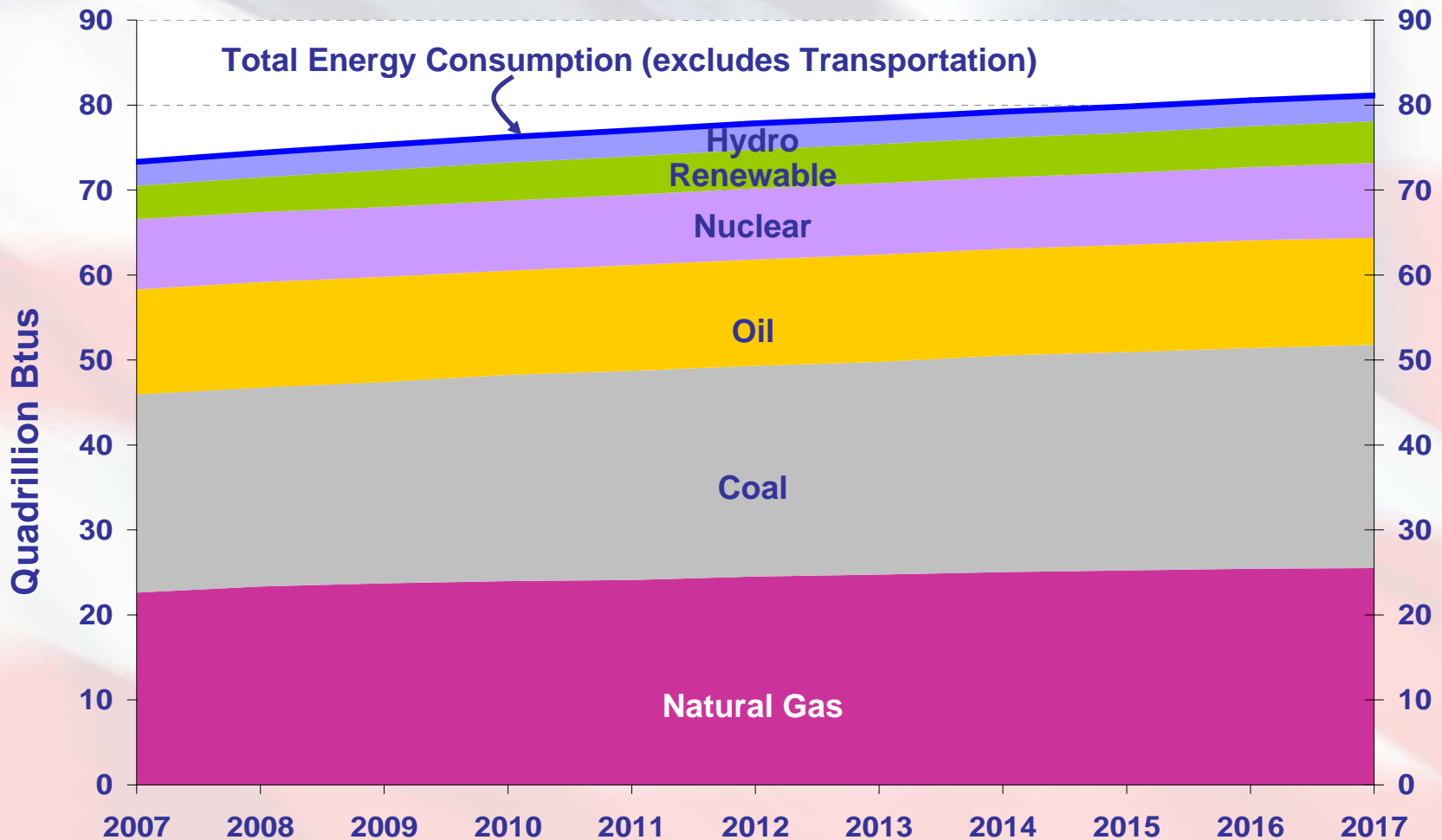
86 percent of the new renewable power generation is wind.



New Natural Gas Fired Generation Between 1997 and 2007 Totaled 268,860 MW



Between 2007 and 2017 Natural Gas Will Continue to be an Important Part of U.S. Energy Supply



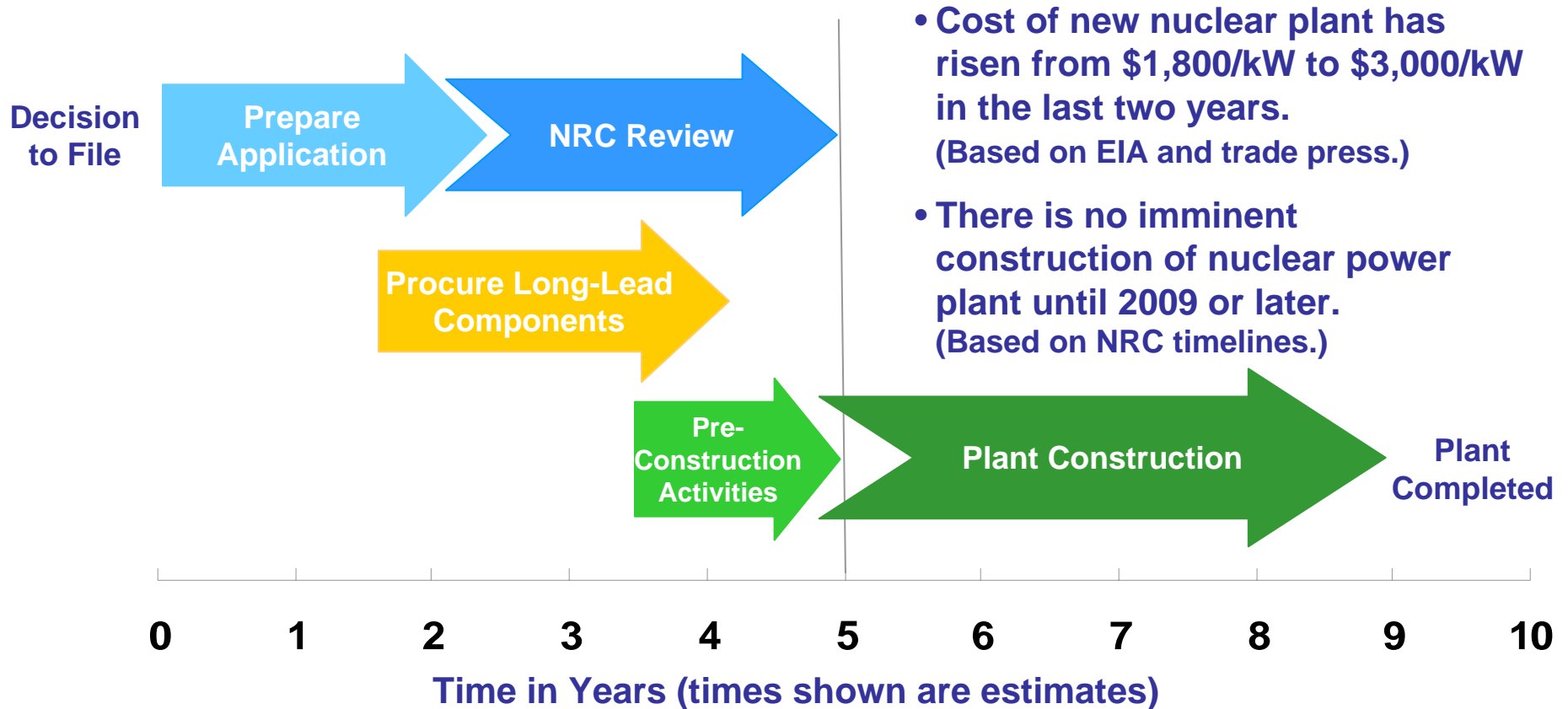
Source: EIA Annual Energy Outlook 2007, Table 2 – Energy Consumption by Sector and Source, and Table 16- Renewable Energy Consumption by Sector and Source and Reference Case Table 13 – Natural Gas Supply, Disposition, and Price.

Challenges in Meeting Our Energy Demand in the Next 10 Years?

- ⇒ Nuclear energy - lengthy construction time
- ⇒ Coal - CO₂ capture, transportation and storage
- ⇒ Renewable - need to build new transmission

Nuclear Energy Has A Long Timeline

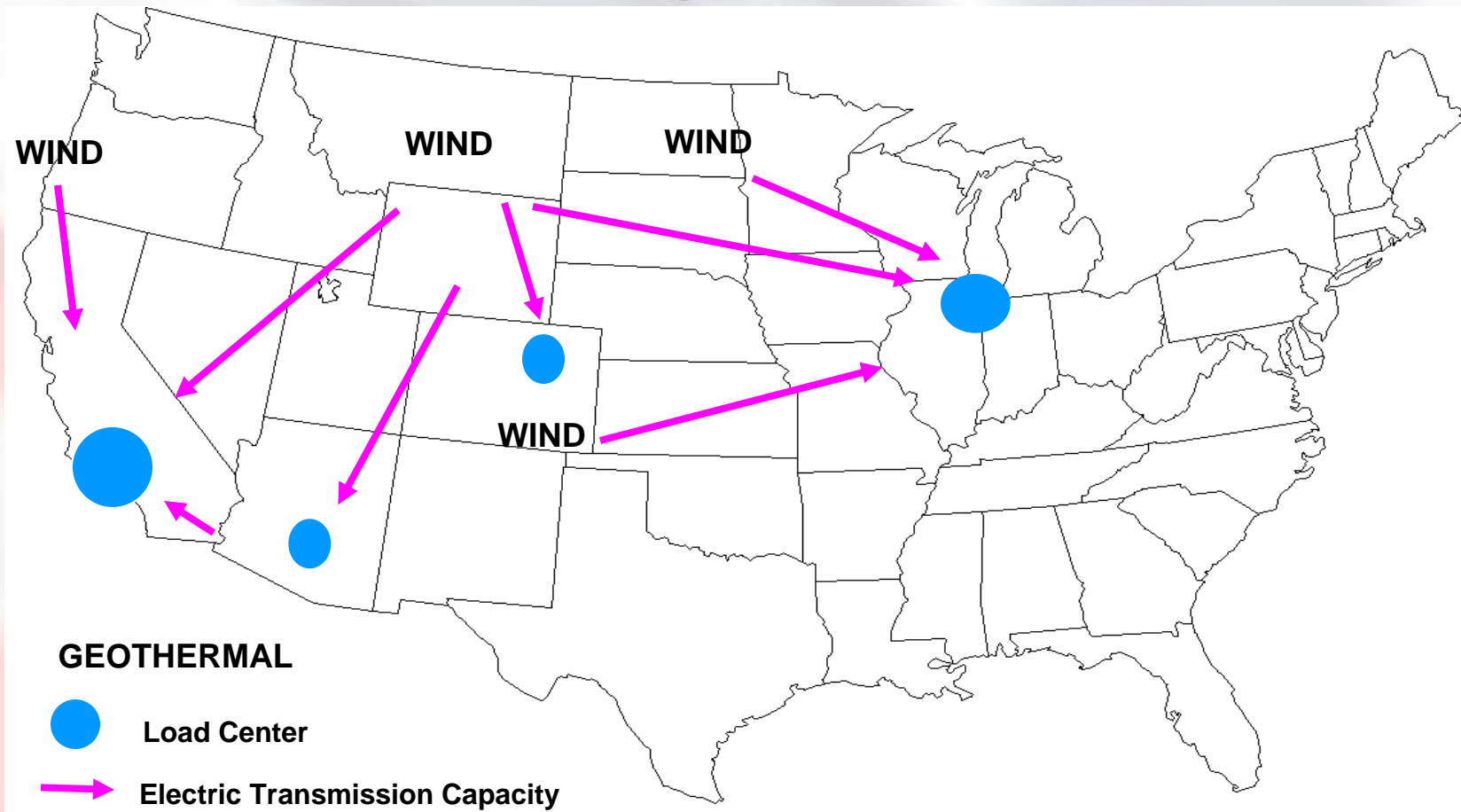
The Nuclear Energy Institute estimates that it will take 9 years to build a new nuclear power plant in the U.S.



Coal-fired Generation is Problematic

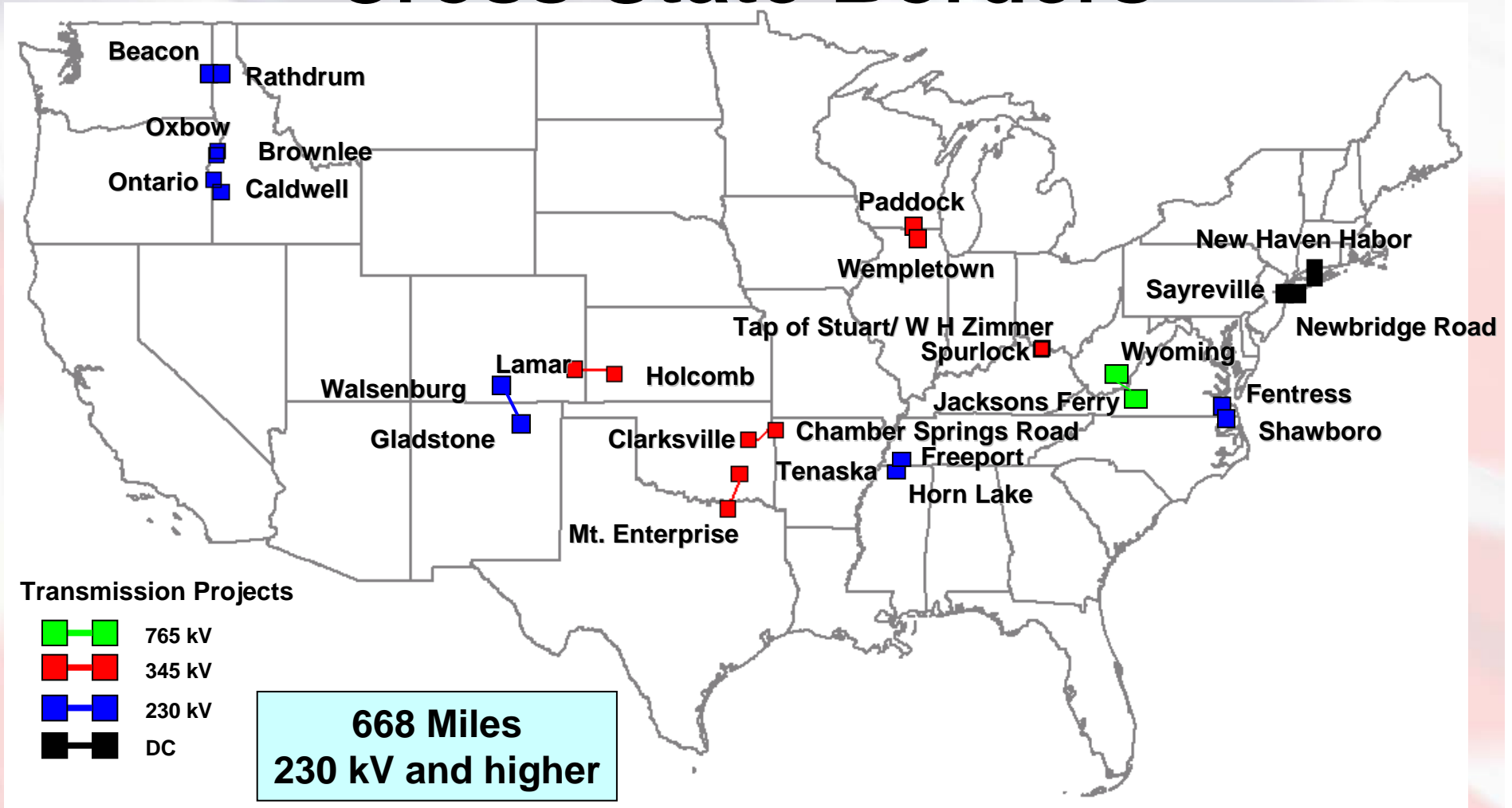
- From 2006 to the present, over 24,700 MW of coal fired power plants projects were canceled.
- Legislation introduced in Congress to capture carbon dioxide was read twice and referred to the Energy and Natural Resources Committee. Cost of new coal fired power plant has increased twenty five to thirty percent in the last 18 months, from \$1,300/kW to about \$2,200/kW, and rising.
- In comparison, the cost of new gas-fired generating plant is about \$1,000/kW.

Getting Power from Renewable Sources to Load Centers Will Challenge the Grid



Source: FERC Staff

Since 2000, 14 Transmission Lines Have Been Built That Physically Cross State Borders

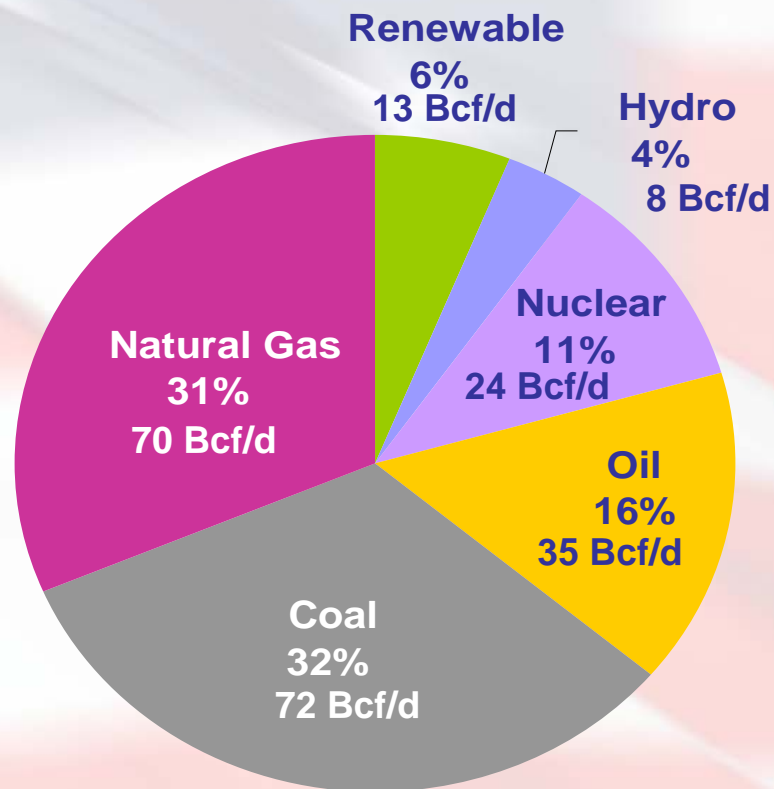
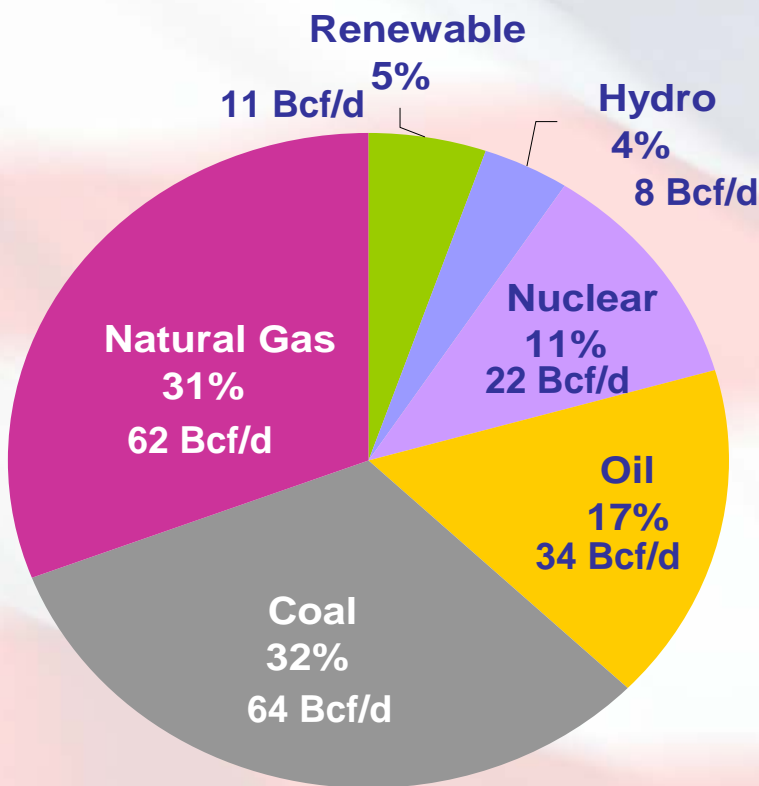


Sources: NERC Summer and Winter Assessments, WECC Existing Generation and Significant Additions and Changes to System Facilities Reports and FERC's Transmission Database

Total Daily Energy Consumption for 2007 and 2017

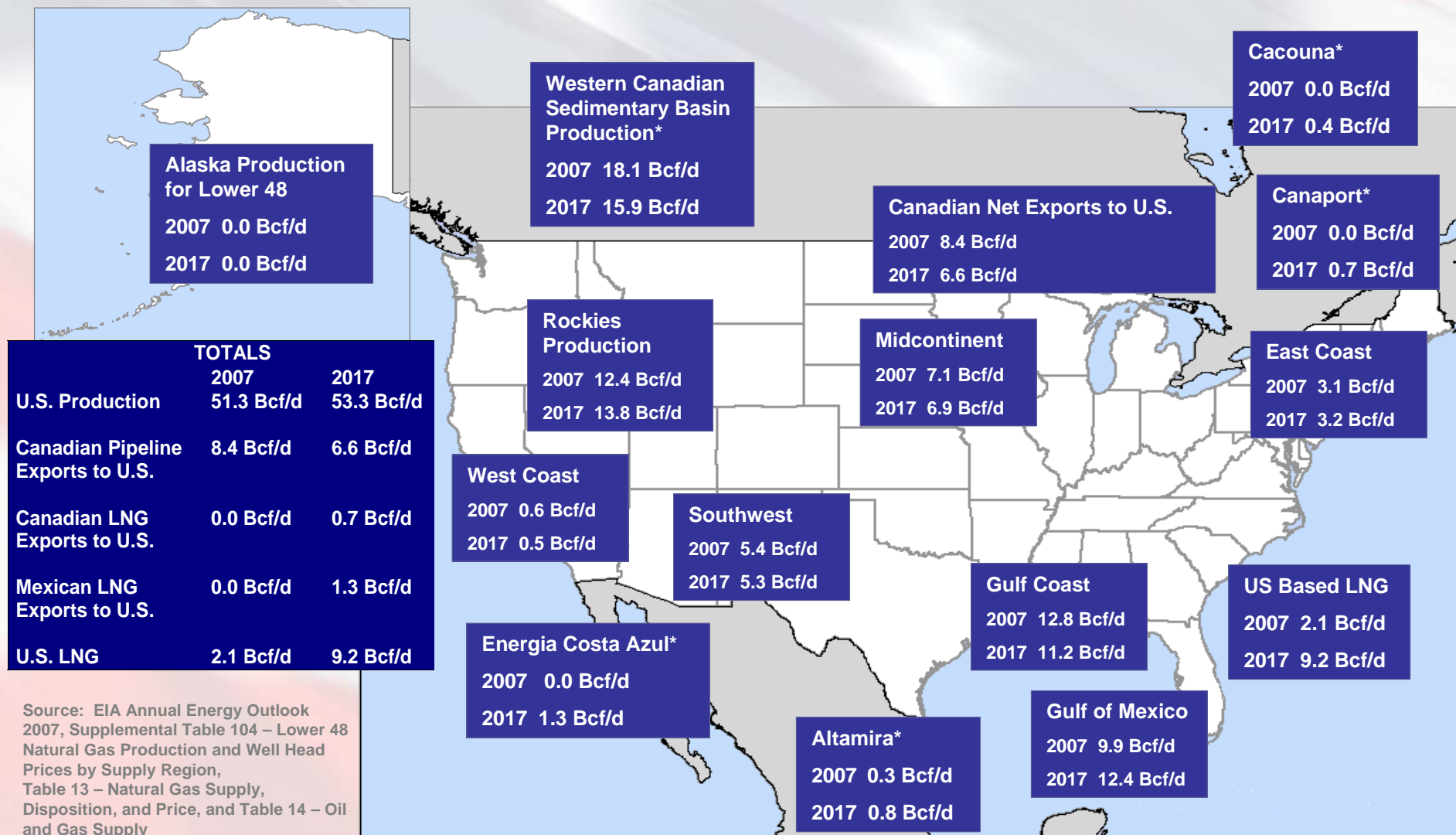
By the end of 2007, total daily energy consumption is projected to be equivalent to about 201 Bcf/d.

By the end of 2017, total daily energy consumption is projected to be equivalent to about 222 Bcf/d.



Source: EIA Annual Energy Outlook 2007, Table 2 – Energy Consumption by Sector and Source, and Table 16- Renewable Energy Consumption by Sector and Source and Reference Case Table 13 – Natural Gas Supply, Disposition, and Price.

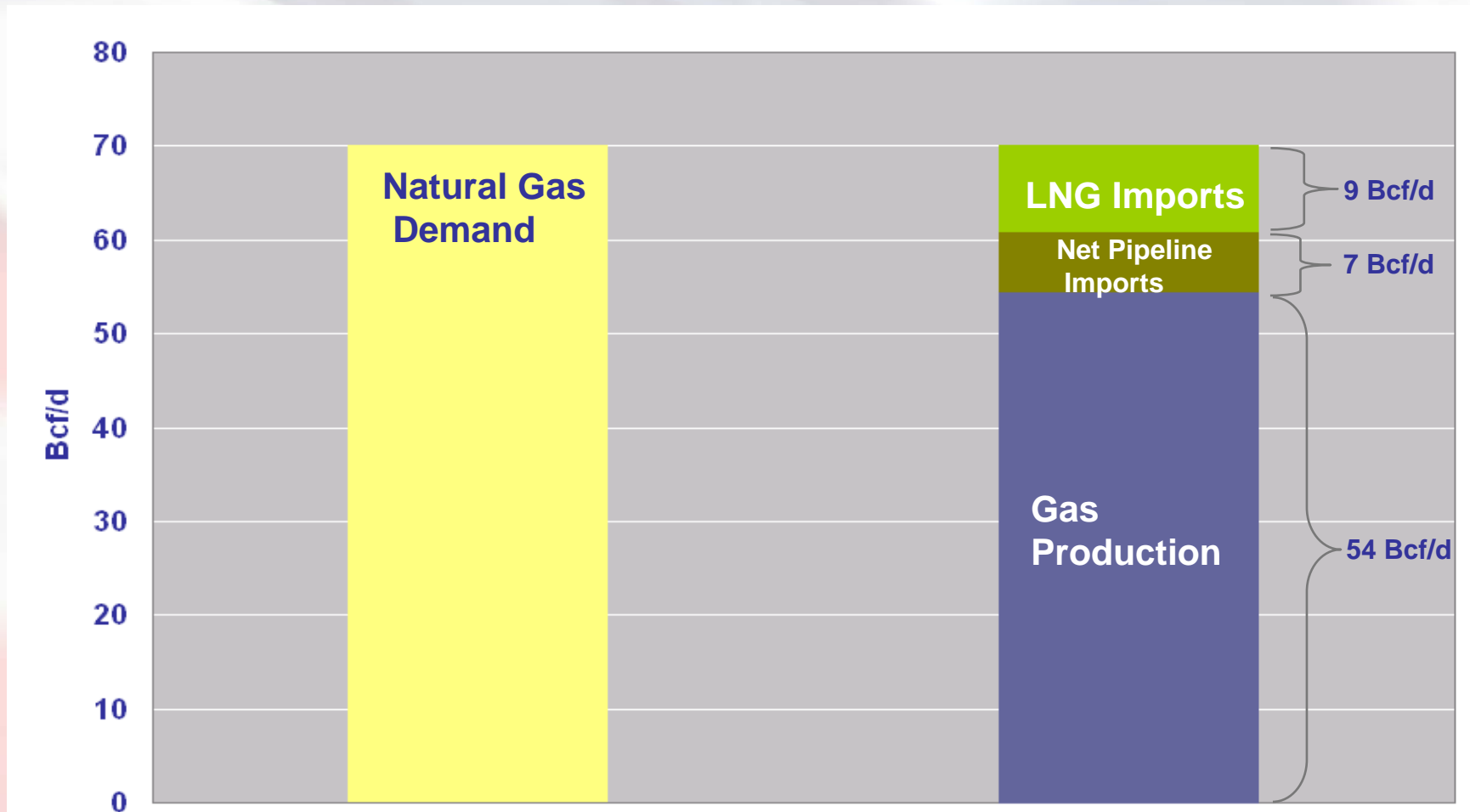
United States Production for Lower 48 and LNG Overview



TOTALS		
	2007	2017
U.S. Production	51.3 Bcf/d	53.3 Bcf/d
Canadian Pipeline Exports to U.S.	8.4 Bcf/d	6.6 Bcf/d
Canadian LNG Exports to U.S.	0.0 Bcf/d	0.7 Bcf/d
Mexican LNG Exports to U.S.	0.0 Bcf/d	1.3 Bcf/d
U.S. LNG	2.1 Bcf/d	9.2 Bcf/d

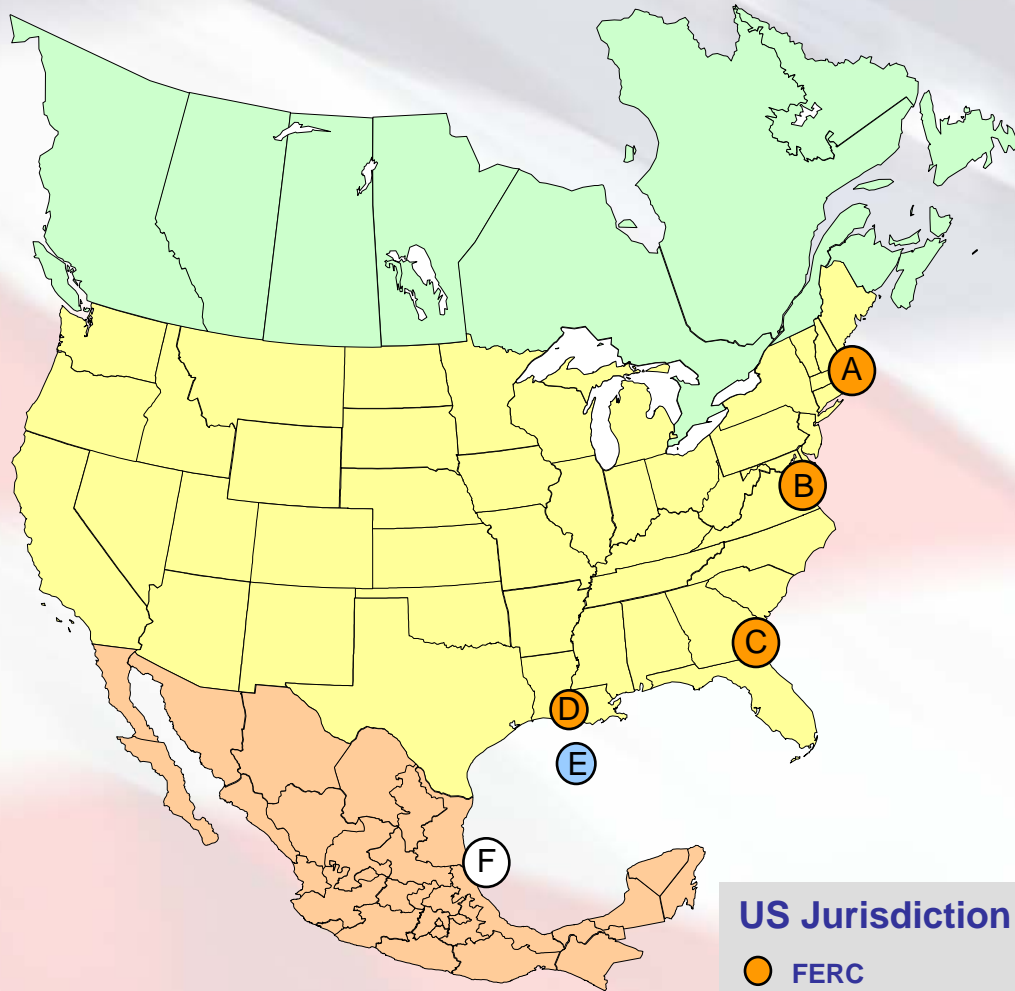
Source: EIA Annual Energy Outlook 2007, Supplemental Table 104 – Lower 48 Natural Gas Production and Well Head Prices by Supply Region, Table 13 – Natural Gas Supply, Disposition, and Price, and Table 14 – Oil and Gas Supply
 * EEA October 2007 Compass Report

In 2017, the Amount of Imported LNG Will Exceed Pipeline Imports



Source: EIA's Annual Energy Outlook 2007, Reference Case Table 13 – Natural Gas Supply, Disposition, and Price.

North American LNG Terminals Existing



As of October 31, 2007

US Jurisdiction

- FERC
- US Coast Guard

U.S.

A. Everett, MA : 1.035 Bcfd (SUEZ LNG - DOMAC)

B. Cove Point, MD : 1.0 Bcfd (Dominion - Cove Point LNG)

C. Elba Island, GA : 1.2 Bcfd (El Paso - Southern LNG)

D. Lake Charles, LA : 2.1 Bcfd (Southern Union - Trunkline LNG)

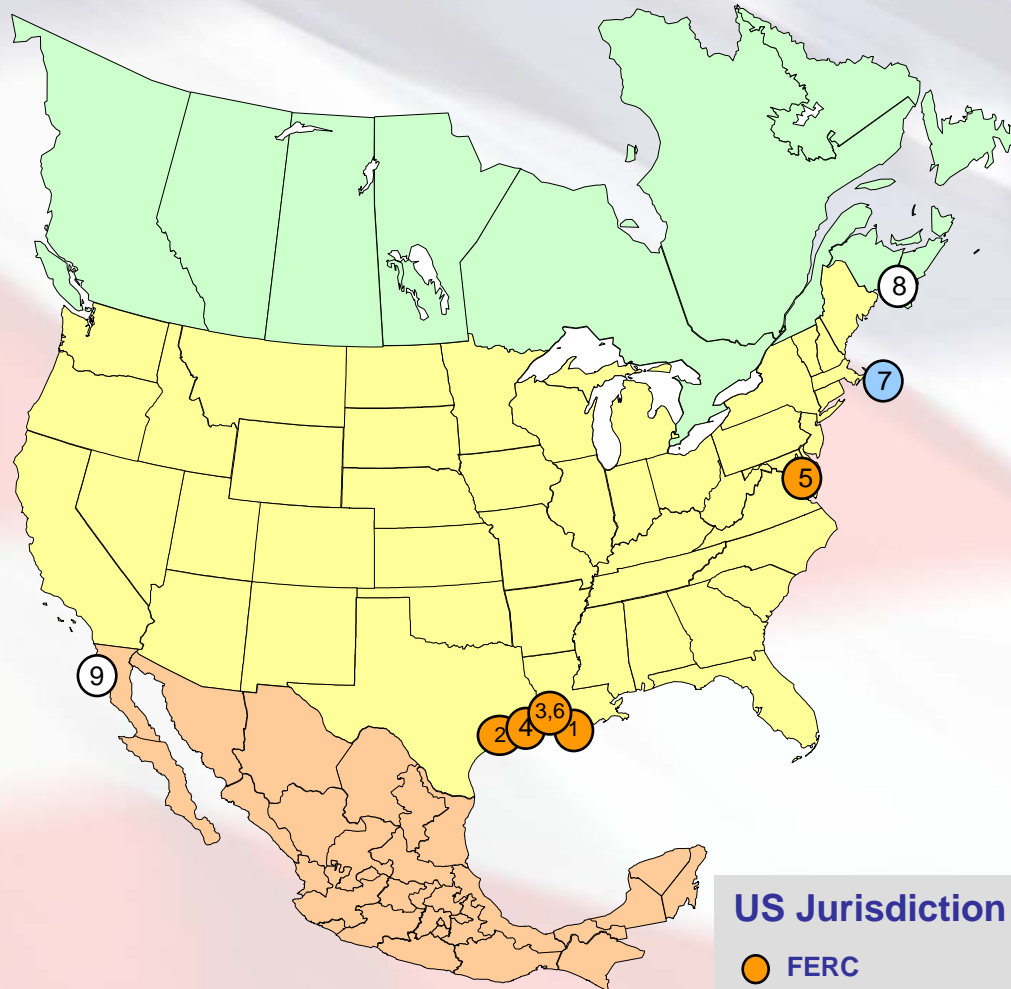
E. Gulf of Mexico: 0.5 Bcfd, (Gulf Gateway Energy Bridge - Excelerate Energy)

Mexico

F. Altamira, Tamulipas: 0.7 Bcfd, (Shell/Total/Mitsui)

Total: 6.5 Bcfd

North American LNG Terminals Under Construction



U.S.

1. **Hackberry, LA:** 1.8 Bcfd (Cameron LNG - Sempra Energy)
2. **Freeport, TX:** 1.5 Bcfd, (Cheniere/Freeport LNG Dev.)
3. **Sabine, LA:** 2.6 Bcfd (Sabine Pass Cheniere LNG)
4. **Sabine, TX:** 2.0 Bcfd (Golden Pass - ExxonMobil)
5. **Cove Point, MD :** 0.8 Bcfd (Dominion - Expansion)*
6. **Sabine, LA:** 1.4 Bcfd (Sabine Pass Cheniere LNG - Expansion)
7. **Offshore Boston, MA:** 0.8 Bcfd (Northeast Gateway - Excelebrate Energy)

Canada

8. **St. John, NB:** 1.0 Bcfd, (Canaport - Irving Oil)

Mexico

9. **Baja California, MX:** 1.0 Bcfd, (Sempra)

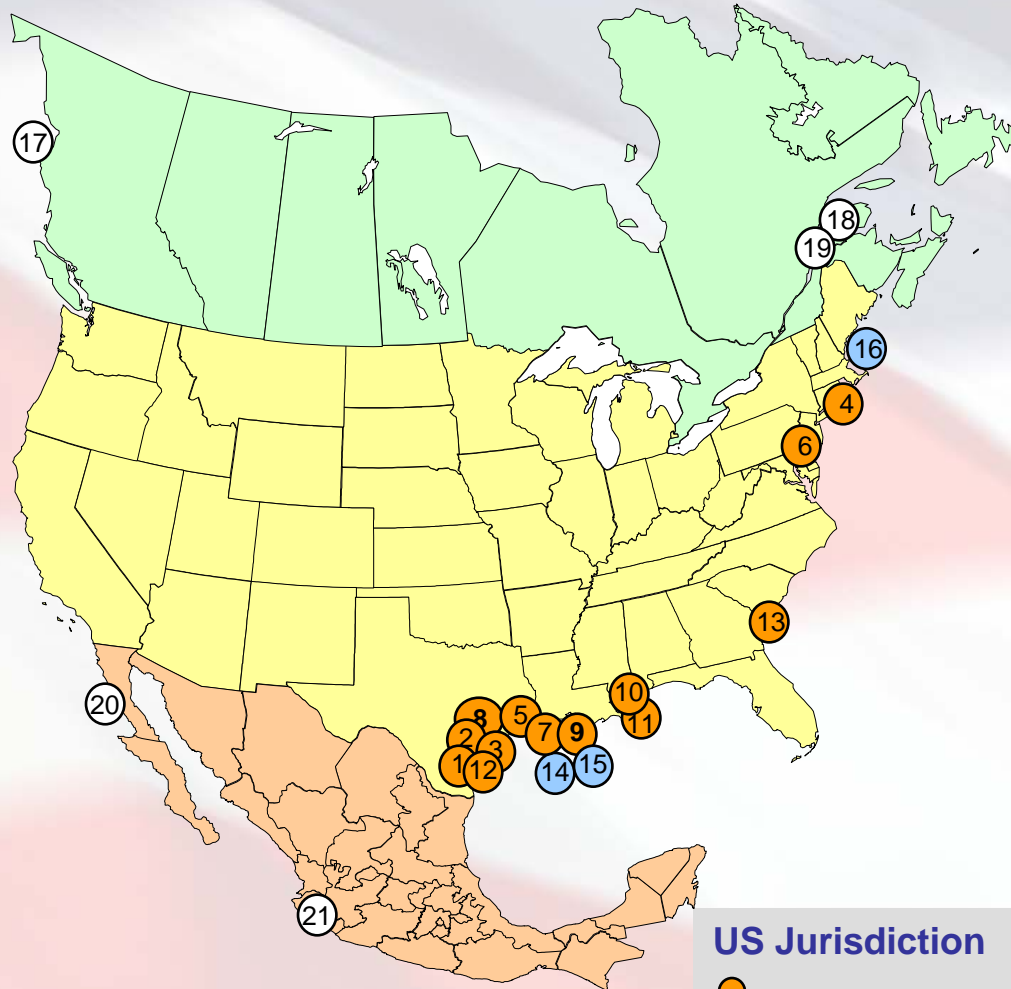
US Jurisdiction

- FERC
- US Coast Guard

Total: 12.9 Bcfd

* Expansion of an existing facility **As of October 31, 2007**

North American LNG Terminals Permitted



Permitted - NOT UNDER CONSTRUCTION

U.S. - FERC

1. Corpus Christi, TX: 1.0 Bcfd (Ingleside Energy – Occidental Energy Ventures)
2. Corpus Christi, TX: 2.6 Bcfd, (Cheniere LNG)
3. Corpus Christi, TX : 1.1 Bcfd (Vista Del Sol - ExxonMobil)
4. Fall River, MA : 0.8 Bcfd, (Weaver's Cove Energy/Hess LNG)
5. Port Arthur, TX: 3.0 Bcfd (Sempra)
6. Logan Township, NJ : 1.2 Bcfd (Crown Landing LNG - BP)
7. Cameron, LA: 3.3 Bcfd (Creole Trail LNG - Cheniere LNG)
8. Freeport, TX: 2.5 Bcfd (Cheniere/Freeport LNG Dev. - Expansion)
9. Hackberry, LA: 0.85 Bcfd (Cameron LNG – Sempra Energy - Expansion)
10. Pascagoula, MS: 1.5 Bcfd (Gulf LNG Energy LLC)
11. Pascagoula, MS: 1.3 Bcfd (Casotte Landing - ChevronTexaco)
12. Port Lavaca, TX: 1.0 Bcfd (Calhoun LNG – Gulf Coast LNG Partners)
13. Elba Island, GA: 0.9 Bcfd (El Paso - Southern LNG Expansion)*

U.S. - MARAD/Coast Guard

14. Port Pelican: 1.6 Bcfd, (Chevron Texaco)
15. Gulf of Mexico: 1.0 Bcfd (Main Pass McMoRan Exp.)
16. Offshore Boston, MA: 0.4 Bcfd (Neptune LNG - Tractebel)

Canada

17. Kitimat, BC: 1.0 Bcfd (Galveston LNG)
18. Rivière-du- Loup, QC: 0.5 Bcfd (Cacouna Energy - TransCanada/PetroCanada)
19. Quebec City, QC : 0.5 Bcfd (Project Rabaska - Enbridge/Gaz Met/Gaz de France)

Mexico

20. Baja California, MX : 1.5 Bcfd (Energy Costa Azul - Sempra - Expansion)
21. Manzanillo, MX: 0.5 Bcfd

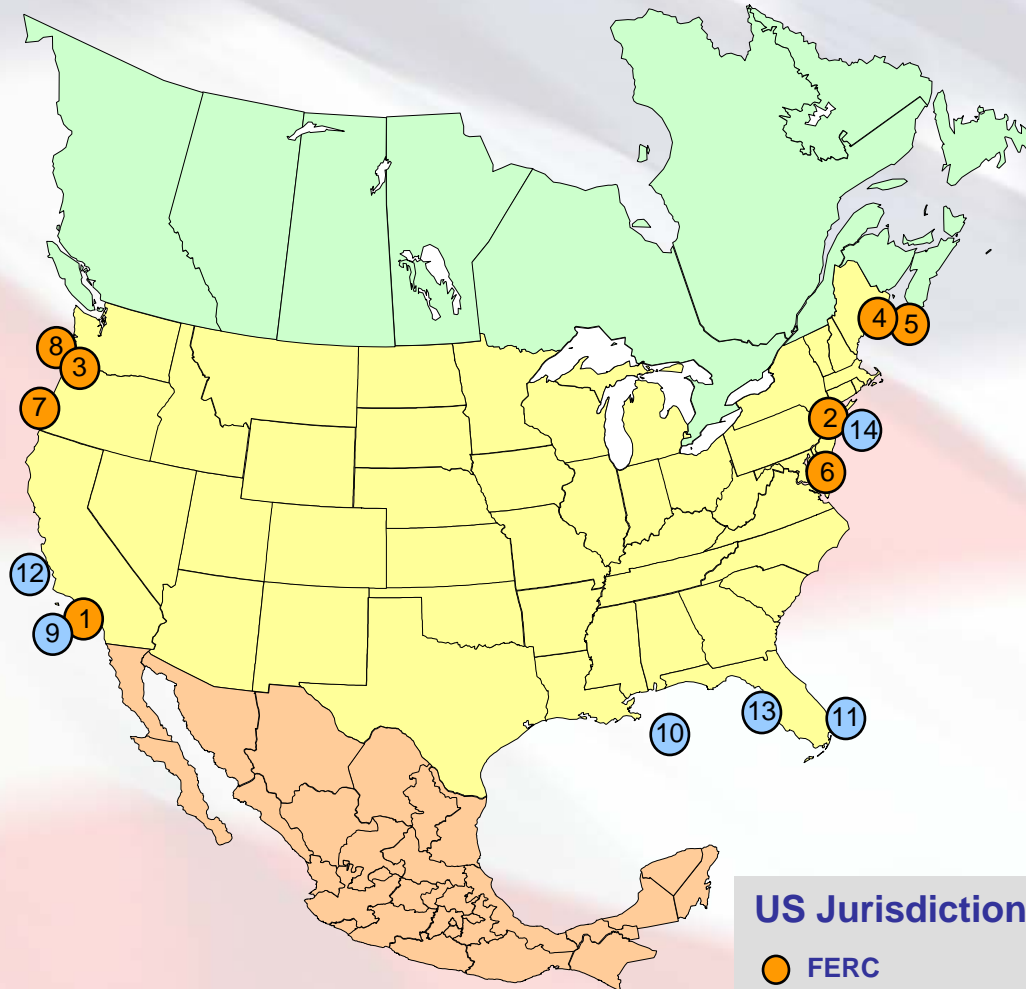
US Jurisdiction

- FERC
- US Coast Guard

Total: 28.1 Bcfd

* Expansion of an existing facility As of October 31, 2007

North American LNG Terminals Pending



PROPOSED TO FERC

1. Long Beach, CA : 0.7 Bcf/d, (Mitsubishi/ConocoPhillips - Sound Energy Solutions)
2. LI Sound, NY: 1.0 Bcf/d (Broadwater Energy - TransCanada/Shell)
3. Bradwood, OR: 1.0 Bcf/d (Northern Star LNG - Northern Star Natural Gas LLC)
4. Pleasant Point, ME: 2.0 Bcf/d (Quoddy Bay, LLC)
5. Robbinston, ME: 0.5 Bcf/d (Downeast LNG - Kestrel Energy)
6. Baltimore, MD: 1.5 Bcf/d (AES Sparrows Point - AES Corporation)
7. Coos Bay, OR: 1.0 Bcf/d (Jordan Cove Energy Project)
8. Astoria, OR: 1.5 Bcf/d (Oregon LNG)

PROPOSED TO MARAD/COAST GUARD

9. California Offshore : 1.4 Bcf/d, (Clearwater Port LLC)
10. Gulf of Mexico: 1.4 Bcf/d (Bienville LNG - TORP Technology)
11. Offshore Florida: 1.9 Bcf/d (SUEZ Calypso - SUEZ LNG)
12. Offshore California: 1.2 Bcf/d (OceanWay - Woodside Natural Gas)
13. Offshore Florida: 1.2 Bcf/d (Hoëgh LNG - Port Dolphin Energy)
14. Offshore New York: 2.0 Bcf/d (Safe Harbor Energy - ASIC, LLC)

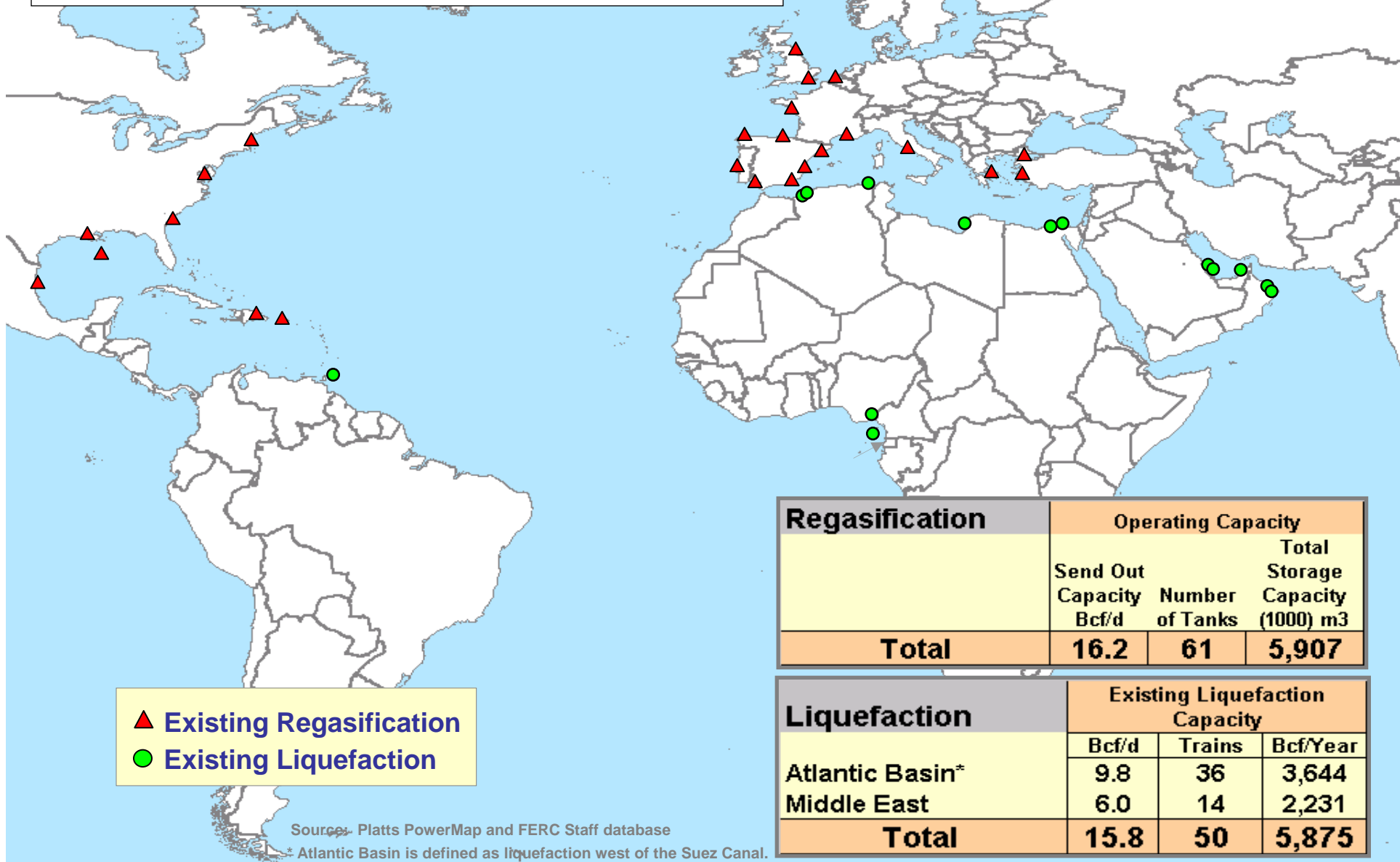
US Jurisdiction

- FERC
- US Coast Guard

Total: 18.3 Bcf/d

* Expansion of an existing facility As of October 31, 2007

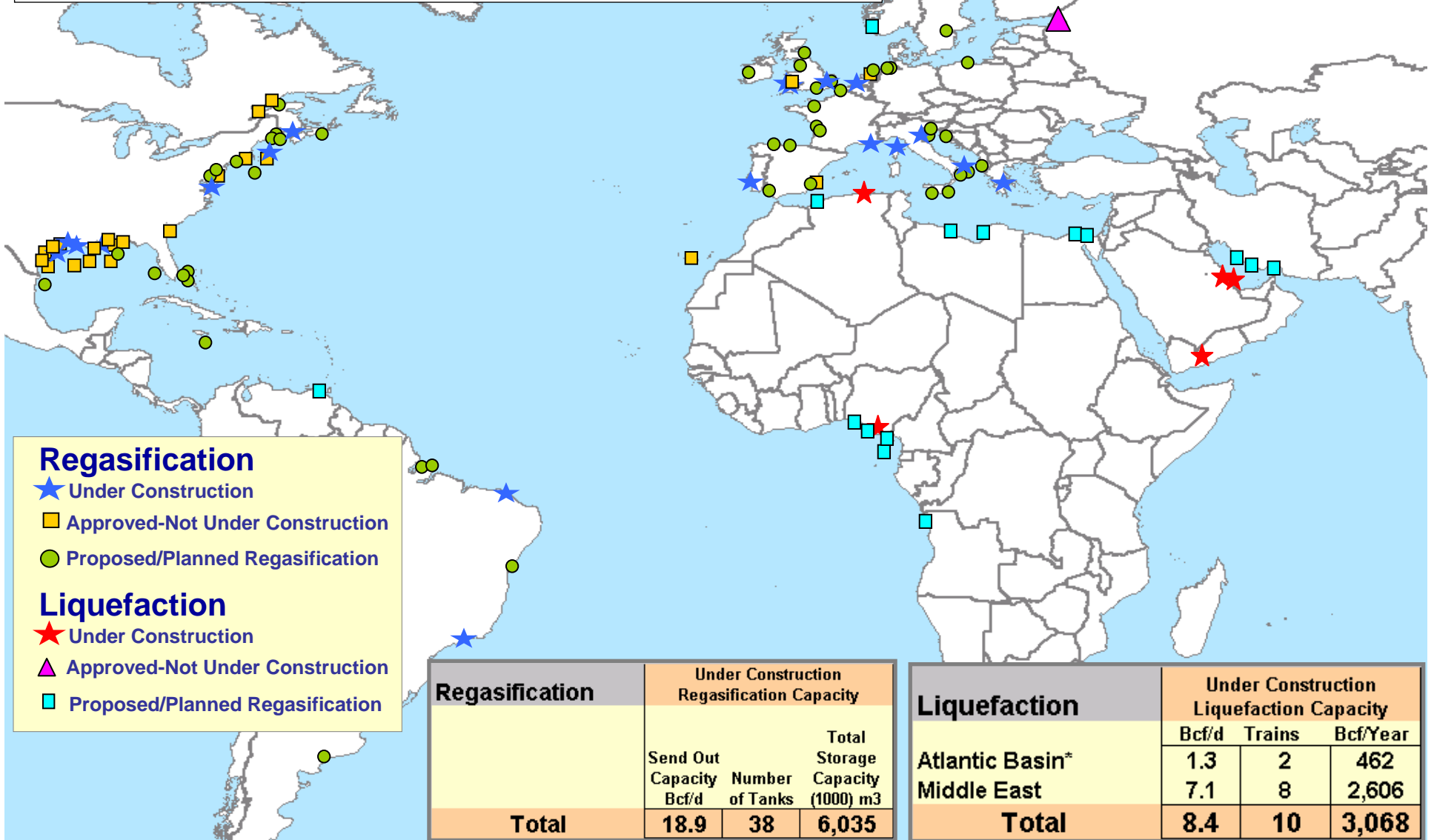
Atlantic Basin – Existing Regasification and Liquefaction



Regasification	Operating Capacity		
	Send Out Capacity Bcf/d	Number of Tanks	Total Storage Capacity (1000) m3
Total	16.2	61	5,907

Liquefaction	Existing Liquefaction Capacity		
	Bcf/d	Trains	Bcf/Year
Atlantic Basin*	9.8	36	3,644
Middle East	6.0	14	2,231
Total	15.8	50	5,875

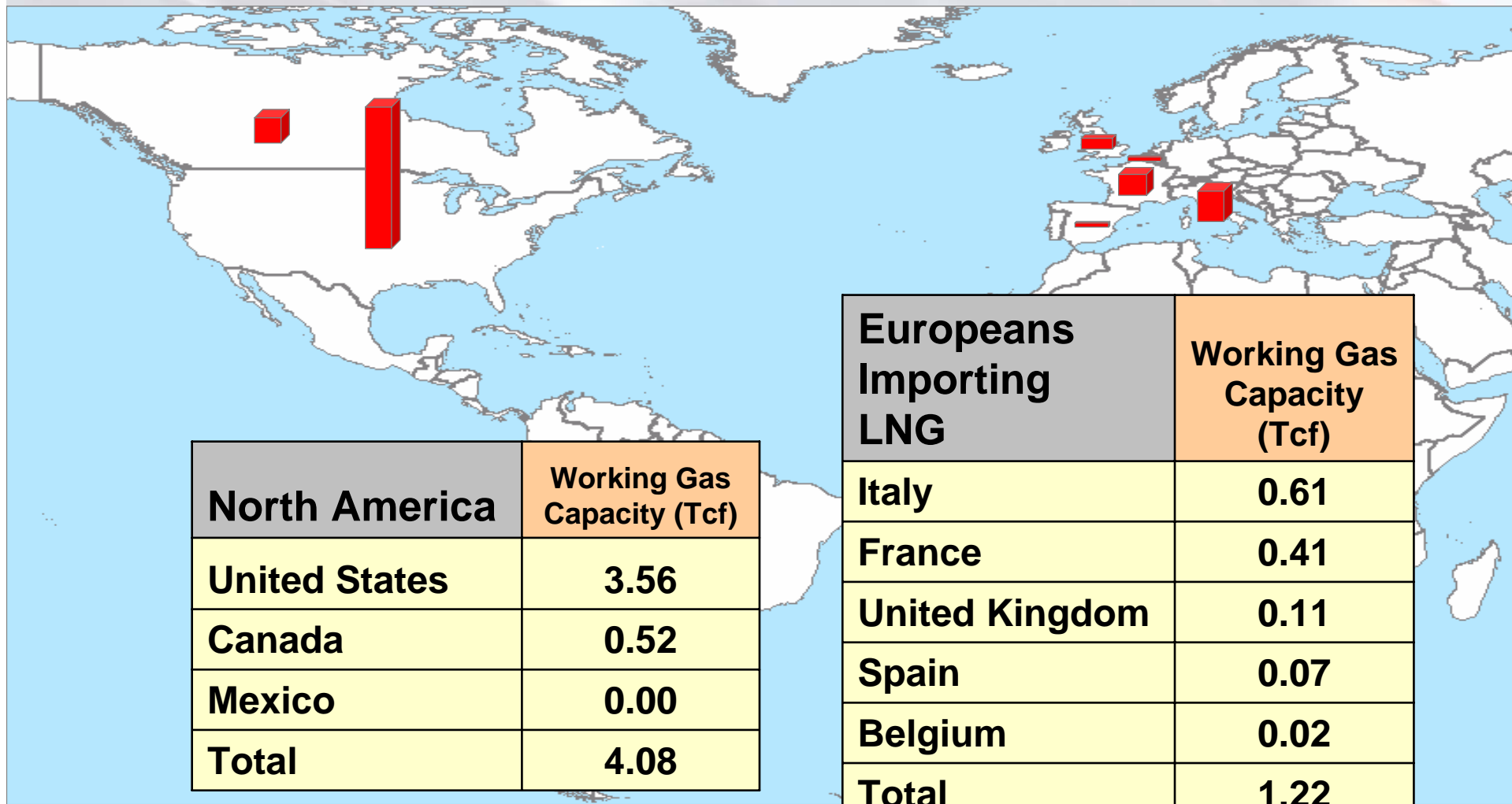
Atlantic Basin - 2017 Regasification and Liquefaction



Source: Platts PowerMap and FERC Staff's Data Base

* Atlantic Basin is defined as liquefaction west of the Suez Canal.

Storage Capacity in North America Far Surpasses LNG-importing European Countries



Source: Data from IGU 23rd World Gas Conference-WGC 2006

Conclusion

- Natural gas-fired power:
 - ⇒ Emits the least pollution of all fossil fuels.
 - ⇒ Has the lowest capital cost.
 - ⇒ Will be the fuel of choice for electric generation for the foreseeable future in the U.S.
- North America:
 - ⇒ Has only 4 percent of the world's proven gas reserves.
 - ⇒ Has been producing (and consuming) about one-quarter of the world's annual gas production.
- LNG will be an increasingly large component of the U.S. natural gas supply in order to satisfy demand.
- Since regasification capacity, especially in the Atlantic Basin, will continue to exceed Atlantic Basin liquefaction capacity, LNG will first flow to the markets that value it the most.
- The U.S., with a large amount of storage capacity, is able to take advantage of receiving LNG and storing the regasified volumes during non-peak periods.