



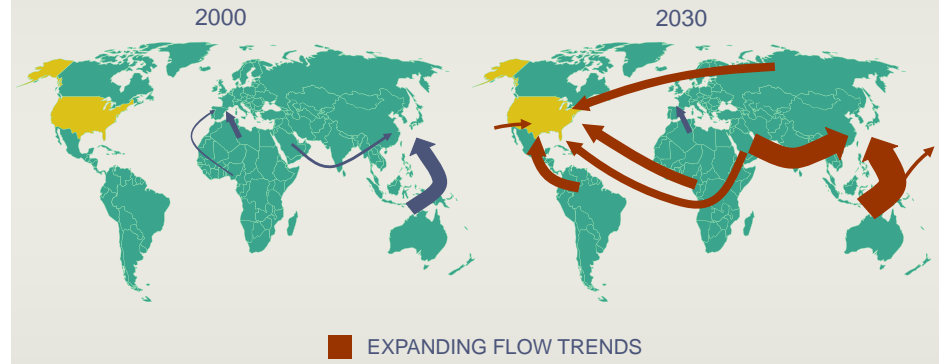
Global Perspectives on LNG

AAPG 2011 Annual Convention & Exhibition

April 12, 2011

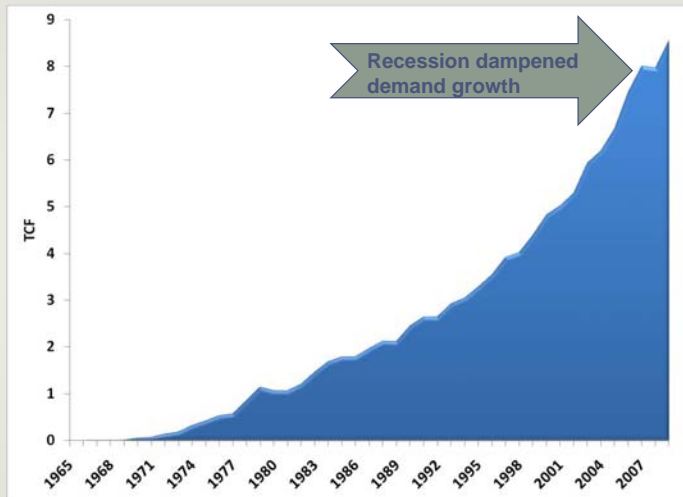
Gürcan Gülen, Ph.D., Senior Energy Economist

Global LNG Trade – Expectations Few Years Back



Source: NPC 2007, consolidated forecasts

LNG Trade Grew



Source: CEE calculations based on BP Statistical Review of World Energy

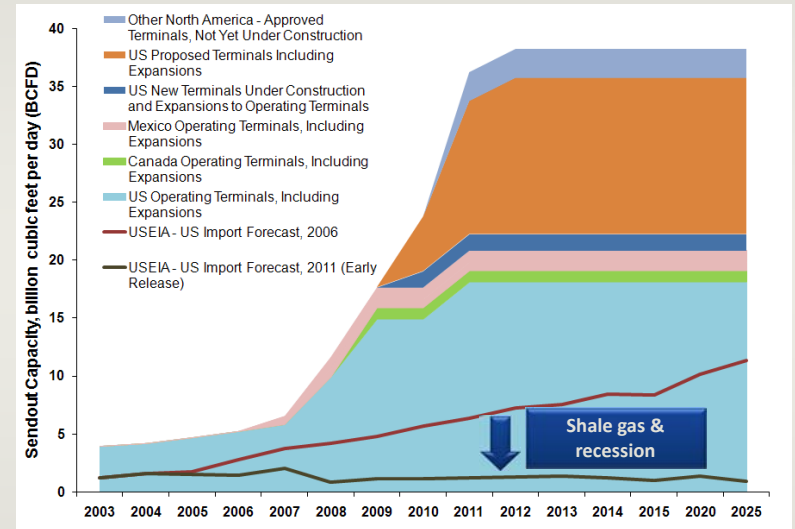
Growing LNG Export Capacity

- Export capacity in 2009 was >10 TCF (versus 8.5 TCF imported)
- Export capacity grew by >60% between 2005 and 2010
- It is expected to grow another 25-30% by 2015

Softening Markets

- Excess LNG supply
- Weak U.S. price impacting UK and Europe
- Pressure on oil indexed contracts
- LNG displacing pipeline gas in Europe: Russia and Algeria lose market share
- 25%-50% decrease in prices from 2008 to 2009

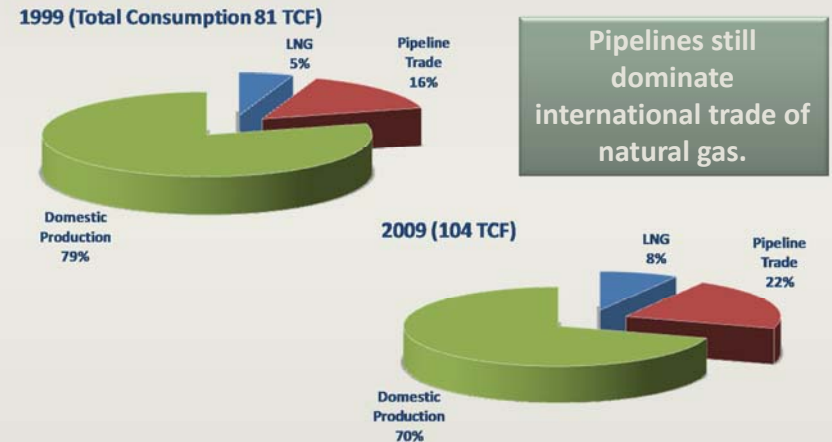
Much Idle Capacity in NA



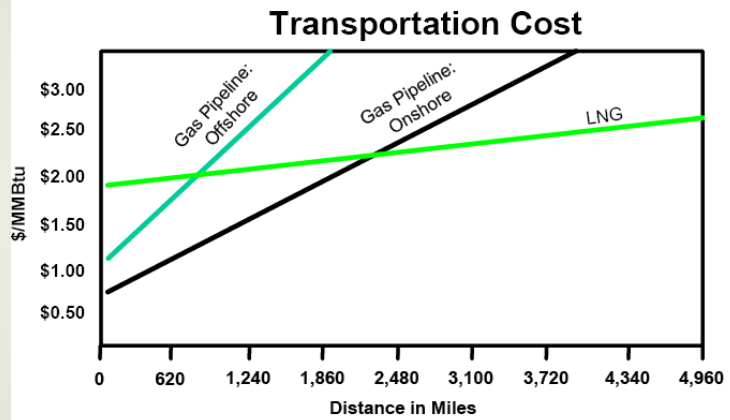
US LNG Exports Not Likely

- Gas feedstock in the U.S. is more expensive, especially in the Atlantic Basin
 - Panama canal expansion may render exports to Pacific Basin a possibility
- Excess LNG export capacity globally
- Gas is quite abundant globally
- The U.S. may need all of its domestic gas (consumption in 2010 surpassed 24 TCF for the first time in history)

Global Natural Gas Trade Growing



Pipeline vs LNG: Representation

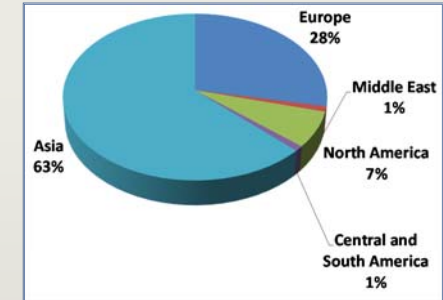


Source: Institute of Gas Technology.

Changing World LNG Trade – Importers Mix



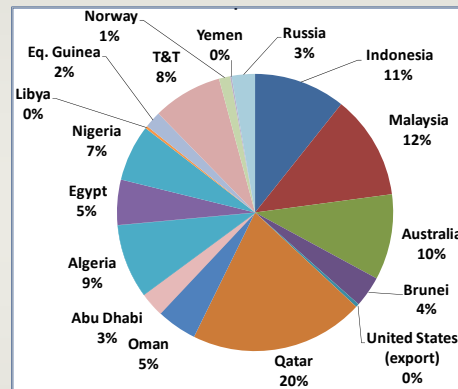
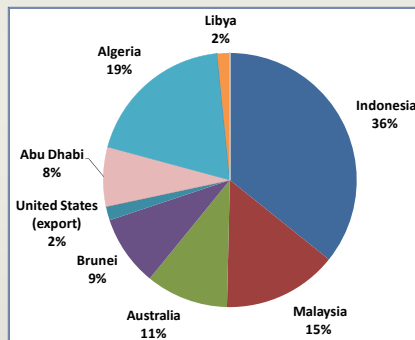
Many new players entered the market (Mexico, Canada, Brazil, Chile, Argentina, Portugal, Greece) and others needed LNG again (UK) since the late 1990s (2009)



Source: CEE calculations based on petroleum-economist.com and BP Statistical Review of World Energy

Changing World LNG Trade – Exporters Mix

Small group dominated by Asian suppliers (1995)



Much more diversified, emerging Middle East suppliers led by Qatar (2009)

Source: CEE calculations based on petroleum-economist.com and BP Statistical Review of World Energy

Some Changes in LNG Trade – Arbitrage opportunities

- Increased flexibility in terms of
 - Contract duration (5-10 years versus 25-30 years)
 - Shifting away from oil-based formulas to gas-based pricing (at least in the Atlantic Basin)
 - Less than 100% take-or-pay obligations
 - Ability to divert cargoes
 - Ability to share windfall profits
- Increased arbitrage opportunities (16% of trade was in the short-term market in 2009)
 - With more suppliers, especially from the Middle East
 - Panama Canal?

LNG Netbacks: Algeria Example

	Barcelona	Everett	Isle of Grain	Lake Charles	Sodegaura	Zeebrugge
1/1/2010	6.65					
1/2/2009	12.08					
1/4/2008	7.73					
1/5/2007	7.88					
1/6/2006	5.77	9.68	12.64	7.75	4.39	5.84
1/7/2005	4.07	8.54	5.20	3.81	3.44	4.23
1/2/2004	3.54	10.27	4.76	4.41	2.50	2.95
1/3/2003	3.32	6.70	2.44	2.99	2.31	2.59

Late 2005 to early 2006: Hurricane Katrina, UK became a net importer, hydro shortage in Spain, cold weather in Europe, tightness in Asian markets

Still an Expensive Business

- \$4-10 billion for the value chain
- Project financing requires cash flow security
- Long-term contracts provide anchor
- Flexibility will help with taking advantage of arbitrage opportunities

LNG Value Chain Costs

EXPLORATION & PRODUCTION	LIQUEFACTION	SHIPPING	REGASIFICATION & STORAGE
\$0.65-\$1.30/ MMBtu	\$1.04-\$1.56/ MMBtu	\$0.53-\$1.30/ MMBtu	\$0.39-\$0.65/MMBtu

Total 2002 = \$2.00 - \$3.70

Total 2007 (with cost escalation) = \$2.60 - \$4.80

Sources: Industry (estimates exclude some O&M and tax costs)