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# Shale gas in North America and Asian LNG market

IEEJ-CGEP Seminar:  
Pacific Rim energy trade and economic competitiveness  
in the age of shale oil and gas

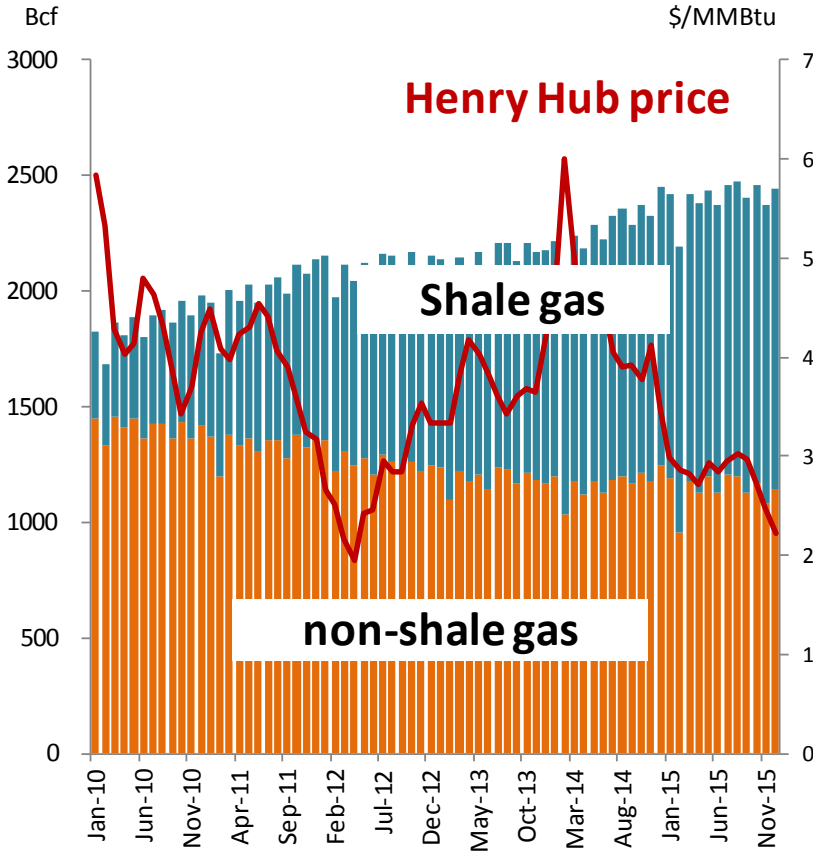
April 7<sup>th</sup>, 2016

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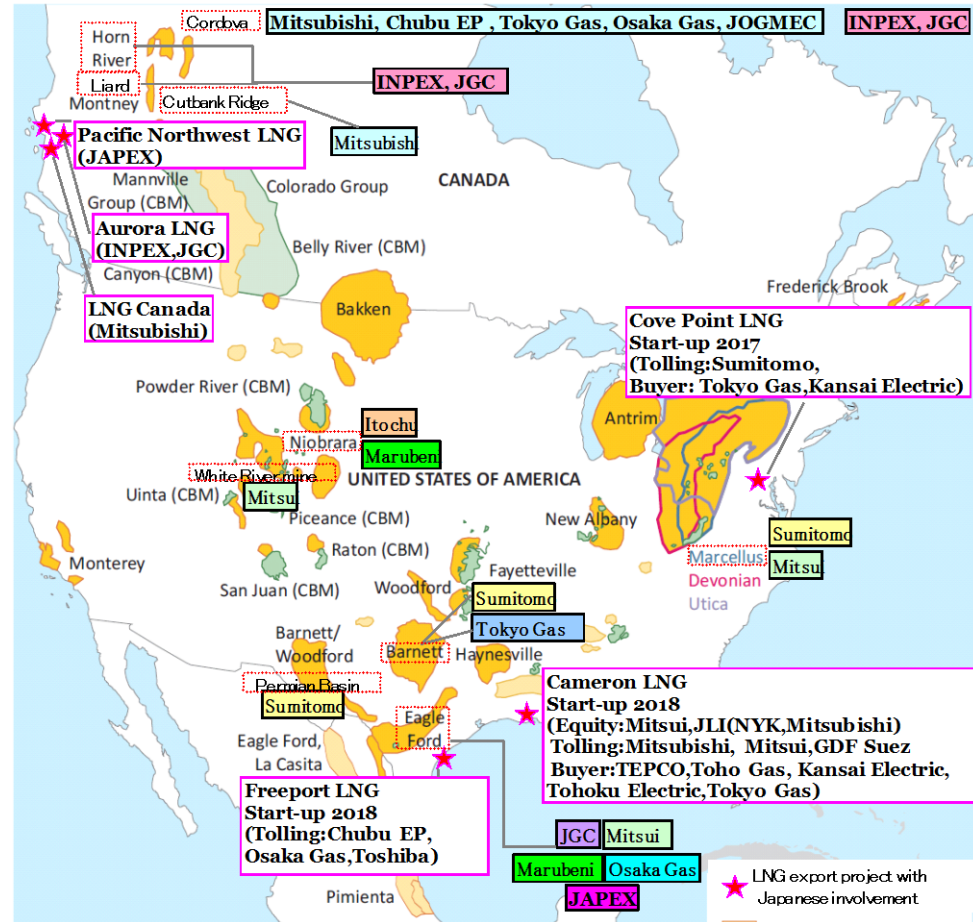
# U.S. shale gas and LNG export projects

## Production



Source: EIA, company websites

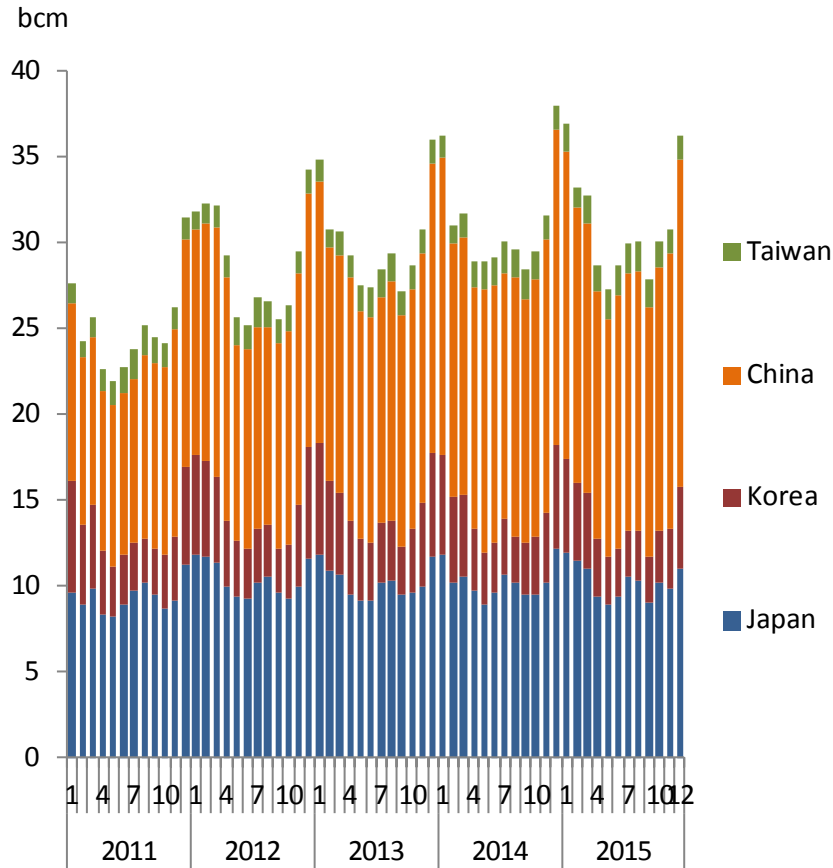
## LNG export projects with Japanese interests



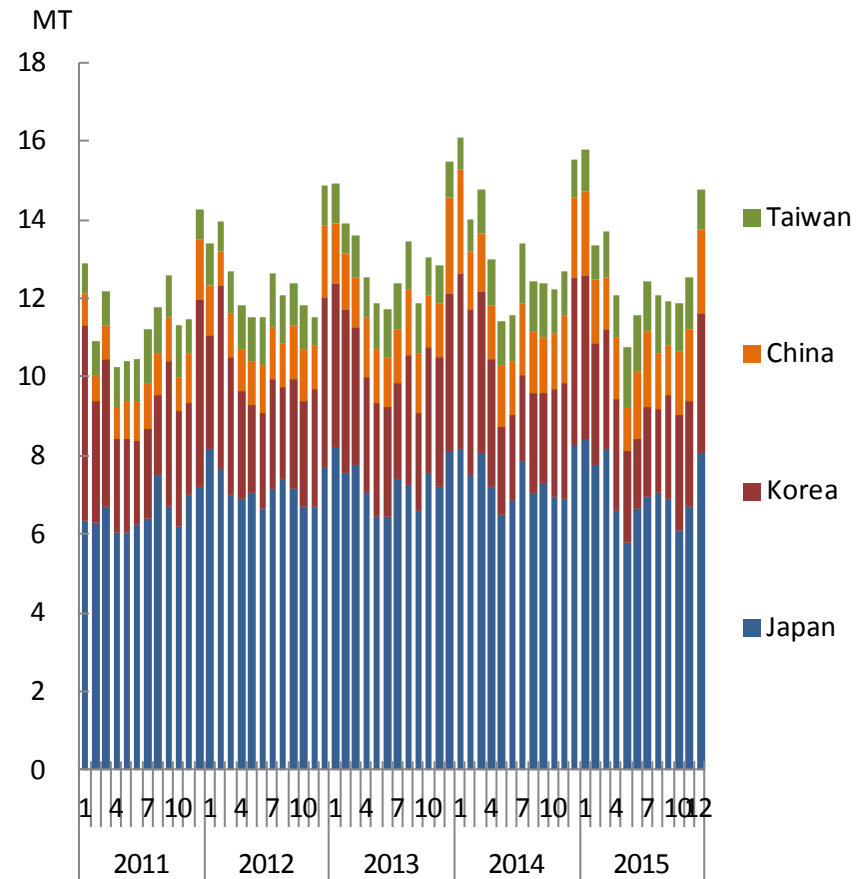
- Shale gas production still growing despite low price
- First LNG exported in February, and the U.S. will be the third largest LNG exporter by 2020

# Natural gas demand in Northeast Asia

## Natural gas



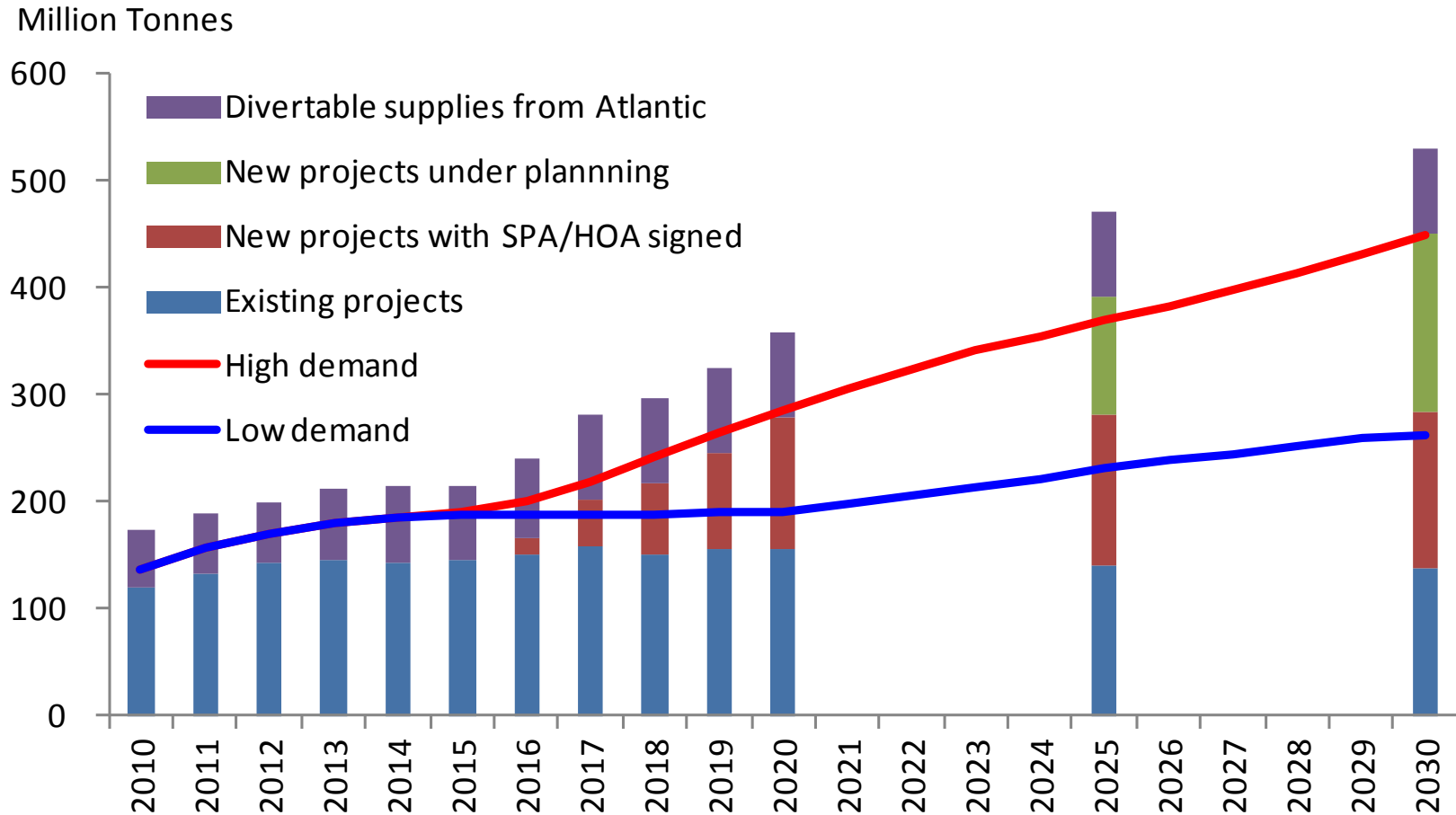
## LNG imports



Source: Trade statistics

- Natural gas: 372bcm in 2015 (no growth since 2014)
- LNG: 153MT in 2015 (-6.6MT y/y)

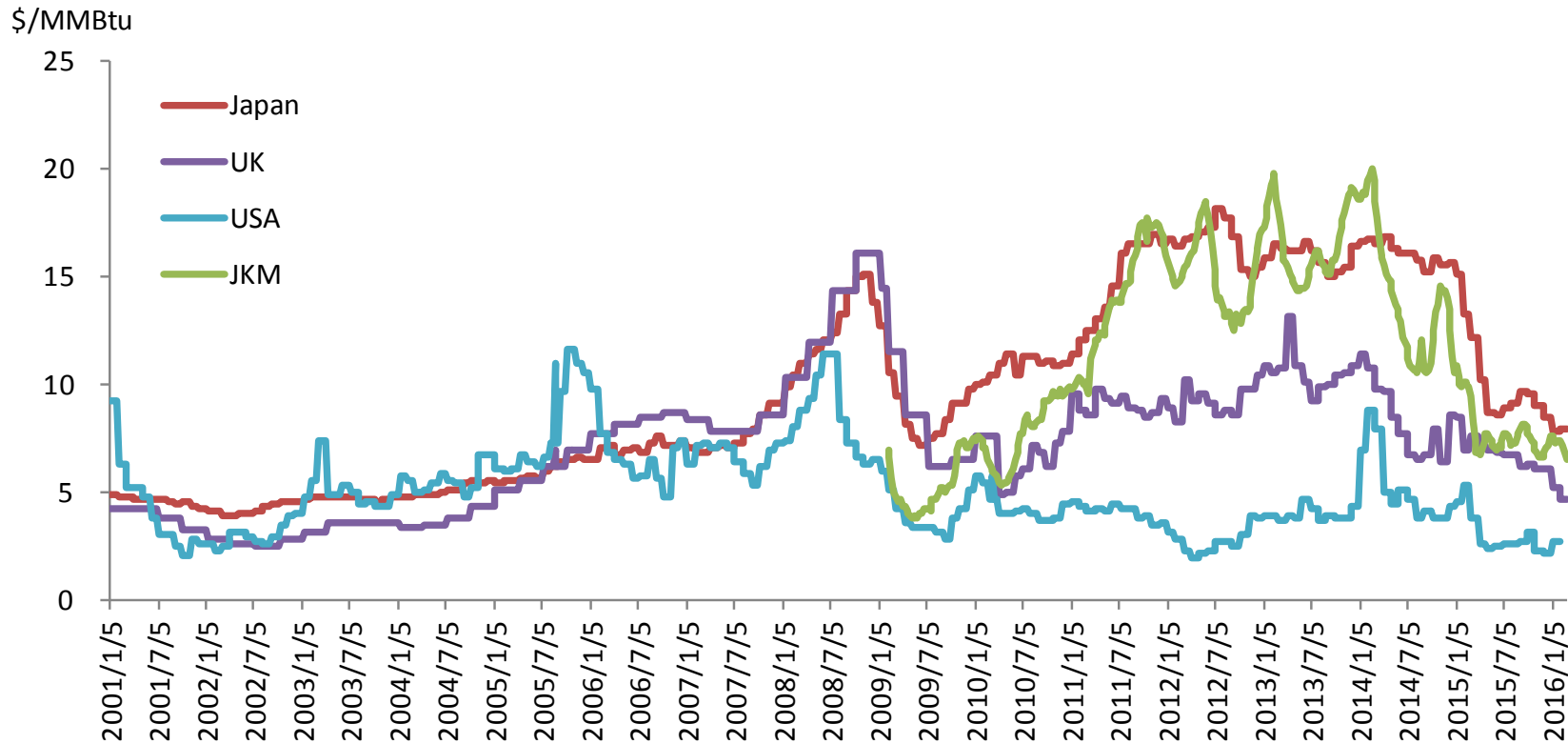
# LNG balance outlook for Asia



Source: IEEJ

- LNG will be oversupplied at least till 2020
- Timely upstream investment is the key to meet the demand growth towards 2030

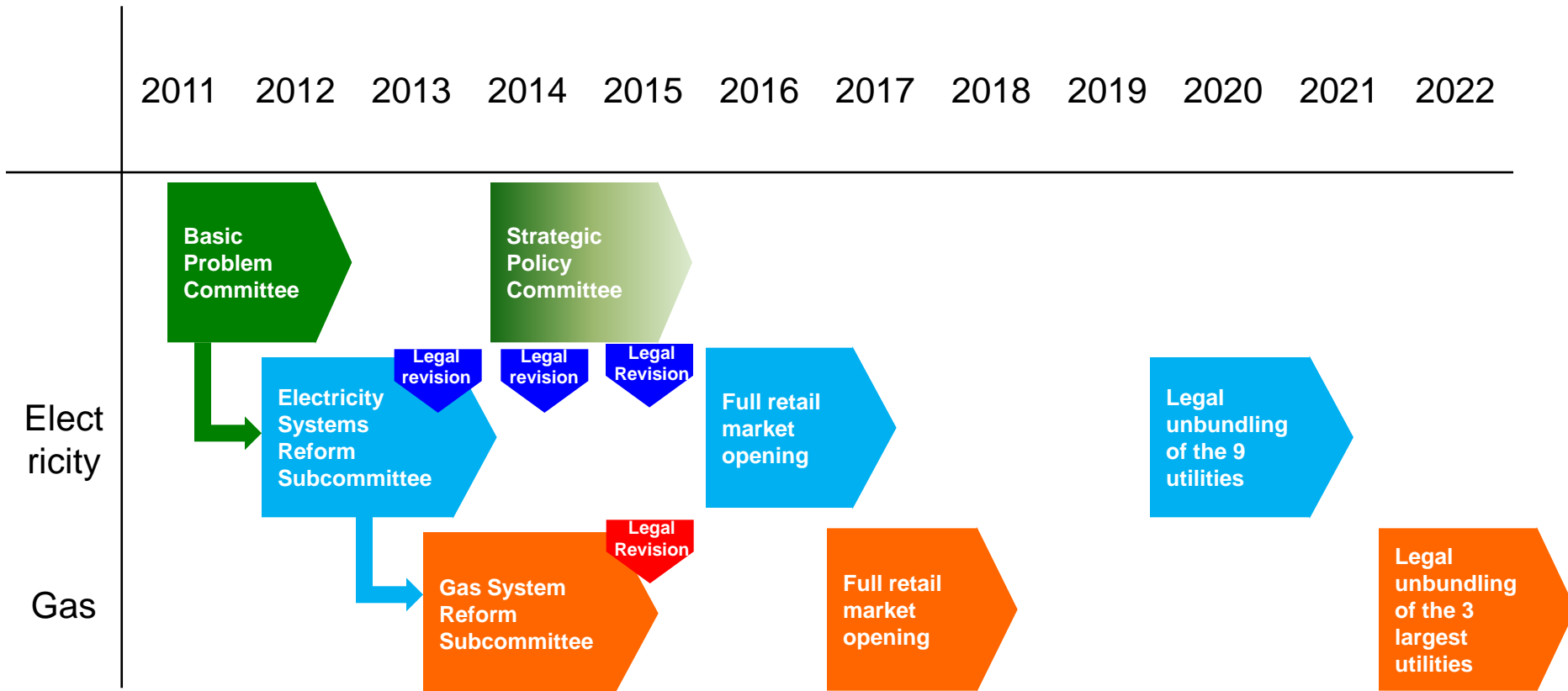
# Natural gas import prices



Source: Trade Statistics, EIA, Energy Intelligence

- Asian Premium of LNG has diminished significantly, but can widen again if oil prices rise
- Asia needs more rationale LNG pricing to reflect market fundamentals accurately

# Electricity and gas market liberalization in Japan



- Electricity and gas market will be fully open in 2016 and 2017, respectively
- 9 power utilities and 3 largest gas utilities will be legally unbundled in 2020 and 2022
- Flexible LNG supply is increasingly important for LNG importers in Japan

# How do we develop Asian benchmark price(s)?

## Domestic approach

Gas market liberalization

Domestic wholesale price (hub) development

Divergence of hub and oil-indexation prices

De-oil-indexation of import prices

## International approach

Relaxation/Elimination of destination clause / Over supply

Spot market development

Divergence of spot LNG and oil-indexation prices

Spot LNG price(s) development

**Asian benchmark price(s)**

- International approach quicker to develop Asian benchmark price(s) of natural gas
- Drastic demand/supply changes will accelerate the process

# LNG trading hub initiatives in Japan



## Contract specifications

<b>Commodity</b>	LNG DES Japan
<b>Price quotations</b>	U.S. dollars and cents per MMBtu
<b>Heating value</b>	9,000-12,000kcal/m <sup>3</sup>
<b>Contract unit</b>	250,000MMBtu (abt. 5,000t) or 50,000MMBtu (abt. 1,000t)
<b>Contracting month</b>	Monthly forward contracts up to 12 months ahead
<b>Price increment</b>	\$0.01/MMBtu
<b>Settlement price</b>	RIM DES Japan

- JOE started non-deliverable forward in December 2013
- First trade in July 2015
- Lack of physical market liquidity is a challenge