

Summary Statement

LNG Producer-Consumer Conference

24 November 2016 Tokyo

The Ministry of Economy, Trade and Industry (METI)
and the Asia Pacific Energy Research Centre (APERC)

The fifth LNG Producer-Consumer Conference was held on 24 November 2016 in Tokyo, and attended by more than 1,000 company executives and government officials, as well as analysts, from more than 32 LNG producing and consuming countries and regions and international organizations including Mr. Hiroshige Seko, Minister of Economy, Trade and Industry, Japan, representing the organisers, seven other ministers and heads of four international organisations. The conference was organized by the Ministry of Economy, Trade and Industry of Japan (METI) and the Asia Pacific Energy Research Centre (APERC).

Opening Address:

- H. E. Hiroshige Seko, Minister of Economy, Trade and Industry, Japan

The global LNG demand is expected to grow by 40% by 2020 and the global LNG supply capacity is set to increase by 90 million tonnes per year during the same period mainly from new projects in the United States and Australia. The previously segregated regional markets of North America, Europe and Asia are expected to be connected into a global market, leading to convergence of regional prices. Japan is implementing its LNG market strategy set out in May

2016. Japan intends to lead the global LNG market reform through pursuit of the three pillars in the strategy: 1) better tradability of LNG by easing destination restriction clauses; 2) open and sufficient infrastructure with non-discriminatory Third Party Access to LNG-related facilities and; 3) establishing an LNG pricing index. Japan also plans to enhance security of LNG supply, through measures including being the first country to be evaluated in the IEA's initiative of LNG resiliency assessments. Japan intends to implement measures toward promotion of natural gas use in Asia that Japan proposed in the East Asian Energy Ministerial meeting in September. Through discussions at today's conference, the government of Japan wants to enhance coordination between producing and consuming countries and convey their messages toward healthy development of the LNG market to the world.

- H. E. Dr. Mohammed Bin Saleh Al-Sada, Minister of Energy and Industry, Qatar

Qatar, being the world's leading supplier and like other LNG players, is faced with falling prices, stagnating demand and rising global production capacity. Qatar is concerned about the impact of curtailed capital investment on future developments of gas resources that are necessary to sustain the long-term consumption growth and undermine the global effort to mitigate climate change. However, Qatar is optimistic about the future of LNG considering huge demand potential for LNG underpinned by affordability and environmental friendliness. It is essential that producers, consumers and other stakeholders engage in a genuine cooperation and constructive dialogue to establish stable LNG market and healthy business environment.

Session1: Ministerial Keynote Speeches:

Scene Setting:

- H. E. Dr. Fatih Birol, Executive Director, International Energy Agency (IEA)

The share of LNG in the global natural gas trades is expected to grow continuously from 42% in 2014 to 53% in 2040. LNG contract structures are

becoming less rigid – increasing market efficiency. A “second natural gas revolution” is on its way, driven by a wave of new LNG projects, with far-reaching implications for gas pricing & contracts. Contracts with flexible destinations and shorter terms are becoming more common; buyers will accept longer contracts in exchange for increased destination flexibility. In the energy mix of tomorrow, natural gas & low-carbon technologies will be the big winners. Natural gas use increases in all IEA Scenarios of future energy demand, highlighting its key role in the energy transition. Security of natural gas markets should not be taken for granted and effort is necessary for the stabilization.

- Dr Emmanuel Ibe Kachikwu Hon Minister of State Petroleum Resources, Federal Republic of Nigeria

While the recent 50 years of upstream development in Nigeria since 1958 can be regarded as the oil age, the next 50 years would be the age of gas. Nigeria currently has LNG liquefying capacity of 22 mtpa and additional major LNG projects are in their planning stages. Although the traditional destinations for Nigeria LNG have been America and Europe, the dynamics of the LNG market, such as shale gas development and technical advancement in transportation, has highlighted the importance of the Asian market. Hence Nigeria wants to increase exports to Japan and other Asian nations. Nigeria also welcomes interested Japanese firms to invest directly in upcoming LNG production facilities.

- H. E. Shahid Khaqan Abbasi, Minister for Petroleum and Natural Resources, Pakistan

Pakistan started import of LNG using an FSRU in 2015 and plans to install a second unit in early 2017 and a third unit in 2018. Pakistan plans to have an import capacity of 30 million tonnes, with additional FSRUs by both public and private sectors. Imported LNG is currently used for power generation and industry, and expected to be used for transportation in the future. 3,600 MW of oil fuelled power generation capacity with 35% thermal efficiency can be

replaced by CCGTs with 62% efficiency resulting in 1 billion USD cost savings. By 2018 Pakistan could be among the top six LNG importers in the world. The country could achieve zero power shading, enhanced gas supply and sustainable economic growth by the promotion of LNG usage.

- H. E. Nixon Duban, Minister for Petroleum and Energy, Papua New Guinea

Papua New Guinea still has huge resource potential with three quarters of promising areas not having been explored yet. The country is open to overseas companies for resource development. The country continues promoting LNG project development, with its strategic locational advantage, close to Northeast Asian markets. The country welcomes investors from outside of the country to entire gas value chain from upstream development, pipeline infrastructure, to downstream facilities including gas-fuelled power generation projects, with appropriate investment protection and supportive measures including simple licensing procedures and streamlined processes. Another LNG production project is planned with an FID planned in the last quarter of 2018, targeting start of production in 2022.

- Mr. Bill Walker, Governor of Alaska, United States of America

The state of Alaska is promoting monetization of its natural gas resources through streamlined regulatory and taxation frameworks for efficient upstream development. Alaska is a stable supply source in the region with a direct route to major Asian markets including Japan. Alaska has the ability and flexibility to offer innovative pricing terms and flexible conditions of contract. Alaska has low cost, proven conventional reserves. Alaska offers value chain integration and investment opportunity, as well as complete elimination of destination clauses.

Session 2: Pathways to Develop Flexible and Liquid LNG Market

- Mr. Howard Rogers, Chairman, Natural Gas Research Programme and Senior Research Fellow, The Oxford Institute for Energy Studies

There are different aspects for LNG liquidity: judging from statistics of spot and short-term transactions, direct liquidity may not look huge. But there are hidden liquidity incorporated in recent more flexible contracts. Linkage between regional markets of Asia, North America and Europe and arbitrage opportunities between these markets also provide indirect liquidity. Confidence among players built through the above elements also encourages flexibility of trade.

- Mr. Yuji Kakimi, President, JERA Co., Inc.

JERA is in the process to integrate fuel related and overseas power generation business of Tokyo and Chubu Electric Power Companies to be the world leading company of energy procurement and thermal power generation. Larger procurement volumes would enable the company to procure LNG in a more economical, flexible and stable manner. Innovations are underway in every segment of the LNG value chain - (1) new business models and technologies in LNG production; (2) spot transactions and flexible pricing arrangements; and (3) increasing LNG demand through floating receiving terminals and LNG bunkering. The company pursues diversification of LNG supply regions, contract durations, and pricing indices leading to well-balanced portfolio. JERA also aims to support and lead the ongoing innovation in the LNG business through its LNG procurement and equity participation in LNG production projects.

- Mr. Peter Coleman, CEO and Managing Director, Woodside Petroleum

The LNG market is undergoing profound changes with expanding more liquid spot market. However, it is inevitable that investors will be reluctant for the investment in LNG production facilities due to their worsened balance sheets. Not only abundance of LNG supply, but also abundance of shipping and regasification capacity helped by FSRUs, is already changing the LNG market.

The emergence of new LNG buyers is creating competition and risks to existing LNG buyers. Significant increase is expected in LNG demand in transportation sector. Long-term contracts are still needed to sanction massive investment for new LNG production facilities. Sustainable LNG market development requires balanced approach.

- Mr. Derek Chen, Chairman, CPC Corporation

Natural Gas has expanded its presence in recent years as a low-carbon energy in addition to renewable energy sources; this combination would lead Chinese Taipei towards a low-carbon society (LCS) and a sustainable future. CPC, as the sole LNG importer in Chinese Taipei, has diversified its LNG supply sources. The demand for LNG is expected to further increase on the back of the government measures to improve air quality. Given the rapid growth of gas demand, the company has attempted to expand tank capacity as well as to build a third LNG receiving terminal located in the northern region with annual receiving capacity of 6 million tonnes. The company is committed to helping establish a more robust, flexible and liquid LNG market through three core values: affordable and reasonable price, security of supply, and consolidated cooperation.

- Mr. Mitchell W. Ingram, Executive Vice President, Global LNG, Anadarko

Anadarko is proceeding with an LNG project in Mozambique and is prepared to offer flexible pricing arrangements to prospective buyers. The company considers East Africa as a strategic location in the LNG market.

- Mr. Jonty Shepard, Chief Operating Officer - LNG, BP Gas Marketing Ltd

As a portfolio player BP provides competitive LNG supply to its customers, having supplied Henry Hub and European price linked LNG to the Japanese

market. BP also makes some counter-cyclical moves, including the FID on Tangguh Train 3 in July 2016 and the offtake agreement from Coral Floating LNG.

- Mr. Bhuwan Chandra Tripathi, Chairman and Managing Director, GAIL (India) Limited

In order to expand LNG imports into the Indian market, further pipeline infrastructure development is important. Contract flexibility will be more important in the future to control mismatches in demand and supply.

- Mr. Steve Hill, Executive Vice-President for Gas and Energy Marketing and Trading, Shell

Both sellers and buyers face uncertainty in the current LNG market. Shell has introduced more flexible contract terms in its second franchise arrangement in Singapore. Marine transport fuel demand is likely to be crucial for the future LNG demand. Players should recognise that flexibility in LNG transactions often comes with costs.

- Mr. Hadi Hallouche, Global Head of LNG, Trafigura

Commodity traders have gained more roles in the LNG markets in recent years, mainly encouraged by emergence of new LNG buyers with FSRUs and shorter-term contracts.

[Comments during the panel discussions]

The most notable change in future LNG contract terms is increasing Henry Hub linked LNG supply. Pricing indices are expected to diversify with more use of JKM and JLC, rather than crude oil prices. (JERA)

The prolonged period of low oil prices are deteriorating upstream companies' balance sheets, making financing of new LNG projects more difficult. (Woodside)

Somebody has to assume risks to realise a new LNG project. Either developing companies should change their business models, or long-term commitments should be made by either end-use companies or companies between buyers and sellers. (Shell)

While it is important for the government to improve institutional frameworks such as regimes of third-party access to LNG related infrastructure facilities, the government should also consider improving taxation frameworks to attract investment money. (Woodside)

The government of India has an important role in expanding infrastructure. It is important to establish such regimes to encourage new entrants into the LNG business, such as third-party access to facilities. (GAIL)

Gas has inherent value as a clean energy source. Producers and buyers should collaborate to inform such value to final consumers. (Woodside)

LNG should be able to play an important role as a mid-term bridging fuel toward renewable energy in terms of climate change measures. (GAIL)

LNG has some short-comings of low liquidity and low price transparency. It could lose against other energy sources unless it overcomes such short-comings. Therefore it is essential for the LNG industry to establish a transparent market for the future development of the industry. (JERA)

Session 3: Keynote Speeches by Ministers on Emerging LNG Markets in Asia

- H.E. Yosuke Takagi, State Minister of Economy, Trade and Industry, Japan

Japan has been contributing to the development of the LNG market as the largest importing country in the world, and other Asian countries are expected to have rapid growth of gas demand. Those countries have different prospects of LNG introduction with variety of challenges including better primary energy mix, competition against pipeline gas, and infrastructure development. It is important to make LNG more attractive through discussions on how to achieve sustainable growth of LNG markets in Asia and how stakeholders from both public and private sectors should be involved in the process.

- H.E. Pehin Dato Mohammad Yasmin Umar, Minister of Energy and Industry at the Prime Minister's Office, Brunei Darussalam

As LNG demand is expected to grow mainly in Asia and LNG supply is also expected to grow mainly from the United States and Australia, the market is in great transition. Natural gas is considered to be one of the main energy sources to contribute to realisation of the Paris agreement, and is expected to play an important role as the cleanest among fossil fuels with least CO₂ emission and air pollution such as NO_x and SO_x. 60 more importing countries and 37 million tonnes of additional annual demand may emerge by 2025. Brunei, as the first LNG producing country in the Western Pacific, has been a stable LNG supplier for more than 40 years, and is expected to be so for another 60 years thanks to plant rejuvenation conducted in 2004. Both producing and consuming countries should recognise that the global LNG market is in transition and work together to create mutually beneficial solutions.

- H.E. Alfonso G. Cusi, Secretary of Energy, Philippines

Although natural gas demand in the Philippines mostly for power generation is supplied by the domestic gas field, the reserves will start to deplete in 2022. Thus, imports of LNG will be the only sure source of new gas in the medium-term. LNG import is expected to commence in 2018 and 2 million tons of import will be realized by 2024. Further potential demand of LNG will also come from the off-grid islands which are currently without transmission grid and pipeline. Although import of coal for power generation can be increased on a short term basis, natural gas is a responsible choice to bridge the transition to

clean energy. Contribution of gas to the primary mix by 2030 is targeted at minimum 11.1 % on a business as usual scenario and minimum 14.9% for a more ideal low carbon scenario. In order to deal with many challenges including development of LNG infrastructure, the government has established an organization to create roadmap of LNG industry. The government recognizes the importance of collaboration between producers and consumers to attain a sustainable, flexible and transparent LNG market development.

- H.E. General Anantaporn Kanjanarat, Minister of Energy, Thailand

While Thailand is expected to import 3 million tonnes of LNG in 2016, volumes are expected to rise in the future because of increasing demand and decreasing domestic gas production. The government is proceeding with liberalisation of the domestic gas market to establish an equitable and transparent energy market, with measures to grant third-party access to LNG facilities and enhance pipeline and LNG terminal infrastructure. The government also enhances collaboration with ASEAN members and has established the ASEAN LNG partnership, to strengthen cooperation in different areas from upstream, LNG transportation, trading and procurement. The state-owned oil company, PTT plans to expand its presence in overseas LNG projects through equity participations. Thailand also welcomes investment by companies from other countries to expand Thailand's LNG market. The country wants to continue its role as a partner to take care of global energy issues.

- Dr. Tun Naing, Deputy Minister, Ministry of Electric Power, Myanmar

Myanmar is in a position of fundamental need to develop its industries and to improve people's living standard. Gas is most likely the best answer for Myanmar's Long-Term energy needs because of significant gas reservoirs in Myanmar and environmental friendliness. To fulfil the gas demand of gas for power and industry in next five years, introduction of LNG is indispensable because current upstream development of natural gas requires 6 to 7 years to start production. MOGE, national oil and gas companies have already started

preparation of LNG import business and now welcome investor's intent for interest. To make use of LNG in domestic market, infrastructure for re-gasification is necessary. These challenges and researches on infrastructure and business model are now underway funded by the World Bank. Myanmar is willing to introduce LNG with the cooperation between producer and consumer.

- Prof. Hidetoshi Nishimura, President, Economic Research Institute for ASEAN and East Asia (ERIA)

The natural gas market in ASEAN is in transition, which will result in the import of a significant amount of natural gas to the ASEAN region by 2035. To enhance deployment of LNG, it is necessary to develop a mechanism to promote establishment of infrastructure from upstream to downstream. Considering that East Asia purchases LNG with the highest price in the world, it is essential to adjust price to utilize it as a fuel for power generation although it is clean in terms of environment. Establishment of price index is also important from the viewpoint of purchase contract as well as upstream investment. Consensus among producers and consumers in this region has also been achieved on the following points: (1) The relaxation or abolishment of destination restrictions, especially in the Free-On-Board contracts, is one key condition to creating hubs. (2) The liberalization of domestic markets is also key to increasing the number of traders and the amount of transactions. (3) The development of infrastructure for natural gas is equally important. It is through achieving the above three points that the security of supply for the future of this region can be realized.

Session 4: Opportunities in Emerging LNG Markets in Asia

- Mr. Masakazu Toyoda, Chairman and CEO, The Institute of Energy Economics, Japan (IEEJ)

Increasing LNG use in Asia hinges on LNG's competitiveness against other energy sources; and sufficient investment throughout the value chain. The LNG business has been led by industry players and is expected to be so in the future.

However, some features of LNG have resulted in difficulties in expanding LNG use solely dependent on market principles in the Asian markets. Taking into account of benefits and deficiencies of market mechanisms, governments need to play important roles when the market does have its own limitation.

- Mr. Seah Moon Ming, Chief Executive Officer and Executive Director, Pavilion Energy Pte Ltd.

In today's international LNG market, there are three opportunities for growth: Firstly, creating new markets for LNG: LNG Bunkering and small-scale LNG in Southeast Asia. Secondly, creating an LNG hub: Singapore is neither a significant LNG seller nor big buyer, making this price discovery platform comparatively neutral. Thirdly, developing LNG ecosystems: Promoting the transition from traditional fossil fuels to gas not only protects the environment, but creates sustainable value in the lives of our people.

- Mr. Leonid Mikhelson, Chairman of Management Board of Directors, NOVATEK

Novatek is constructing the Yamal LNG project, which is accompanied with huge gas reserves and has competitive production costs. The project is expected to achieve annual production capacity of 16.5 million tonnes in 2019. The company also plans another project, Arctic LNG, for which the company proceeds with a study to optimize investment costs. The LNG produced from those projects could reach the Asian markets through the Northern Sea Route in shorter time periods than through the Suez Canal. In order to achieve such transportation, the Yamal LNG project has ordered 15 ice-class LNG carries. The project is a competitive one and welcomes equity participation by Japanese companies.

- Mr. Michiaki Hirose, President, Tokyo Gas Co., Ltd.

As Tokyo Gas has been one of the biggest beneficiaries of the successful half century of LNG, the company intends to contribute to the LNG industry in the next fifty years taking advantage of expertise, knowledge and human resources it developed during the past five decades. Southeast Asia, which has supported development of the Japanese LNG market through stable LNG supply, now expects to increase its own LNG use significantly. The company aims to help LNG market development in the region. In order to achieve the goal, it is essential to have cooperation from trading houses, shipping, engineering, and construction companies, not to mention local prominent energy companies as business equity partners. Tokyo Gas now operates under its "challenge 2020 vision" strategy toward the year that begins the "next half century". The strategy boasts contribution to development of Southeast Asian LNG markets as one of its cores. The company has already launched its regional organisation in Southeast Asia and started talks on alliance formation with local energy companies.

- Datuk Mohd Anuar Taib, Executive Vice-President & CEO, PETRONAS

Asia is expected to increase LNG imports prompted by environmental concerns, new technologies including FSRUs, and decreasing domestic gas production, on the back of expanding population, economic activities and people's income levels. Based on three core values of stable supply, supply flexibility and cooperation with buyers, PETRONAS is poised to offer its value proposition throughout the LNG value chain in ensuring sustainability of the business. The first floating LNG production facility - Petronas FLNG is scheduled to start LNG production in February 2017. As LNG is a long term business, responsibility of sellers, buyers, and policymakers provides security, safety, and sustainability.

- Mr. Tadashi Maeda, CEO, Executive Managing Director, Japan Bank for International Cooperation (JBIC)

There are three keywords to watch when future development of the LNG market is considered, starting with "L", "N" and "G", respectively. As "Logistic" for

liquefaction and regasification is important, not only commercial banks but also governmental financial institutions play an important role in constructing infrastructure facilities. "New Players" of LNG production is emerging in Russia, where the Yamal LNG project is developed. "Government policy and commitment" play an important role in LNG market development in presenting overall energy policy direction. LNG market development in the Asian countries will be the key to establishing liquidity (similar to the one in the crude oil market) in the LNG market in the longer-term.

- Ms. Yenni Andayani, Gas Director of PT Pertamina (Persero)

Due to increasing domestic gas demand, more Indonesian gas production is expected to be allocated to domestic consumption, rather than exports. LNG imports are also expected as a future option. The Indonesian domestic market is not really ready to make long-term purchase commitments, although demand and supply are certainly there for LNG. The country still lacks enough receiving facilities. Even without such restrictions domestic users are not ready to utilise LNG yet.

- Mr. Laurent Vivier, President of Gas Division, Total S.A.

Asia is increasingly more important in the LNG industry. In order to develop new LNG markets, infrastructure development is the key. Technological development can reduce required time and costs to construct LNG receiving terminals and change assumptions of LNG transactions significantly. New importing countries, new consumers and new demand segments could bring rebalancing of the current oversupply in the market much earlier than previously expected.

[Comments during the panel discussions]

A coordinated approach is often needed between LNG procurement, infrastructure development, and securing demand, to introduce LNG to a market. This will be the case for new LNG markets in Asia. As stakeholders'

determination is also necessary, the government should make commitment to the importance of LNG in its energy policy. (Tokyo Gas)

Asia has two types of countries in terms of availability of natural gas supply: those countries with no alternatives other than LNG to obtain natural gas, such as Japan and Korea; and those with pipeline gas alternative such as China. LNG has an advantage of being able to reach market without geographical restrictions. Japan can contribute to LNG introduction by other Asian countries at all stages of the value chain from procurement and liquefaction to regasification and would like to create new LNG markets through such contributions. (JBIC)

In recent years the Asian premium of LNG prices has almost been eliminated. In order to ensure competitiveness of LNG, it is crucial to make efforts to reduce costs of LNG plant construction and production. (Novatek)

Consideration of competitiveness against coal is necessary when a market is to introduce LNG. When adverse impacts on human bodies and environment are taken into account, coal is not really cheap. In future LNG infrastructure development, new technologies such as FSRU and further cost reductions should be considered, which should enable new market development. (Petronas)

Delays of FIDs are inevitable under the current low-price environment. Total embarks on solving the problem by reducing costs and investing in downstream projects to create new demand. As the spot LNG market in Asia has not really established, traders and portfolio players need to stand between suppliers and consumers to provide bridges to long-term contracts that are needed for new project development. (Total)

Session 5: Keynote Speeches on Producer-Consumer Cooperation

Speeches

- Dr. Urban Rusnák, Secretary General, Energy Charter Secretariat

The Energy Charter Treaty has major LNG producing countries including Australia, Norway, and Russia, as well as major consumers including Japan,

Turkey and European countries as its signatory nations. As LNG is an energy source that requires massive investment and, depending on regions, re-gasified LNG is transported by cross-border pipeline, the Energy Charter Treaty covers issues of protection of such investment and stable transportation of energy. The Energy Charter initiated its work on a Multilateral Framework Agreement on Energy Transit. Destination clauses in the long term LNG contracts could be seen as an obstacle for the international gas trade, as the clauses limit the free flow of the commodity. This does not reflect actual situation of LNG business and could be eliminated from long-term gas contracts.

- Dr. Sun Xiansheng, Secretary General, International Energy Forum (IEF)

The world faces three global challenges of economic development, climate change issues, and development to a sustainable society, as well as three energy market challenges of reducing greenhouse gas and other emissions, access to clean energy sources, and managing market volatilities. The LNG industry observes expanding gas markets, emergence of new pricing signals, slowing investment activities in LNG related facilities, and renegotiations of long-term contract pricing due to lower spot prices. More timely and complete data on demand and supply, transparent and effective as trading hubs, and a standard format of contracts that reflects interest of both producers and consumers should be developed toward future LNG market development.

- Mr. Francesco Fini, Deputy Head of Delegation, European Union delegation to Japan

Both pipeline gas and LNG will continue being an important energy supply source for Europe. LNG has an important role in diversifying energy supply sources for EU member states. EU published an LNG strategy statement in February 2016, in which policy directions were presented for infrastructure development, right pricing signals, and contribution to a liquid and transparent LNG market. LNG contracts without destination restrictions will contribute to both gas supply security and competitive gas supply. Constructive discussions on these issues at meetings of G7, G20 and IEA are necessary.

- Mr. Masaki Mita, Head of Argus Media Limited Japan

The Argus Northeast Asia (ANEA) DES index is one of Argus' most liquid LNG indices, representing physical cargoes delivered into Japan, Korea, Chinese Taipei and China. It reflects the marginal market price of LNG into northeast Asia, and is often referred to as the LNG index which "is quickest to reflect the true market price". ANEA is based on collected information about actual trades, its refinement and finding the "true" price. ANEA is fully compliant with the international PRA Principles, known as the IPRO Code. As the global LNG market becomes increasingly driven by fundamentals - rather than just simply tracking the oil market - it is essential to understand the supply and demand dynamics which are driving it. Argus maintains a global database of spot LNG cargoes that the market is bidding for and offering. This trade data underpins the ANEA index and enables Argus to track spot market liquidity in a transparent way. Because ANEA tracks METI's Japanese spot LNG price data very well, it can be a good benchmark to reflect Japanese LNG price.

- Mr. Benjamin Wetherall, Head of Gas, ICIS

ICIS has LNG editorial teams in Tokyo, Singapore, Houston, and London. ICIS East Asia Index (EAX) is an assessed DES price in China, Japan, Korea and Taiwan, and is published at 16:30 Singapore time every trading day. The price is assessed based on information from 93 players with diversified geographical and trading positions. Appropriateness of price is verified with actual trading data and tanker movements collected by ICI S. Assessment of ICIS is fully compliant to IOSCO's guideline, and is independent, neutral, transparent, and is backed by ample experience.

- Mr. Naruhito Yanagi, Vice President, and Mr. Mizuki Fukami, LNG Chief Editor, Rim Intelligence Co.

Rim publishes its spot LNG price assessment - DES Japan, based on its proprietary survey on offers and bids, as well as agreed transactions, as well as reference to prices on JOE and CME. Rim does not provide a trading platform where actual cargo transactions are made.

- Ms. Shelley Kerr, Director - LNG, Coal, Nuclear, S&P Global Platts

Platts JKM assessment is based on information from 75 industry players, including sellers, buyers and traders. The key point here is that JKM has been adopted in short and medium term transactions, as well as long term contracts, including one between Chubu Electric Power and BP. It is also used as an index to determine prices of LNG and natural gas in Mexico, Thailand, Jordan, Brazil and India.

- Ms. Lily Chia, Head of Oil, Power & Gas for Derivatives, Singapore Exchange Limited (SGX)

"SLInG" (SGX LNG Index Group) is a series of spot indices for Asian LNG developed by SGX. It is the calculated average of expert assessments, contributed by a balanced portfolio of producers, consumers and trading companies. Singapore SLInG started in 2014 and currently has 24 participants and 100 subscribers. North Asia SLInG was launched in September 2016. When the index is published, SGX ensures the no price manipulation is made, through gathering information from experts with various backgrounds.

Observers' Comments:

- Mr. Kaoru Kanie, Business Development Manager, Intercontinental Exchange (ICE)

ICE publishes ICE JKM Futures (a.k.a. JKM Swap). Its trading volume and open interest of have increased this year, particularly that of the one year future trade. ICE encourages the industrial players in LNG market to reduce hedging cost using ICE products instead of OTC arrangement.

- Mr. Nicolas Depuis, Senior Director, Energy Products – Asia Pacific, CME Group

There is a strong consensus that LNG price is linked to LNG benchmark instead of crude oil price. Because of its high price volatility, hedging needs of LNG market is high. CME's Henry Hub futures can be an effective tool for hedging as

it is a very liquid market.

- Mr. Kosuke Araki, Senior Manager, Research Institute of Market Structure, Tokyo Commodity Exchange, Inc. (TOCOM), Director, JAPAN OTC EXCHANGE (JOE)

Market exchange has two functions: price discovery and risk hedging. High trading liquidity is needed for price discovery function, but in LNG market, standardizing of trading conditions is difficult and thus OTC price becomes better price information. Market exchange therefore needs to provide risk hedging function based on OTC price information, and in case of TOCOM, established JOE to proactively provide a price discovery system based on OTC trading. TOCOM plans to launch a futures product with physical delivery in 2017, and also actively forms an alliance with international partners such as SGX or Platts, which enables. Price benchmarks already exist. It is market players' decision to determine which benchmark is most appropriate.

(Panel discussions)

- Trading information is often provided by industry players as many players are interested in forming a market price by themselves. Japanese players are on the other hand reluctant to provide information, and it is desired they will become more open-minded to disclose such information. (Argus)
- RIM would like the industry to “open door” as RIM ensures confidentiality and fairness of trading data. (RIM Intelligence)
- Reviewing the assessed price level is equally important to information collection. (Platts9)
- The key of price reliability is the number of market participants. Larger number of participants enables democracy of price information assessment. (SGX)
- Cross checking of futures price and PRA's assessment will ensure the reliability of PRA's assessment prices. (ICE)
- In European gas market, market deregulation encouraged gas companies to engage in more spot trading and enhanced liquidity. It is expected Asian gas market will follow the same path. (CME)
- Even if spot trading will not be active in the future, swap trading can

provide price information reflecting actual trading like TOCOM's Middle East crude futures does. TOCOM)

- Market liquidity has significantly improved than in five years ago. Market deregulation can be a catalyst to change the market. (ICIS)

Closing remarks:

- Mr. Ryuichi Yamashita, Director-General, Natural Resources and Fuel Department, Agency for Natural Resources and Energy, METI

The conference heard discussions on (1) developments toward more liquid LNG market - increasing flexible and shorter contracts and diversified pricing mechanisms; (2) producer - consumer cooperation to promote more consumption of LNG in Asia; and (3) formation of user-friendly, reasonable and transparent price indices. The ministry intends to continue efforts to ensure this conference keeps its important role to provide a platform for those discussions.