

What is the future of LNG?

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Issues to watch in the international gas and LNG markets

- While LNG (and natural gas as a whole) is in a period of unprecedented expansion, further growth is expected especially in the Asia Pacific region.
- New LNG production projects are expected to come online underpinned by buoyant demand prospects in the region, with advanced technology, although there are some challenges to overcome.
- The role of LNG will evolve and expand in the region as the market structure is changing into a hybrid one comprising of traditional LNG importers (e.g. Japan, Korea), emerging markets (e.g. China, India) and Southeast Asia as a future producing and consuming center.
- Policies on nuclear power generation in various countries, in the wake of the nuclear accident in 2011, will have significant impacts on future LNG business.

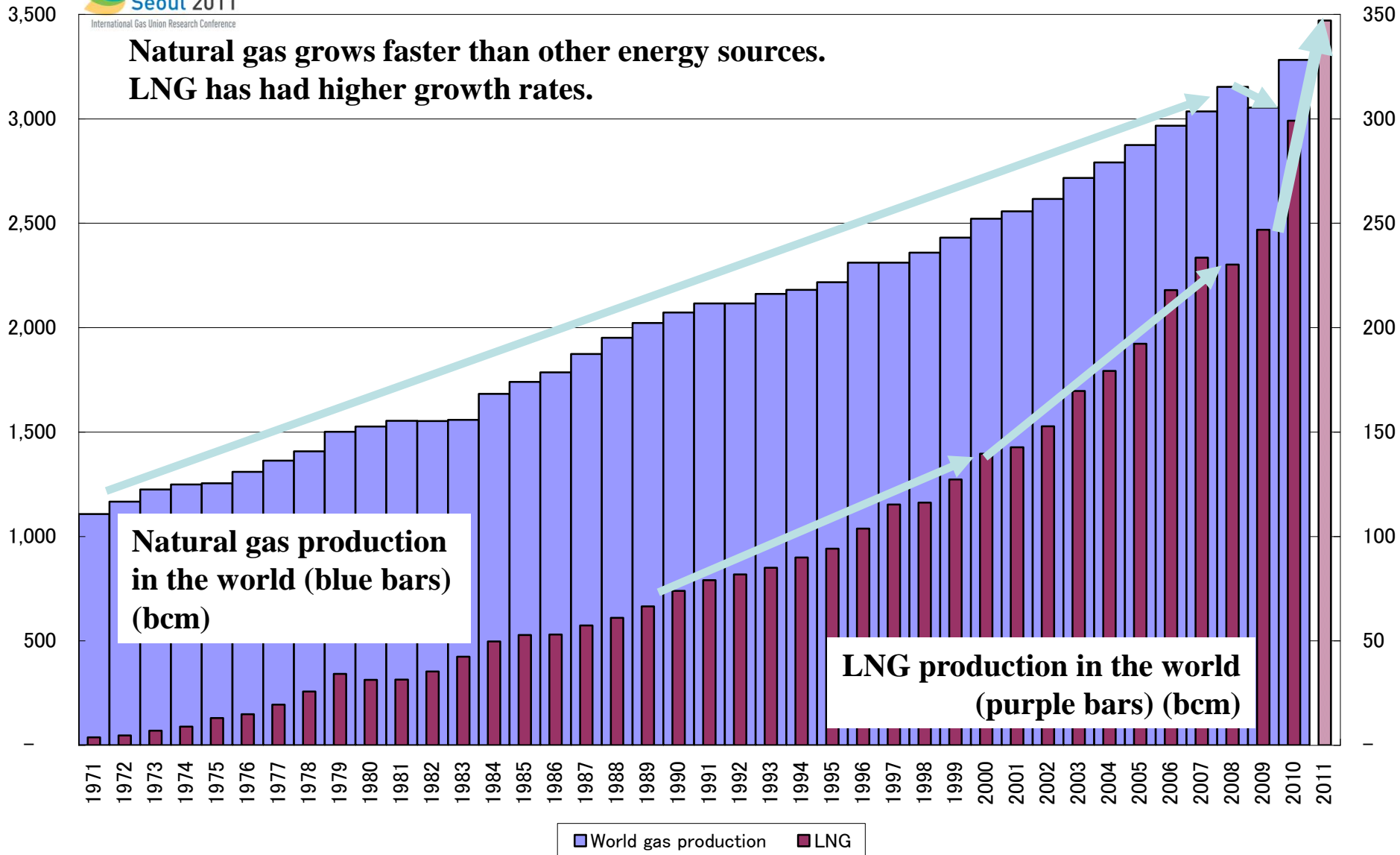
An LNG revolution is underway

	Shale gas revolution	LNG revolution
Economic driver	<ul style="list-style-type: none"> - Higher prices of oil and energy - Price gaps 	<ul style="list-style-type: none"> - Higher prices of oil and energy - Price gaps
Technology factor	<ul style="list-style-type: none"> - Advancing drilling technology 	<ul style="list-style-type: none"> - Advancing LNG technology and increasing size - Floating solutions
Implication	<ul style="list-style-type: none"> - LNG export proposal from the United States Energy substitution 	<ul style="list-style-type: none"> - Unprecedented expansion of LNG markets

Existing and expected changes of the LNG world

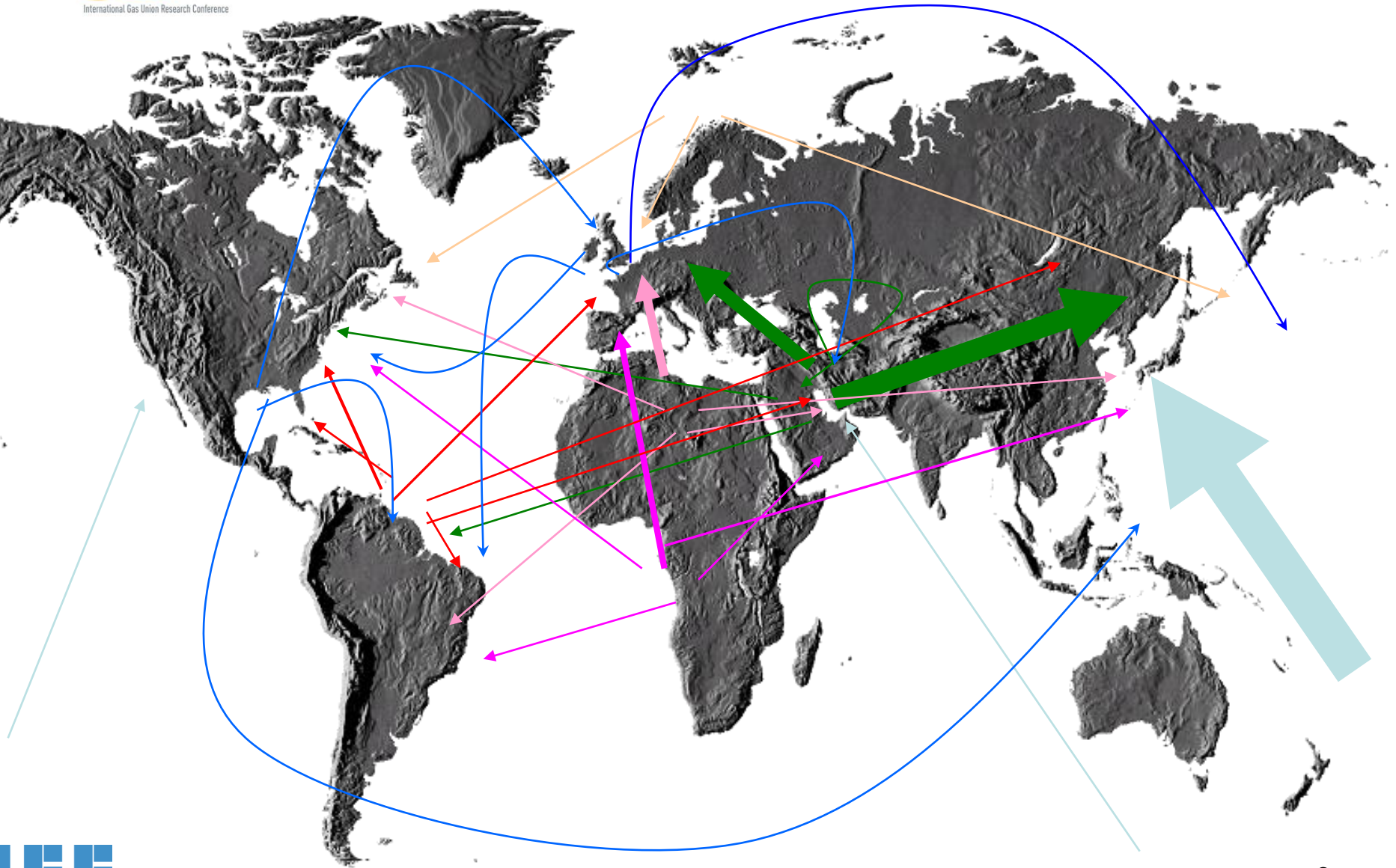
	Past	Present	Future
Unprecedented expansion of the LNG market	Growth rates: LNG > gas as a whole > total primary energy	LNG continues growing faster than gas as a whole, although representing less than 10% of the total gas	LNG is expected to expand its share in the total gas trade
The hybrid structure of the Asia Pacific market	Simple trade flows from Southeast Asia and Australia to North Asia's traditional buyers	Emerging markets joins traditional markets as core buyers to underpin new supply project development	New emerging markets (Southeast Asia) develop into a production and consumption center
Emerging LNG markets in Southeast Asia, Middle East, and South America	Standalone and small-scale pipeline gas markets, with some LNG exports	Fast-track LNG import projects with LNGRVs and FSRUs to meet rapidly growing local gas demand	Gas market sizes catch up with and surpass those of some OECD members
Evolving roles of LNG	LNG provides long-term security of supply and demand. LNG represents a premium energy source.	LNG is a clean and affordable essential energy source. LNG transmits price signals between regional gas markets.	LNG promotes increasing use of natural gas (in different regions and applications). LNG acts as a balancer between markets.

Unprecedented jump in LNG production

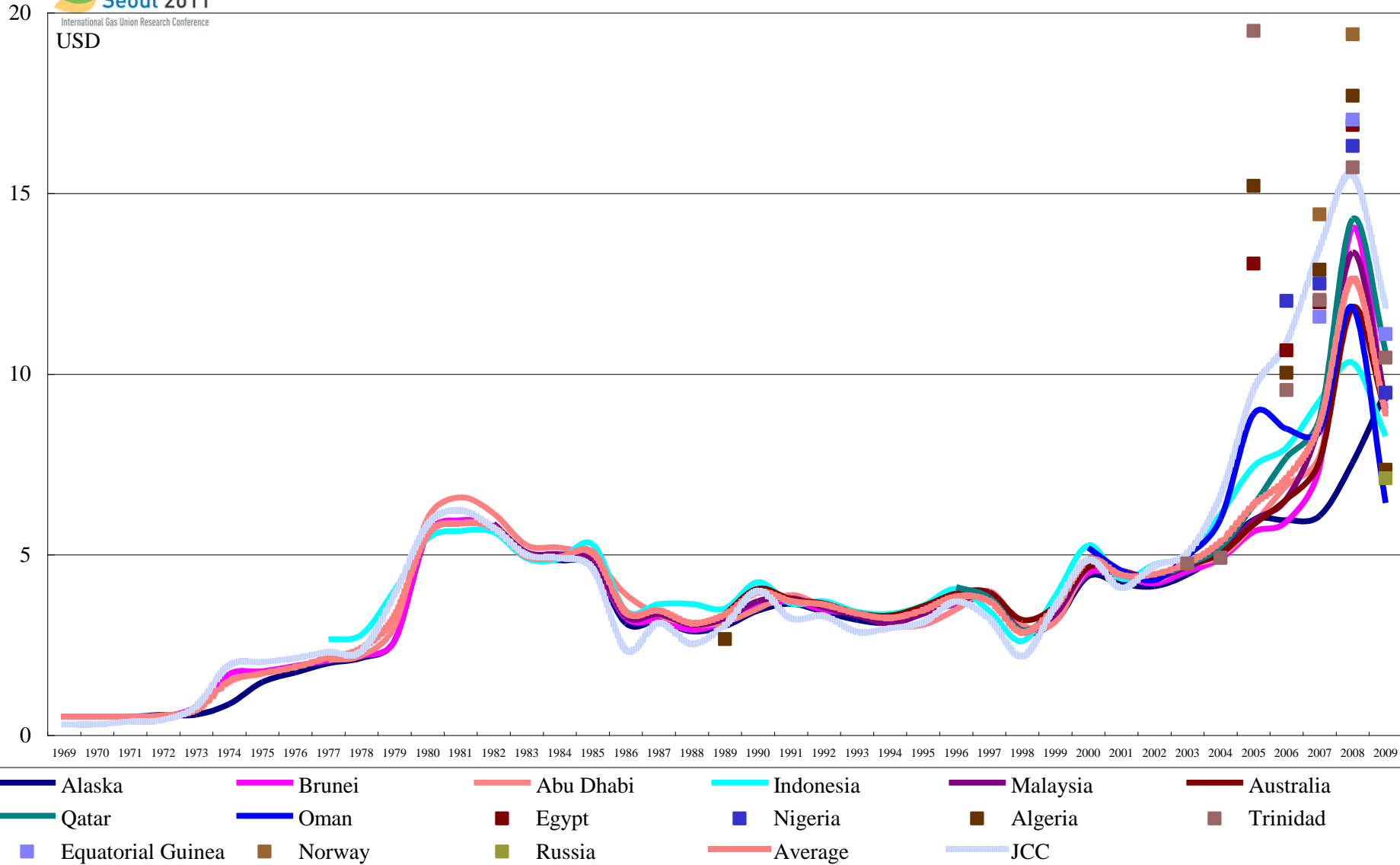


[Data source] Natural Gas Information 2011, International Energy Agency

LNG trade flows are diversifying



Diverging LNG prices in Japan - changes since 1969



LNG in the 20th and 21st centuries

	1990	2010
LNG as. . .	The most expensive fossil fuel	A less expensive alternative to oil, and pipeline gas
Importers	Exclusive club, mostly OECD members	Affordable to emerging economies
Players	Sellers, buyers, transporters	Players have multiple roles, integrated business models
Value chains	Parallel, point-to-point	Multiplied chains and points
Finance	Based on integrated supply chain	Some projects are financed with looser commitment
Regions	Pacific and Atlantic independent to each other. Middle East annexed to Pacific.	Closer linkage between regions. Middle East (and some others) supply to global.
Middle East	Distant from any major consuming centres Supplemental LNG supplier to other regional market	Conveniently located to supply any global markets Supplier to global markets, as well as significant energy consumer
Projects	Capital intensive, bigger and bigger	Even more super giant, but also small-scale models emerging
Gas fields	Large, easy to tap	Frontier, difficult to exploit

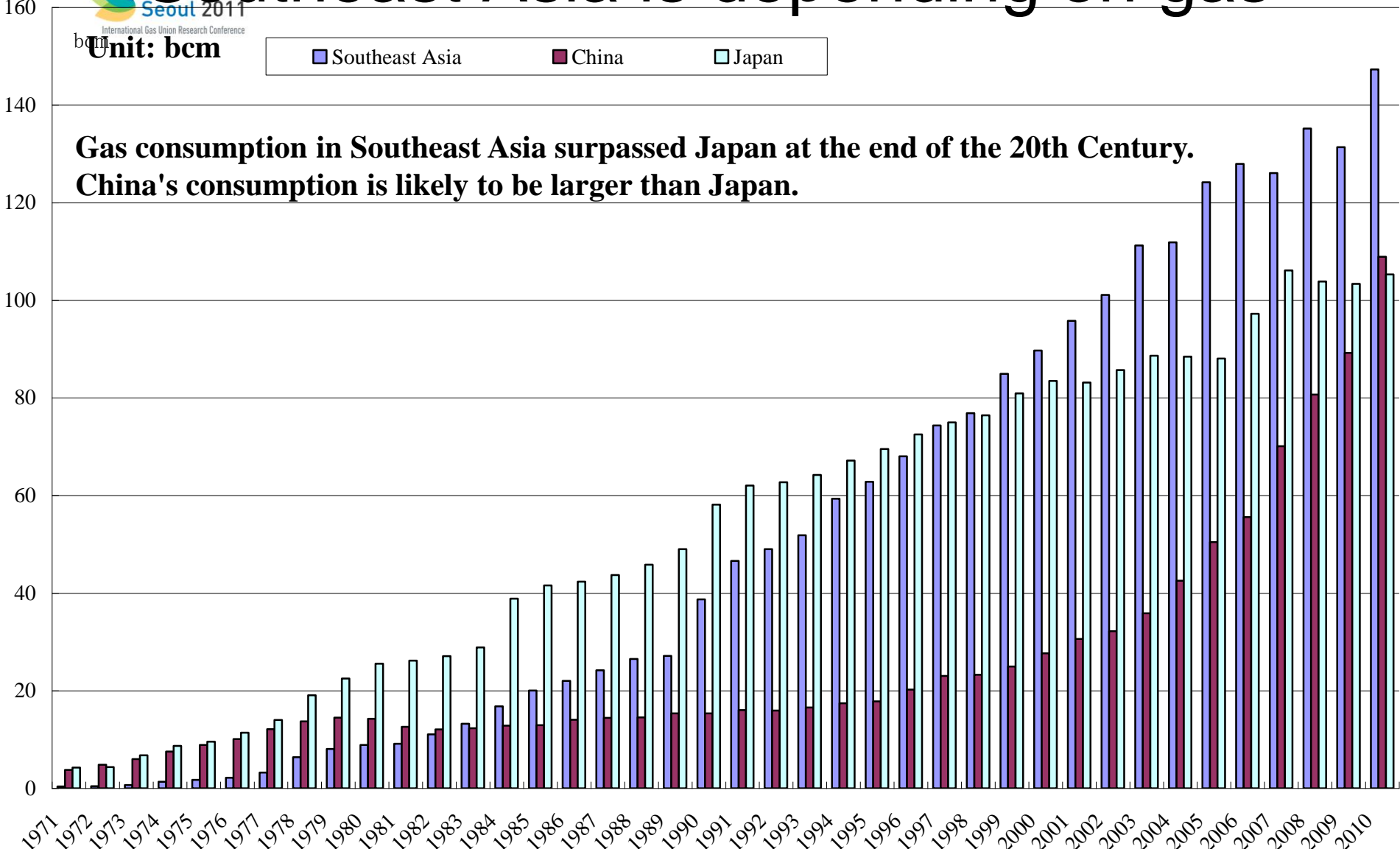


Southeast Asia is depending on gas

Unit: bcm



**Gas consumption in Southeast Asia surpassed Japan at the end of the 20th Century.
China's consumption is likely to be larger than Japan.**



[Data source] Natural Gas Information 2011, International Energy Agency



Conclusions

- An LNG revolution is underway along with the unconventional gas revolution.
- Fukushima impact is significant but how much is unknown.
- LNG assumes more, and new, roles
 - Southeast Asia becomes an important producing and consuming region
- Resources are abundant while development is not always easy.