# Cheniere LNG

**A wholly owned subsidiary of Cheniere Energy, Inc.**

## *Energy Summit 2004*

***"Securing Louisiana's Economic Growth in a Volatile Energy Environment"***

**October 21-22, 2004**

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**American Stock Exchange: LNG**

# Safe Harbor Act

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# Securing Louisiana's Economic Growth in a Volatile Energy Environment

**Too much or too little LNG development in NA over the next several years?**

- North America's need for LNG
- Potential North American LNG gateways
- Strategic opportunities



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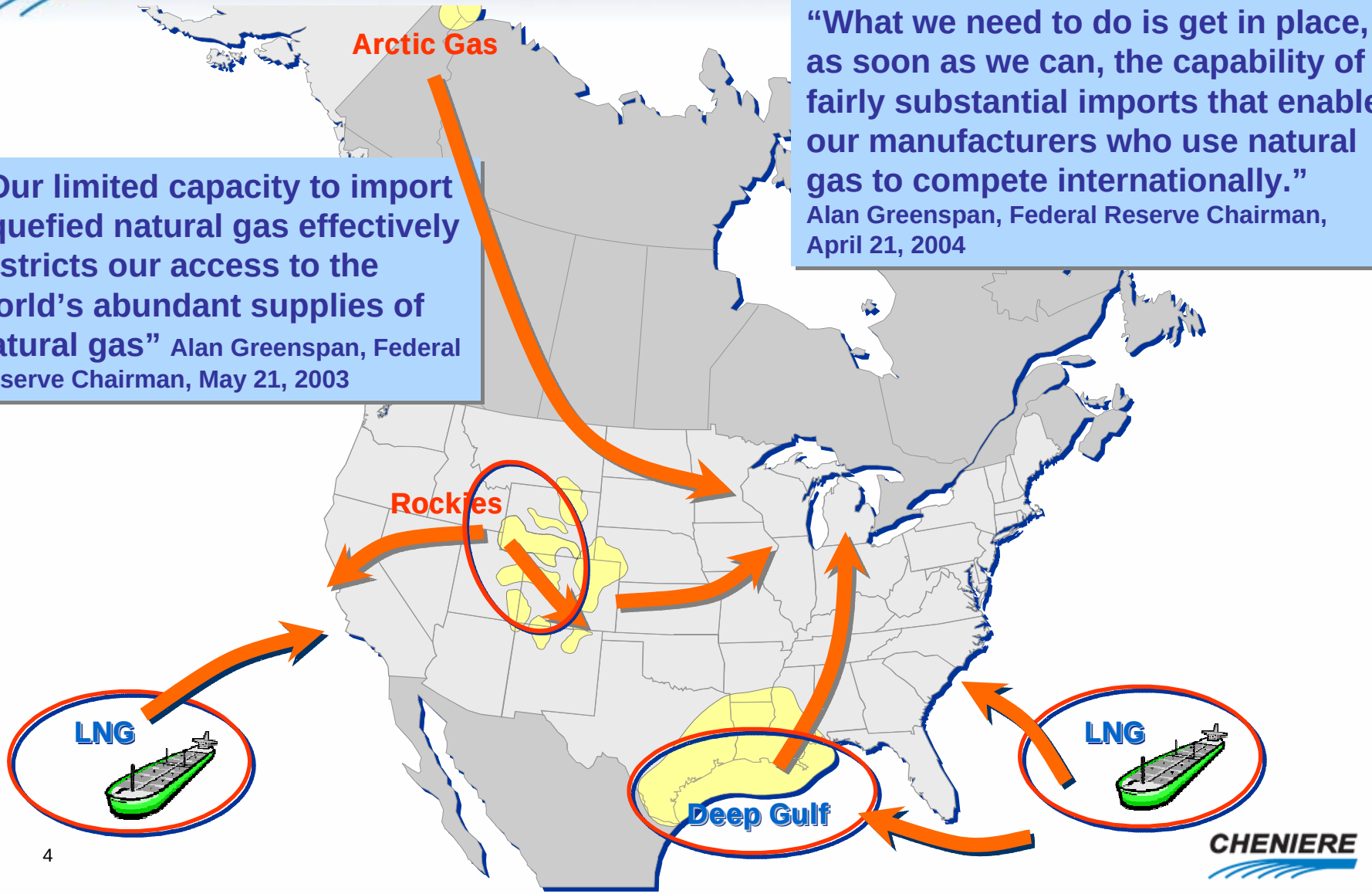
# New Supply Must Come from New Areas…

"What we need to do is get in place, as soon as we can, the capability of fairly substantial imports that enable our manufacturers who use natural gas to compete internationally."
Alan Greenspan, Federal Reserve Chairman, April 21, 2004

"Our limited capacity to import liquefied natural gas effectively restricts our access to the world's abundant supplies of natural gas" Alan Greenspan, Federal Reserve Chairman, May 21, 2003



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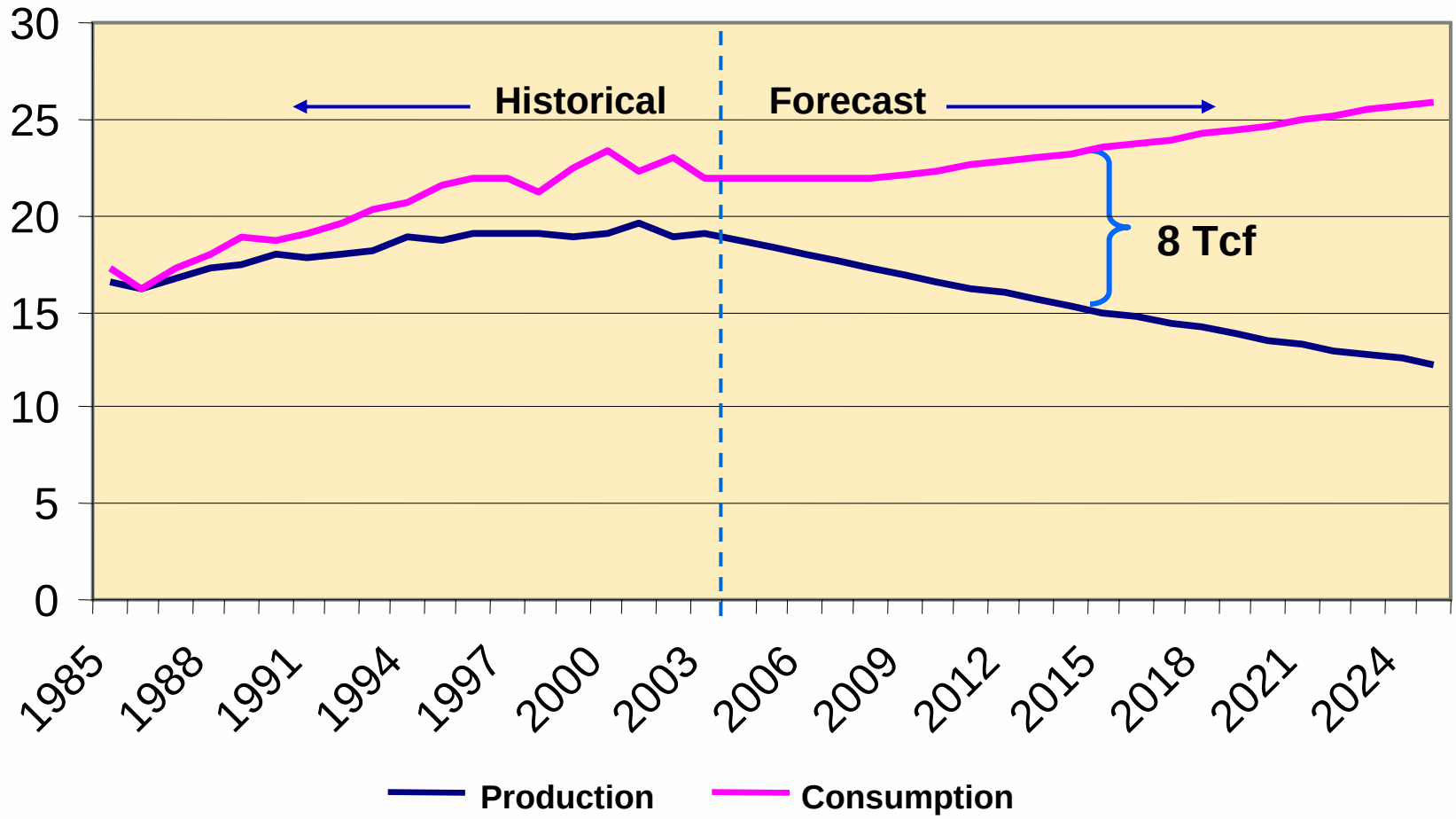
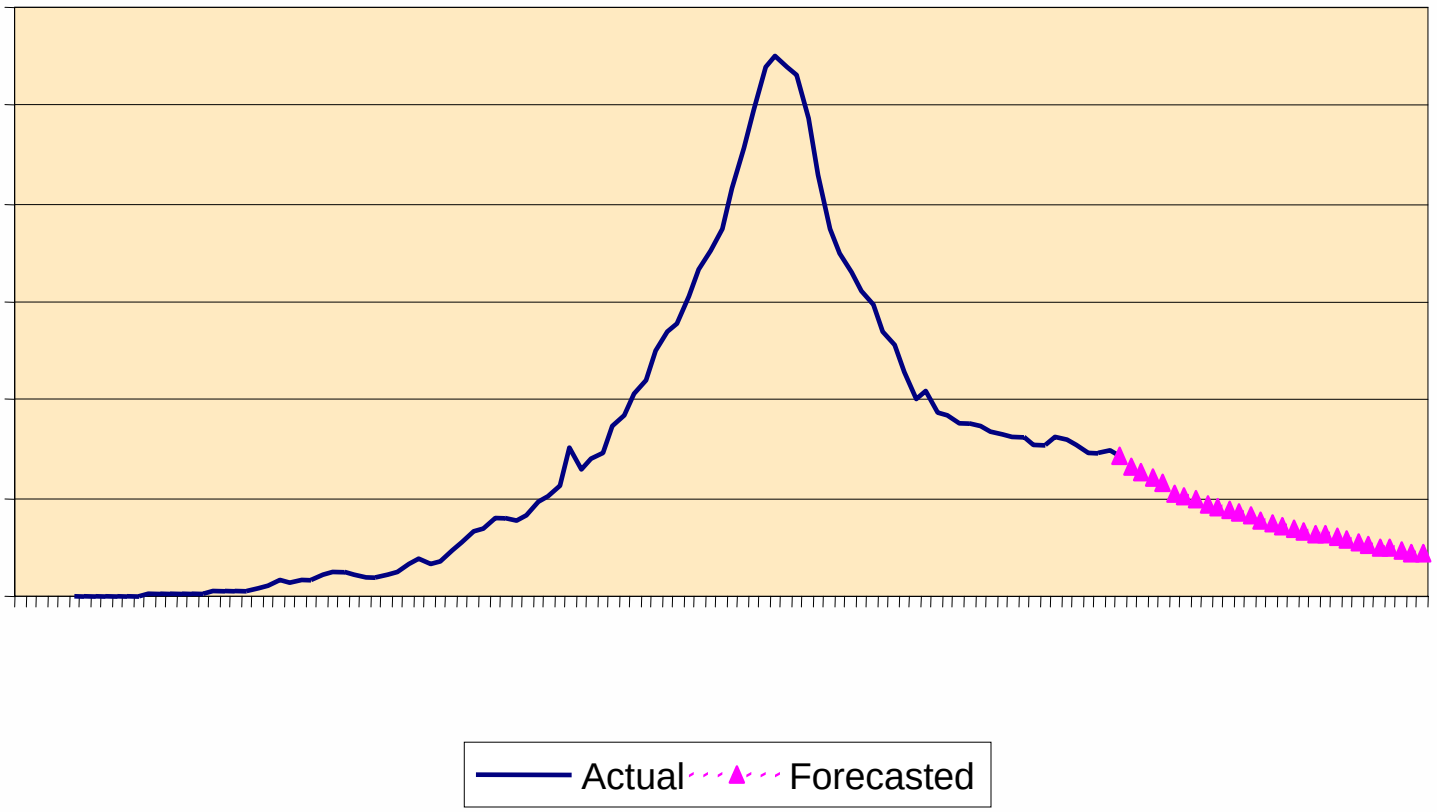
# Production vs Consumption (Tcf)




*Cheniere estimate based on 2% annual average decline in production, 1% annual average growth in consumption post-2008*

# Profile of Decline …



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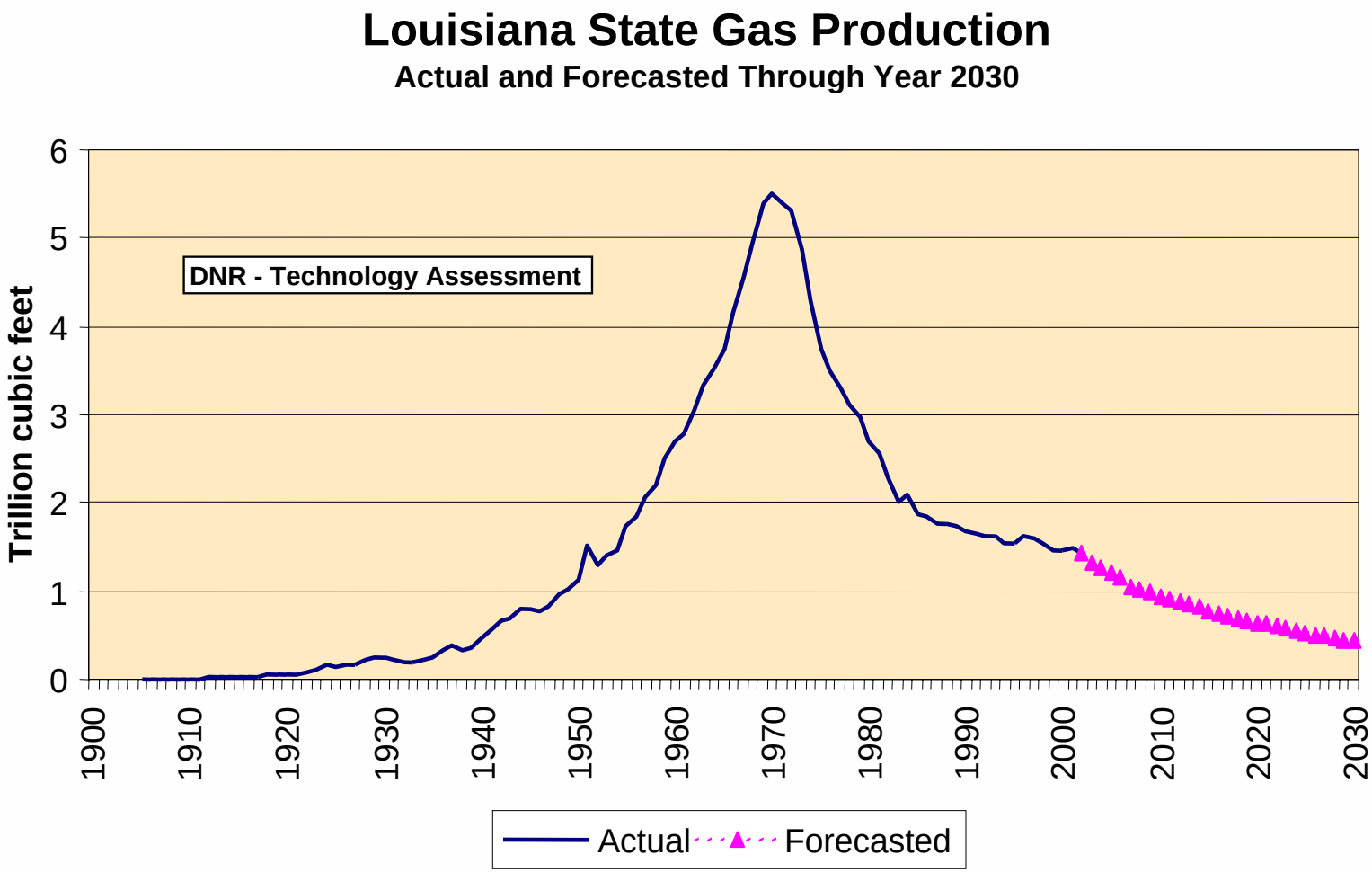
# … State of Louisiana



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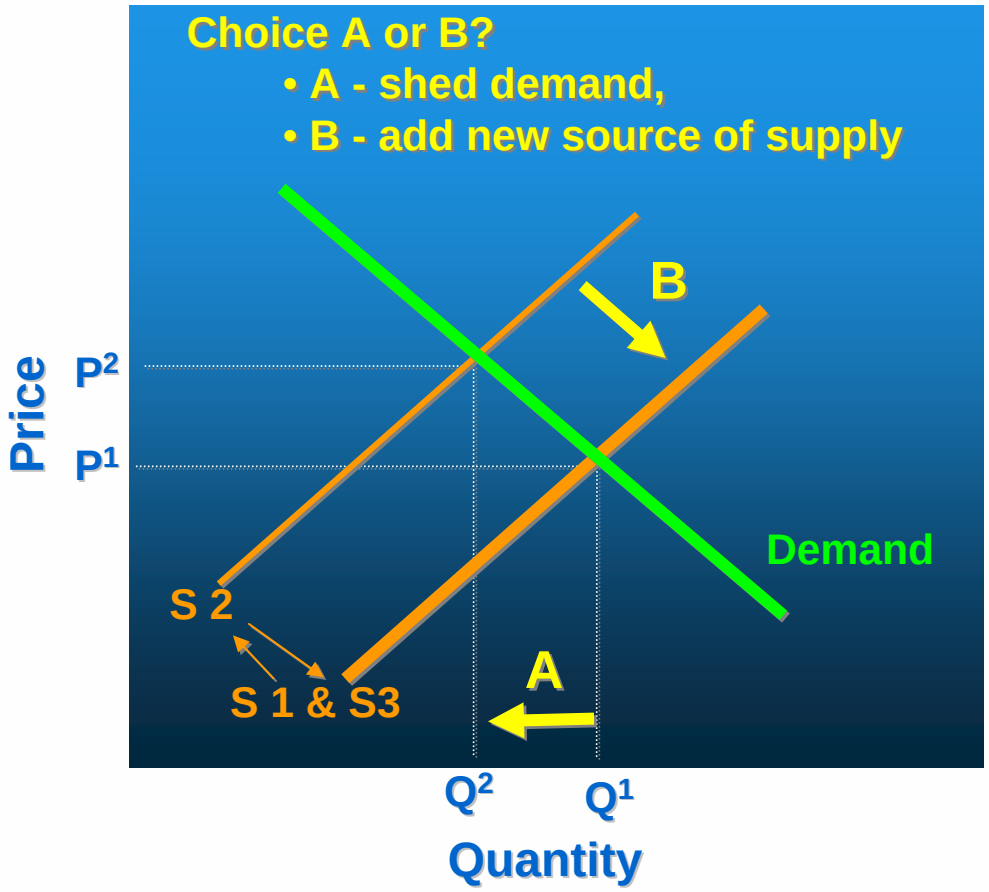
# Supply-Demand Realities:
## Moderate Price = Healthy Demand




- Loss of traditional supply shifts supply curve upward and left (S1 to S2)
- Two rational choices:
  - A: Reactive: Shed demand (Q1 to Q2)
  - B: Proactive: Add supply from new sources (S2 to S3)



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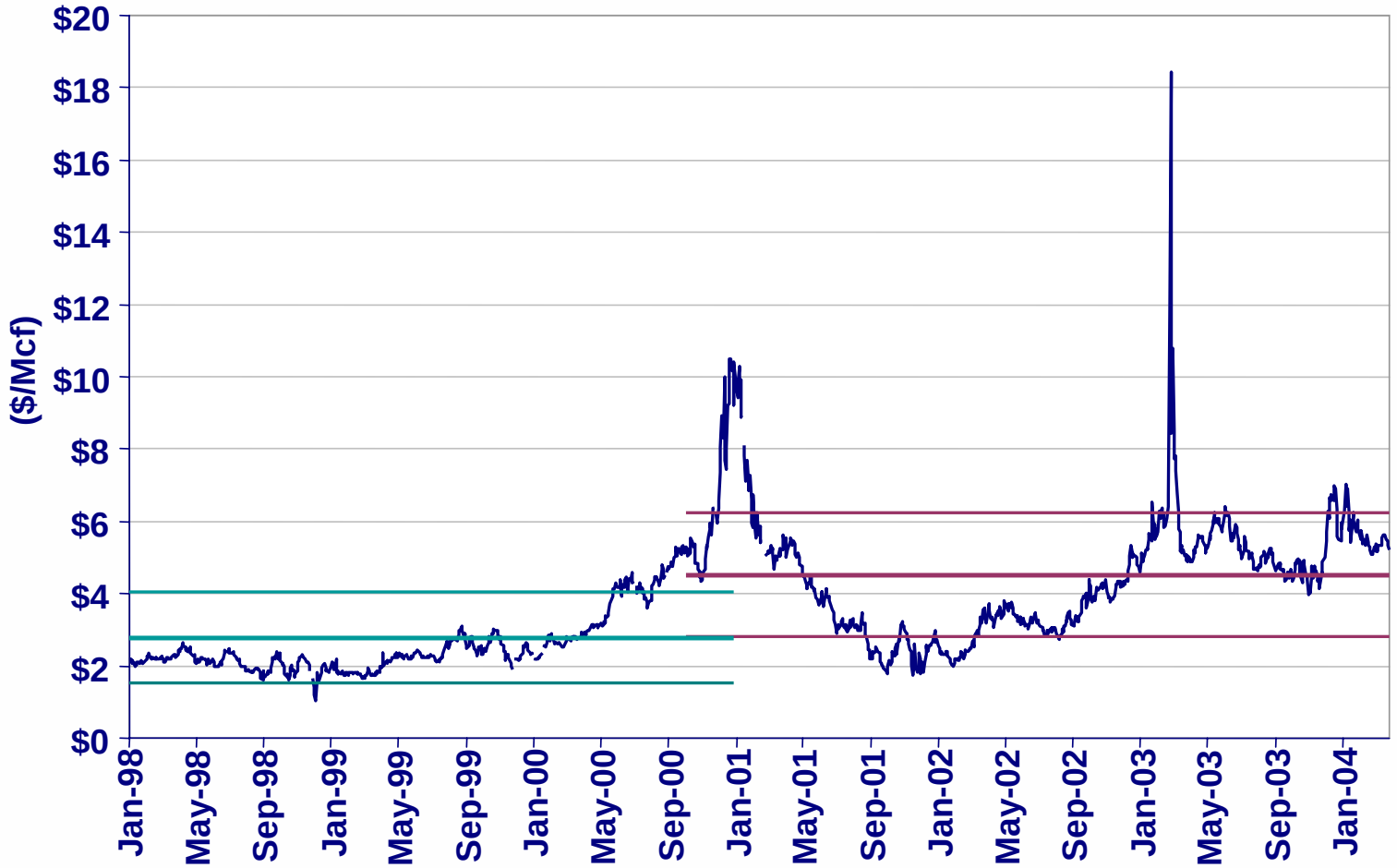
# US Gas Prices at Henry Hub




Source: Center for Energy Studies, LA State University, April 2004



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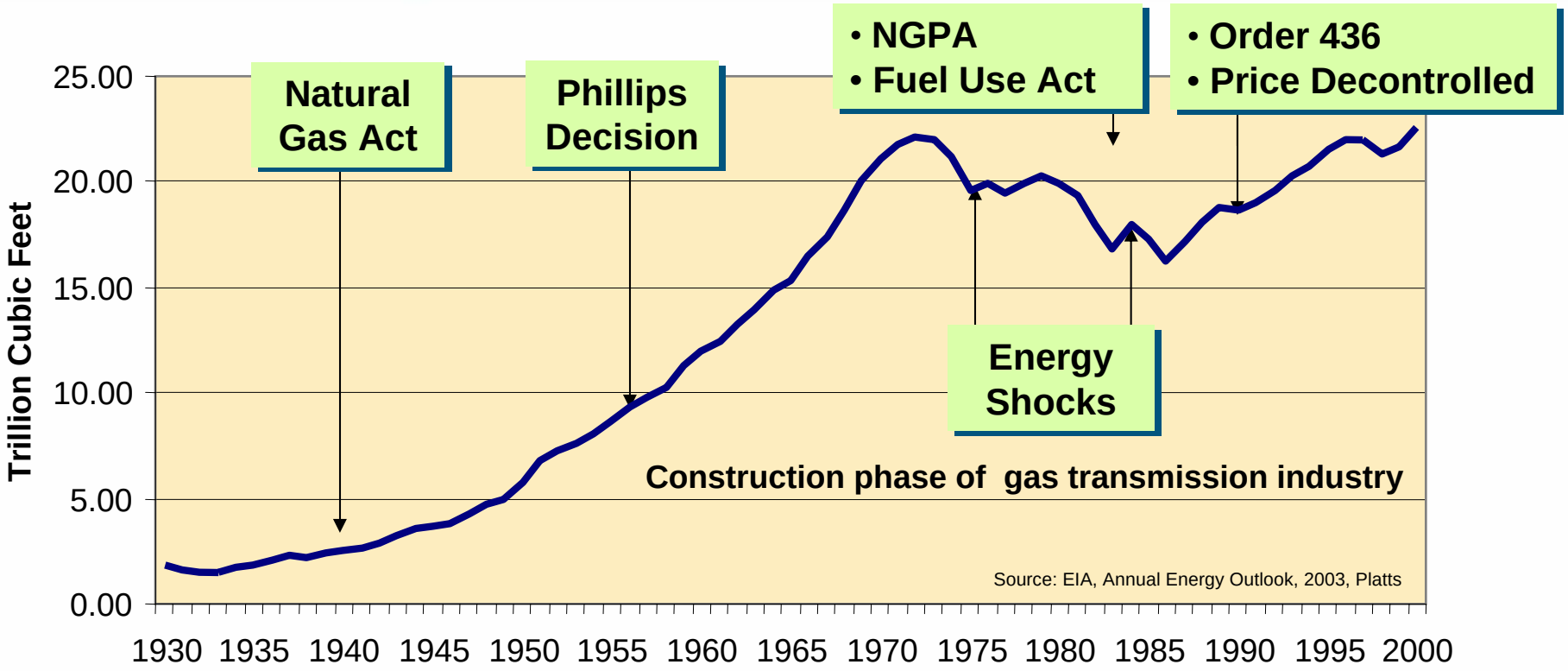
# US Gas Consumption – Historical Trends

## Price shocks of 1970s led to mandated usage restrictions, higher prices, and demand destruction




**1935 – Natural Gas Act –** Created Federal Power Commission to regulate pipelines.
**1954 - Phillips Decision –** Supreme Court finds that pipes *and* wellhead prices should be regulated to protect consumers.
**1978 - NGPA** – Reversed Phillips Decision, initiated deregulation of wellhead gas prices.
**1978 - Fuel Use Act** – Restricted new gas fired power plants.
**1985 - Order 436** – Pipelines required to be open access; consumers negotiate directly with producers.
**1985-93 – Phased Wellhead Price Decontrol** – Deregulation of wellhead prices.



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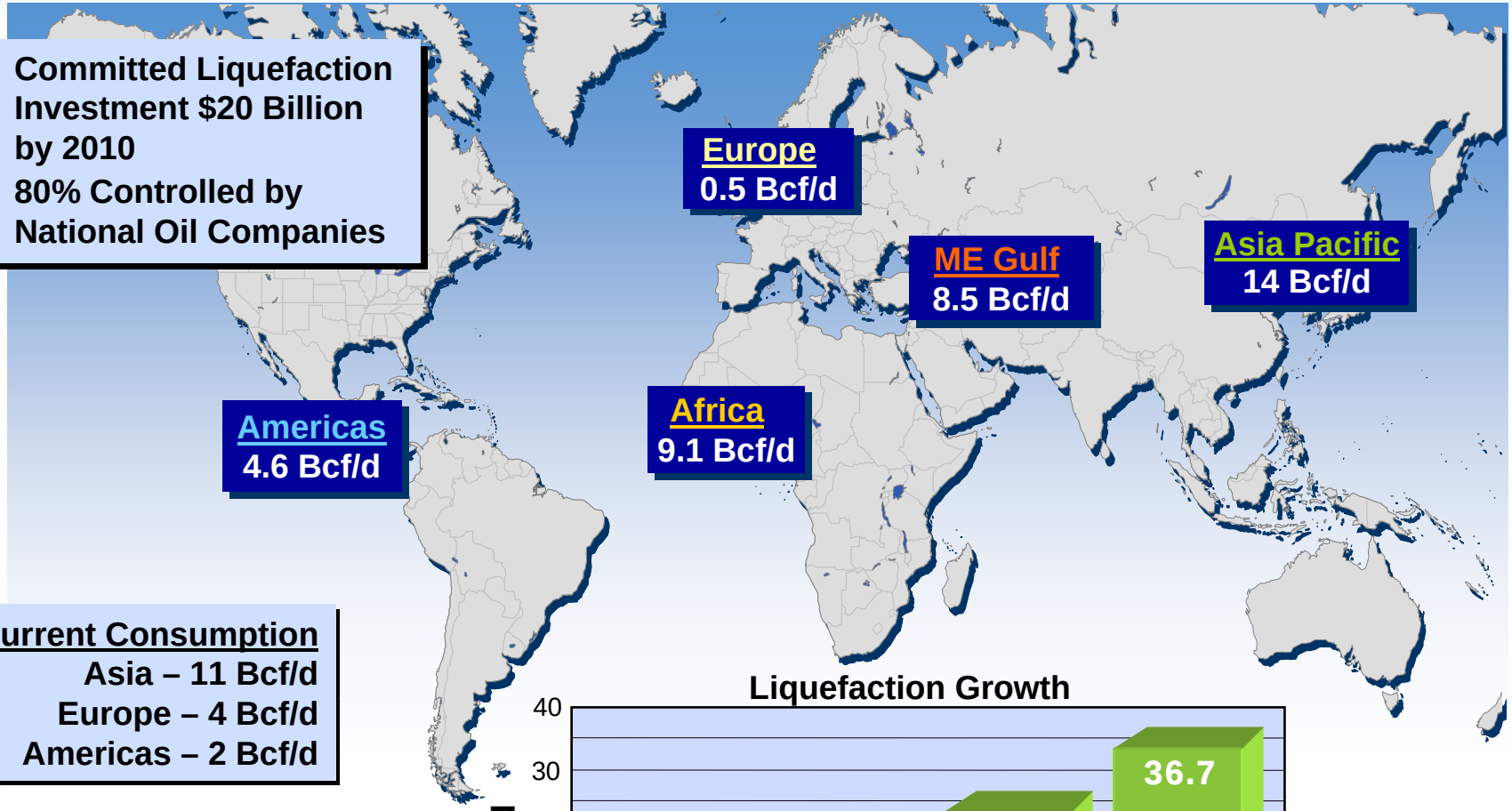
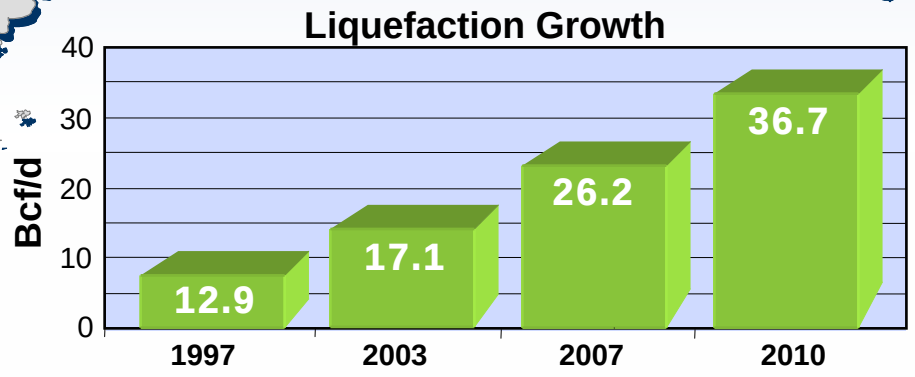
# Supplies Ample

## LNG capacity by region in 2010

- Committed Liquefaction Investment $20 Billion by 2010
- 80% Controlled by National Oil Companies




**Current Consumption**
Asia – 11 Bcf/d
Europe – 4 Bcf/d
Americas – 2 Bcf/d






*Existing and proposed*

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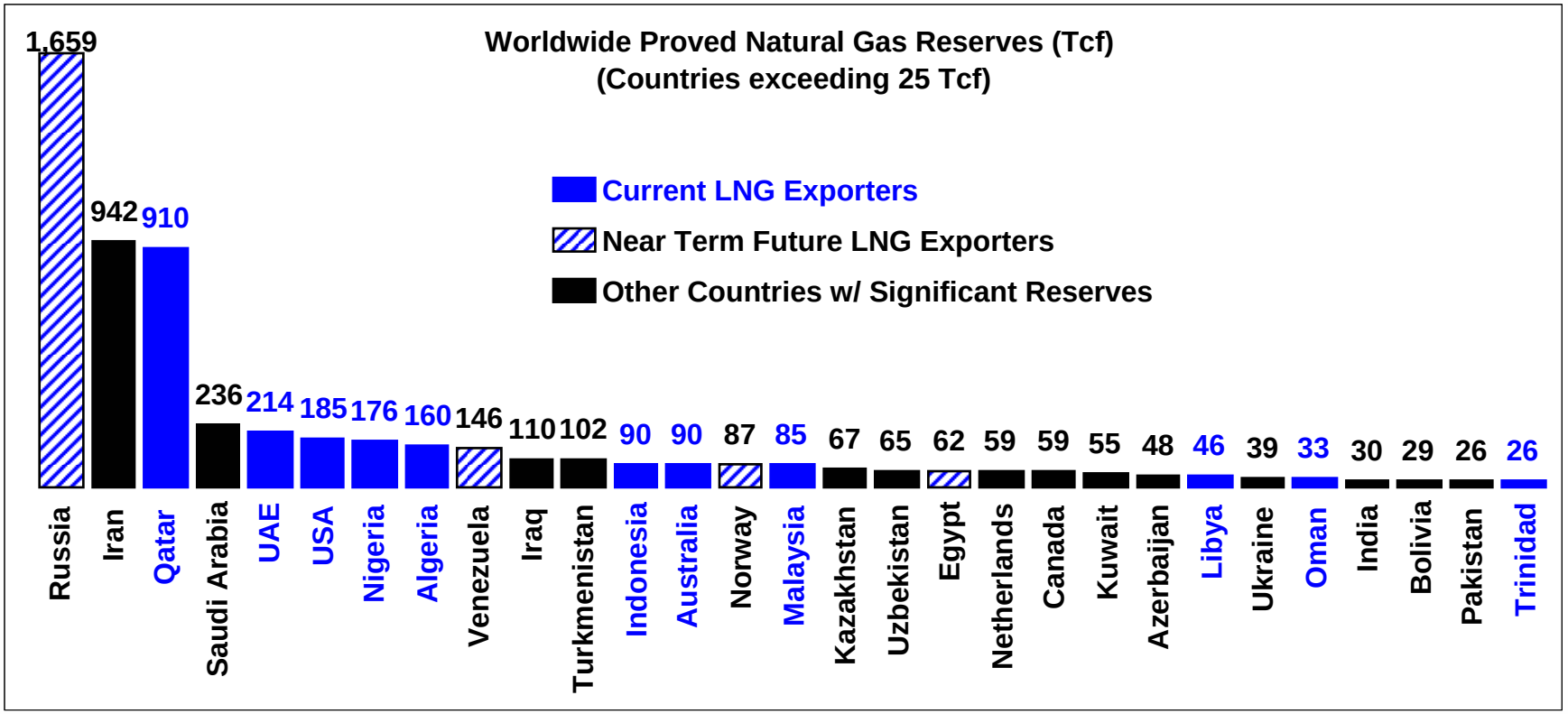
# World-wide Robust Supply Potential

- 6,000 Tcf – world PROVED gas reserves
- USGS estimates additional 6,000 + Tcf undiscovered gas reserves




Source: BP Statistical Review, 2004



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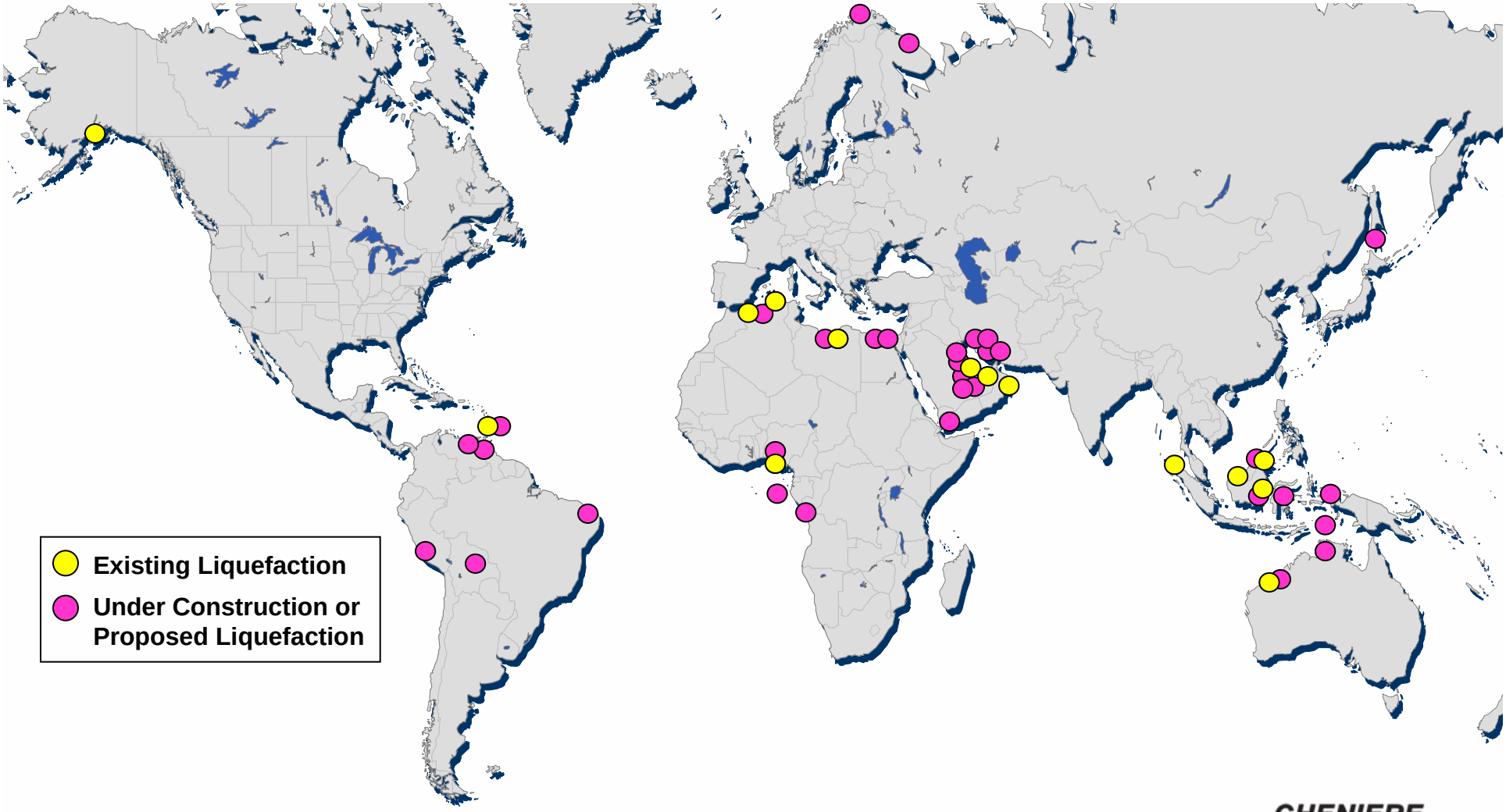
# New Liquefaction Competes for Market Share




Source: Petroleum Economist 2004



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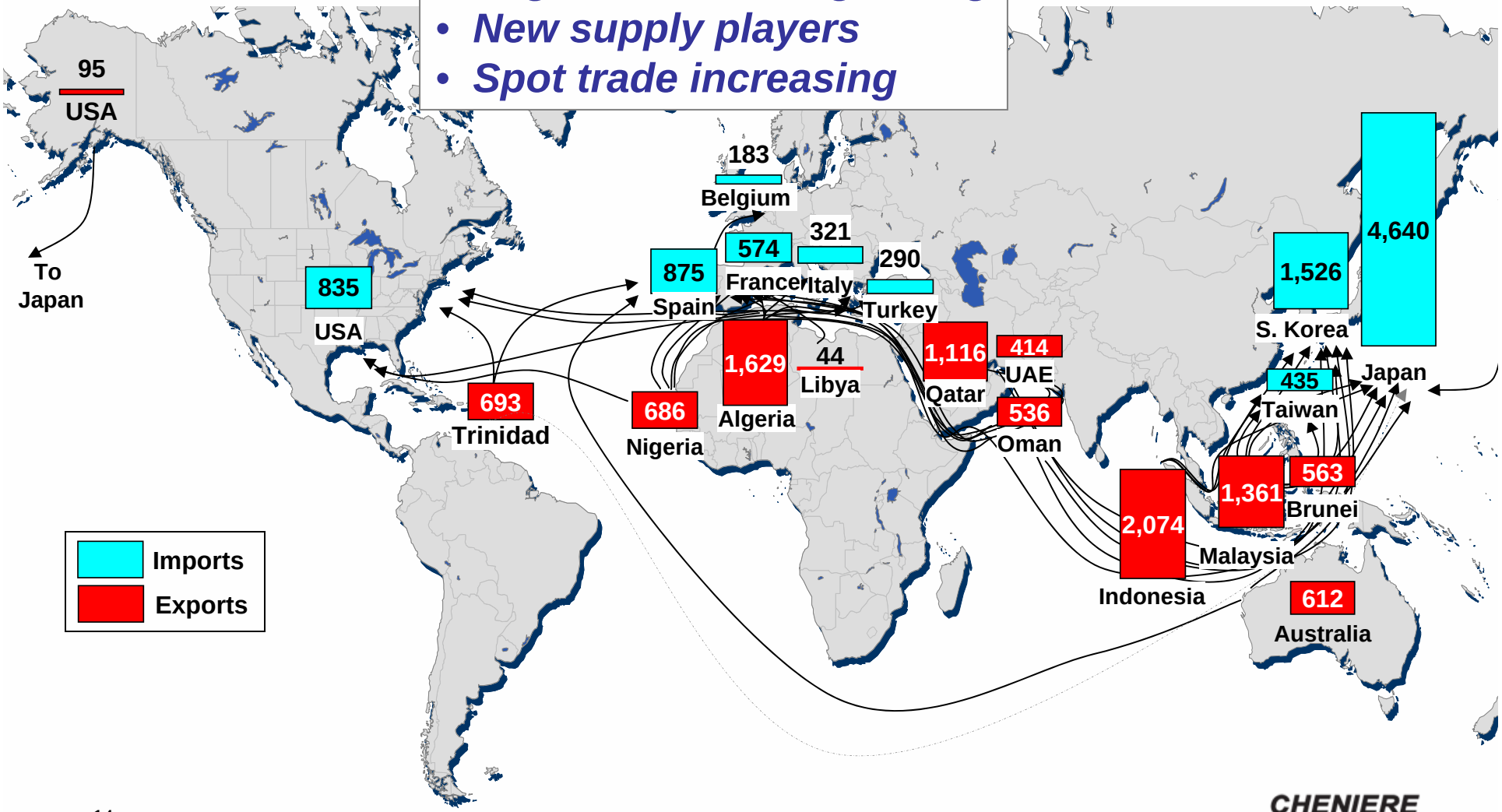
# LNG Trade in 2003, MMcf/d

- *Regional markets growing*
- *New supply players*
- *Spot trade increasing*




*Portugal, Puerto Rico, Greece, and Dominican Republic each import less than 50 MMcf/d



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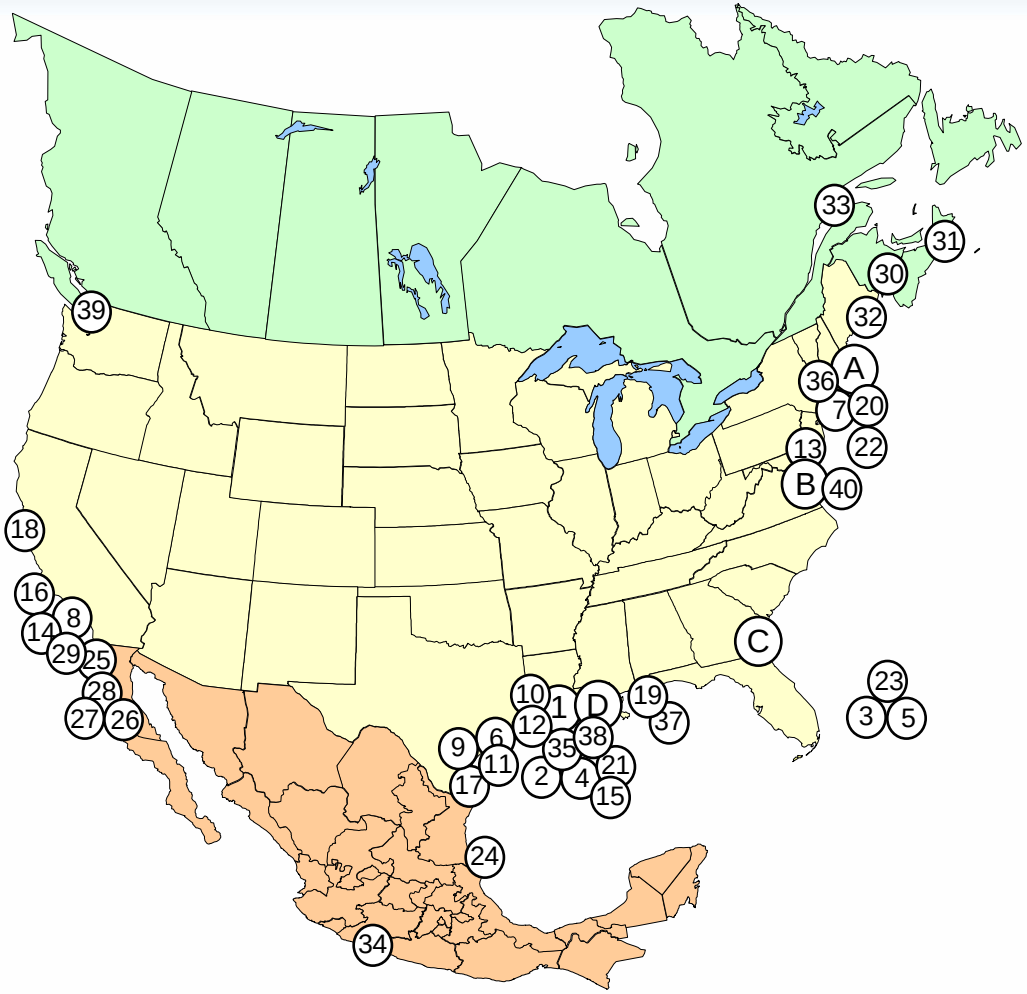
# Proposed LNG Facilities

**Existing Terminals with Approved Expansions**
**A. Everett, MA :** 1.035 Bcfd (Tractebel)
**B. Cove Point, MD :** 1.0 Bcfd (Dominion)
**C. Elba Island, GA :** 1.2 Bcfd (El Paso)
**D. Lake Charles, LA :** 1.2 Bcfd (Southern Union)
**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 Global)
**Proposed Terminals – FERC**
**5. Bahamas :** 0.83 Bcfd, (Calypso Tractebel)
**6. Freeport, TX :** 1.5 Bcfd, (Cheniere / Freeport LNG Dev.)
**7. Fall River, MA :** 0.8 Bcfd, (Weaver's Cove Energy)
**8. Long Beach, CA :** 0.7 Bcfd, (SES/Mitsubishi)
**9. Corpus Christi, TX :** 2.6 Bcfd, (Cheniere LNG Partners)
**10. Sabine, LA :** 2.6 Bcfd (Cheniere LNG)
**11. Corpus Christi, TX :** 1.0 Bcfd (Vista Del Sol/ExxonMobil)
**12. Sabine, TX :** 1.0 Bcfd (Golden Pass/ExxonMobil)
**13. Logan Township, NJ :** 1.2 Bcfd (Crown Landing LNG – BP)
**Proposed Terminals – Coast Guard**
**14. California Offshore**: 1.5 Bcfd, (Cabrillo Port – BHP Billiton)
**15. Louisiana Offshore :** 1.0 Bcfd (Gulf Landing – Shell)
**16. So. California Offshore :** 0.5 Bcfd, (Crystal Energy)
**Planned Terminals and Expansions**
**17. Brownsville, TX :** n/a, (Cheniere LNG Partners)
**18. Humboldt Bay, CA :** 0.5 Bcfd, (Calpine)
**19. Mobile Bay, AL:** 1.0 Bcfd, (ExxonMobil)
**20. Somerset, MA :** 0.65 Bcfd (Somerset LNG)
**21. Louisiana Offshore :** 1.0 Bcfd (McMoRan Exp.)
**22. Belmar, NJ Offshore :** n/a (El Paso Global)
**23. Bahamas :** 0.5 Bcfd, (Seafarer - El Paso/FPL )
**24. Altamira, Tamulipas :** 1.12 Bcfd, (Shell)
**25. Baja California, MX :** 1.0 Bcfd, (Sempra & Shell)
**26. Baja California :** 0.6 Bcfd (Conoco-Phillips)
**27. Baja California - Offshore :** 1.4 Bcfd, (Chevron Texaco)
**28. Baja California :** 0.85 Bcfd, (Marathon)
**29. California - Offshore :** 0.5 Bcfd, (Chevron Texaco)
**30. St. John, NB :** 0.75 Bcfd, (Irving Oil & Chevron Canada)
**31. Point Tupper, NS** 0.75 Bcf/d (Access Northeast Energy)
**32. Harpswell, ME :** 0.5 Bcf/d (Fairwinds LNG – CP & TCPL)
**33. St. Lawrence, QC :** n/a (TCPL and/or Gaz Met)
**34. Lázaro Cárdenas, MX :** 0.5 Bcfd (Tractebel)
**35. Gulf of Mexico :** 1.0 Bcfd (ExxonMobil)
**36. Providence, RI :** 0.5 Bcfd (Keyspan & BG LNG)
**37. Mobile Bay, AL:** 1.0 Bcfd (Cheniere LNG Partners)
**38. Lake Charles, LA:** 0.6 Bcfd (Southern Union)
**39. Cherry Point, WA:** 0.5 Bcfd (Cherry Point Energy LLC)
**40. Cove Point, MD :** 0.8 Bcfd (Dominion)

** US pipeline approved; LNG terminal pending in Bahamasr*




Source: Federal Energy Regulatory Commission



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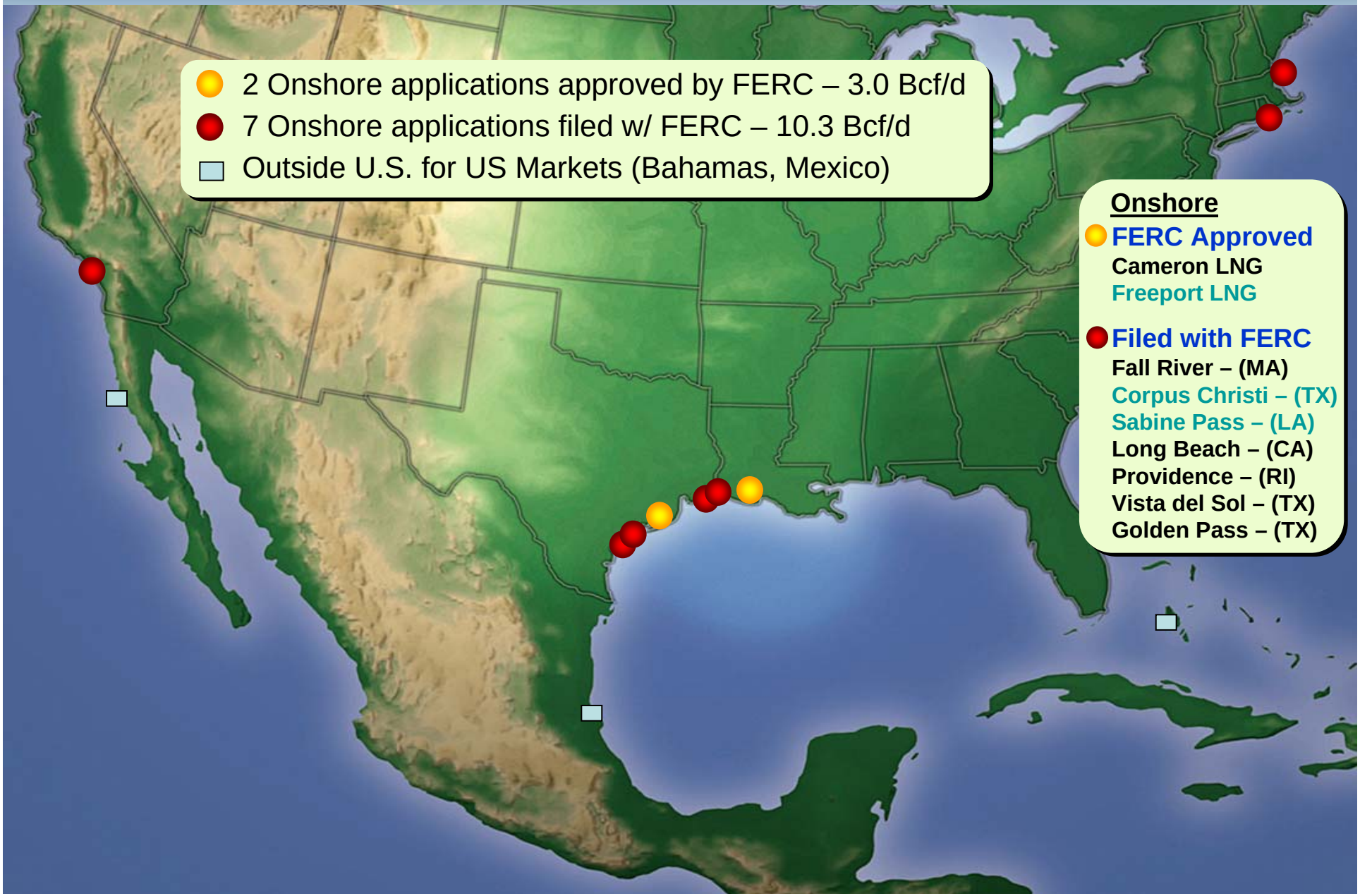
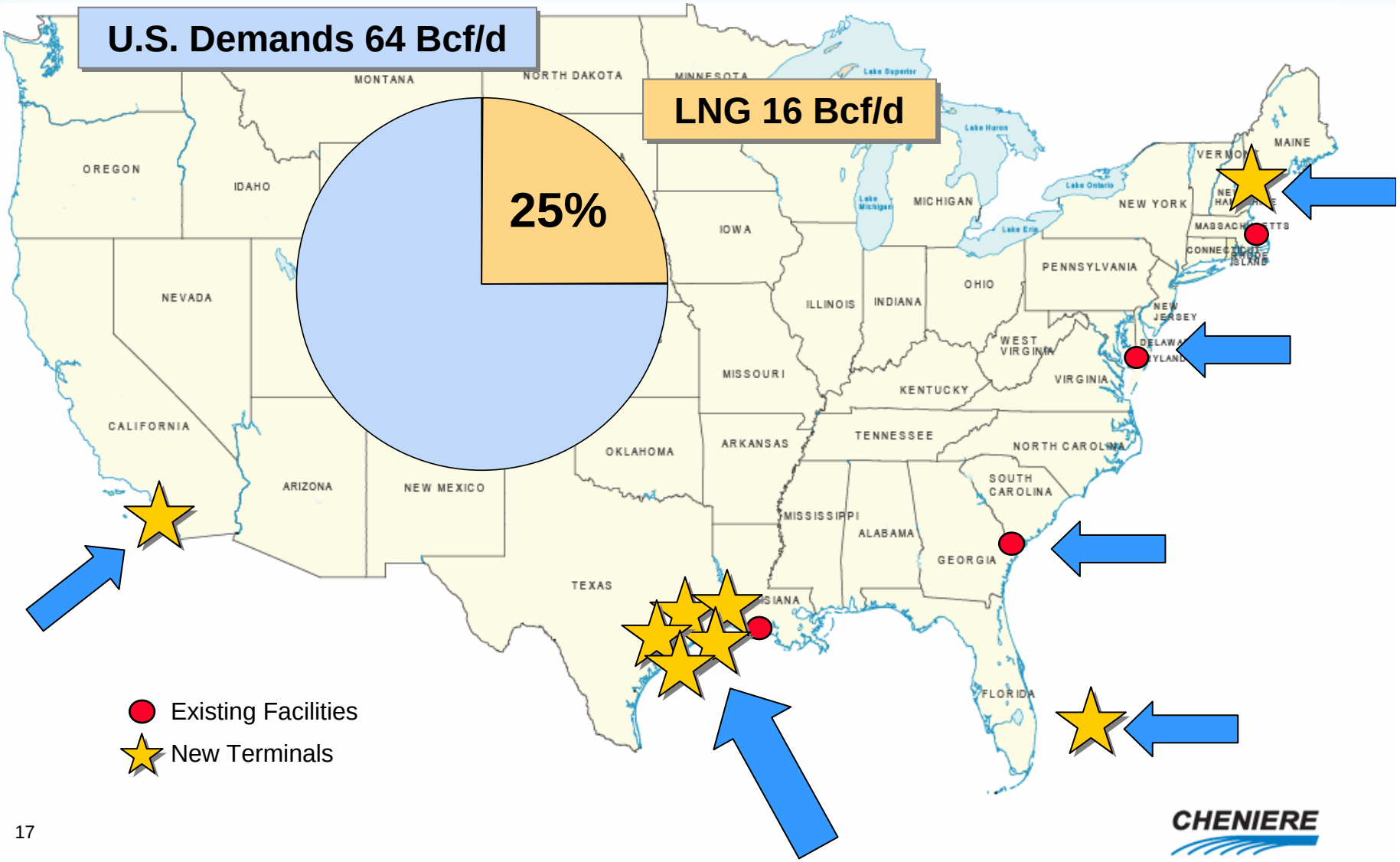
# Actual Onshore Applications



# US Regasification Capacity
## 2010



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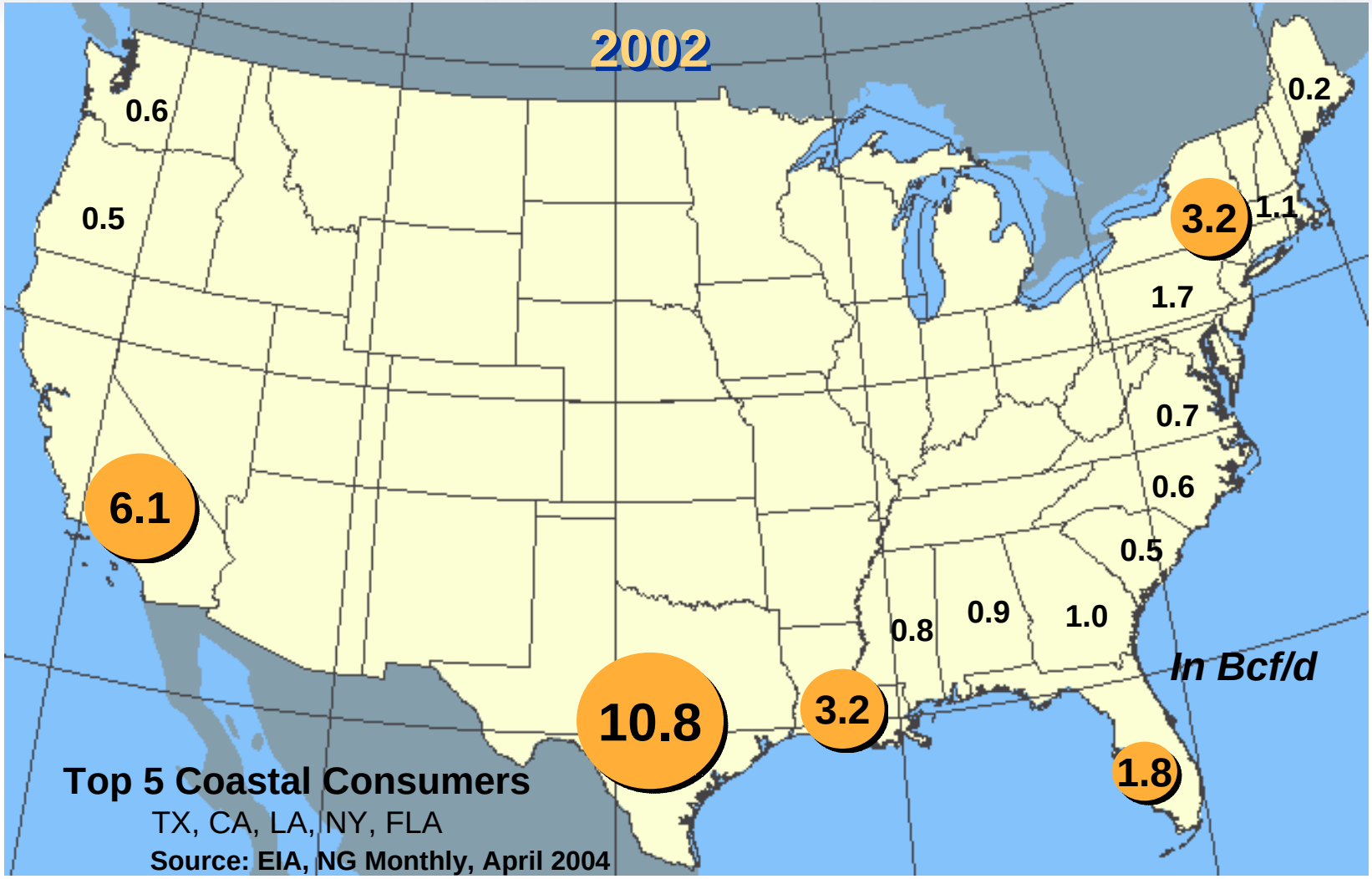
# Terminal Siting Best Practices

- ✓ **Deepwater port access and compatibility with shipping traffic;**
- ✓ **Safety, especially suitability of acreage for safety exclusion zones;**
- ✓ **Pipeline takeaway capacity;**
- ✓ **Acceptance by local communities;**
- ✓ **Coordination of federal and state agencies;**

# Coastal States Gas Consumption



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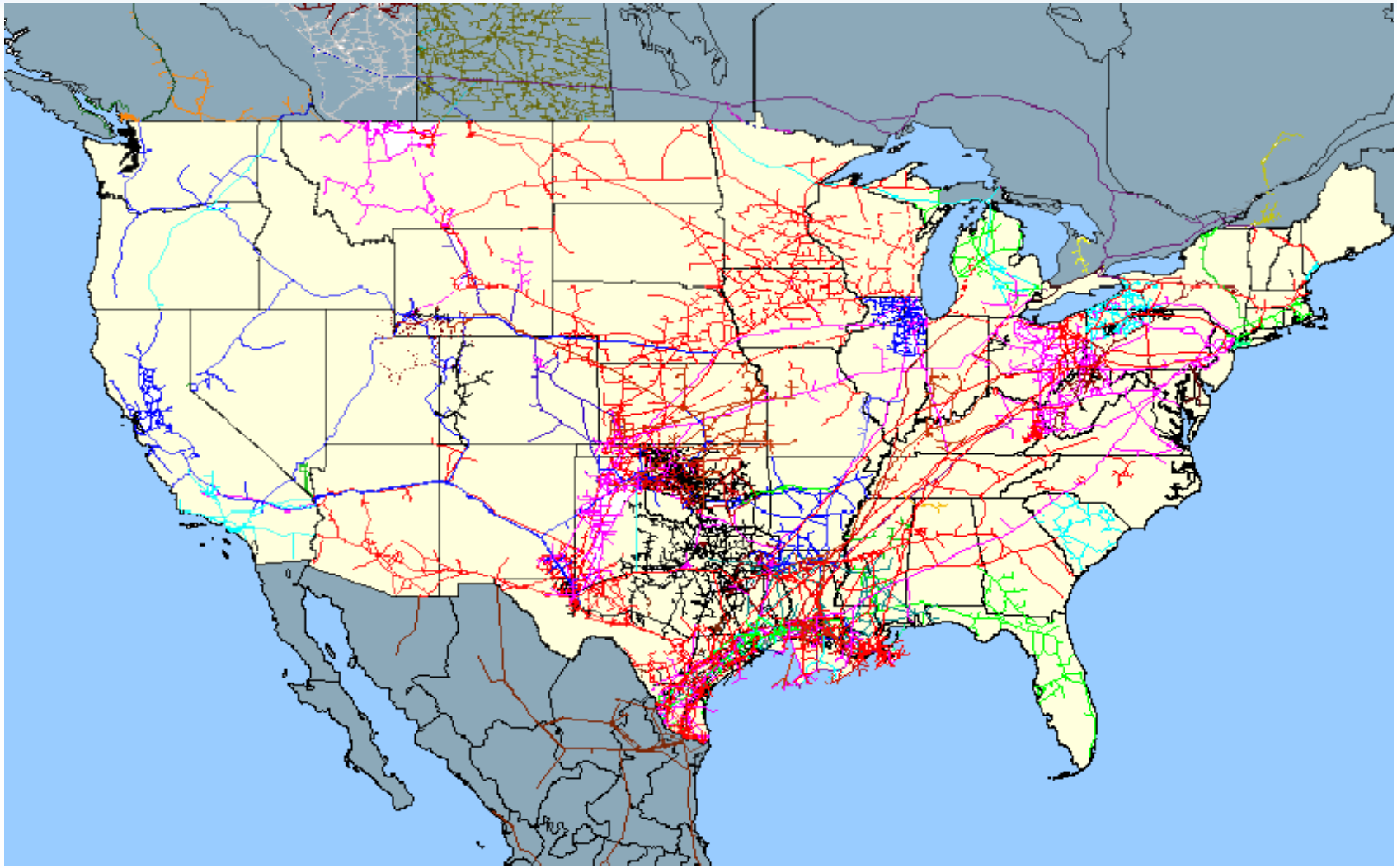
# US Gas Pipeline System

## Gulf Coast-centered transmission system reaches all US markets





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# Cheniere LNG Receipt Network

- 3 Deepwater Ports
- 5 Unloading Docks
- 8 Storage Tanks (27 Bcf equivalent)

- 6.7 Bcf/d Sendout
- 14 Bcf/d Interstate Pipeline takeaway capacity
- 15 Bcf/d Local Markets

Sabine Pass

Freeport

Corpus Christi

- Optionality
- Flexibility
- Reliability
- Liquidity
- Low Cost

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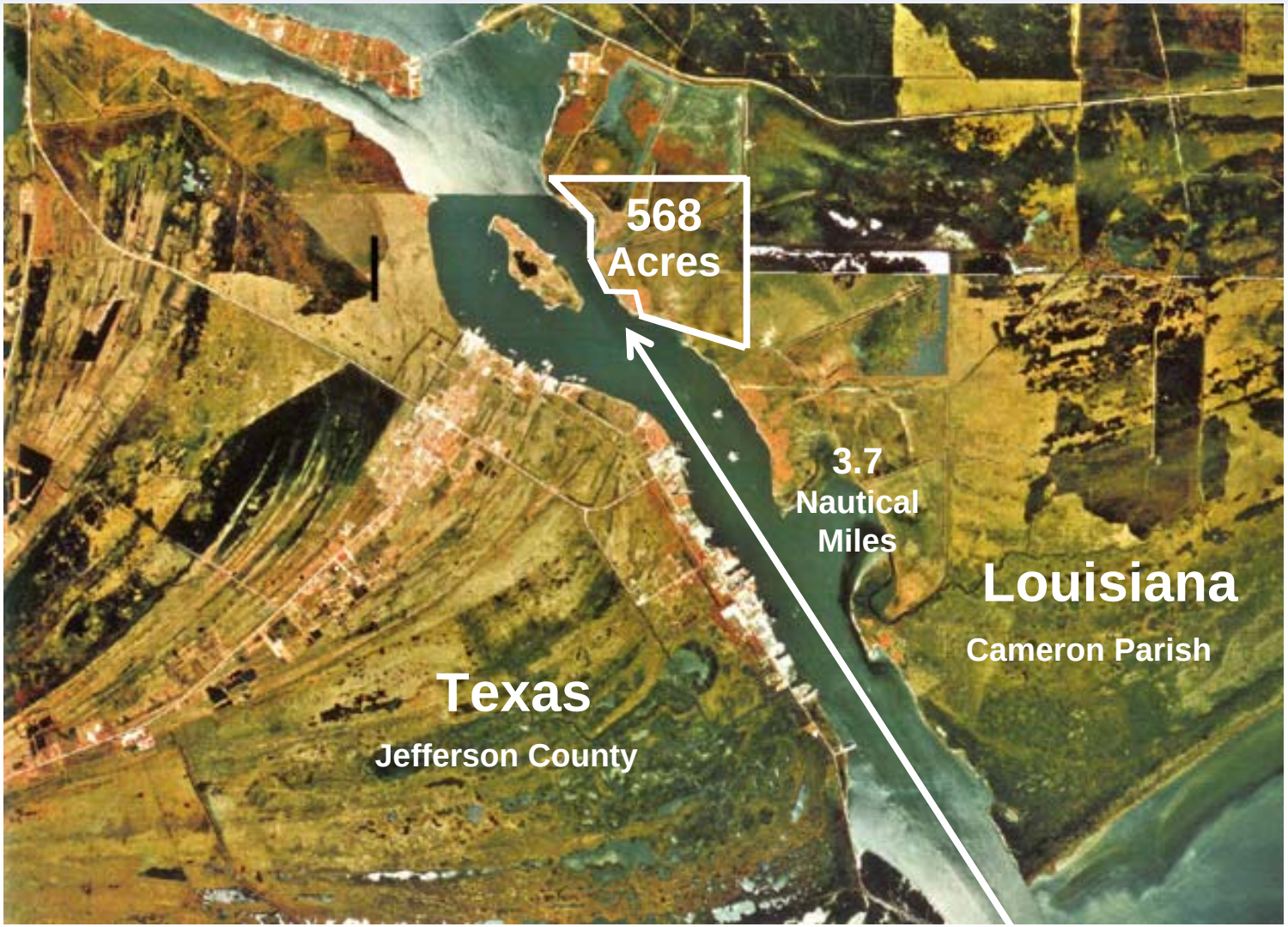
# Sabine Pass LNG Site



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# Sabine Pass LNG
## Facility Design Highlights

- **Berthing/Unloading**
  - 2 docks handle 87,000 cm to 250,000 cm LNGCs
- **Storage**
  - 3 x 160,000 cm (10.1 Bcfe)
- **Vaporization**
  - 2.6 Bcf/d capacity
- **Filed December 22, 2003**
  - Docket No. CP04-47-000
- **In-Service Date**
  - Winter Heating Season 2007
- **Strong Community Support**

Sabine Pass - Artist's Rendition



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# Local Support

◆ EDITORIALS

LNG terminals could safely be productive asset

◆ JOHNSON BAYOU, LA.

Parish opens arms to LNG plant

LNG Terminal gets strong support here

By CYNDI SELLERS

Business

D12 caller.com Corpus Christi Caller-Times

Cheniere plant backers pack meeting

Environmental topic of meeting rarely comes up; regional leaders turn out, show support

By ALISON ZIELENBACH
Caller-Times

Register to comment

LNG Questions & Answ

◆ READERS WRITE

New gas plants will be boon for economy

I have read recently all of the comments regarding the proposed liquefied petroleum gas plants in this (and other) areas. Let me tell you a story, going back some 62 years.

After the Japanese cut off our natural rubber supply in the Far ...st, our U.S. government began ...lding synthetic rubber plants ...well as plants to produce raw ...rials. These plants were a ... to employment for thou... of unemployed men and ... throughout America. The ...id not have the safety fea... ...t have developed in the ... years.

...belief that LN... ...the plan...

KIEFER
Beaumont

Blanco endorses Cheniere Energy Sabine Pass

Louis Rom
lrom@theadvertiser.com

LAFAYETTE — Gov. Kathleen Blanco, attending an oil and gas conference Monday in Houston, threw her support behind a plan that would reportedly bring more than 120 jobs to southwest Louisiana.

The Sabine Pass Liquid Natural Gas Receiving Terminal along the Texas border, if completed according to plan, would be the largest receiving terminal in the country, importing more than 2.6 billion cubic feet per day of LNG.



Gov. Kathleen Blanco

Blanco, speaking at the annual Offshore Technology Conference, said she is "committed to ensuring access to economic, safe and environmentally friendly energy supplies that will not only create jobs in our state, but will keep jobs here."

About 1 percent of the country's natural gas supply is liquefied natural gas, a figure that experts say could triple by 2020.

Blanco has asked all state agencies and the federal government to support the project and work with Cheniere Energy to expedite permitting for the project.

Cheniere and its contractors are expected to employ more 600 people during construction of the project, which will create more than 120 direct and indirect jobs when it opens.

But the long-term impact could be much greater, Blanco said, citing a recent study by LSU's Center for Energy Studies.

The report, "Economic Opportunities for LNG Development in Louisiana," concluded that development of a liquefied natural gas infrastructure in the state could mean 13,000 new jobs and job security for more than 11,000 employees in the industry today. In all, the ripple effect, said Blanco, could mean as much as $2.3 billion to the state's economy.

Cheniere Chairman Charif Souki said the company is excited about the governor's eagerness to make the project happen. Cheniere said that he hopes to begin construction of the terminal by the end of year, with operations to begin by winter 2007, Souki said.



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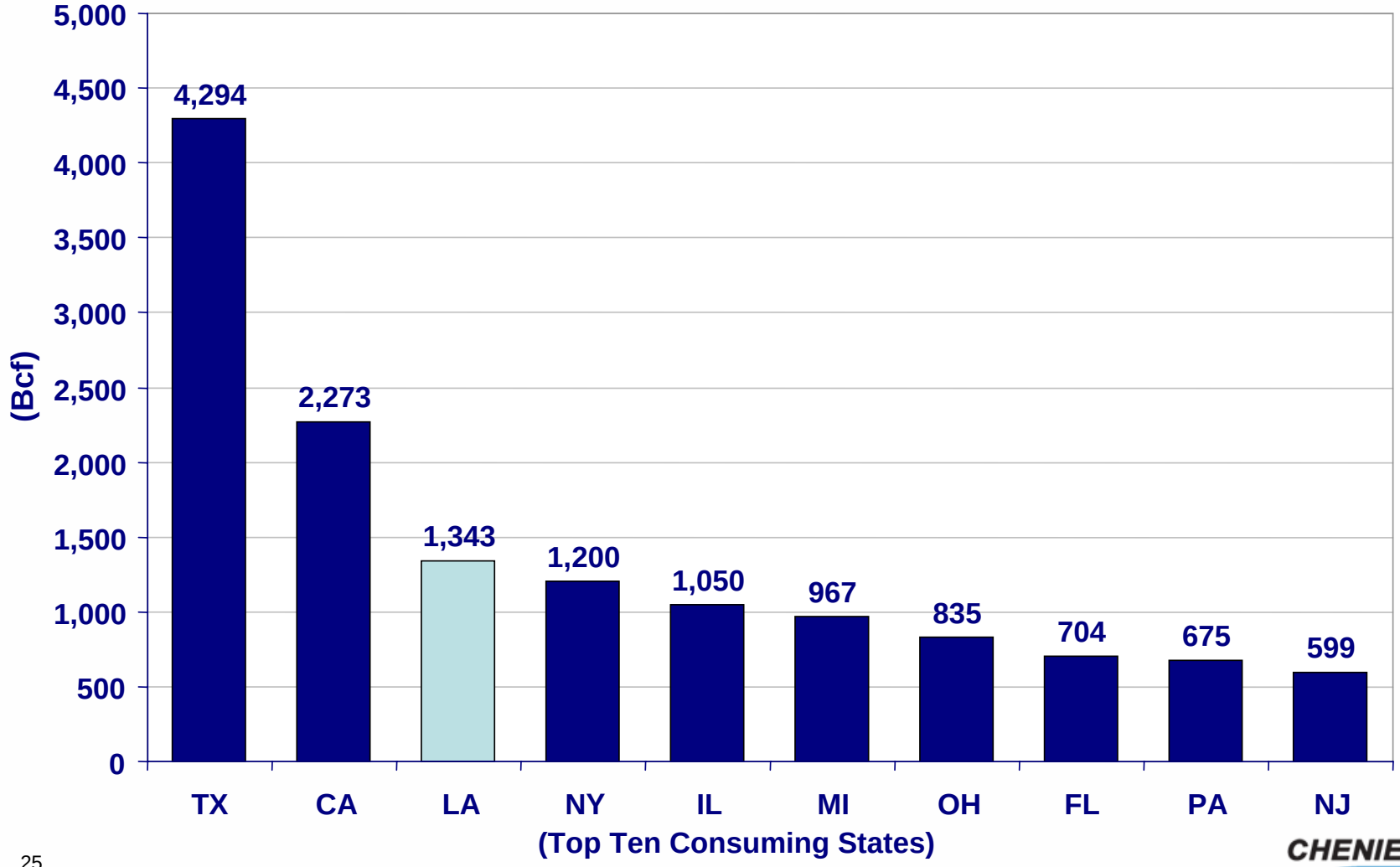
# Natural Gas Consumption in the U.S. (2002)

## Louisiana is the 3rd largest consumer of natural gas in the US






Source: Energy Information Administration, Department of Energy.

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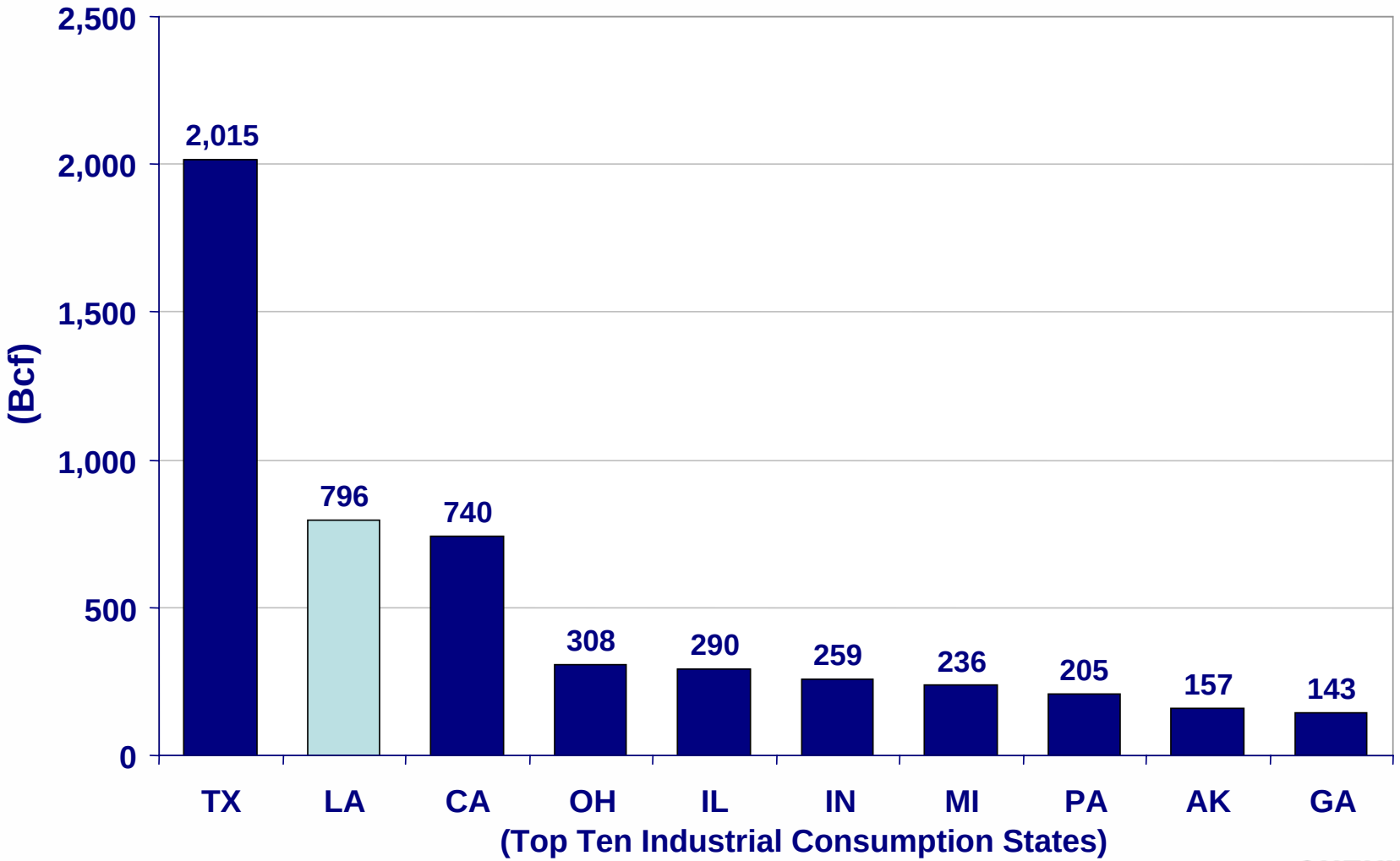
# Industrial Natural Gas Consumption (2002)

## Louisiana industrial consumption ranks 2nd in the US




Source: Energy Information Administration, Department of Energy
Center for Energy Studies, LA State University, April 2004



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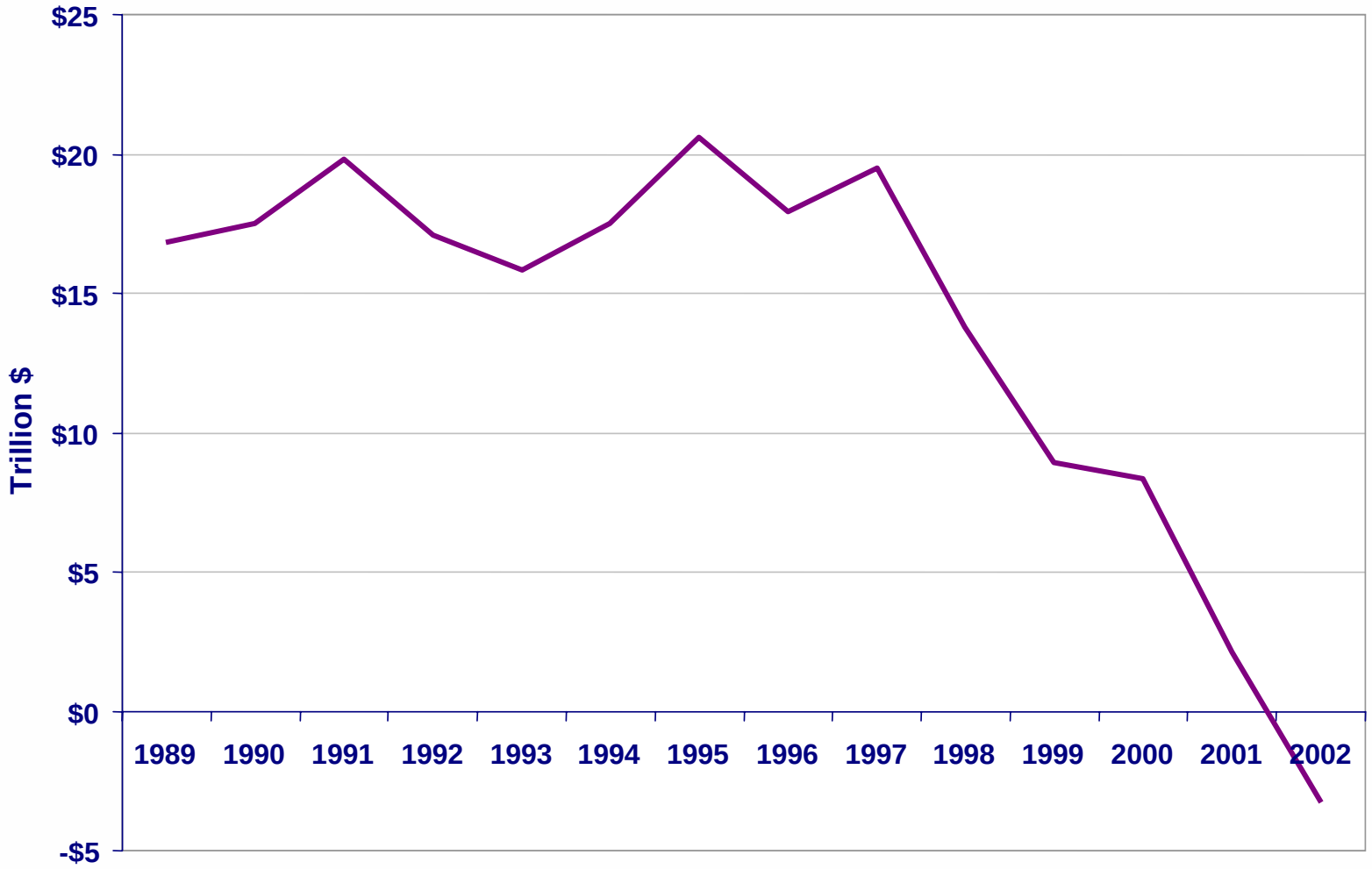
# Value of Net Exports – Chemicals

## In 2002 the US became a net importer of chemicals






Source: Office of Trade and Economic Analysis, International Trade Administration, U.S. Department of Commerce
Center for Energy Studies, LA State University, April 2004

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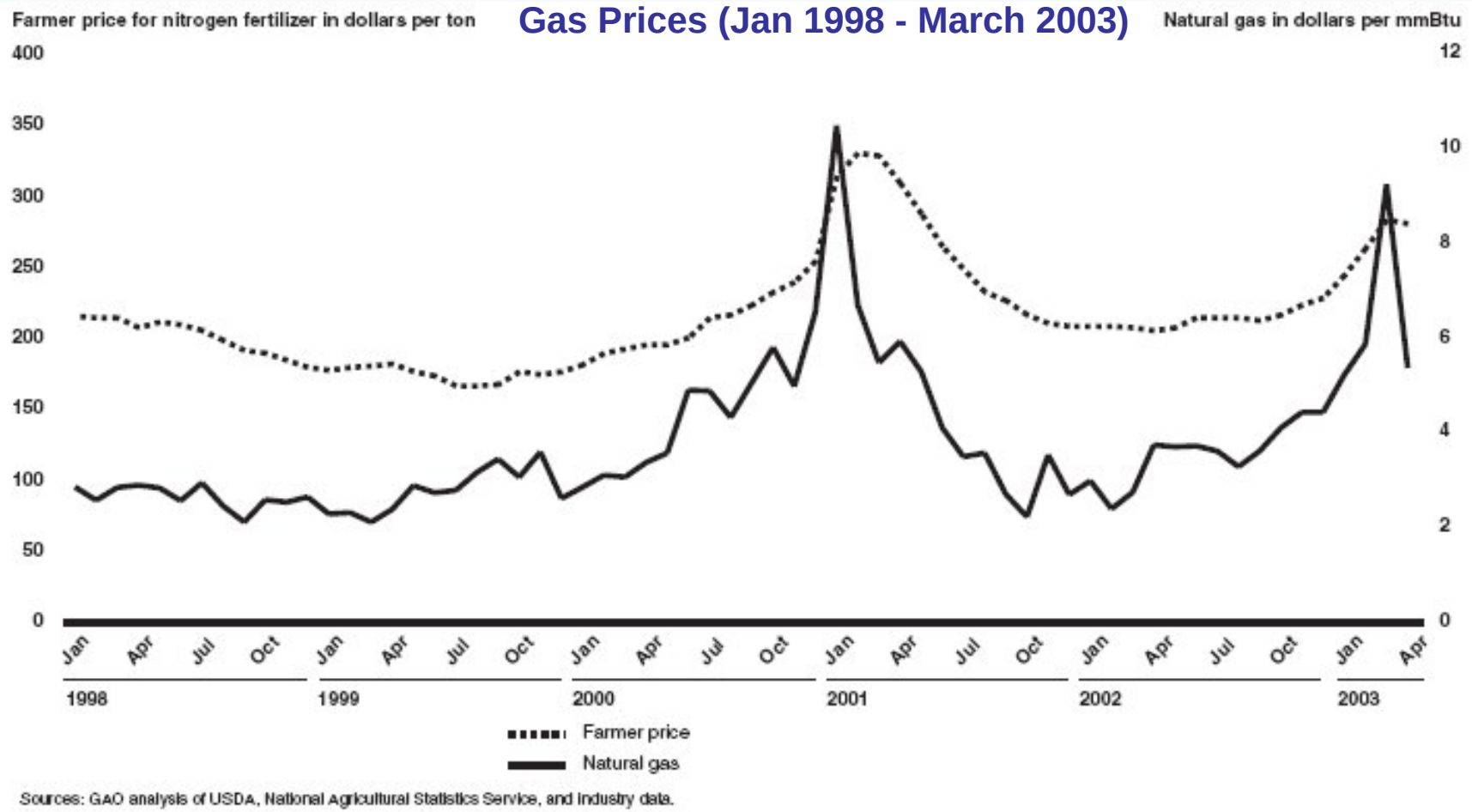
# Farmer Prices for Nitrogen Fertilizer Relative to Natural Gas




Note: Nitrogen fertilizer prices were calculated using USDA price indices and the amount of nitrogen contained in anhydrous ammonia, urea, and UAN.

Source: "Domestic Nitrogen Fertilizer Production Depends on Natural Gas Availability and Prices," U.S. General Accounting Office, September 2003. Center for Energy Studies, LA State University, April 2004



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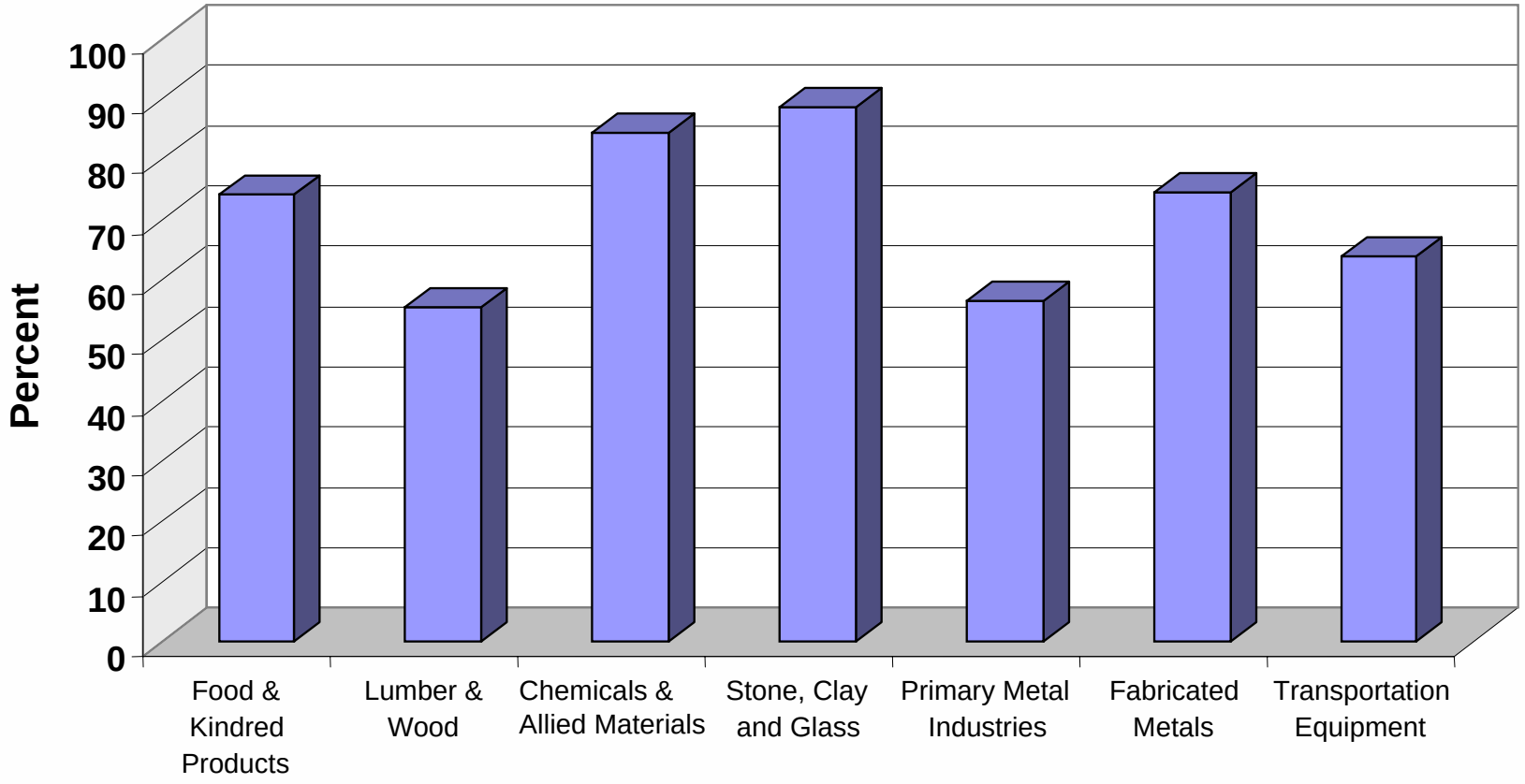
# Natural Gas Used in Louisiana

## Percentage of Total Energy by Selected Industrial Sectors






Source: Center for Energy Studies, LA State University, April 2004

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# LNG Schematic
# Production to End-User

## One LNG Tanker Carries Enough Fuel


**to Fuel Entergy Louisiana's Little Gypsy Plant (1,251 MW) for 1 month or Waterford 1&2 (891 MW) for 2 Months**

**OR**

**to Fuel over 5 percent of Louisiana's Residential Customers for 1 Year (over 51,000 customers)**

**OR**

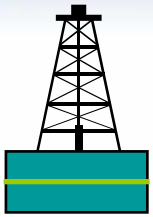
**to Fuel 5 Industrial Plants for 1 Year**

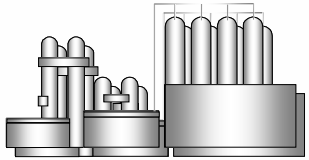
**Note: Assumes average monthly power usage of 1,275 MMcf; and average annual industrial usage of 536 MMcf**

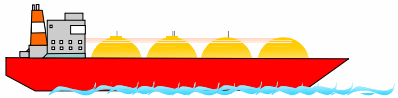


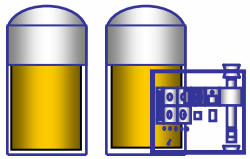
Source: Energy Information Administration; Federal Energy Regulatory Commission; IELE, University of Houston; and Statoil.com.

# LNG Value Chain









## Supply

| | |
|---|---|
| Reserves | 9 Tcf |
| Scope | $0.05B |
| Initial drilling | $0.05B |
| Develop-ment | $1.4B |

## Liquefaction

| | |
|---|---|
| Trains required | 2 |
| Cost per train | $1.0B |

## Shipping

| | |
|---|---|
| Distance | 12,000 nm |
| Trip Time | 30 days |
| Ships Required | 12 |
| Cost per ship | $0.17B |

## Regasification

| | |
|---|---|
| Port | $0.09B |
| Storage | $0.16B |
| Vaporization | .19B |
| Engineering & Other | .06B |

## Total

| | | | | |
|---|---|---|---|---|
| 1 Bcf/d Scenario | | | | |
| **$1.5 B** | **$2.0 B** | **$1.0 – 2.0 B** | **$0.5 B** | **$5.0 – 6.0 B** |
| Per Unit $/Mcf | | | | |
| **$.50 – 1.25** | **$.80 – 1.00** | **$.60 – 1.60** | **$.30 – .50** | **$3.25 – 4.35** |



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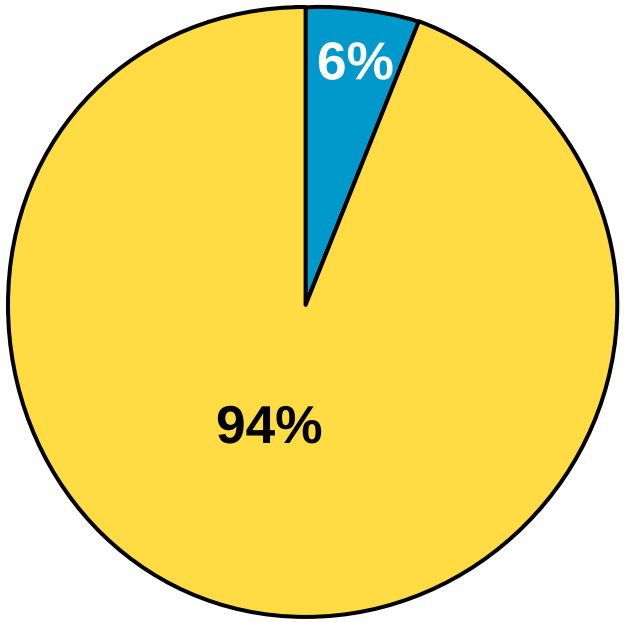
# Worldwide Regas Capacity Holders
## 2002

### Top Capacity Holders
By Region

- Japan
  - Tokyo Electric
  - Tokyo Gas
  - Toho Gas
  - Osaka Gas
  - Chubu Electric
- Korea
  - Kogas
- Taiwan
  - CPC
- Europe
  - Gaz de France
  - Gas Natural (Spain)
  - Snam Rete Gas (Italy)
  - Distrigas (Belgium)
  - Transgas (Portugal)
  - Depa (Greece)
  - Botas (Turkey)

Sellers
2.4 Bcf/d




Buyers
37.6 Bcf/d



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# Cheniere Capacity Sales

| | |
|---|---|
| **Total capacity in development** | **6.7 Bcf/d** |
| Held to Cheniere's Account | 2.2 Bcf/d |
| Offered to Market | 4.5 Bcf/d |
| Committed - Dow Chemical & ConocoPhillips | 1.5 Bcf/d |
| Committed – Total Option | 1.0 Bcf/d |
| Available | 2.0 Bcf/d |



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# Too Much or Too Little?

## Risks of too little

- Demand destruction and job loss
- Reliance on imports of value added products
- Economic pain across most sectors
- High natural gas prices



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## Barriers against too much LNG

- Limited number of adequate sites
  - Deepwater port
  - Pipeline capacity
  - Large site
- Lack of public reception in many locations
- Large upstream capital requires contract foundation



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# Summary

- US needs access to the world's abundant supplies of natural gas
- LNG will stabilize and lower natural gas prices
- 8-10 US import terminals will be built
- LNG could provide 25% of domestic consumption
- More large users will contract directly for supply (e.g., DOW, FPL)
- Strategic window of opportunity is open