

Maintaining Adequate Infrastructure in the Natural Gas and Electric Industries

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United States Demand Overview

Alaska

2007 1.3 Bcf/d

2017 1.3 Bcf/d

2030 1.6 Bcf/d

TOTALS

(Bcf/d)

	2007	2017	2030
Residential	13.4	14.3	15.4
Commercial	8.2	8.6	9.2
Industrial	19.0	19.3	22.2
Electric Generation	15.9	24.5	25.6
Total	56.5	66.7	72.3

Northwest

2007 1.8 Bcf/d

2017 2.2 Bcf/d

2030 2.6 Bcf/d

Rockies

2007 2.5 Bcf/d

2017 3.1 Bcf/d

2030 3.4 Bcf/d

Midcontinent

2007 14.5 Bcf/d

2017 15.6 Bcf/d

2030 17.4 Bcf/d

New England

2007 2.4 Bcf/d

2017 2.3 Bcf/d

2030 2.0 Bcf/d

California

2007 6.2 Bcf/d

2017 6.9 Bcf/d

2030 7.8 Bcf/d

Southwest

2007 5.4 Bcf/d

2017 5.3 Bcf/d

2030 5.0 Bcf/d

Gulf Coast

2007 17.0 Bcf/d

2017 20.0 Bcf/d

2030 22.0 Bcf/d

East Coast

2007 10.7 Bcf/d

2017 13.8 Bcf/d

2030 13.5 Bcf/d

Florida

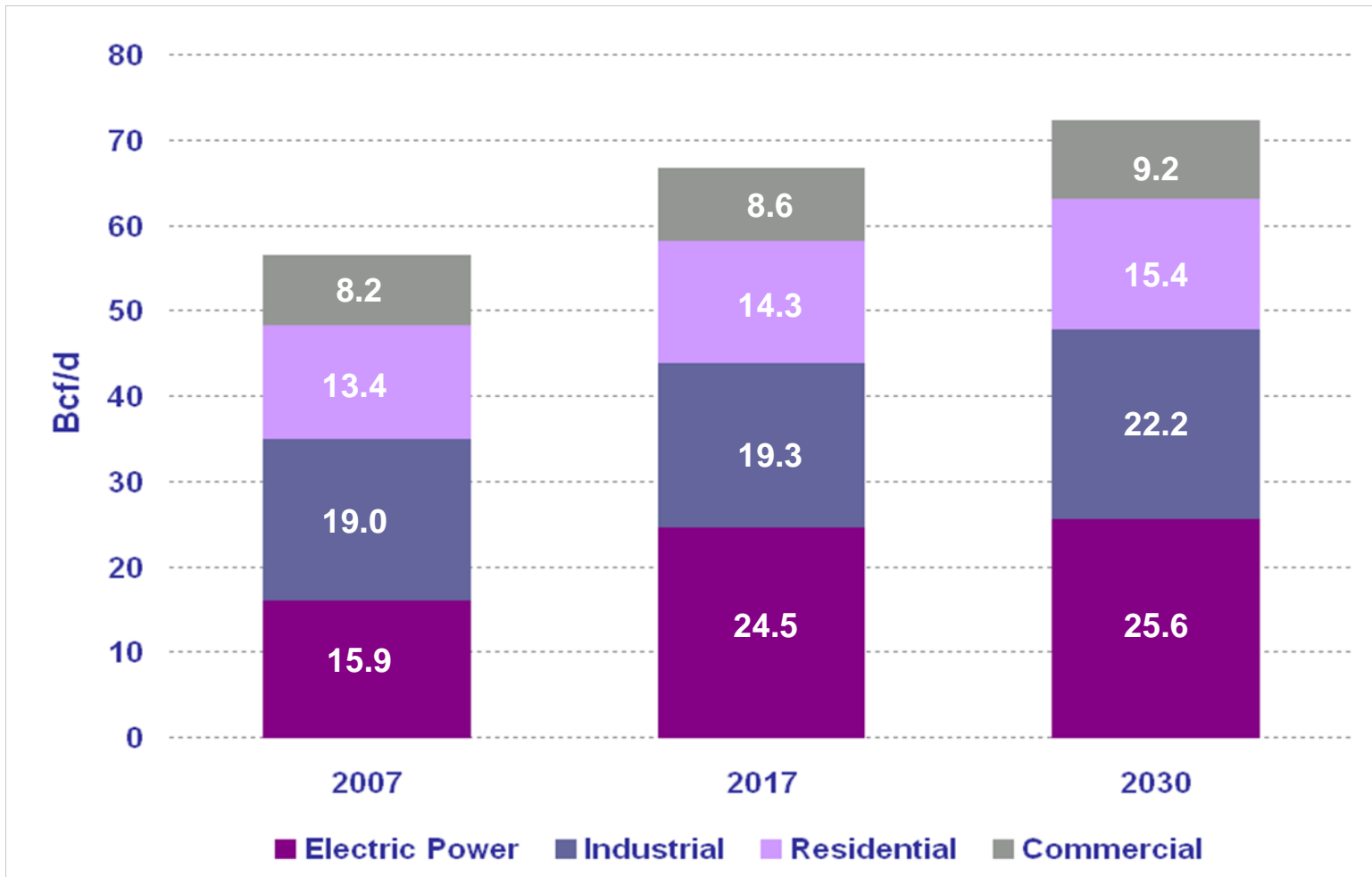
2007 2.8 Bcf/d

2017 4.5 Bcf/d

2030 5.0 Bcf/d

Source: EEA January Compass Report

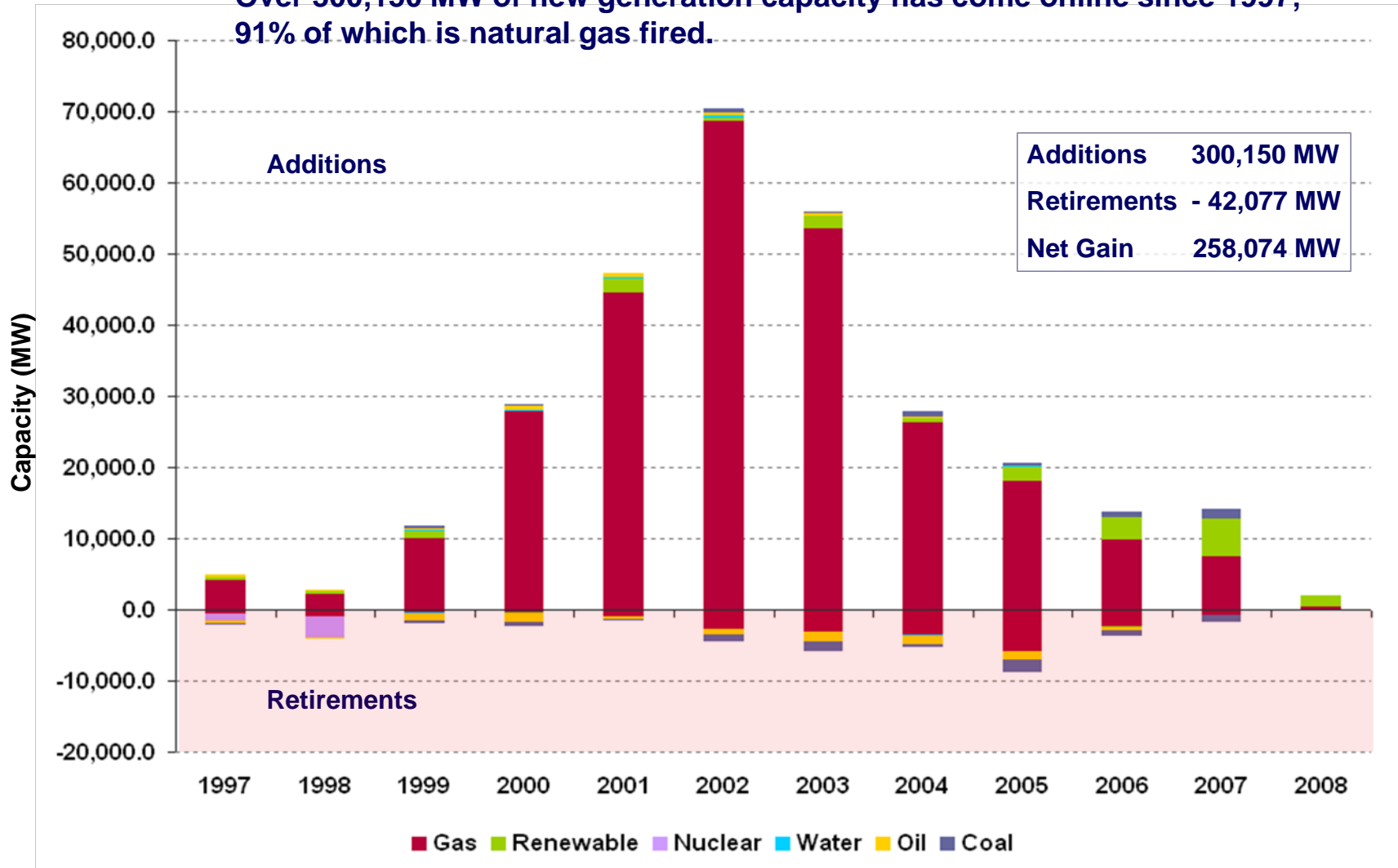
The largest increase in natural gas usage is projected to be the electric power sector



Source: EEA's Compass Report for January 2008

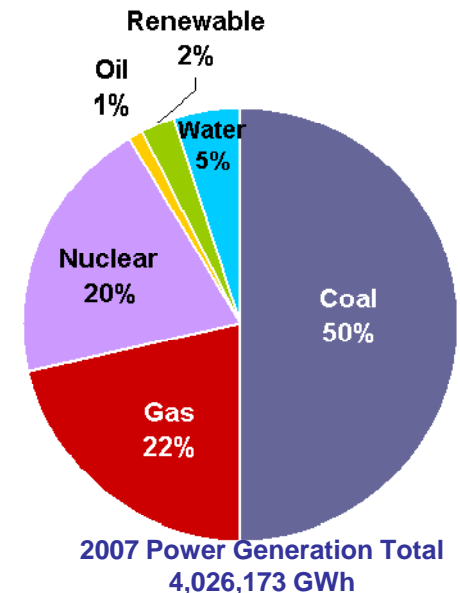
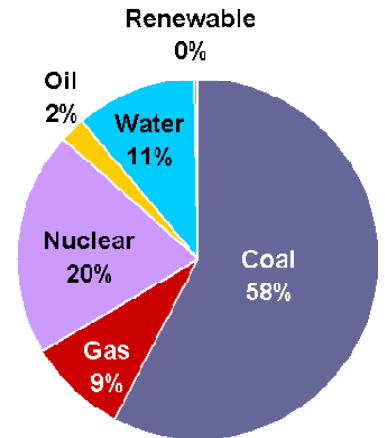
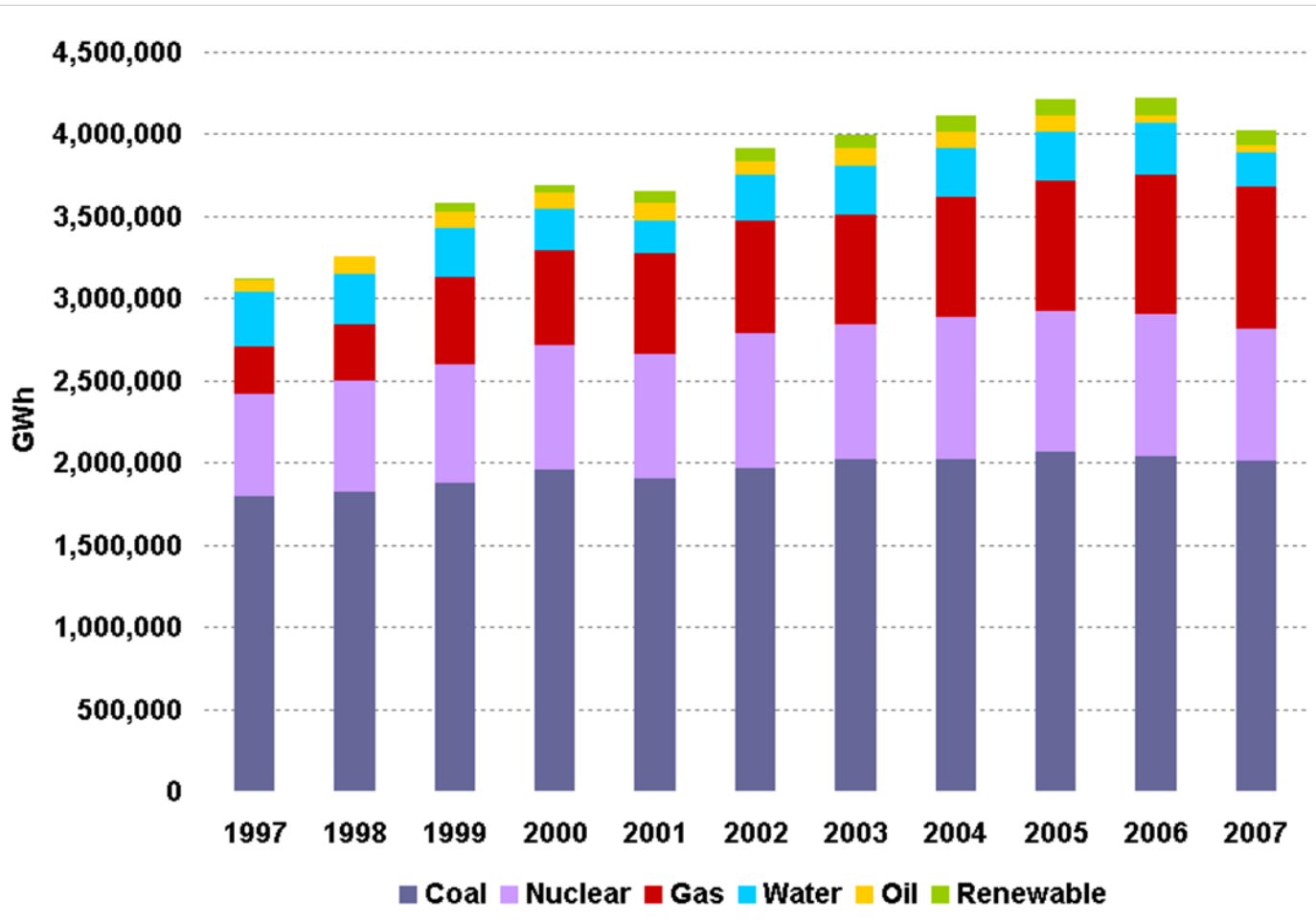
Gas-fired generation has dominated recent U.S. expansion of generation capacity

Over 300,150 MW of new generation capacity has come online since 1997; 91% of which is natural gas fired.



Source: Based on data from Ventyx Global Energy Decisions, Inc., Velocity Suite, April 2008.

Electric generation from gas fired plants is 22 percent of the total in 2007, increased from 9 percent in 1997.

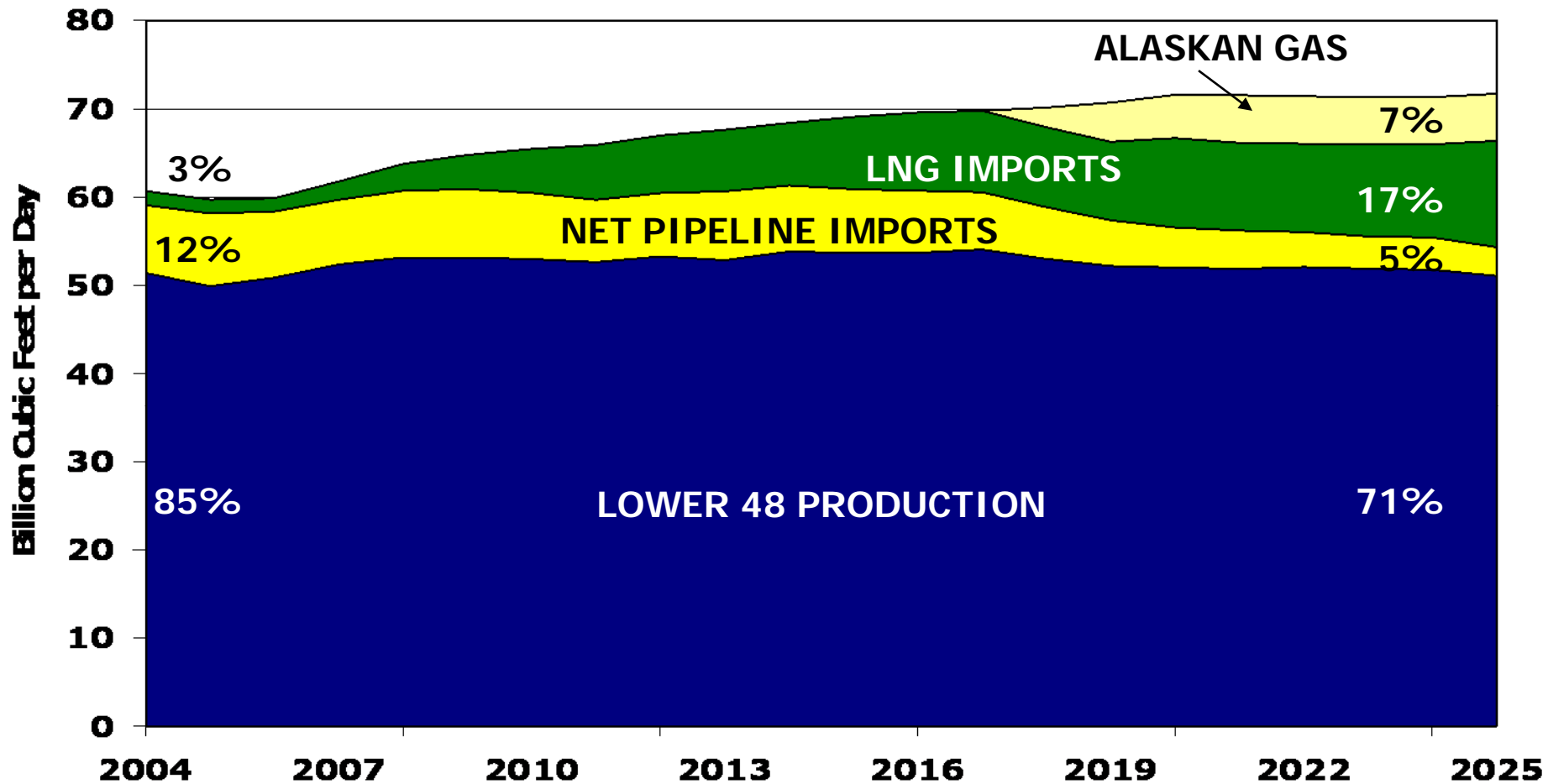


Source: Based on data from Ventyx Global Energy Decisions, Inc., Velocity Suite, April 2008.

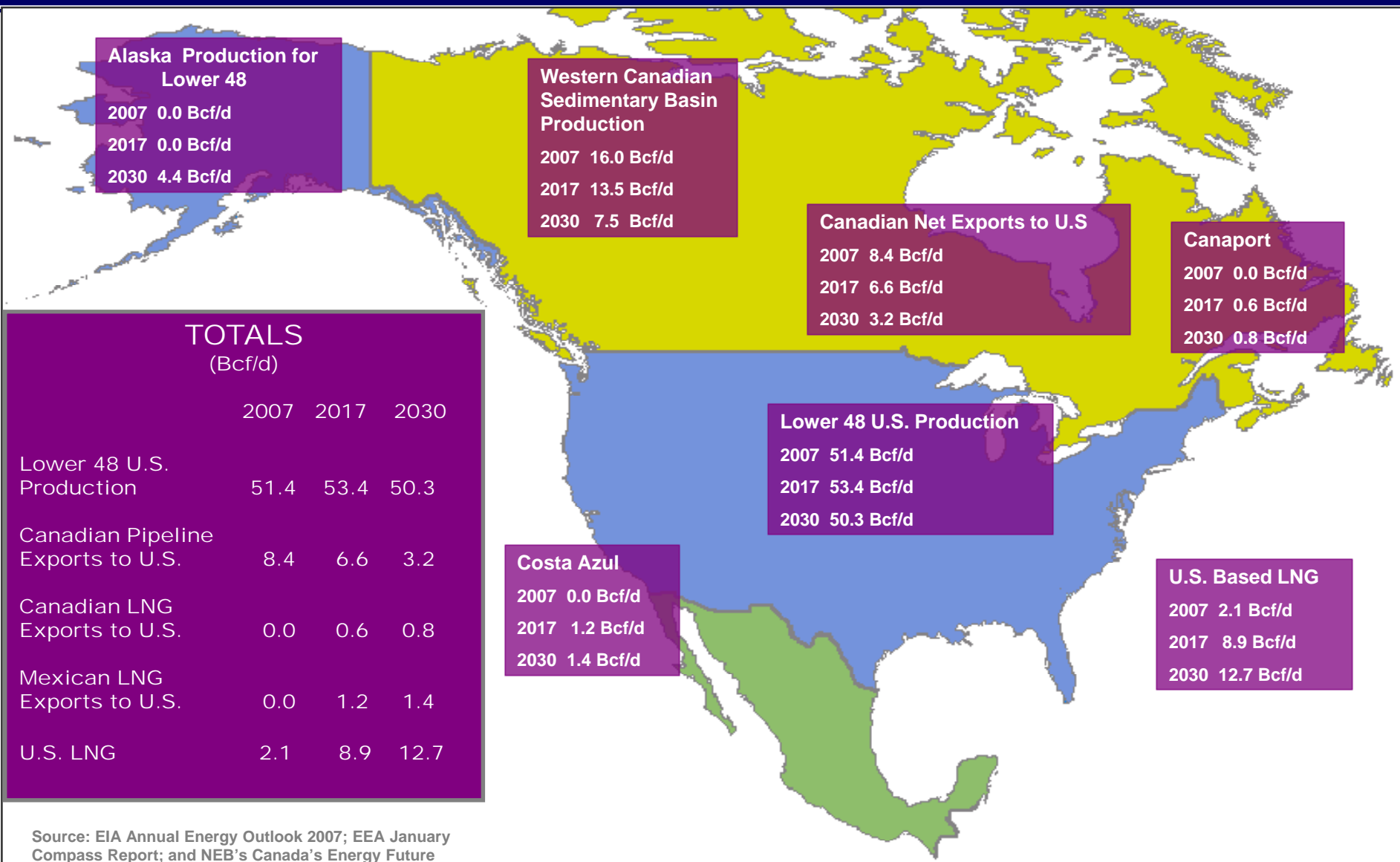
Gas – Pivotal Fuel for Electric Generation

- ➔ Coal is plentiful in North America; but carbon output brings uncertainty – CCS issues
- ➔ Renewables increasing; but still a small percentage of generation mix – Transmission is the problem
- ➔ Nuclear approval process and construction time is extensive – Estimates vary but minimum of ten years
- ➔ Gas-fired generation has smallest “carbon footprint” of fossil fuels; lowest capital cost

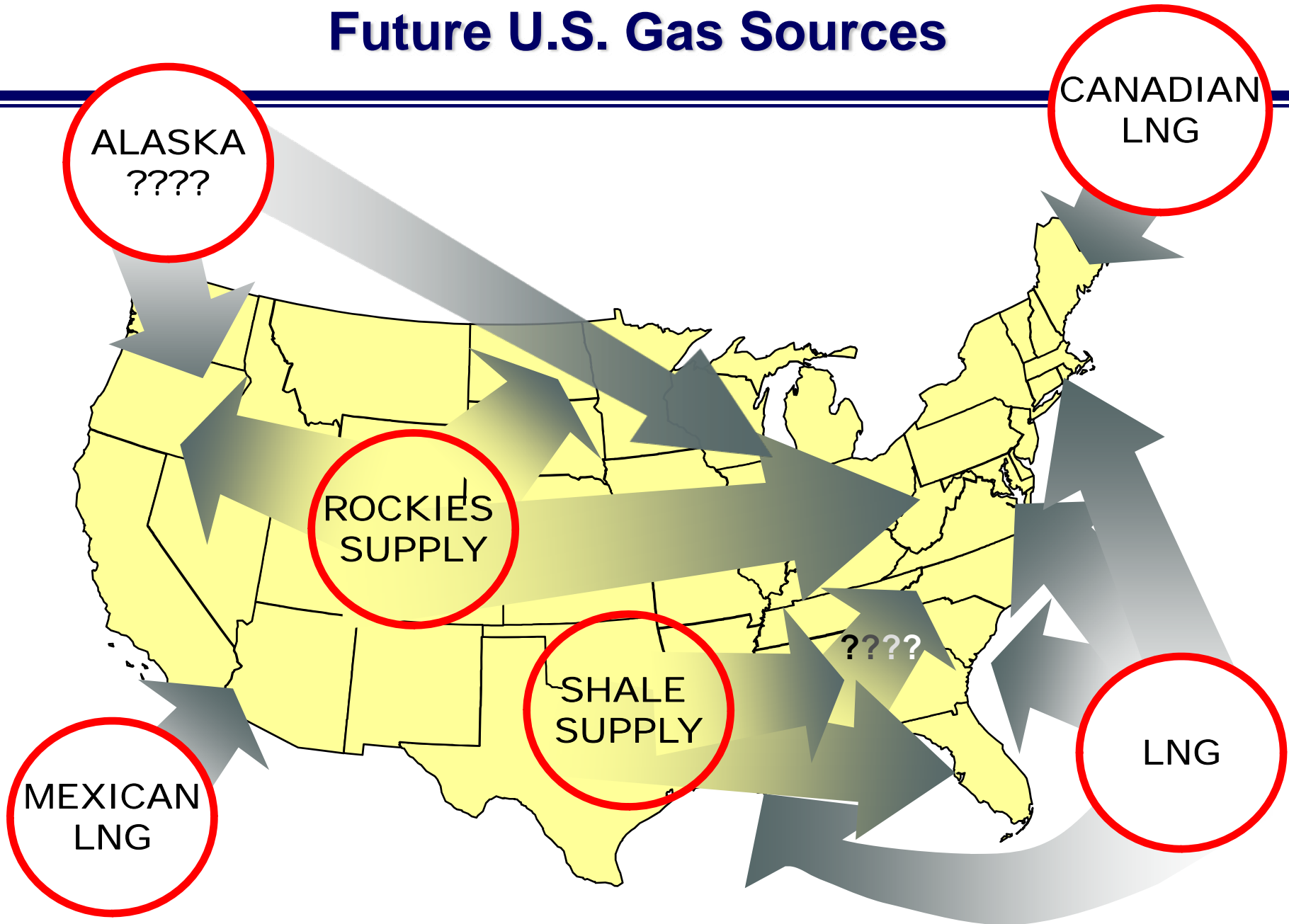
More Than Just Production and Canadian Imports Are Needed



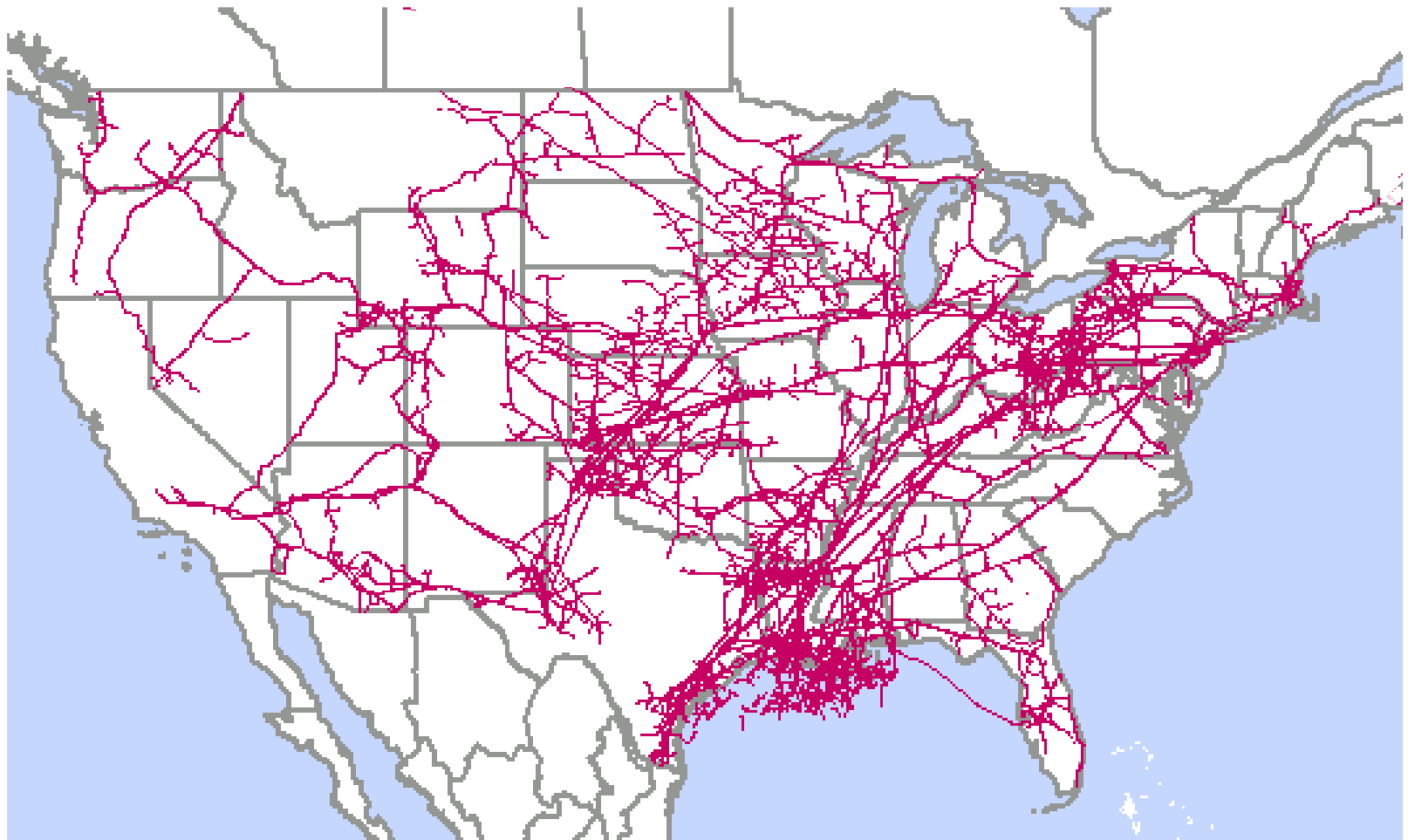
United States Supply Overview



Future U.S. Gas Sources



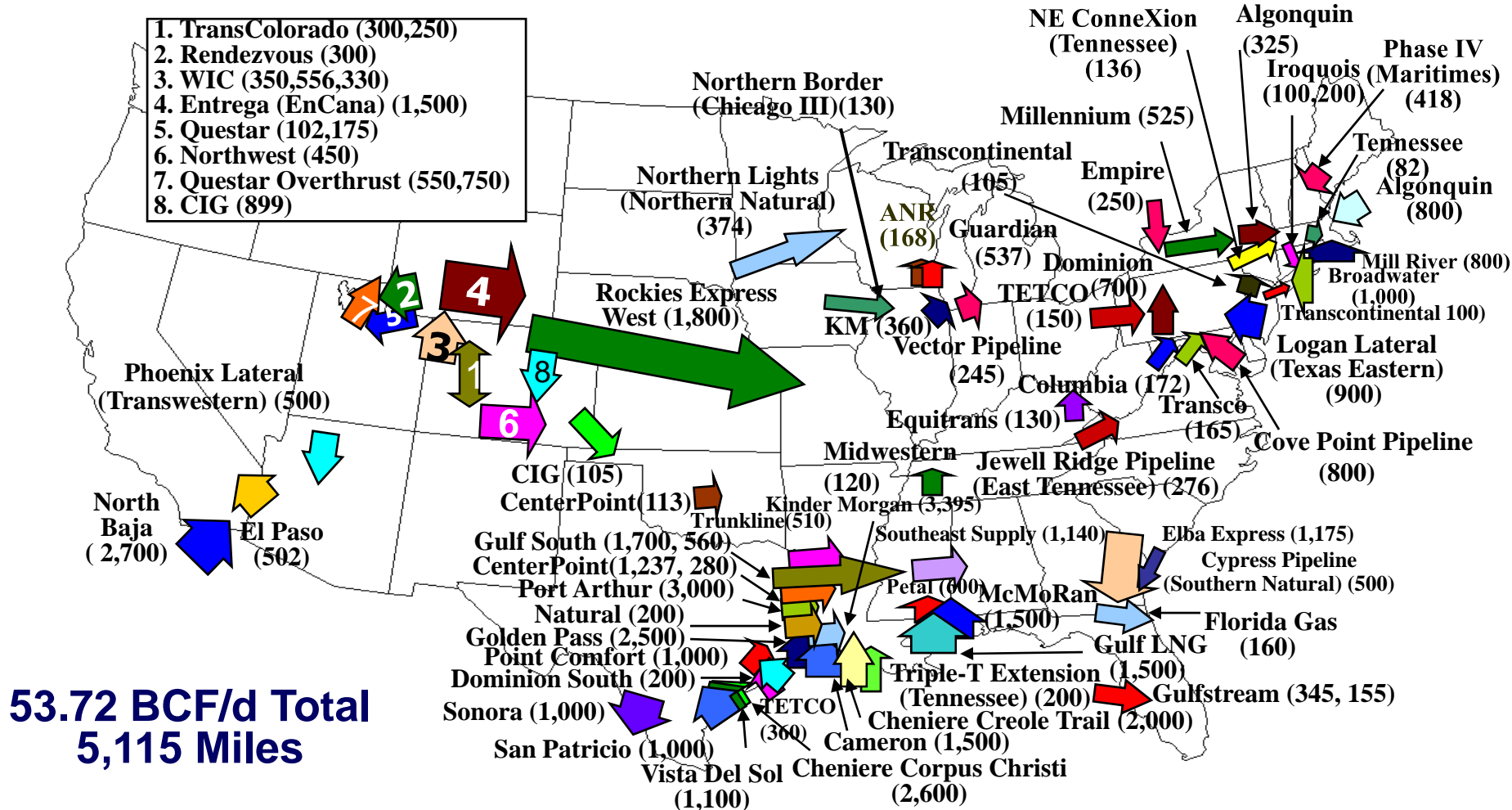
In the United States, there are over 213,000 miles of interstate natural gas transmission pipeline.



Source: Based on data from Ventyx Global Energy Decisions, Inc., Velocity Suite, April 2008.

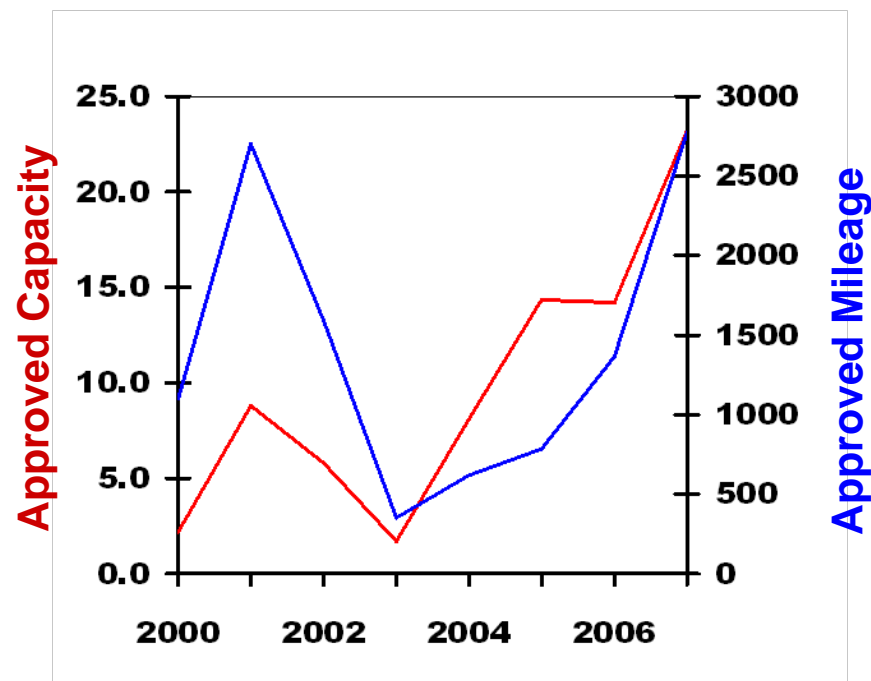
Major Pipeline Projects Certificated (MMcf/d)

January 2005 to March 2008



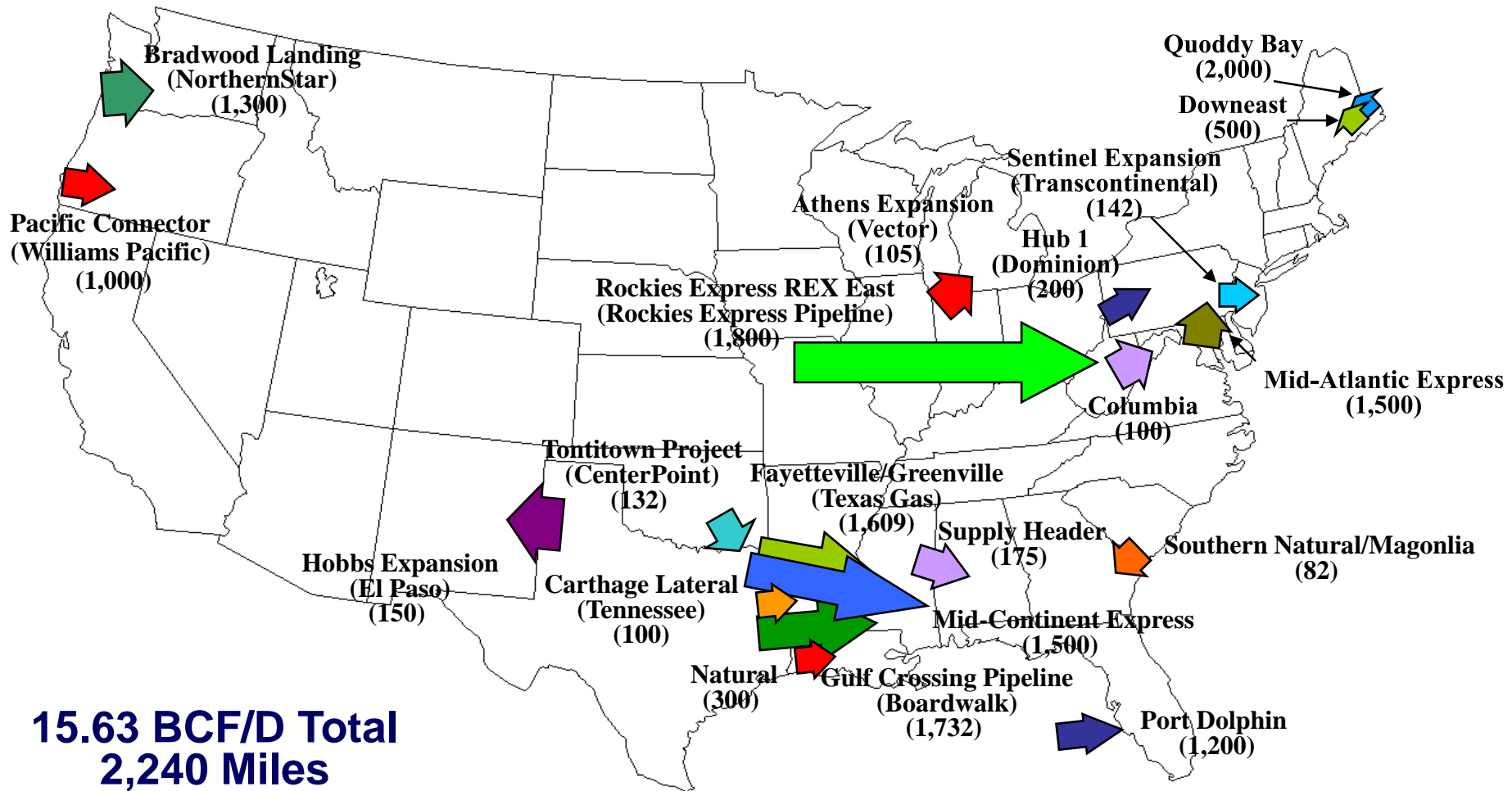
Purpose of Pipeline Construction Varies Over Time

	Capacity (Bcf/day)	Miles of Pipe	Compression (HP)	Cost (Bil \$)
2000	2.2	1,102.8	151,096	0.8
2001	8.8	2,700.3	870,767	4.4
2002	5.8	1,590.0	560,064	3.1
2003	1.7	352.4	221,545	1.0
2004	8.1	619.3	83,538	1.2
2005	14.3	785.1	123,036	1.9
2006	14.2	1,363.6	329,657	4.2
2007	23.2	2,772.7	849,110	8.1
2008	2.1	194.4	30,900	0.4
Total	80.4	11,480.6	3,219,713	25.1



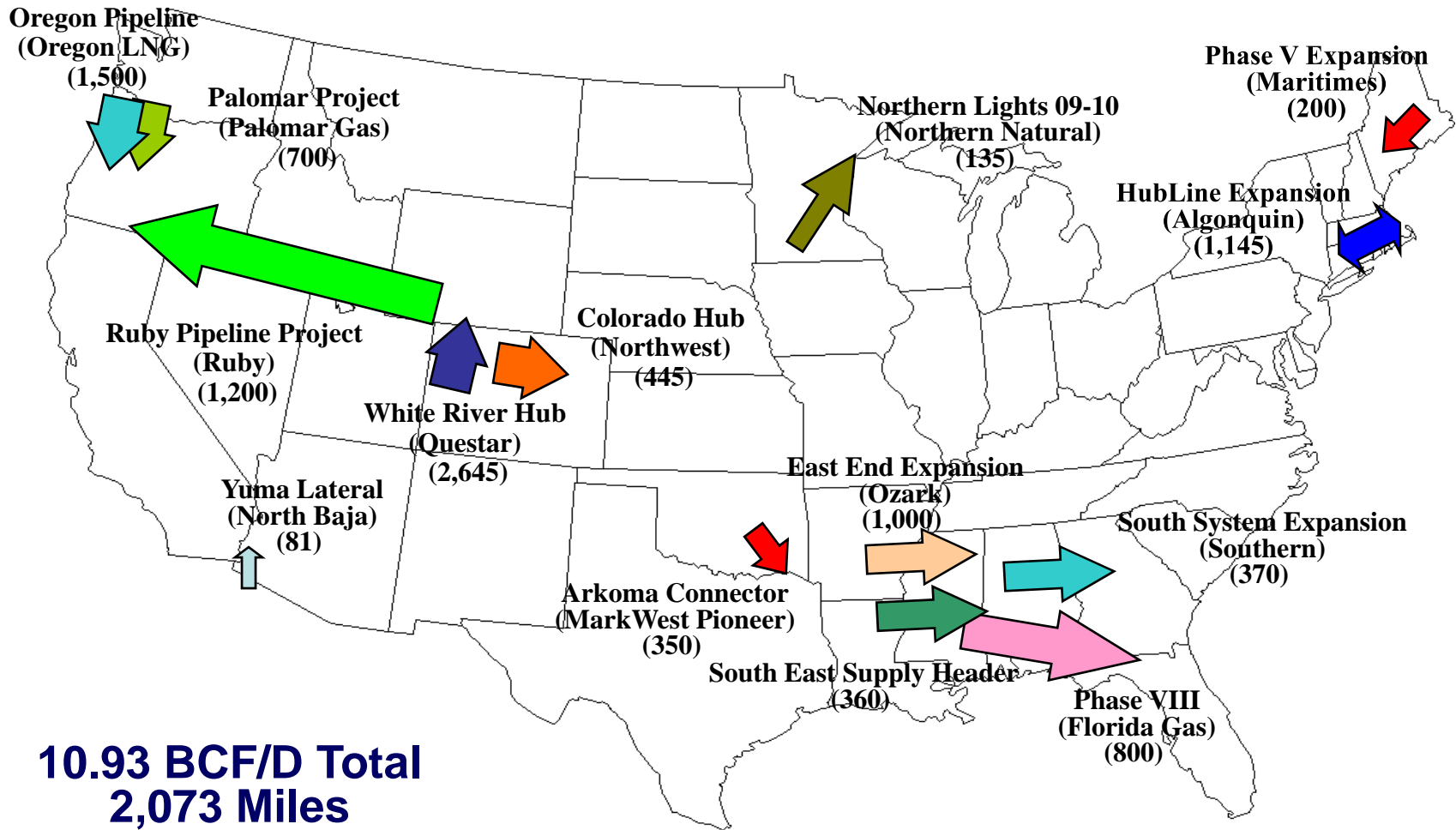
Major Pipeline Projects Pending (MMcf/d)

April 2008



Major Pipeline Projects Pre-Filing (MMcf/d)

April 2008



Major Pipeline Projects On The Horizon (MMcf/d)

April 2008

Alaska (4,500)

Panhandle Eastern (750)
 Kinder Morgan (360)
 Kinder Morgan (170)
 Northern Natural (82)
 Hub III (Dominion) (570)
 Williston Basin (20)
 REX East Exp. (1,000)
 Texas Eastern (150)
 Trunkline (650)
 Seminole (80)

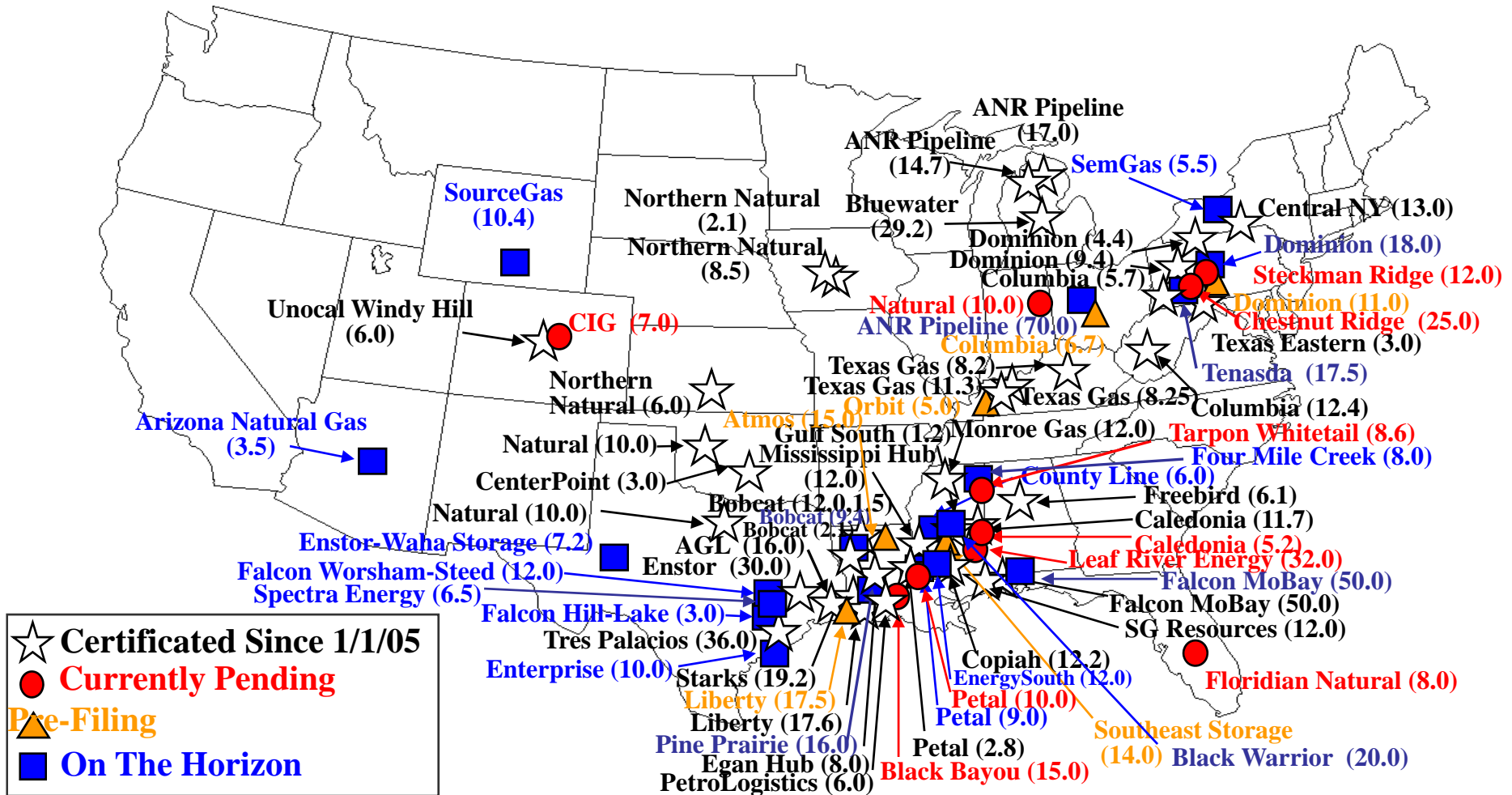
Northeast Expansion (NFG) (500)
 MetroExpress (Iroquois) (300)
 Northeast Express (Rockies) (1,500)
 Tennessee (1,100)
 New Penn (Nisource) (500)
 Texas Eastern (325)
 Rockies Connector (Williams) (688)
 East-West Connector (NFG) (750)

Paso Norte Pipeline Project (380)
 Greasewood Lateral (Northwest) (200)
 Piceance Lateral Expansion (WIC) (230)
 Eastern & Western Flow Path (Questar) (2,000)
 White River Lateral (Questar) (810)
 Pathfinder (TransCanada) (1,200)
 Bison Pipeline (Northern Border) (400)
 Blue Bridge (Williams) (500)
 Sunstone Pipeline (Williams) (1,200)
 Sundance Trail (Northwest) (150)
 Bronco Pipeline (Spectra) (1,000)
 Kern River (500)

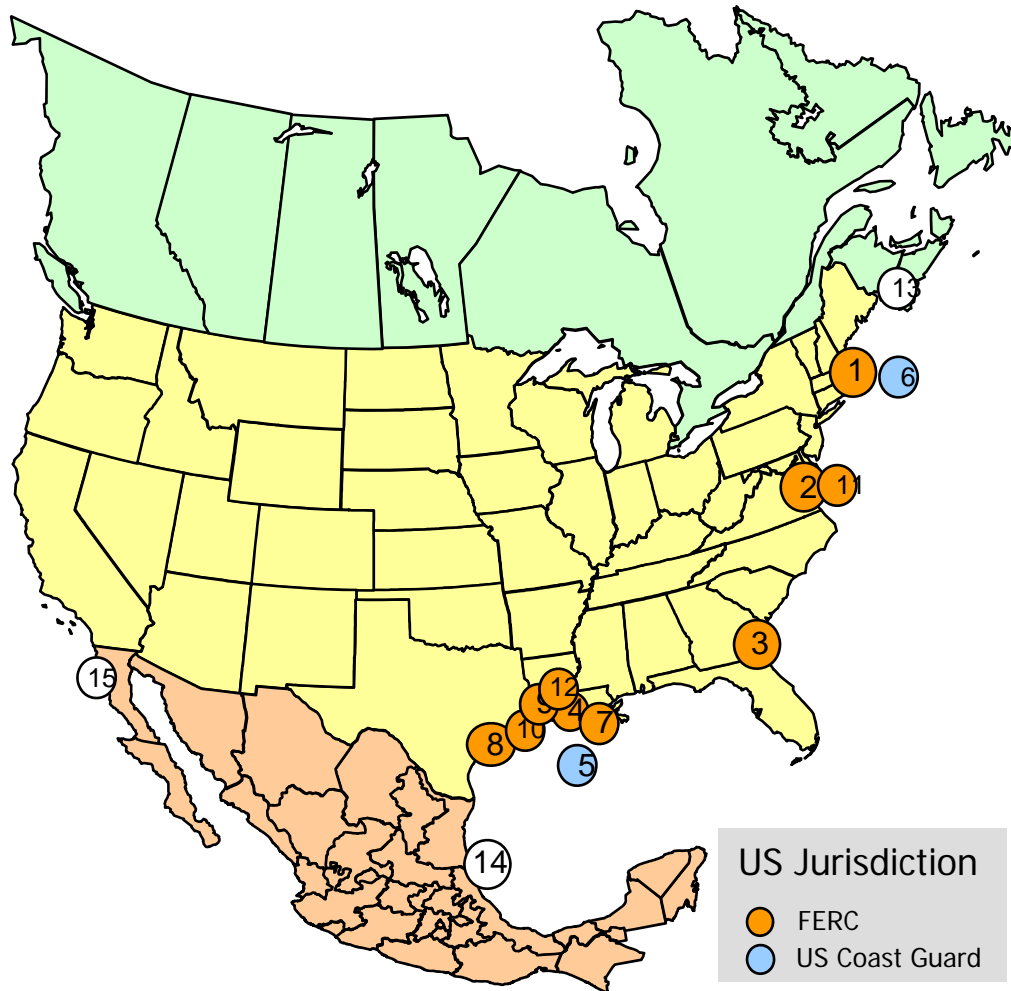
A/G Line Expansion (Natural) (139)
 Transcontinental (Mobile Bay) (700)
 Transcontinental (Pascagoula Exp) (467)
 Transcontinental (85 North Expansion) (250)
 Mobil Bay South (Williams) (700)
 Enogex Pipeline (Southern Star) (100) Gulfstream (750)
 Greenway Expansion (East Tennessee) (450)
 Centerville Expansion (Columbia Gulf) (235)
 Worsham-Steed (Falcon Gas) (150)
 Gulf Coast Connector (NGS) (2,000)
 800 Line Expansion (Tennessee) (400)
 Henry Hub Expansion (Trunkline) (600)
 Houston Market (KM Interstate) (400)
 Highland Trails (Southern Star) (1,000)
 Henry Hub (Columbia Gulf) (200)
 Eagle Hub Project (Lehman) (2,000)
 Shenzi Lateral (Enbridge) (100)

33.21 BCF/D Total
5,473 Miles

All Storage Projects (Capacity in Bcf)



North American LNG Terminals Potentially In Service by 2010



U.S.

1. Everett, MA : 1.035 Bcfd (SUEZ LNG - DOMAC)
2. Cove Point, MD : 1.0 Bcfd (Dominion - Cove Point LNG)
3. Elba Island, GA : 1.2 Bcfd (El Paso - Southern LNG)
4. Lake Charles, LA : 2.1 Bcfd (Southern Union - Trunkline LNG)
5. Gulf of Mexico: 0.5 Bcfd, (Gulf Gateway Energy Bridge - Excelerate Energy)
6. Offshore Boston, MA: 0.8 Bcfd (Northeast Gateway - Excelerate Energy)
7. Hackberry, LA: 1.8 Bcfd (Cameron LNG - Sempra Energy)
8. Freeport, TX: 1.5 Bcfd, (Cheniere/Freeport LNG Dev.)
9. Sabine, LA: 2.6 Bcfd (Sabine Pass Cheniere LNG)
10. Sabine, TX: 2.0 Bcfd (Golden Pass - ExxonMobil)
11. Cove Point, MD : 0.8 Bcfd (Dominion - Expansion)*
12. Sabine, LA: 1.4 Bcfd (Sabine Pass Cheniere LNG – Expansion)

Canada

13. St. John, NB: 1.0 Bcfd, (Canaport – Irving Oil)

Mexico

14. Altamira, Tamulipas: 0.7 Bcfd, (Shell/Total/Mitsui)
15. Baja California, MX: 1.0 Bcfd, (Costa Azul - Sempra)

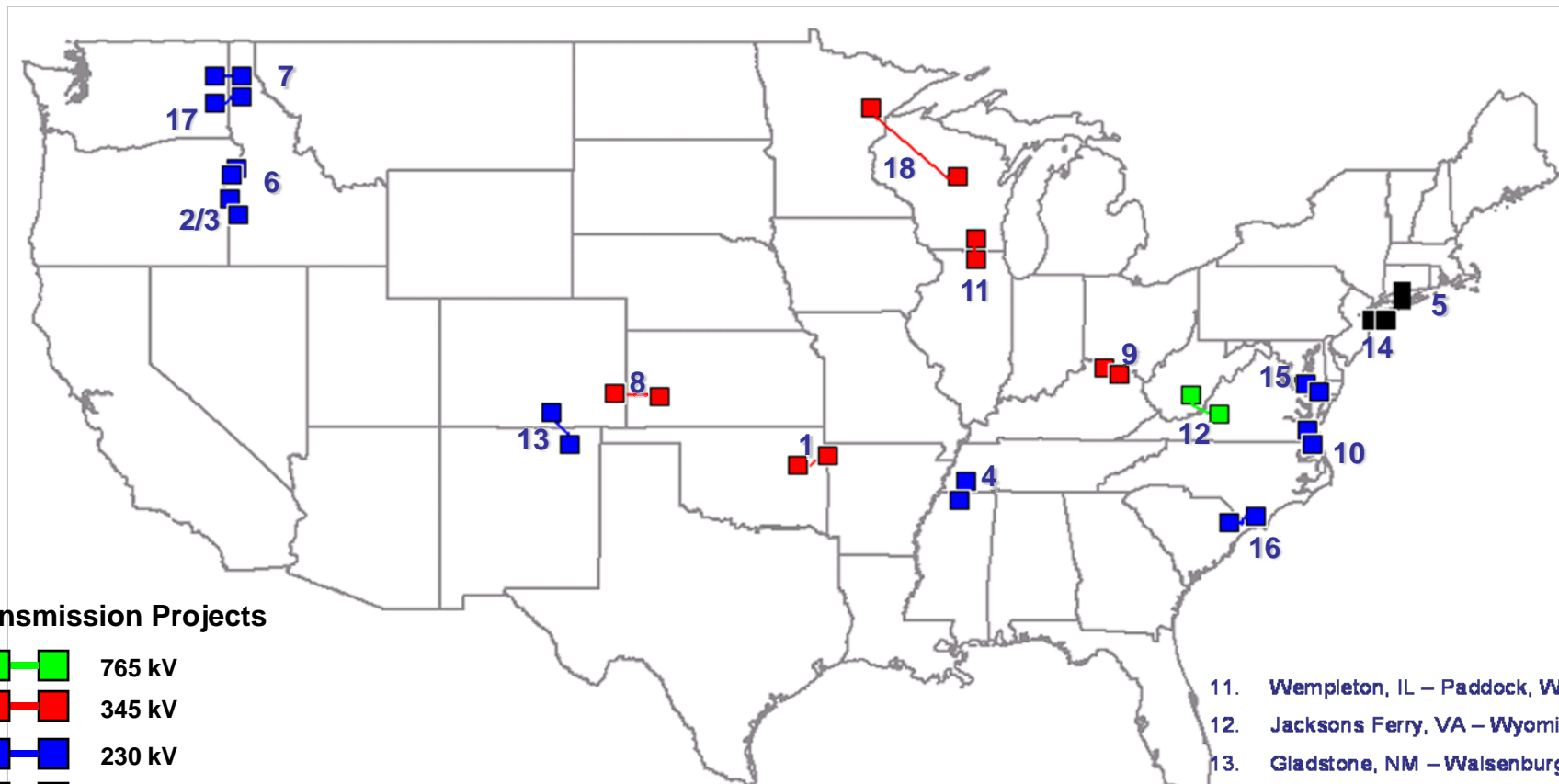
US Jurisdiction

- FERC
- US Coast Guard

* Expansion of an existing facility

As of April 14, 2008

Since January 1, 2000, 18 interstate electric transmission lines have been built totaling 917 miles.



Transmission Projects

- 765 kV
- 345 kV
- 230 kV
- DC

- | | | |
|---|-------------------------------------|---|
| 1. Clarksville, OK - Chamber Springs Rd, AR | 6. Brownlee, ID – Oxbow, OR | 11. Wempleton, IL – Paddock, WI |
| 2. Caldwell, ID – Ontario, OR | 7. Rathdrum, ID - Beacon, WA | 12. Jacksons Ferry, VA – Wyoming, WV |
| 3. Paddock, ID - Ontario, OR | 8. Lamar, CO – Holcomb, KS | 13. Gladstone, NM – Walsenburg, CO |
| 4. Freeport, TN – Horn Lake, MS | 9. Spurlock, KY - Stuart/Zimmer, OH | 14. Neptune Project |
| 5. Cross Sound Cable | 10. Fentress, VA – Shawboro, NC | 15. Palmers Corner, MD – Potomac Rvr PP |
| | | 16. Marion, SC – Whiteville, NC |
| | | 17. Benewah, ID – Shawnee, WA |
| | | 18. Arrowhead, MN – Weston, WI |

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

FERC and Transmission

⇒ Section 1221 - Siting of Interstate Electric Transmission Facilities

- ⇒ New Section 216 of the FPA
- ⇒ FERC given authority to site interstate transmission after attempting to site at state level
 - Must be in corridors designated by DOE
 - Must render decision within 12 months of filing date
- ⇒ DOE delegated lead agency authority to FERC
- ⇒ MOU signed with DOE and seven other federal agencies to coordinate processing.
- ⇒ Order No. 689 issued by FERC on November 16, 2006
- ⇒ Final rule provides direction for filing an application
 - Pre-filing process
 - Application process

Final Observations

- Traditional gas supplies – domestic and Canadian imports are declining
- LNG could be a solution – if it is allowed
- There is some pipeline expansion expected to get the Rockies gas to the Northeast
- It would appear that expansion of the existing long lines from the Southeast to the Northeast will be necessary to get new sources to market
- Power generation will be increasingly dependent upon gas-fired generation
- Will need more activity on the electric transmission side to get the energy where it is needed.