Research Paper

Recommendations to Realize the Development of Sound LNG Market

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The Institute of Energy Economics, Japan

Acknowledgement

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Introduction

In parallel with the spectacular growth of the global LNG market in recent years - except for the last couple of years - regional price gaps of the commodity have grown so significantly as not seen in other energy sources. Particularly in Asia, the expensive prices have been imposing grave macroeconomic burdens to regional economies and threatening future growth of the local LNG markets. In order to bring back healthy growth of the market for LNG, structural solutions are required to various issues observed in the global LNG marketplace.

This document has been drafted by the Institute of Energy Economics, Japan (IEEJ) with an aim to make recommendations to stakeholders and governments to promote sound development of the LNG market, based on ideas formulated through discussions with a group of experts, to be presented at the LNG Producer-Consumer Conference on 6 November 2014 in Tokyo.

Recommendations to Realize the Development of Sound LNG Market

(Draft, as of 31 October 2014)

1 Stakeholders from both the supply and the demand sides are encouraged to make their respective efforts with regard to price formation and the development of a flexible and transparent market in order to minimize regional price differences, in particular so called “Asian Premium”. While the private sector is ultimately responsible for commercial deals, the public sector should create an enabling environment to develop a sound LNG market.

2 Price formation

2.1 The stakeholders in the private sector are encouraged to pursue pricing mechanisms that most appropriately and timely reflect prevailing LNG market conditions, and can eventually serve as an alternative to oil indexation in structuring long term contracts.. This approach would lead to mutually acceptable levels of prices that should result in the development of the sound LNG market that is mutually and equitably beneficial to all stakeholders.

2.2 The public sector should create an environment suitable for the development of a market that properly reflects regional supply and demand conditions, by liberalising end user markets, supporting development of necessary infrastructure and ensuring reasonable open access to relevant facilities, which may lead more LNG spot transactions and arbitrages, as well as establishment of Asian trading hubs,.

3 Promotion of a flexible and transparent market

3.1 The stakeholders in the private sector are encouraged to eliminate destination restrictions in FOB LNG transactions and relax them in DES transactions.

* FOB = free on board; DES = delivered ex-ship

3.2 The private and public sectors should collaborate to strengthen market function to disseminate highly transparent pricing terms and other market information, including short-term and long-term supply-demand outlooks.

4 Cooperation between stakeholders along the whole value chain

4.1 The stakeholders should remain committed to the principle of mutual cooperation, which has been the core of sound development of the LNG industry, albeit in different shapes reflecting evolutional changes in it, bearing in mind LNG projects are expected to continue requiring heavy investment and hence long-term commitments between stakeholders.

Annex.

1. Current situation

1.1 In recent years, the global LNG market has undergone major changes, accompanied with a lot of uncertainty in both supply and demand sides while increasing concerns are expressed with large regional price differences, notably “Asian Premium”.

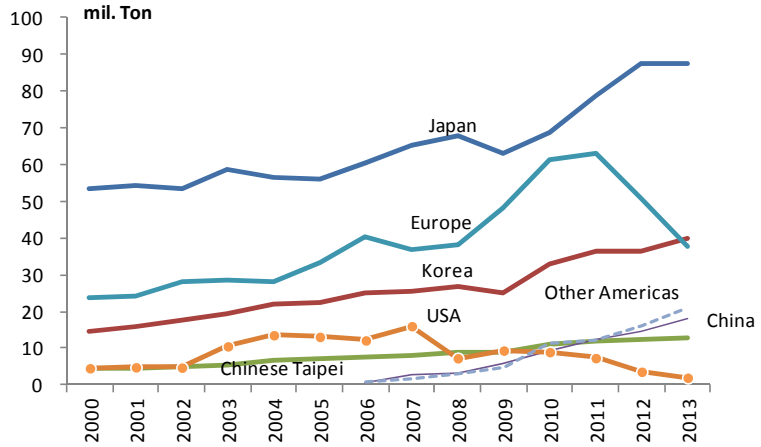
1.2 LNG supply-demand

1.2.1. LNG demand is increasing in Asia which continues to enjoy economic growth. On the other hand, LNG demand is decreasing in the United States where the shale revolution is changing gas supply-demand picture, and in Europe where the economy is stagnating while the use of coal and renewable energy is rising. Future outlook of demand is surrounded by uncertainty over government policies on nuclear power, renewable energy and environmental issues.

1.2.2. On the demand side, across the world, the number of LNG consuming countries is increasing. The new LNG consuming countries include countries in Asia and the Middle East where the supply-demand gap of natural gas is expected to increase, as well as some European, Central and South American countries which aim to expand the use of natural gas (not only for power generation and other traditional usage but also notably for transportation) and diversify supply sources.

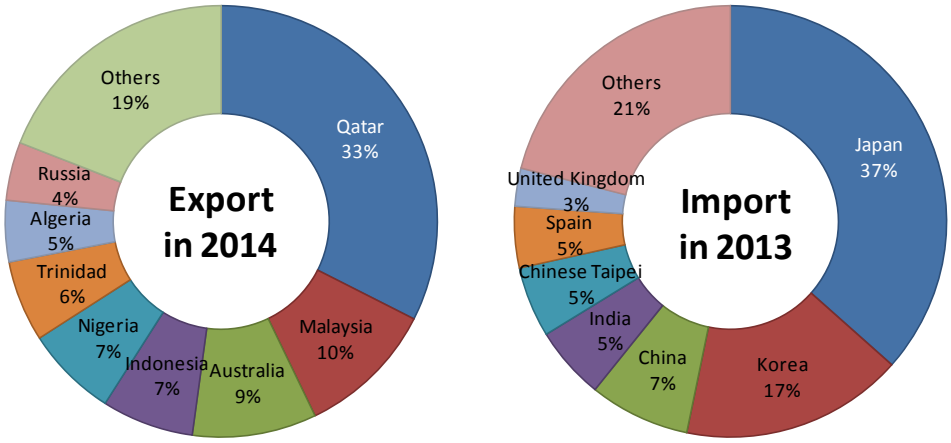
1.2.3. On the supply side, new LNG supplier countries have emerged in the market. In addition to the traditional LNG supplying countries in Asia, the Middle East, and Russia, more LNG projects are being developed. As more LNG exporting capacity is expected to be operational albeit uncertainty, there is hope among LNG consumers that they may have greater liquidity in the market and subsequently more choices of supply sources

LNG demand of major importers



Source: Trade statistics in each country, IEA, EIA

LNG export / import by country in 2013



Source: BP, Statistical Review of World Energy 2014

Uncertainties in the future LNG market

Demand side	Supply side
・ Chinese economy ・ Japan's energy policy, restarting of nuclear power stations ・ Competition with other fuels in power generation ・ Domestic gas pricing system reforms in such countries as India ・ Unconventional gas development in LNG importing countries ・ Steady increase in pipeline gas supply in LNG importing countries	・ Impact of cost rises in new projects ・ Hydraulic fracturing technology regulations in North America ・ Domestic natural gas demand in the US ・ LNG export plan in the US ・ Possibility to shape the market so that it guides investment decision-making (similar to oil market) ・ Sharp increases in natural gas demand in the Middle East ・ Possibe new development in Indonesia

Source: Multilateral Joint Study Group on LNG, 1st meeting

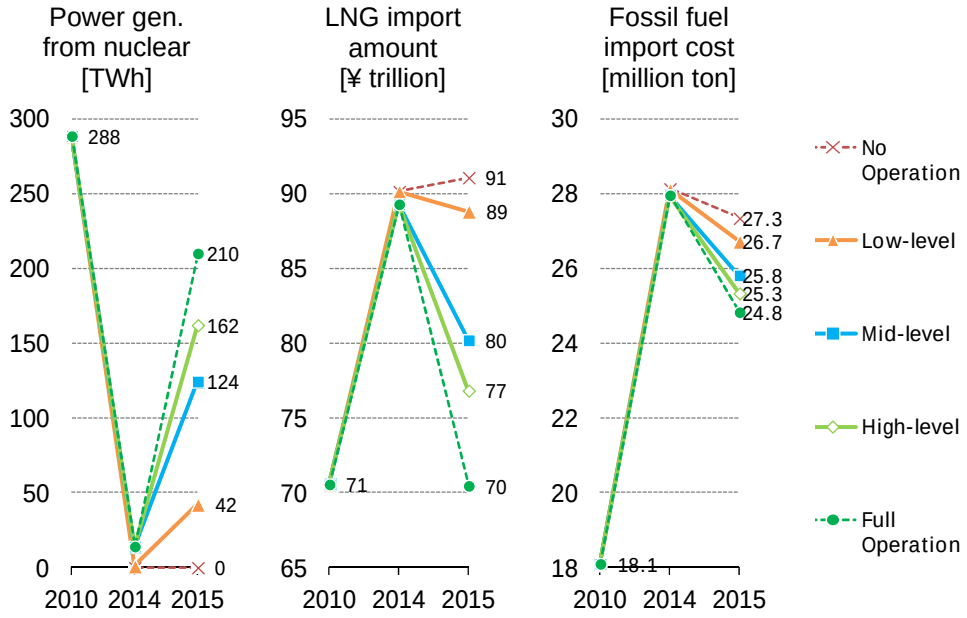
LNG export potential from USA

	FTA	non-FTA
Application filed (as of Jul 9, 2014) *	413 Bcm	368 Bcm
Approved (as of Jul 9, 2014) *	385 Bcm	95 Bcm
Compare with;		
World natural gas demand in 2013	3,348Bcm	
World LNG trade in 2013	325Bcm	
World top 3 gas exporter in 2013	Russia: 226 Bcm	
	Qatar: 126 Bcm	
	Norway: 106 Bcm	

* Sum of listed project capacities.

Source: Department of Energy, USA; BP, Statistical Review of World Energy 2014

Impact of restarting nuclear power plants in Japan



Source: IEEJ, Jul 2014

1.3 LNG price

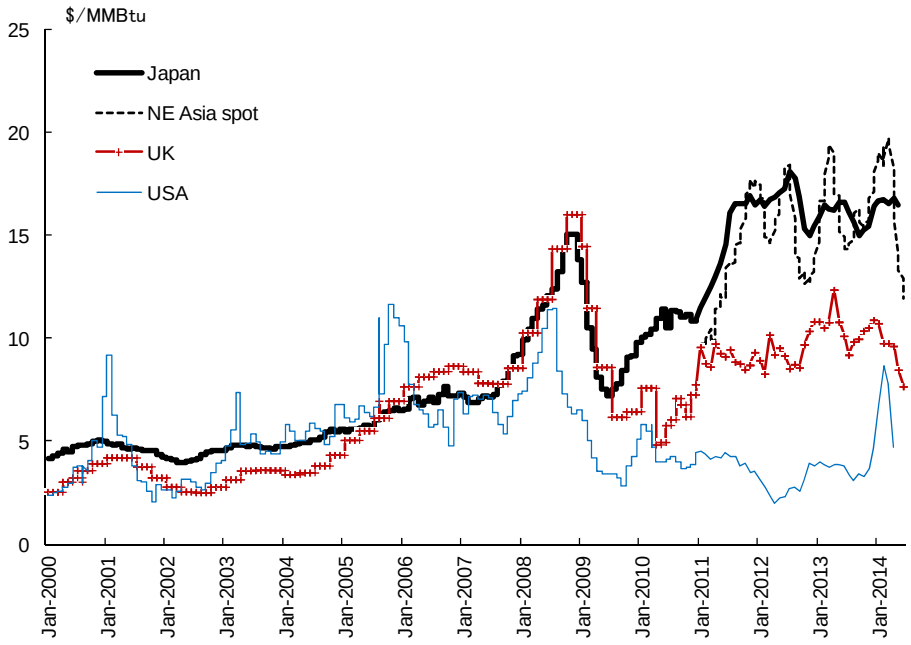
1.3.1. Substantial gaps exist in gas prices between North America (USD 3-5/million Btu at Henry Hub), Europe (USD 9-15 at regional hubs and borders), and Asia (USD 15-17 at LNG import terminals). The price variations result from various factors including differences in pricing mechanisms; North American prices reflect gas supply-demand balances, European prices are linked both to oil prices and hub prices, and Asian prices are linked to crude oil prices. The easing of gas supply and demand due to the shale revolution is the main cause of the current low gas prices in the United States, while increases in crude oil prices since mid-2000's

are the main causes of the ever increasing LNG price in Asia.

1.3.2. New ways of LNG pricing for future supply have already been observed, including Henry-Hub based ones from the United States and hybrid ones combining oil-linkage and hub-based elements. This reflects the increase in the number of buyers and sellers as the LNG market develops.

1.3.3. The low liquidity of international LNG transactions is also influencing price variations, while greater liquidity does not always mean lower prices. Spot and short-term transactions have increased significantly in recent years to cope with demand fluctuations and to take advantage of arbitrage opportunities between regions, driven by portfolio players and producers with flexible capacity. Although LNG prices may be inherently expensive due to the additional costs of liquefaction and shipping, a delinking from oil prices might bring LNG prices lower than the current ones. While possible lower oil prices may bring down oil-linked LNG contract prices, different pricing mechanisms are expected to bring benefits of diversification.

Natural gas import price in major countries



Source: Energy Intelligence, EIA, Ministry of Finance GOJ

2. Challenges

2.1 A number of challenges exist to realize the development of sound LNG market.

2.2 Regional differences of LNG prices

2.2.1. In Asia, where energy consumption is on the rise, higher LNG prices may become an important factor to hinder expansion of the LNG market. In particular, in the power generation sector where the demand for natural gas is expected to increase, the potential of natural gas use is not being fully realized or commercialized due to the relative disadvantage in LNG's price competitiveness. Governments need to have clear and stable energy policies so that commercial players can make long term decisions within this framework.

2.2.2. Higher LNG prices can consequently be a macroeconomic burden for importers. Increasing demand for relatively cheap coal can reduce LNG exporters' opportunities to develop their gas resources for new export projects. Higher prices of LNG could prevent the fuel from fully performing its relative environmental friendliness among fossil fuels.

2.3 Competitive situation of the LNG market

2.3.1. Going forward, LNG will need to have more competitive pricing against other energy sources, for the sound development of the LNG market. This requires that the market be sufficiently flexible and transparent.

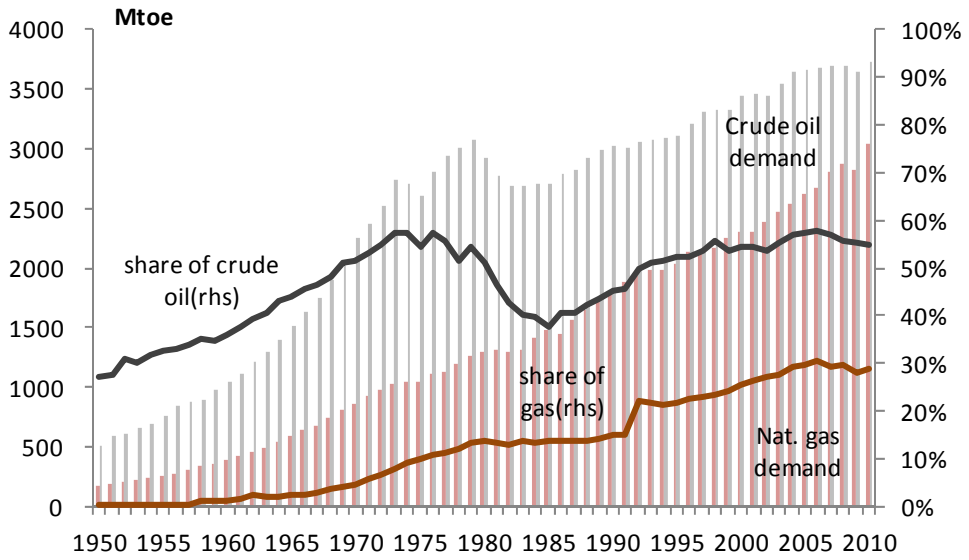
2.3.2. In the current LNG market, there already exists competition between sellers and buyers, between sellers, and between buyers. On the supply side, many new LNG projects are under way to come on stream. On the demand side, there are multiple plans for new LNG import. Accordingly, competition in LNG transactions could increase further. The advancement of electricity and gas market reform in many consumer countries in Asia will also be a contributing factor, adding more pressure to the competition. Governments should continue to pursue such reforms.

2.3.3. However, it is important that initiatives need to be taken to further increase market flexibility and transparency.

2.3.4. The LNG market transparency has witnessed ongoing changes, including the implementation of LNG spot price assessments in Asia in recent years. Further efforts are needed to disseminate highly transparent price information.

2.3.5. The establishment of hub in Asia is one option which can contribute to enhance flexibility and transparency of the LNG market. At the same time, it is important to recognize that gas hub price is subject to substantial fluctuation or volatility, and does not necessarily mean lower price.

Oil / gas demand and share of internationally traded amount



Source: United Nations

2.4 Soundness of transactions

2.4.1. Many of the current LNG transaction practices continue reflect the issue and concern of the past.

- Long-term contracts and the introduction of take-or-pay clauses were considered to assure investment recoveries for sellers (in particular in a low price environment) and were a means of ensuring stable supplies for buyers. They had advantages for both.
- Destination restrictions were initially introduced with an aim to ensure stable export for sellers and stable import for buyers.

2.4.2. However, some of the transaction practices, notably, the destination restrictions, may have become obstacles to increasing flexibility and liquidity of the LNG market. Thus, the relaxation or elimination of destination restrictions are on the agenda for a sound and transparent LNG market.

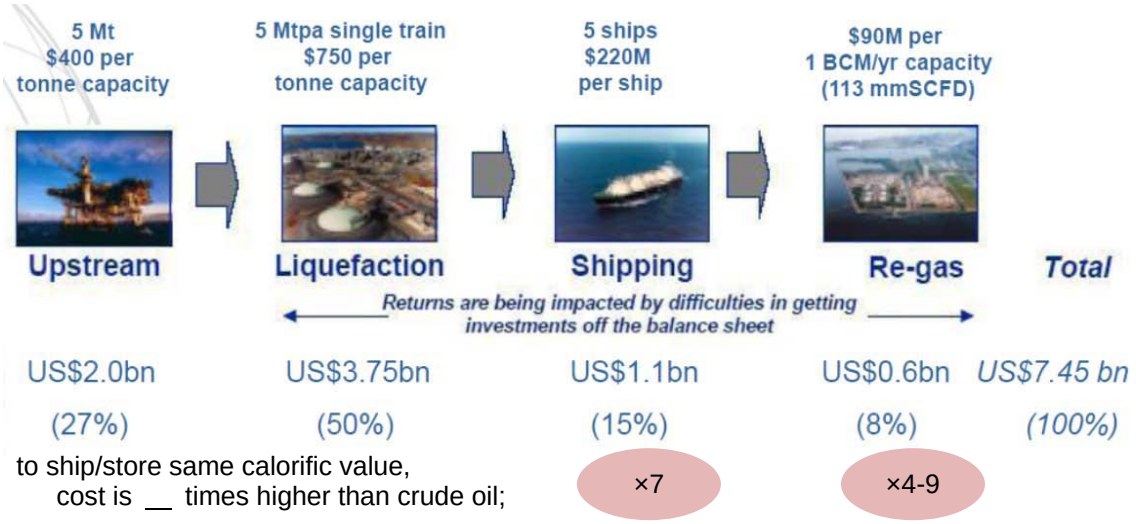
2.4.3. Destination restrictions have lead to inefficiencies in the market. In practice there have been a lot of reloadings of LNG cargoes in order to bring volumes to final destinations - partly because of destination restrictions of the original transactions. Without such restrictions savings could be expected by directly diverting volumes. Third party access to import terminals and pipelines as well as reduced unnecessary regulation and restrictions on imports, such as in shipping, by buying countries would also reduce costs.

2.4.4. This is in line with the agreement reached at the G7 Summit (June 2014), which set out that the G7 members would promote “flexible gas markets, including relaxation of destination clauses.” Similar message which encourages “relaxing destination clause” was delivered at the APEC Energy Ministerial Meeting (September 2014).

2.4.5. However, the following issues need to be kept in mind in negotiating/discussing transaction practices.

- The current transaction practices are an outcome of negotiations and agreements between sellers and buyers in the market. As a general rule, changes to these practices must also be made through negotiations and agreements between sellers and buyers.
- Liberalization in destinations needs to take into consideration issues and challenges related to third party access to LNG receiving terminals, funding for the construction of LNG vessels, and the operation of LNG vessels.
- Shortening the contract term has a benefit to increase flexibility in the market. However, it is necessary for LNG market stakeholders to take into account the characteristics of investments in natural gas supply chain including production and liquefaction facilities when they attempting to shorten the contract term. This also depends on the needs of the buyers, with many still preferring long term stable supply for some portions of their procurement portfolios.

Cost of LNG chain



Source: Wood Mackenzie, Deutsche Bank

End

Supplement.

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