

Japan's LNG Market Strategy

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Japan's Energy Mix Forecast released in 2015

(primary energy supply)

	1970	2010	2015	2030
Fossil Fuel	92%	82%	92%	76%
Others	8%	18%	8%	24%
	1970	2010	2015	2030
Oil	70%	40%	45%	33%
Coal	21%	23%	25%	25%
Natural Gas	1%	19%	22%	18%
	1970	2010	2015	2030
LNG	1 million ton	71 million ton	85 million ton	62 million ton

Assumption
(IEA WEO2014)

Oil
LNG

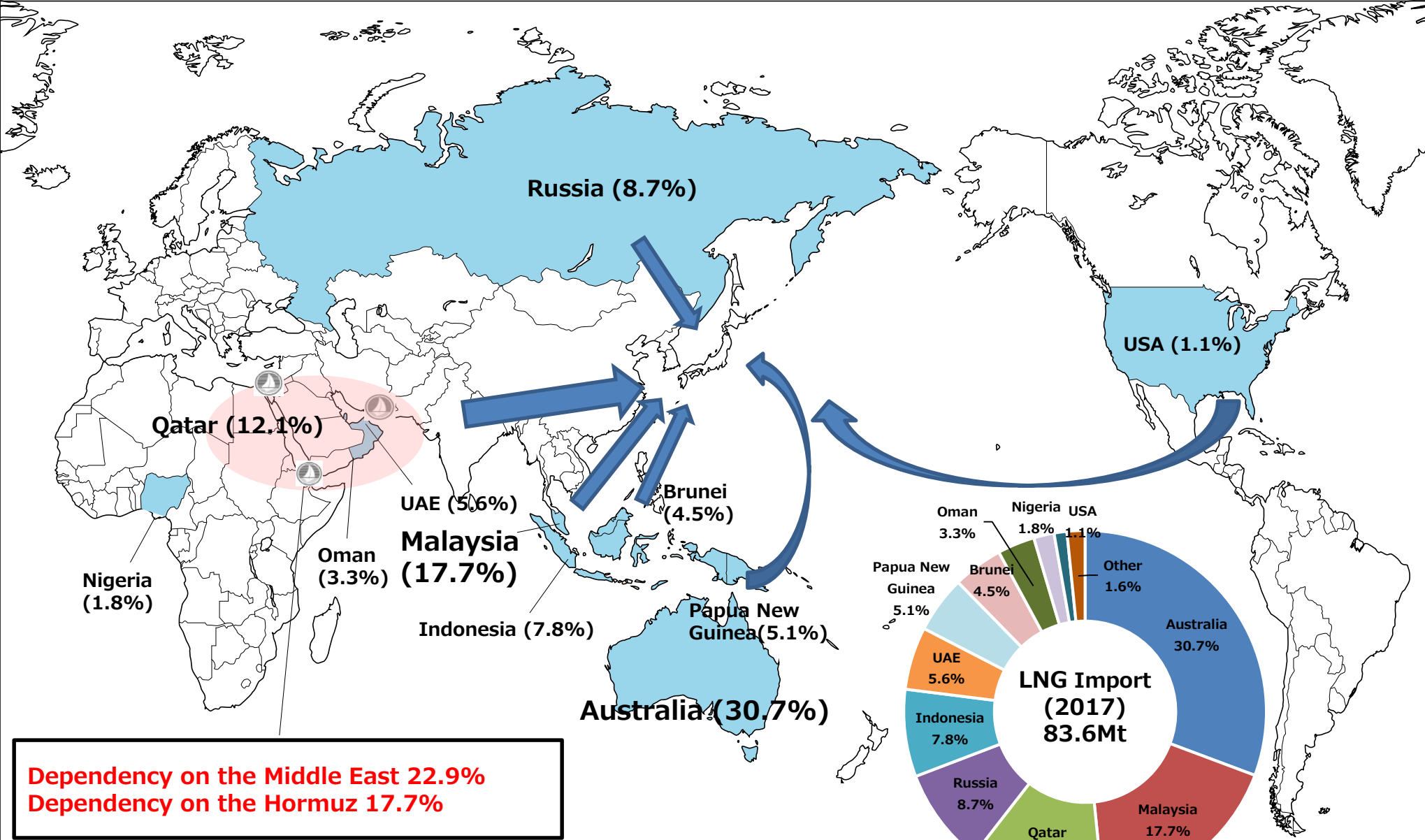
Price
Price

123
14.6

\$ / bbl
\$ / MMBTU

(111)
(11.9)
(IEA WEO2016)

Japan's LNG Procurement (2017)

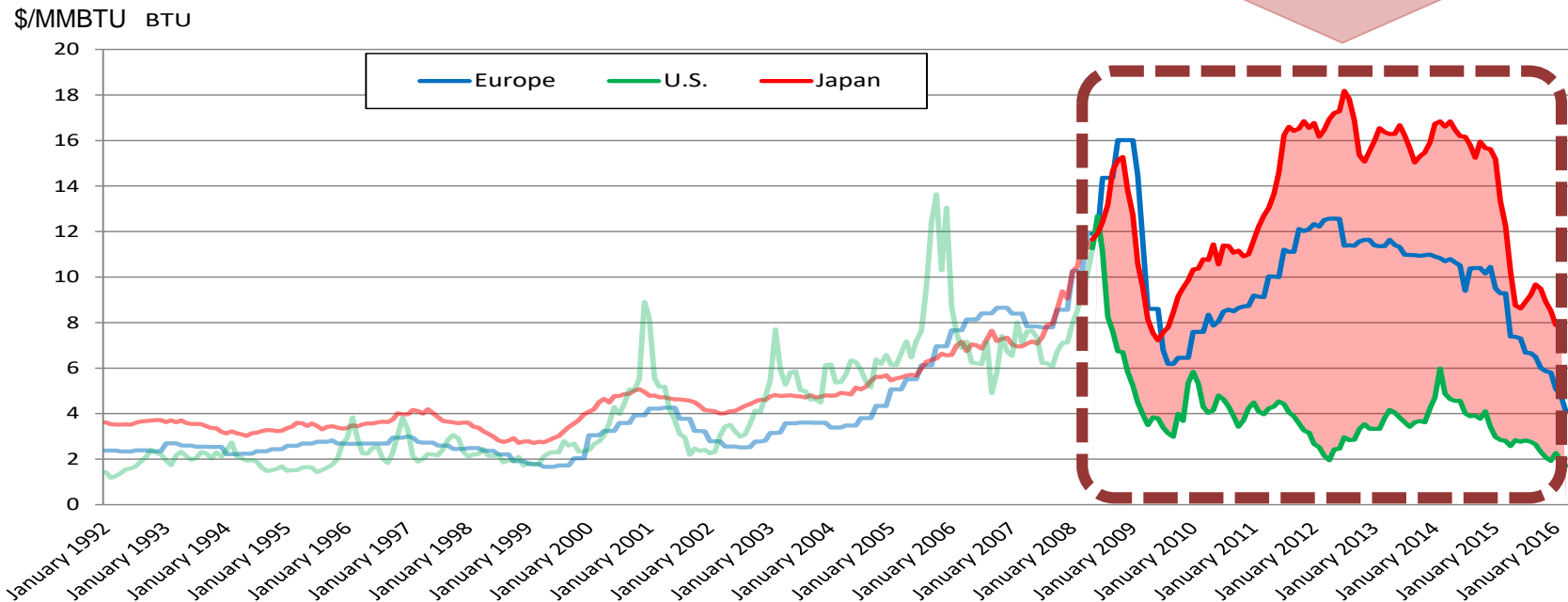


* Drawn based on "Trade Statistics" from the Ministry of Finance and other sources. "Dependency on Hormuz" is the summation of percentages of major exporting countries west of the Straits of Hormuz.

Trends in LNG Price Gap between Japan and the West

	Before 2008	Since approx. 2008
Japan vs. Europe	Small price gap (mainly in natural gas liquefaction and freight costs)	<div> <p>Large price gap (lower in Europe and higher in Japan)</p> <p>(European gas market liberalization, the revolution of gas price indices ⇔ Crude oil-linked prices, crude oil price hikes)</p> </div>
Japan vs. the U.S.	Small price gap (mainly in natural gas liquefaction and freight costs)	<div> <p>Large price gap (lower in the U.S. and higher in Japan)</p> <p>(Price drops mainly in the wake of the Shale Revolution) ⇔ Crude oil-linked prices, crude oil price hikes)</p> </div>

Changes in natural gas prices



Source: trade statistics, IMF Primary Commodity Prices, Japan: JLC, the U.S.: Natural Gas spot price at the Henry Hub, Europe: Russian Natural gas border price in Germany

Vision of LNG Trade Japan Should Pursue

LNG trade in the past

- Largely long-term contracts
- Reselling restricted by destination clauses
- Pricing linked to crude oil prices

LNG trade in the future

- **Minimize long-term contracts. Increase short-term and spot contracts**
→ **Supply and demand stabilization**
- **Abolish or relax the destination clause. Utilize reselling and arbitrage trading**
→ **More reasonable Price**
- **Pricing reflecting LNG supply and demand**
→ **Price stabilization and transparency**

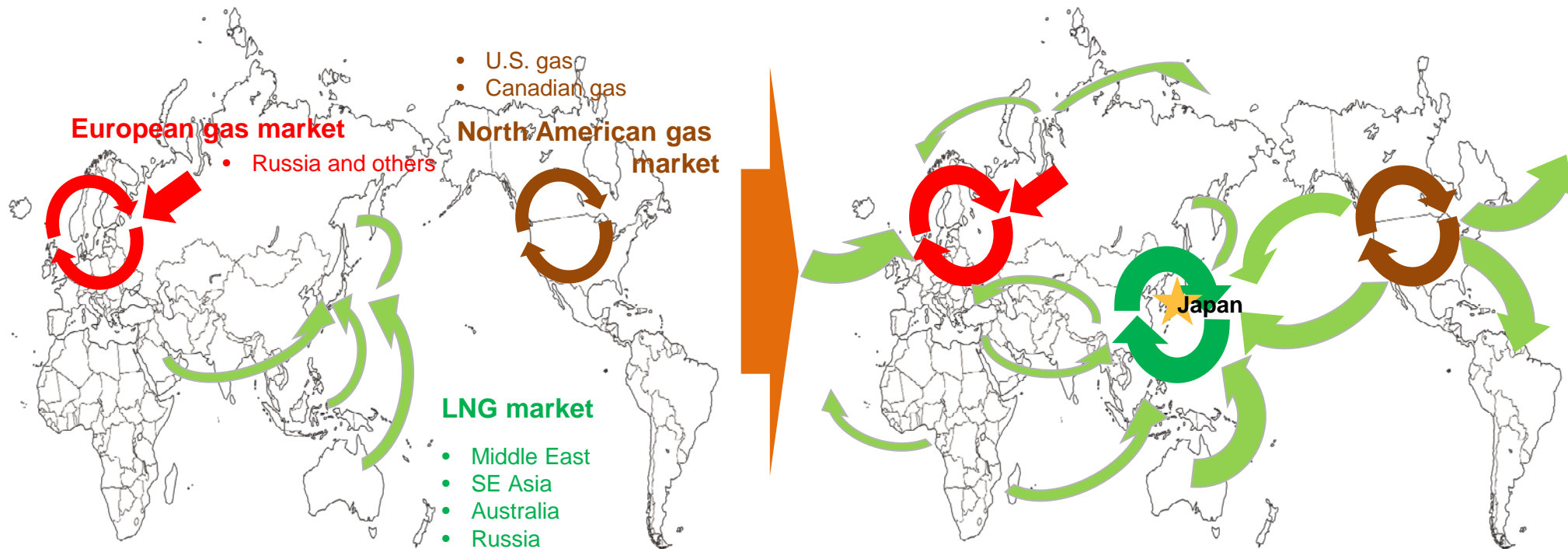


- A highly fluid and **global LNG market** is required to bolster LNG trade in the future.
- At the same time, **Japan, as the world's largest LNG consuming country**, should attempt to become **an LNG trading hub**, engaging in price formation, and dissemination
→ Improvements in positions of procurement negotiations and the ability to achieve reasonable LNG prices
- Taking these substantial changes in environment at home and abroad as an opportunity, Japan will accelerate every possible action to establish itself as an **LNG trading hub some time in the first half of the 2020s**.

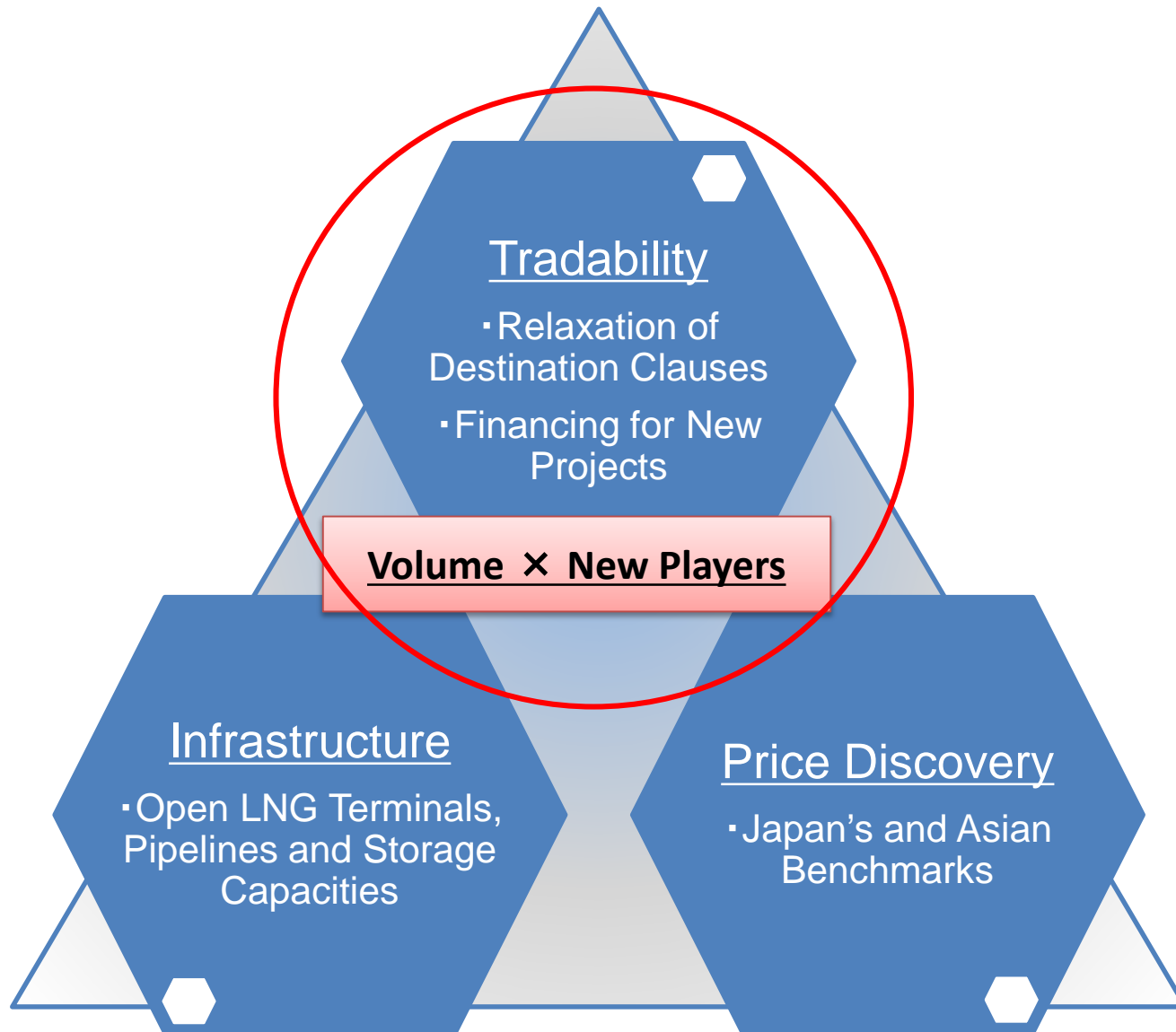
“Strategy for LNG Market Development“

(announced by METI in May 2016)

- In addition to the growth in global LNG demand, the market environment surrounding LNG is now experiencing drastic changes; the reform of the electricity and gas market in the biggest LNG market, Japan, the shale revolution, the development of LNG spot markets and rapid increase of related players in this market.
- Taking into account the size of its LNG demand and the proximity to LNG trade routes, Japan should accelerate all efforts in order to achieve the goal of obtaining the status as an internationally recognized hub (*) by the early 2020s.
 - * a base where many LNG trades take place, market prices are formed and publicly reported
- To meet this goal, ①enhancement of tradability, ②creation of a proper price discovery mechanism, and ③ open and sufficient infrastructure are important elements.



Three Pillars of "Strategy for LNG Market Development" (announced by METI in May 2016)



Japan Fair Trade Commission's Report on LNG Trades (June, 28th, 2017)

- JFTC released a report on Japanese LNG market and trades.
- The report concluded that providing destination clauses and/or profit share clauses in FOB term contracts is likely to be in violation of the Antimonopoly Act and providing these clauses in DES term contracts or providing take-or-pay clauses may be in violation of the Act in certain cases.

<JFTC's Report>

<http://www.jftc.go.jp/en/pressreleases/yearly-2017/June/170628.html>

<Reference: Government's Commitment "Growth Strategy 2017"> (Cabinet Decision of 9th June, 2017)

*"Based on 'the LNG Market Strategy,' the Government, together with business stakeholders, proceed with actions to realize a flexible and transparent LNG market. In particular, with **eliminating destination restriction** and supporting LNG market expansion in Asia as a whole including Japan, we'll realize an Asia-wide energy security."*

Effect of the JFTC's Report (JERA's Press Release on Malaysia LNG)

- On 25th October , 2017, JERA announced that it had entered into a Heads of Agreement with Malaysia LNG Sdn. Bhd. for the sale and purchase of LNG.
- JERA plans to purchase approximately up to 2.5 million tons per annum of LNG from Malaysia LNG for a period of three years beginning in 2018.
- JERA considers **the destination clause in this HOA to be in line with the Survey on LNG Trades report released by the Japan Fair Trade Commission in June 2017.** JERA believes this will contribute to its ability not only to respond to uncertainties in LNG demand, but also to put JERA in position to optimize its LNG operations.

Outline of HOA

Seller: Malaysia LNG Sdn. Bhd.

Buyer: JERA Co., Inc.

Contract period: April 2018 to March 2021 (3 years)

Contract volume: Approx. up to 2.5 MTPA

Delivery mode: DES and FOB

(Source)

http://www.jera.co.jp/english/information/20171025_98.html

Bilateral MOCs on LNG Market (Japan-EU , Japan-India)

- METI is strengthening international cooperation with LNG consuming countries such as **EU** and **India** to establish a flexible and transparent global market. MOU/MOC between Japan ,China and Korea is presently under discussion.

<Areas of cooperation>

Sharing knowledge and conducting initiatives for raising public awareness of best practices in the fields such as...

- ✓ more flexible LNG sales contracts
- ✓ highly transparent price indices
- ✓ emergency responses to supply disruptions etc.

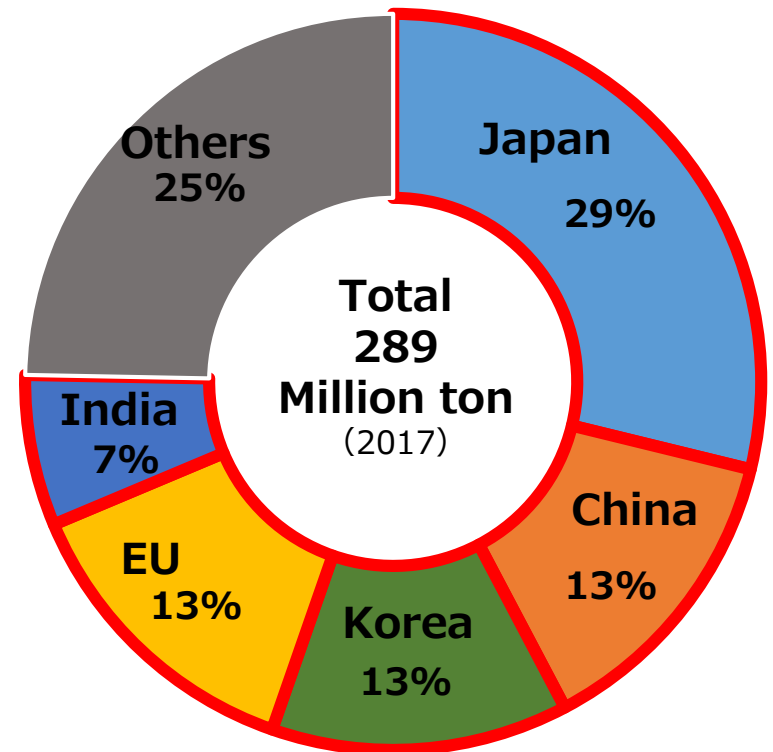


MOC with EC
(Signed on July 2017)



MOC with India (MOPNG)
(Signed on October 2017)

Japan and cooperating countries account for **75%** of the Global LNG imports



Source : GIIGNL

Market Expansion ① LNG Bunkering

Roadmap for the development of LNG bunkering base byMLIT (Dec. 2016)

Phase I (started)	Optimization of “Truck to Ship” bunkering Optimize the existing “Truck to Ship” LNG Bunkering operation by approximating the LNG tank lorry and the LNG fuelled ship.
Phase II (2020) Investment Approx. 6 billion yen	Introduction of “Ship to Ship” Bunkering Introduce a LNG bunkering ship and start “Ship to Ship” bunkering, using the LNG terminal in Tokyo bay (Sodegaura terminal)
Phase III (After the demand reaches a certain scale) Investment Approx. 10 billion yen	Strengthening of “Ship to Ship” bunkering Strengthen of the bunkering operation by introducing new LNG supply system and 2 nd bunkering ship at the Port of Yokohama.



LNG bunkering area at the Port of Yokohama

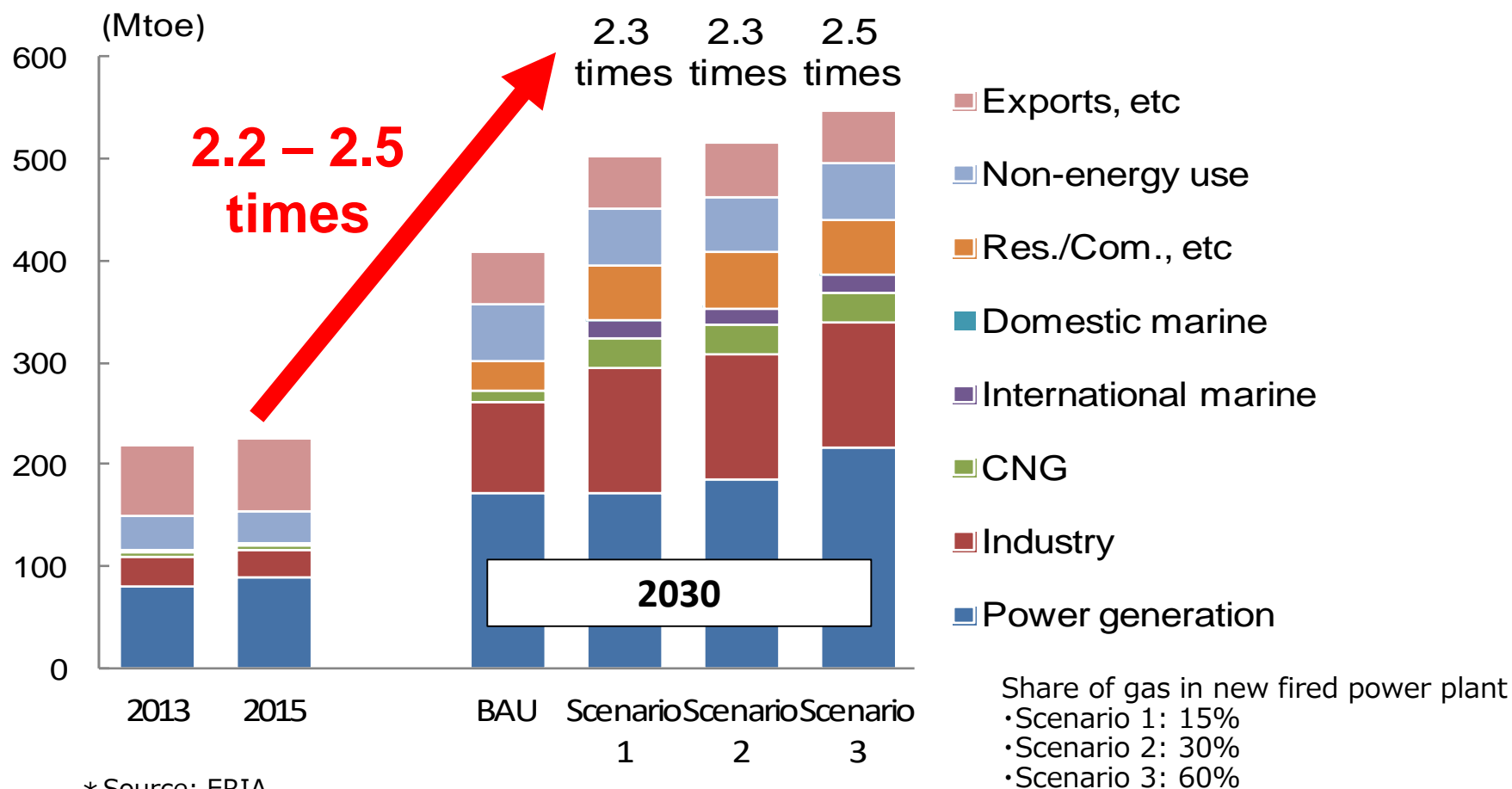
Announcement of establishment of an LNG bunkering business JV (May. 2018)

- On May 10th, “K” Line, Chubu Electric Power, Toyota Tsusho, and NYK Line announced that they established the two JVs to do LNG bunkering business.
- The two main business contents are (1) LNG Bunkering Business (2) Ownership of the LNG Bunkering Vessel.

Market Expansion② Gas demand potential (ASEAN + India)

- Natural gas demand in East Asia could potentially expand about **2.5 times between now and 2030** and require about **\$80 billion in LNG supply chain investments**.

cf: if the investment for natural gas fired power plants are included, this figure would increase significantly.



The Joint Ministerial Statement of the 10th East Asia Summit Energy Ministers Meeting

The Ministers, mindful of the pivotal role of natural gas for sustainable growth of the region, noted the importance to energy security of developing a liquid, transparent and secure LNG market and agreed to accelerate efforts to;

- (i) promote investments in related infrastructure, equipment, and services which advance a secure LNG supply to users with investments in sectors such as upstream, transportation, regasification, pipelines and end-use including gas-fired power plants;
- (ii) provide capacity building for the development of laws and regulation and for gas utilisation technologies; and
- (iii) promote new natural gas demand such as LNG bunkering, gas co-generation, and small-scale distribution to islands.



the 10th East Asia Summit
Energy Ministers Meeting

September 28, 2017, Manila

Announcement at LNG Producer Consumer Conference

- The 6th Conference was held on October 18th, 2017 with attendance of 12 ministers from consuming and producing countries.
- Minister Seko announced Japan's contribution and commitment (**\$10 billion** financing and **500 people** capacity building) during his keynote speech, in order to further the expansion of the Asian LNG market.

JAPAN'S CONTRIBUTION/COMMITMENT

Finance

\$10 billion of investment by Japan's public and private sectors

Capacity Building

500 people In 5 years



JAPAN'S PROMISE

Liquid LNG Markets

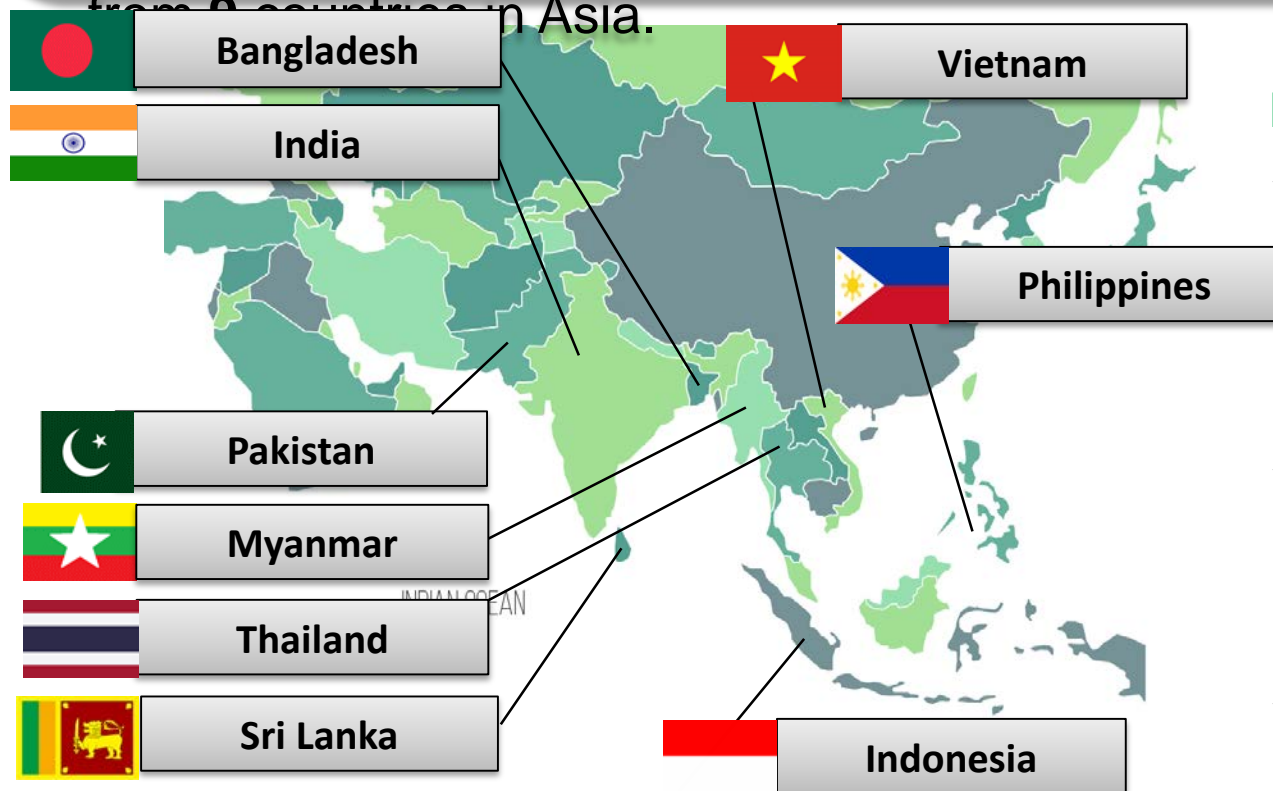
New LNG Utilization Measures

International Consensus on the benefits of LNG



LNG Value Chain Training Program

- JOGMEC has launched the LNG Value Chain Training Program to contribute to expanding the LNG market in Asia.
- Spearheading the Program to reflect the commitment of Mr. Hiroshige Seko, Minister of METI during “the LNG Producer-Consumer Conference 2017” at Tokyo.
- 1st round of the program was held in June, and 2nd round is scheduled in August.
- The participants include high-level Government officials and NOC employees from 9 countries in Asia.



Program Contents

- ◆ Introductory Session: Commercial aspects of LNG value chain business and general information on the technical aspects of regasification. (Incl. FSRU)
- ◆ Practical Business Session: Finance, contracts, relevant parts of the legal system of Japan, project management, etc.
- ◆ 2 weeks duration of each round.