
Natural Gas Market in Asia and Japan-China cooperation

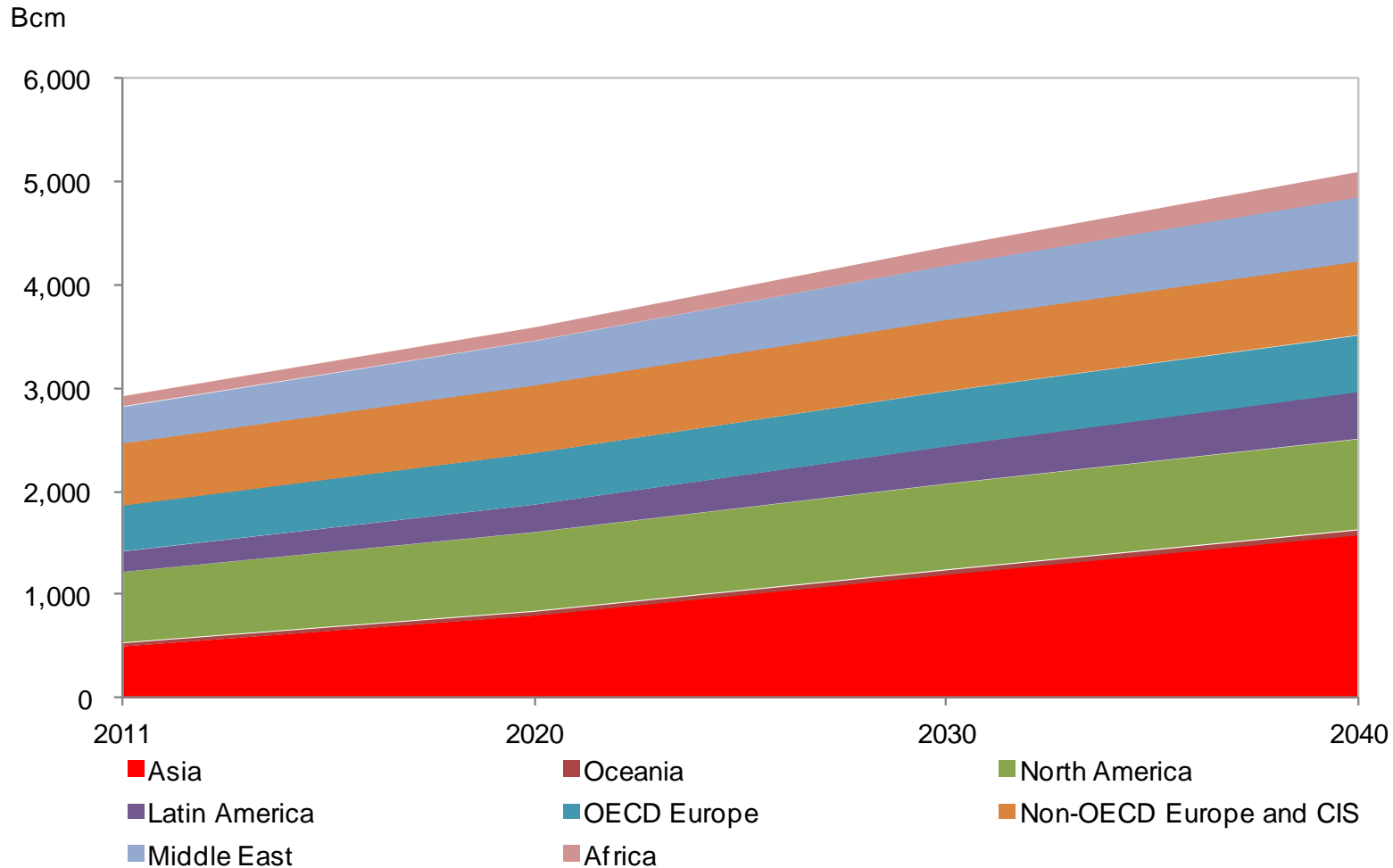
IEEJ-CNPC Workshop

December 12, 2013

The Institute of Energy Economics, Japan

Tetsuo Morikawa

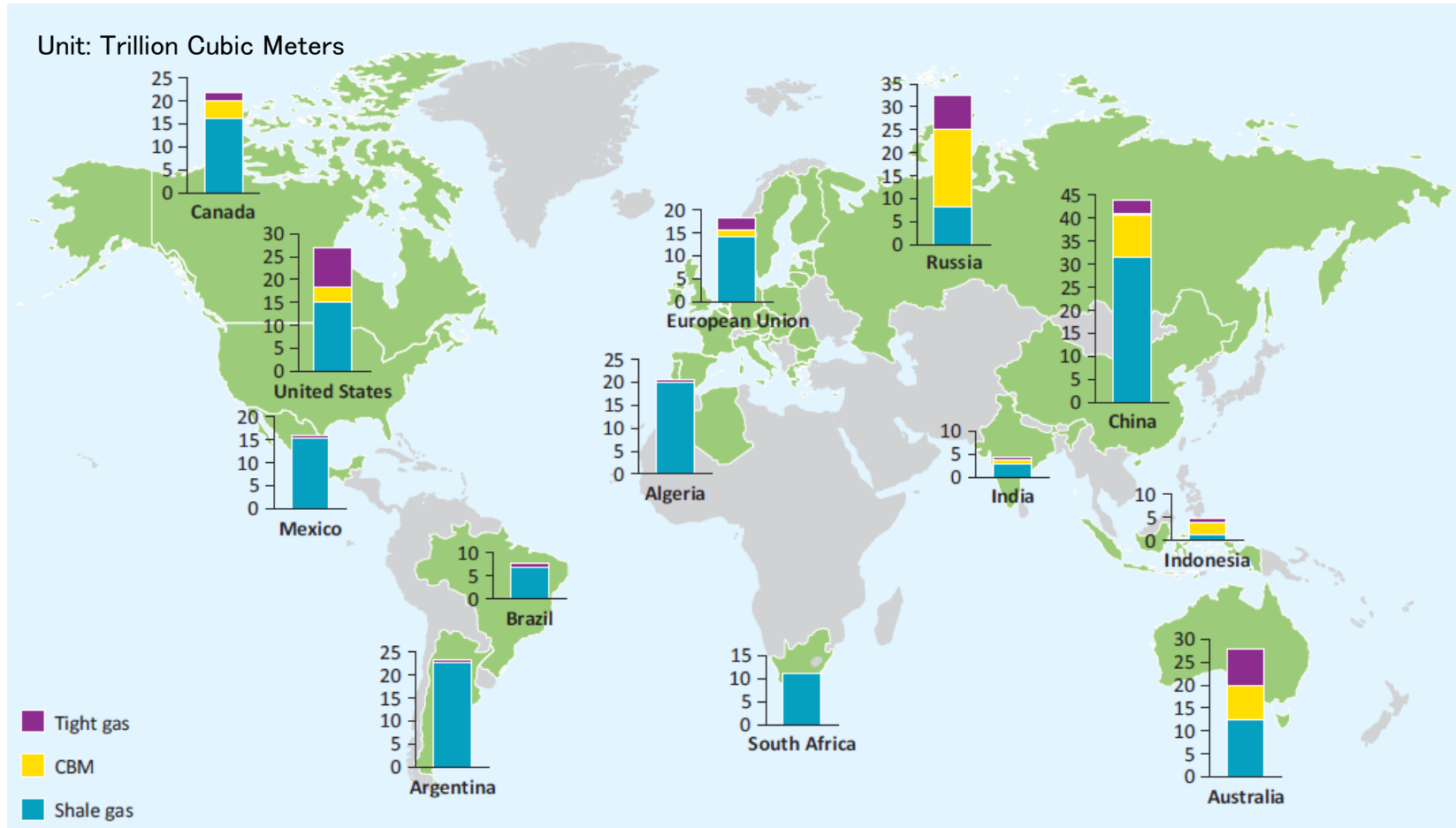
Natural gas demand outlook



Source: IEEJ Asia/World Energy Outlook 2013

- Half of the world demand growth will be generated in Asia

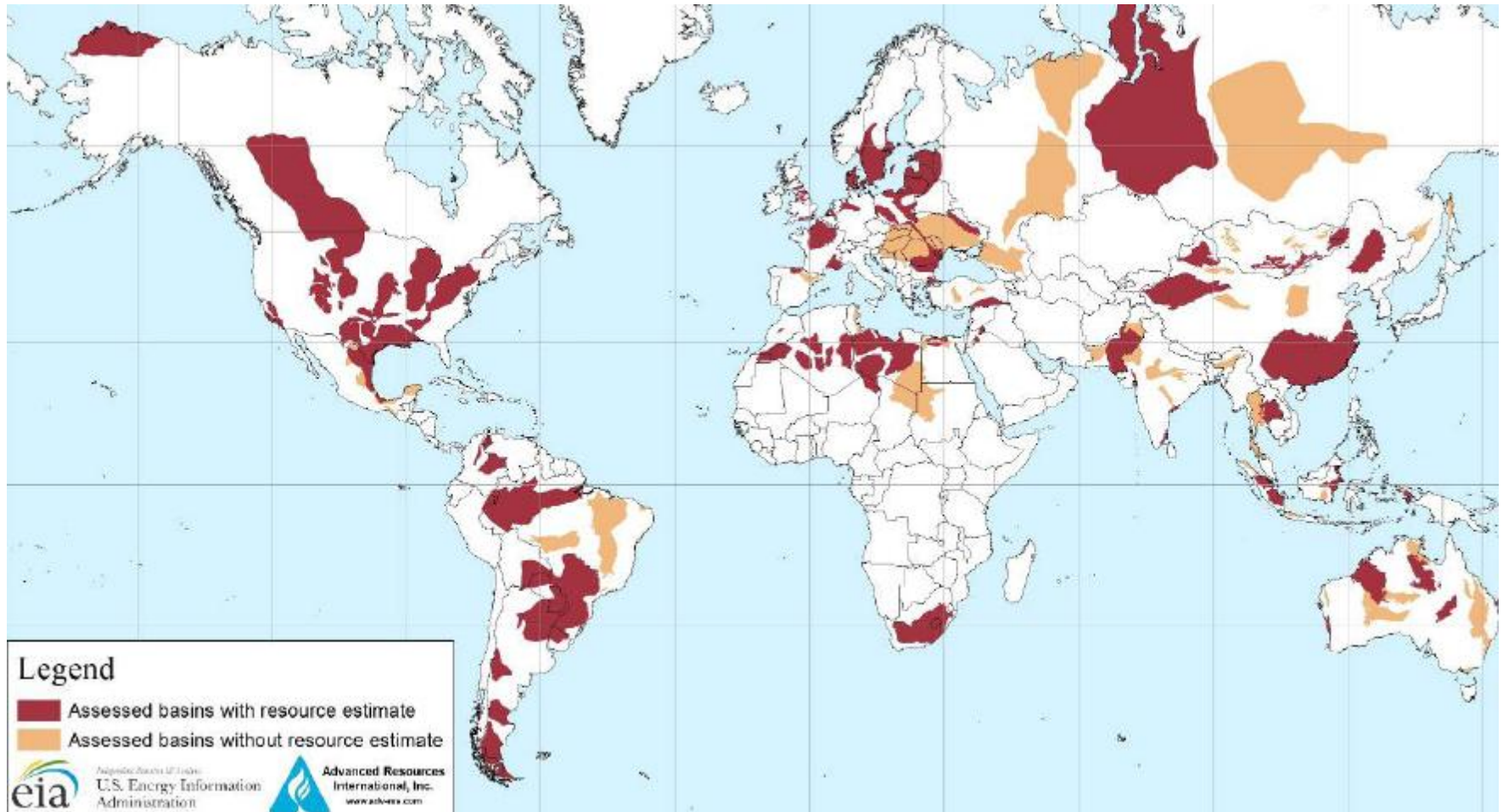
World unconventional gas resources



Source: IEA

- More than 250Tcm of unconventional gas could be recoverable
- Enormous recoverable conventional and unconventional gas resources

Shale gas revolution globalised?

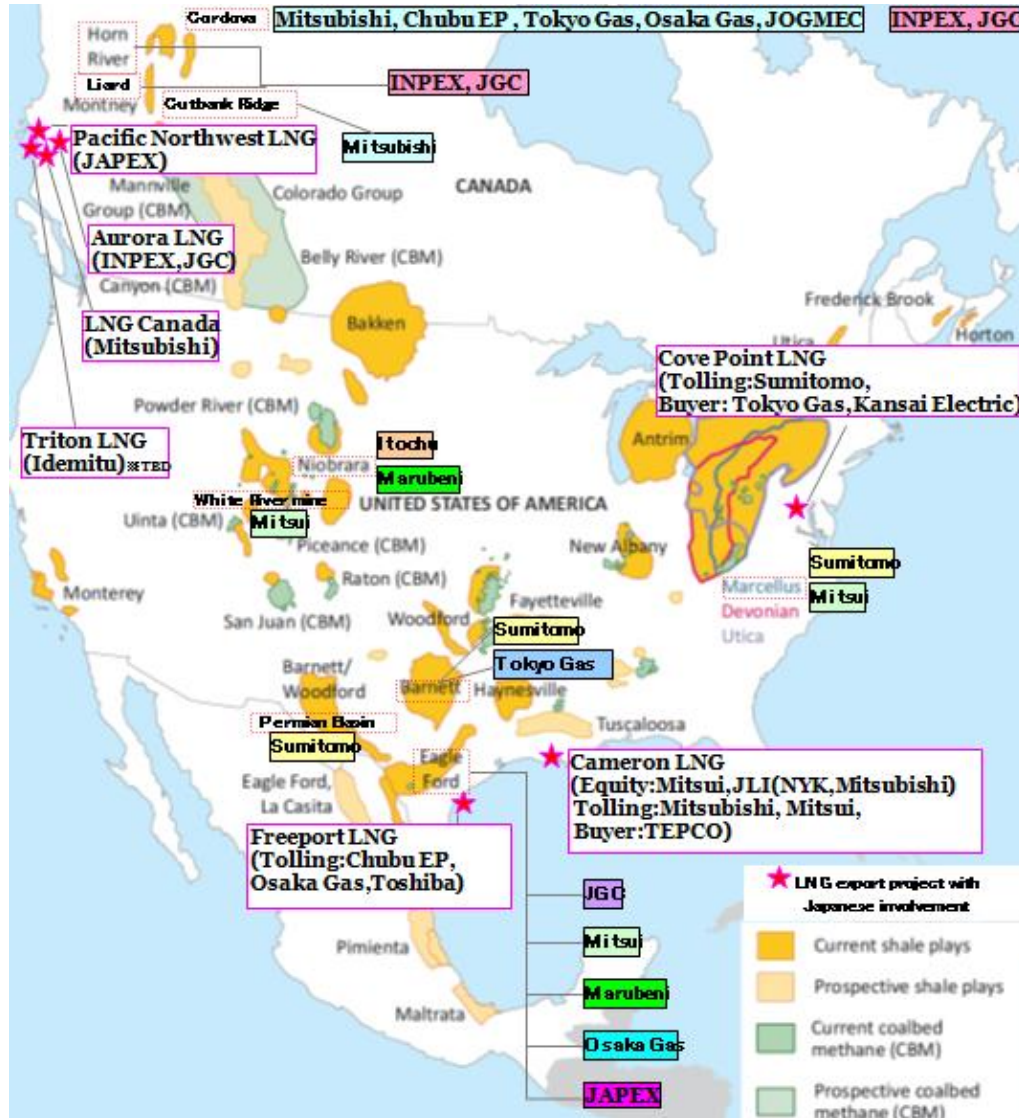


Source: DOE

- Shale gas developments in China crucial for Asia



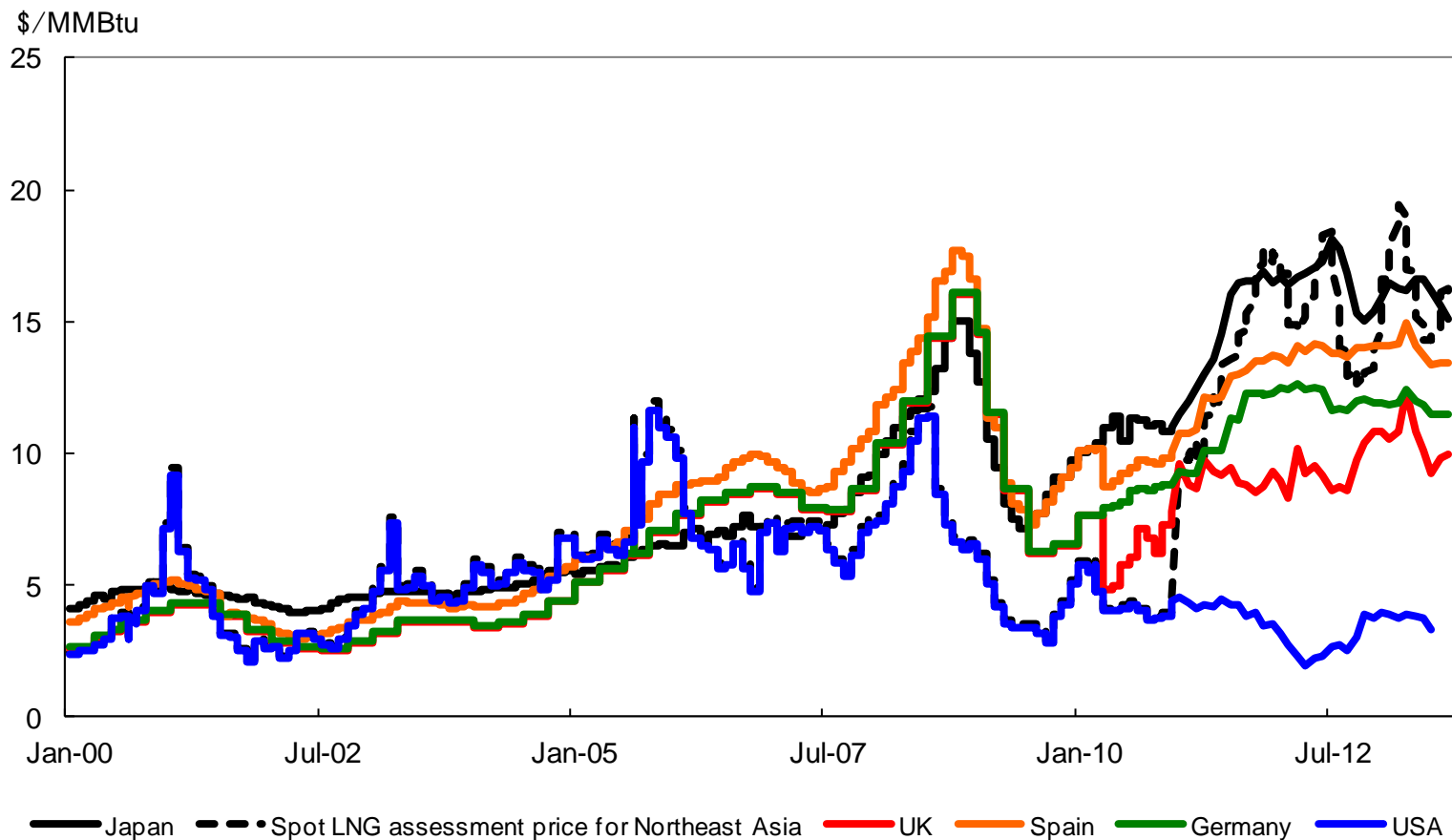
North American LNG export projects



- More than 100MT of export potential
- Japanese companies
 - 17MT commitments to the US LNG
 - Participating Canadian projects
- North American LNG important in term of both supply and pricing diversifications

Source: IEA and Company Websites

International gas prices



Source: Energy Intelligence, EIA

- Widening price gap between Asia and Atlantic market
- Asia Premium of LNG hurting economy of importing countries

What is causing the Asia Premium?

	Asia	Europe	North America
Pricing	<ul style="list-style-type: none"> ▪ Mostly oil-linked pricing 	<ul style="list-style-type: none"> ▪ Shifting to hub pricing 	<ul style="list-style-type: none"> ▪ Hub pricing
Market liquidity	<ul style="list-style-type: none"> ▪ Limited producers/sellers ▪ Illiquid LNG Market 	<ul style="list-style-type: none"> ▪ Liquidity increasing 	<ul style="list-style-type: none"> ▪ 8000+ producers ▪ Highly liquid market
Demand/supply fundamentals	<ul style="list-style-type: none"> ▪ Strong demand growth ▪ Rising import dependency 	<ul style="list-style-type: none"> ▪ Weak demand at the moment ▪ Rising import dependency 	<ul style="list-style-type: none"> ▪ Oversupplied ▪ Huge export potential
Supply cost	<ul style="list-style-type: none"> ▪ High 	<ul style="list-style-type: none"> ▪ Medium 	<ul style="list-style-type: none"> ▪ Low

What should government and industry do?

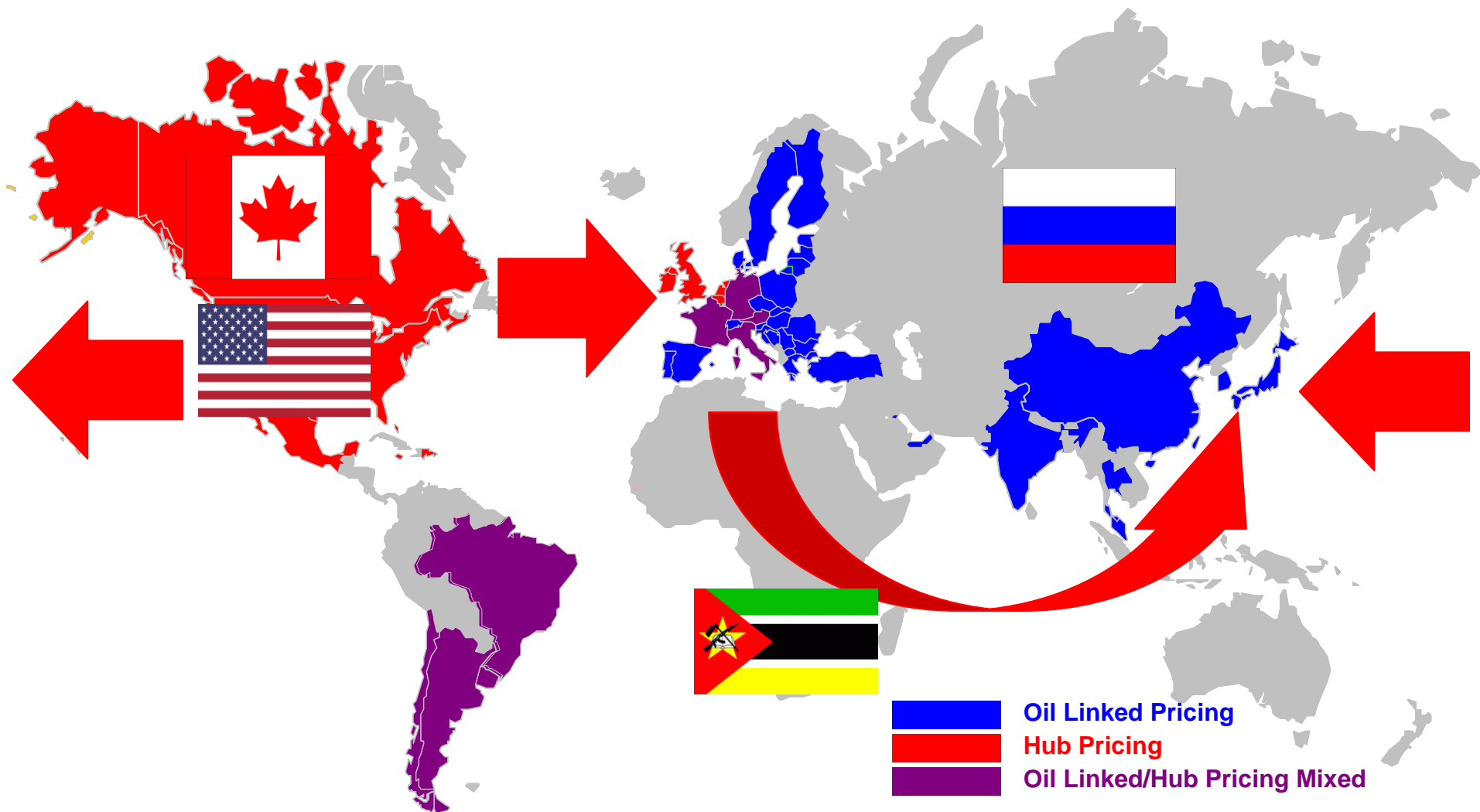
	Countermeasures	
Pricing	Industry:	<ul style="list-style-type: none"> ▪ Pricing diversifications (Henry Hub, Asian hubs, spot LNG)
	Government:	<ul style="list-style-type: none"> ▪ Diplomatic effort towards export countries for rationale LNG pricing
Market liquidity	Industry:	<ul style="list-style-type: none"> ▪ Supply diversifications (including pipeline gas imports) ▪ Flexible contractual terms (destination free, lower ToP)
	Government:	<ul style="list-style-type: none"> ▪ Creating competitive domestic energy market environment
Demand/supply fundamentals	Industry:	<ul style="list-style-type: none"> ▪ Supply expansion (domestic gas development, overseas upstream investment) ▪ Joint procurement/Swap ▪ Infrastructure developments
	Government:	<ul style="list-style-type: none"> ▪ Nuclear re-start (Japan) & development (other Asian importers) ▪ Financial and diplomatic assistance for domestic and overseas gas/LNG developments ▪ Promoting efficient use of gas (MACC, CHP etc) ▪ Domestic pricing reform especially in China and India

LNG Pricing Options for Asia

	Hub pricing		Spot LNG pricing	Adjustment within oil-linked pricing	Link with other fuels (Electricity, Coal)
	Henry Hub, NBP	Hubs in Asia			
Advantages	<ul style="list-style-type: none"> • Already available • Lower prices (for now) 	<ul style="list-style-type: none"> • Possible to reflect regional market balance 	<ul style="list-style-type: none"> • Already available 	<ul style="list-style-type: none"> • Possibly the quickest solution 	<ul style="list-style-type: none"> • Rational for power utilities
Disadvantages	<ul style="list-style-type: none"> • Higher volatility • Asia market balance not reflected 	<ul style="list-style-type: none"> • Not yet available • Higher volatility 	<ul style="list-style-type: none"> • Higher volatility • Limited liquidity (so far) 	<ul style="list-style-type: none"> • Gas market balance not reflected 	<ul style="list-style-type: none"> • Irrational for gas utilities • Lack of power market liquidity

- Rationality of oil-linked pricing being questioned
- Sustainable and rational pricing needs to emerge for mutual benefit between sellers and buyers

Pricing and supply diversifications

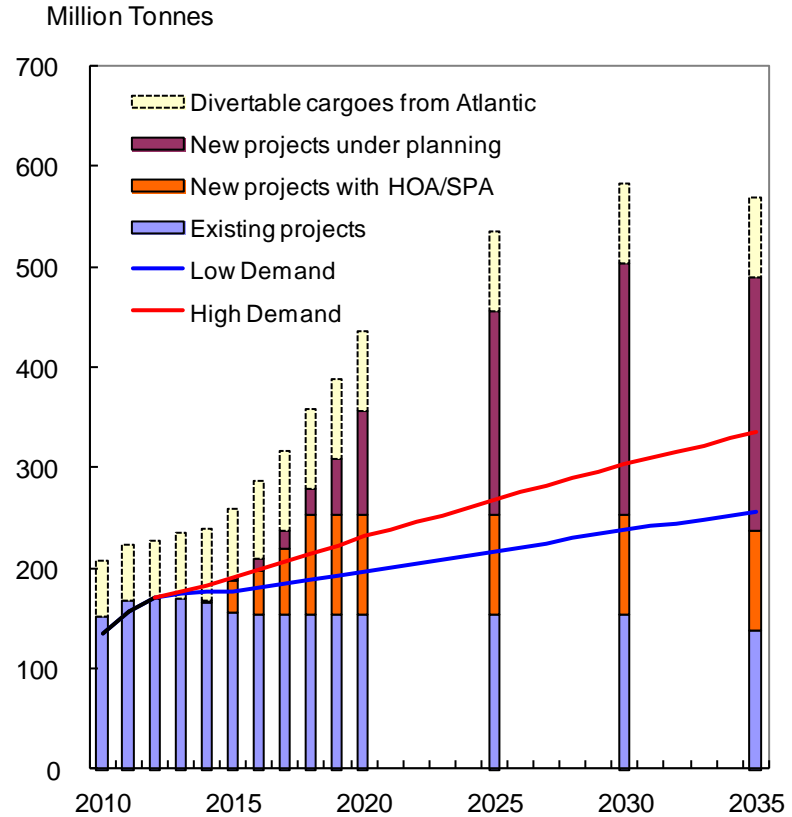
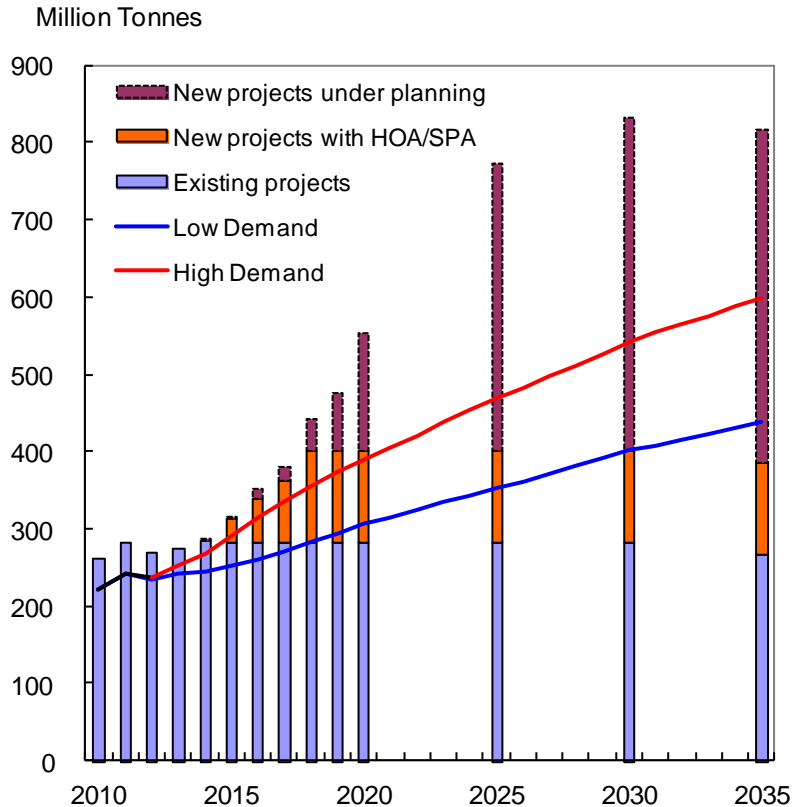


- Henry Hub and other alternative pricings available for Asia
- North America, Russia, East Africa will emerge as enormous gas exporters for Asia

LNG Outlook

World

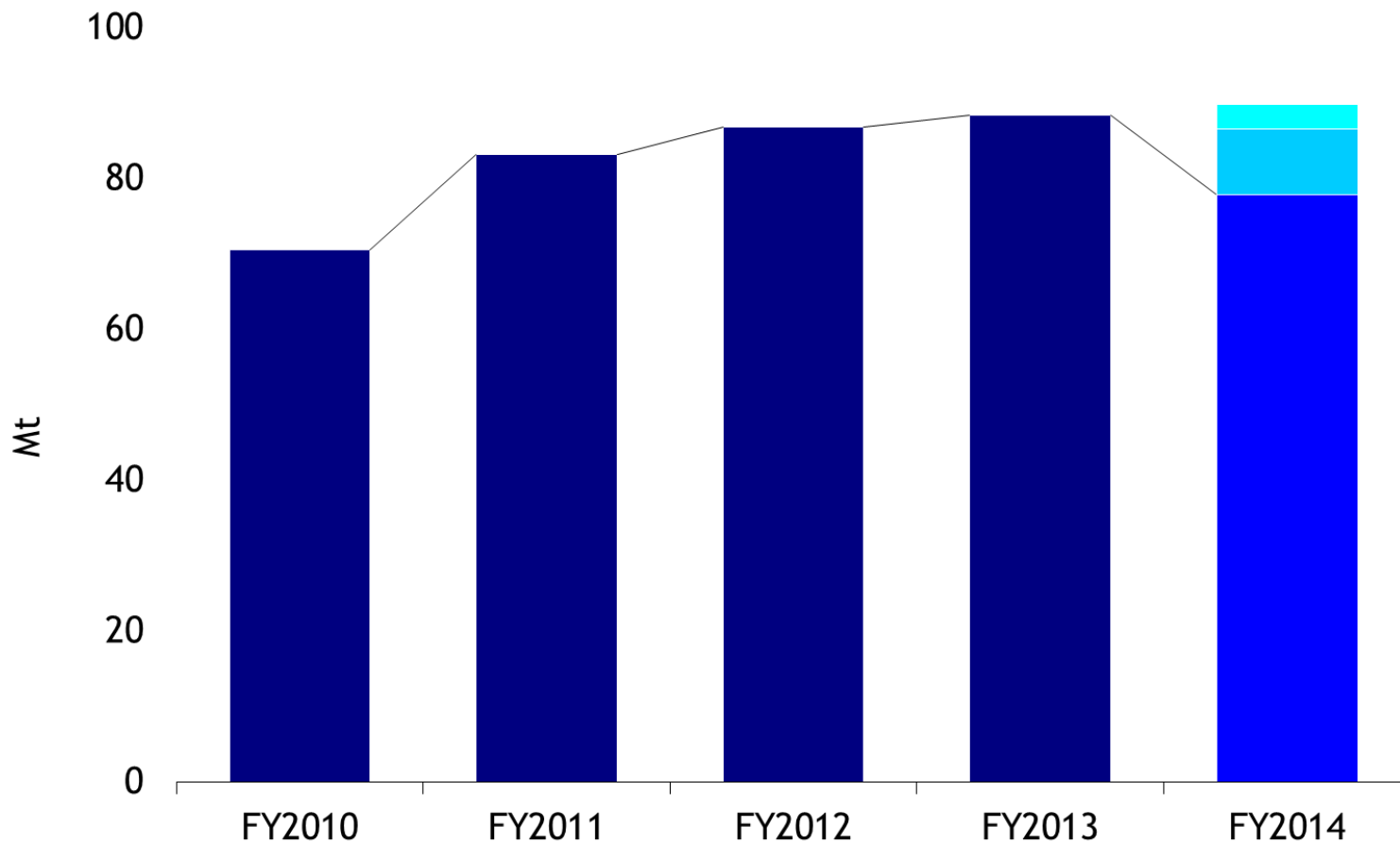
Asia and Middle East



Source: IEEJ

- Supply capacity will increase significantly towards 2020, leading to fierce competition among LNG suppliers.

Japan's LNG imports



Cases by nuclear restart: ■ Full operation ■ High-level ■ Mid-level ■ Low-level

Source: Trade Statistics and IEEJ

- Japan could reduce LNG imports significantly by nuclear restarts

Regional pipeline network in Northeast Asia



Source: Northeast Asian Gas & Pipeline Forum

- China's pipeline gas imports could exceed 100Bcm/y in the long-term
- Pipeline network in Northeast Asia beneficial for the region

Japan-China cooperation on natural gas

	Cooperation area
Demand/supply fundamentals	<ul style="list-style-type: none"> ▪ Efficient use of gas (MACC, CHP including Fuel Cell, and other efficient gas appliances) ▪ Overseas upstream investment ▪ Regional pipeline network
Market liquidity	<ul style="list-style-type: none"> ▪ Eliminating destination clause ▪ Joint purchase of LNG ▪ SWAP

- There are significant opportunities for Japan and China to cooperate to tackle Asia Premium of LNG

Conclusions

- Asia will drive the world gas demand
- Asia Premium of LNG stem from the differences of demand/supply fundamentals, supply cost, pricing, and market liquidity
- LNG market balance likely to ease towards 2020, a good opportunity to solve Asia Premium and to achieve rationale pricing
- Japan and China can cooperate to tackle Asia Premium of LNG in terms of demand/supply and market liquidity