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Energy Bridge
Bringing Continents of Energy Together
Marine Technology Society
Houston, Texas
April 28, 2005
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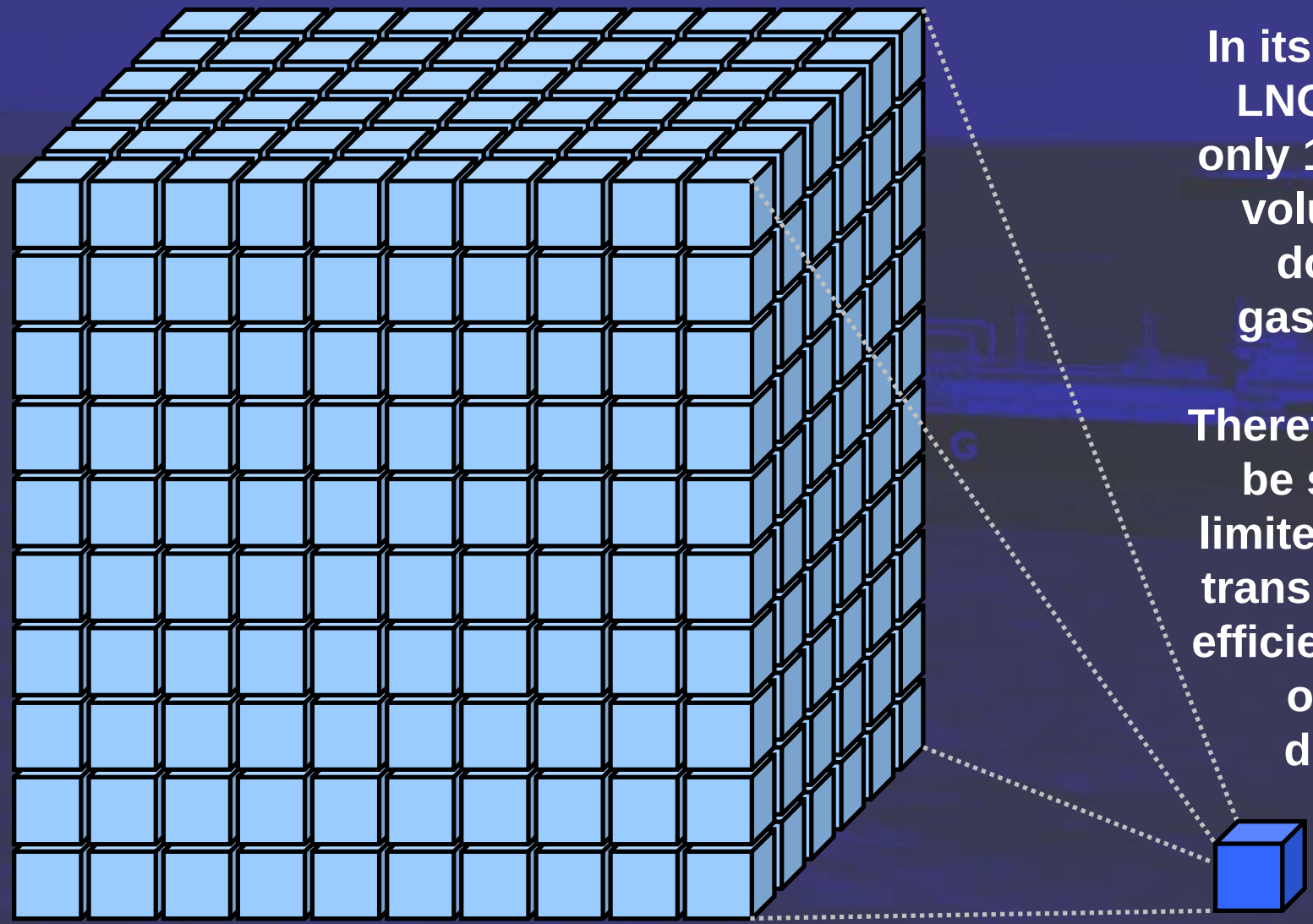
Agenda

- The economics of LNG
- Challenges to building regasification facilities in the United States
- Growth in worldwide liquefaction capacity
- Will betting on economies of scale pay off in LNG?
- Excelerate Energy…a catalyst for action in the LNG space
- What might the future hold for United States imports of LNG?

Natural Gas and LNG Volumes



In its liquid form, LNG occupies only 1/600th of the volume that it does in its gaseous state

Therefore, it is can be stored in a limited space and transported more efficiently by ship over long distances

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The LNG Value Chain

Natural Gas Production

$0.50 -- $1.00

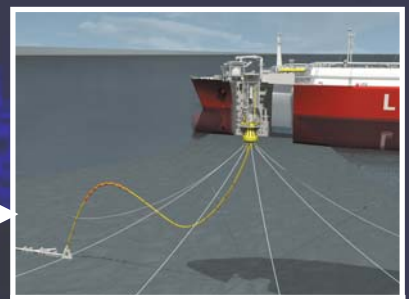
Liquefaction Plant

$0.80 -- $1.00

LNG Tanker

$0.40 -- $1.60

Regasification Terminal



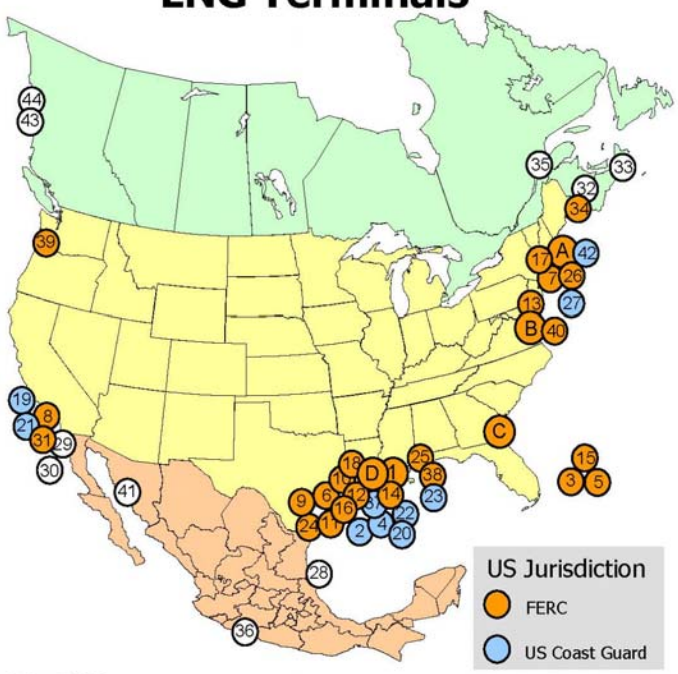
$0.30 -- $0.60

LNG is economically delivered to the US at $2.00 to $4.20 (plus or minus location value)

Challenges to Building New Regasification in the U.S.

FERC

Existing and Proposed North American LNG Terminals



July 2004

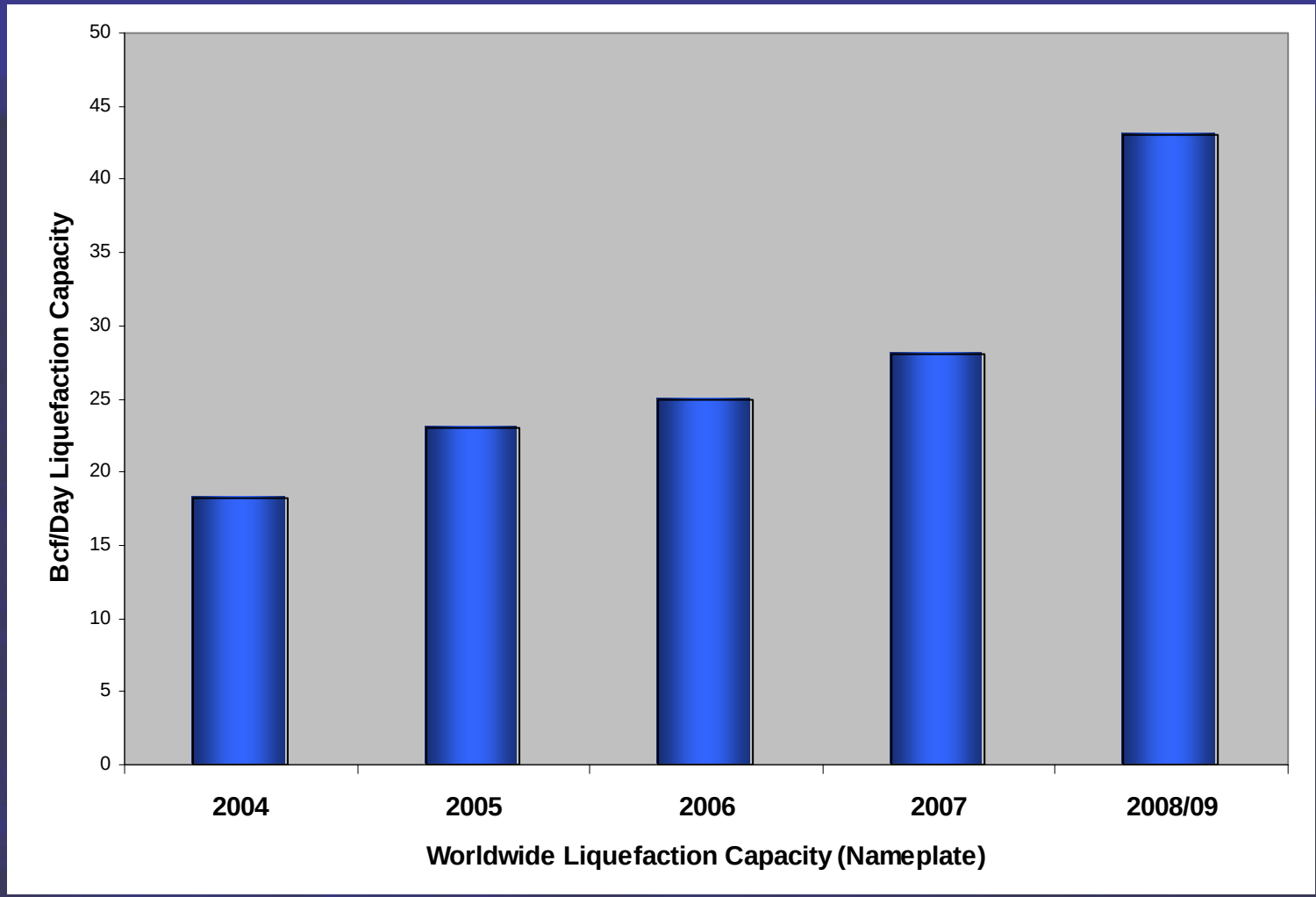
Office of Energy Projects

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.)
Proposed Terminals and Expansions – FERC
7. Fall River, MA : 0.8 Bcfd, (Weaver's Cove Energy/Hess LNG)
8. Long Beach, CA : 0.7 Bcfd, (Mitsubishi/ConocoPhillips – Sound Energy Solutions)
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)
14. Lake Charles, LA: 0.6 Bcfd (Southern Union – Trunkline LNG)
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)
Proposed Terminals – Coast Guard
19. California Offshore: 1.5 Bcfd, (Cabrillo Port – BHP Billiton)
20. Louisiana Offshore : 1.0 Bcfd (Gulf Landing – Shell)
21. So. California Offshore : 0.5 Bcfd, (Crystal Energy)
22. Louisiana Offshore : 1.0 Bcfd (Main Pass McMoRan Exp.)
23. Gulf of Mexico: n/a (Compass Port - ConocoPhillips)
Planned Terminals and Expansions
24. Brownsville, TX : n/a, (Cheniere LNG Partners)
25. Mobile Bay, AL: 1.0 Bcfd, (ExxonMobil)
26. Somerset, MA : 0.65 Bcfd (Somerset LNG)
27. Belmar, NJ Offshore : n/a (El Paso Global)
28. Altamira, Tamulipas : 1.12 Bcfd, (Shell)
29. Baja California, MX : 1.0 Bcfd, (Sempra & Shell)
30. Baja California - Offshore : 1.4 Bcfd, (Chevron Texaco)
31. California - Offshore : 0.75 Bcfd, (Chevron Texaco)
32. St. John, NB : 0.5 Bcfd, (Canaport – Irving Oil)
33. Point Tupper, NS 1.0 Bcf/d (Bear Head LNG - Access Northeast Energy)
34. Pleasant Point, ME : 0.5 Bcf/d (Quoddy Bay, LLC)
35. Quebec City, QC : n/a (Enbridge/Gaz Met/Gaz de France)
36. Lázaro Cárdenas, MX : 0.5 Bcfd (Tractebel/Repsol)
37. Gulf of Mexico : 1.0 Bcfd (Pearl Crossing - ExxonMobil)
38. Mobile Bay, AL: 1.0 Bcfd (Cheniere LNG Partners)
39. St. Helens, OR: 0.7 Bcfd (Port Westward LNG LLC)
40. Cove Point, MD : 0.8 Bcfd (Dominion)
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)
** US pipeline approved; LNG terminal pending in Bahamas*

Challenges to Building New Regasification in the U.S.

- Proximity to population and infrastructure
  - Impact of spill scenarios onshore
  - Affect of infrastructure and existing waterway usage
- Environmental impacts
  - Dredging and wetlands impacts
  - Facility footprint
  - Water usage and air emissions
- Long lead time to permit and construct facilities
- Further complicated by public perception

Growth in Liquefaction Capacity



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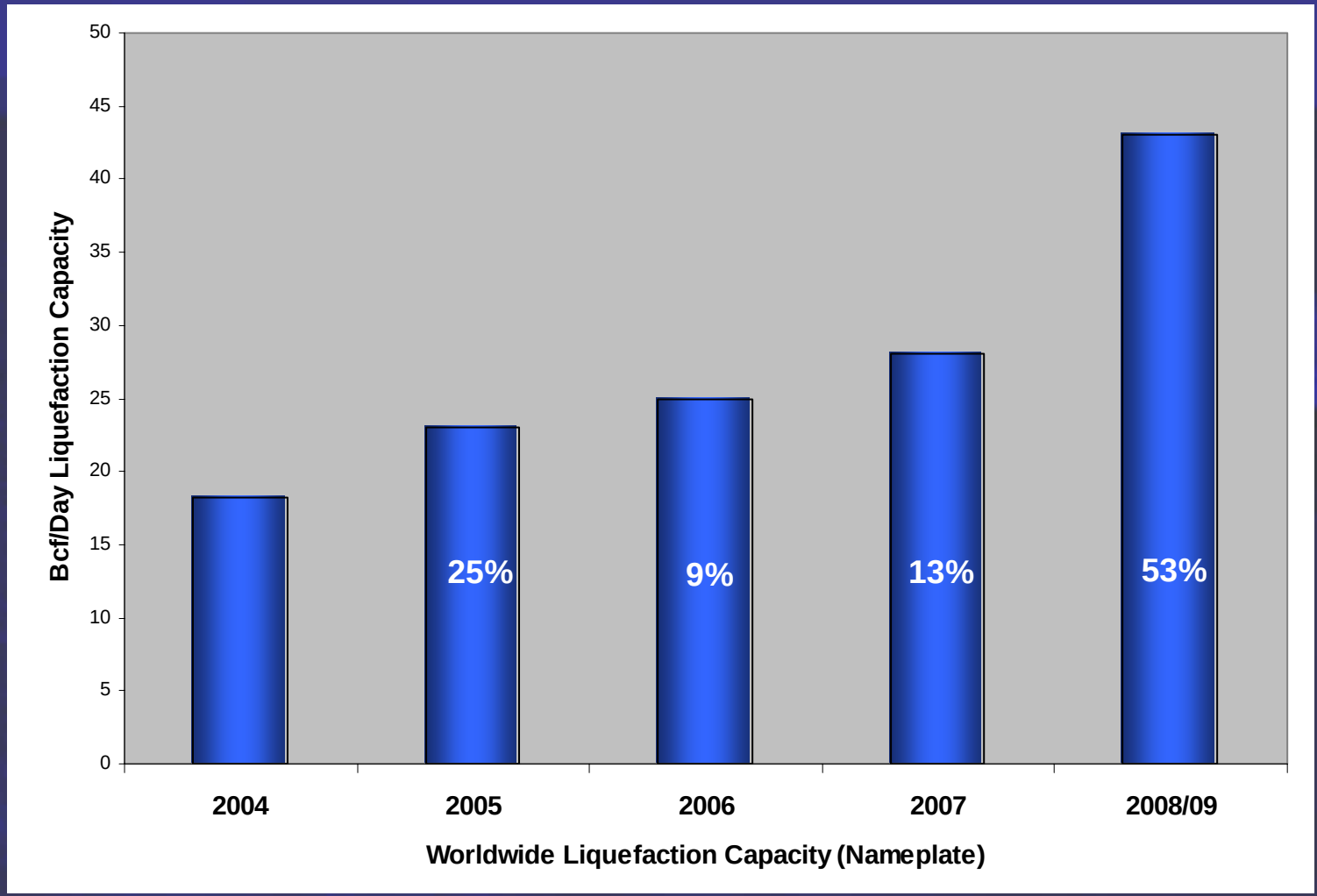
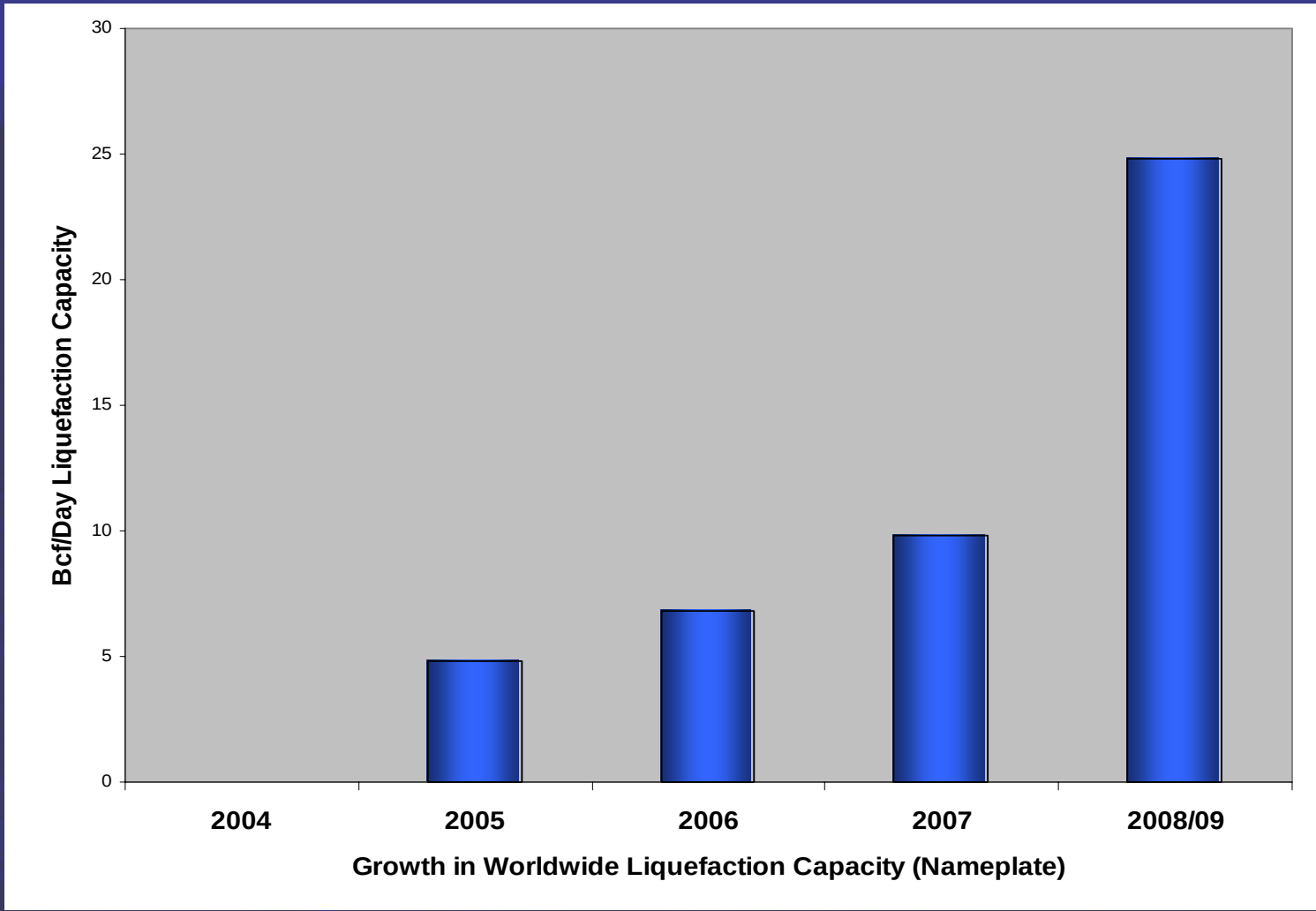


Excess Liquefaction Capacity??



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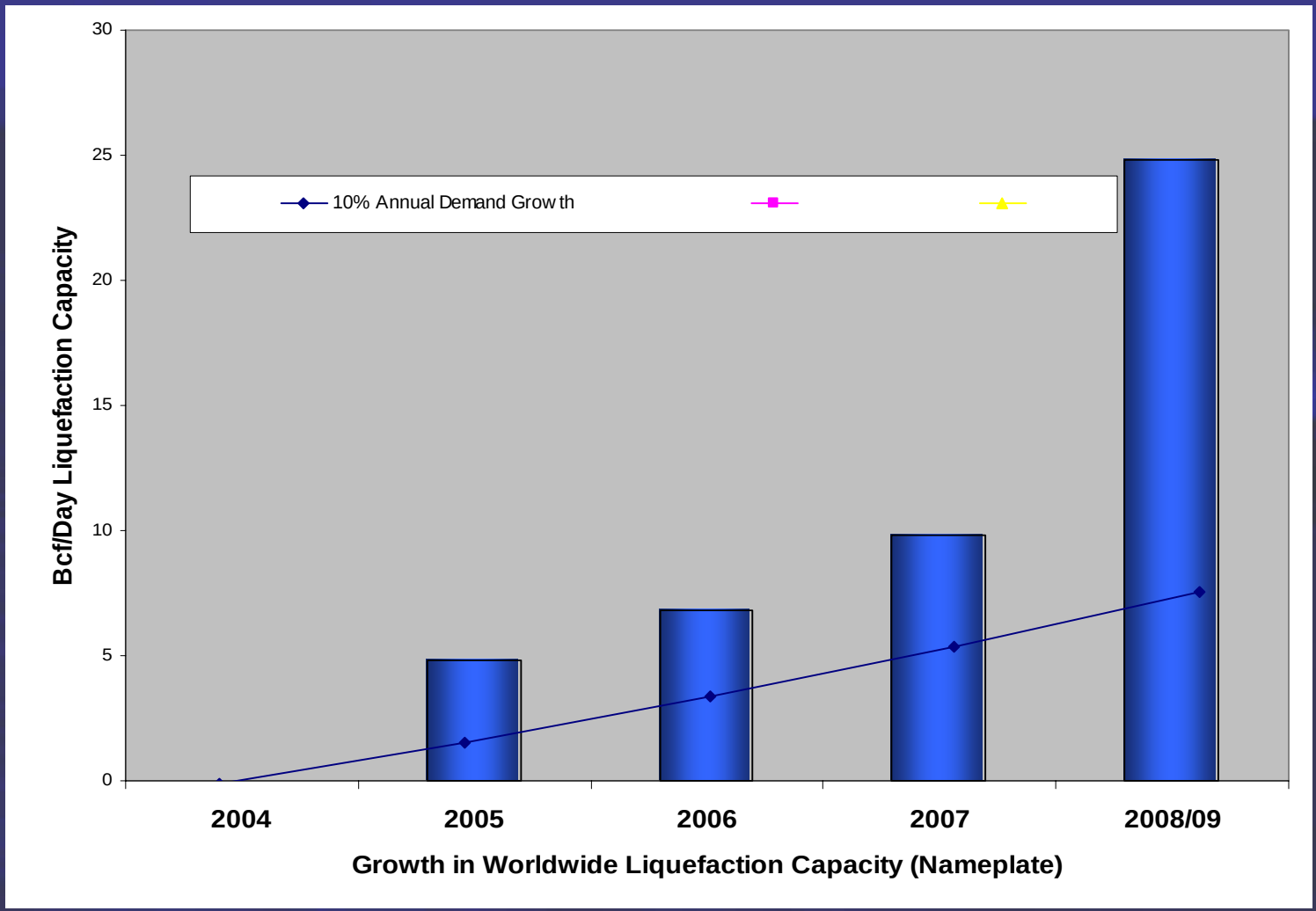

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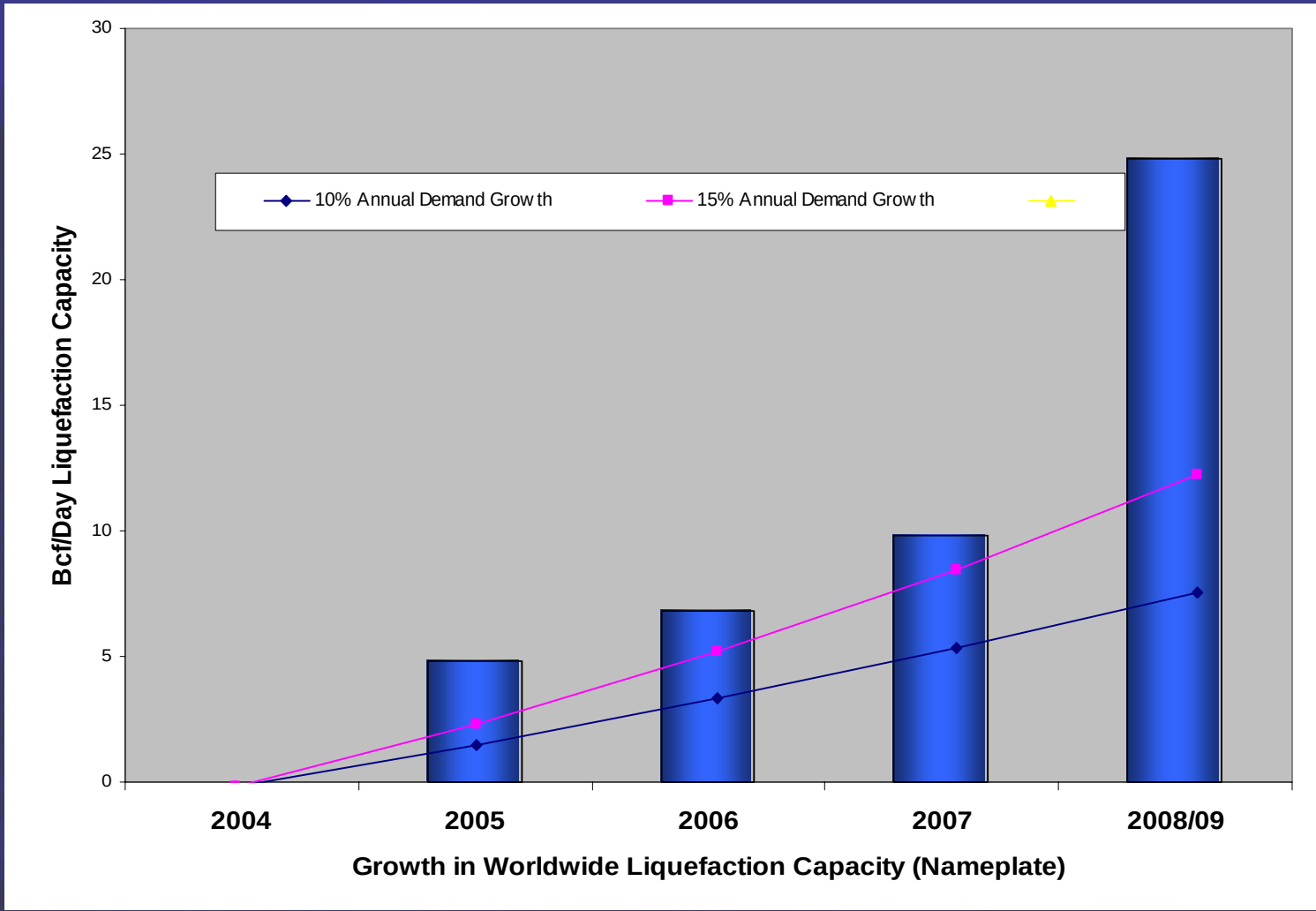

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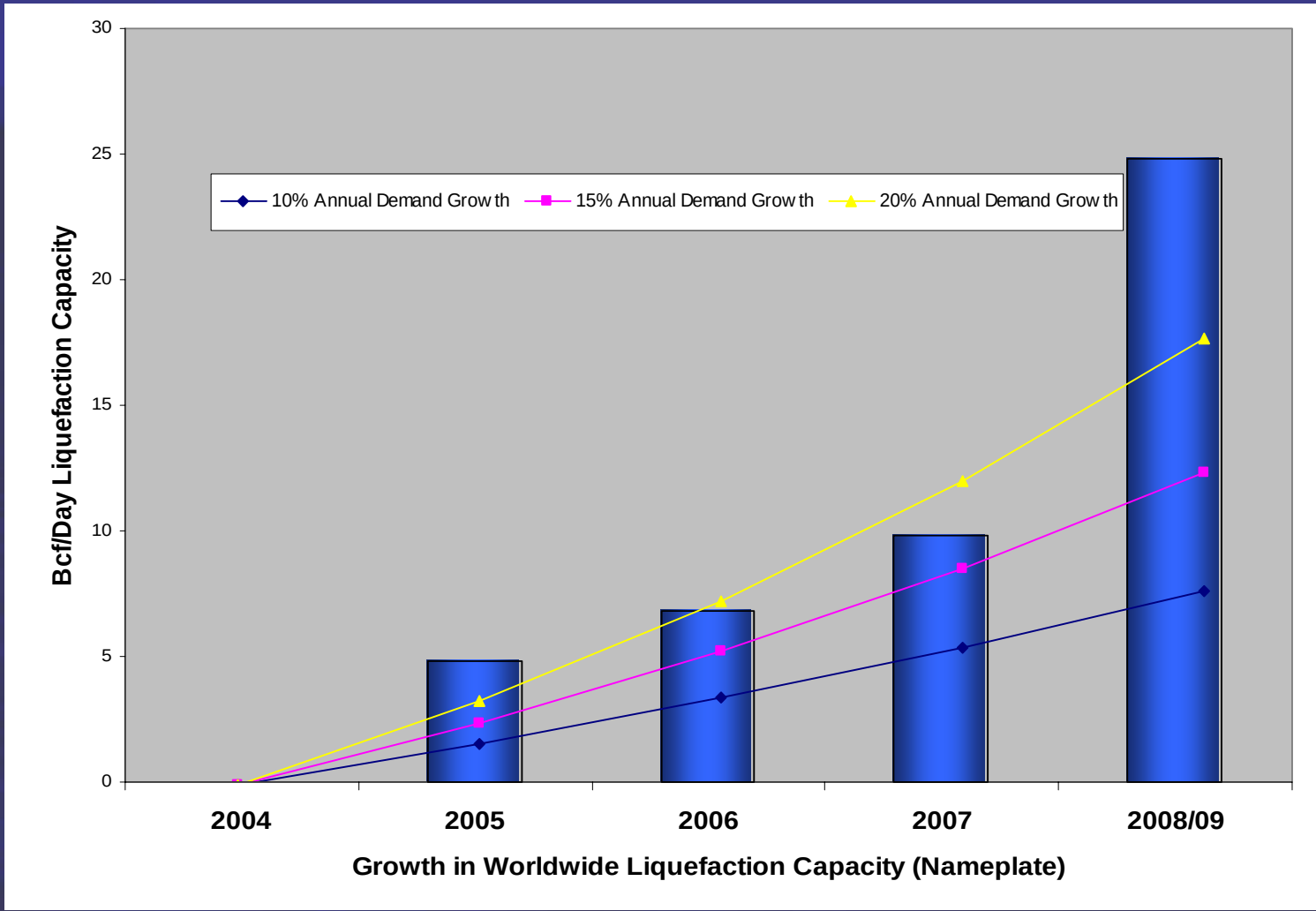


Are Technology Changes Creating Economic Step Change?

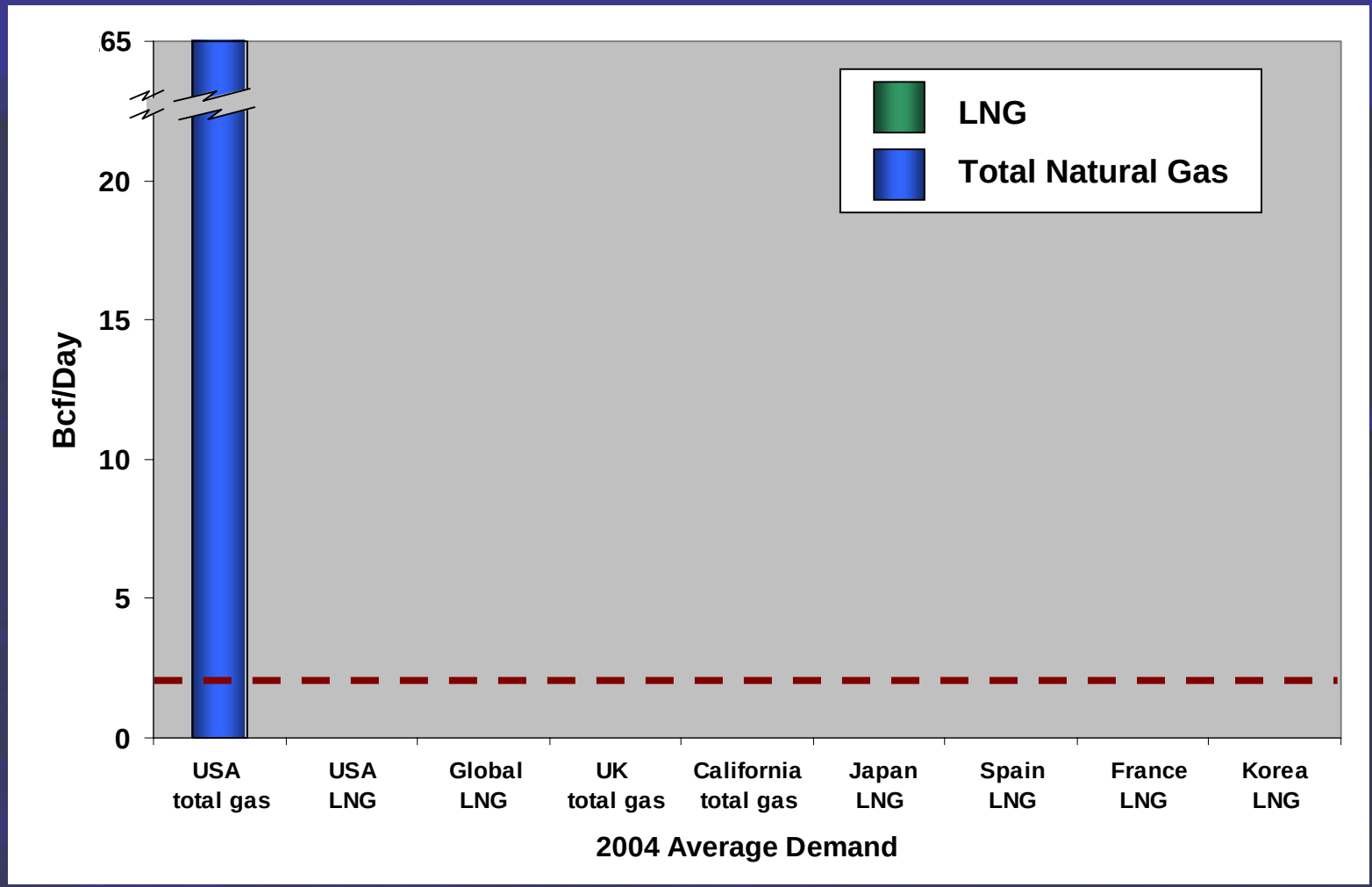
Economies of scale

- Liquefaction
- Shipping
- Regasification

Question: Will the practical application match the theoretical expectation for benefits from economies of sale?

Will the Practical Application Match the Theoretical Expectation?

A two-train liquefaction project at 7.8 mtpa each



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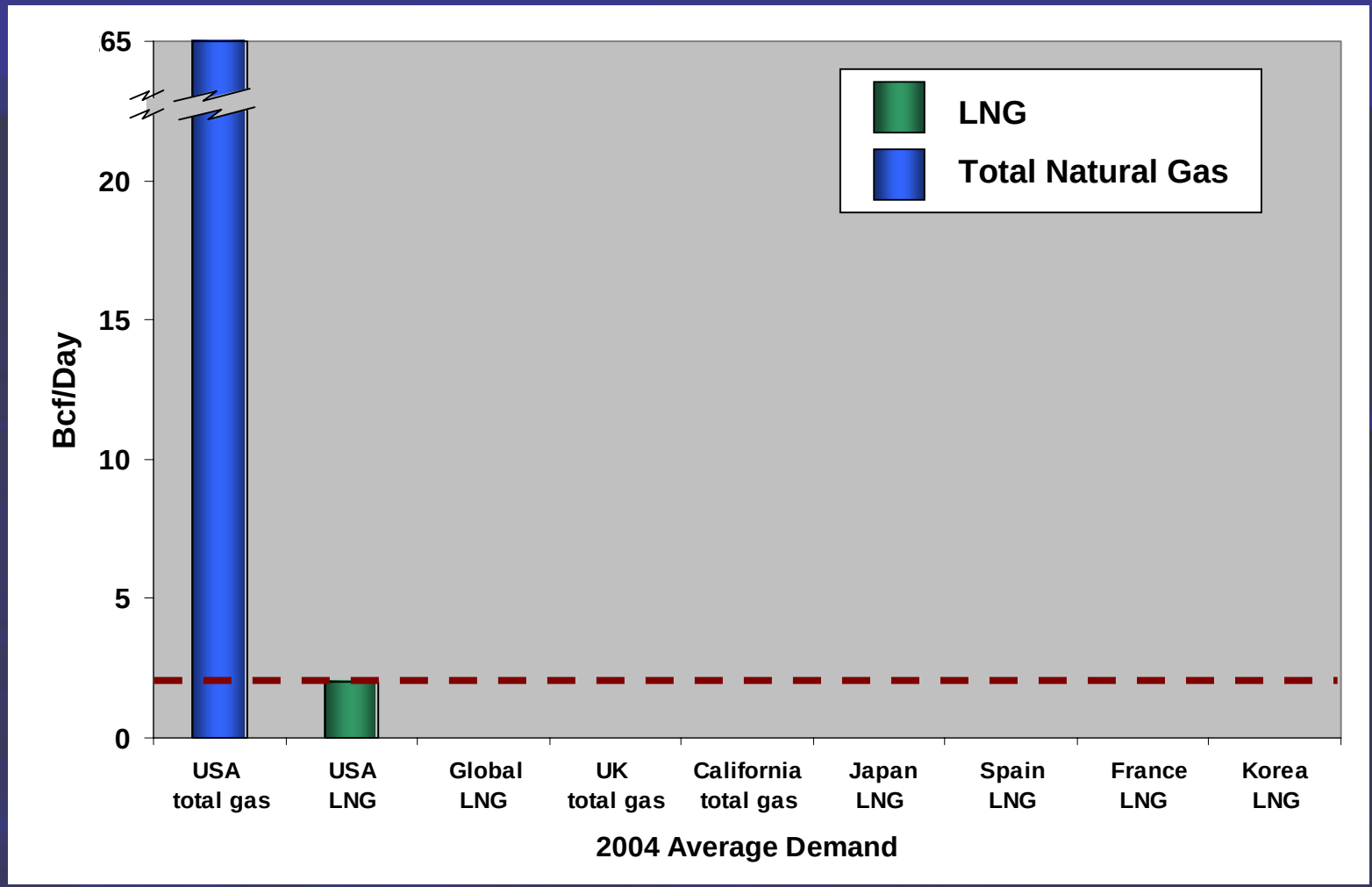

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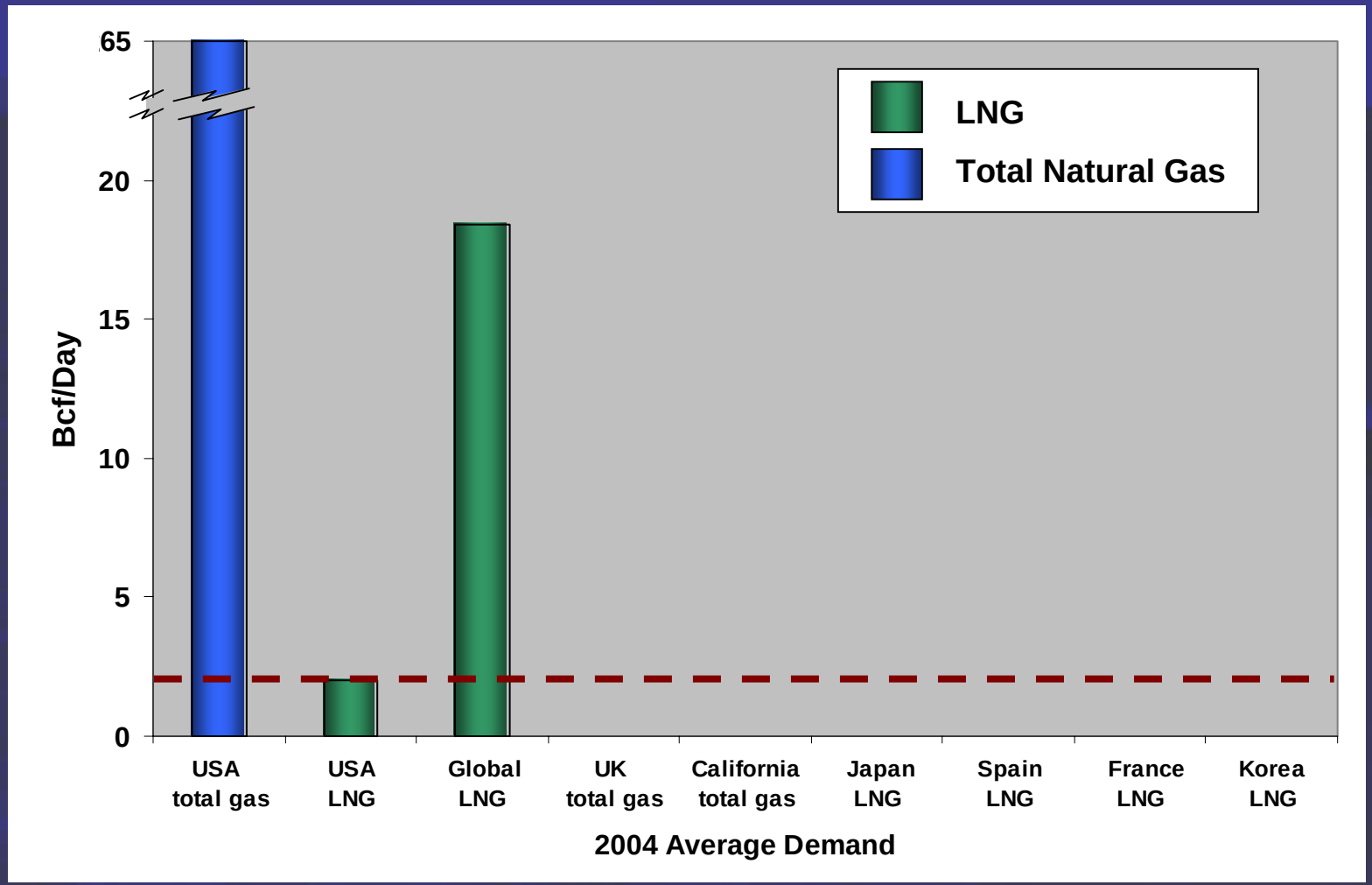

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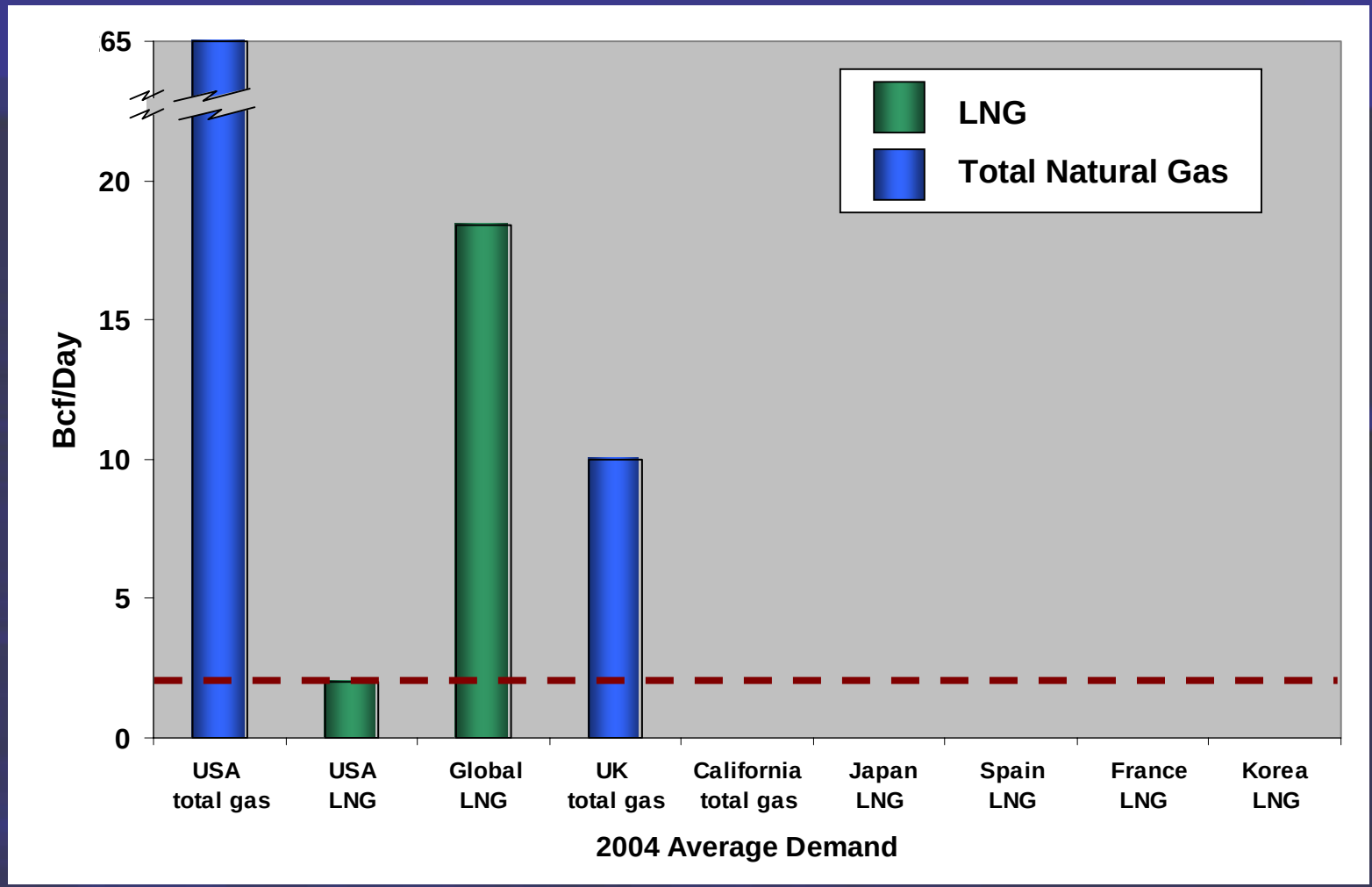

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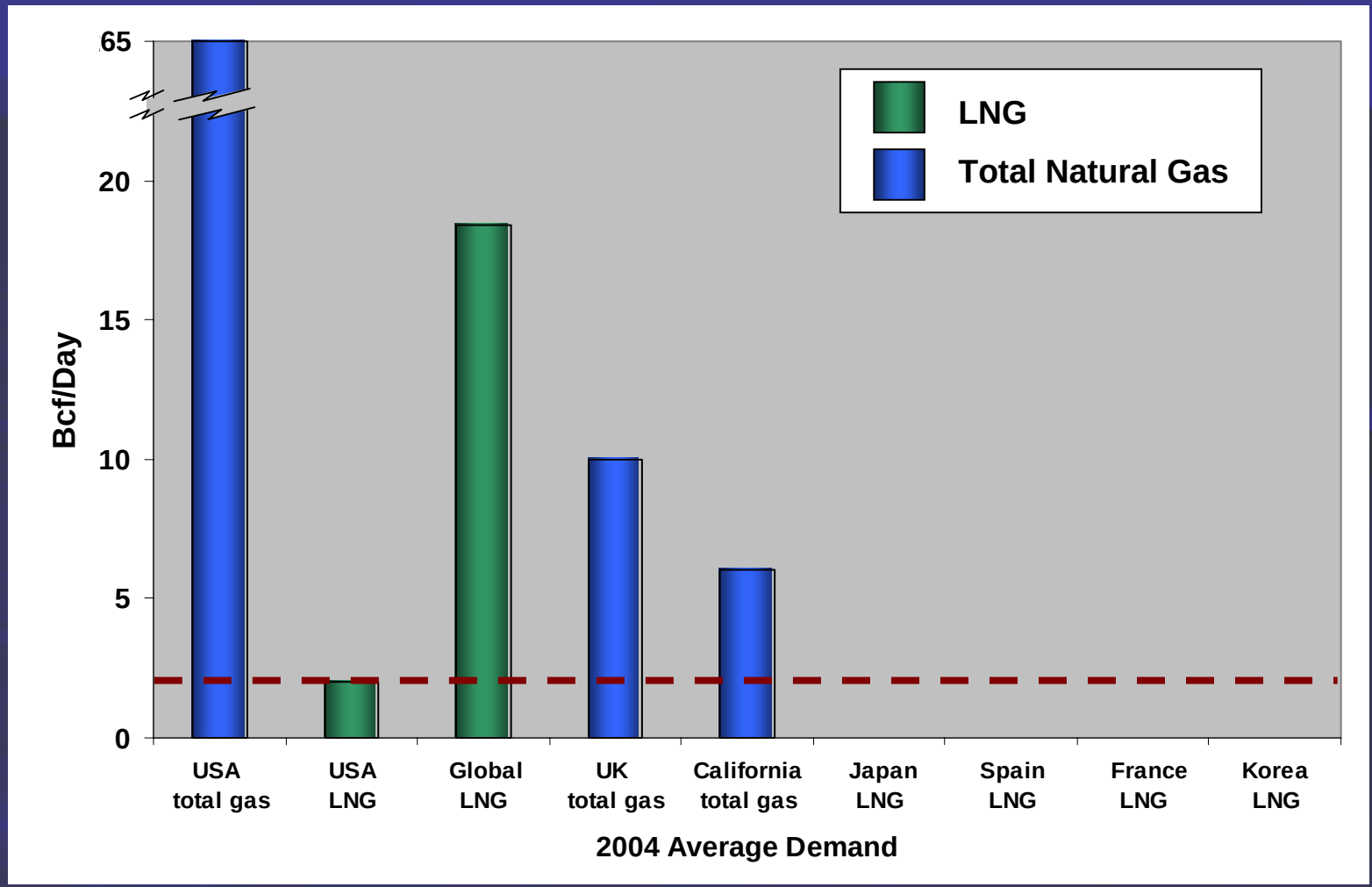

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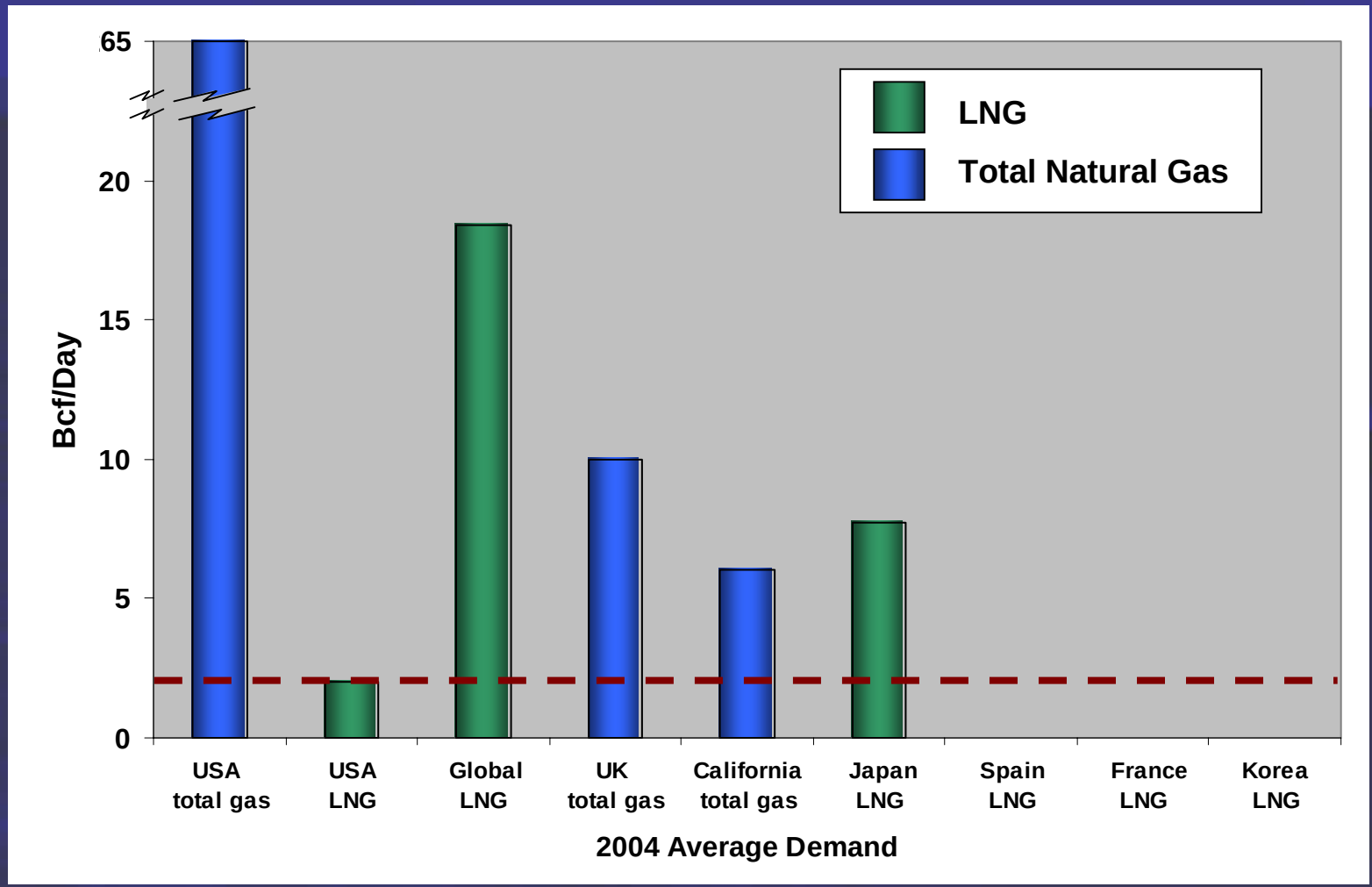

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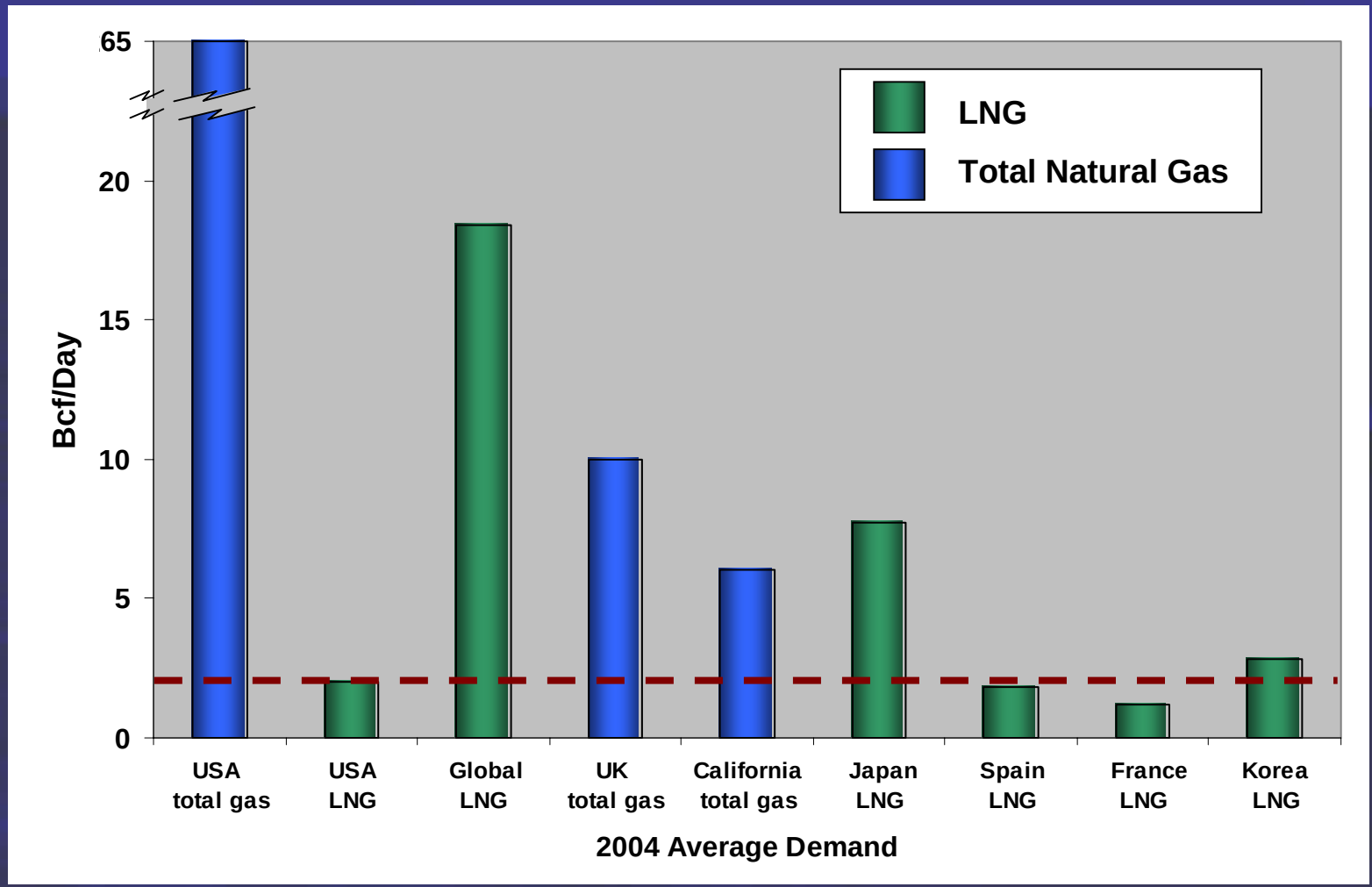

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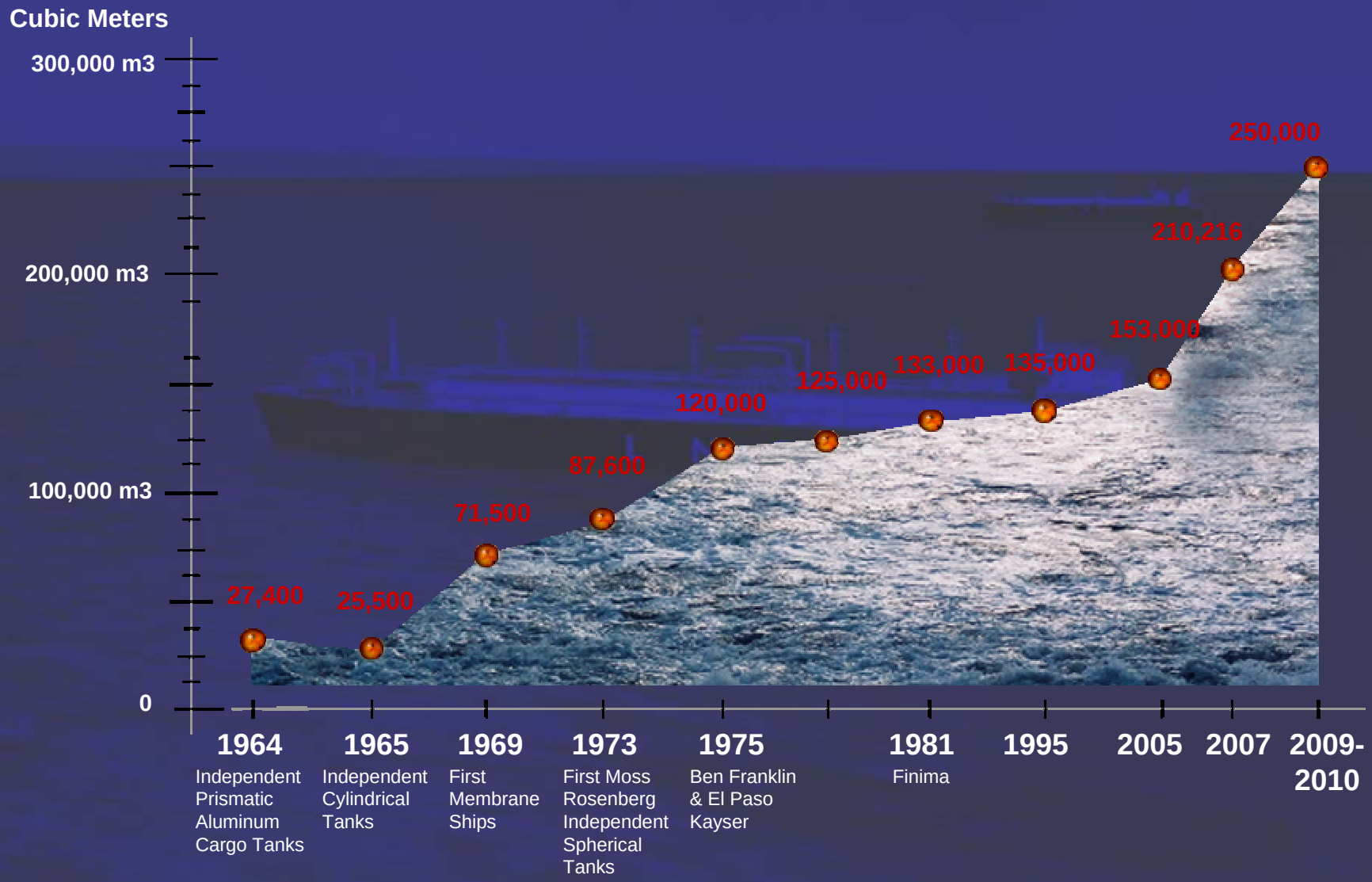
Evolution of LNG Carrier Size



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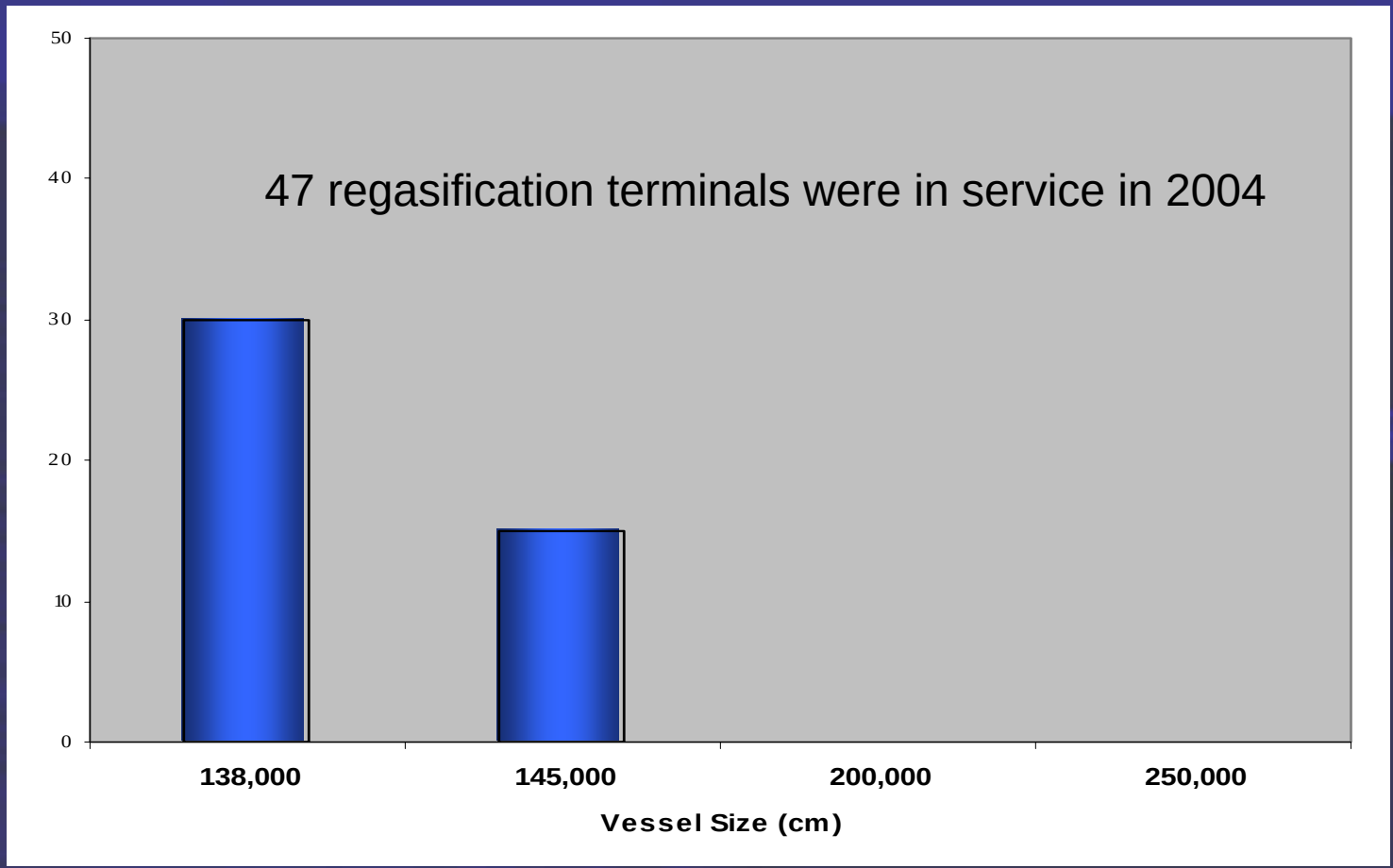
Number of Regasification Terminals Accessible to Large LNG Vessels in 2004



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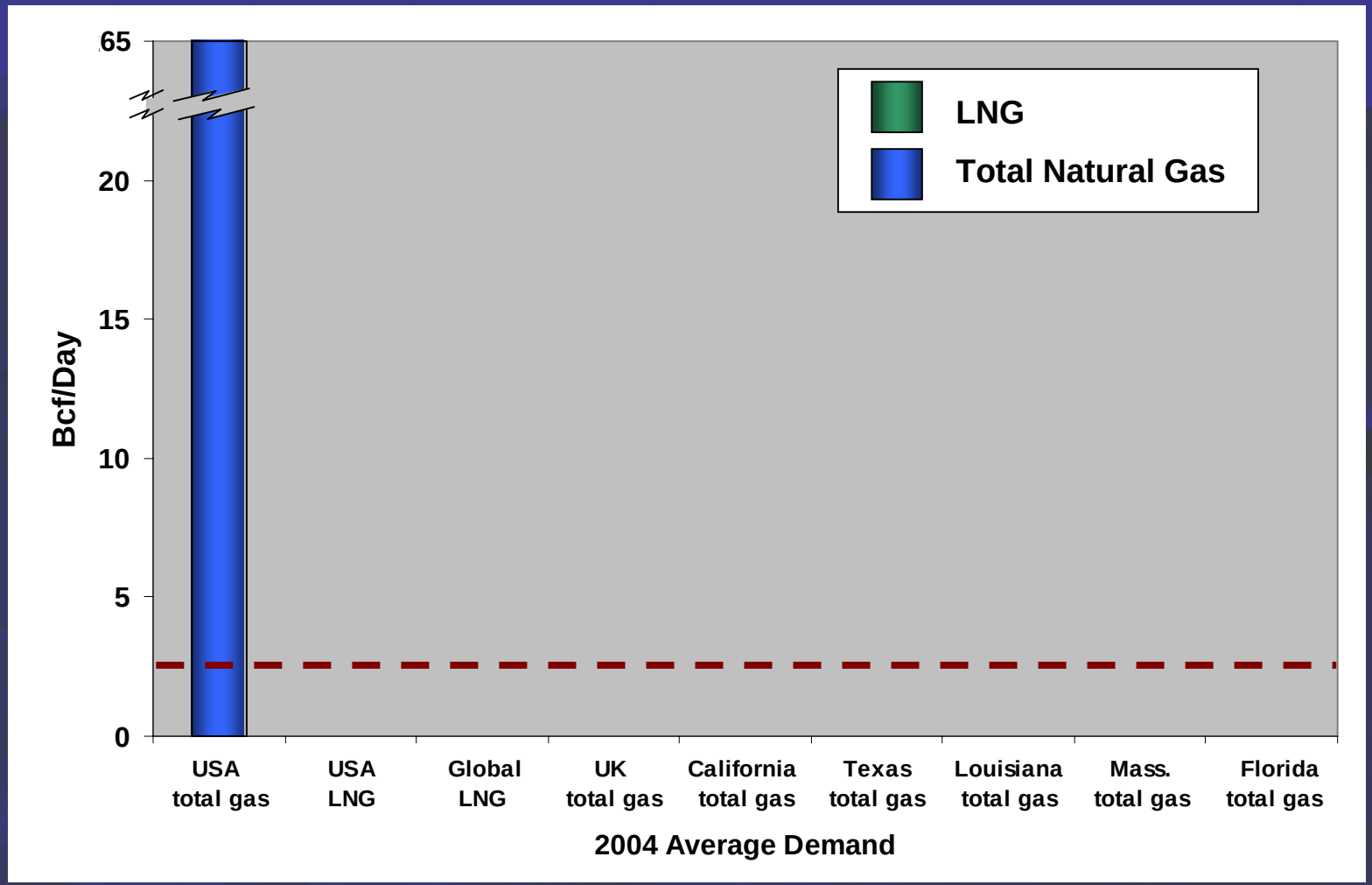
A 2.6 Bcf/Day Regasification Terminal



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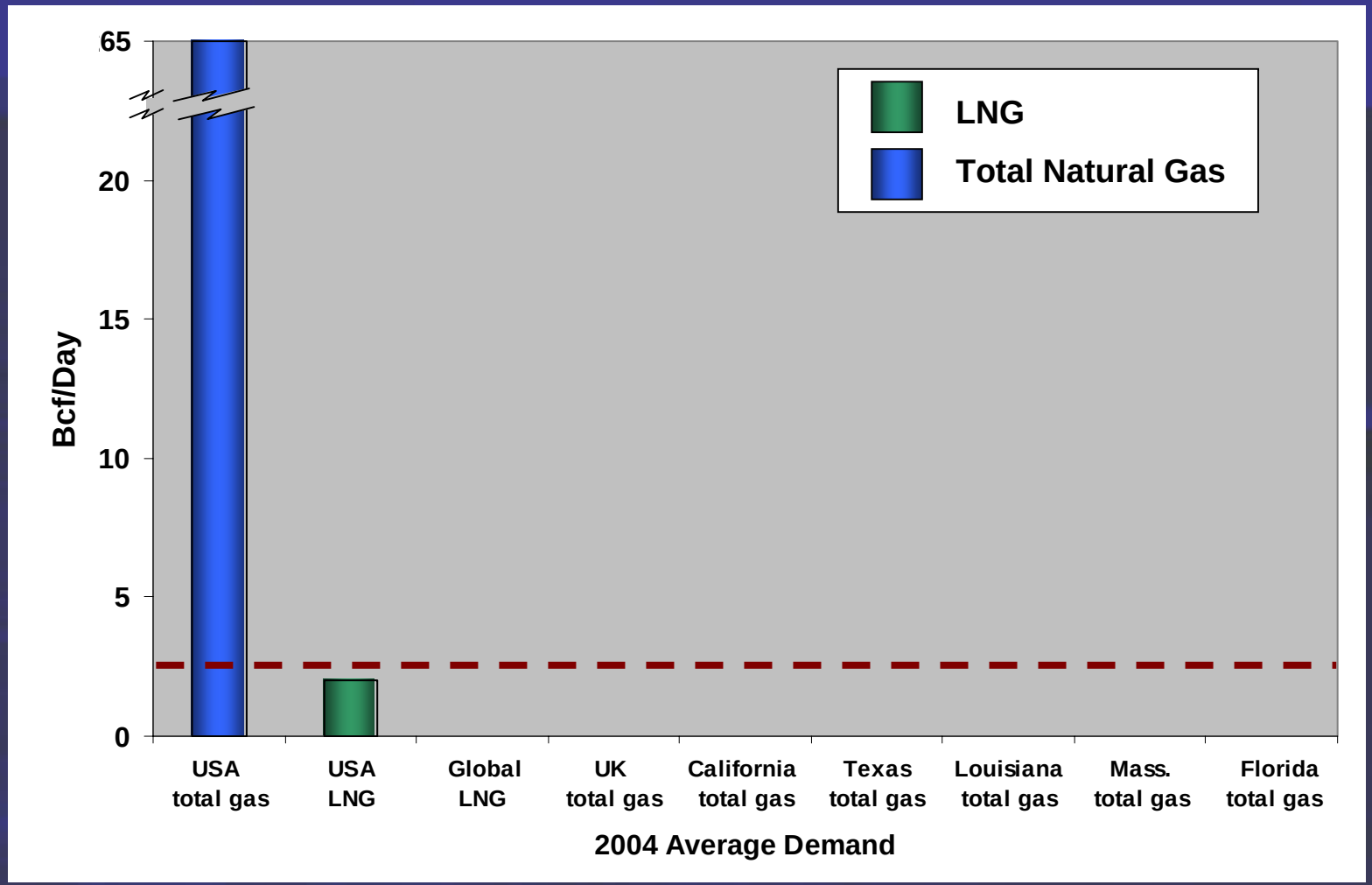

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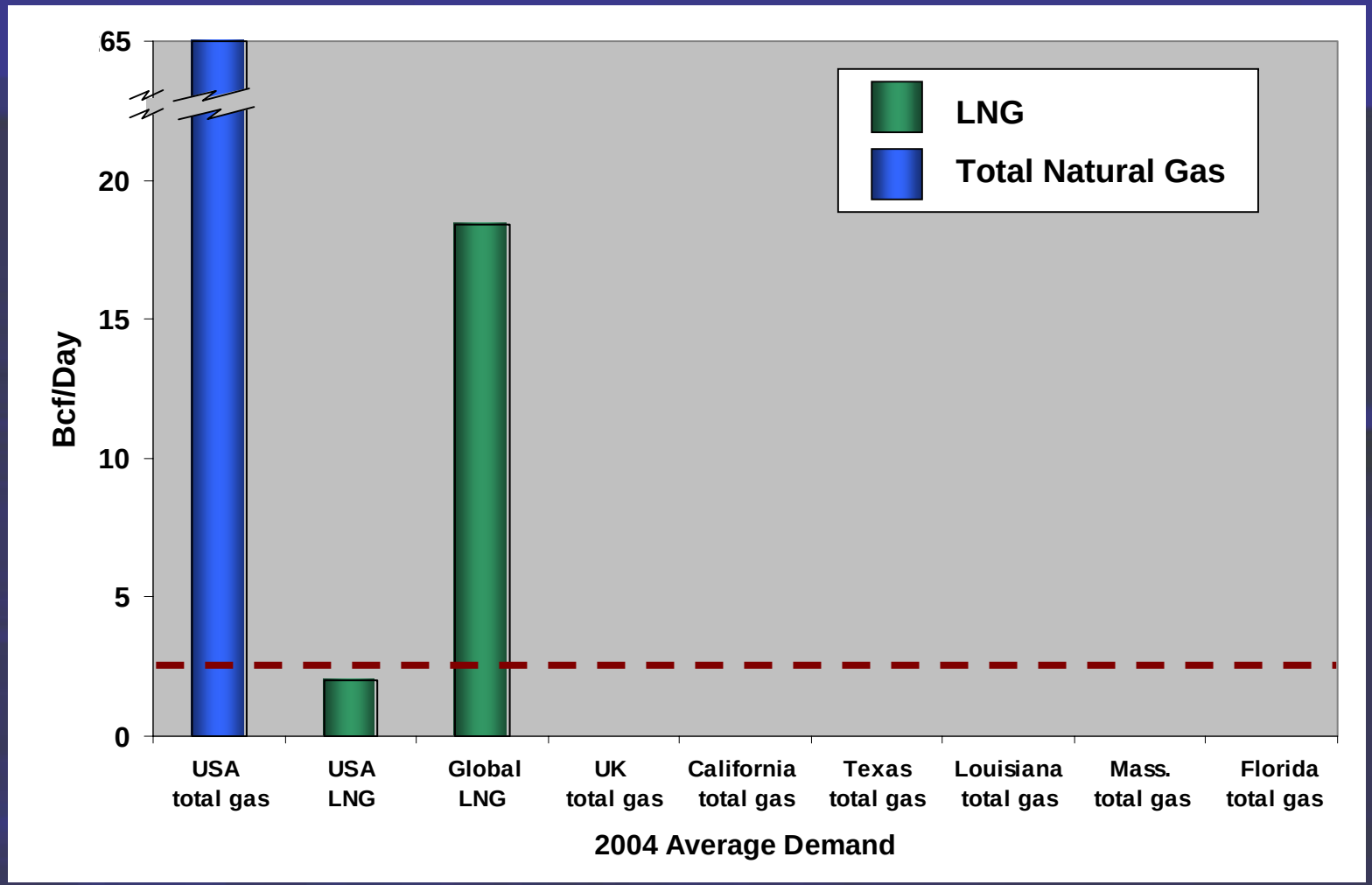

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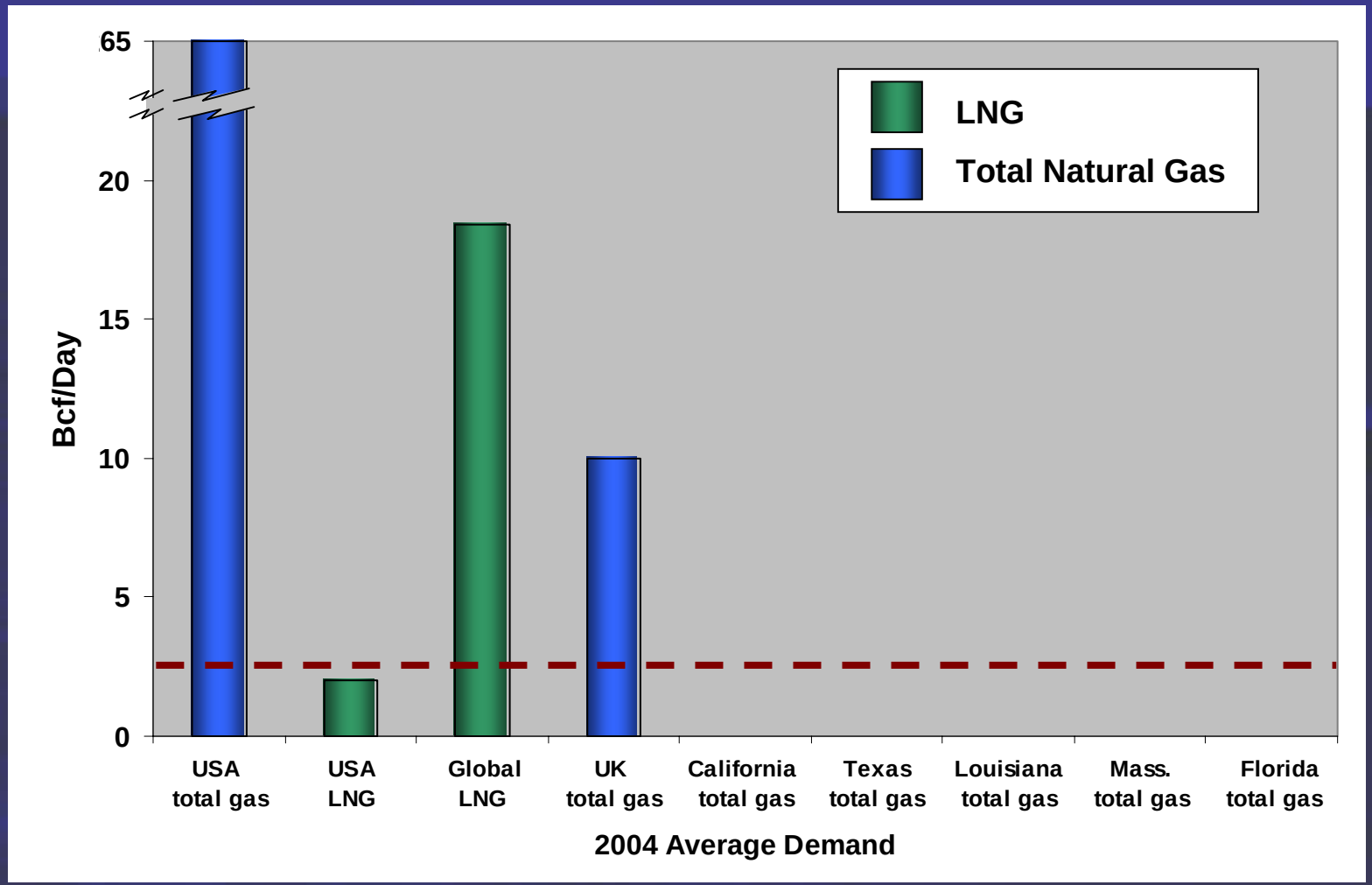

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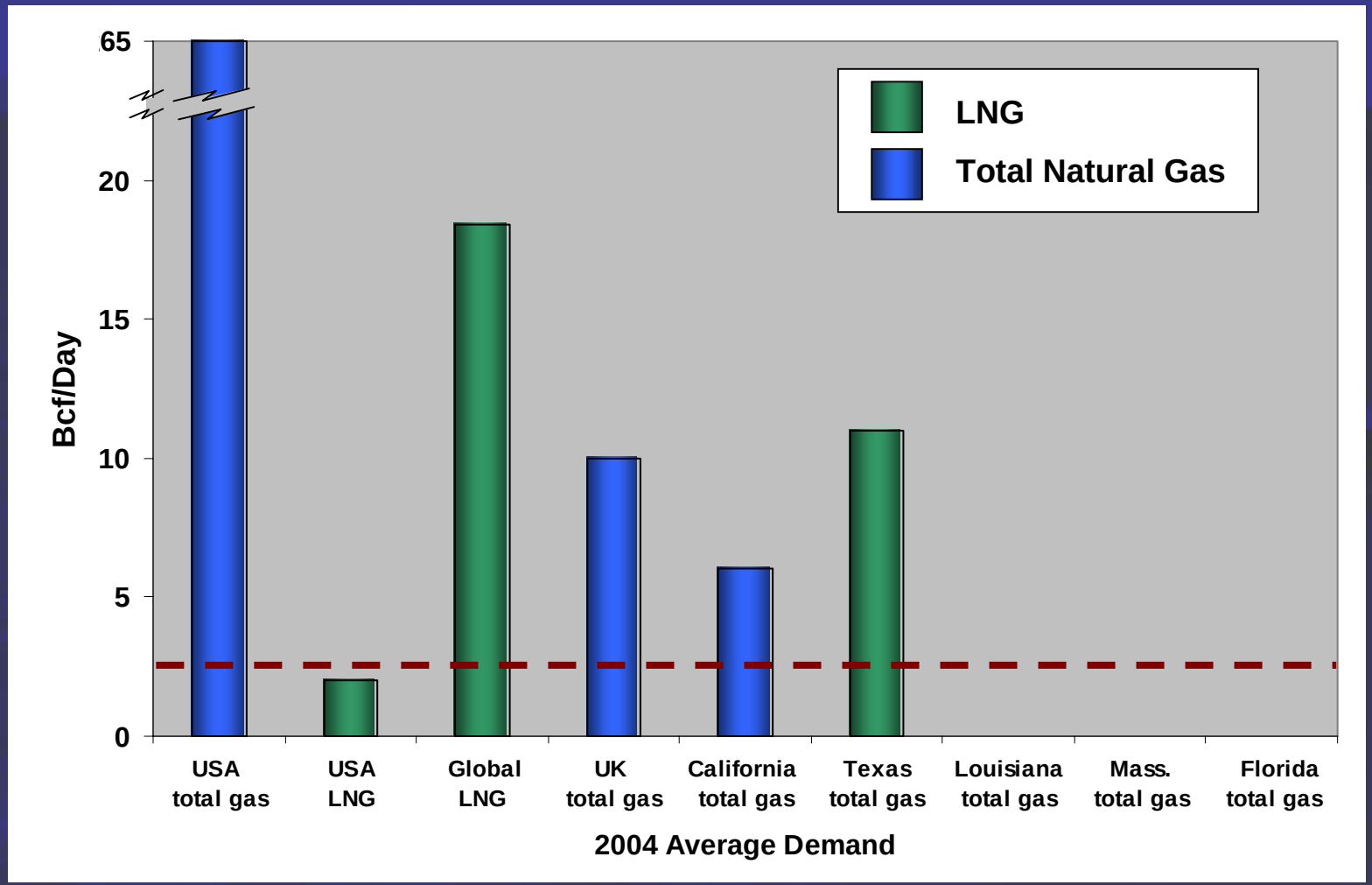

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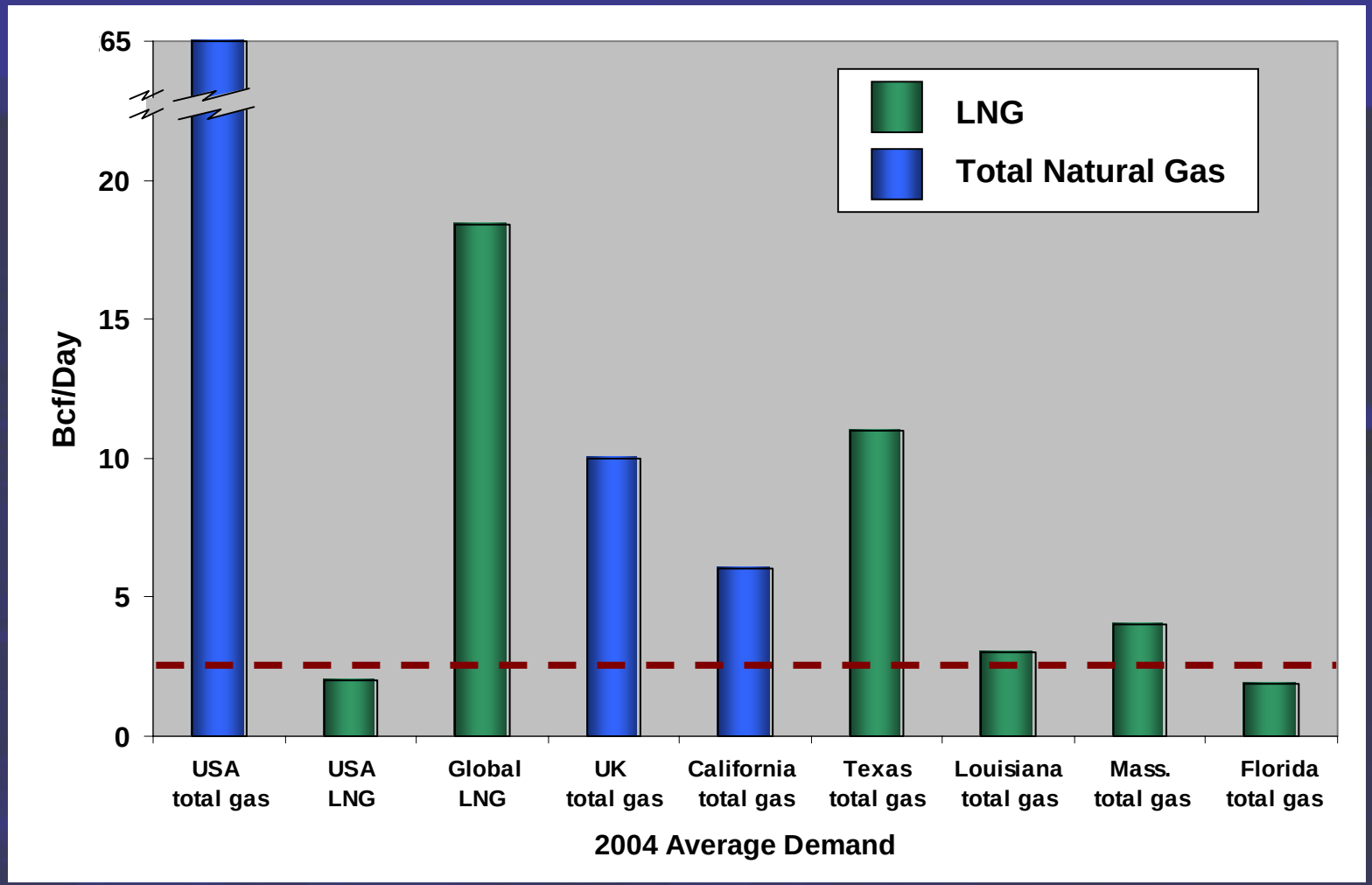
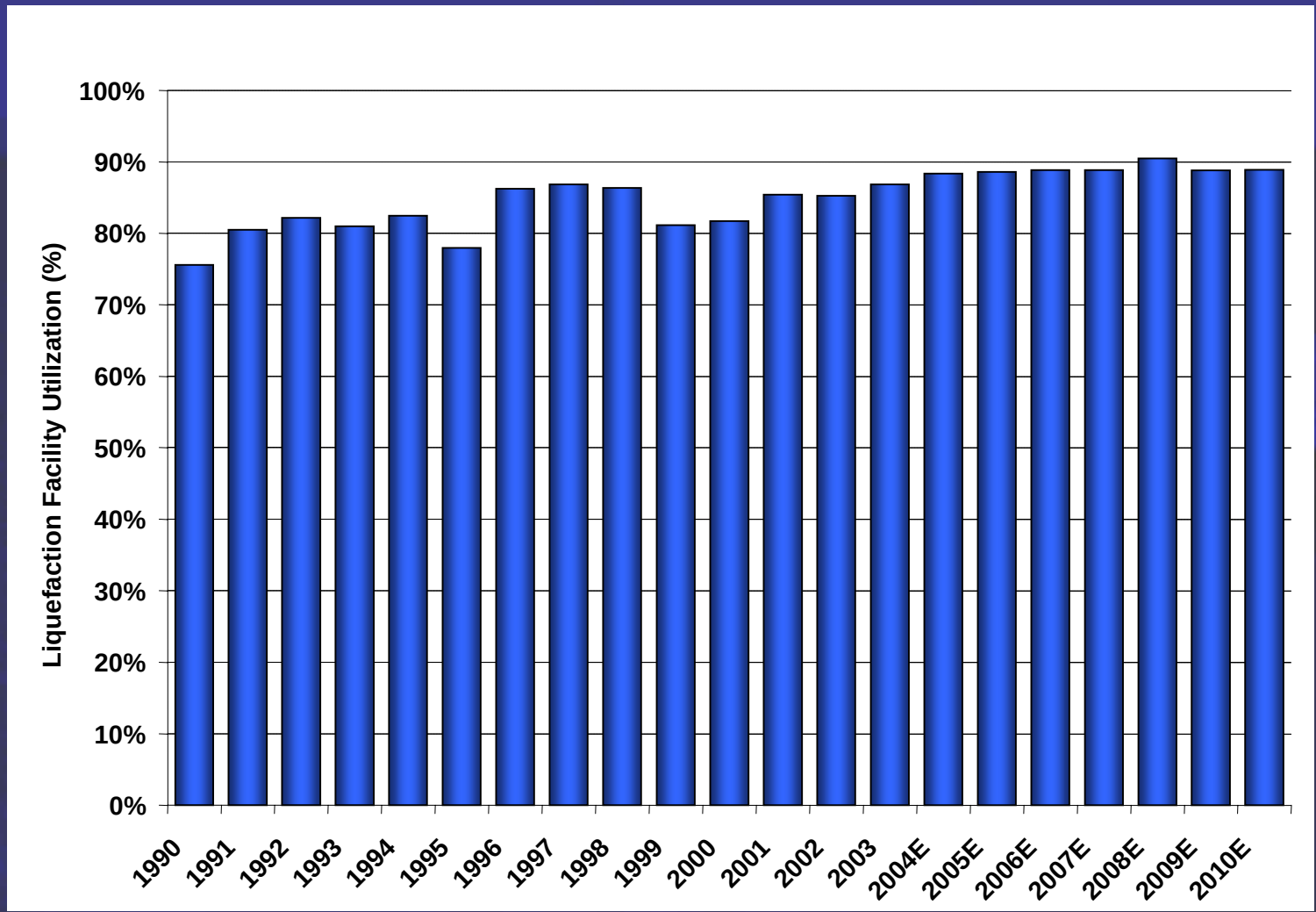


Worldwide Liquefaction Utilization



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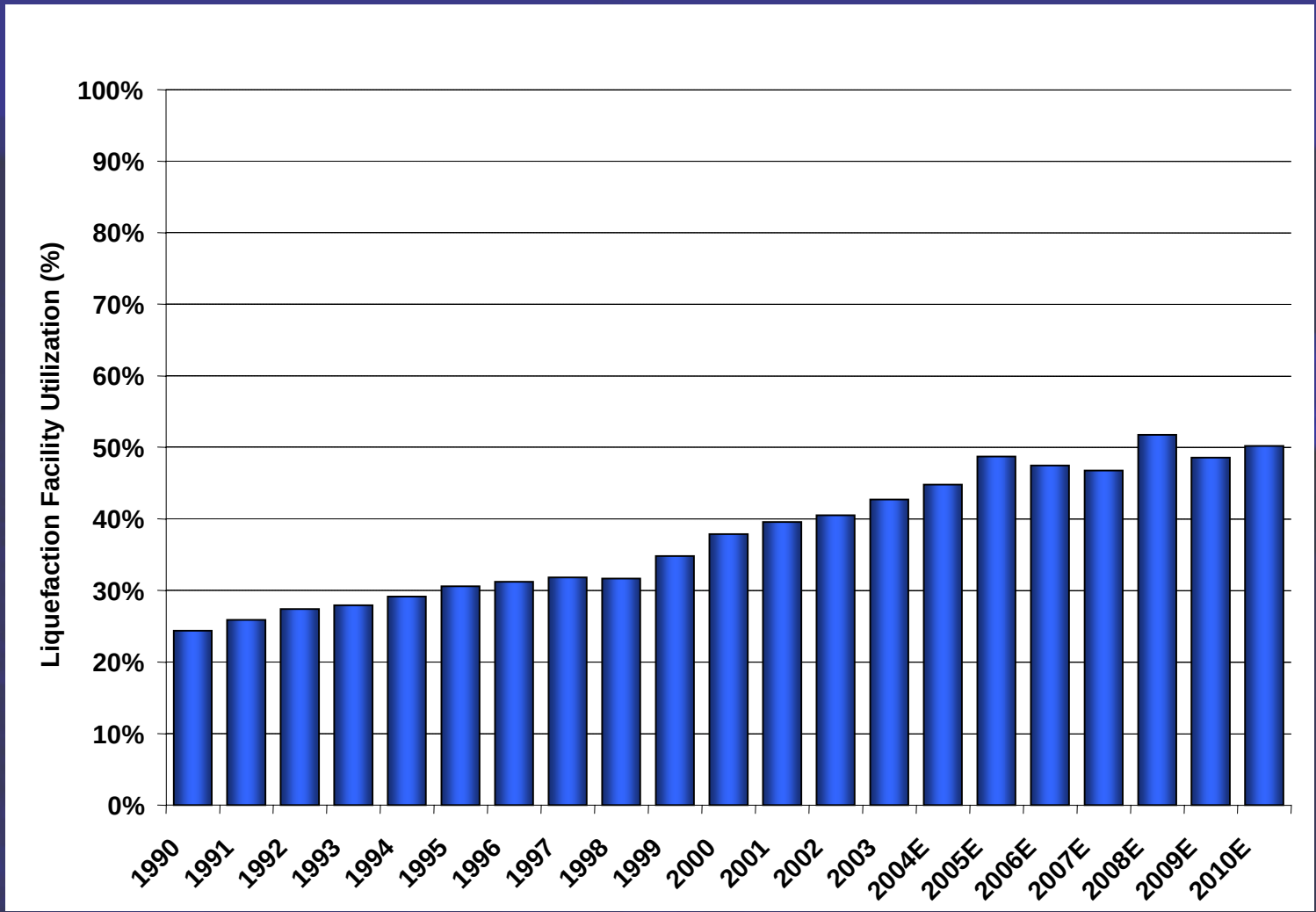

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Will the Practical Application Match the Theoretical Expectation?

Issues

- Will enough regasification be built to handle the large liquefaction trains?
- Will enough regasification with capacity to accept the newer, larger ships be built?
- Will the regasification that is built be able to effectively distribute the gas downstream?

Projections

- The “lumpiness” of LNG infrastructure additions, particularly at the scale of current & forecast mega projects, will introduce significant additional volatility to the global LNG marketplace
- The Global LNG industry is building enough liquefaction

  and will build enough ships to move it

  such that attendant growth in demand will be difficult to achieve for the next decade

Hypothesis – Liquefaction will continue to outpace demand

Probability of Achieving High-end Growth Objectives Within 36 to 42 Month Horizon

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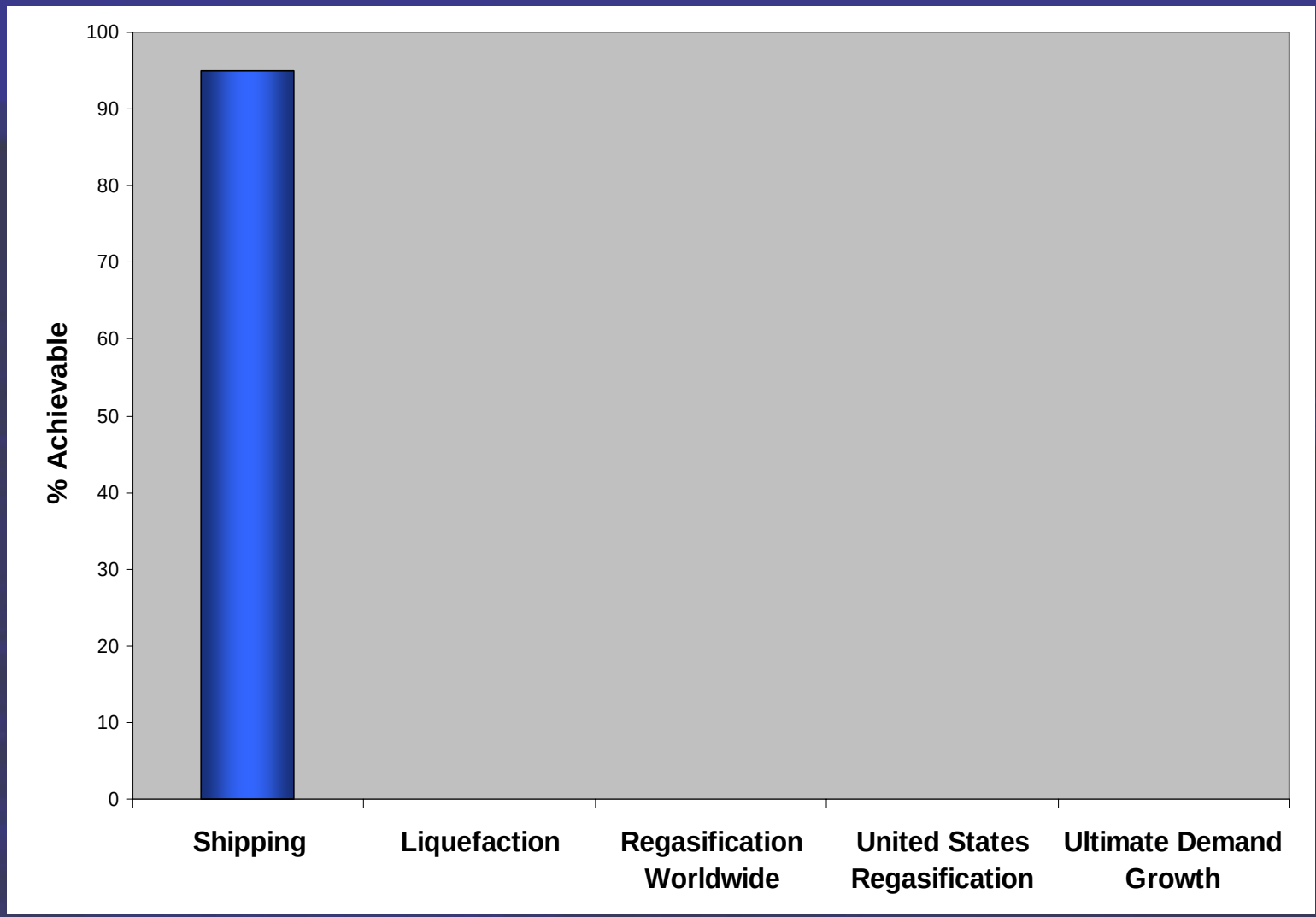

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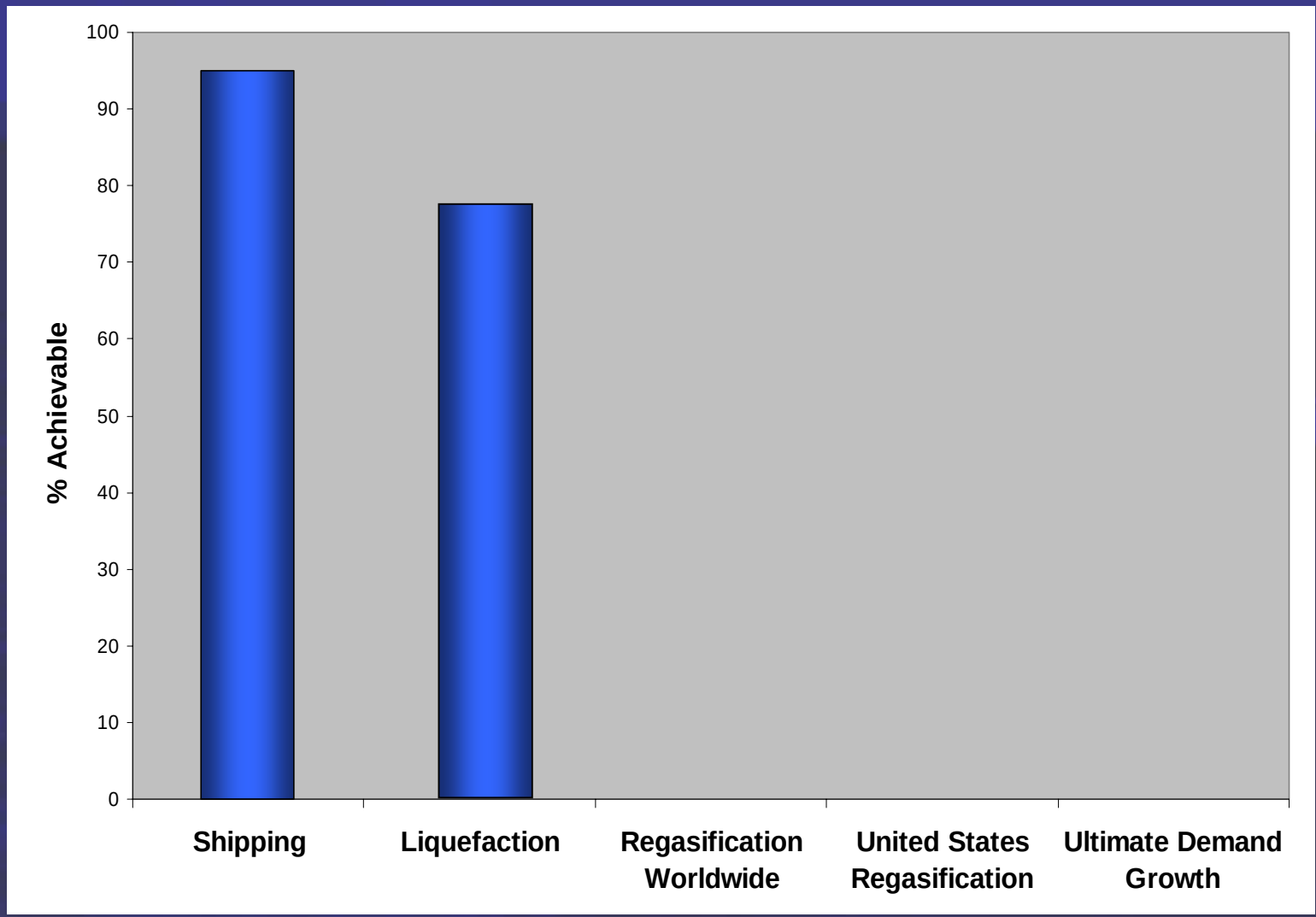

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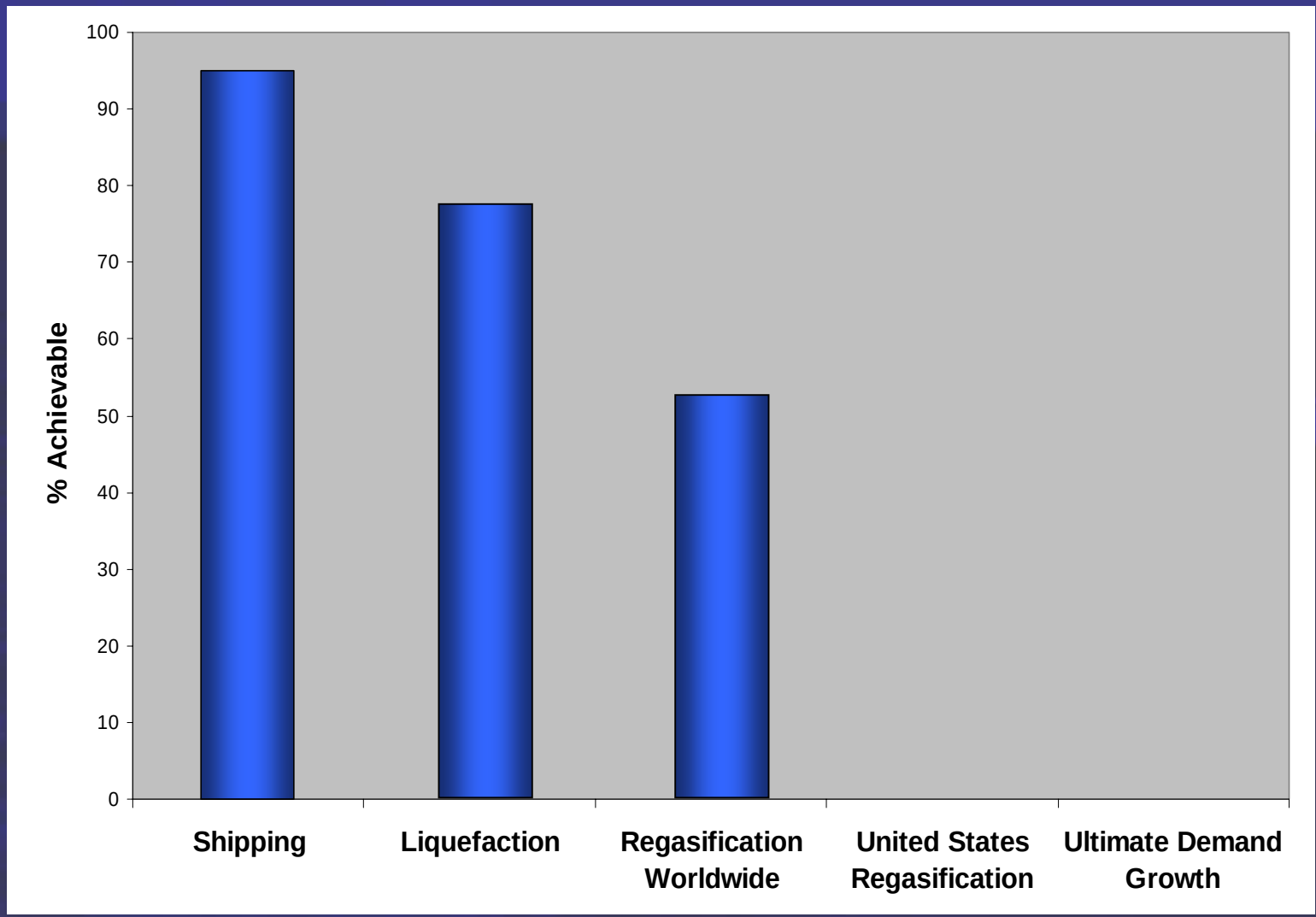

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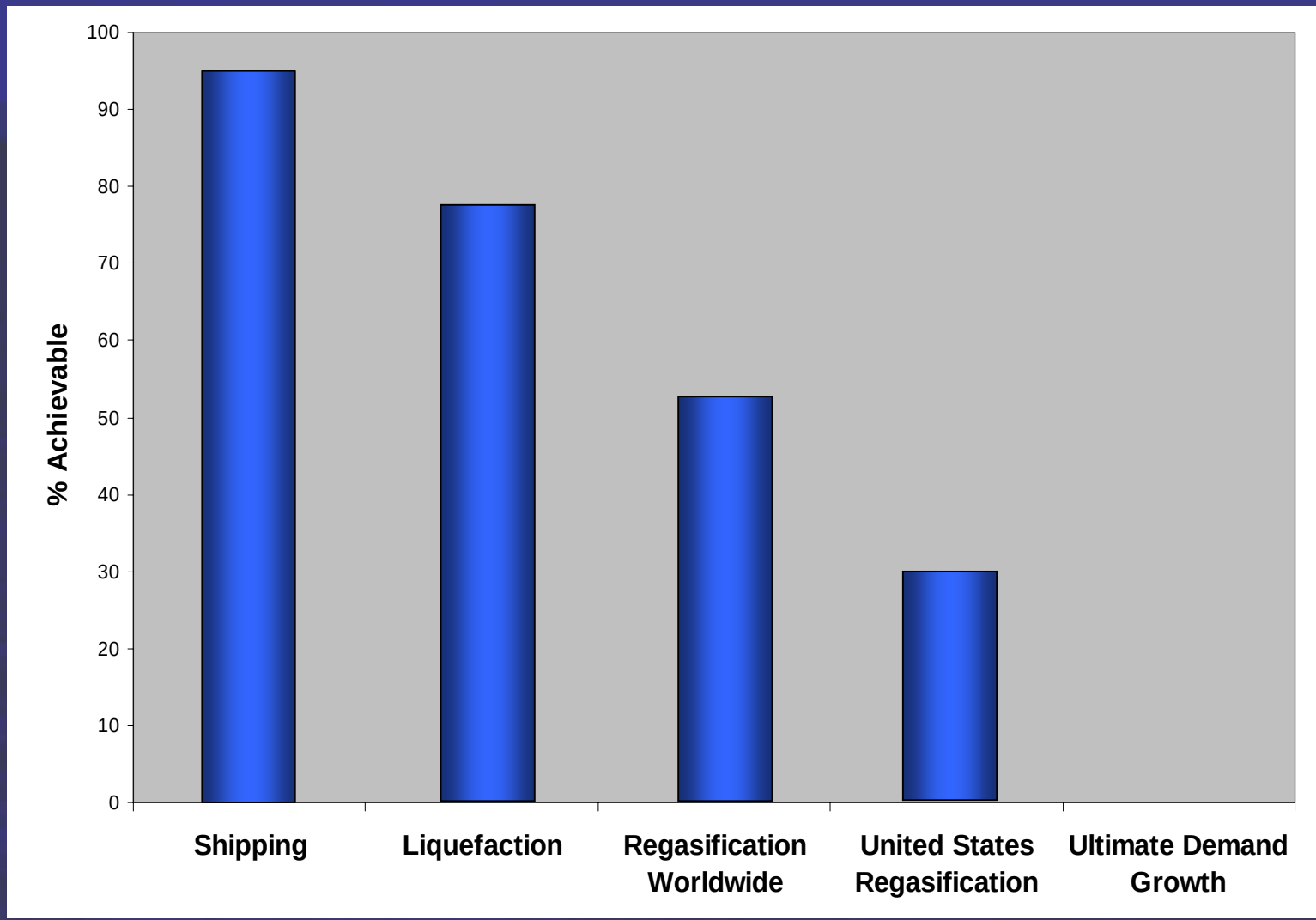

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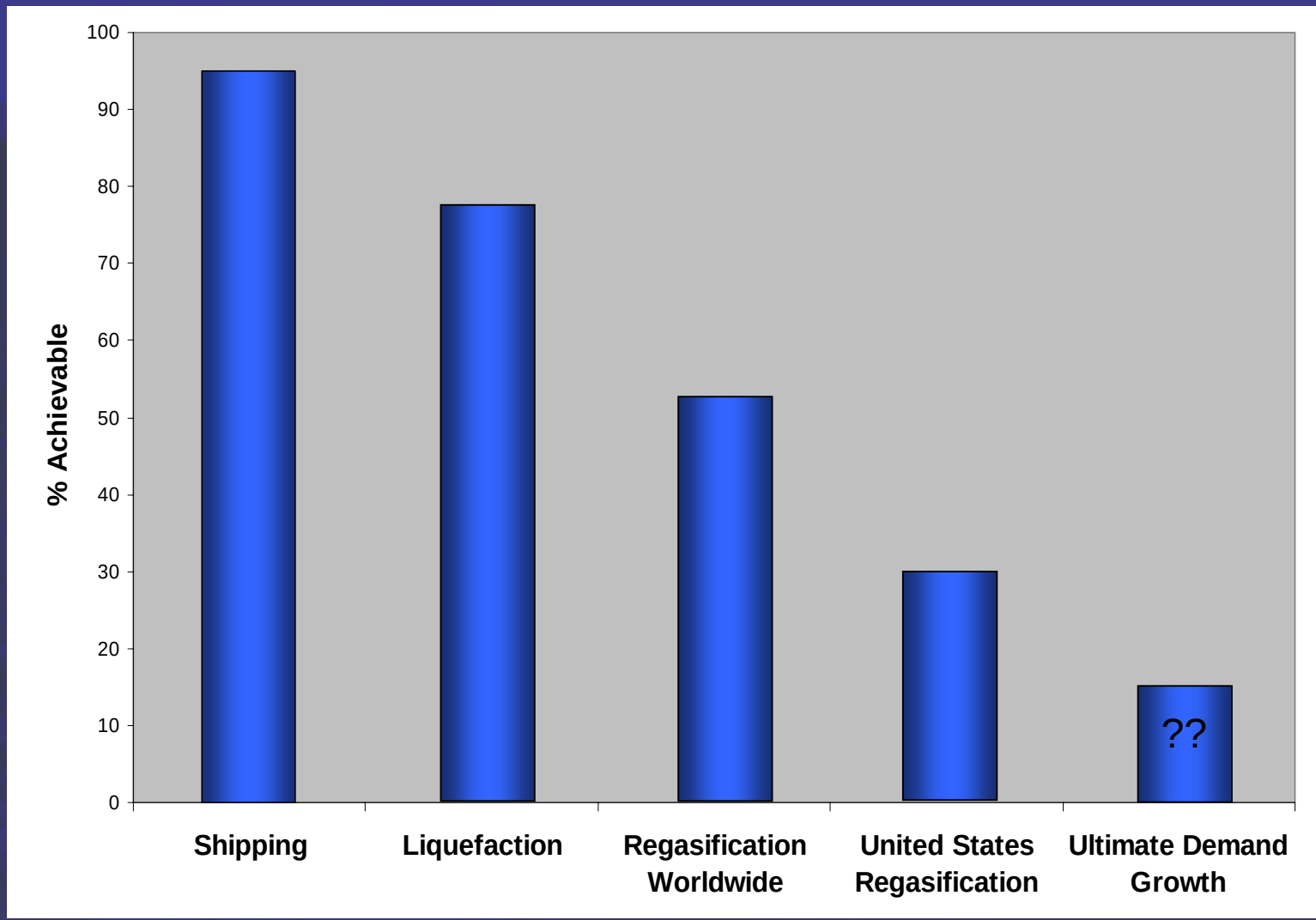
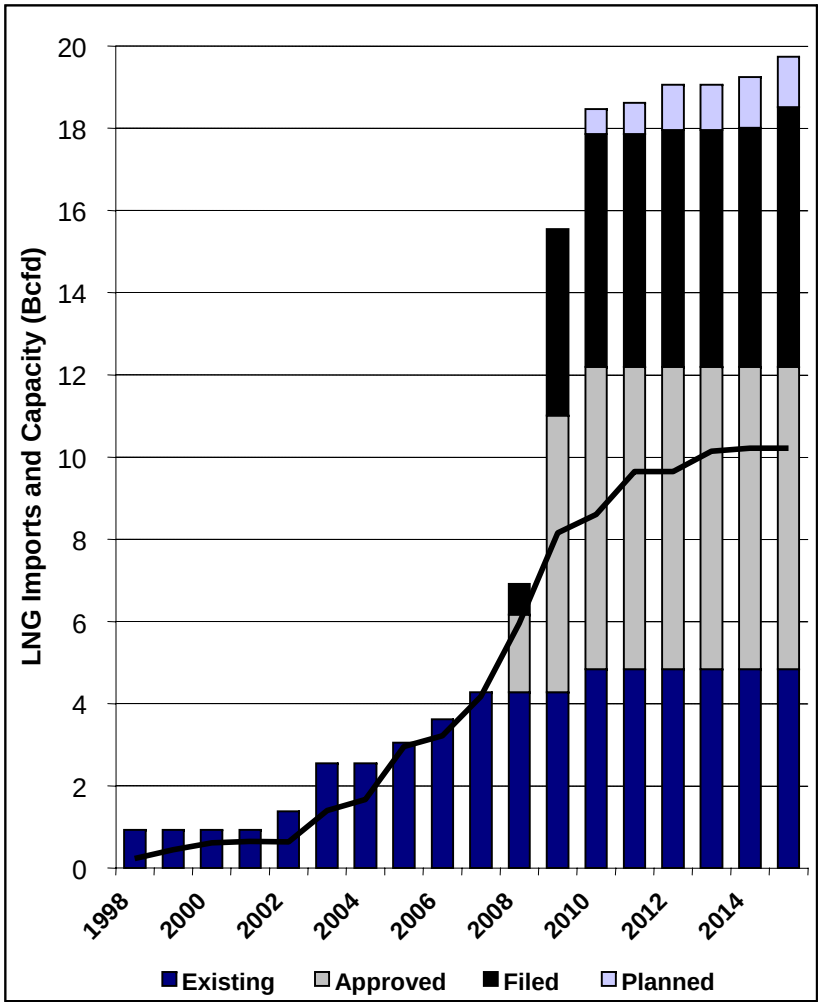


US LNG Forecast



Name	Region	Capacity (mmcfd)	%	Filed/ Approved	In Service
Lake Charles	GC	1,800	83%	F, A	1981
Everett	EC	725	100%	F, A	1971
Elba Island	GC	806	100%	F, A	2002
Cove Point	EC	1,550	85%	F, A	2003
Energy Bridge	GC	500	100%	F, A	2005
Freeport	GC	4,000	48%	F, A	2008
Calypso	GC	830	75%	F, A	2008
Main Pass Energy Hub	GC	934	50%	F	2008
Ocean Cay - Bahamas	GC	842	25%	F, A	2008
KeySpan LNG	EC	500	25%	F	2008
Clearwater Port	WC	800	15%	F	2008
Sound Energy Solutions	WC	700	5%	F	2008
Sabine Pass	GC	2,600	70%	F, A	2009
Corpus Christi LNG	GC	2,000	60%	F, A	2009
Cameron LNG	GC	1,500	70%	F, A	2009
Port Arthur	GC	1,500	50%	F	2009
Gulf Landing	GC	1,000	70%	F, A	2009
Ingleside Energy Centre	GC	1,100	50%	F	2009
Pearl Crossing	GC	2,000	50%	F	2009
Vista del Sol	GC	1,000	50%	F	2009
Golden Pass	GC	1,000	50%	F	2009
Compass Port	GC	1,000	50%	F	2009
Crown Landing	EC	1,200	25%	F	2009
Calhoun LNG	GC	1,000	15%	F	2009
Port Pelican	GC	800	10%	F, A	2009
Cabrillo Port	WC	800	5%	F	2009
Pascagoula - Casotte Landing	GC	1,300	50%	F	2010
Creole Trail LNG	GC	3,300	15%		2010
Broadwater Energy	EC	1,000	25%	F	2010
Beacon Port	GC	1,500	15%	F	2010
Quoddy Bay	EC	500	15%		2010
Northeast Gateway	EC	400	10%		2010
Gulf LNG - Pascagoula	GC	1,000	10%		2011
Skipanon LNG	WC	500	10%		2011
Pelican Island	GC	1,200	15%		2012
Somerset LNG	EC	650	15%		2012
Weaver's Cove	EC	600	15%	F	2012
Dorado HiLoad LNG	GC	1,400	5%		2012
St. Helen's LNG	WC	700	15%		2014
Neptune LNG	EC	400	15%	F	2014
Coos Bay	WC	130	15%		2014
High Rock LNG/Seafarer	GC	1,000	0%		2008

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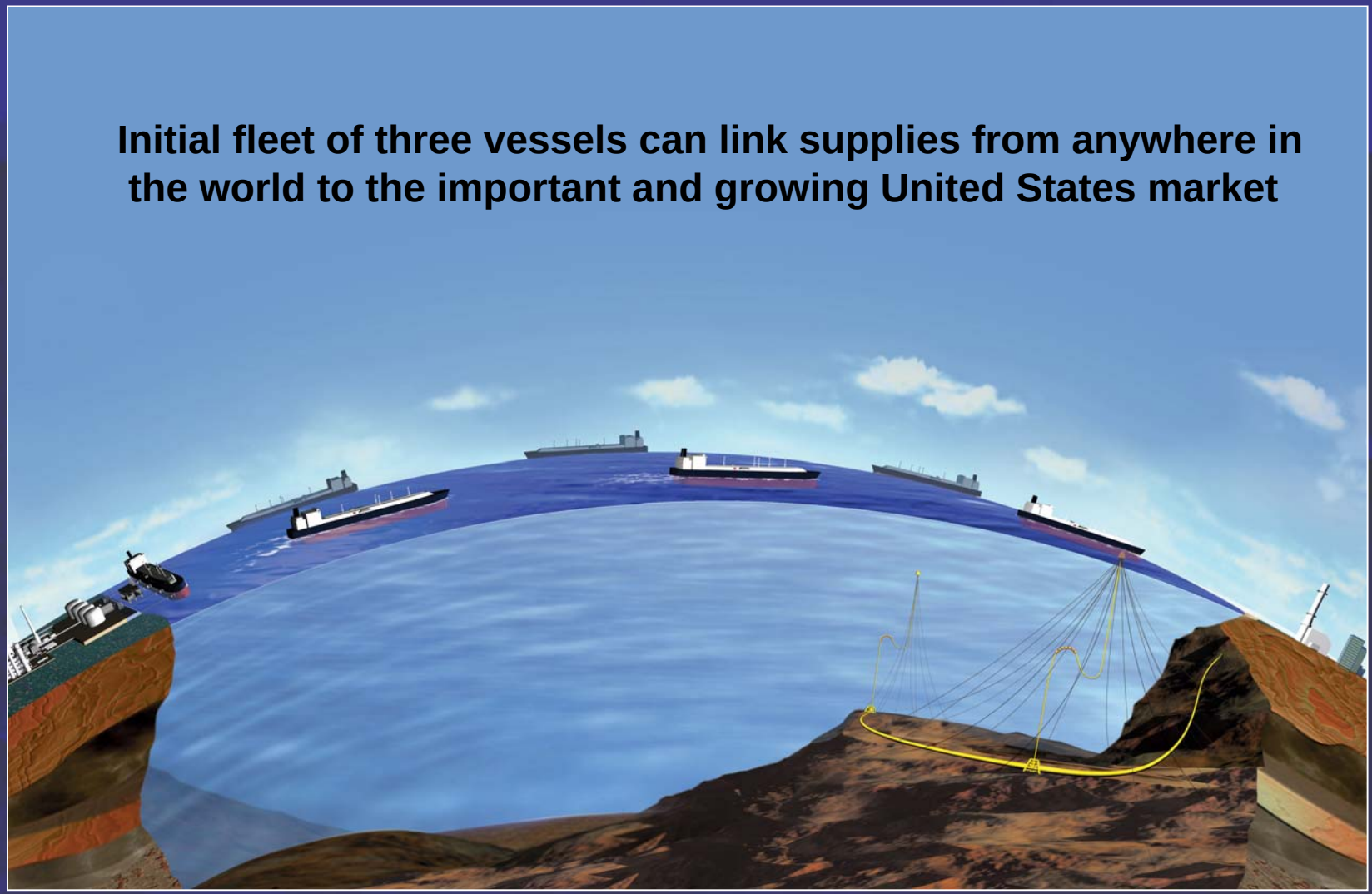
A Catalyst for Growth in Downstream LNG

- Excelerate Energy
  - A new player in the LNG Industry
  - Focused on adding regasification infrastructure to growing markets for natural gas
  - Recently completed successful commissioning & commercial operations of the first off-shore regasification in the world, and the first new regasification terminal to serve the US in more than 20 years

excelerate energy

Energy Bridge is a Flexible, Floating Pipeline

Initial fleet of three vessels can link supplies from anywhere in the world to the important and growing United States market



Gulf Gateway Technical Specifications

World's First LNG Regasification Vessel Excelsior
Docked at the World's First LNG Deepwater Port

Peak vaporization capacity
- 690 mmcf/d open-loop mode
- 450 mmcf/d closed-loop

Storage tank capacity
- 138,000 cubic meters
  Equivalent to roughly
  3.0 Bcf of natural gas

Commissioned March 17, 2005

Ships meet or exceed all U.S. and international standards for LNG carriers

excelerate energy

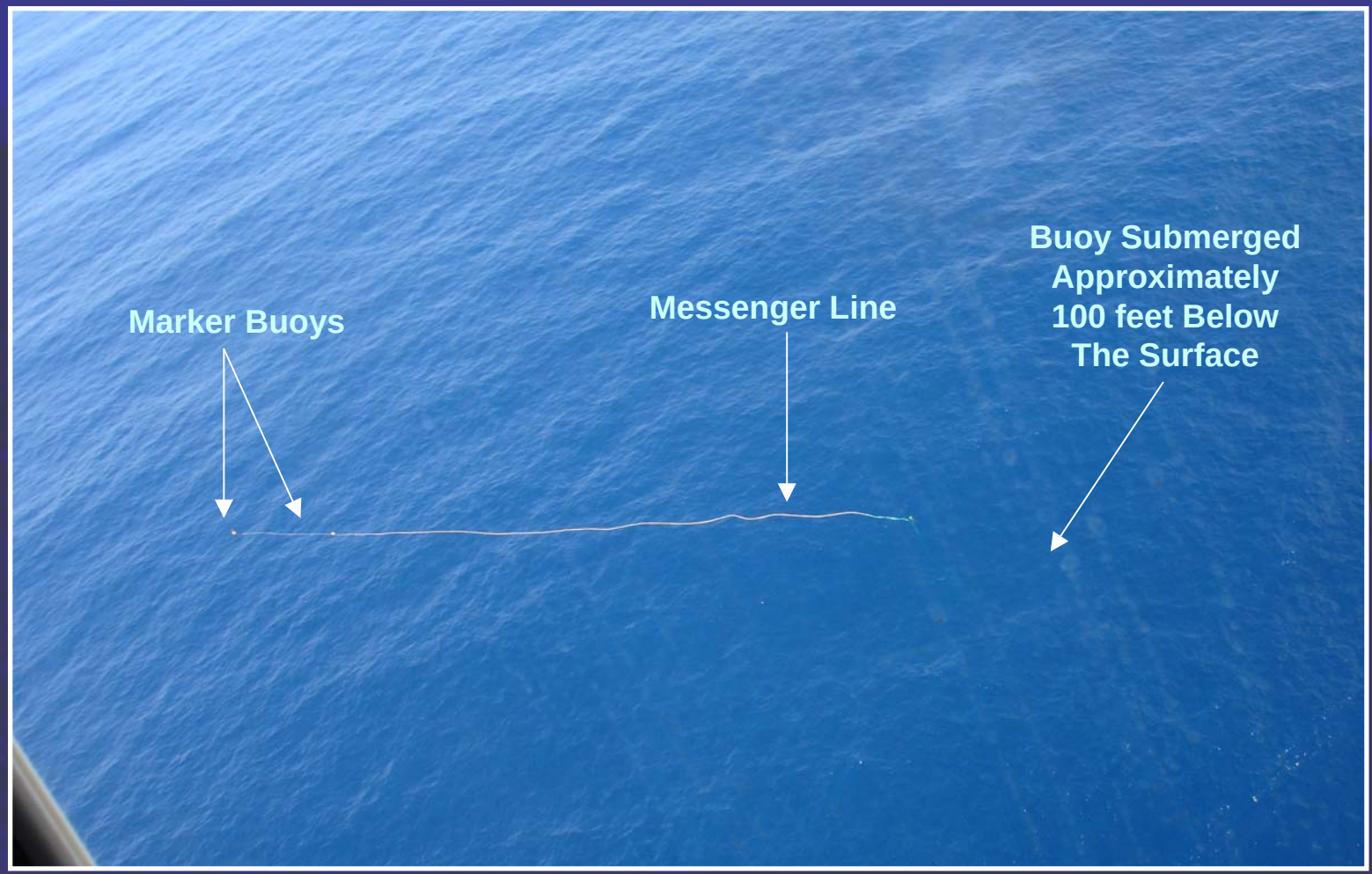
Gulf Gateway required a metering platform given its dual connection to the Sea Robin and Blue Water Pipelines

Other locations will likely not require such a platform

Gulf Gateway Commercial Operations

- Construction completed February 2005
  - Available 3+ years ahead of other new projects; On time, on budget
  - Total construction time – 6 winter months
- Excelsior, Excelerate's first Energy Bridge vessel arrived on March 17
  - Successfully docked to the buoy the same day
  - Commissioning and test flows followed
  - Commercial gas flows commenced March 22
  - Discharge successfully completed on March 30
- Performance now proven
  - Maximum throughput rate of 690 mmcf/d in open-loop
  - Maximum throughput rate of 450 mmcf/d in closed-loop

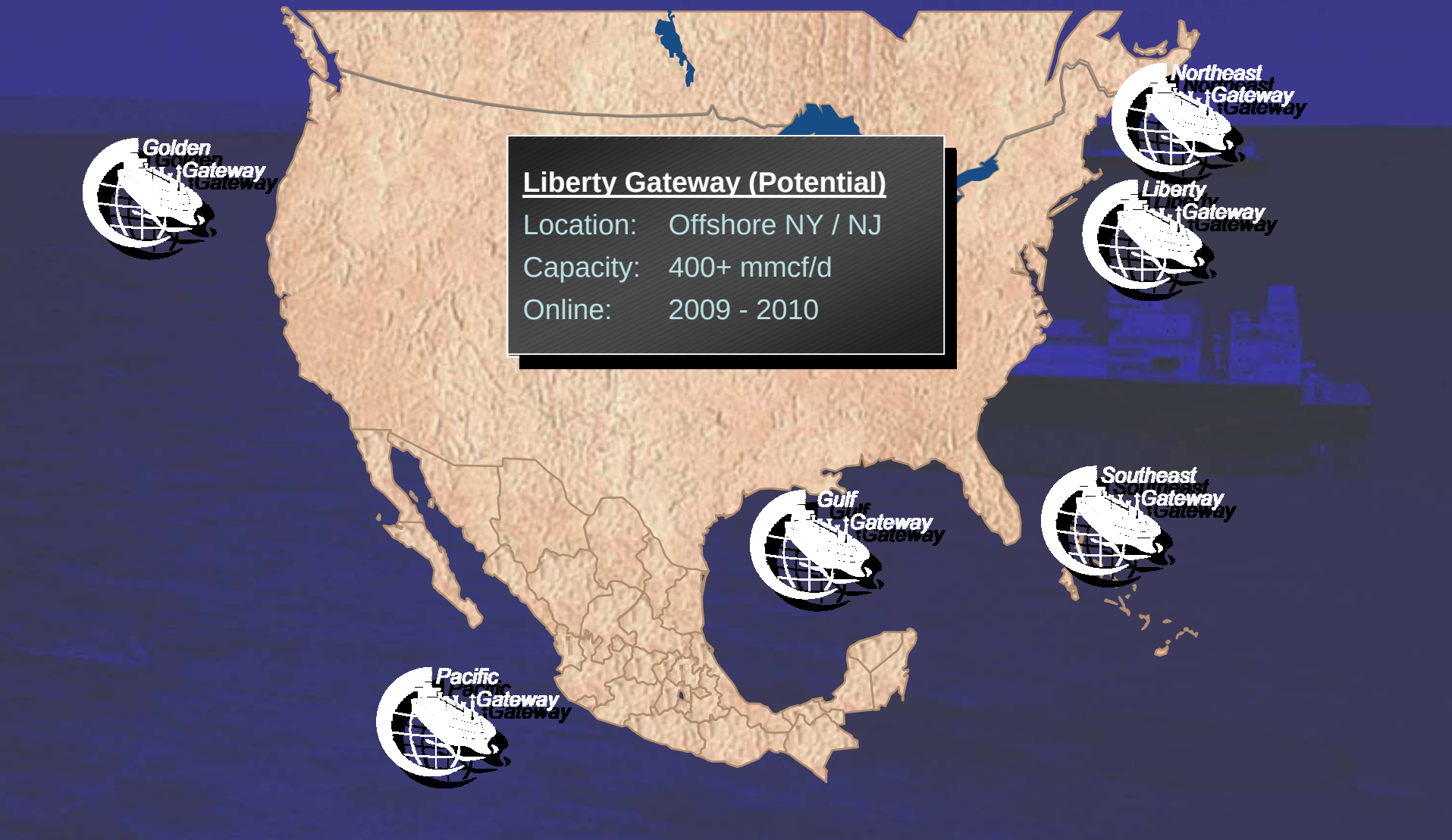
View of the Deepwater Port When no Vessel is Present



excelerate energy

What's On The Horizon?

North American Potential Project Portfolio



Global Potential - Countries Expressing Interest in Energy Bridge

What Might the Future Hold?
A 2010 Regasification Scenario

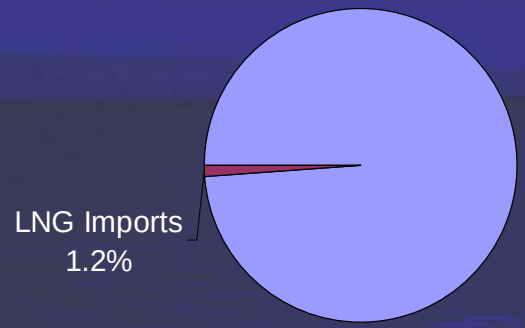
Many of the current regas projects should get built

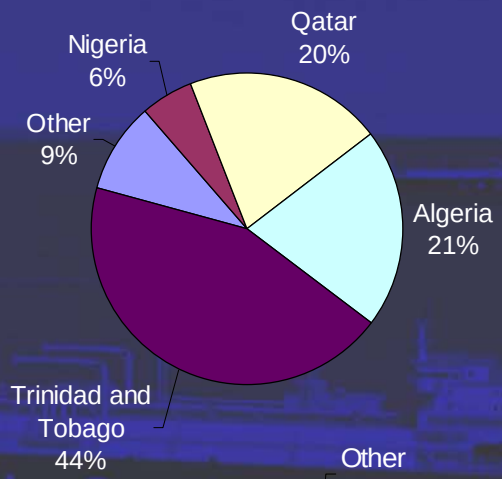
- Current terminals plus expansions — 5 Bcf/day
- 10 facilities at 1 Bcf/day each — 10 Bcf/day
- Total regasification capacity potential — 15 Bcf/day

LNG could represent 20% of Demand by 2010

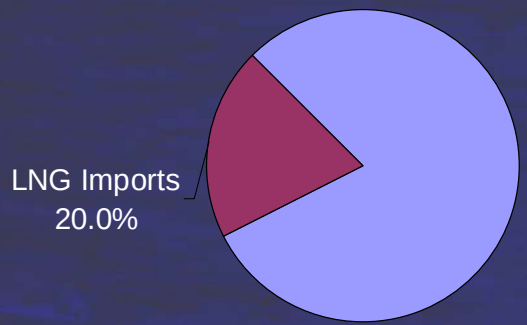
The Potential for an Impactful Decade

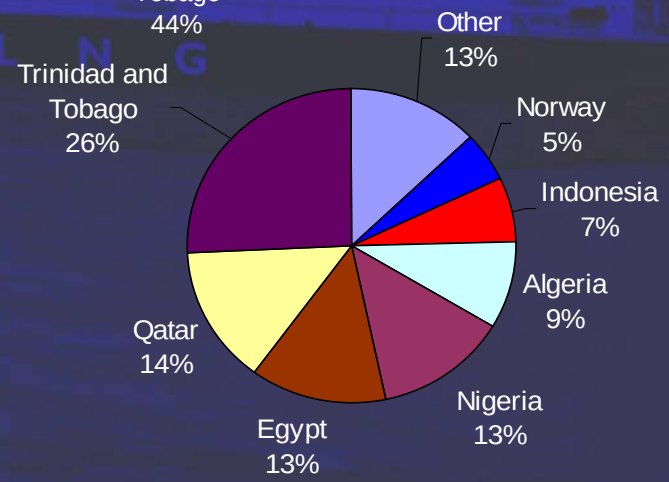
2000 – 0.6 Bcf/day of LNG Imports





2010 – 15.0 Bcf/day of LNG Imports





Over 33 liquefaction trains from 12 countries successfully replace declining US production with a diverse import portfolio

But… It Won't be Easy

- Aligning investment decisions and commitments
- Protecting against Henry Hub price collapse
- Fighting resistance to infrastructure construction
- Competing with push for "Domestic" alternatives
- Allaying safety concerns

Excelerate is Contributing to the Solution