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Fukushima's Impact on Global Gas

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Global LNG Dynamics Post-Fukushima

Global gas: 2011-12 supply shocks

Market shocks

- Continuing Japan nuclear crisis, Arab spring risks persist
- Global gas market has shown surprising flexibility despite Japan's extra LNG needs
- Japan’s call on LNG will remain high throughout spring and summer depending on prefectural political consent to restarts
- Worsening of Eurozone crisis frees some gas for Asia
- Potential geopolitical disruptions which could tighten the LNG market: blockade of Strait of Hormuz

Global gas: new relevance for gas "spare capacity"

Supply buffers

- The LNG market is balanced this year but possibly much tighter next year with only with only 48 mtpa of new capacity come online between now and 2014
- North America: no longer on the map of LNG importer due to shale gas boom, 3 LNG export projects likely to go ahead
- Qatar has become the go-to supplier for markets looking for emergency supply. Japan received 12 mtpa from Qatar in 2011
- Russia's expanded export capacity into Europe
- *Post-2015 LNG supply options center around Australia, North America, unexpected new exporters (Mozambique, Israel)*

Japanese nuclear restarts unlikely until spring

- Government has begun approving stress test results, but prefectural governments will determine when operations resume
- The next key signpost is the 1 April separation of Japan's nuclear regulatory body, NISA, from METI authority. Some restarts likely after April and before summer peak season begins
- Prefectural governments in Fukui and Niigata, with nearly half of Japan's existing nuclear capacity, have been insistent that such structural changes are made to safety regulations before restarts begin
- Major risk to this timeline is possibility of snap elections, which could delay restarts
- Nuclear reactors likely to remain in operation for next 5-10 years with nuclear share of power mix declining in favor of coal and natural gas

Projected reserve margins by utility August 2012*

Utility	Reserve margin
Kansai	-19.3
Kyushu	-12.3
TEPCO	-13.4%
Shikoku	-11.3%
Hokkaido	-6.4%
Hokuriku	-1.5%
Tohoku	0.3%
Chubu	1.5%
Chugoku	2.7%

*Assuming 2010 demand and no re-starts

Source: Energy and Environment Council, National Policy Unit, Cabinet Secretariat of Japan

Post-Fukushima demand drivers: Asia Pacific and Europe

Asia's gas demand soaring

- Gas demand is expected to grow the fastest in non-OECD Asia from 2012-2030, with LNG representing a growing share of gas supply. Asian LNG demand is expected to account for 61% of global LNG demand growth. As a result, Asian nations are in a hurry to secure as much supply as possible from existing and new suppliers.
- Asia LNG tightness drives supply away from Europe— especially tight shipping
- Japan's LNG needs for 2012 could be in the range of 88 million tons

Europe's gas demand uneven

- Germany's phase-out plan and Italy's cancellation of new reactor plans will have prolonged impact on energy policy
- European gas demand falls by 11% year-on-year in 2011 due to warming weather, Eurozone crisis and soaring gas prices
- Europe's 19 receiving terminals will see lower utilization rate

Southeast Asia: niche markets trigger competition

LNG demand drivers

Historical demand centers	New and strong demand	Niche markets
North Asia (Japan, Korea, Taiwan) Western Europe	India China	Southeast Asia Middle East South America

- South East Asia is becoming a major importer of natural gas, notably via LNG
- Gas demand driven by growing domestic needs and slow demise of established gas producers (Indonesia, Malaysia)
- Five Southeast Asian nations will be LNG importers by 2013 (Thailand, Singapore, Indonesia, Malaysia, Vietnam, the Philippines) with an aggregated LNG import capacity of about 20 million tons before 2015
- Singapore emerges as LNG trading hub trading with a gas-on-gas pricing rather than JCC

Japan’s new LNG strategy

Japan: Concern about LNG pricing driving shifts in government and industry strategy

- The Japanese government is increasingly concerned about the premium price it is paying to acquire LNG and its potential effect on the country's fragile economic recovery
- In a move to reduce its energy bill and improve security of supply, the Japanese government will release in June a new LNG purchase strategy and will encourage Japanese energy companies to buy more upstream equity in LNG liquefaction projects (competition at home, cooperation abroad)
  - Negotiating low prices through involvement in unconventional gas and small-scale-and-medium scale LNG projects
  - Creation of Japanese consortium and pursuit of joint procurement with other companies or countries (Korea)
  - Diversification of stable procurement and expansion of upstream activities (Canada LNG, Mozambique)

Japan enhances the LNG value chain

Japan's investments in planned LNG projects

Country	Project	Status	Shareholders/Japanese companies	Total Japanese participation
Venezuela	Delta Caribe	on hold	Itochu, MIMI (Japan Australia LNG is a 50-50 joint venture between Mitsubishi and Mitsui)	NA
Nigeria	Brass LNG	FID expected in 2012	Japanese companies could help financing by arranging a loan in exchange of equity shares (LNG Japan (4%), Itochu Corporation (3%) and Sojitz Corporation)	7%
Indonesia	Donggi-Senoro LNG, Sulawesi	FID taken in Jan. 2011, start-up expected in 2014	Sulawesi LNG Development 59.9% (joint venture between Mitsubishi 75% and Kogas 25%)	50%
	Abadi LNG	start-up 2016	Inpex (60%)	60%
Papua New Guinea	PNG LNG	start-up 2014	JX Nippon Oil & Gas Exploration	
Australia	Gorgon LNG	start-up 2014	Osaka Gas (1.25%), Tokyo Gas (1%), Chubu Electric (0.417%)	2.67%
	Pluto LNG	2012	Kansai Electric (5%) Tokyo Gas (5%)	10%
	Ichtys LNG		Inpex (76%)	76%
Canada	KM LNG	2017	Mitsubishi	NA
Russia	Vladivostok LNG	2017	Japan Far East Gas Co (a joint venture between Japan Petroleum Exploration Co. (32.5%), Itochu (32.5%), Marubeni (20%), Inpex (10%) and by Itochu Oil Exploration Co. (5%))	NA
Mozambique	Mozambique LNG		Mitsui (20%)	20%

Source: Eurasia Group Research

Gas pricing is evolving worldwide

Asia: The emergence of a second marker in Singapore

- In the longer-term, we can expect Japanese companies to start testing the market with other pricing options, albeit slowly and cautiously, in a move to depart from pure oil-indexation in their long-term contracts
- Singapore could become the second price marker in Asia after the Japanese price indexed to the Japan Crude Cocktail (JCC), and Shanghai aims also at becoming a gas hub
- Beijing pursuing major internal gas reform

Gas pricing is evolving worldwide

Europe: Current oil-indexed LTCs are unsustainable

- Pricing renegotiations underway between European gas resellers (RWE, EON) and suppliers like Gazprom to obtain reduced take-or-pay volumes or greater indexation to spot prices
- German utilities claim that gas is currently too expensive relative to coal and in order to make gas more competitive, the oil-linked gas pricing system must change

US: North American LNG exports will put pressure on Henry Hub prices and give price signal towards potential convergence of worldwide prices of natural gas

- LNG exports from North America are expected to put upward pressure on prices
- EIA report shows LNG exports could raise gas prices for US customers up to 54% by 2018

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