

ASIAN GAS MARKET: VARIETY, CHALLENGES AND POTENTIAL

PGCC “Asia: Gas Market No.1?”

By: Shigeki Sakamoto, JOGMEC

Date: June 5, 2012

Venue: Kuala Lumpur



Patron



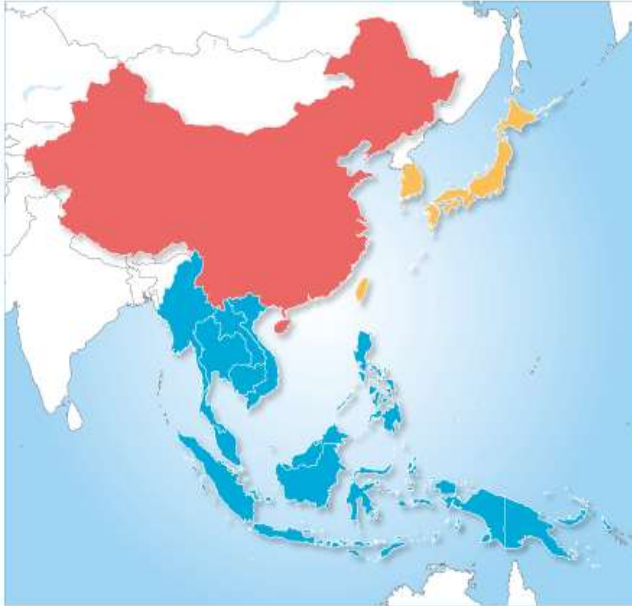
Host



Host Sponsor



Purpose & Scope of C1 Study



Study Group C1: Gas markets in ASEAN+4 (Malaysia, Indonesia, Thailand, Vietnam, Brunei, Philippines, Myanmar, China, Korea, Japan and Taiwan)

Purpose

Review and analyse security of supply, **identify local gas market drivers** and explore additional supply from **non-conventional sources** (e.g. CBM, hydrates).

Scope

- Assess security, reliability, and sustainability of gas supply and demand for the region.
- Identify emerging issues and challenges in developing and growing gas markets, considering **potential LNG imports** (e.g. **Indonesian supply, high CO₂**).
- Identify opportunities to further develop and grow gas markets. **Demand centres located away from supply sources**. Long term availability depends on upstream development and downstream infrastructure.
- Identify investments/funding throughout the gas chain

- Session theme “**Asia - Gas Market No.1?**”
- Reporting the Study Result
(**Focused analysis**)
- NORTHEAST ASIA GAS MARKET
- THE GAS MARKET OF CHINA
- THE GAS MARKETS OF ASEAN
- WILL THERE BE A TWO-TIER LNG CONTRACT PRICING MECHANISM IN ASIA?

Gas Market in ASEAN

■ Changing from gas supplier to consumer

- Increase in domestic gas consumption ← subsidised price

■ LNG imports:

- Started in Thailand in 2011, will commence in Indonesia and Malaysia in 2012
- Followed by Singapore etc.

■ Challenges

- Raise gas price ← reduce subsidies
- Increase in domestic gas production ← higher costs
- Potential of unconventional gas (CBM, shale gas)?

■ How much will gas consumption grow?

- Supply of imported LNG is expensive for ASEAN gas demand
- Cheaper coal in Indonesia is available for power generation



- **The Largest potential for growth** in the world
 - Gas ratio of the total energy suppl in 2011= 4.7%
 - Target of 8% in 2015, 10% in 2020
- **Option of gas supply:**
 - Domestic production, conventional & unconventional
 - Pipeline gas imports from FSU, LNG imports
- **Challenges**
 - Gas price mechanism
 - Status of shale gas production ← production cost?
 - Competition with coal, in power generation
- **Big difference** in gas demand between high/low cases



- **Relatively stable gas demand after 2012**
- **Challenges**
 - Japan; resuming nuclear power stations
 - Korea; PL gas imports from Russia through North Korea
- **LNG imports:**
 - Gradual change of supply from S.E.Asia to Australia, Qatar
 - Supply from North America & east Africa is expected
 - Possibility of growth of market priced LNG imports from US
- **Possibility of gas-to-gas priced markets?**
 - In relation to LNG imports from North America



S.E.Asia : LNG Re-gas Terminals



Start-up of re-gas terminals

2011 Thai - Ta Phut

2012 Indonesia - West Jawa

Malaysia - Malacca

2014 Singapore

▪ Increase of domestic gas demand in ASEAN ← subsidized gas prices

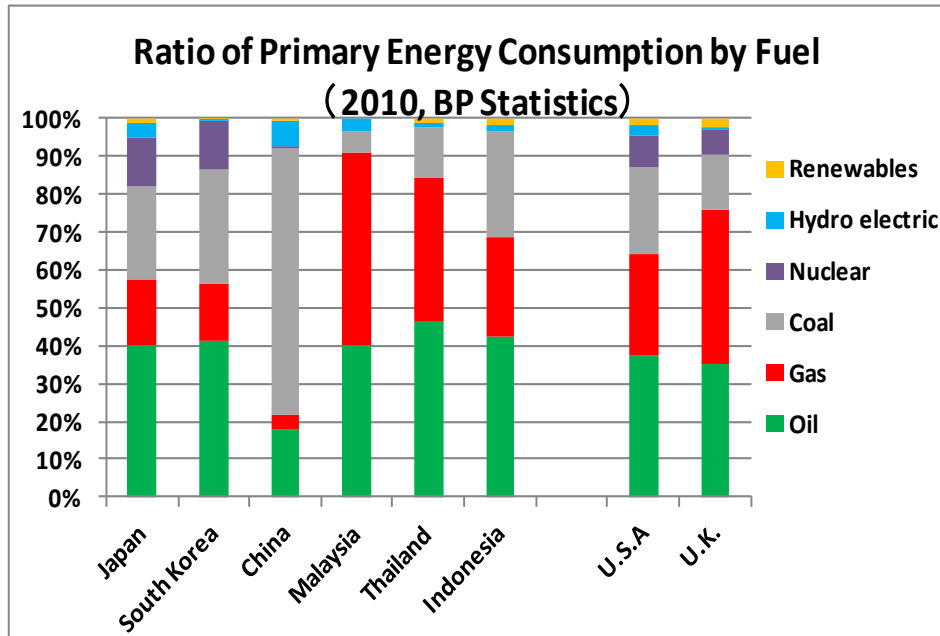
▪ Stagnant domestic production of conventional gas

⇒ Shortage of regional supply of natural gas

⇒ Major ASEAN markets decided to start LNG imports for domestic markets

▪ Coal may be preferred as energy for power generation in the long-term

Energy & Gas Supply in China



Chinese energy supply is dominated by coal

- Share of coal = 70%, share of gas = 4% (2010, BP statistics)
- Government plans to increase the consumption of gas

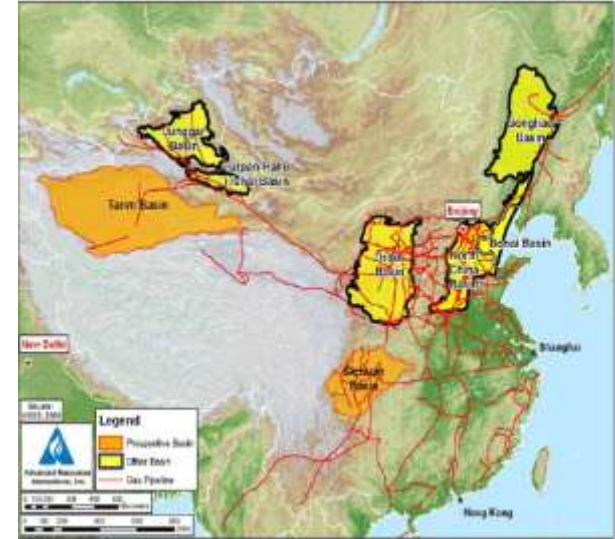
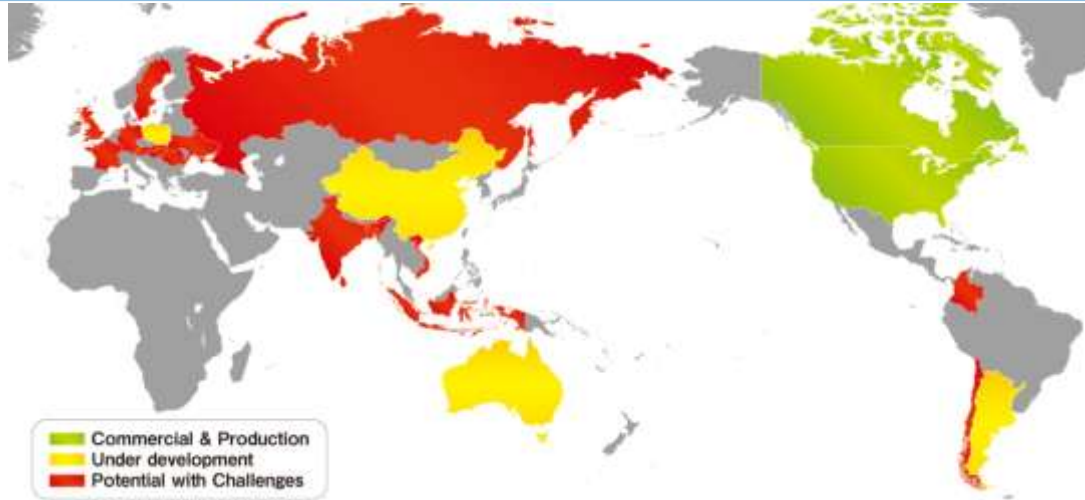
For the past 15 years, long-distance gas supply has consisted of:

- 1996~ Ordos basin to Beijing by Shaanxi-Beijing pipeline
- 2006~ Xinjiang to Shanghai by West-East pipeline
- 2009~ Launch of pipeline gas imports from Turkmenistan

Options for gas supply

⇒ Domestic production, pipeline gas import balanced by LNG imports

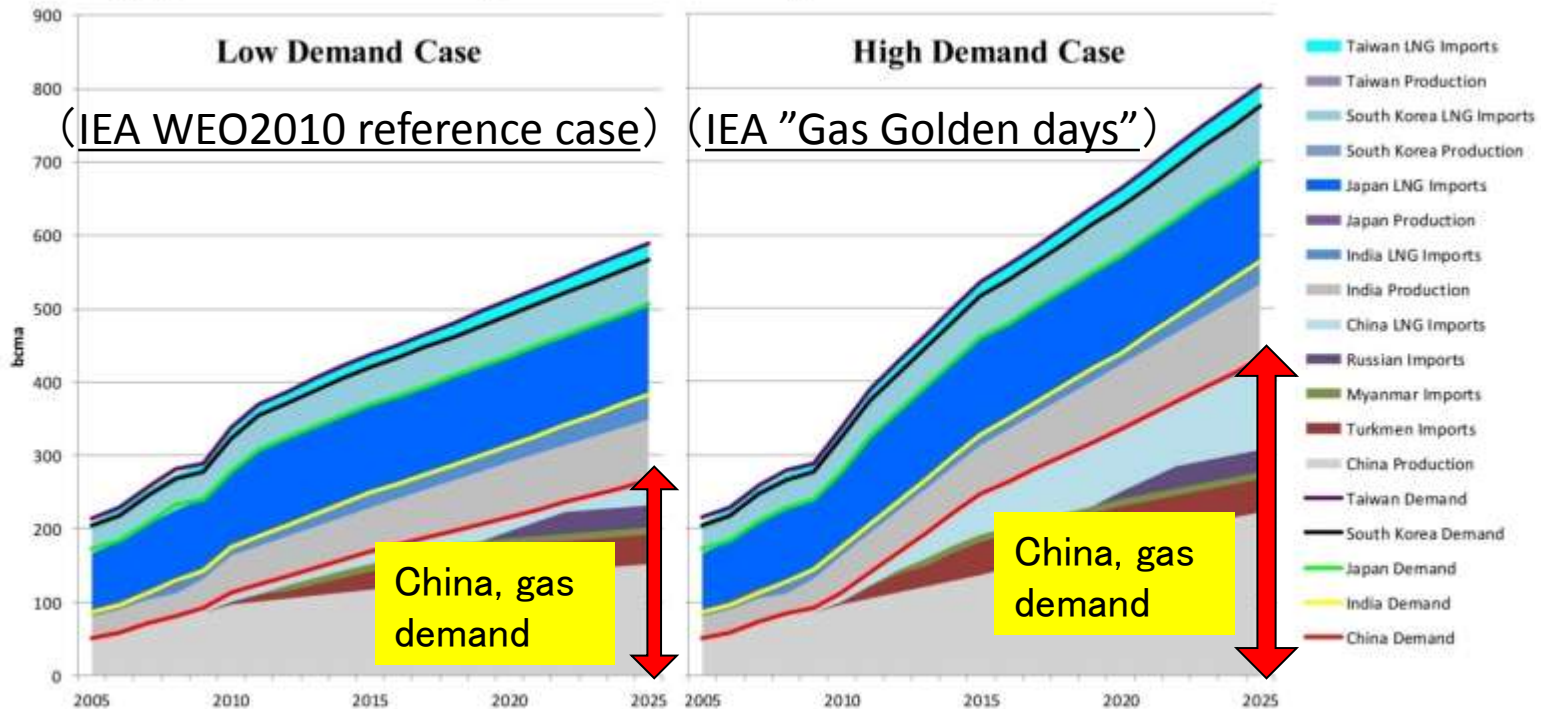
China: Status of Shale gas development



- US DOE “the potential of the world shale gas resources in April 2011”
“China has the largest shale gas potential of 1,275 tcf followed by U.S.”
 - 1) Discussion in the US-China oil & Gas industries’ forum
 - 2) NOC’s JV (PetroChina, Sinopec) with Shell, BP
 - Areas for exploitation: Sichuan, Guizhou, Jiangsu
 - Government’s aggressive plan of development: 60-100 Bcm by 2020
 - The 1st bidding in April, 2011 → 2 blocks awarded (JV with IOC?)
- ⇒ Several challenges for development

Gas demand in China could establish future LNG projects

Asian Supply and Demand Assumptions – Low and High Demand Cases



Source: IEA, Waterborne LNG, BP Statistical Review of World Energy, own analysis

- Future gas demand will establish new LNG projects
- Low gas demand scenario=IEA WEO 2010standrd (New Policies)
- High gas demand scenario=IEA 2011"Gas Golden days"
- ⇒success in shale gas development will make a big change in gas demand in China
- substantial transfer of energy consumption to gas

China: Gas PLs & Re-gas Terminals

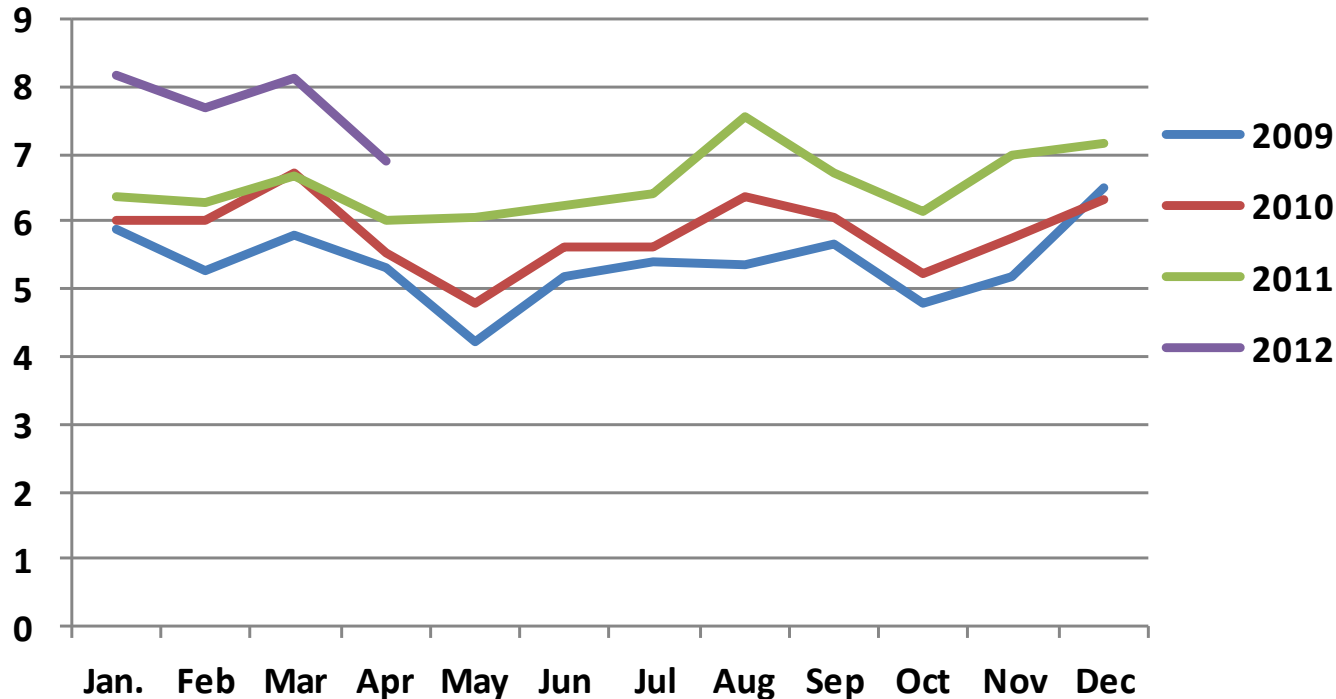


- Gradual expansion of gas trunk lines
- 5 operational re-gas facilities:
Dapeng (Guangdong)
Fujian
Shanghai
Rudong (Jiangsu)
Dalian
- Many more are planned & under construction

Japan: Monthly LNG Imports

MM tons

Japan: Monthly LNG Imports



Source:
Ministry of Finance

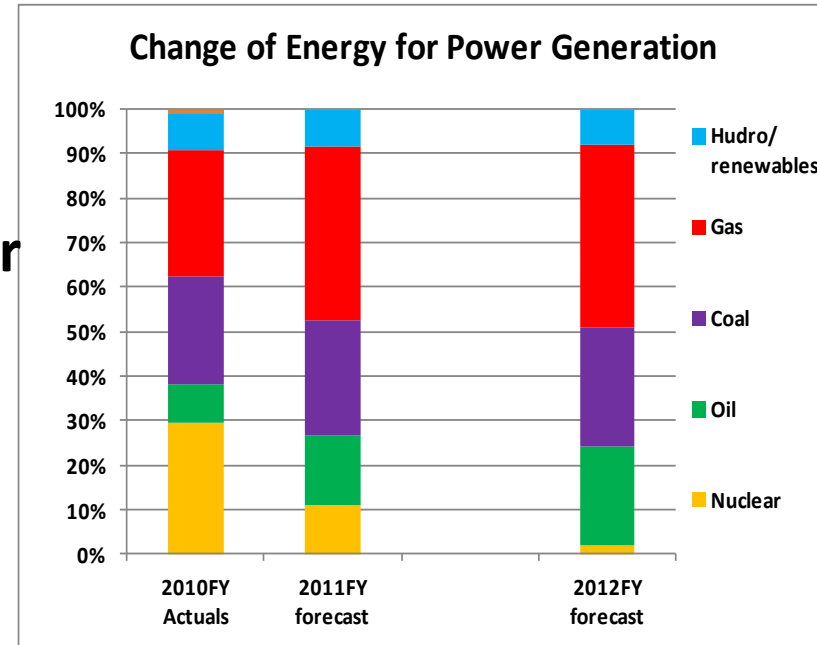
Monthly LNG imports have been increasing from the same period of previous year since April, 2011.

⇒ 2011 CY imports = 78.5 MM tons (+12% from 2010, +8.5 Million tons)

The yearly imports for mid-term after 2012 is forecast to be around 85-90 MM

Japan: Power Generation by Energy Source

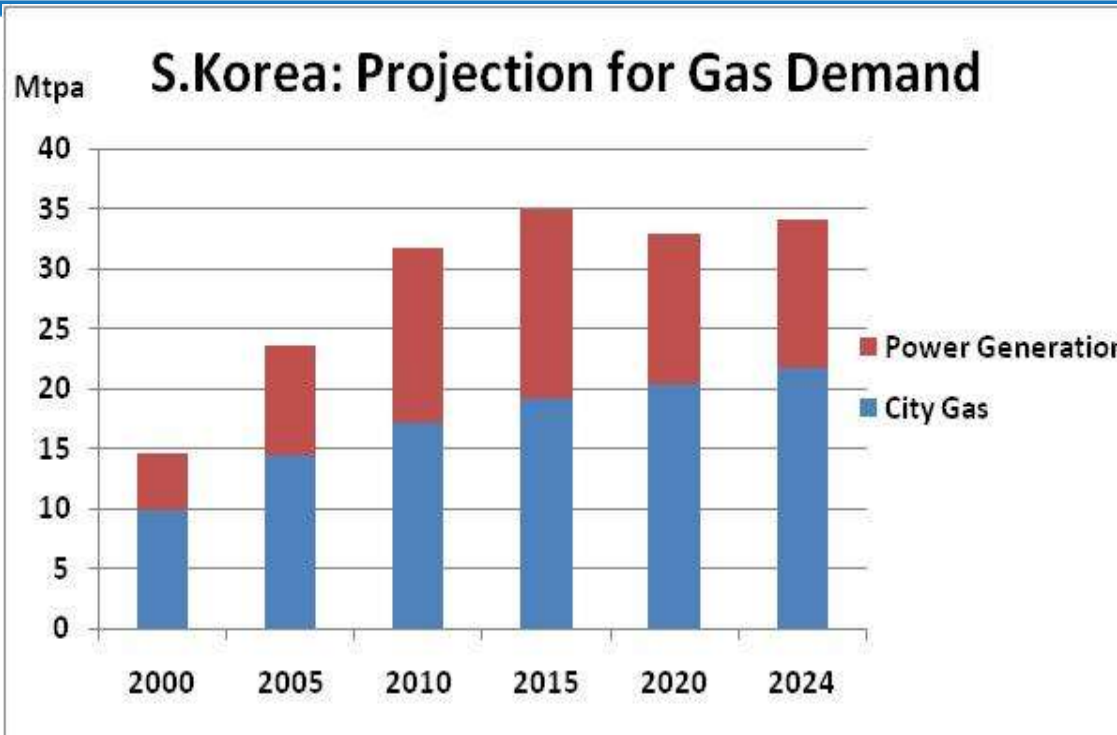
- The nuclear power ratio in the total power generation decreased after Fukushima accident.
- Restarting of nuclear power units after regular checks is difficult due to anti-nuclear attitudes in the society.



Long-term energy supply policy by Japanese Government

- Previous plan was to increase the ratio of nuclear in order to reduce dependence on imported oil and gas.
- Now it is under discussion for amendment: reduce nuclear ratio and increase renewables and fossil fuels (→gas);
range of nuclear ratio under discussion= 0– 25%

Gas Demand Projections in S. Korea



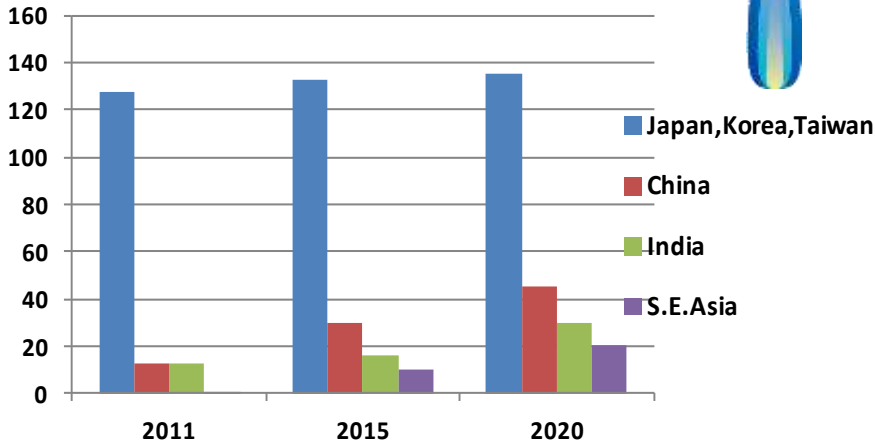
- City gas driven by residential use has dominated Korean gas demand
- In the future, Korea will see a greater increase in industrial use
- The demand for power generation will slightly decrease after 2015 due to an increase in the usage of nuclear and renewables

Source: “The 10th long-term gas supply & demand plan”

Ministry of Knowledge & Economy, South Korea

Projections for LNG Supply/Demand

Million tons **LNG Demand in Asian Markets**



Japan, Korea, Taiwan

Government projections (partially revised)

China

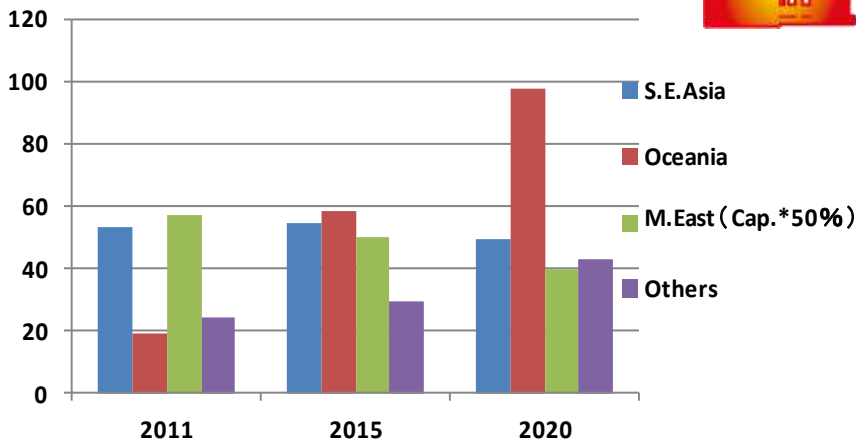
Demand in 2020 = 45 million tons case
(possible big difference between
high/ low demand cases)

India, South East Asia

As per re-gas terminal schedules

Assumptions

Million tons **LNG Supply to Asian Markets**



S. E. Asia

Liquefaction capacity basis

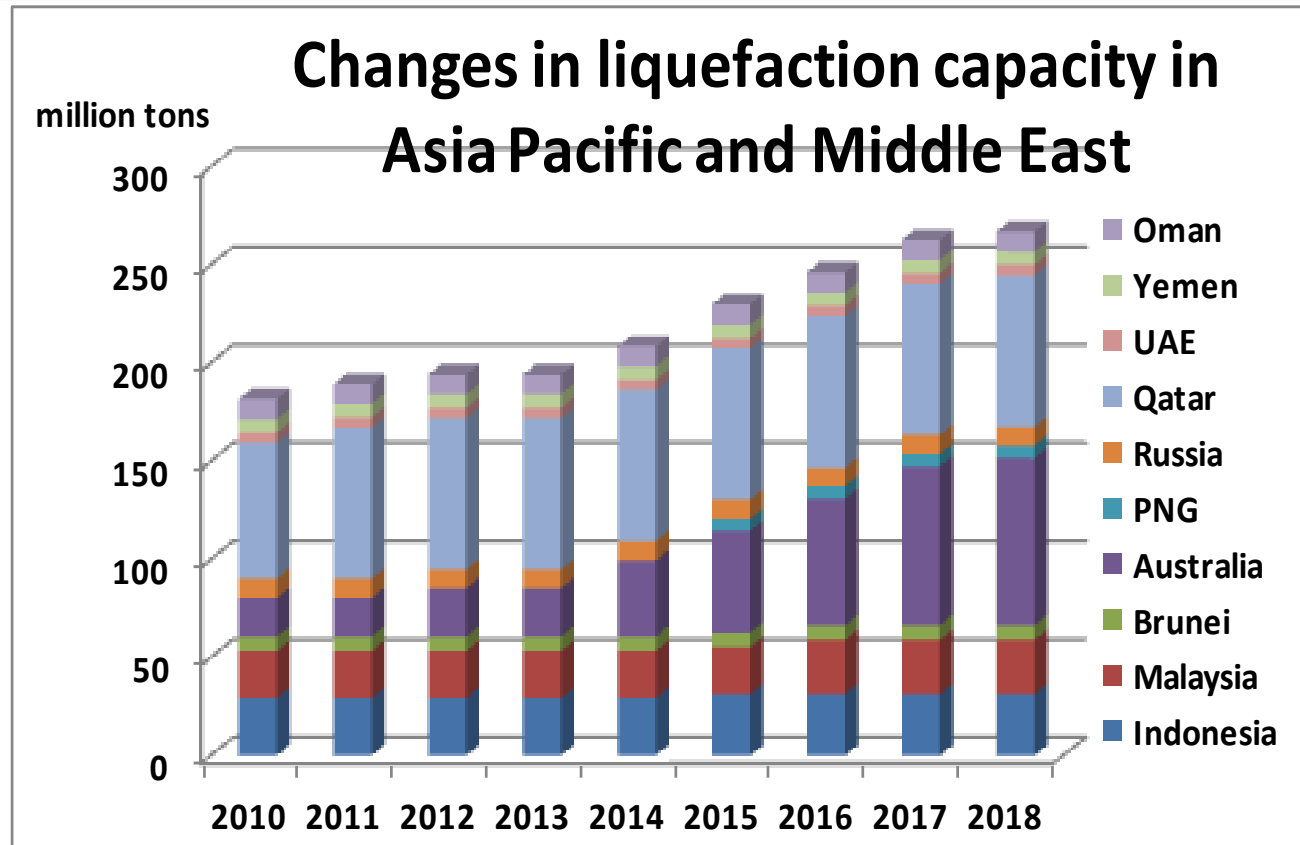
Oceania (Australia, PNG) : SPA basis

Middle East

Around 50% of capacity for Asia

Others: including possible supplies from North
America, East Africa

Changes in Liquefaction Capacity



- Qatar completed expansion of its capacity to 77 million tons in 2010.
- Australia is the only LNG supplier in the Asia Pacific which will increase its capacity significantly during this decade. Australian liquefaction capacity is likely to surpass that of Qatar around 2017.

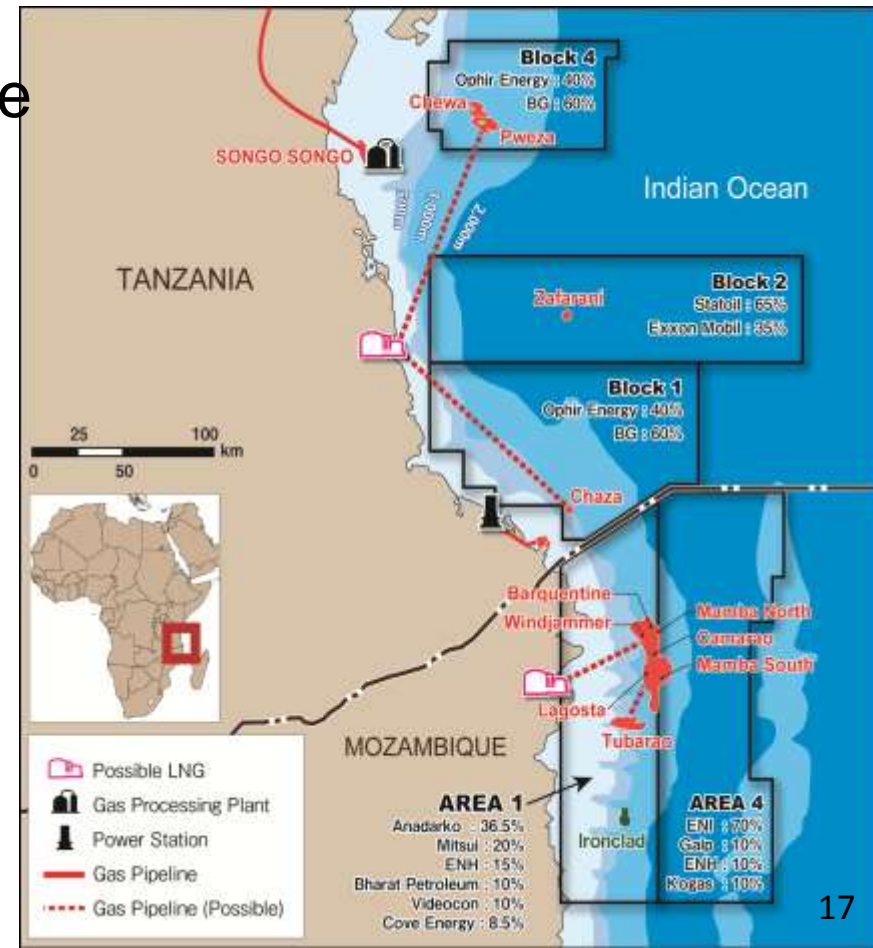
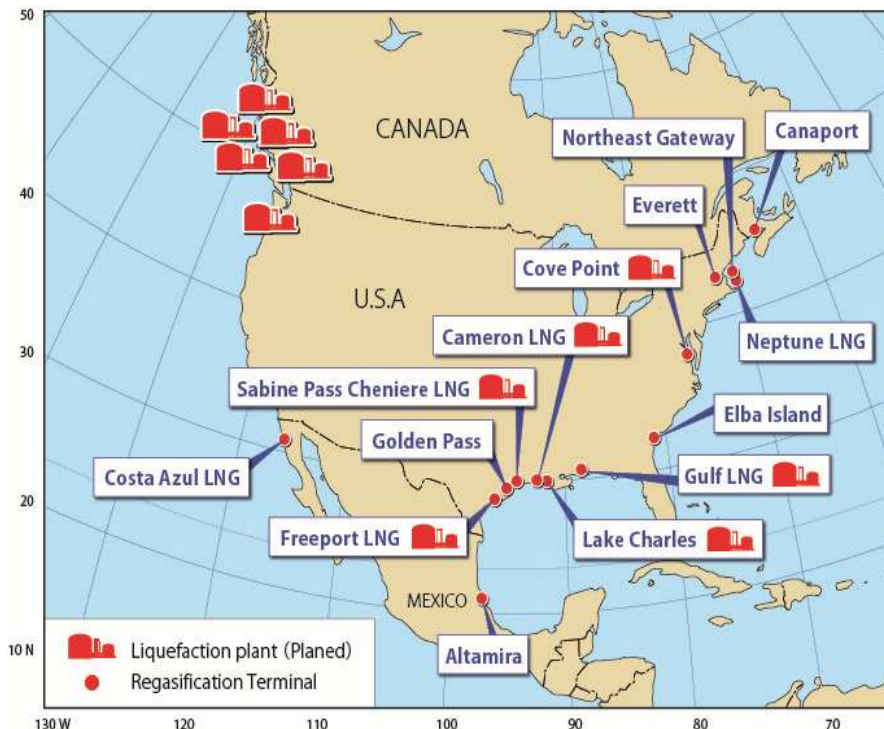
LNG supply to East Asian Gas Markets

Australia will be the main LNG supplier to Asian markets

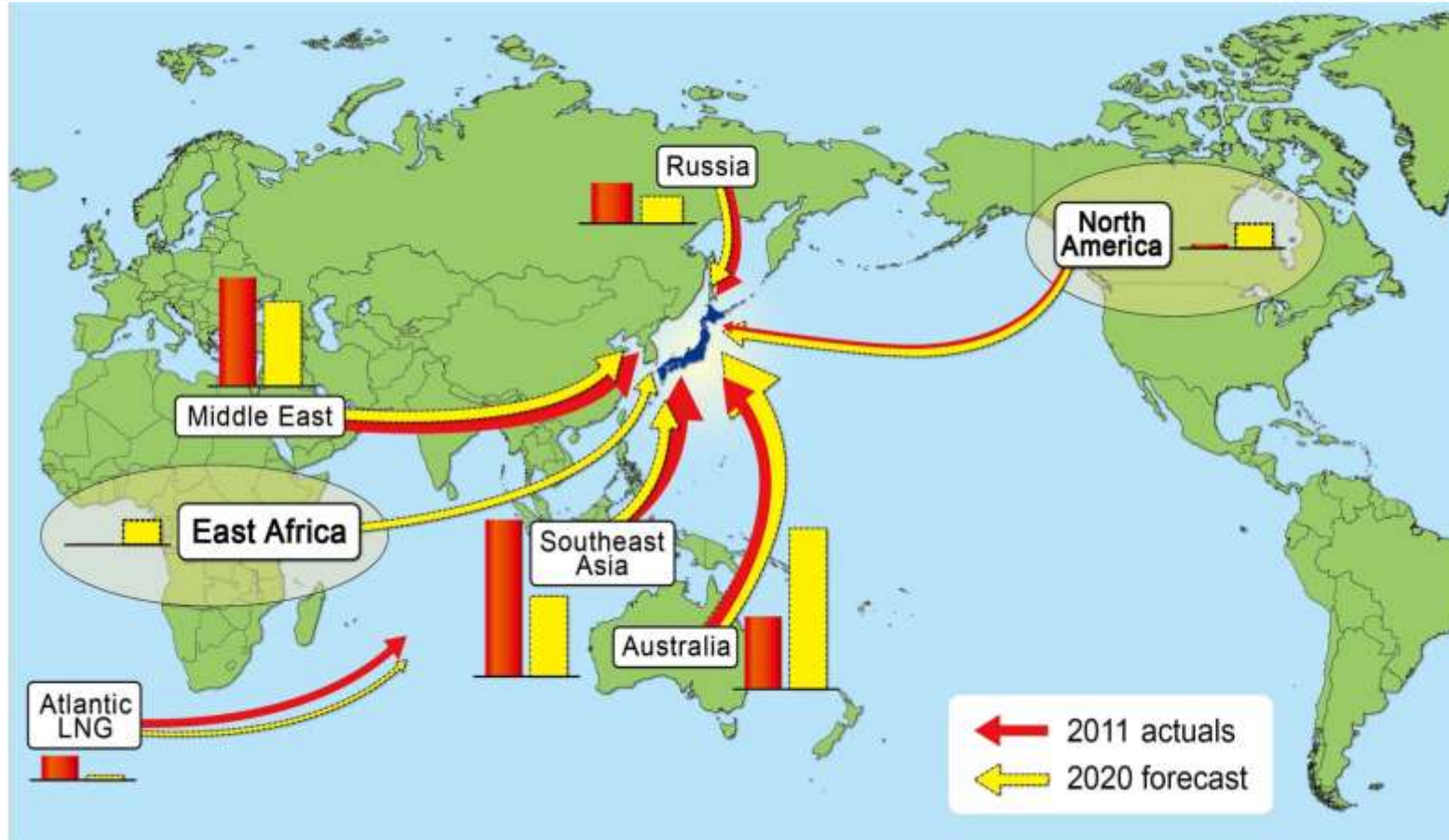
- Australia has a significant number of new LNG projects

Emerging LNG supplies

- North American shale gas-source
- East Africa offshore gas fields



Japan: LNG Import Diversification



- Increase in imports from new Australian projects
- Decrease in imports from S.E. Asian projects
- Emerging supplies from North America and East Africa

THANK YOU

KUALA LUMPUR
2012
WORLD GAS CONFERENCE



4-8 June 2012
Kuala Lumpur Malaysia