

# Federal Energy Regulatory Commission



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## Pipeline Facilities - Major Projects, LNG and Storage

Interstate Pipeline Regulatory Committee

October 13, 2004

Michael J. McGehee, Chief, Branch I

Division of Pipeline Certificates

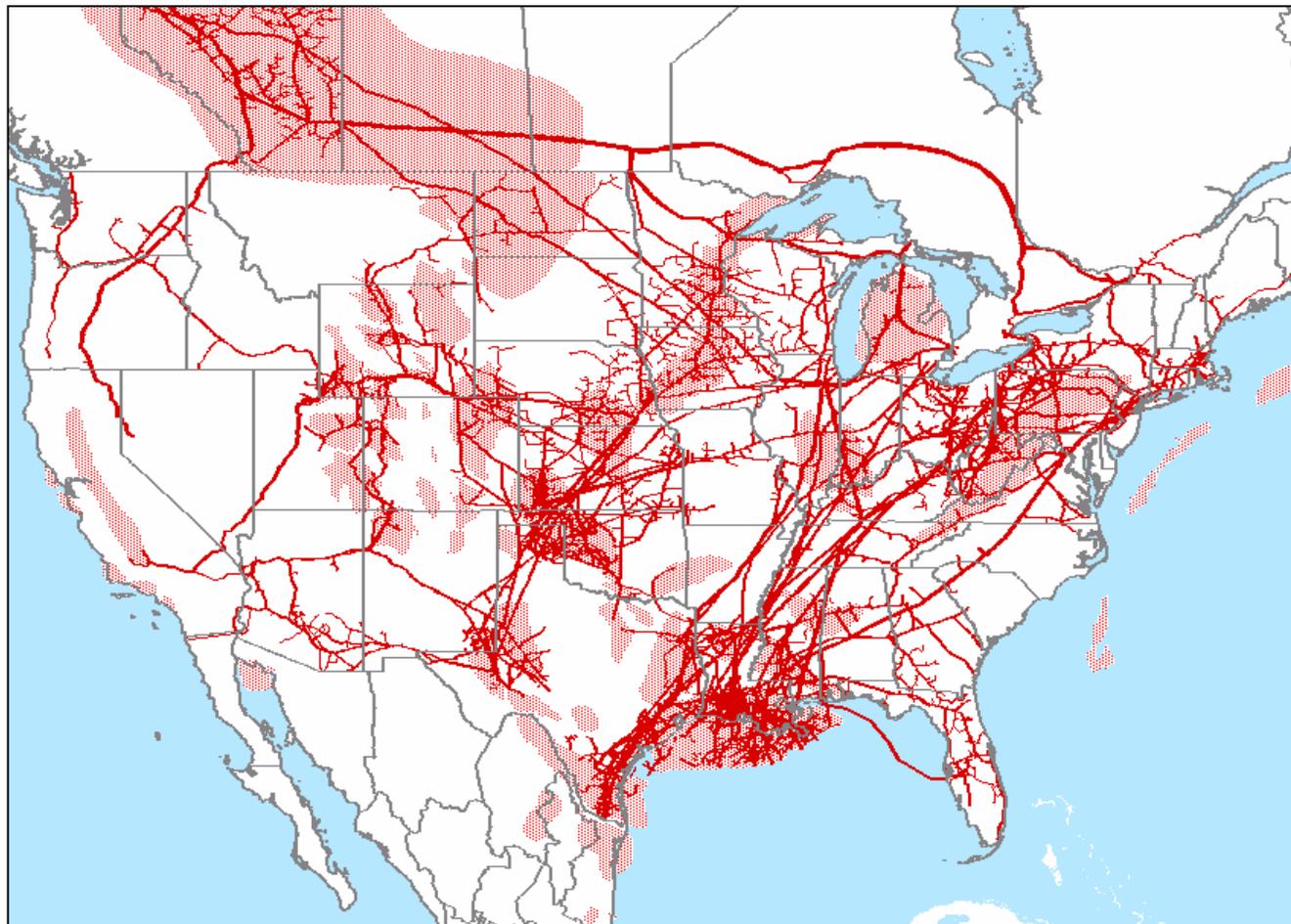
# Want to Build A Pipeline? Where?



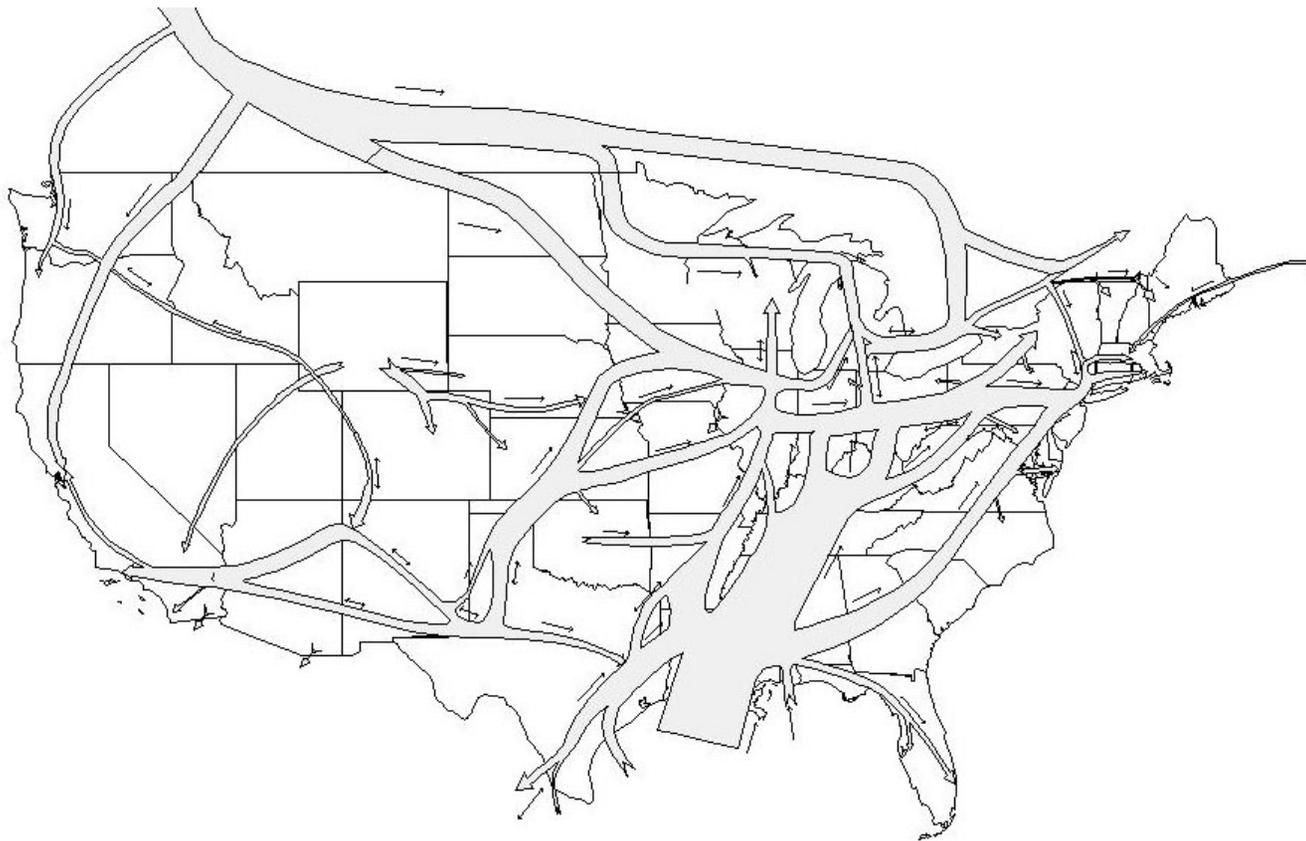
Frustrated?  
Feeling  
Hemmed In?

Don't Be. We're  
Here to Help!

# Major Interstate and Canadian Pipelines and Gas Production Areas



# North American Gas Paths



# Major Pipeline Construction Projects



# Major Pipeline Projects



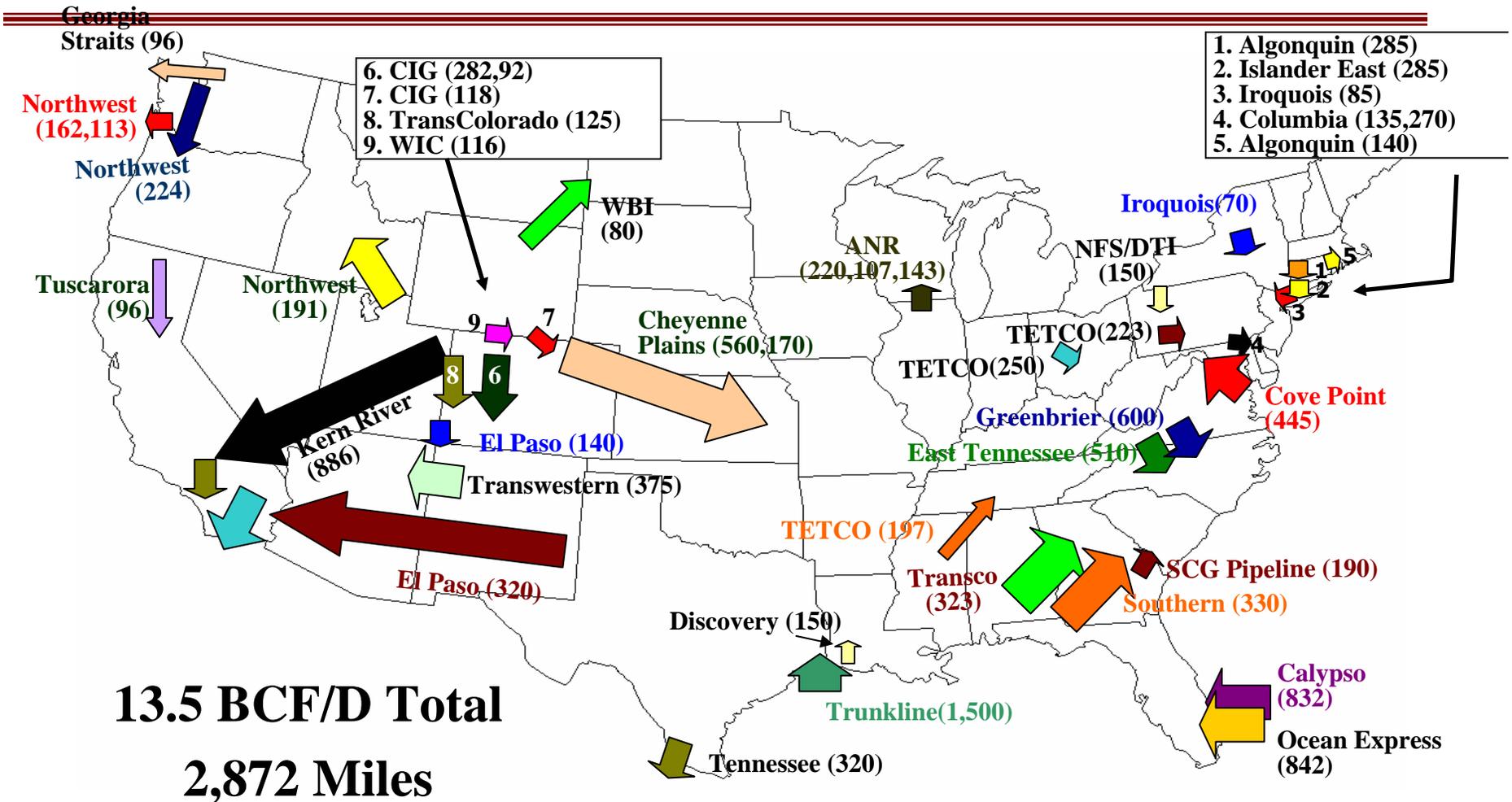
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**Certificated**  
**Currently Pending**  
**On The Horizon**

# Projects Certificated



# Major Pipeline Projects Certificated (MMcf/d) January 2002 to October 2004



# Currently Pending Projects

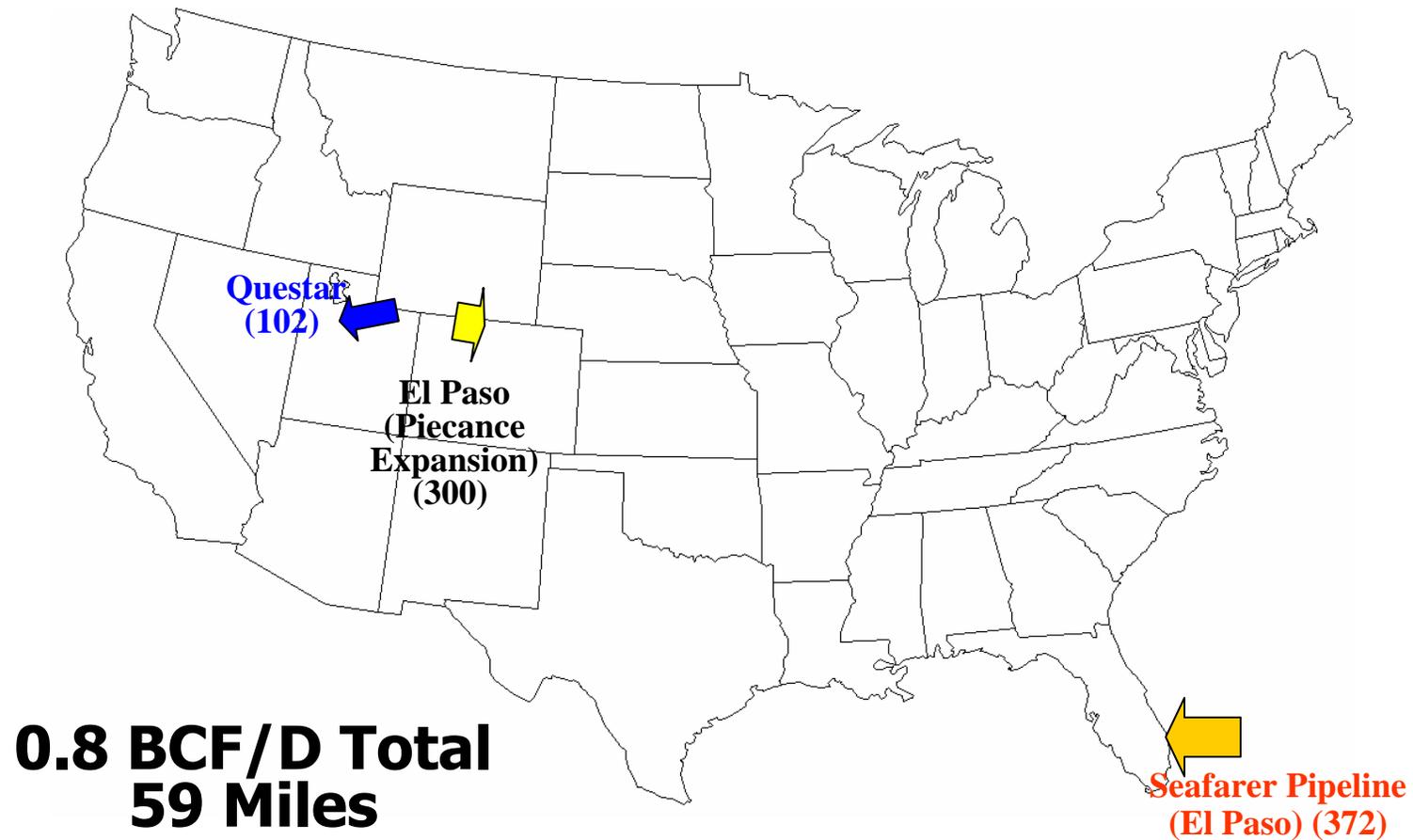




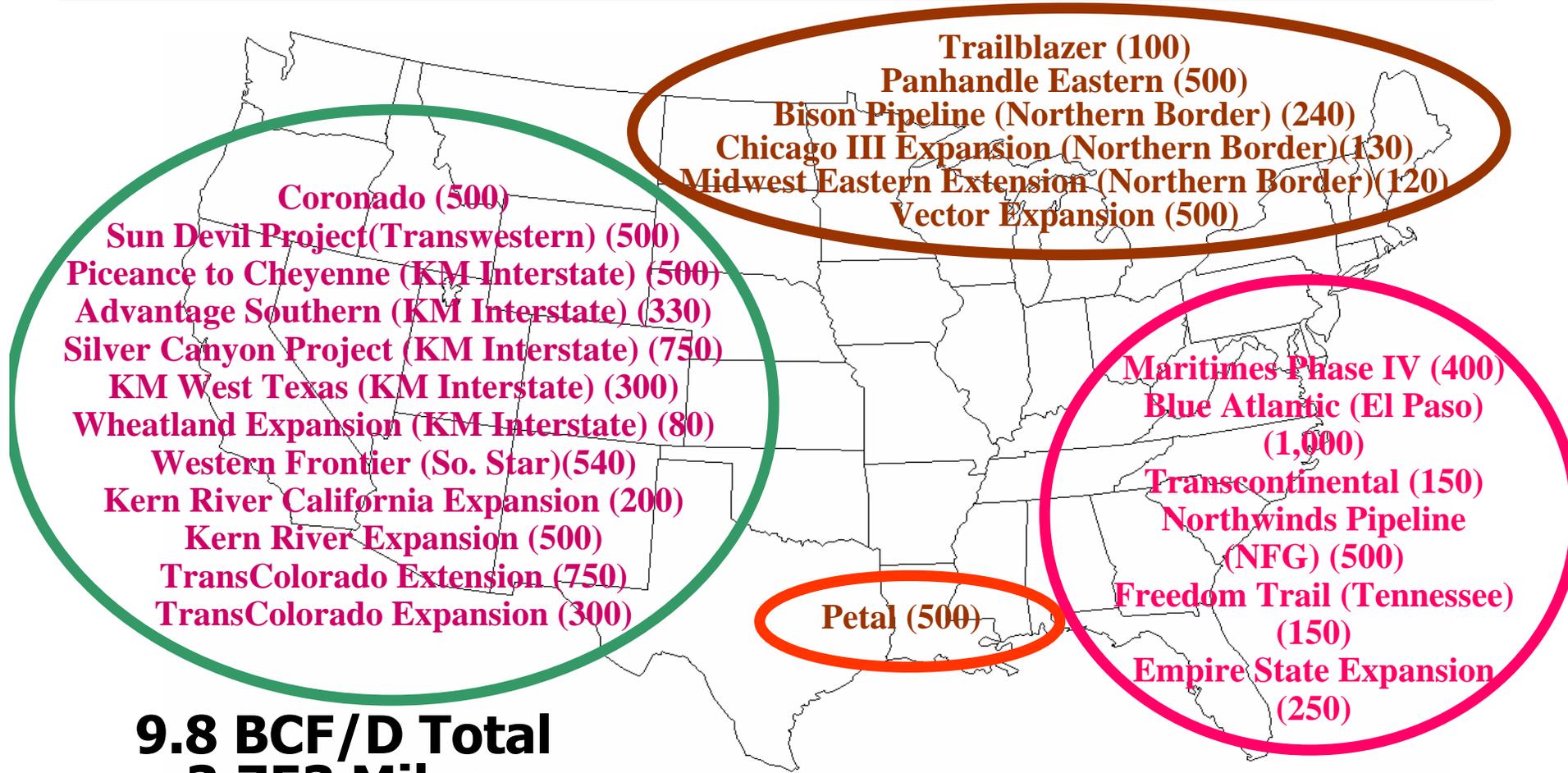
# On The Horizon



# Major Pipeline Projects in Pre-filing (MMcf/d) October 2004



# Major Pipeline Projects On The Horizon (MMcf/d) October 2004



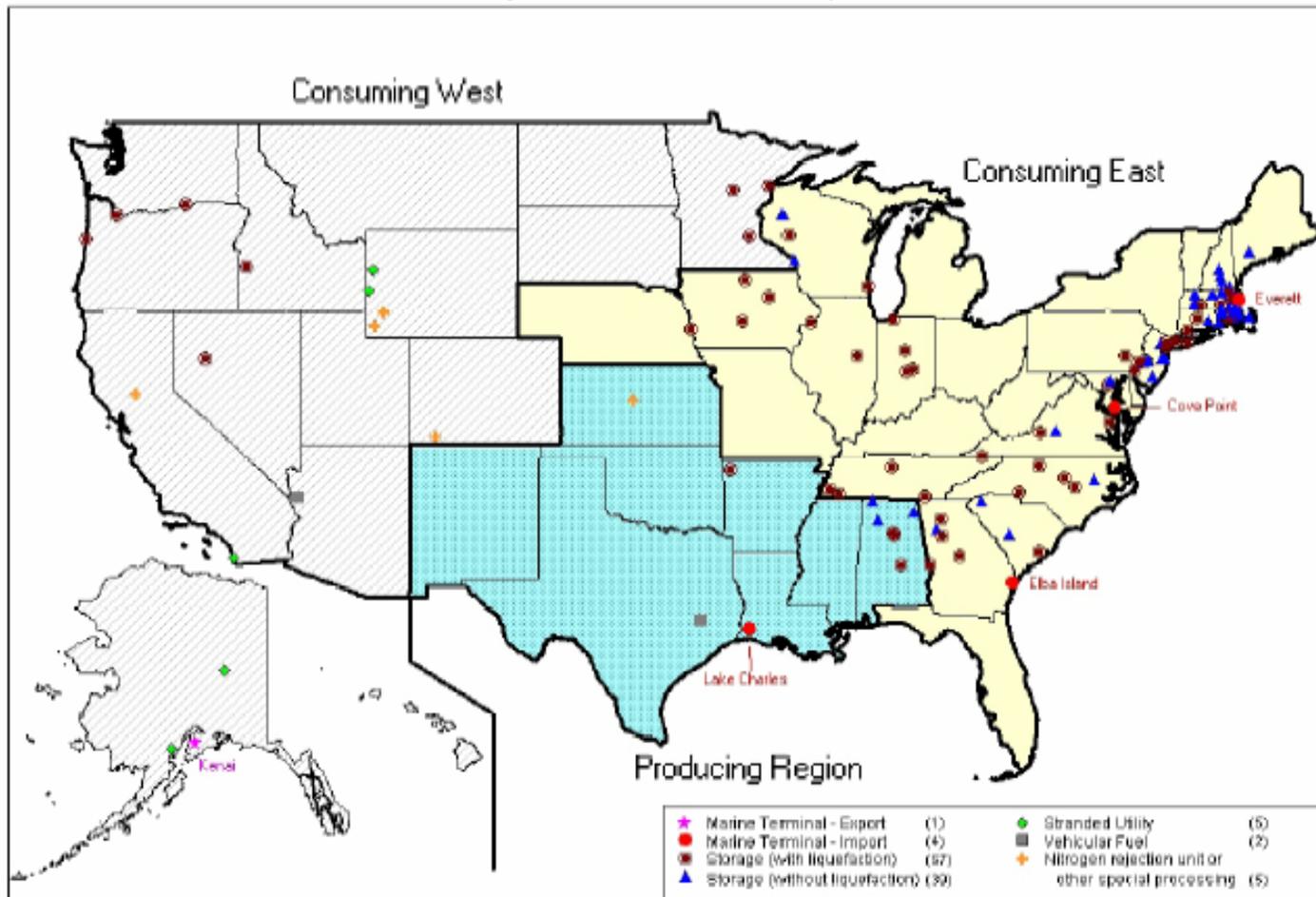
**9.8 BCF/D Total  
3,753 Miles**

# LNG Facilities



## New Terminals to Help Relieve Supply Shortage

# LNG in the US

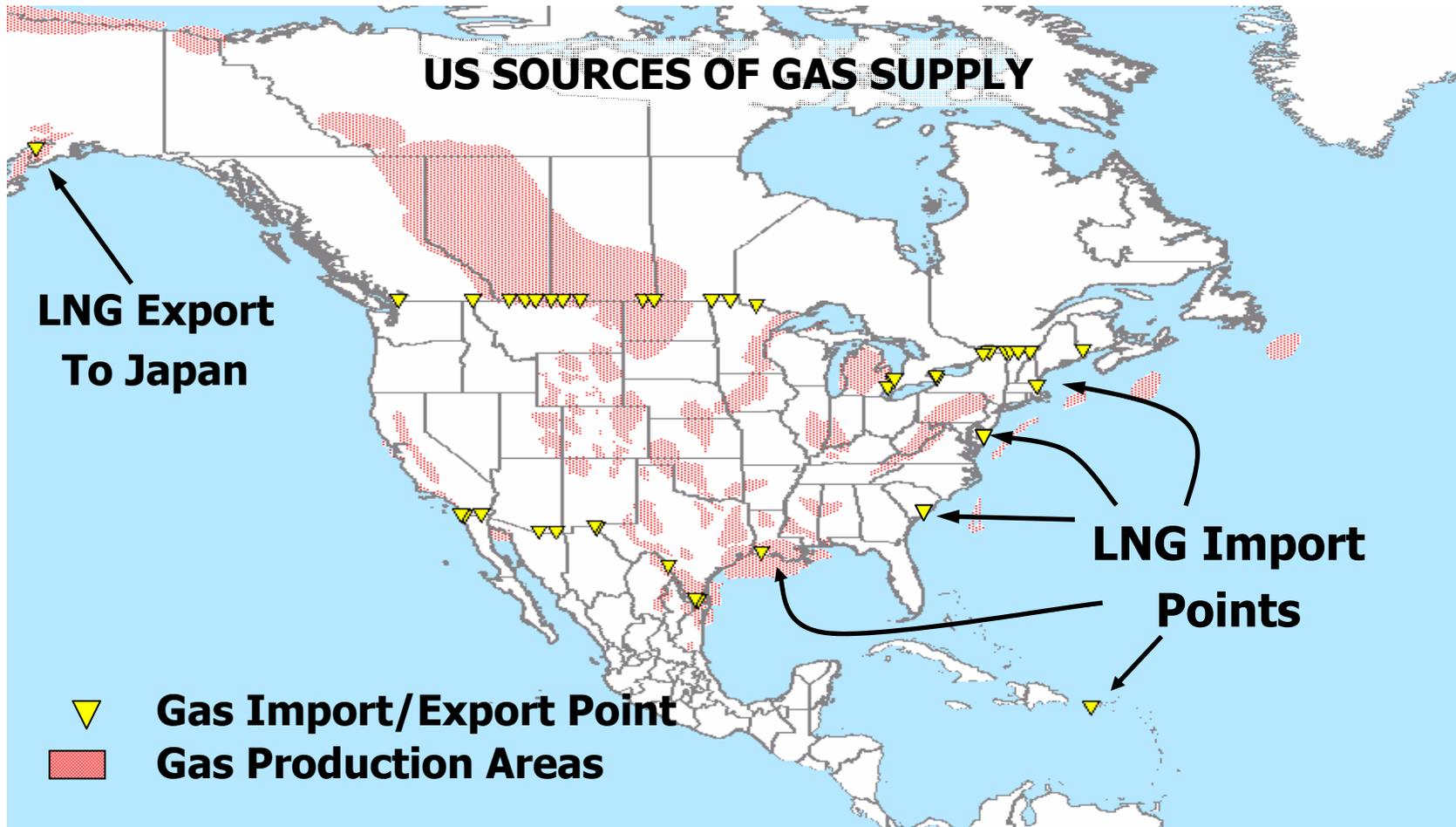


Source: EIA

# Existing LNG Terminals



# LNG Terminals



Source: Platts POWERMap, FERC

# NPC Study



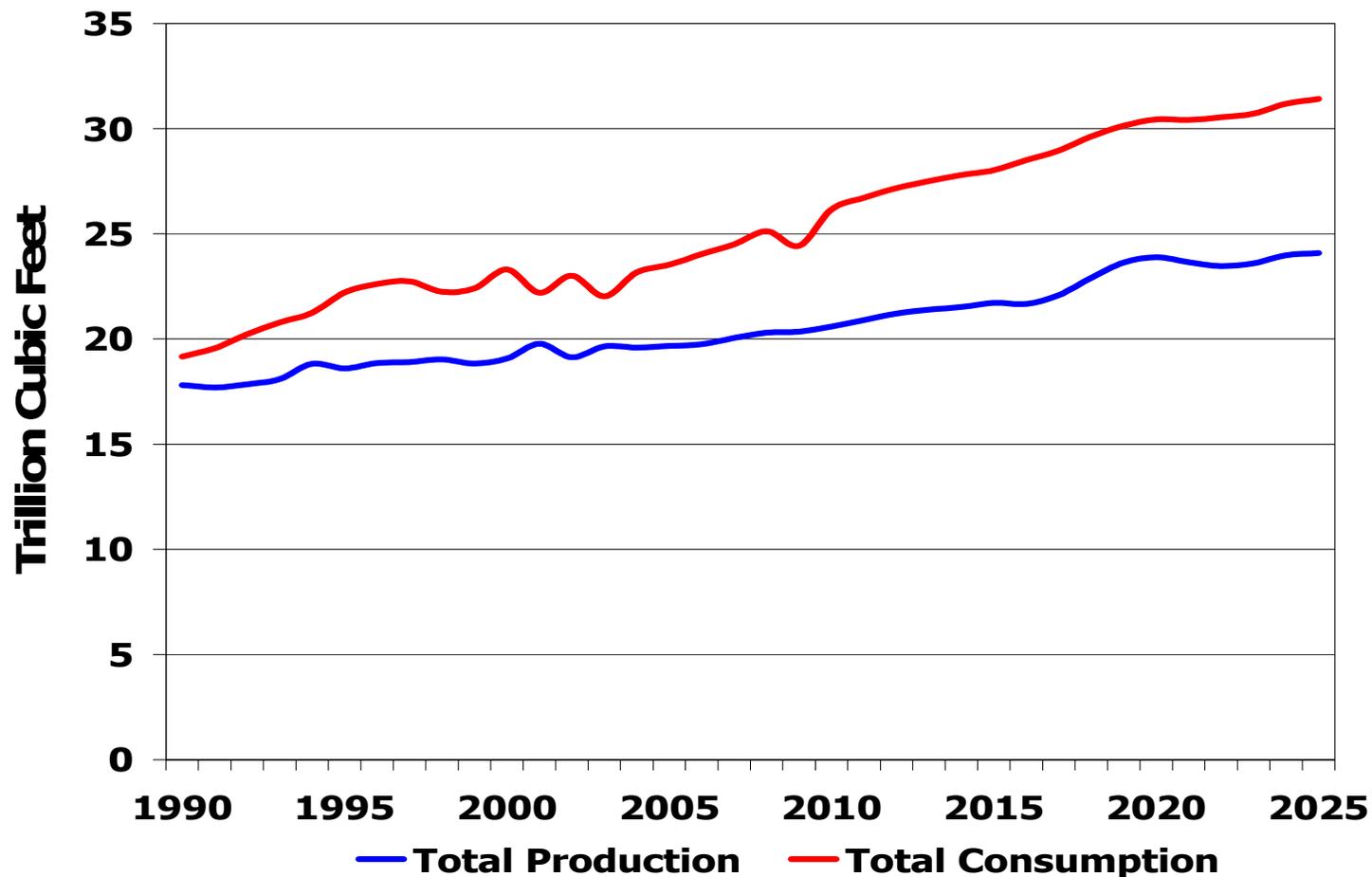
- 
- Align the conflicting policies
    - - Policies that encourage consumption
    - - Policies that inhibit gas supply

# Two Points



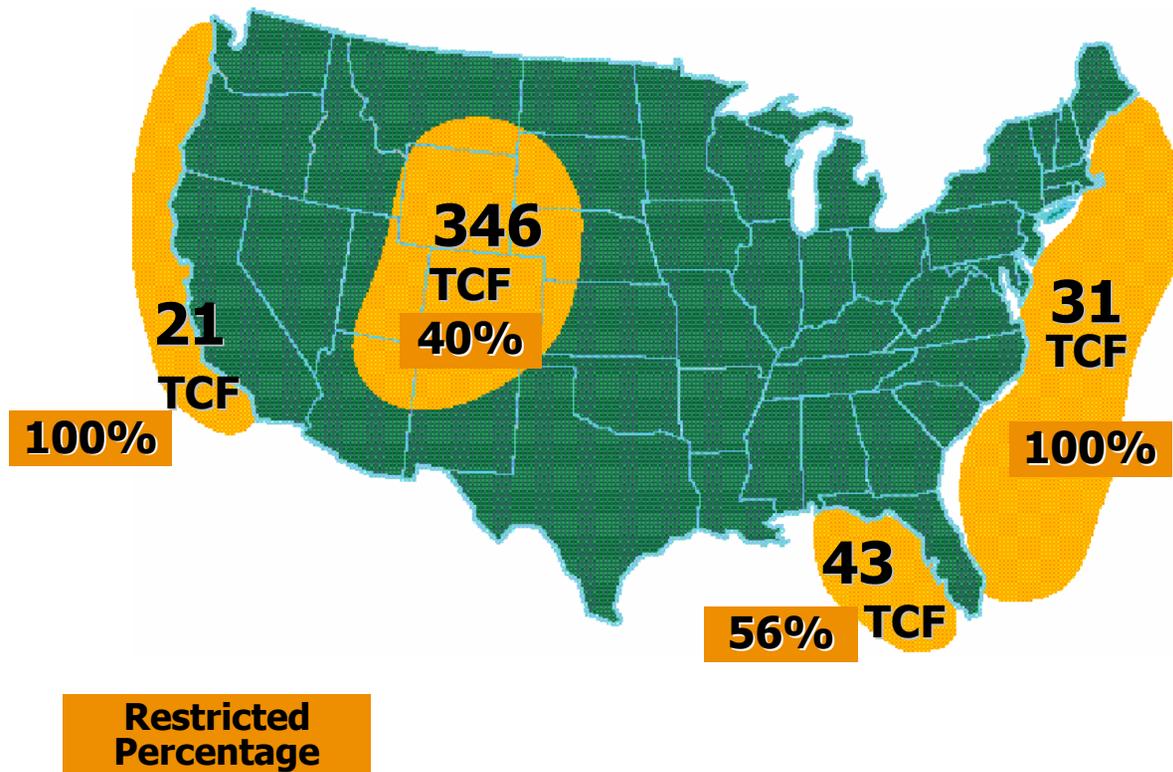
- 
- **Natural gas is the fuel of choice.**
  - **96% of natural gas reserves are outside North America.**

# Historic and Projected US Gas Production and Consumption



Source: EIA AEO 2004

# Some Production Areas Are Not Accessible



**\* Approximately 29 TCF Of The Rockies Gas Resources Are Closed To Development and 108 Tcf Are Available With Restrictions.**

Source: NPC

# What is the answer? Imports

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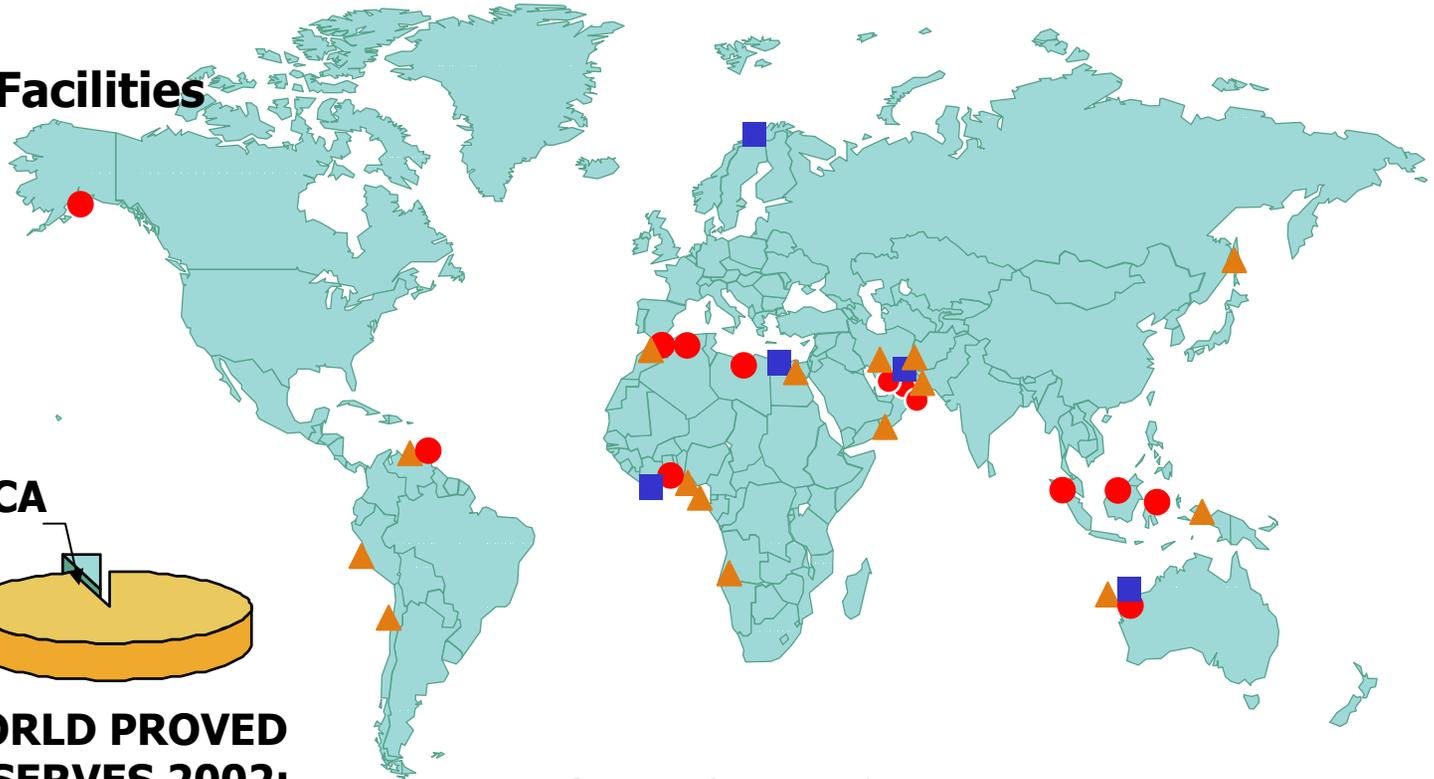
- Imports must make up the difference between domestic production and consumption
- Delivered in two ways:
  - Gaseous form by pipeline
  - Liquid form by tanker (LNG)

# How Much Natural Gas Is Out There?

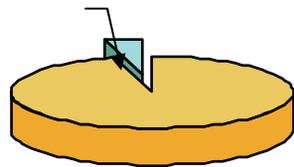


## Global LNG Supply Facilities

- Existing
- Under Construction
- ▲ Proposed



**NORTH AMERICA  
RESERVES  
4%**

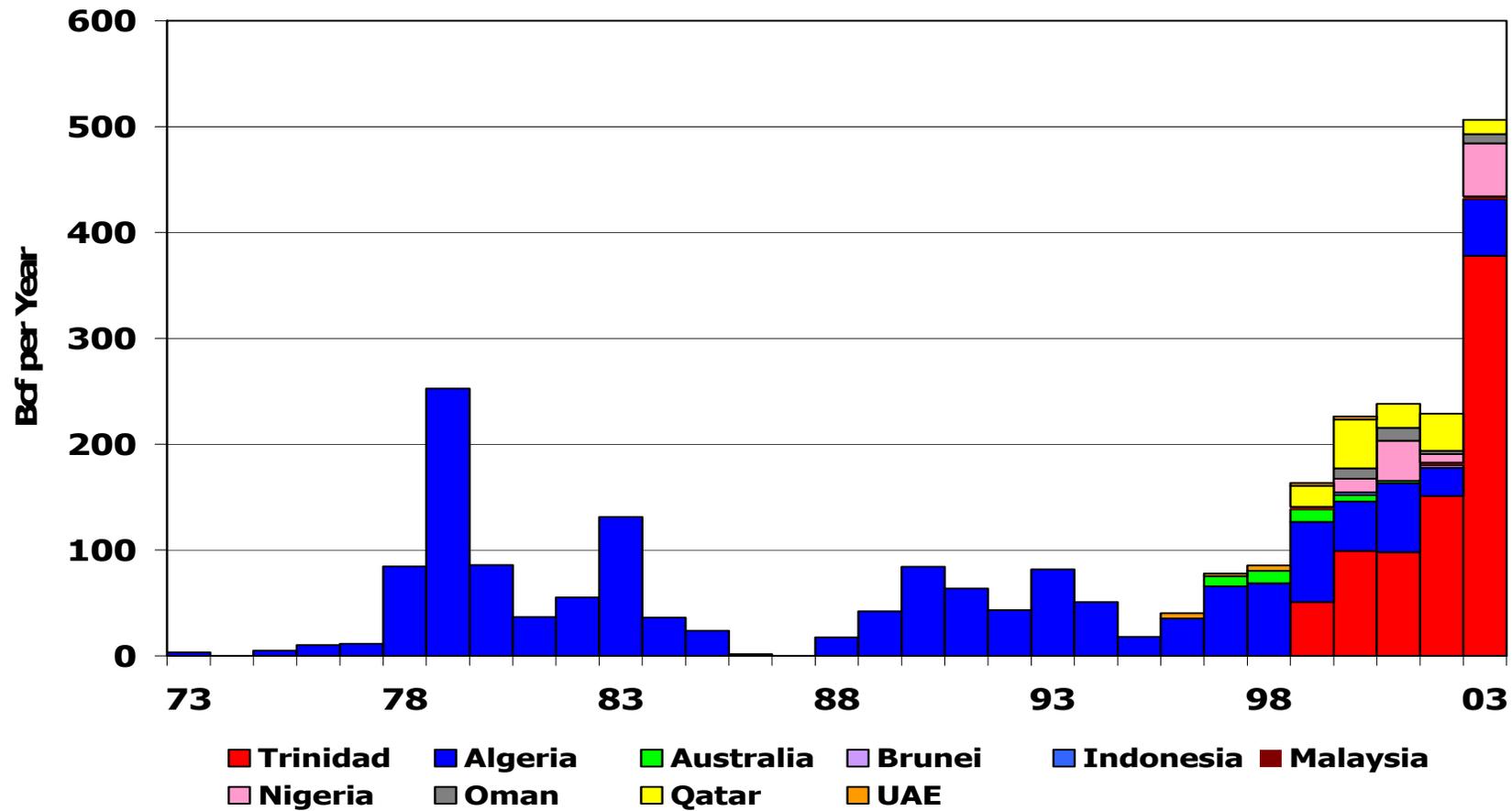


**WORLD PROVED  
RESERVES 2002:  
6,270 TCF**

- LNG supply growing
- Multiple LNG supply proposals announced
- Long term LNG supply outlook robust

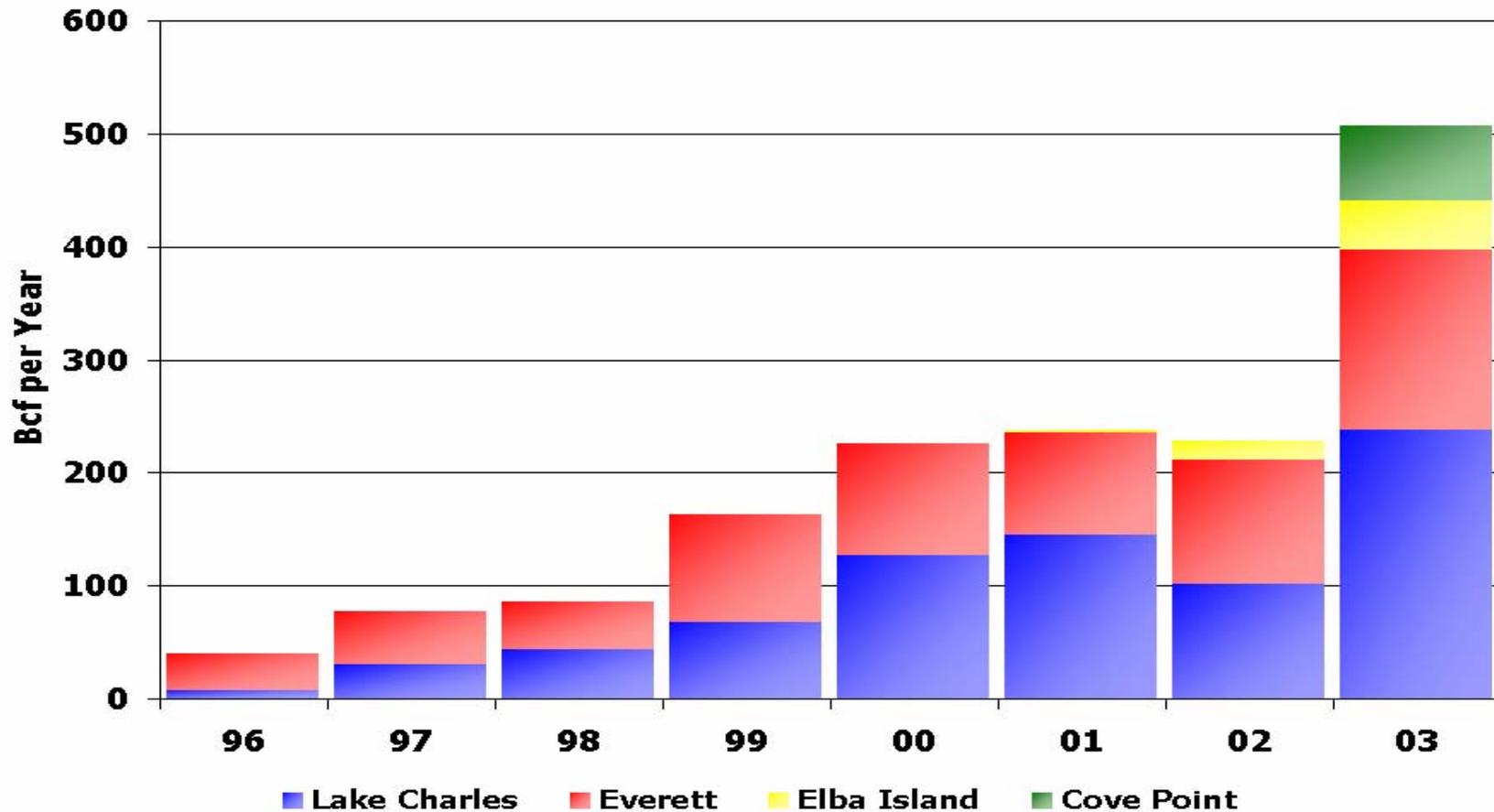
Source: Cedigaz, NPC

# LNG Imports by Country



Source: EIA

# LNG Imports by Point of Entry



Source: EIA, DOE/FE

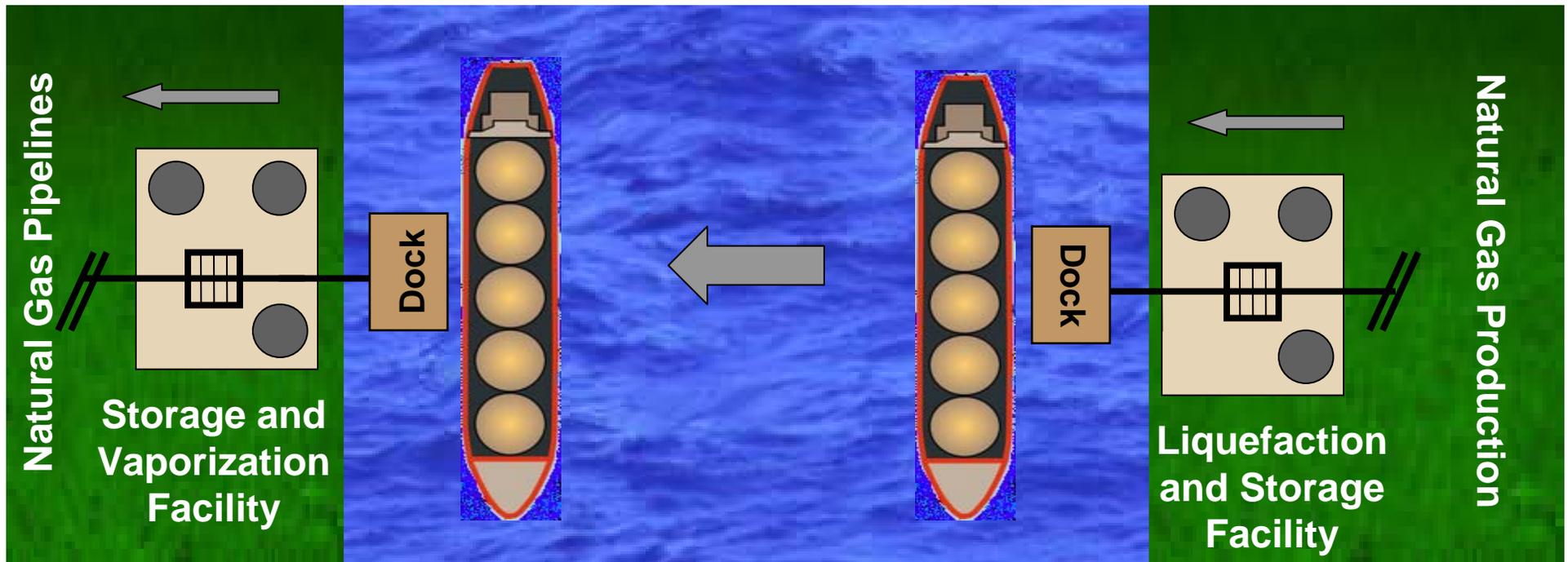
# Maritime Security Act of 2002 (November 2002)

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- Amendment of the Deepwater Port Act of 1974
  - Transferred jurisdiction of offshore natural gas facilities from FERC to Maritime Administration and Coast Guard.
- Lowers Regulatory Hurdles
  - No requirement for open access to terminal.
  - Decision required within 365 days.

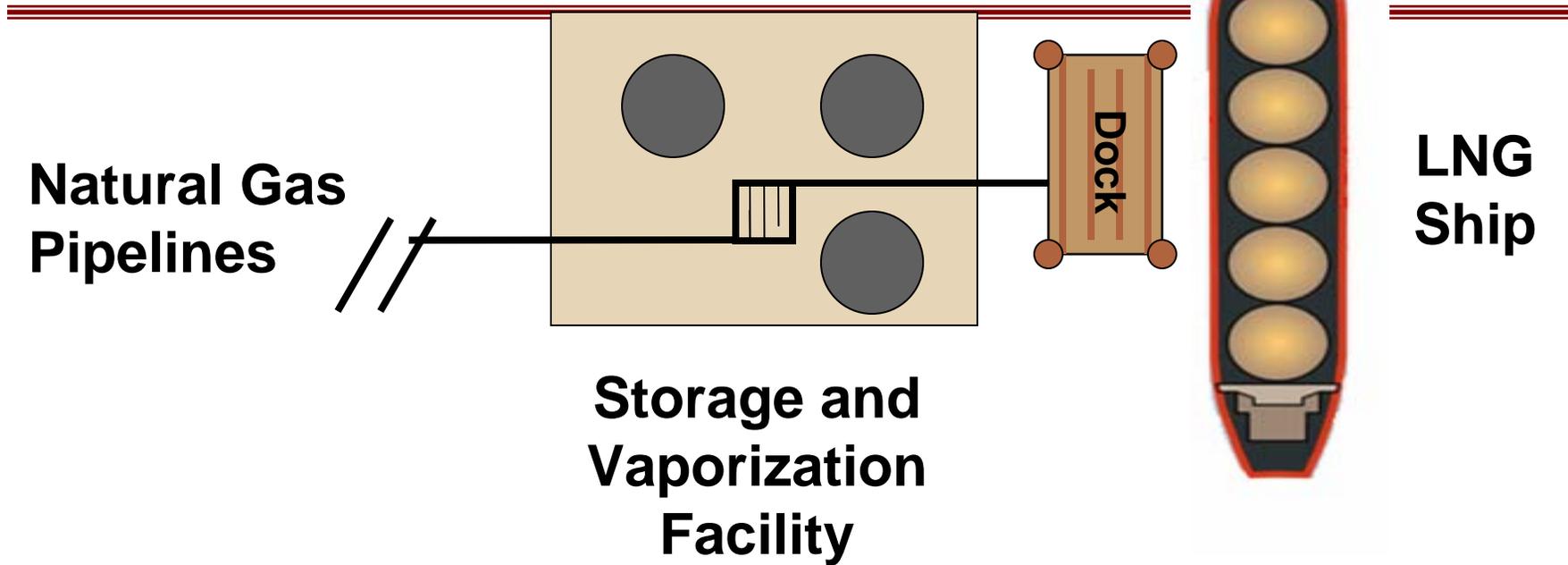
# LNG Supply Stream -- From Production to Distribution



# Economic Oversight – Access to LNG Terminal



Liquid to Vapor Flow



**New FERC Policy – Hackberry Case**  
**NO oversight for access, rate or tariff for LNG terminals;**  
**vaporized LNG competes with unregulated domestic supply.**

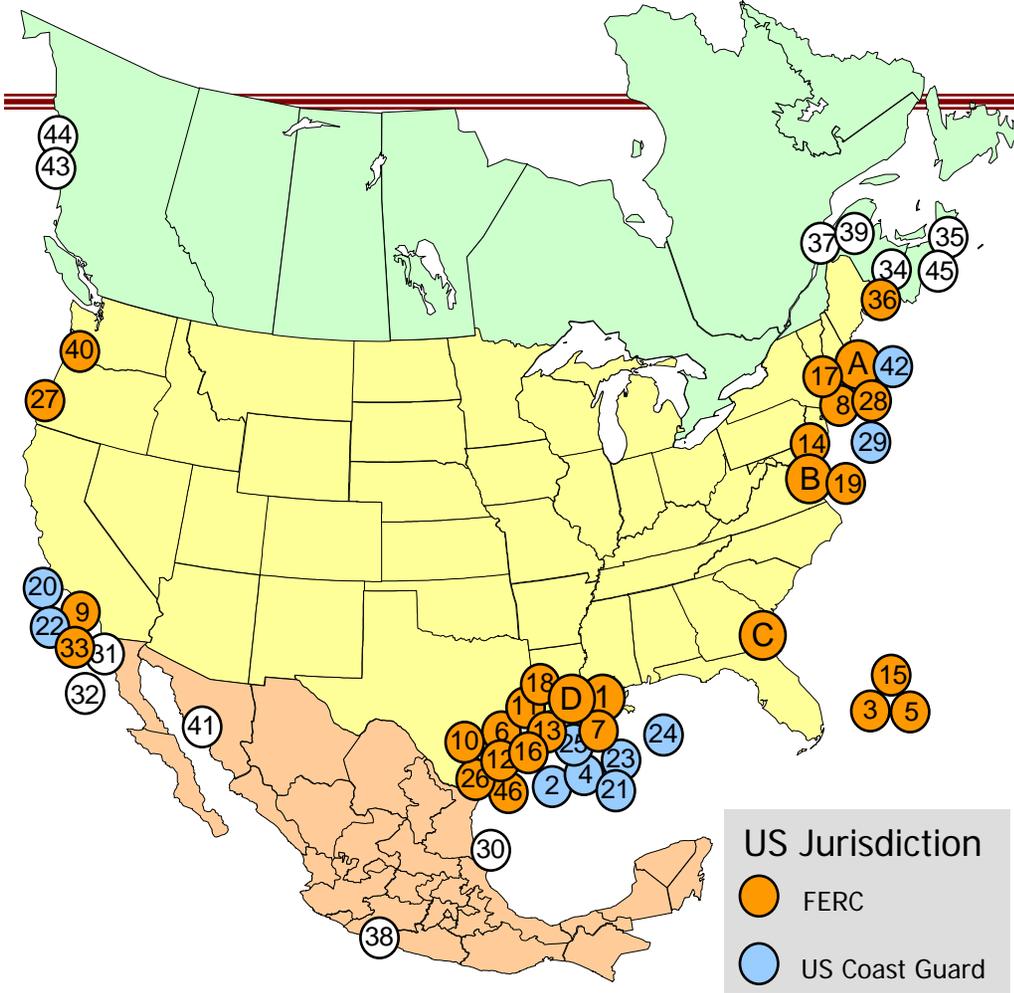
# Benefits of the New LNG Policy

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- Stimulates development of new LNG terminals
- Accommodates various business models
- Increases gas supplies to the U.S.
- Maintains FERC's responsibility for environmental and safety reviews.

# Existing and Proposed North American LNG Terminals



October 2004

\* US pipeline approved; LNG terminal pending in Bahamas

**Existing Terminals with Approved Expansions**

- A. Everett, MA : 1.035 Bcfd (Tractebel – 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 : 1.2 Bcfd (Southern Union – Trunkline LNG)

**Approved Terminals**

- 1. Hackberry, LA : 1.5 Bcfd, (Sempra Energy)
- 2. Port Pelican: 1.6 Bcfd, (Chevron Texaco)
- 3. Bahamas : 0.84 Bcfd, (AES Ocean Express)\*
- 4. Gulf of Mexico: 0.5 Bcfd, (El Paso Energy Bridge GOM, LLC)
- 5. Bahamas : 0.83 Bcfd, (Calypso Tractebel)\*
- 6. Freeport, TX : 1.5 Bcfd, (Cheniere/Freeport LNG Dev.)
- 7. Lake Charles, LA: 0.6 Bcfd (Southern Union – Trunkline LNG)

**Proposed Terminals and Expansions – FERC**

- 8. Fall River, MA : 0.8 Bcfd, (Weaver's Cove Energy/Hess LNG)
- 9. Long Beach, CA : 0.7 Bcfd, (Mitsubishi/ConocoPhillips – Sound Energy Solutions)
- 10. Corpus Christi, TX : 2.6 Bcfd, (Cheniere LNG Partners)
- 11. Sabine, LA : 2.6 Bcfd (Cheniere LNG)
- 12. Corpus Christi, TX : 1.0 Bcfd (Vista Del Sol - ExxonMobil)
- 13. Sabine, TX : 1.0 Bcfd (Golden Pass - ExxonMobil)
- 14. Logan Township, NJ : 1.2 Bcfd (Crown Landing LNG – BP)
- 15. Bahamas : 0.5 Bcfd, (Seafarer - El Paso/FPL )
- 16. Corpus Christi, TX: 1.0 Bcfd (Occidental Energy Ventures)
- 17. Providence, RI : 0.5 Bcfd (Keyspan & BG LNG)
- 18. Port Arthur, TX: 1.5 Bcfd (Sempra)
- 19. Cove Point, MD : 0.8 Bcfd (Dominion)

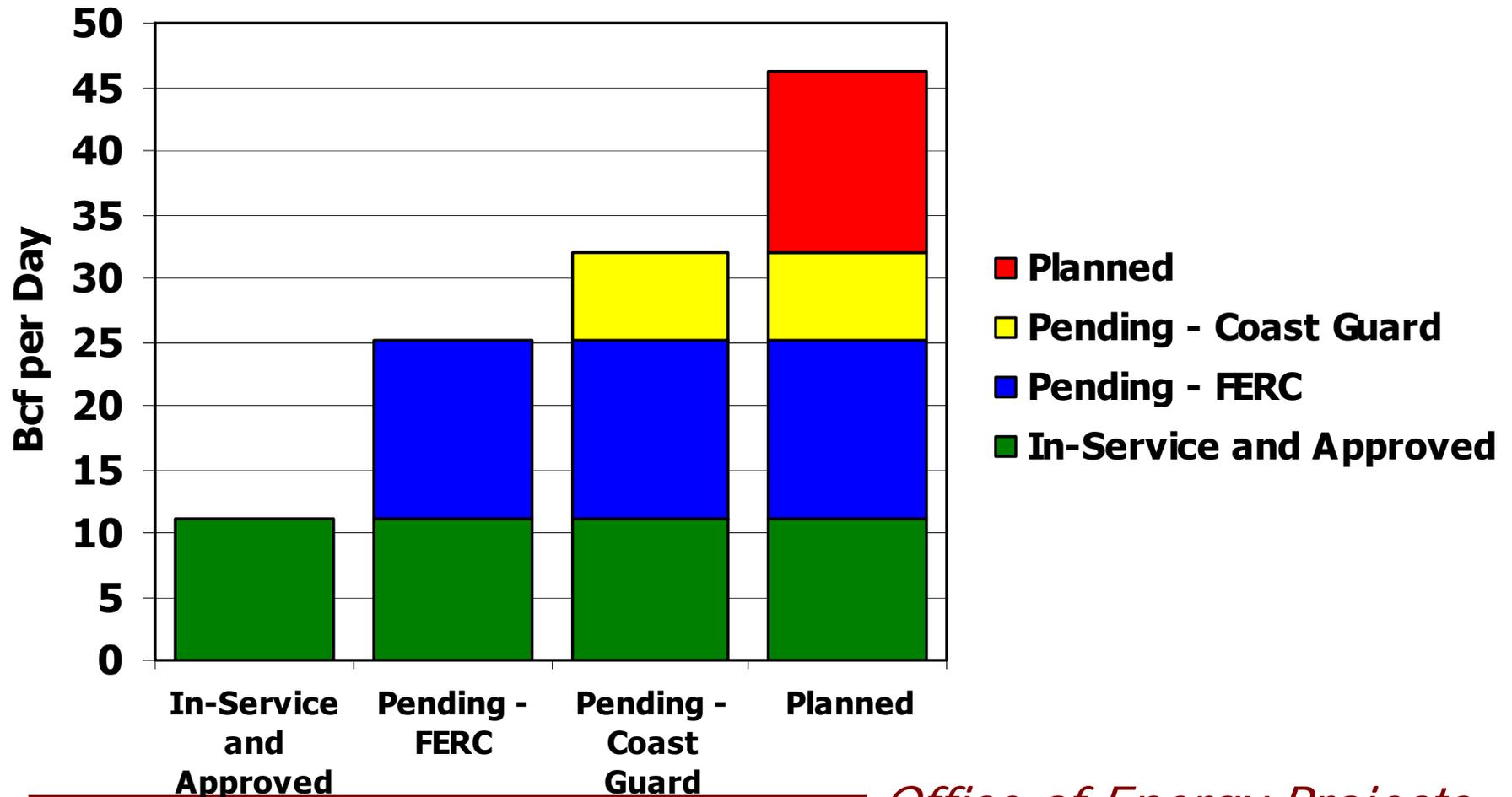
**Proposed Terminals – Coast Guard**

- 20. California Offshore: 1.5 Bcfd (Cabrillo Port – BHP Billiton)
- 21. Louisiana Offshore : 1.0 Bcfd (Gulf Landing – Shell)
- 22. So. California Offshore : 0.5 Bcfd, (Crystal Energy)
- 23. Louisiana Offshore : 1.0 Bcfd (Main Pass McMoRan Exp.)
- 24. Gulf of Mexico: n/a (Compass Port - ConocoPhillips)
- 25. Gulf of Mexico : 2.8 Bcfd (Pearl Crossing - ExxonMobil)

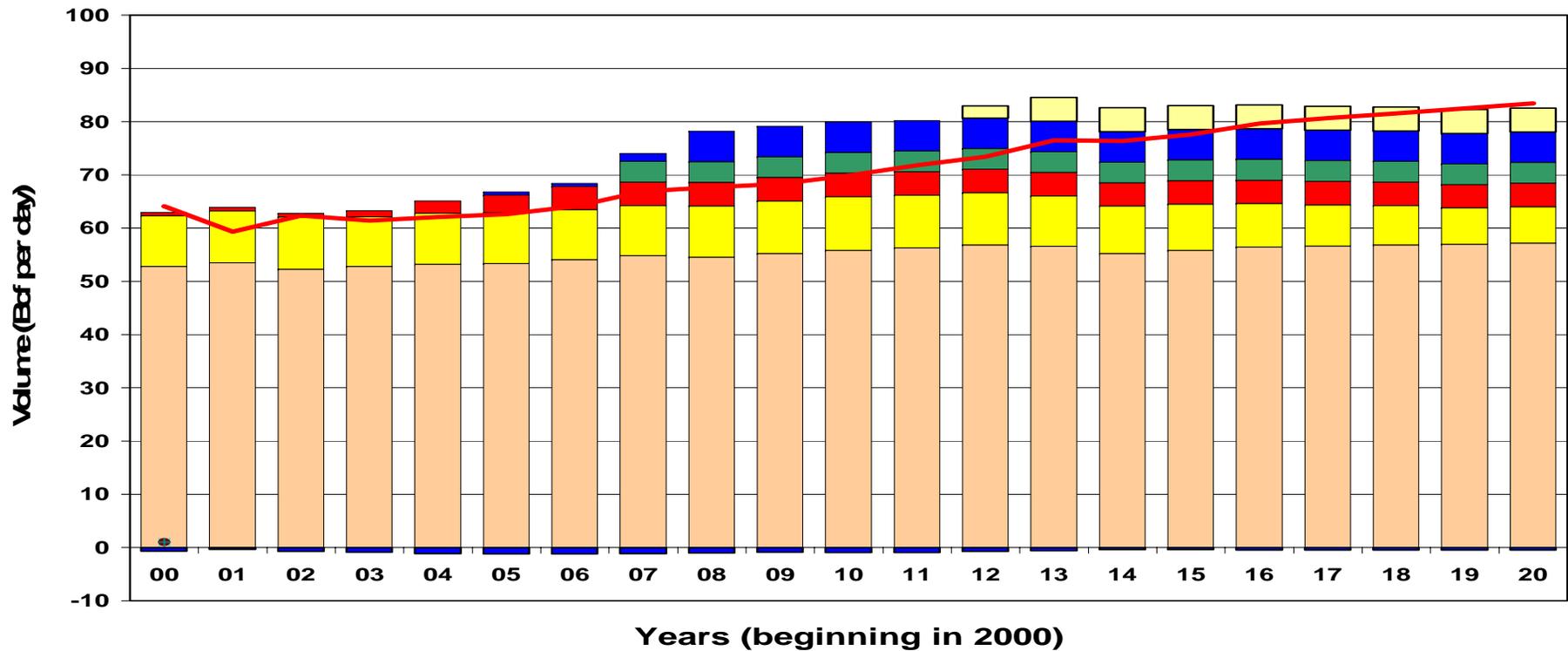
**Planned Terminals and Expansions**

- 26. Brownsville, TX : n/a, (Cheniere LNG Partners)
- 27. Coos Bay, OR: 0.13 Bcfd, (Energy Projects Development)
- 28. Somerset, MA : 0.65 Bcfd (Somerset LNG)
- 29. Belmar, NJ Offshore : n/a (El Paso Global)
- 30. Altamira, Tamulipas : 1.12 Bcfd, (Shell)
- 31. Baja California, MX : 1.0 Bcfd, (Sempra & Shell)
- 32. Baja California - Offshore : 1.4 Bcfd, (Chevron Texaco)
- 33. California - Offshore : 0.75 Bcfd, (Chevron Texaco)
- 34. St. John, NB : 1.0 Bcfd, (Canaport – Irving Oil)
- 35. Point Tupper, NS 1.0 Bcf/d (Bear Head LNG - Access Northeast Energy)
- 36. Pleasant Point, ME : 0.5 Bcf/d (Quoddy Bay, LLC)
- 37. Quebec City, QC : 0.5 Bcfd (Project Rabaska - Enbridge/Gaz Met/Gaz de France)
- 38. Lázaro Cárdenas, MX : 0.5 Bcfd (Tractebel/Repsol)
- 39. Rivière-du- Loup, QC: 0.5 Bcfd (Cacouna Energy – TransCanada/PetroCanada)
- 40. St. Helens, OR: 0.7 Bcfd (Port Westward LNG LLC)
- 41. Puerto Libertad, MX: 1.3 Bcfd (Sonora Pacific LNG)
- 42. Offshore Boston, MA: 0.8 Bcfd (Northeast Gateway – Excelerate Energy)
- 43. Kitimat, BC: 0.34 Bcfd (Galveston LNG)
- 44. Prince Rupert, BC: 0.30 Bcfd (WestPac Terminals)
- 45. Goldboro, NS 1.0 Bcfd (Keltic Petrochemicals)
- 46. Galveston, TX: 1.2 Bcfd (Pelican Island – BP)

# Maximum LNG Deliverability Growth



# US Natural Gas Balance



- Total Production
- Existing Terminals
- Proposed and Planned Terminals (FERC & Coast Guard)
- Alaska (to Lower 48)
- Canada
- Approved Terminals (FERC & Coast Guard)
- Net Exports to Mexico
- Demand - US

# Benefits of the New LNG Policy

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- Stimulates development of new LNG terminals
- Accommodates various business models
- Increases gas supplies to the U.S.
- Maintains FERC's responsibility for environmental and safety reviews.

# LNG Terminal Siting Issues

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- Safety
- Take Away Capacity
- Local acceptance
- Federal and State approvals

# LNG: Where the Action Is

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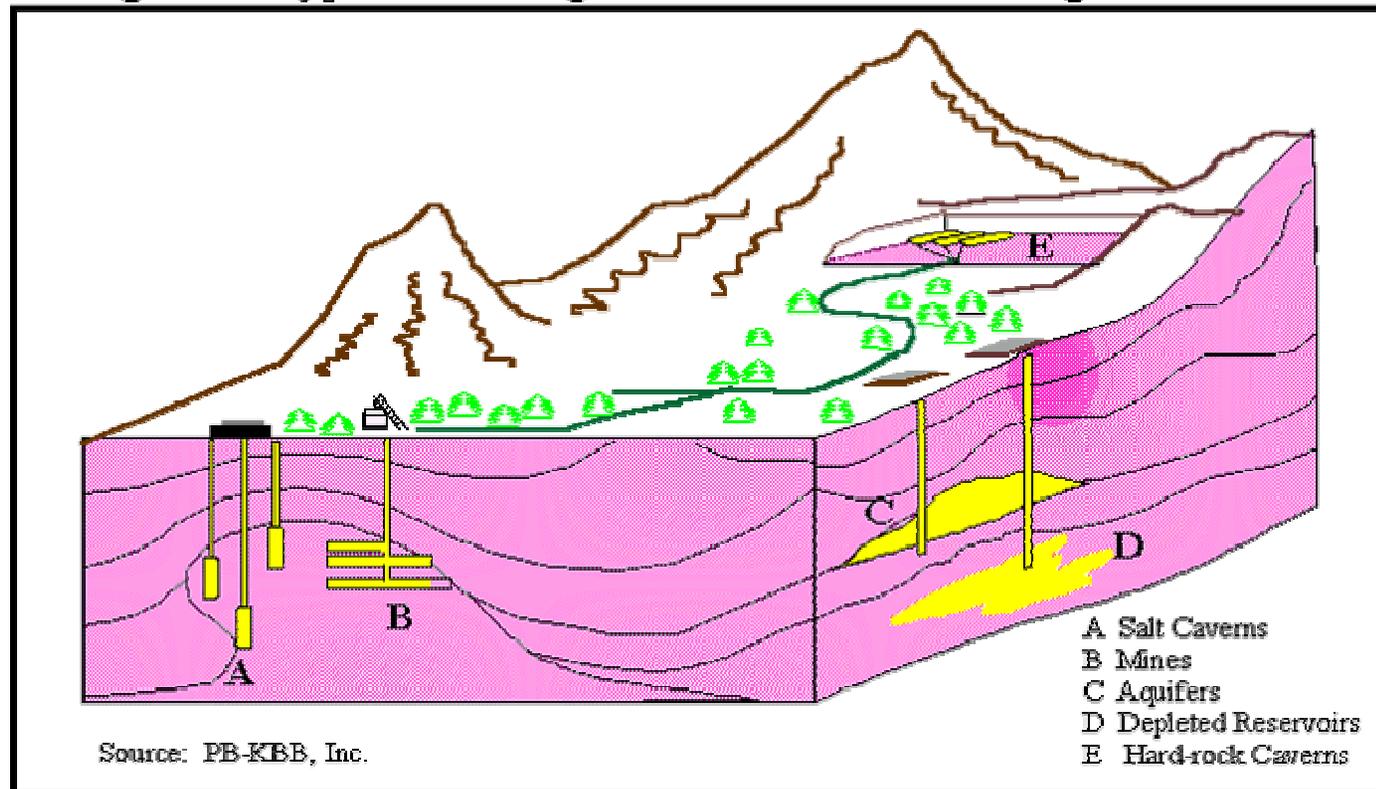


- What is FERC Doing?
  - New LNG Branch at FERC to focus on and enhance LNG review, inspection programs
  - Provide for Seamless Review of LNG Facilities
    - Interagency Agreement on Safety and Security
  - Development of FERC Model for LNG Tanker Release Consequences
  - Participating in Conferences/Seminars/Tours

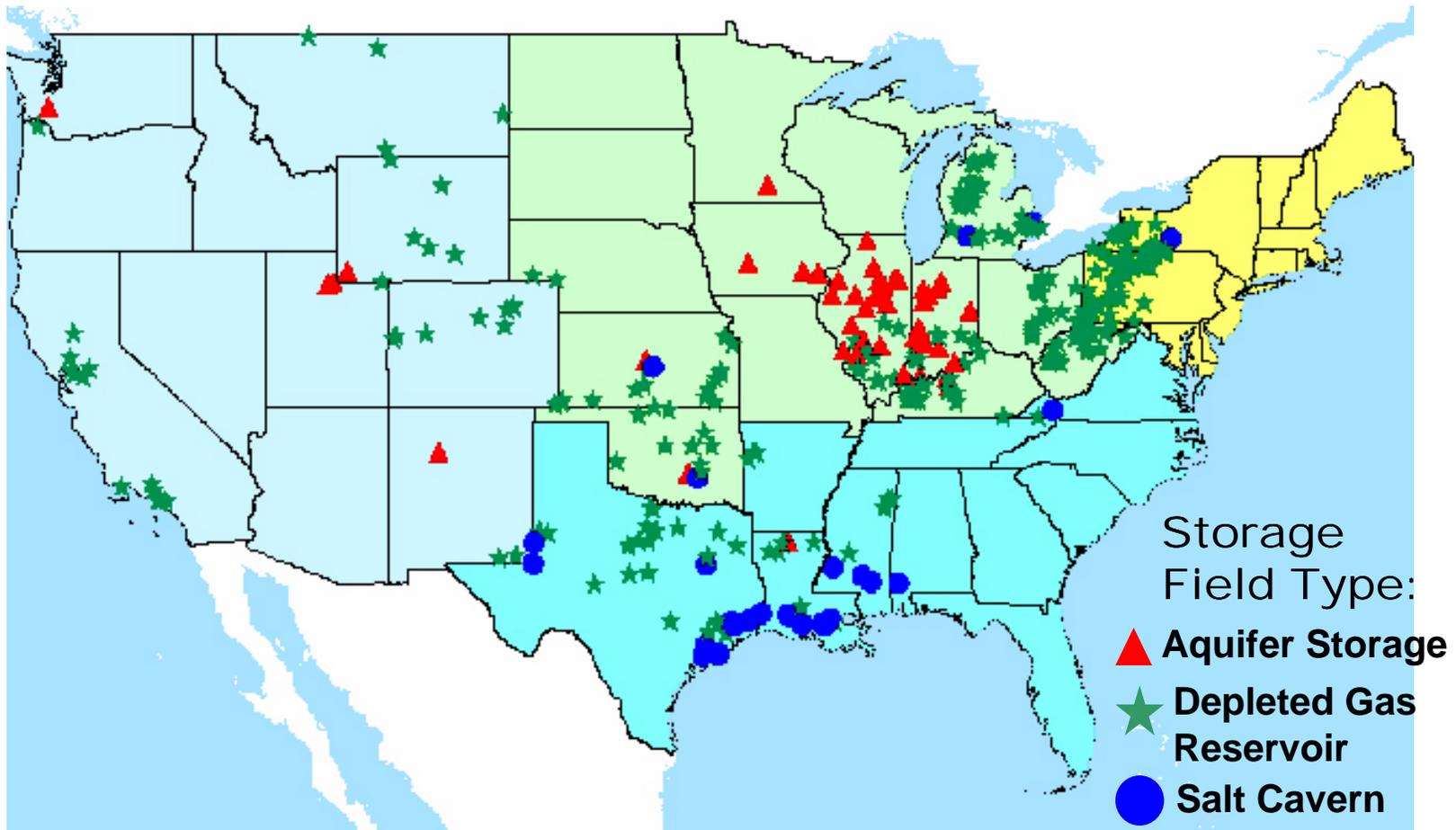
# Underground Natural Gas Storage



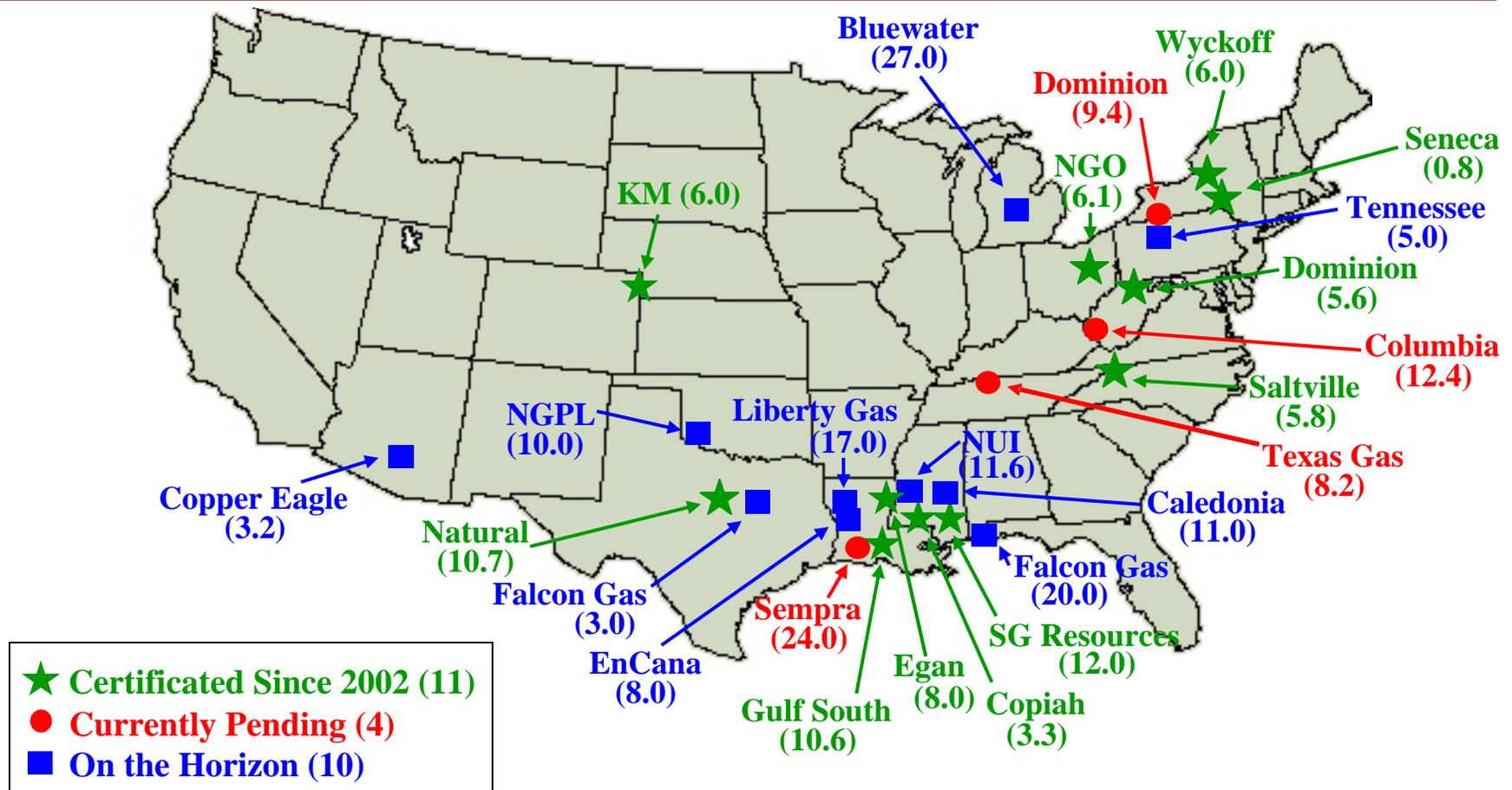
Figure 1. Types of Underground Natural Gas Storage Facilities



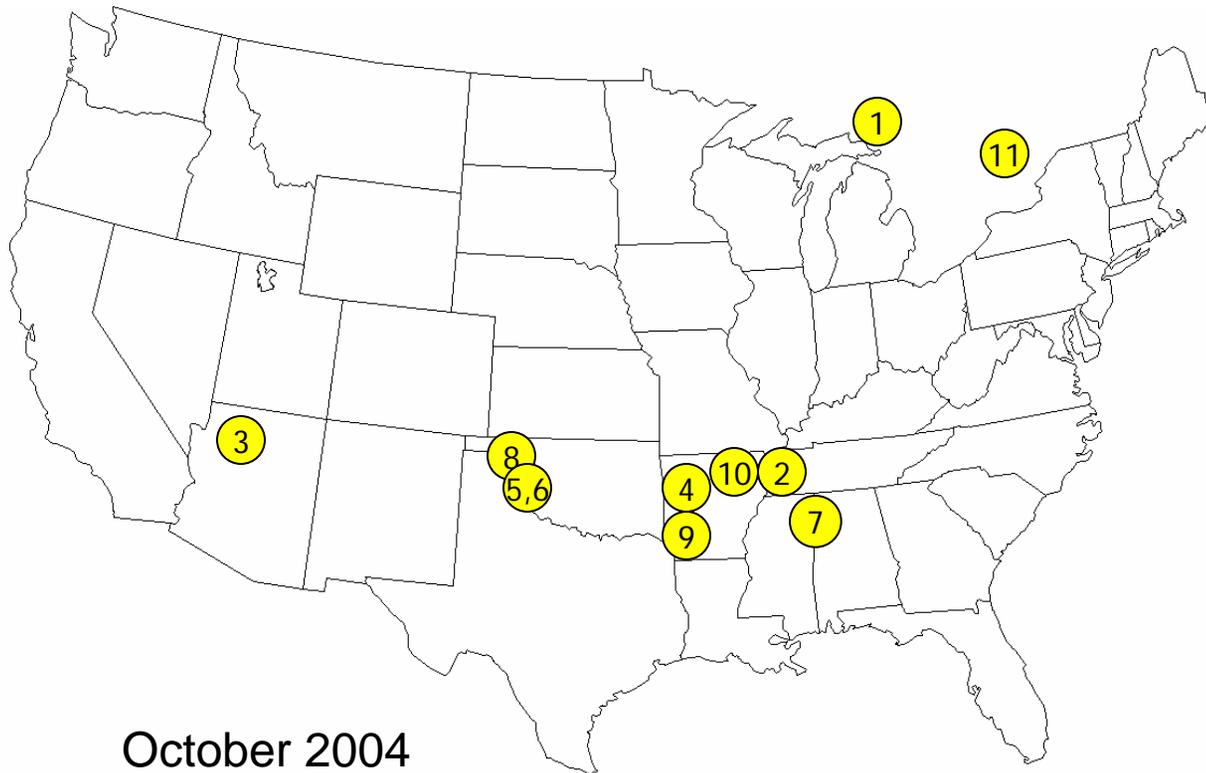
# U.S. Storage by Region



# Recent Storage Projects - August 2004 (Capacity in Bcf)



# Major Storage Projects On The Horizon



October 2004

## Project Name or Company Name

1. **Bluewater Gas Storage LLC**
2. **Caldonia Energy Complex**
3. **Copper Eagle Salt Cavern Storage**
4. **EnCana Gas Storage**
5. **Hill Lake Phase II**
6. **Hill Lake Phase III**
7. **MoBay Storage Phase I**
8. **Worsham-Steed Gas Storage Project**
9. **Liberty Gas Storage, LLC**
10. **Richton Storage Project**
11. **Northeast ConneXion Project**

# Continued Storage Growth

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- **Certificated projects 2002-2004:**
  - 75 Bcf approved
  - 57 Bcf in service
- **Pending projects in 2004: 54 Bcf**
- **Expected projects through 2005: 116 Bcf**
- **NPC estimate of up to 700 Bcf of new storage needed by 2025**
- **INGAA Foundation estimate of up to 651 Bcf of new storage needed by 2020**

# Meeting Future Storage Needs



- 
- **There will be reclassification of working vs. base gas plus new-technology projects**
  - **LNG is not a substitute for all attributes of underground storage**
  - **Certain regions lack infrastructure**
    - **New England is limited by geology**
    - **West is limited by geology and market factors**

# Storage Project Economics



- 
- **Storage investments must provide attractive financial characteristics.**
    - **Costs vary greatly by the type of storage and its performance characteristics.**
    - **The projected revenue, and hence valuation, differs for facilities designed to ensure reliability versus capturing of arbitrage opportunities.**
  - **Regulated storage companies are allowed returns of up to 15%.**
  - **Storage developers generally target equity returns even greater.**

# Storage Performance and Costs



- 
- **Development costs vary with:**
    - **Type of storage and its performance characteristics**
    - **Location**
    - **Base gas requirements**
    - **Proximity to pipelines**
  - **Costs range from \$5 million/Bcf of reservoir storage to \$10-\$12 million/Bcf of salt cavern storage in the Gulf Coast. Development costs for salt cavern storage in other regions may be much higher.**

# Storage Use and Market Valuations



- 
- **Storage value depends on its function: supply reliability, imbalance management, seasonal arbitrage and trading.**
  - **Customer valuation of storage depends on the use of the storage:**
    - **Cost-of-service**
    - **Least-cost supply planning**
    - **Intrinsic/Seasonal arbitrage**
    - **Extrinsic/Option-based valuation**

# Current Storage Pricing Options



- 
- **Traditional cost-based rates**
  - **Nontraditional cost-based rates**
    - **Peak/off-peak rates**
    - **Term-differentiated rates**
    - **Negotiated rates**
    - **Auctions**
  - **Market-based rates**

## **Examples:**

**Katy and Unocal Keystone storage vs.  
Red Lake storage**

# Policy Options to Encourage Development



- 
- **Re-examine current cost-based pricing flexibility**
  - **Re-examine criteria for storage market-based rates**
  - **Re-examine certificate review and service policies**

# Preliminary Findings



- 
- **Under average conditions and from a nationwide perspective, storage appears to be adequate to meet seasonal demand; however, recent price spikes indicate that more storage may be appropriate.**

# Preliminary Findings (continued)



- 
- **Storage may be the best way of managing gas commodity price volatility, so the long-term adequacy of storage investment depends on how much price volatility customers consider “acceptable.”**

# Preliminary Findings (continued)



- 
- **Creative ratemaking approaches, along with certificate and policy choices, may increase storage development.**

# Public Conference 10/21/04



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UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

State of the Natural Gas Industry Conference  
Staff Report on Natural Gas Storage

Docket No. PL04-17-000  
Docket No. AD04-11-000

NOTICE OF PUBLIC CONFERENCE  
(September 30, 2004)

The Federal Energy Regulatory Commission (FERC) will hold a conference on October 21, 2004, to engage industry members and the public in a dialogue about policy issues facing the natural gas industry today and the Commission's regulation of the industry for the future. In each of the prior two years, the Commission held wide-ranging discussions concerning its regulatory goals for the natural gas industry (Docket Nos. PL02-9-000 and PL03-6-000). This year's conference on the state of the natural gas industry will focus on underground storage and other factors that differentiate regional natural gas deliverability and market needs. The conference will have panels and an open forum that will give all interested individuals an opportunity to raise issues.

# Public Conference 10/21/04



## I. Scope of Inquiry

### A. Responses to Report

The Commission seeks comments on certain findings in the FERC Staff Report, Current State of and Issues Concerning Underground Natural Gas Storage, released concurrently with this notice. These findings are:

The market's various methods for the valuation of storage are a challenge in matching storage's value with the cost of new storage development.

Storage may be the best way of managing gas commodity price volatility, so the long-term adequacy of storage investment depends on how much price volatility customers consider "acceptable."

Storage projects in certain geographic areas often fail the Commission's market-based rates tests. Thus, creative policy, certificate and ratemaking approaches may encourage storage development. Examples of these approaches are:

- Re-examining current cost-based pricing flexibility
- Re-examining criteria for storage market-based rates
- Re-examining certificate review and service policies



# Public Conference 10/21/04

## B. Investment in Storage and Pipeline Infrastructure

How do existing Commission policies impact the development of new storage or pipeline infrastructure? The Commission would like to hear a discussion from entities that have recently developed new storage or pipeline projects. The Commission is also interested in hearing from parties that have recently canceled or postponed the development of new storage or pipeline infrastructure. The discussions should focus on how the decisions to develop these projects were impacted by existing Commission policies.

## C. Need for Uncommitted Reserve Storage and Pipeline Capacity

Would a program for creating more uncommitted reserve storage and pipeline capacity be useful? In the next several years, the natural gas industry could experience increased capacity constraints and service interruptions or outages associated with facility inspection compliance activities required by the Department of Transportation. Also, recent experience with colder than normal weather has shown that certain regions' pipeline infrastructure is very near maximum capacity during such times. Other regions may approach their pipeline infrastructure's maximum capacity during peak electric generation seasons.

What actions, if any, should the Commission take to create more uncommitted reserve storage and pipeline capacity? Further, if uncommitted reserve storage and pipeline capacity is needed, what level of "reserve margin" might be appropriate? What options could be used to recover the costs of such capacity reserve margins? Should certain costs of uncommitted reserve storage and pipeline capacity be given presumptive rolled-in rate treatment in pipeline rate cases, or should cost tracking mechanisms for these types of costs be developed?

# Public Conference 10/21/04



## D. Changing Roles of Industry Segments and Commodity Price Volatility

As the natural gas industry matures and experiences more service unbundling down to end use levels, the various service provider roles will continue to change/evolve. One trend that seems to be emerging is a preference to purchase gas supplies at hubs in market areas, and a corresponding desire to shed upstream capacity commitments. This market evolution may have service implications depending on who holds upstream capacity contracts, and may lead to additional service balancing issues for supply aggregators and end users alike and increased commodity price volatility. Many local distribution companies (LDCs) are still redefining their role in the industry – will they continue their supply aggregation functions or will they become local “pipes” companies? When marketers were on the rise in many states, LDCs wanted to shed upstream capacity and supply aggregation roles in favor of having marketers handling these roles. Also, we believe that electric generators may be reluctant to commit to long-term capacity obligations, preferring to rely on downstream gas markets. In general, increased reliance on downstream markets as a substitute for capacity commitments may tend to increase seasonal commodity price volatility.

The Commission is interested in hearing views on how much seasonal commodity price volatility the industry and consumers can tolerate? Are customers and the industry, in general, willing to contract for the additional storage and pipeline capacity that may be necessary to mitigate commodity price volatility? Would we be better served with more storage and pipeline capacity as insurance against commodity price volatility?

# Public Conference 10/21/04



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## II. Open Forum

In addition to addressing the above mentioned issues, the Commission also seeks input from industry representatives and interested individuals regarding other issues they believe are ripe for Commission consideration in shaping its future natural gas industry regulatory policies.

## III. Participation

The conference will be held on October 21, 2004 at the Commission's headquarters, 888 First Street, N.E. in Washington, D.C. beginning at 9:00 am (EST) in the Commission's Meeting Room. The public is invited to attend. Anyone interested in being considered as a speaker to present their views at the conference should contact Richard Foley at 202-502-8955 or at [Richard.Foley@ferc.gov](mailto:Richard.Foley@ferc.gov) by October 12, 2004. Requests to speak should include information concerning the issue or issues the participant would like to speak on. Time constraints may not allow all requests to speak to be fulfilled. Persons requesting to speak on the same topic, with the same views, may be asked to consolidate their remarks through a single representative. We will issue further details on the conference, including the agenda and a list of participants, as plans evolve. Interested parties are urged to

# Public Conference 10/21/04



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watch for further notices providing more information on the conference. You may register online at <http://www.ferc.gov/docs-filing/esubscriptions.asp> to be notified via Email of new issuances and filings related to these dockets.

The conference will be transcribed. Those interested in acquiring the transcript should contact Ace Reporters at 202-347-3700 or 800-336-6646. Transcripts will be placed in the public record ten days after the Commission receives the transcripts. Additionally, Capitol Connection offers the opportunity for remote listening and viewing of the conference. It is available for a fee, live or over the Internet, via C-Band Satellite. Persons interested in receiving the broadcast, or who need information on making arrangements should contact David Reininger or Julia Morelli at Capitol Connection (703-993-3100) as soon as possible or visit the Capitol Connection website at <http://www.capitolconnection.gmu.edu> and click on "FERC."

Magalie R. Salas  
Secretary

# Contact



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