

Effects of Shale Gas Revolution on Korea and Northeast Asia

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Introduction



Introduction

- A *megatrend* defined in Dictionary.com
 - noun. a major trend or movement
 - Origin. mega- + trend
 - Contemporary definitions for megatrend : noun. a large-scale change in circumstances or fashion
- Characteristics of a megatrend in www.ask.com/question/what-is-a-megatrend
 - It is **a long-term change**
 - that affects governments, societies and economies **permanently**
 - Megatrends **drive other trends**
 - **Driving forces** behind megatrends are unique and complex. Examples are demographic changes, resource limitation/expansion and technological advances.
- The term, megatrend, came from John Naisbitt's *Megatrends: Ten New Directions Transforming Our Lives*, New York: Warner Books, 1984.
- A megatrend out there in natural gas markets?



What Has Been Happening



What Has Been Happening

- A sharp increase in recoverable resources
 - Americas, Africa, The Mediterranean, China, etc.
 - Unconventional natural gas resources
- Technological advances in natural gas production and consumption
 - Horizontal drilling, hydraulic fracturing, FLNG, FSRU, small-scale LNG value chain
- Larger-scale cheaper LNG transportation: ship building, Panama Canal
- New business model in LNG industry
 - Tolling of liquefaction facilities
 - More flexible LNG: Less stringent destination restriction
 - More short-term trades and more portfolio players
- Transit problems and Russia's pivot towards Asia
 - Higher LNG dependence by Europe

What Has Been Happening

- Choi, B. at the 3rd International Shale Gas Conference, Sep.16, 2014.
 - A Value Chain model is being constructed since Shale Gas is recognized as *the new paradigm* in the energy sector.
 - Shale Gas industries based on North America are *expected to be expanded to other countries* as well as *have influences on other industries*.
 - Occurrence of commercial activities for Shale Gas in China, the Middle East and other countries will have a greater ripple effect than now.
- ☞ Italics stressed by the original author

- ❖ Looks like it may be called a *megatrend*.
- ❖ Results could be *long-term* in nature and affect stakeholders *permanently*. It is *driving other trends* in related industries.

- ❖ End results and their paths depend on players' interactions.

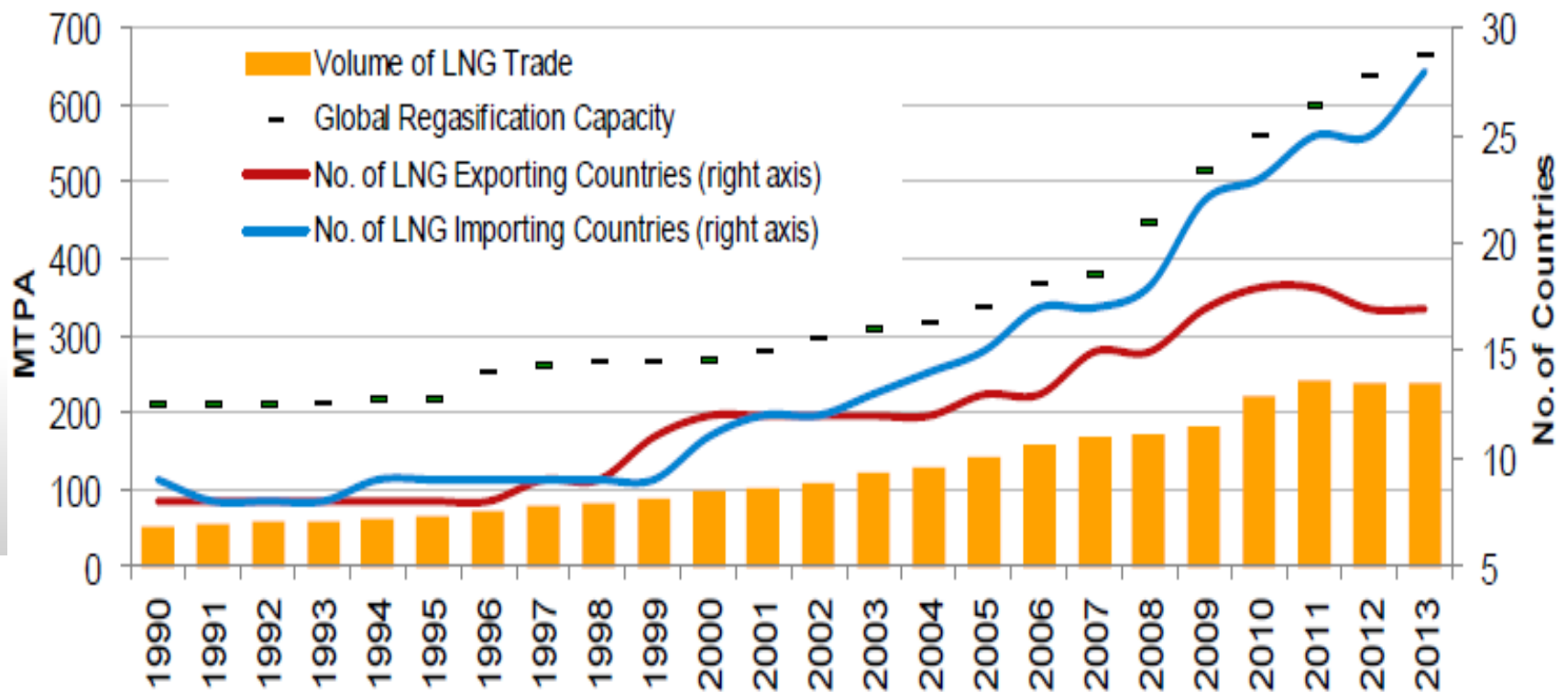


LNG Market Trends



LNG Market Trends

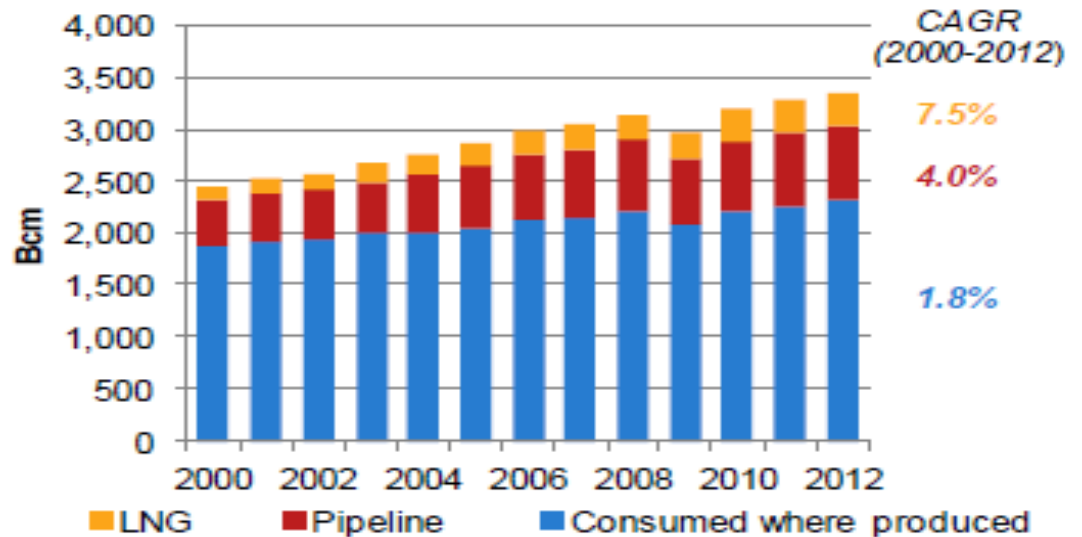
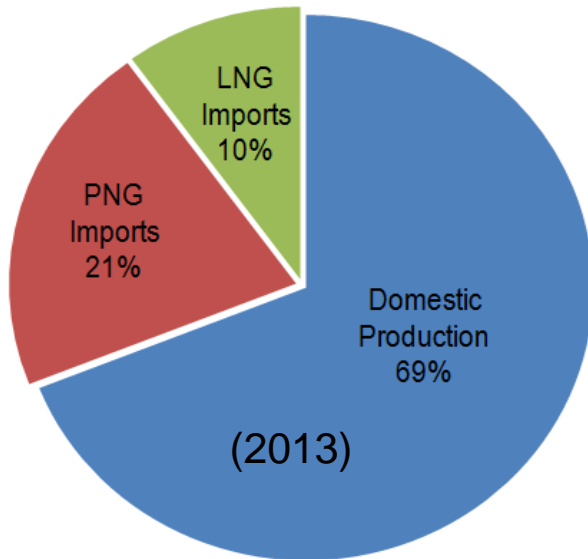
- Global LNG Trade in 2013: 236.8 million mt
 - Growing trends in volume (2000~2012 CAGR at 7.5%) and in number of importers and exporters



Source: IGU(2014)

LNG Market Trends

- Natural Gas Consumption: 3,348 Bcm
 - Pipeline imports : 710.6 Bcm (21%), LNG imports : 325.3 Bcm (10%)

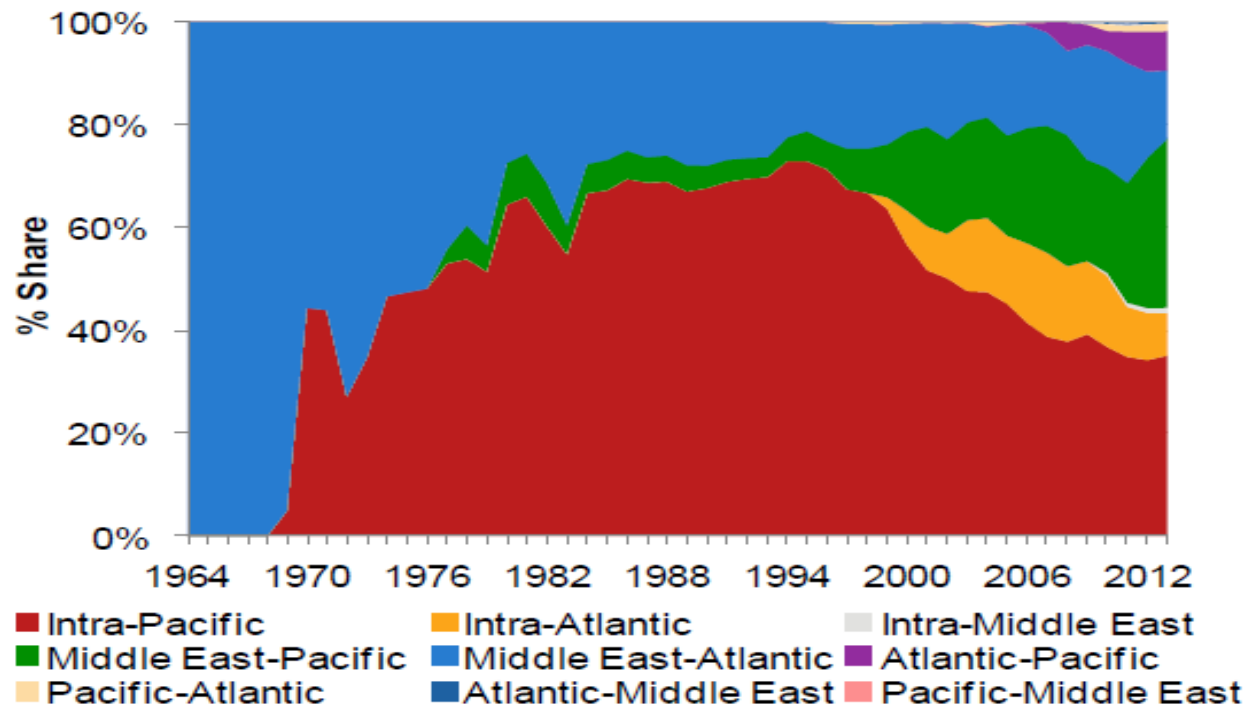


Source: IGU(2014)

LNG Market Trends

- Global LNG Markets: Asia, Europe, North America
 - LNG share in gas trade expanding: 25.8%(2002) → 31.4%(2013)
- Major LNG Trade Movements by region
 - Asia imports in 2013 : 176.98 million mt (74.7%) out of total 236.8 million mt
 - Europe imports: 33.74 million mt (14.2%), North America 3.6%, Latin America 6.1%, M.E. 1.3%

< Interregional LNG Trade >

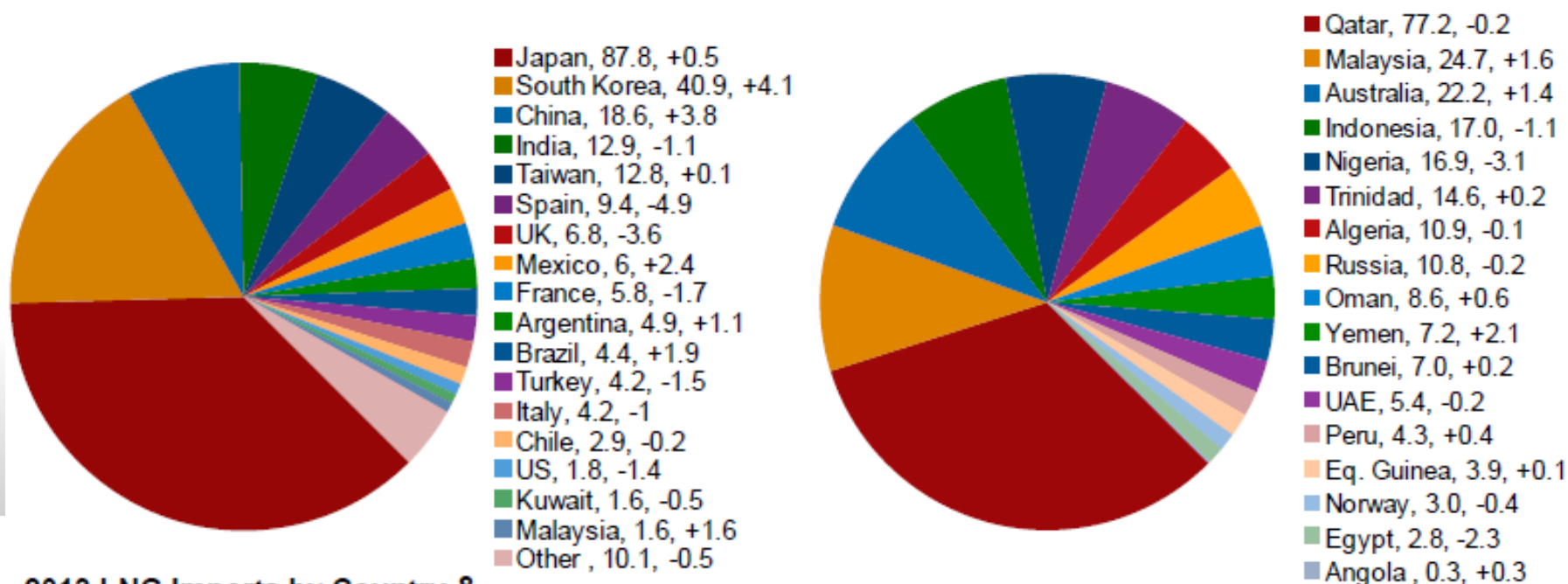


Source: IGU(2014)

LNG Market Trends

No. of countries	1990	2002	2010	2013	2020 est.
LNG Exporters	8	12	18	17	~25
LNG Importers	9	12	24	29	~40

Source: Ju (2014), GIIGNL (2014). Re-quoted from Doh (2014)



2013 LNG Imports by Country & Incremental Change Relative to 2012 (in MTPA)

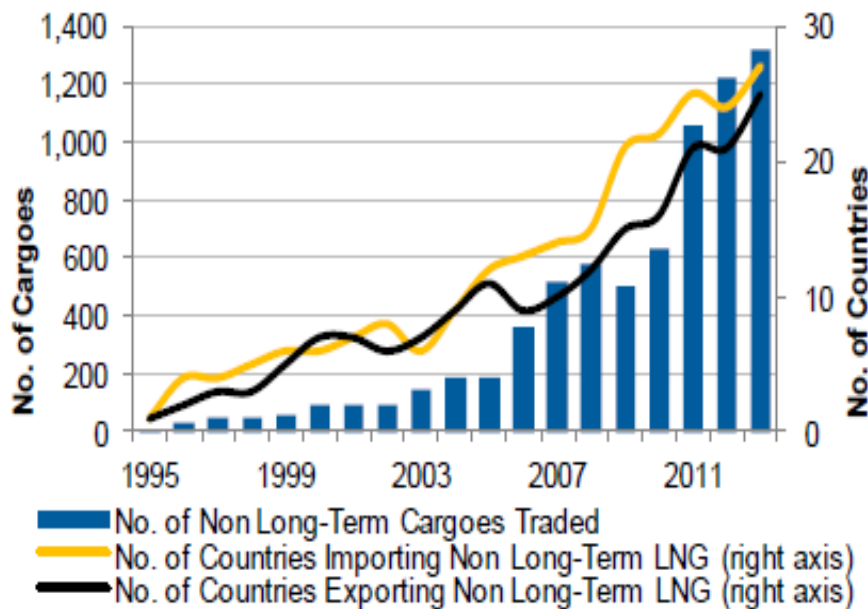
"Other" includes Belgium, Canada, Dominican Republic, Germany, Greece, Israel, the Netherlands, Portugal, Puerto Rico, Singapore, Thailand, UAE

2013 LNG Exports by Country & Incremental Change Relative to 2012 (in MTPA)

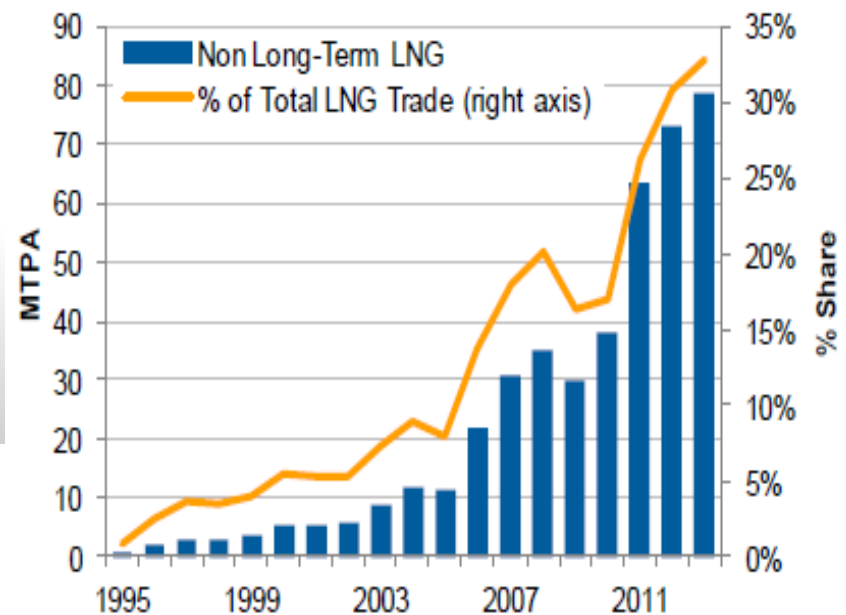
Source: IGU(2014)

LNG Market Trends

- Non-long-term trade: 77.3 million mt traded on a spot or short-term basis (**33% of total LNG trade**)
 - ~2000, less than 5% of volume traded → in 2005, 8% → in 2007~2010, 17~20%
 - growth in LNG contract with destination flexibility
 - increase in # of exporters and importers
 - disparity in regional prices → arbitrage



Non Long-Term Cargo Market Development

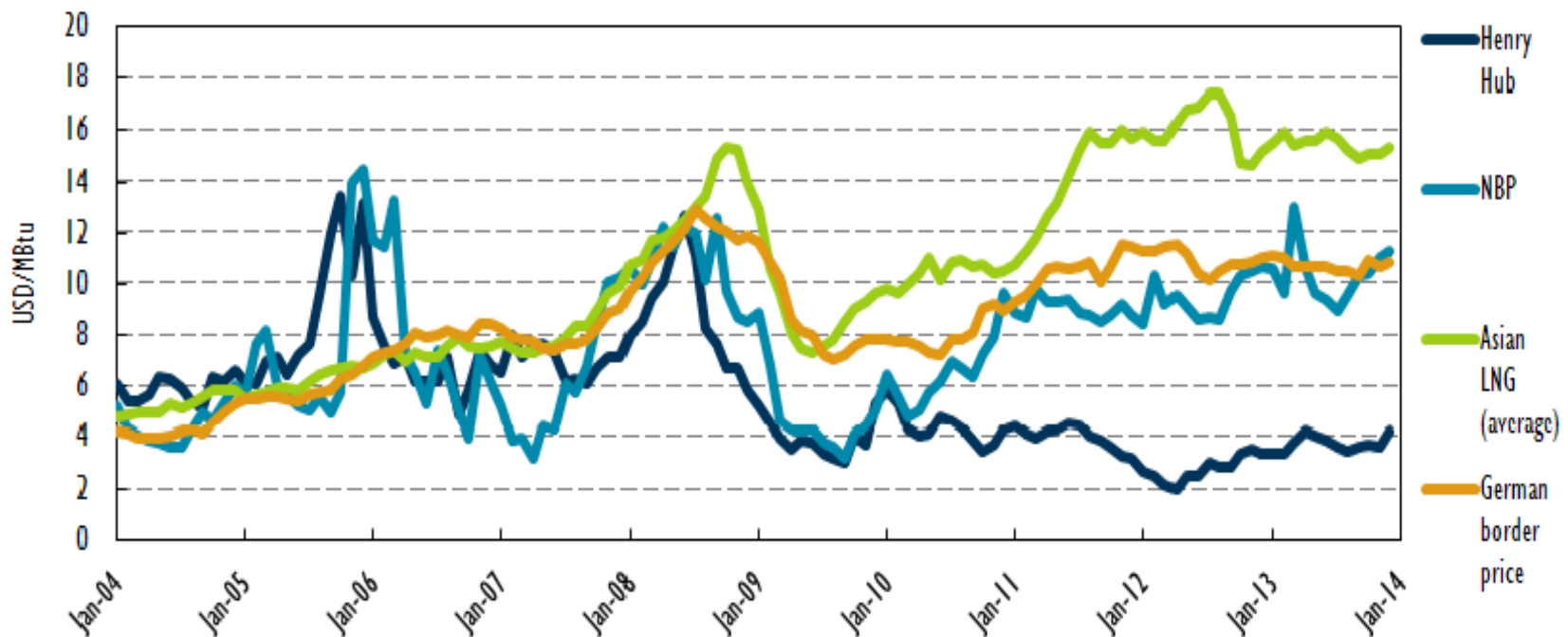


Non Long-Term Volumes

Source: IGU(2014)

LNG Market Trends

- Price divergence between markets: a trend that seems to move in the opposite direction of the quantities
 - The market of over 70% share is called the “premium market” (30% is called a “discount market”).
 - Oil-linked prices, insufficient indigenous gas and other energy resources, etc.



Source: IEA



Effects of Shale Gas Revolution



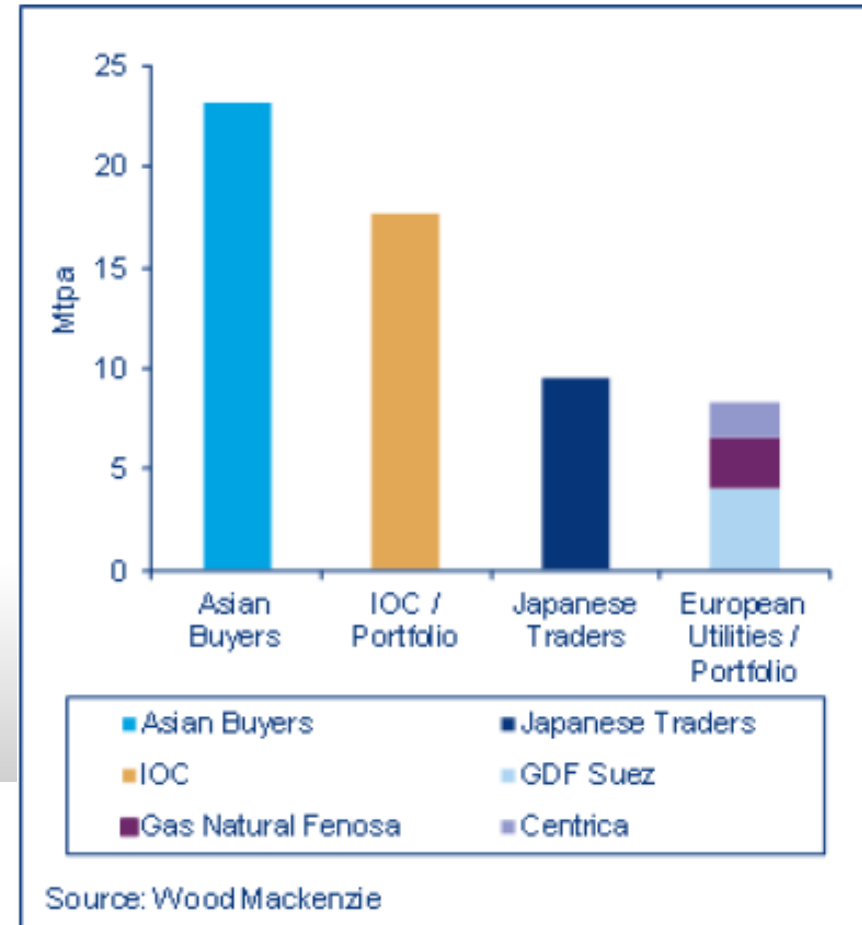
Effects of Shale Gas Revolution

- No. 1 effect is to have Asian LNG buyers buy as much US LNG as possible
 - US LNG reflects market fundamentals (at least those of US market)
 - No destination clause

⇒ good for fostering a trading market
- US LNG conducive to global trading activity
 - Japanese traders consider direct US LNG to Europe as a potential back stop
 - KOGAS sold 0.7Mtpa to Total out of its initial purchase of 3.5Mtpa from Sabine Pass LNG of Cheniere

⇒ consider trading part of the rest (“flexible” management of supply)
- US LNG may provide Asian buyers with bargaining position in LNG SPAs

< US LNG contracted by off-taker type >



Effects of Shale Gas Revolution

- NEA countries' individual / joint efforts to improve trading conditions of LNG
 - JOE (Japan OTC Exchange) launched dollar-based OTC trading platform on Sep 12, 2014 with 17 companies participating including a foreign company, Vitol Asia.
 - China to float natural gas on Shanghai Futures Exchange
 - International fora
 - Japan-initiated LNG Producer-Consumer Conference
 - Japan-India Joint Study
 - Japan-led multilateral joint study of LNG trading
 - Japan-led multilateral study on rational LNG price formation
 - China-led Asian Natural Gas Market Forum
- ❖ Buyers' disenchantment with LNG
 - that is NOT priced on the basis of gas market fundamentals
 - that is supplied under rigid destination restrictions
 - that is supplied under rigid off-take obligations
 - ❖ Buyers' efforts to grope the way toward a market compensating for efficiency and balanced by market fundamentals



Determinants of the Path



Determinants of the Path

- Demand Side
 - Long-term demand growth
 - Competition between buyers
 - Development of intra-regional market in NEA
- Supply Side
 - Liquefaction capacity growth, particularly in North America
 - Competition between sellers
 - Production and transport costs
 - Russia's gas supply policy toward Asia
 - Speed of securing and developing unconventional resources by majors
 - GECF's move, particularly sellers with long LNG position
 - Sellers' strategy to maintain market segregation
- Outside the Natural Gas Market
 - Shale oil production and exports by the US
 - Environmental regulation and carbon price

Determinants of the Path

- Upside Risks in Long-Term LNG Demand Growth
 - LNG demand from Europe, South America, Southeast Asia in addition to China and India
 - New type of demand like LNG bunkering
 - Restart of Japan's nuclear power plants
 - Russia's LNG pricing policy and European countries' supply diversification
 - New demand for LNG generated from flexible terms of trade of LNG
 - GHG emissions policy
- Downside Risks in Long-Term LNG Demand Growth
 - Unconventional gas production in China, Europe and others
 - High price and supply disruptions of LNG
- A piece of good news about US LNG is USDOE now follows the changed procedure for approving LNG exports to NFTA countries effective Aug. 15, with 9 projects totalling 9.3bcfd as of Sep 10.

Determinants of the Path

- Score cards of NEA countries w.r.t. wholesale natural gas market
 - They regard developing an intra-regional trading market leveraging US LNG (of course, there are many risks involved with US LNG) as the utmost imperative task for better terms of trade of LNG.

< Comparison of Competitive Market Environment >

Institutional / Structural requirement	Japan	Korea	China	Singapore
Hands-off government approach	-	-	-	+
Separation of transport & commercial activities	-	-	-	+
Wholesale price deregulation	+	-	+/-	+
Sufficient network capacity and non-discriminatory access	-	-	-	+
Competitive number of market participants	+	-	+	+/-
Involvement of financial institution	+/-	-	-	+



Concluding Remarks



Concluding Remarks

- It seems to be the utmost imperative shared goal between NEA countries to have a functioning regional market from which price signal is produced and conveyed into term contracts of LNG .
- But it will take long and NEA countries do not seem to be well-prepared for the “market”, although certain efforts are being made, with some individually and others collectively.
- There are many physical and institutional constraints on achieving the goal at both national and inter-national levels.
- Institutional or policy-philosophical harmonization seem to be harder and take longer to achieve than aligning physical infrastructures, necessitating more and deeper discussions between NEA countries.
- Why not resolve short- to medium-term issues in the mean time for which the solutions or direction to follow are evident, whether they are at the national or company level?
- Examples include; joint procurement of more hub-linked and flexible volumes, information sharing on easing of contractual terms, allowing more players in national markets, sharing best practices, etc.

Thank you.



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