



# **LNG's Role in US Natural Gas Supply**

## **March 23, 2004**

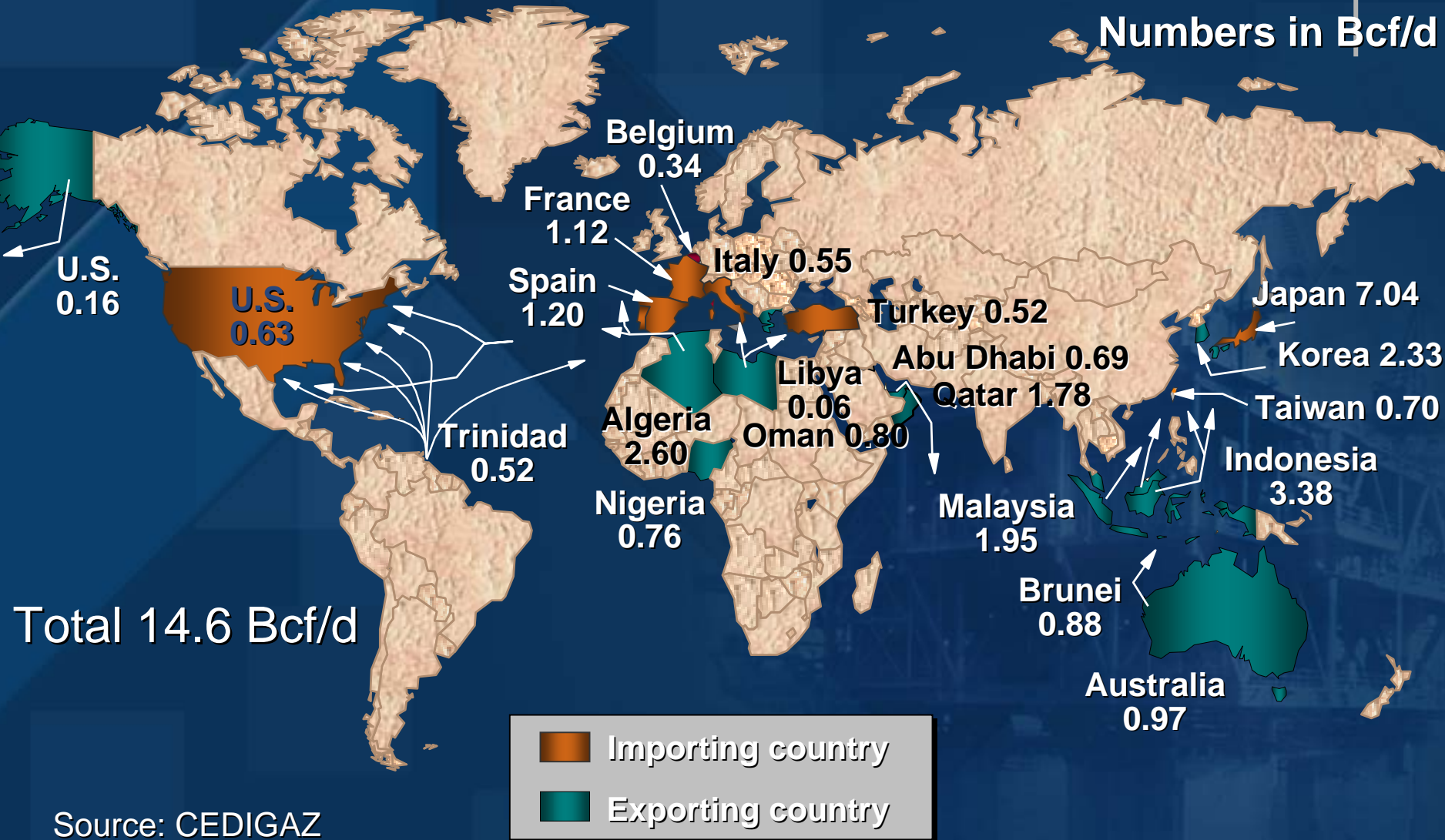
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**El Paso Corporation**

# Global LNG Trade: 2002



Numbers in Bcf/d



Source: CEDIGAZ

# Value Chain



\$5-6 Billion

- ^ LNG capital costs are significant
- ^ High utilization of facilities is essential to keep the cost per unit down
- ^ Capabilities of entire chain designed to mirror each other

SUPPLY



TRANSPORTATION



LIQUEFACTION

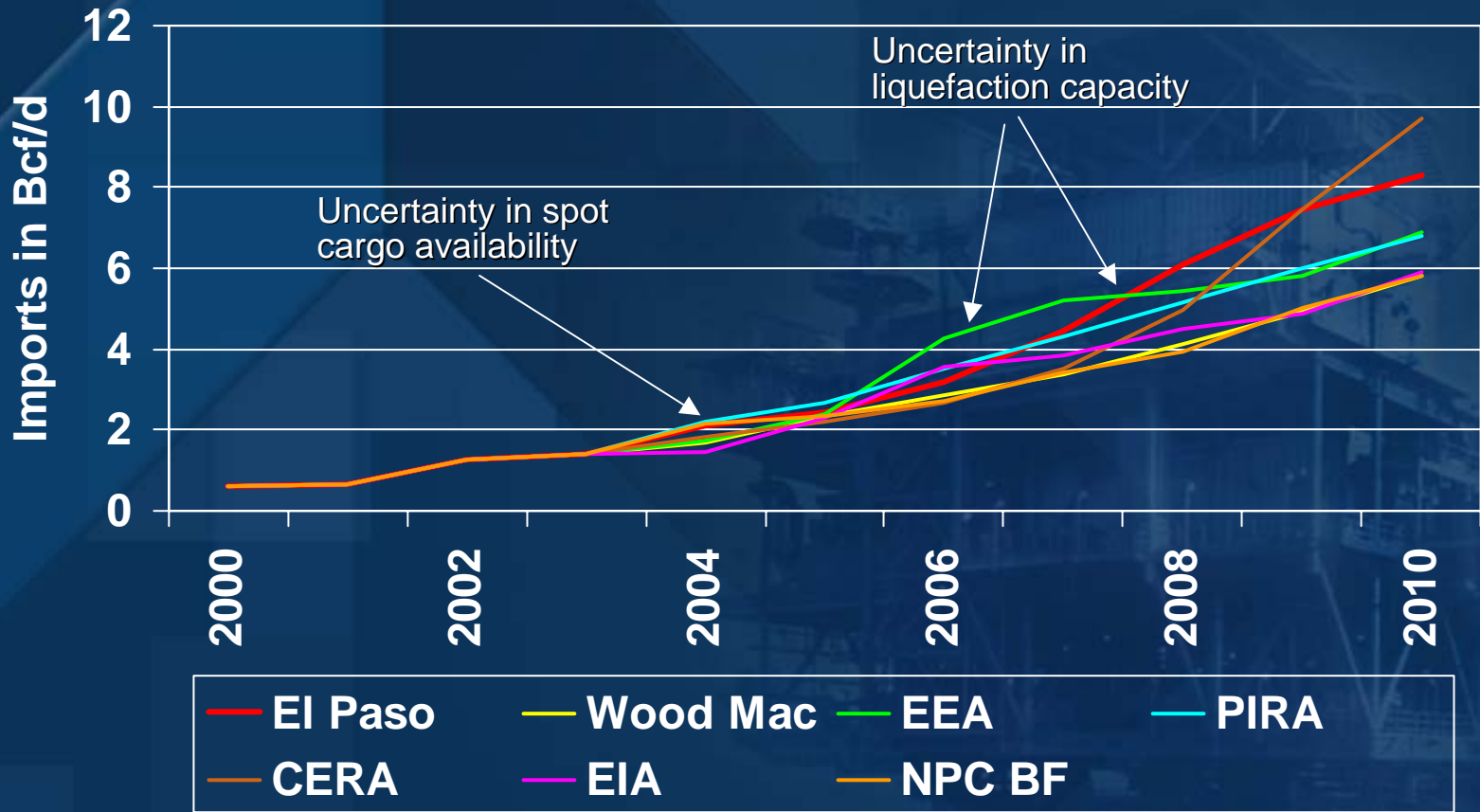


REGASIFICATION

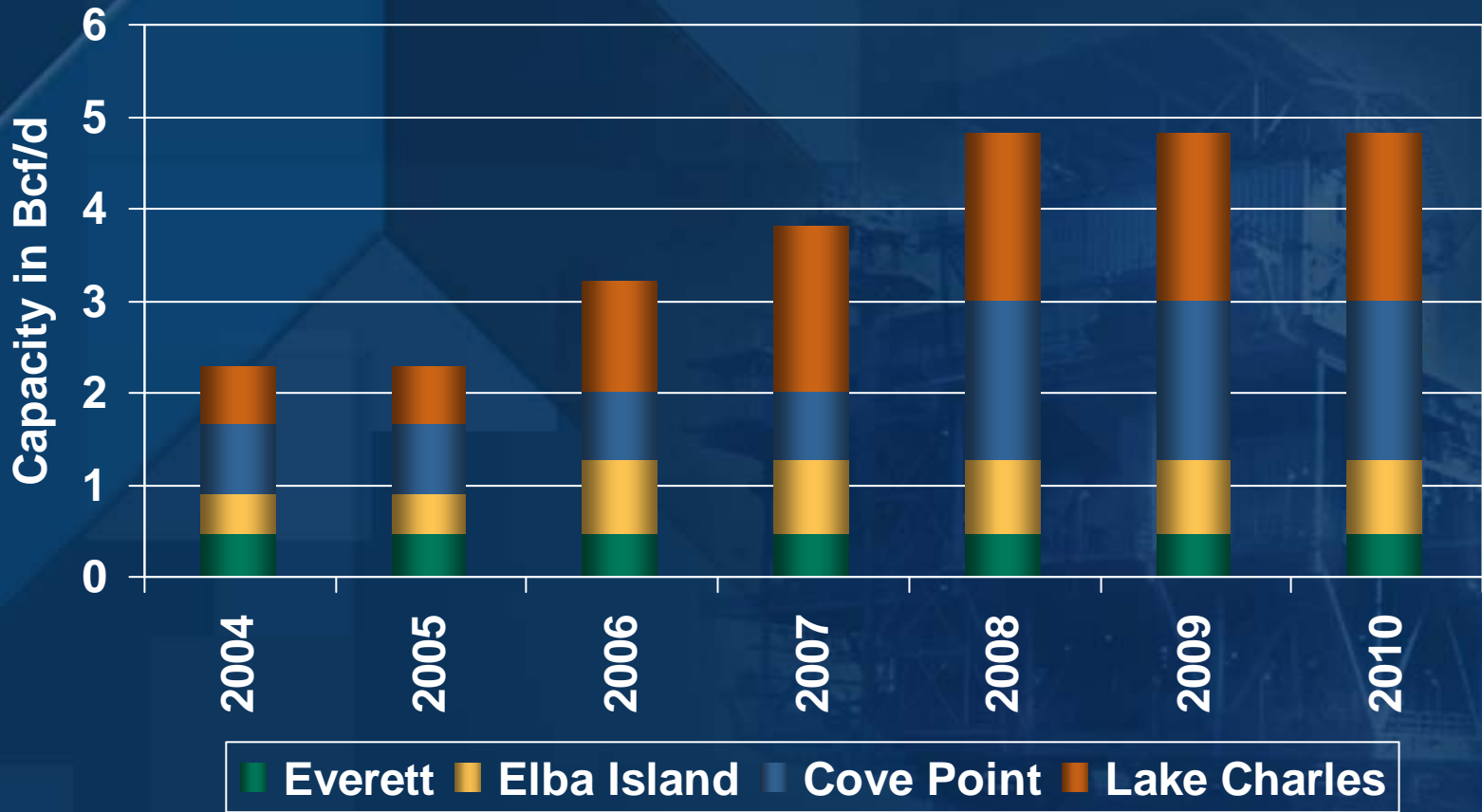
PIPELINE



# Projected US LNG Imports



# Expansions at Existing Terminals





# Existing and Proposed North American LNG Import Terminals



- Proposed terminals
- ▲ Existing terminals

# Market Delivery



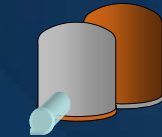
DWPA



Deepwater  
Port Act

Hackberry

Pipeline  
Sec  
7(c)



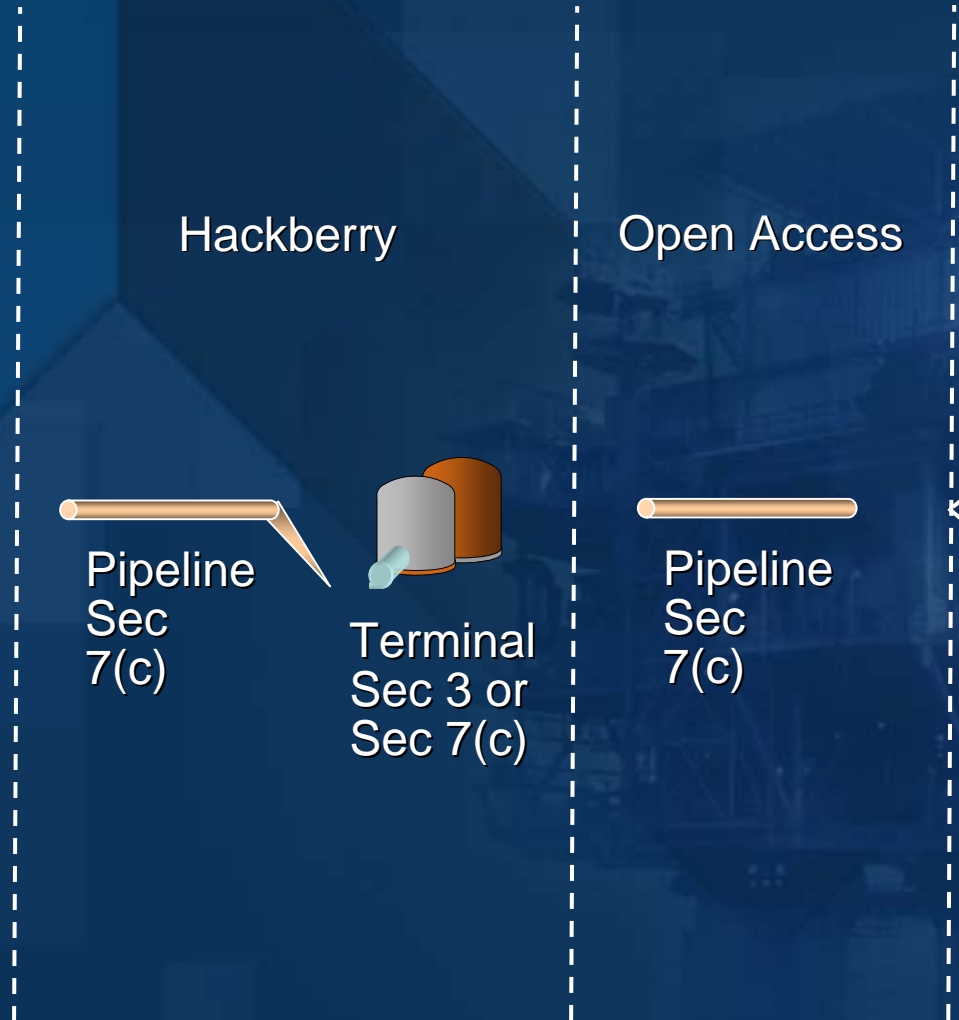
Terminal  
Sec 3 or  
Sec 7(c)

Open Access

Pipeline  
Sec  
7(c)

To Grid

To Market



# Gas Content



## ^ Gas interchangeability

- The ability of a gas to be used successfully and safely in an appliance that has been previously set for a different gas

## ^ Gas quality

- The ability of a gas to be transported without liquids fallout, corrosive effects, or other negative safety factors

## ^ Issues

- High Btu content can lead to poor combustion
- Hydrocarbon Dew Point can cause liquid fallout
- Tariff specifications regulated by FERC
  - ^ Pipeline specific (Btu, HDP, C3+)
- Impact to pipelines, plants, and existing customers



# Gas Content Management



- ^ Processing plants
  - Provides merchantable “pipeline quality” gas to the pipelines on behalf of the producers
  - Gulf of Mexico infrastructure in place
  - Cryogenic plants allow for ethane rejection
  - Fee based vs. % of proceeds
- ^ Pipelines
  - Access to processing plants
  - Ability to blend or isolate streams
  - Tariff waivers or modifications
- ^ Air or nitrogen injection
  - Dominantly performed in market areas
- ^ Gulf of Mexico best suited for processing and pipelines

# Regional Profiles for New Terminals



	Permitting	Gas Content	Pipeline Access	Market
Gulf Coast	Excellent	Excellent	Excellent	Excellent
Southeast	Poor	Poor	Fair	Good
Northeast	Fair	Fair	Good	Excellent
West Coast	Poor	Poor	Fair	Good

# Gulf Coast Region



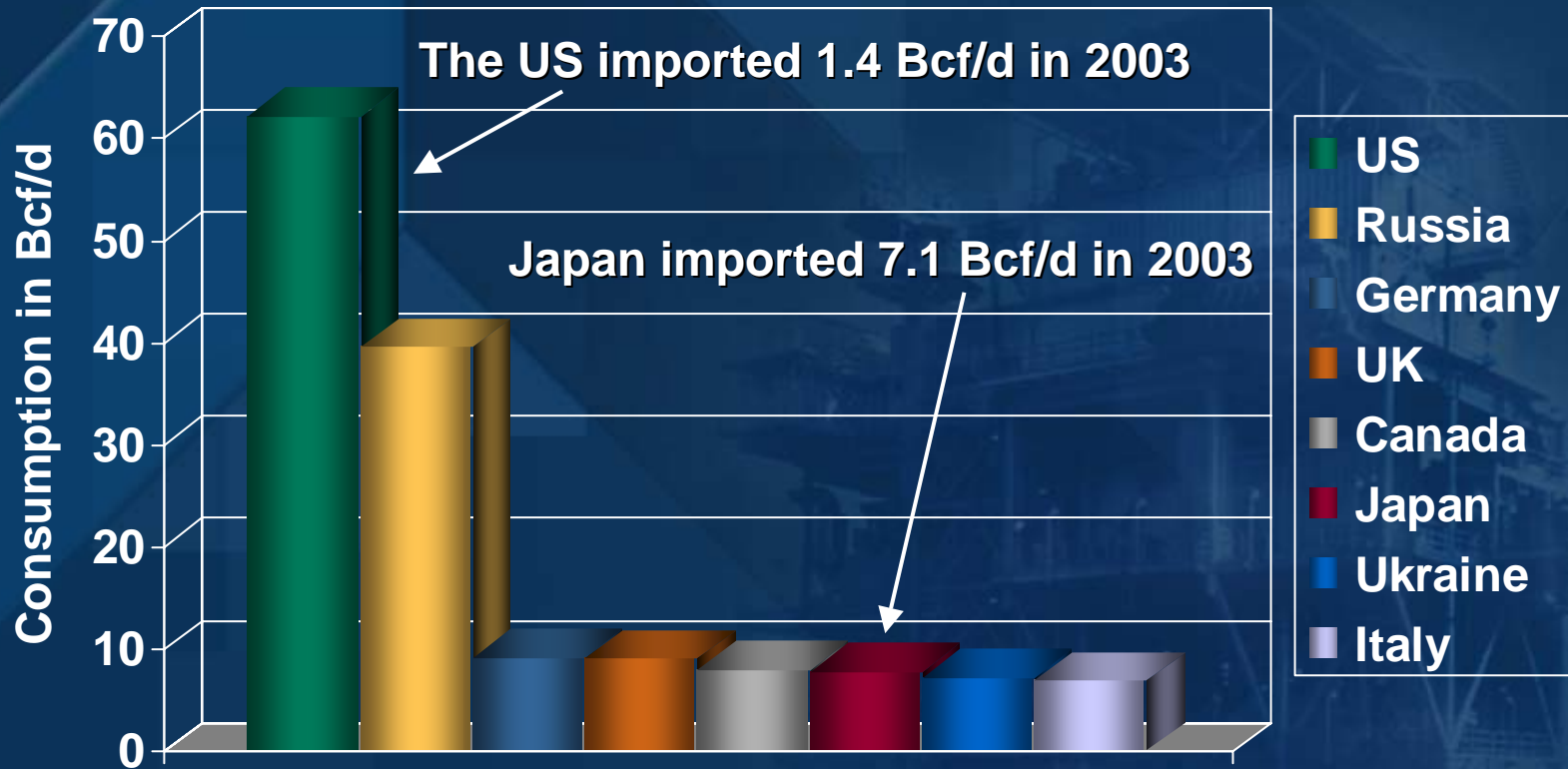
- ^ The Gulf Coast has the largest number of announced projects (16)
- ^ NIMBY objections not a concern in Louisiana and Texas
- ^ The Gulf Coast region is experiencing the least difficulty in permitting new projects
  - The only three projects which have received approval notices are in this region
- ^ This region has substantial processing infrastructure for non-spec LNG
- ^ There are a number of ports with sufficient draft and the region has extensive shipping channels
- ^ Offshore pipeline grid offers significant advantages for DWPA facilities

# Supply Overview



- ⤴ Global reserves of natural gas are estimated at 5,450 Tcf
- ⤴ Over 1,600 Tcf of these reserves are “stranded” and considered suitable for LNG development
  - Stranded:
    - ⤴ Reserves must be distant from a market
    - ⤴ Reasonable access to a deepwater port

# Is the US an Attractive Market?





# Supply Projects



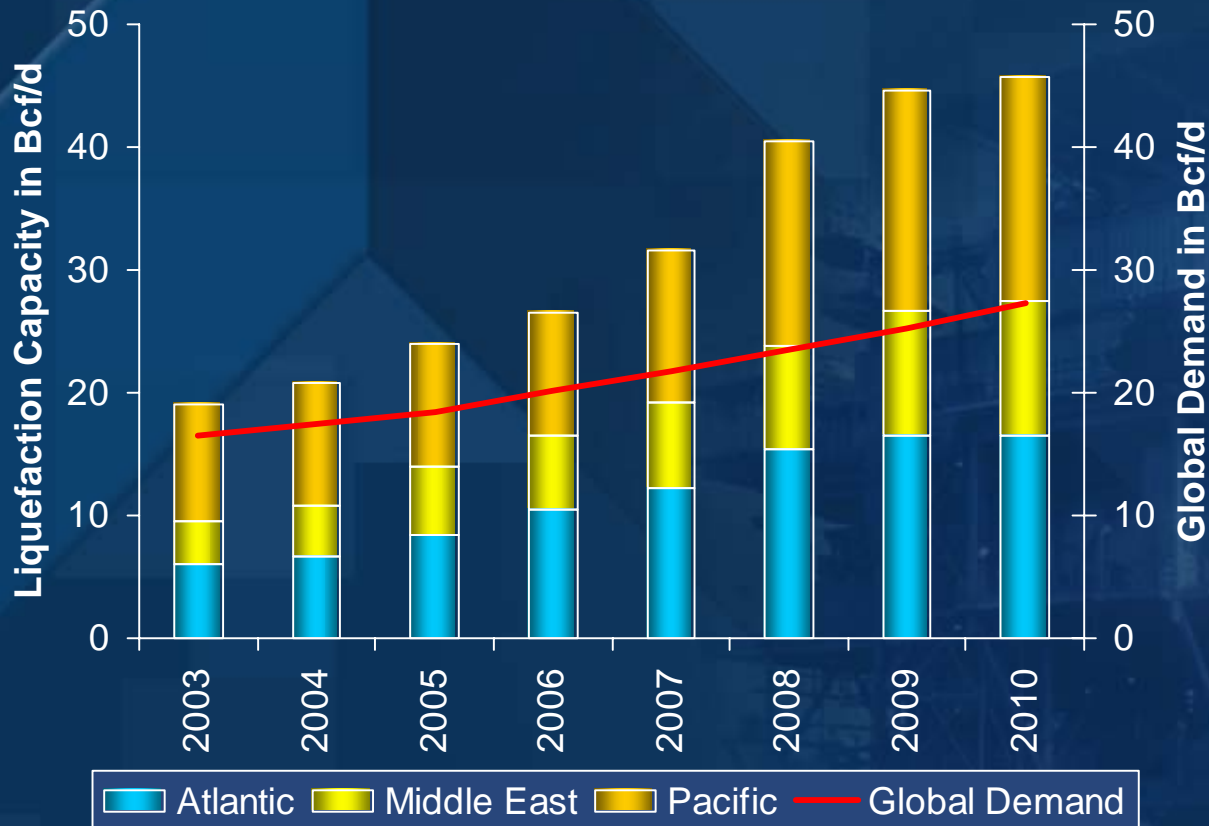
- ⤴ There are 12 LNG producing countries with a current capacity of 16.9 Bcf/d
- ⤴ There are 19 liquefaction projects under construction, which will add 9.9 Bcf/d of supply
  - Atlantic Basin      4.3 Bcf/d
  - Pacific Basin      3.1
  - Middle East      2.5

# Supply Projects



- ⤴ There are 28 liquefaction projects in active development which could provide another 17.9 Bcf/d of supply
  - Atlantic Basin      7.0 Bcf/d
  - Pacific Basin      5.3
  - Middle East      4.9

# Potential Global Liquefaction Capacity and Expected Demand



Sources: Capacity - El Paso; Demand - CERA

# Conclusions



- ^ US demand for natural gas will outstrip domestic production
- ^ LNG will be an important source of supply to meet US needs
  - LNG imports are predicted to surge to 6-10 Bcf/d by 2010
- ^ The gas content issue can and will be solved
- ^ The US is a highly attractive market
- ^ The Gulf Coast has substantial advantages for the siting of new terminals
- ^ There are enough liquefaction projects to meet the 10 Bcf/d level of supply