

Summary Statement

LNG Producer-Consumer Conference

16 September 2015 Tokyo

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

The fourth LNG Producer-Consumer Conference was held on 16 September 2015 in Tokyo, and attended by more than 1,000 company executives and government officials, as well as analysts, from combined more than 50 LNG producing and consuming countries, regions and international organizations, including two ministers, with Mr. Yoichi Miyazawa, Minister of Economy, Trade and Industry, Japan, representing the organisers. 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. Yoichi Miyazawa, Minister of Economy, Trade and Industry, Japan

The LNG market recently has seen increasing spot cargo transactions, relaxation of destination restriction and diversification of pricing. It is important to bring about mutual and sustainable benefits to both producing and consuming countries by supporting those profound changes and developing a well-functioning market. Japan is going to be more conscious of economics of LNG procurement in addition to stable supply in the face of planned liberalisation of electric power and city gas markets, as well as declining share of

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LNG-fired power generation. The year 2016 will see the first LNG exports from the United States and increasing production of LNG in Australia and other producing countries. It is important to develop and taking advantage of a well-functioning market with more flexible contract conditions while LNG project investment decisions are being made. At the same time it is also necessary to enhance capability to respond to emergency in the international LNG market. While cooperation among consuming countries, and information sharing between producing and consuming countries should be enhanced, the issue of development of a well-functioning LNG market will be raised at the G7 energy minister meeting next year aiming at develop mutual trust between countries.

Keynote Speech:

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

During the past twelve months in the global gas market, shale gas production in the United States continued to grow and slow recovery of gas demand in Europe was observed. Demand has been weaker in North Asia due to warmer winter and slowdown of economic activities while LNG demand has been increasing in India. Imports of LNG have started in Jordan, Egypt and Pakistan as Latin American countries are increasing use of LNG for power generation. While new export projects gearing up for start to add 110 million tonnes per year in next three to four years and demand is expected to grow, consumers now take wait and see positions, not in a hurry to sign new long-term contracts. However in order to secure future supply to meet expected demand growth, investment should be made. Qatar continues its efforts to respond to customers' need by reducing the cost, improving efficiency and reliability in LNG production and promoting environmental and economic benefits of gas, including reduction of flaring and other emissions.

- Mr. Jae-do Moon, Vice Minister, Ministry of Trade, Industry and Energy, Korea

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The global LNG market has been showing signs of becoming a buyer's market due to the fall in oil prices, economic recession and increase in shale gas production. Under these circumstances, ensuring flexible contract conditions and relatively low prices compared to competing fuels will be important for LNG to maintain its competitive edge over other energy sources. Northeast Asian countries are recommended to conduct joint research on relaxation of destination and take-or-pay clauses, diversification of supply sources including pipeline gas, and an Asian LNG hub. Korea will hold the World Gas Conference in 2021.

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

As natural gas has been squeezed out of the market by emerging use of coal and renewables, a golden age of gas is still merely a dream for many people. As exemplified in India and ASEAN countries, the traditional idea that Asian markets would accept LNG at any price as natural gas demand is continue increasing has turned out to be wrong. LNG projects need to have competitive advantages against coal and renewables. In addition to better economics, supply security is also essential to realise a golden age of gas. The IEA continues its efforts to improve natural gas emergency preparedness in collaboration with governments. With adequate investment, appropriate policy measures, and cooperation among producing and consuming countries, a golden age of gas will be realised on the global basis.

- Mr. Bill Walker, Governor of Alaska

A gasline/LNG export project is the State of Alaska's number one priority. The state is developing a regulatory and statutory package to realise LNG exports by 2024. Alaska's LNG is the closest to the Asian market among LNG projects in the United States. Much of Alaska's gas is associated gas, which is produced with the oil each day. Alaska's North Slope has a large proven and potential conventional gas resource of more than 200 trillion cubic feet. This trip to Korea and Japan inspires potential of increasing LNG exports from Alaska. An MOU has been signed with the governor of Kyoto regarding LNG supply to the Japan Sea Coast. Alaska is ready to take gas to the Asian markets.

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Session 1: Gas Security

- European Commission

The EU's current gas system suffers from a number of deficiencies such as several Member States being heavily dependent on a single supplier and lack of supply diversity having significant impact on the competitiveness of market prices. As one of the potential ways of addressing the deficiencies, the European Commission is currently developing a comprehensive LNG strategy to be announced in early 2016. The strategy will aim at exploiting opportunities, offered by LNG markets becoming more global, liquid and more competitive, for reliable, diverse and competitive gas supplies to the EU. It will look at both the internal EU dimension (infrastructure needs, regulatory barriers) and the international aspects (future development of the global market).

- Department of Energy, United States of America

According to the Energy Information Administration (EIA) the global LNG production capacity is expected to expand by 32% by the end of the decade. LNG pricing is also changing with persistent weakness of oil prices and diversification away of oil linkage. While Chinese demand is allowing and nuclear power is returning in Japan, spot LNG transactions are increasing. Europe has challenges to diversify supply sources and routes while developing a single European gas market. In the United States unconventional gas production doubled from 2010 to 2014. Lowering production costs have enhanced competitiveness of shale gas. LNG production capacity under construction and planning stages amounts to 100 bcm per year in the United States. The Department of Energy has ceased to issue conditional license to export LNG to streamline the approval process.

- Agency for Natural Resources and Energy, Ministry of Economy, Trade and Industry, Japan (Mr. Satoshi Kusakabe, Commissioner)

Japan's LNG demand is expected to decrease to 62 million tonnes in the fiscal 2030 from 90 million tonnes today. Encouraged by the planned market liberalisation, electric power, city gas, and petroleum companies are expected to mutually enter into each other's traditionally segregated energy markets. LNG

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procurement sources will be diversified by newly starting supply from the United States and incremental production from Australia, and so on. It is essential to enhance LNG supply security on the global basis. To achieve this goal, recommendations include: broad range of cooperation between producing and consuming countries beyond energy issues; cooperation among energy consuming nations on energy saving and emergency mutual assisting measures; supporting measures to develop a well-functioning LNG market by relaxing destination restrictions and promoting more spot transactions; and strengthening gas market analysis and establishing emergency communication network through IEA.

- Energy Market Authority, Singapore

Singapore believes that diversification is the key to energy security. Thus, Singapore adopts a multi-pronged approach to ensure diversification, by having a good mix of LNG and piped gas, through diversification of sources, by having a mix of long term, medium term and short term gas supplies, by having multiple aggregators for procurement, and by allowing diversity in gas pricing. LNG trading is an important component in facilitating diversification and enhancing energy security. In order for LNG trading and gas price discovery to flourish, there are four important requirements – the removal of destination restrictions, availability of infrastructure, transparency of rules and industry support.

- Economic Research Institute for ASEAN and East Asia (ERIA)

Natural gas assumes an increasingly significant role in East Asia, largely playing down the dominating role of coal. A sustainable regional natural gas market, which implies security and flexibility, is called for. The following policies are recommended to enhance the competitiveness of natural gas as a clean energy in East Asia: sharing understanding of possible benefits brought about by expansion of flexibility and rationalization of pricing; accelerating the process of domestic natural gas market liberalization; encouraging and facilitating regional natural gas trading hub; formation of intraregional agreement on the natural gas and LNG trade; and market monitoring based on such agreement.

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Session 2: LNG supply outlook & Actions by producers

- Department of Industry and Science Australia

The global LNG market is undergoing an easing of supply-demand conditions. Global LNG imports will lag increasing supply. Supply-side competition is becoming fiercer. New project delays and deferrals are becoming more common globally as investment capital becomes scarce. Beyond 2021 the current oversupply is expected to be largely absorbed by demand growth. Australia's industry is becoming increasingly cost competitive. The Australian Government is also working with industry on a range of measures to add to our cost-competitiveness. As a reliable supplier, Australia also brings to bear its advantages as a stable investment destination.

- Ministry of Energy and Mineral Resources, Indonesia

As Indonesia's domestic natural gas demand increases and production does not catch up with the pace, the country is expected to start importing gas in the next several years. However the country still has abundant conventional and unconventional natural gas resources, the government encourages domestic and international companies to develop them. As domestic natural gas demand is expected to increase by 20% in the next five years, USD 32.4 billion should be invested in numerous receiving terminals and pipeline networks. The country is discussing with neighbouring ASEAN countries to develop regional LNG hubs.

- ExxonMobil Gas and Power Marketing Company

The low price environment has sparked concern about the future competitiveness of liquefied natural gas (LNG) projects. LNG will continue to assume a growing share of the global gas trade. Supply constraint may arise by the latter half of the 2020s. The challenge lies in developing supplies fast enough to keep up with the growing demand. ExxonMobil will bridge the gap between long-term opportunities and short term-challenges so LNG can fulfill its potential to meet the world's needs.

- Total Gas & Power Ltd.

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While the LNG market undergoes profound changes - arrival of new LNG volumes from the United States, evolution of contractual terms, the impact of low oil prices, and slow economic growth - two LNG worlds are expected to coexist: LNG under long-term contracts remain preponderant; but the recent changes are favoring further development of a physical spot market and entrance of new players. TOTAL group's LNG strategy is to expand its portfolio with increasing flexible volumes and market access with regasification in Europe, India and global onshore gas trading presence. The diversified portfolio and risk management capabilities allow TOTAL to meet its customers evolving needs.

- Sempra LNG

Benefits of LNG from the United States include abundant gas resources, gas market liquidity, and competitive and flexible LNG supply. In addition to Cameron LNG Trains 1-3, Sempra LNG develops Cameron Trains 4&5, Port Arthur Trains 1&2, and Energía Costa Azul Trains 1&2 that are developed on the existing site of a regasification terminal on the West Coast of Mexico. Trains 1-3 of Cameron LNG are under construction and expected to start commercial operation in 2018. Trains 4 - 5 are expected to come online in 2019 - 2020, and the Port Arthur and Costal Azul projects are expected in 2021 - 2022.

- Jordan Cove LNG LLC

The Jordan Cove LNG project is expected to supply cost-competitive LNG to Asian buyers, taking advantage of relatively short transportation distance, established gas pipeline infrastructure, and competitive feed gas supply from Western Canada and the Rockies. As the project adopts a tolling model similar to other projects in the United States, buyers will be able to procure volumes without destination restrictions. While recent low oil prices hinder new LNG project development, this project is favoured by those buyers who understand its strategic advantages.

Session 3: LNG demand outlook & Actions by consumers

- JERA Co., Inc.

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As one of the biggest buyers of LNG in the world JERA intends to establish new fuel procurement models and support innovation and change in Asian LNG by: diversifying and optimizing our portfolio of long-term, mid-term, short-term and spot transactions, introducing more market index pricing, enhancing our trading function to enable flexible response to demand fluctuations, and contributing to LNG project development through investments and/or train capacity sized procurement. For successful sellers, it will be important to understand the changing needs of buyers and to work with buyers to create solutions.

- CPC Corporation, Taiwan

The global LNG market is undergoing fundamental changes driven by multiple sources, multiple players, multiple participation and multiple applications. The Asian LNG market - characterized by long-term LNG supply contracts - will shift towards a more liquid spot market. The forces driving movements in the prices of LNG will continue to operate. LNG producers and consumers will therefore have to be more creative in dealing with these issues and work together to explore the potential of a promising future.

- Tokyo Gas Co., Ltd.

Tokyo Gas implements measures to strengthen its business value chain and expand its global reach by: diversifying and expanding its LNG procurement and upstream projects; pursuing energy service and engineering opportunities; and establishing overseas LNG value chains. The company continues exploring natural gas demand not only in Japan but in Asia as a whole. Sellers are asked to enhance win-win partnership by offering competitive LNG deals.

- Petronet LNG Ltd., / GAIL (India) Ltd.

India is becoming an LNG demand center with expected incremental demand of 9 - 10 million tonnes per year from power generation, fertiliser and vehicle fuel sectors. As global LNG production and receiving capacities are expanding, the market is rapidly maturing and prices are converging with some time lags. As in North America, increasing number of smaller producers have contributed to

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higher liquidity in the market. Similarly competition is being intensified between suppliers in the LNG market.

- CNPC Economics & Technology Research Institute

Because of the weak economic growth, China's natural gas consumption may not reach 300 bcm in 2020 without substantial supporting policy measures, far short of the government's plan of 360 bcm. The Chinese government has a plan for natural gas supply capacity of 400 bcm in 2020. Although the development of unconventional gas and SNG is not advanced as expected, imports are going well according to the plan. Total amount of imported LNG might be 40 - 45 million tonnes in 2020. The expected excess supply will give China the best chance to promote reform of natural gas market, including pricing mechanism, third party access and market deregulation.

- The Institute of Energy Economics, Japan (IEEJ)

Enhanced flexibility of LNG transactions is essential to realise a functioning LNG market in Asia. The market should also introduce pricing mechanisms that timely reflects prevailing market conditions. Supply security measures should include those of flexible contract terms and conditions and price signals, not necessarily limited to purely balancing measures. In order to secure timely investment in upstream development, it is necessary to promote better investment environment, more flexible take-or-pay applications, equity participation by companies from importing countries, and institutional supports by governments from importing countries.

- Ministry of Economy, Trade and Industry, Japan (Mr. Takayuki Sumita, Director-General for Commerce, Distribution and Industrial Safety Policy)

Profound changes are underway at the both supply and demand ends of the global LNG market: the shale gas revolution, relaxation of destination clauses, call of highly flexible supply, increasing geopolitical risks and diversification of supply sources, and the planned energy market liberalisation in Japan. While the planned market liberalisation will no longer allow importers to pass on LNG costs to customers, crude oil futures are not suitable for hedging new types of

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contracts, such as spot LNG trades as well as gas-price linked LNG contracts. Those changes have been increasing the necessity of hedging LNG prices in Asia. Japan OTC Exchange's LNG futures market has seen an increasing number of participating companies and its first deal was done in July. Along with the increasing needs of hedging, the number of transactions at JOE is also expected to increase. More companies are encouraged to join the JOE market.

Session 4: New LNG demand, Natural Gas as fuel

- Ministry of Land, Infrastructure, Transport and Tourism, Japan

The ministry recognises importance of natural gas to diversify transportation fuels and have provided assistance to CNG vehicles in accordance with the policy to increase the share of next generation vehicles - including CNG powered ones - to 50%-70% by 2030. The ministry also appreciates LNG as an even more intensive fuel enabling a driving distance of more than twice of that of CNG vehicles. As there are still technical issues to overcome before commercial use of LNG as a vehicle fuel, the ministry intends to help technology development and establish consistent standards in collaboration with auto manufacturers.

- Shell

LNG is emerging as a cost-competitive and cleaner burning fuel for shipping and heavy-duty road transport. The transportation sector has the total fuel demand of 750 million tonnes per year of LNG equivalent. If 10% - 12% of it was converted to LNG, it would lead to 80 - 100 million tonnes of incremental LNG demand. LNG's development as a successful fuel option requires infrastructure, the right regulatory framework to foster growth, and a good business case for customers to invest in new vehicle technology. Shell is focused on developing a network of LNG fuel stations for heavy-duty trucks in the United States. In Europe, Shell already operates LNG refuelling business for ships and trucks. Shell tries to develop new demand for LNG in the transportation sector.

- Nippon Yusen Kabushiki Kaisha (NYK Line)

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NYK is developing LNG-fuelled vessels and LNG bunkering operations as the company considers LNG as a next-generation vessel fuel to cope with stricter environmental regulations and mitigate risks of spikes of liquid fuel prices. The company received delivery of Japan's first LNG-fuelled tugboat in August 2015. The company also expects a dual-fuelled newbuild ship in the second half of 2016 that can run on either oil or LNG. ENGIE, Mitsubishi Corporation and NYK have ordered an LNG bunkering vessel to be based in Zeebrugge port in Belgium starting LNG bunkering operation in fall 2016.

- Isuzu Motors Ltd.

Natural gas fuelled vehicles (NGVs) are expected to expand their reach helped by dramatically enhanced availability of the fuel through the shale gas revolution and driven by advantages of natural gas in terms of environmental friendliness, economic competitiveness and energy security, as well as perceived contribution to Japan's policy of national resilience. Measures should be taken to improve natural-gas fuelled engines and other related products, reduce natural gas prices, and expand natural gas refuelling station networks. The company plans to start marketing heavy-duty CNG trucks and also considers LNG-fuelled vehicles. Through international standardization and harmonization initiatives by the government and companies which should make less expensive parts and materials available, the company plans to further reduce vehicle prices.

Session 5: Unconventional Gas Developments

- Citigroup

Unconventional natural gas production in North America is expected to continue increasing. “Golden Age” of gas production continues over there against the background of the huge potential to increase production, keeping prices low. As expected increase of renewables limits the potential for much stronger gains in gas demand for power generation, LNG exports will be necessary to absorb increasing production. Although LNG demand is lackluster so far; supply shortage could loom in the 2020s. Increasing LNG exports from

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the United States should establish a new wave of global gas supply.

- Japan Oil, Gas and Metals National Corporation (JOGMEC)

JOGMEC provides equity and liability guarantees to multiple shale gas development projects in Canada involving Japanese companies. JOGMEC also develops partnership with gas producing nations exemplified by an MOU with Pemex and an MOC (Memorandum of Cooperation) with Canada's NRCAN. JOGMEC has accumulated expertise and understanding toward methane hydrate monetization through conducting the first onshore and offshore extraction tests in the world. JOGMEC implement measures to contribute to global stable energy supply as a Japanese government-backed agency.

- University of Buenos Aires, Argentina

While resources of 800 TCF have generated great expectation in Argentina, unconventional gas production represents less than 1% of annual consumption. Development activities are focused on the Vaca Muerta Formation. Although the country has huge potential of shale gas production, a wide variety of challenges are present including in-depth geological knowledge, fracking design and response, water accessibility and disposal, equipment availability.

- CNPC Economics and Technology Research Institute

The Chinese government and companies has invested CNY 23 billion in shale gas exploration and development. The shale gas output in China also increased from 200 million cubic meters in 2013 to 1.3 billion cubic meters in 2014. The shale gas production is expected to reach 6.5 billion cubic meters per year by the end of 2015. However, shale gas is facing huge challenges: weak gas demand and high cost of shale gas development. Globally LNG oversupply will last at least 3 - 5 years. The uncertainty continues over competitive relationship between oil-linked and Henry Hub linked LNG prices in the Asian LNG market.