Japan's city gas and electric power industries are undergoing unprecedented but somewhat anticipated structural changes brought about by the recent regulatory restructuring. The process in fact dates back as far as 1995, when gas sales to the largest industrial customers were opened for competition. The ensuing regulatory measures have been considered and implemented extremely carefully so as not to jeopardise security of supply at affordable prices to end consumers in a country who does not have a lot of energy production within its territory. During the period the country's LNG market has successfully grown to be the largest and the most diversified in the world in terms of volumes, as well as numbers of both supply sources, importers and their receiving facilities, incorporating great flexibility in procurement with around 30% of the total volumes coming from short-term contracts and spot cargo purchases supplementing the main-stream long-term purchase contracts. In the latest stage of the industry restructuring, as the retail markets are opened for competition, city gas and electric power companies are entering into each other's home grounds by taking advantage of their own muscles and expertise, leading to the most unique, realistic and useful competition in the energy consuming market in the world. This revolution in the largest LNG consuming market in the world is having a significant impact on the rapidly expanding global LNG market, too. The evolutions affected by the Japanese developments include initiatives to abolish unnecessary destination restrictions and evolving LNG sale contract conditions.
Introduction

In parallel with the ongoing massive expansion the global LNG market, the Japanese LNG market has been undergoing another revolutionary change: domestic retail energy market restructuring. Since Japan has been the largest LNG market in the world since 1970 and the largest importer of natural gas as a whole in the world since 2011, the impact of this revolution would not stay within its national border, worth being called a third revolutionary event in the global LNG industry in recent years, following the shale revolution and the ongoing unprecedented expansion of the LNG industry. As the retail energy market liberalisation is part of Japan's overall energy strategy, other measures in the strategy has been designed to work hand in hand with the retail energy market liberalisation. The strategy intends to bring benefits to consumers with more competitive energy supply. The strategy also intends to make Japanese energy companies globally more competitive, in turn leading to more benefits to energy consumers.

Two years have passed since Japan's city-gas retail market for all the market segments was opened for competition. Along with the liberalisation of the electric power retail market implemented one-year earlier, competition has been the fiercest in the biggest urban areas between city-gas and electric power utility companies penetrating each others' traditional customer bases. The companies who have sometimes helped each other in LNG procurements and competed against each other in end-user energy supply are now directly trying to deprive each other of traditional customers - creating one of the most sustainable and much unique battle grounds of energy suppliers around the world.

After twenty-one months passed since the latest city-gas full retail competition was introduced, mostly targeting smaller and residential customers, 1,701,374 customers, or 6.7% of the total, had switched their suppliers as of the end of December 2018. As 8.27 million electric power retail customers, or 13.2% of the total, had switched their suppliers as of the end of October 2018, readers may have an impression that progress of liberalisation looks slower in the city-gas market.

However, the share of volumes sold by new entrants used to be much higher in the city-gas market than that in the electric power market, ever since the large-volume sales of city gas was liberalised in 1995 until as recently as three year ago. The shares of volumes sold by new entrants in the two markets have been rather comparable to each other during the last twelve months. In addition to supplier switching, in the designated transitional supply franchise areas, where transitional regulations are applied because of concern over less effective competition, more and more customers have switched to deregulated pricing provided by the respective incumbent city-gas utility companies. Furthermore, accelerated activities have been observed from newly entering players to acquire more customers, especially in the Kanto region in recent months, after the new players have taken measures to deal with gas procurement and other necessary issues.

The four biggest city-gas companies are all alarmed at the switching rates - losing rates for them - in their respective service areas after one year of retail competition, as they are all beyond their prior anticipation, encouraging better quality of customer service by both existing and new providers.

Players in the Japanese energy industry are entering an era of unprecedented competition and alliances, trespassing regional and industry borders, leading to significant restructuring of the nation's energy industry. The significant changes could have, and already have had, rippling effects on LNG procurement activities.

This paper looks at major developments in the competitive city-gas market resulting from the recent liberalisation of the city-gas retail business, as well as partnering and alliancing activities between companies responding to the recent competitive environments.
1 Competition in the City-Gas Market

The city-gas industry had been liberalised in four partial openings of the markets, leading to the full liberalisation in April 2017. The sales to large-volume customers with annual consumption of more than 2 million m³ were deregulated in 1995, opening 49% of the gas market in volume basis for competition. This was followed by subsequent partial liberalisation in 1999 (covering 53% of the total gas sale volumes), in 2004 (57%), and in 2007 (64%), resulting in majority of gas sales volumes already liberalised even before the latest full liberalisation.

Figure 1 A Brief History of City-Gas Liberalisation

(Source) Material on "Full Liberalisation of Retail Sales of Electric Power and City Gas" by the Electricity and Gas Market Surveillance Commission (EGC)
Although shares of new entrants in electric power sales volumes had been increasing since the electric power partial liberalisation started in 2000, the shares had been relatively lower than those of new entrants in city-gas sales volumes. One of the reasons had been limited electric power sources for new entrants as traded volumes in the whole sale electric power exchange, which was inaugurated in 2004, had not been enough. On the other hand, shares of new entrants in city-gas sales volumes had been stepping up, especially rapidly since the liberalised market was expanded to sales to those customers who consumes more than 500,000 m$^3$ a year in 2004, until the shares reached 17.0% in the fiscal 2011 (the year ending in March 2012). Thereafter the shares declined until the fiscal 2014, as large volume gas sales for power generation were switched over to self consumption by those power generators. The shares of new entrants have been increasing again since the fiscal 2015. In the city-gas market, competition had been fierce as new players, mostly electric power companies who had been procuring LNG for their own purposes, were entering the market for large-volume gas sales.

1,701,374 retail customers have applied to switch their city-gas providers as of the end of December 2018 in the nation, representing 6.7% of the nation's total number of customers at the time when the full retail liberalisation was implemented. Among the total switching customers, 731,687 were in the Kinki (or Kansai) area, followed by 663,786 in the Kanto, 230,902 in the Chubu/Hokuriku, and 74,999 in the Kyushu/Okinawa areas. As the Tohoku and Chugoku/Shikoku areas have not seen switchings yet, city-gas supplier switchings have been largely limited only to the service areas of the four biggest city-gas utility companies. As majorities of those customers acquired by the new entrants have been acquired by the local electric power companies in the same areas who already had owned LNG related infrastructure before the liberalisation, effective competition has been between incumbent city-gas and electric power utility companies in the same areas.
The Kinki area has seen higher numbers and shares of switchings to new entrant providers than other areas, indicating fiercer competitive environment. This is partly because Kansai Electric Power Company as a new entrant into the city-gas market in the Kinki area already had gas heating value adjusting facilities which was needed to physically provide grid-quality gas by the time of city-gas liberalisation. Although the numbers of customers who have changed their city-gas providers have been smaller in the Chubu and Kyushu areas than some other areas, the shares of such customers in the totals have been higher than the Kanto area. In Kyushu in particular, approximately 20,000 customers, or 2% of the total, changed their city-gas providers in August 2017 alone, thanks to aggressive efforts by new entrants.

During the first year of the city-gas retail liberalisation, customers’ switching rates were in general higher in the western parts of the country. Although the Tepco (Tokyo Electric Power) Group has lagged Kansai Electric Power in entering the city-gas retail business, the number of customers switching from incumbent city-gas providers to new entrants in the Kanto area has started increasing steadily. Various new entrants have expressed their intentions to start city-gas retailing in the Tokyo Metropolitan area as they see business opportunities in the big market and even fiercer competition is anticipated there. There have been intense regional battles in the Tokyo Metropolitan, Chubu, Kinki and Kyushu areas since the city-gas retail liberalisation was implemented, as indicated in the numbers of customer switchings presented earlier.
In the Tokyo Metropolitan area, Tepco Energy Partners (TepcoEP) did not start city-gas residential retailing until July 2017, three months after the liberalisation. TepcoEP set a goal to acquire only 40 thousand city-gas retail customers in the fiscal 2017 (the year ending in March 2018), not only because of the late entry in the market, but also because of the physical volumetric limit of city-gas supply as it does not have city-gas heating value adjusting facilities to provide pipeline quality gas and rely on heating value adjusting services from Tokyo Gas. Hence, TepcoEP has been forming partnerships with different companies in city-gas retailing business, heating-value adjusting facilities, and city-gas retailing business in other areas. TepcoEP’s partnership strategy is described in a latter chapter.

In the Kinki area, Kansai Electric Power acquired 420 thousand city-gas retail customers during the first year of city-gas liberalisation. The company targets to acquire cumulative 800 thousand customers in early fiscal 2019, which represents one-tenth of Osaka Gas’ total customers. In the Kansai Electric Power’s medium-term business plan set in May 2017, city-gas business is stipulated as one of the most important sectors to grow, with gas sale volumes to expand from 710 thousand tonnes in the fiscal 2016, to 1 million tonnes in the fiscal 2018 and 1.7 million tonnes in the fiscal 2025. The company partners with Iwatani, a major player in LPG business, in gas sales and safety related operations, where new entrants may encounter difficulties.

In the Chubu area, Chubu Electric Power has already acquired nearly 200 thousand city-gas retail customers in the former franchise area of Toho Gas by the end of November 2018. Chubu Electric Power established CD Energy Direct Company with Osaka Gas in April 2018, to initiate city-gas supply business in the Tokyo Metropolitan area, where the joint-venture company hopes to acquire 200 thousand city-gas retail customers in the fiscal 2018.
In the Kyushu area, Kyushu Electric Power has acquired more than 55 thousand city-gas retail customers in the former Saibu Gas’ franchise area. Kyushu Electric Power has stipulated city-gas retail business as one of the most important business measures in its medium-term business strategy. The company entered the former Saibu Gas city-gas franchise areas in Fukuoka and Kita Kyushu in April 2017. Its first-year goal of 40 thousand city-gas retail customers was achieved within the first six months.

The other areas have not seen actual city-gas supply by electric power companies yet as of November 2018. However, in Hokkaido, Hokkaido Electric Power started operating its own LNG tank of 230 thousand kl from August 2018 at the Ishikari LNG receiving terminal operated by Hokkaido Gas. Hokkaido Electric Power intends to enter the city-gas business upon completion of the tank, with a sale goal of 10 thousand tonnes per year. In the Tohoku area, although Tohoku Electric Power has not supplied city-gas to any residential customers, the company set, in its medium-term business strategy in January 2017, gas sales volume goals of 450 thousand tonnes in the fiscal 2020 and 600 thousand tonnes in the fiscal 2030, respectively, compared with 340 thousand tonnes of actual sales in the fiscal 2015. The Hokuriku, Chugoku, Shikoku, and Okinawa areas have not seen any customer switching yet.

Both incumbent city-gas and electric power utility companies, as well as new entrants, commonly put emphasis on combined offers of city-gas and electric power. This trend of combined offers not only provides opportunities of acquiring customers of both products but also risks of losing customers of both products. If a competitor reduces offering electric power prices, another competitor may have no choice but to reduce its own electric power prices so as not to lose its city-gas customers, too.

Kansai Electric Power in May 2018 announced and reported to the authority that the company would reduce electric power retail prices from July, taking into account of the restart of No. 3 and 4 units at its Ohi Nuclear Power Plant, following the preceding price reduction in August 2017 based on then-anticipated restart of No. 3 and 4 units at its Takahama Nuclear Power Plant. The latest reduction from JPY 17.08 to JPY 16.44 / kWh will bring back the company’s price level back closer to that before the price hike in May 2013 after the nuclear shutdown. At the same time, the company expand its electric power and city-gas combined pricing programs offering high-consuming low-voltage electric-power customers, including stores, offices and restaurants. Osaka Gas has also announced a plan to reduce electric power retail prices in July 2018. In a typical plan with city-gas combined, the company claims that its residential retail prices will be cut by approximately 4.6%, resulting in lower prices for the company’s customers than those for the main competitor’s customers at all consumption levels. And the competition may well go beyond traditional geographical areas. TEPCO Energy Partners, who has entered the Kinki area market, and new electric power retail providers, such as KDDI, are considering price reductions as a countermeasure against the above-mentioned two traditional regional rivals.

In the future, triggered by electric power price reductions based on nuclear restarts and corresponding more competitive offers of combined city-gas and electric power, city-gas prices could be well under pressure to be lowered. Nuclear restarts may also could create spare LNG supply for power companies, who may increase motives to sell more gas, further increase downward pressure on gas prices.

The progress of city-gas retail liberalisation is closely watched by different authorities from different angles. The Electricity and Gas Market Surveillance Commission (EGC) was established in September 2015, directly reporting to the Minister of Economy, Trade and Industry (METI), as an organisation to foster appropriate competition in the city-gas and electric power retail markets. The commission closely monitors the city-gas market to ensure that transactions are carried out in appropriate manners, as well as express opinions and make recommendations to the minister on necessary rule making and regulations. The Advisory Board on Regulatory Reforms established in September 2016 by the Cabinet Office discusses basic issues related to regulatory reforms, responding to requests from the Prime Minister. Recent recommendations from the board in June 2018 include one to direct METI to consider measures to promote more competition in the liberalised city-gas retail market, including possible introduction of a city-gas wholesale exchange place. In addition, the General Research Committee on Resources and Energy, reporting to METI, the Cabinet Office, as well as the nation’s Diet, periodically review progress of the city-gas retail liberalisation.
2 Partnership Strategies Along the Value-Chain in the Wake of Liberalisation

Declining birth-rate, aging and decreasing population is expected to result in little or no increase in demand for city-gas and electric power in the long-term future in Japan. In the wake of liberalisation of such saturated city-gas and electric power retail markets, the industry undergoes structural changes. More specifically, companies have been shifting from vertically-integrated business models within individual companies within their respective regions, to different partnerships and alliances traversing over industry and geographical borders in different segments of the value-chain, such as LNG procurement, power generation, and retail business. This section looks at changes happening in the value-chain from LNG procurement to retail activities and evolving functional partnerships between companies in recent couple of years in the wake of city-gas and electric power liberalisation mainly in the Tokyo Metropolitan area.

2.1 Partnerships by Tokyo Electric Power Group in Different Segments of Value-Chain

The most prominent example of Tepco’s partnership has been JERA, an equal joint venture between Tepco Fuel & Power (TepcoFP) and Chubu Electric Power. While JERA was originally established to enhance bargaining power in fuel procurement as dependence on thermal power generation became heavier after the East Japan Great Earthquake in March 2011, the full liberalisation of electric power retail business also had something to do with this business integration. In July 2016, JERA took over existing upstream and fuel procurement operations and overseas power generation business from the two parent companies to be one of the largest LNG buyers in the world with committed LNG volumes of 35 million tonnes per year.

JERA pursues more flexible and competitive fuel procurement under more and more uncertain environment where it is very difficult to find out future supply and demand of fuels thanks to the full liberalisation and uncertain nuclear power operations. JERA agreed with EDF Trading, the energy trading unit of Électricité de France, to integrate the two companies’ spot and short-term LNG sale and purchase activities under a joint venture between the two companies in July 2018. This will enable JERA to optimise its LNG procurement by taking advantage of EDFT’s access to LNG terminals and pipeline gas markets in Europe.

JERA also plans to integrate existing thermal power generation business in Japan of TepcoFP and Chubu Electric Power in April 2019, holding 66 GW of thermal power generation capacity in the Tokyo Metropolitan and Chubu areas. Although any announcement is not made, there have been media reports that Tepco FP and JXTG holding plan to establish an equally owned company to construct a 1.3 GW LNG-fired power generator on the JXTG site adjacent to TepcoFP's Higashi Ohgishima Thermal Power Station. According to the reports, the two companies plan to make an investment decision in 2018 to start operation in 2024. As TEPCOFP’s existing thermal power generation assets are scheduled to be taken over by JERA in April 2019 and TEPCOFP and JXTG Energy have advanced their city-gas retail partnership, the future direction of the two companies’ partnership in the domestic city-gas and electric power markets is closely followed.

The Tepco Group is advancing partnerships with other companies in the retail city-gas market, where it is partnering with Nicigas (Nippon Gas), a major LPG company who has entered the retail city-gas market in the Tokyo Metropolitan area since the full liberalisation of the market. The key ingredient of the partnership has been complementary expertise of the two companies in entry into the city-gas market in the Tokyo Metropolitan area. Tepco’s ability to procure large amount of LNG and Nicigas’ safety and other consuming market expertise result in significant resources in the city-gas retail business in the area. Nicigas switched its city-gas source procurement of 240,000 tonnes per year from Tokyo Gas to Tepco Energy Partner (TepcoEP) in April 2017 at the start of the full liberalisation of city-gas retail business. TepcoEP and Nicigas established an equally-owned company Tokyo Energy Alliance in August 2017, which has been advancing city-gas business activities including city-gas wholesale to JXTG Energy and other new entrants, as well as safety operations. At the time of its establishment, Tokyo Energy Alliance had a city-gas sales goal to have one million retail customers in the fiscal 2019 (by March 2020), although TepcoEP has advanced the goal one year earlier to achieve it in the fiscal 2018. TepcoEP acquired 3% of
Nicigas’ issued shares in March 2018 and agreed to gain a seat in the latter’s board of directors, strengthening the ties between the two companies.

Tepco’s partners in heating value adjustment facilities, which are needed to produce grid quality city-gas supply, have been JXTG Energy and Osaka Gas. TEPCOFP, JXTG Energy and Osaka Gas established the Ohgishima City Gas Supply Company in September 2017, as a city-gas processing company in the Tokyo Metropolitan Area (TEPCOFP 69%, JXTG Energy 16%, and Osaka Gas 15%). The new company plans to supply 1.1 million tonnes of regasified LNG to TEPCOFP's Shinagawa Thermal Power Plant, as well as to construct and own heating-value adjustment facilities to have its own grid quality gas. TEPCOFP is also constructing another heating-value adjustment facility at its Anegasaki Thermal Power Plant with processing capacity of 600,000 tonnes per year to be operational by fall 2018. Once TepcoFP’s business is transferred to JERA in April 2019, the latter is expected to control downstream city-gas business and establish an integrated value chain of gas business in the Tokyo Metropolitan area.

The Tepco Group is in partnership with Chubu Electric Power through JERA in fuel procurement and power generation business, and with Osaka Gas in city-gas processing through the Ohgishima City Gas Supply Company, respectively, as well as partnership with both Chubu and Osaka Gas in city-gas wholesale business in the Tokyo Metropolitan area. In April 2018, Chubu and Osaka Gas established CD Energy Direct Company to announce plans to enter the city-gas and electric power business in the Tokyo Metropolitan area. CD Energy Direct plans to procure city-gas sources from TepcoFP (JERA from April 2019) and Tokyo Energy Alliance and to launch gas sales in August 2018. CD Energy Direct further plans to expand gas sales of 1 million tonnes by 2030.

Meanwhile, the Tepco Group and CD Energy Direct are competitors against each other in the retail electric power market in the Tokyo Metropolitan area. CD Energy Direct has said that it aims to have electric power sales of 20 TWh by 2030 and 3 million retail customers, or more than 10% of the total households in the Tokyo Metropolitan area in the future. This indicates companies' strategies to compete and partner with other companies in different segments of the value-chain or different geographical areas - a partnership strategy based on the idea of horizontal sharing or division of business, which was not often observed in the Japanese energy industry in the past.

The complicated partnership has been also observed in the Kinki area. Some media reports said in July 2018 that TepcoEP was expected to launch city-gas retail sales in the Kansai area by procuring city-gas supply sources from Kansai Electric Power According to the reports, TepcoEP’s expected procurement from Kansai is expected to be approximately 100,000 tonnes per year, or equivalent to supply volumes to 300,000 residential customers. While the Tepco Group partners with Osaka Gas to enter the former Tokyo Gas franchise supply area in the Tokyo Metropolitan area’s city-gas business, the Tepco Group partners with Kansai Electric Power to enter the former Osaka Gas franchise supply area in the Kinki area’s city-gas business. As Kansai Electric Power has resumed nuclear power plant operations in phases and tends to have more LNG for thermal power operations, the company’s desire to expand sales channels of gas goes well with Tepco's desire to strengthen its gas business in the country. If TepcoEP launches gas sales in the Chubu area in the future, the company may supply gas that it procures from Chubu Electric Power with which it partners in the JERA joint venture. The full liberalisation of city-gas retail business has encouraged new entries from other business sectors and other geographical areas, leading to various partnerships without borders between different business sectors and different geographical areas.

2.2 Partnerships by Tokyo Gas in Different Segments of Value-Chain

Then how does Tokyo Gas, the other incumbent giant in the markets in the Tokyo Metropolitan area, act in response to the moves by the Tepco group? While the Tepco Group is strengthening partnerships over different geographical areas and different business segments, Tokyo Gas is strengthening partnership with electric power companies in Western Japan. Through these the company is apparently focusing on enhancing flexibility in LNG procurement. As in general electric power demand is higher in summer and city-gas demand is higher in winter, there have been seasonal gaps of demand for LNG between city-gas and electric power companies. The progress
of downstream energy industry liberalisation means the need of more responsive and flexible LNG procurement. Having a partner could enhance more flexibility in LNG procurement than acting alone.

Tokyo Gas in April 2016 agreed with Kansai Electric Power to strengthen partnership in LNG procurement. The two companies are both buyers from the Cove Point LNG project in the United States which started operation in April 2018 and have introduced a framework to exchange and swap LNG cargoes between them. The two companies' previous cooperative relationship as core buyers from Australia's Pluto LNG project and the Cove Point LNG project that started operation in April 2018 in the United States enabled the latest partnership agreement. Tokyo Gas agreed with Kyushu Electric Power in April 2017 to discuss strategic partnership in LNG procurement and transportation.

Tokyo Gas announced in June 2018 that the company will procure LNG from Mozambique jointly with Centrica of the United Kingdom. The deal was the first such contract where gas companies from Japan and Europe partnered and is expected to realise flexible adjustments of supply and demand taking advantage of different market conditions in Japan and Europe.

In the power generation business in the Tokyo Metropolitan area, JXTG Energy (51%) and Tokyo Gas (49%) have Kawasaki Natural Gas Power Generation (847 MW) in operation since 2008. The two companies had a plan to expand the power plant by 1.1 GW in 2021, which was scrapped in July 2017. Tokyo Gas plans to expand electric power sales from 15 TWh in the fiscal year 2017 to 31 TWh in the fiscal year 2020 (the year ending in March 2021) in the company's business plan for the period of fiscal years 2018 - 2020.

Tokyo Gas rolls out its business outside of its traditional region in close cooperation with local energy players to develop and expand natural gas demand in targeted areas. One typical example is the Niihama LNG Co., Ltd. which was established in April 2018 by Tokyo Gas Engineering Solutions Co., Ltd. (50.1%), Shikoku Electric Power (30%), Sumitomo Chemical (9.9%), Sumitomo Joint Electric Power (5%), and Shikoku Gas (5%). The purpose is to construct an LNG receiving terminal within the site of Sumitomo Chemical's Ehime Plant to supply gas to the plant itself and a new gas-fired power generation plant to be built by Sumitomo Joint Electric Power. The LNG terminal is scheduled to be operational in February 2022.

2.3 Other Partnership Arrangements in the Value-Chain

In the wake of the full liberalisation of city-gas retail business, joint-ventures have been set up between companies from different geographical regions and different industry segments. Among them is Fukushima Gas Power Co., Ltd. led by Japan Petroleum Exploration Co., Ltd. (Japex). Japex and Mitsui & Co. established Fukushima Gas Power Co., Ltd. in April 2015 (JAPEX 50.7% and Mitsui 49.3%), later joined by Osaka Gas, Hokkaido Electric Power, and Mitsubishi Gas Chemical Co., Inc. in October 2016, resulting in the following shareholdings: JAPEX 33%; Mitsui 29%; Osaka Gas 20%; Hokkaido Electric Power 9%; and Mitsubishi Gas Chemical 9%. The power generation unit of 1.18 GW has been under construction since October 2017, to be operational in spring 2020. The Soma LNG receiving terminal commenced operation in March 2018. The terminal is expected to fuel the Fukushima Gas Power's plant, develop gas markets in southern Tohoku region, deliver LNG to satellite LNG stations, and ship LNG by coastal LNG carriers to the Yufutsu LNG receiving terminal in Hokkaido operated by JAPEX.

3 Evolving Partnerships between Companies and Stable Supply

The recent partnerships between companies from different geographical regions and different business segments in LNG procurement, power generation, city-gas wholesale, and city-gas retail businesses, described in earlier sections of this paper, could not have been developed without the latest full liberalisation of city-gas and electric power retail business. Partnerships between energy companies are not necessarily new. But the recent
partnerships are something different - in nature and ways of formation - from earlier ones between vertically-integrated companies.

Traditional partnerships between energy companies related to the city-gas industry had mostly been aimed at ensuring stable supply, more specifically in LNG procurement and disaster response. Partnerships between players in LNG procurement have been one of the core elements of the history of Japan's LNG imports. Tokyo Gas and Tokyo Electric Power jointly received LNG for the first time in Japan in November 1969 from Alaska at the Negishi receiving terminal, followed by joint procurement of LNG between the two companies from other supply sources. It was the initiative by the two companies to take advantage of their respective expertise that enabled them in a stable and affordable manner to introduce LNG, which had been considered effective as an environmental fuel but had not been used on commercial basis before.

Similar cooperative initiatives were observed elsewhere outside of the Tokyo Bay where Tokyo Gas’ and Tepco’s LNG receiving terminals are concentrated. City-gas and electric power companies have helped each other in respective bay areas where regional city-gas and electric power companies have LNG receiving terminals and spent decades with stable and safe operations of LNG discharging - Toho Gas and Chubu Electric Power in Ise Bay and Osaka Gas and Kansai Electric Power in Osaka Bay and Himeji Port.

Joint investment by city-gas and electric power companies in LNG terminals has been observed to ensure stable supply of energy. In Hokkaido, Hokkaido Gas and Hokkaido Electric Power have established equally-owned Ishikari LNG Operations Company and expect to help each other in their LNG receiving operations. Hokkaido Gas is the operator of the Ishikari LNG terminal, the only large-scale LNG receiving terminal on the island. Hokkaido Electric Power plans to start operating the LNG-fired Ishikariwan Shinko Power Station in February 2019. The Hibiki LNG Terminal in Kita-Kyushu was established by Saibu Gas (90%) and Kyushu Electric Power (10%) and start operation in November 2014. The two companies help each other in stable supply of energy in the region as Saibu Gas operates the gas pipeline network in northern Kyushu and Kyushu Electric Power operates the older Tobata LNG terminal.

Partnerships in disaster responses have been effective and flexible in emergency situations. City-gas supply was relatively quickly restored by efforts by local city-gas companies with helping forces from city-gas companies around the country led by the Japan Gas Association, after the East Japan Great Earthquake in March 2011, the Kumamoto Earthquake in April 2016, and the Northern Osaka Earthquake in June 2018. The latter one was the first major natural disaster related to city-gas supply since the full liberalisation of city-gas retail business. It also turned out to be the first case where both the incumbent city-gas utility company and new entrants worked together in restoring city-gas supply services and new entrants were involved in restoring activities.

Japan from time to time encounters with major natural disasters caused by earthquakes, tsunamis, torrential rains, floods, and typhoons. While competition triggered by the liberalisation attracts attention, daily efforts to ensure safety and prevent disasters, mutual help between energy companies, and enhancement of transmission pipeline infrastructure are still essential. The latest Osaka case of the earthquake demonstrated that restoring activities engaged new entrants and no deterioration of stable supply was caused by the latest liberalisation. Having said that, the industry should make sure that cooperation between companies ensuring stable supply and appropriate levels of facility investment should not be jeopardised under even fiercer competitive city-gas and electric power markets in the future.

4 LNG Procurement Strategy and Destination Clauses

The LNG market development strategy, published by the Ministry of Economy, Trade and Industry (METI) in May 2016, provides elements and required actions of both government and private sector to develop a sound LNG market. Tradability improvement, price discovery mechanism, and open and sufficient infrastructures are main goals. The strategy states that Japan should endeavour to develop a flexible and liquid LNG market, and at the
same time, make the most of its position as the world's largest LNG consumer to develop an internationally accepted LNG trading hub from the aspects of both attracting LNG trade from around the world and determining and transmitting price signals.

Building on the strategy, the country's Fair Trade Commission (JFTC) published its report on its investigation into destination restrictive clauses in LNG contracts of Japanese LNG buyers in June 2017, which have had significant impacts on the LNG industry so far. JERA and Tokyo Gas have announced LNG purchase deals which they claim are in line with the recommendation included in the report. So long as new and renewal deals are negotiated, those restrictive clauses are expected to be gotten rid of. While there are still discussions over how to deal with existing contracts with those restrictive clauses remaining, the general trend is to abolish them. The JFTC initiated the investigation in order to clarify the problems in the perspective of competition policy and the Antimonopoly Act after the Japanese government had decided to promote abolishment of destination restrictions at the Cabinet meeting.

The study clearly states that destination restriction in existing LNG contracts are likely to violate the Japanese Anti-Monopoly Act. The study recommends LNG sellers should neither provide competition-restraining clauses nor adopt competition-restraining business practices, when LNG sellers conclude a new contract or revise a contract after the expiration. LNG sellers, at least, should review competition-restraining business practices, as for the existing contracts before the expiration.

In Europe, most likely partly inspired by the Japanese initiative, the European Commission began an investigation into Qatari LNG contracts into the Continent, immediately after its settlement of the investigation into Gazprom's practice in Central and Eastern Europe. Those efforts to abolish restrictive practices would be even more successful and effective, if those efforts are shared between different LNG importing countries - notably competition authorities in China, Korea, India and Chinese Taipei. To abolish such restrictions, multi-front approach should be pursued: legal and commercial. It is also important to convince producers and other parties that flexibility will be beneficial to all parties involved.

5 LNG Terminal Access Regulation

At the same time of the city-gas liberalisation, the LNG terminal third-party use regulation was implemented, covering those terminals with certain storage capacity and grid connections. The idea behind the new regulation was to promote competition in the gas market by utilising unused capacity of the existing terminals. The regulation prohibits owners of primary LNG receiving terminals, without justifiable reasons, from rejecting third parties. Before the latest regime, third-party use of LNG terminal capacity had been at the discretion of each terminal owner. Primary LNG receiving terminals with tank capacity of 200,000 kl or more, owned by city-gas companies, electric power utility companies, petroleum companies, and others, shall be covered. As of the end of 2018, 18 out of 32 terminals were covered.

However, so far, no third-party use under the regulation has been reported. It seems the liberalisation and the third-party use regulation are disconnected. It is no wonder - it is difficult to find a lot of unused capacity at those purpose-built terminals. If there was a lot of unused capacity, that would be disliked by investors and ratepayers of utility companies. The main competitors against the incumbent city-gas utility companies are electric power companies in the same regions, who have already had their own LNG terminals and do not have to use facilities owned by the rivals. Other potential LNG users in Japan tend to construct their own terminals as this option would give them more free-hands in their LNG receiving operations than using terminals owned by others.

It is good to utilise unused capacity - if there is any, especially LNG demand in the country is not expected to grow significantly in the future - and there may be sporadic use by third parties under this regulation in the future, in practice this regulation may not contribute greatly to promote competition in the city-gas market itself. But the spirit of this regulation - maximum effective utilisation of facilities - is important, especially as regional arbitrage and optimisation opportunities are expected to increase in the future. Voluntary capacity arrangements and /or terminal
utilisation deals between companies - such as the one between JXTG and Hokkaido Gas and the one between Saibu Gas and Novatek - may be more effective in promoting more LNG supply by different players into the Japanese market.

**Conclusion**

Media reports often cite the numbers and rates of customer switchings (of retail providers) when they assess effectiveness of liberalisation of city-gas and electric power markets. As the main purpose of liberalisation is to bring benefits to end consumers by encouraging competition in the market, the numbers and rates of customer switchings are certainly important indicators to describe activities of new market entrants. However, looking at the numbers and rates alone may lead to a false conclusion that the liberalisation of the city-gas market lags the liberalisation of the electric power market, or lacks proactive efforts.

The partnerships that this paper has described earlier are examples of unquantifiable initiatives of players to survive in the wake of the liberalisation. Such initiatives are likely to reproduce fiercer competition, in turn leading to improved benefits to consumers. Although an excessively competitive environment may alter traditional partnerships between energy companies mainly aiming at stable supply, players including new market entrants worked closely together to quickly restore city-gas supply after the Northern Osaka Earthquake in June 2018 as done in similar cases before the liberalisation. At least for the moment the industry has not apparently lost the good legacy developed under the traditional partnerships. While stable supply should be maintained as the most important goal, the regulatory framework of liberalisation should be continuously improved so that a wider-range of benefits reach customers.

The domestic market restructuring has also encouraged city-gas and electric power companies to diversify their business activities, including those activities in emerging markets in Asia. They have begun to pursue gas and electric power opportunities in those countries, potentially leading to expanding new LNG markets.

Companies in the Japanese LNG industry are responding to new reality brought to them by the greatest restructuring process, within the context of the greatest evolution of the global LNG industry.