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LNG Outlook in Asia

An Overview

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Growing LNG Demand in Asia and the Role of US LNG Export Terminals

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Overview of Asian Market

- Traditionally major LNG buyers since the inception of international LNG business in the 1960's.
  - Japan, Korea, Taiwan
- Two significant emerging economies in the world began importing LNG in the 2000's.
  - China, India
- New LNG buyers
  - Singapore (Jurong Island, 2Q 2013), Malaysia* (Melaka, 2012) Indonesia* (West Java, 2012), Thailand (Map Ta Phut, 2011) Vietnam (planned), Philippines (planned)

    *Malaysia and Indonesia have been major LNG suppliers in Asia in the past

Japan

- The largest LNG importer in the World
- Fukushima nuclear power accident and consequences to energy supply sources for power generation
  - Immediate solution – fuel oil, LNG
    - ✓LNG import (Source: BP statistical review of world energy; Economist intelligence

•2010	2011	2012	2013	2014
69	79	87	90	93

  - Mid-term – shifting interest to renewables and coal but LNG is expected to remain a significant supply source
- Nuclear power resumption – when and to what extent?

Japan - continued

- Changing environment in LNG procurement
  - Diversification of LNG sources and optimization of price formula
  - Participation to US LNG export terminals

Korea

- Second largest LNG importer in the world
- Constant natural gas demand growth toward 2024 (10^{th} long term natural gas supply/demand plan)
  - 25.92mmt in 2009 to 34.12mmt in 2024
- LNG import demand forecast surpassed the plan (by Ministry of Trade, Industry and Energy)
  - 37mmt in 2013, 39mmt in 2015, 38mmt in 2027
- Substitution by coal and nuclear
- Staying away from expensive Australian LNG, looking for new supply sources

China

- LNG demand expected to grow but to what Level? (BP statistical review of world energy; other sources): million tons

2012	2014	2018	2020
14	17	19	?

- Uncertainties over:
  - overall energy policy
  - coal, nuclear
  - construction of LNG receiving terminals
  - shale gas development
  - pipeline gas from Russia

Supply Sources

- Australia – many new projects; capacity expected near triple in five years (30 mmt in 2012 to 85mmt in 2017) but prices are expensive linked to crude oil prices
- Middle East – Qatar stays the world's largest supplier but no further plans of expansion beyond 77 mmt
- East Africa – new mega projects in Mozambique and Tanzania
- Canada – Kitimat, LNG Canada, BC LNG Export Co-operative.
  - Shorter distance to Asia. Export licenses are already granted.
  - High cost elements for building infrastructure/long distance pipeline construction needed to loading ports

US LNG Export Terminals

- Abundant shale gas supply, commercial flexibility and availability of finance, 20+ export terminals planned
- Export license to non-FTA countries; pending review by DOE – when and to what extent and with conditions?
- Many terminals are structured as tolling facilities, some others are selling LNG FOB terminals.
- FOB buyers from Sabine Pass: Kogas, BG, Gail, Gas Natural Fenosa
- Tolling facility users: Japanese utilities/trading companies, Koreans, Majors, LNG traders
- China – more interested in shale gas development and learning fracing technologies?
- JCC link

LNG Price Formula

- Hybrid (JCC plus Henry Hub)
- Tolling arrangement (locked into Henry Hub pricing)
- Cost optimization by acquiring upstream gas assets in the US