Japan's City-Gas Market - Full Retail Competition and Partnership

Hiroshi Hashimoto, Yosuke Kunimatsu, and Gen Hosokawa*

Executive Summary

Competition is gradually progressing in Japan's city-gas market, triggered by the full retail competition implemented in April 2017. Although the customer switching rate in the city-gas market may be lower than that of the electric power retail market, the number of customer switching is steadily increasing driven by new entrants from different business sectors, surpassing the one-million mark at the end of May 2018. While better quality of customer services has already been enjoyed by consumers due to the progress of liberalisation, more competitive, or lower, consumer gas prices are anticipated as a fruit of the restructuring.

Players in the Japanese energy industry are entering an era of unprecedented competition, leading to significant restructuring of the nation's energy industry. Under such circumstances, Japanese energy players are searching opportunities to enhance their partnerships for their survival, trespassing regional and industry borders. Such partnerships should be very different in nature from traditional ones, which had been pursued to ensure stable supply of energy.

Liberalisation should bring consumers of energy with great benefits through competition between energy providers. And progress of liberalisation should not have any adverse impacts on the final goal of stable gas supply. While stable supply continues being the most important, the regulatory framework of liberalisation of gas business should be continuously improved.

^{*} Gas Group, Fossil Energy and International Cooperation Unit

Japan's City-Gas Market - Full Retail Competition and Partnership

Hiroshi Hashimoto, Yosuke Kunimatsu, and Gen Hosokawa*

Introduction

More than one year has passed since Japan's city-gas retail market for all the market segments was opened for competition on 1 April 2017, mostly targeting smaller and residential customers this time. 1,118,705 customers, or 4.2% of the total, had switched their suppliers as of the end of June 2018.¹

The latest city-gas retail liberalisation brings changes to competition in the city-gas market. The competition landscape is shifting from the traditional faceoff between city-gas and electric power companies in the same region to new entrants from different regions and different business sectors and new alliances. As combined offers of city-gas and electric power sales gain momentum, risks to lose retail customers of both sales triggered by reduced electricity prices are increasing, potentially putting further pressure to reduce city-gas prices. 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,² encouraging diversification of gas pricing and better quality of customer services.

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.

^{*} Gas Group, Fossil Energy and International Cooperation Unit

¹ According the latest figures from the Agency for Natural Resources and Energy, as of 30 June 2018. The switching rates are based on the number of city-gas customers as of the end of March 2017, just before the latest city-gas retail liberalisation.

² "Tokyo Gas lost 250,000 city-gas retail customers during the first year of city-gas liberalisation" 13 April 2018, Nikkei Newspaper, "Toho Gas reduced profits by more than JPY 1 billion in the last fiscal year in the electric power and city-gas liberalisation exhausting fights" 28 April 2018, Nikkei Newspaper, "Osaka Gas reduce electric power retail prices in a defensive move, with limited resources" 5 June 2018, Nikkei Newspaper, "Saibu Gas sales representatives visit customer homes to avoid losing customers after city-gas retail liberalisation" 16 May 2017, Nikkei Newspaper, and "Results for the first year of city-gas liberalisation of the four biggest city-gas companies" 30 April 2018, Gas Energy News.

1 Competition in the City-Gas Market

1.1 A Brief History to the Full Liberalisation of City-Gas Retail Business

Before going into the main discussions on the full liberalisation of city-gas retail business, this section briefly looks at partial liberalisation processes implemented in phases since 1995 and consequential new entrants' activities.

The city-gas industry had been liberalised in four partial openings of the markets, leading to the full liberalisation in April 2017. Those steps are described in Figure 1. 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

Note 1 Regulated prices have been maintained in certain areas where effective competition may not be expected to protect consumers as a transitional measure.

2 Shares are based on sale volumes of the 10 biggest incumbent city-gas companies.

(Source) Material on "Full Liberalisation of Retail Sales of Electric Power and City Gas" by the Electricity and Gas Market Surveillance Commission (EGC)

Figure 2 shows historical shares of sales volumes by new entrants in the city-gas and electric power markets from 1995 when the partial liberalisation processes started. 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 m³ 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. Specific examples of large-volume sales and wholesale deals are shown in Table 1.

Figure 2 Historical Shares of Sales Volumes by New Entrants in the City-Gas and Electric Power Markets



(Source) Compiled by the authors based on materials provided by the Ministry of Economy, Trade and Industry (METI)

Company		Volumes		
Hokkaido	Based on partnerships with Air Water Co. and Iwatani respectively, the company has			
Electric	started LNG supply marketing activities (company announcement on 27 April 2017)			
Power				
Tohoku	The company intends to increase gas sales from 340,000 tonnes to 600,000 tonnes	+26,000		
Electric	by FY2030, by expanding gas sale channels and providing combined solutions with	tonnes		
Power	electric power supply (Mid-term business plan for FY2017-2020)	(FY2030)		
TepcoEP and	TepcoEP envisions 1 million gas sales customer accounts by FY 2019, by forming an	+1 million		
TepcoFP	alliance with a major LPG retail company and establish a platform for gas sales in			
	the Tokyo Metropolitan area.	(FY 2019)		
	Tepco FP intends to increase city-gas wholesale and large-scale gas sales volumes,			
	by taking advantage of spare capacity of LNG terminals and pipelines resulting from			
	alliances with other energy players.			
	(Revised Comprehensive Special Business Plan (The Third Plan), 11 May 2017 Tepco			
	Holdings)			
Hokuriku	The company pursues comprehensive energy business including LNG, by	n.a.		
Electric	maximising its business resources. (Management Plan in FY 2017)			
Power				
Chubu	The company intends to gas and LNG sales from 830,000 tonnes in FY 2016 to 3	+2.17		
Electric	million tonnes in FY 2030, as part of its comprehensive energy business focusing on			
Power	gas & power. (Challenges in Business for FY 2017)	tonnes		
		(FY 2030)		
Kansai	The company intends to more than double gas sales volumes from 720,000 tonnes	+.98 million		
Electric	in FY 2015 to 1.70 million tonnes in FY 2025. (Mid-Term Business Plan FY 2016 -	tonnes		
Power	2018)	(FY2025)		
Chugoku	The company intends to expand gas sales city-gas companies and other industrial	n.a.		
Electric	customers from the Yanai and Mizushima LNG terminals. (Business Plan for			
Power	FY2017)			
Shikoku	The company intends to expand gas and LNG sales city-gas companies and other	n.a.		
Electric	industrial customers from the LNG terminal adjacent to the Sakaide Power Station,			
Power	trom the current 100,000 tonnes per year. (Business Plan for FY2017)			
Okinawa	The company intends to increase electric power and city-gas sales through its	n.a.		
Electric	comprehensive energy services.			
Power	(Business Plan for FY2017)			

Table 1 New Entrants in Large-Volume Gas Sales and Wholesale Gas Supply

(Source) "Progress of Full Liberalisation of City-Gas Retail Business" (7 July 2017), the Agency for Natural Resources and Energy

1.2 Supplier Switching by Retail Customers

1,118,705 retail customers³ have applied to switch their city-gas providers as of the end of June 2018 in the nation, representing 4.2% of the nation's total number of customers at the time when the full retail liberalisation was implemented.

Among the total switching customers, 523,656 were in the Kinki area, followed by 381,478 in the Kanto,

153,261 in the Chubu/Hokuriku, and 60,310 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.

³ According the latest figures from the Agency for Natural Resources and Energy, as of 30 June 2018.

Figures 3 and 4 show numbers of residential retail customers that new entrants have acquired and shares of them among the total customers, respectively⁴. 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 citygas 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.

⁴ The data in the figures is based on based on materials provided by the Electricity and Gas Market Surveillance Commission (EGC), which are different from those provided by the Agency for Natural Resources and Energy.



Figure 3 Numbers of City-Gas Residential Customers Secured by New Entrants

(Source) Compiled by the authors based on materials provided by the Electricity and Gas Market Surveillance Commission (EGC)



Figure 4 Rates of Customer Switching in Different Areas

(Source) Compiled by the authors based on materials provided by the Electricity and Gas Market Surveillance Commission (EGC)

1.3 Shift to Deregulated Pricing by Retail Customers in Designated Transitional Supply Franchise Areas

Changing pricing arrangements are another measure to assess the progress of liberalisation, in addition to the developments in customer switchings. Before the liberalisation, regulated prices of city-gas had been calculated under the over-all cost-plus methods. After the liberalisation, each retailing company is allowed to set its own pricing in order to diversify and lower prices. However, those areas where incumbent city-gas utility companies are considered to maintain effective monopolistic positions against other city-gas retailers and other energy providers, as there are concerns that city-gas retail prices may go up rather than go down, have been labelled as "Designated Transitional Supply Franchise Areas" in which incumbent city-gas utility companies are required to maintain regulated pricing arrangements, in order to protect consumers⁵.

Those incumbent city-gas utility companies in the Designated Transitional Supply Franchise Areas⁶, therefore, have both regulated and liberalised pricing arrangements available to retail customers. However, even with the same incumbent city-gas utility companies, more and more customers have switched to deregulated pricing provided by the respective incumbent city-gas utility companies, increasing shares of liberalised pricing. Figure 5 shows number of city-gas residential customers with deregulated pricing arrangements in Designated Transitional Supply Franchise Areas. Not only those retail customers who have switched their city-gas retail providers, but also those retail customers who have changed their subscriptions from regulated to deregulated pricing, are increasing. Among contract switchings within the same incumbent city-gas utility companies in the designated transitional supply franchise areas, approximately 1 million residential retail customers had changed their subscriptions from regulated to deregulated pricing as of March 2018, which was greater than the number of customers who had switched their city-gas retail providers as of the same date. This indicates that in the designated transitional supply franchise areas the respective incumbent city-gas utility companies are making very serious efforts to provide better services resulting in fruits from the new pricing and other programs.

⁵ If a city-gas utility operating entity is owned by the relevant local government, the entity's operation is monitored by the local council and there is little possibility of unjustifiable price hikes. Therefore, the transitional regulation is not applicable to those entities owned by local governments.

⁶ Designated Transitional Supply Franchise Areas: Tokyo Gas, Osaka Gas, Toho Gas, Sennan Gas, Keiyo Gas, Keiwa Gas, Nihon Gas, Atami Gas, Kawachinagano Gas, Hamada Gas, Ecore and Nankai Gas.



Figure 5 Number of Deregulated Pricing in the Designated Transitional Supply Franchise Areas

1.4 Competition in Each Region since 2017

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)⁷ 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

⁽Source) Compiled by the authors based on materials provided by the Electricity and Gas Market Surveillance Commission (EGC)

⁷ A Tepco company responsible for retail activities in the electric power and city-gas markets.

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 144 thousand city-gas retail customers in the former franchise area of Toho Gas. 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 citygas 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 July 2018. However, in Hokkaido, Hokkaido Electric Power plans to operate 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 swithchings yet.⁸

⁸ No generalized reason is provided for this, but the market size may not justify entry and the electric power companies may have other priority in the residential energy markets, including promotion of all-electric housing.

1.5 Comparison of City-Gas Retail Liberalisation with Electric Power Retail Liberalisation

1.5.1 Trends in Customer Switchings

This chapter compares the city-gas retail liberalisation with the electric power retail liberalisation implemented one year earlier in April 2016. Figure 6 compares numbers of retail customer switchings in the city-gas and electric power market by geographic area. The red bars indicate city-gas and blue bars indicate electric power customer switchings. While customer switchings in the city-gas retail markets have happened only in the Kanto, Chubu, Kinki and Kyushu areas, customer switchings in the electric power markets have been observed in areas all over the country. In every area, more customers have switched their suppliers in the electric power market than in the city-gas market.

However, differences between the city-gas and electric power markets should be taken into account of to compare switchings in the both markets. Firstly, the market sizes are different. Upon the implementation of the electric power retail liberalisation in April 2016, 85 million electric power residential and small retail customers became contestable in the country. On the other hand, the city-gas retail liberalisation in April 2017 opened 26 million customers for competition. The number of customer switchings tends to be larger for the electric power market than for the city-gas market, as the electric power market as a whole is much larger than the city-gas market as a whole.



Figure 6 Trends in City-Gas and Electric Power Customer Switchings

(Source) Compiled by the authors based on publicly available information

Secondly, numbers of customer switchings tend to be higher for the electric power markets as the electric power retail business was liberalised one year earlier. The gap is expected to be gradually smaller as time goes by, while in early stages of liberalisation the effect of this time lag should be significant.

Switching rates calculated against respective market sizes should be compared with the same lapsed after the respective liberalisation to assess the competitive landscapes of the respective markets. Figure 7 shows the switching rates in the city-gas and electric power markets one year after the respective retail market liberalisation. Customer switching rates for Toho Gas and Saibu Gas, or the companies losing rates, were higher than customer switching rates for Chubu Electric Power and Kyushu Electric Power, or similarly their losing rates. Thus, the first year of the retail competition can be seen harsher for the incumbent citygas companies than for the incumbent electric power companies. In the Kansai area, from the outset of the retail liberalisation, fierce battles to acquire customers in each other's markets have resulted in high switching rates in both the city-gas and electric power markets. On the other hand, in the Kanto area, partly because TepcoEP's entry into the city-gas retail market was later than the other electric power companies in the Chubu, Kyushu, and Kansai areas, Tokyo Gas' customer switching rate has been relatively low.



Figure 7 Customer Switching Rates After One Year of City-Gas and Electric Power Retail Liberalisation in Kanto, Chubu, Kansai, and Kyushu

1.5.2 Different Natures and Features of City-Gas and Electric Power Businesses

The city-gas and electric power businesses have had different natures and features, which have resulted in different progresses of liberalisation. Infrastructure developments have been different between the two industries. While electric power companies have been developed under the guidance of the central government in an orderly manner, city-gas companies have developed mostly based on local demand developments⁹. With those background, while electric power transmission and distribution networks cover whole the country and almost every household in the country has electric power supply. On the other hand, city-gas pipeline networks cover only 6% of the nation's land areas mostly in cities, with a 50% diffusion rate of city-gas supply¹⁰. Local pipeline networks are not necessarily connected with each other and do not constitute a wide-area network to allow active flows of

⁽Source) Compiled by the authors based on materials provided by the Organization for Cross-Regional Coordination of Transmission Operators, Japan (OCCTO) and the Electricity and Gas Market Surveillance Commission (EGC)

 ^{9 &}quot;One year into the gas industry reform, change have emerged" 15 February 2018, The Agency for Natural Resources and Energy,

http://www.enecho.meti.go.jp/about/special/tokushu/denryokugaskaikaku/gaskaikaku.html

¹⁰ The rate of city-gas customers against the nation's total households

gas between areas. Therefore, the city-gas and electric power businesses are different in sizes. And the city-gas business has a significant physical hurdle for new entrants in infrastructure.

Then the next hurdle is procurement of city-gas sources. Most of natural gas used in Japan, which is the main supply source of city-gas, is procured in the form of LNG (liquefied natural gas) from overseas, using dedicated carrier ships for it. Imported LNG is stored at receiving terminals, subsequently regasified, adjusted heating values, odorized and distributed as city-gas through pipeline networks. To supply city-gas to customers, it is essential to establish such a sequential supply chain. Apart from incumbent city-gas utility companies, LNG that can be a source of city-gas has been procured by only electric power companies who buy LNG as a power generation fuel, and petroleum companies who also sell gas to large-volume gas customers. While the LNG terminal third-party use regulation¹¹was introduced at the same time as the city-gas retail liberalisation, actual use of an LNG terminal based on the regulation has not happened yet¹² On the other hand, grid-quality electric power is produced domestically from various sources, including thermal power, solar power, wind power, hydro-electric power, and geothermal power generation, making it easier for new entrants to procure electric power sources than city-gas sources. In addition, a wholesale electric power exchange marketplace had been set up prior to the retail electric power liberalisation, which has been effectively utilised mainly by new entrants in the electric power markets who do not have their own power generation facilities.

Then the quality of gas must be adjusted by adding LPG to regasified LNG to have a heating value of 45MJ/m³ (on monthly average). A city-gas provider should have its own heating-value adjusting facilities, or, should make its gas to be adjusted by other service providers who have such facilities.

Moreover, one of the most important functions in the city-gas business is to establish a safety management system around the gas supply. Pipeline and supply facilities must be maintained and inspected by a gas pipeline company¹³ according to the Gas Business Act¹⁴. While the safe operations of pipeline networks are responsibility assumed by a gas pipeline company, mandatory periodical safety checks should be conducted by the respective city-gas retail provider. Therefore, ensuring and training of human resources with specialised skills are important requirements to enter the city-gas retail market.

¹¹ The LNG Terminal Third-Party Use regulation obligates a company that has an LNG terminal with certain criteria to allow third parties to use the terminal. Such a company must not decline a request by a third party to use the terminal without a justifiable reason. Such a company is required to submit and publish terms and conditions of such third-party use of the terminal, including calculation of the fees.

¹² The Electricity and Gas Market Surveillance Commission (EGC), 23 February 2018

¹³ A gas pipeline company is a company who operates gas supply by its own pipelines with certain criteria (including types of gas and lengths of pipelines).

¹⁴ Article 61 (maintenance of gas supply facilities) of the Amended Gas Business Act stipulates that a gas pipeline company is responsible for ensuring safety operation of the pipeline networks that the company owns.



Figure 8 Responsibility of Safety

(Source) Material on "Full Liberalisation of Retail Sales of Electric Power and City Gas" (9 February 2017) by the Electricity and Gas Market Surveillance Commission (EGC)

The city-gas and electric power businesses, which are often discussed from the same angles, are in fact very different from each other in their natures. Those differences have had big effects on progresses of customer switchings in the respective retail markets.

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 2015¹⁵, directly reporting to the Minister of Economy, Trade and Industry, 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 include one to direct the Ministry of Economy, Trade and Industry (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,

¹⁵ The commission was originally established as the Electricity Market Surveillance Commission in September 2015 and renamed the Electricity and Gas Market Surveillance Commission (EGC) in April 2016 to additionally assume surveillance functions over the city-gas market.

reporting to the Minister of Economy, Trade and Industry, the Cabinet Office, as well as the nation's Diet, periodically review progress of the city-gas retail liberalisation.



(Source) Material on "Full Liberalisation of Retail Sales of Electric Power and City Gas" (9 February 2017) by the Electricity and Gas Market Surveillance Commission (EGC)

2 Benefits of City-Gas Retail Liberalisation

This section describes what consumers have been gifted as benefits from seventeen months of the city-gas retail liberalisation.

2.1 New City-Gas Pricing

Incumbent city-gas utilities have reduced prices, in preparation for the full liberalisation of city-gas retail business in April 2017, to return benefits of streamlining of operations to customers, by revising pricing formulae. Figure 11 shows recent reductions of retail prices provided by the four largest incumbent city-gas utility companies. The main purpose to reduce retail city-gas prices in 2015 well in advance of the full liberalisation of city-gas retail business was to impress customers with combined offers of city-gas and electric power, taking advantage of entry into the retail electric power market in April 2016, by setting more competitive city-gas prices. Such a return of benefits to customer through rate revisions is one of the major achievements of the latest full liberalisation of city-gas retail business.

0	Date	Reduction in small-scale retail prices		
Company		General rate plan	Selective rate plan	on Average
Tokyo Gas	December 2015	▲ 0.73%	▲ 0.68%	▲ 0.71%
	December 2013	▲ 1.59%	▲3.13%	▲ 2.09%
(Tokyo Area)	March 2012	▲ 1.63%	▲ 1.38%	▲1.57 %
	April 2008	▲ 1.40%	▲ 1.81%	▲ 1.51%
	April 2017	-	▲7.5% (at max)	-
Ogelta Cog	January 2015	▲ 1.38%	▲1.07 %	▲ 1.26%
Osaka Gas	February 2012	▲ 1.25%	▲ 1.06%	▲ 1.20%
	November 2008	▲ 0.95%	▲ 1.82%	▲ 1.13%
	April 2017	-	▲ 1.5%	-
Taba Car	September 2015	▲ 1.25%	▲1.89 %	▲ 1.57%
Tono Gas	April 2012	▲ 1.25%	▲ 1.13%	▲ 1.20%
	March 2008	▲ 2.57%	▲ 2.38%	▲ 2.52%
	April 2017	-	▲ 3.0% (at max)	-
Saibu Caa	January 2015	▲ 1.05%	▲1.97 %	▲ 1.44%
Saibu Gas	October 2011	▲ 0.60%	▲ 1.86%	▲ 1.03%
	November 2008	▲ 0.31%	▲1.01 %	▲ 0.53%

Table 2 Recent Reductions of Retail Prices Provided by the Four Largest Incumbent City-Gas Utility Companies

(Source) Compiled by the authors based on the Agency for Natural Resources and Energy's and companies' announcements

*General rate plans: Regulated pricing plans

*Selective rate plans: Specific pricing plans for customers with specific gas appliances (including floor heating by hot water) or certain conditions based on seasonal and hourly gas consumption

2.2 New Service Menus

In addition to reduction of retail prices, incumbent city-gas companies have made efforts to introduce indirect reduction of retail prices through customer reward programs accompanied with payments of city-gas and electric power charges.

New city-gas pricing and new service menus have been introduced. Especially in the Kanto, Chubu, Kansai, and Kyushu areas, where increasing customer switchings have been observed, the incumbent city-gas companies have been making efforts to improve gas pricing and service menus, including more competitive gas pricing, combined offers of city-gas, electric power and telecommunication, surrounding daily-life related services. Retail customers of incumbent city-gas companies who have introduced new city-gas pricing and new service menus because of the latest city-gas full retail liberalisation represent nine-tenth of the nation's total city-gas retail customers (Figures 10 and 11). In the Hokkaido, Tohoku, Hokuriku, Chugoku, Shikoku and Okinawa areas, where customer switching has not happened yet, many incumbent city-gas companies have started offering lower prices and

new service menus. In the wake of city-gas retail full liberalisation, incumbent city-gas companies all over the country are trying to offer better services.

Figure 10 New Initiatives by Incumbent City-Gas Companies to Offer Better Services [1]¹⁶



(Source) "Progress of City-Gas Retail Full Liberalisation", the Agency for Natural Resources and Energy, 6 July 2018

Figure 11 New Initiatives by Incumbent City-Gas Companies to Offer Better



Services [2]

(Source) "Progress of City-Gas Retail Full Liberalisation", the Agency for Natural Resources and Energy, 6 July 2018

¹⁶ As Figures 10 and 11 provide specific company names with specific names of offers in Japanese that are not necessarily relevant to readers, the authors have decided not to translate individual names into English but just show how many new offers have been made. Practically it has turned out to be very difficult to translate those specific names of offers.

2.3 City-Gas Retail Prices Following Changes in Electric Power Retail Prices Particularly in Combined Offers of City-Gas and Electric Power

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.

3. Partnership Strategies Along the Value-Chain in the Wake of Liberalisation

Declining birthrate, 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 especially focusing on the Tokyo Metropolitan area, where even fiercer competition is expected with more new entrants coming.

3.1 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)¹⁷ 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 integration¹⁸. 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.

Figure 12 The Tepco Group's Partnerships in Different Segments of the Value Chain



(Source) Compiled by the authors based on company announcements

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.

¹⁷ Tepco Fuel & Power (TepcoFP): A Tepco group company in charge of fuel and thermal power business.

¹⁸ "JERA - integration and future -" (9 June 2017) Tepco's newsletter on its website.

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 Station¹⁹ 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 citygas 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 citygas 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

¹⁹"Tepco plans to have a JPY 120 billion thermal power generation in Kawasaki along with JXTG" (2 September 2017) Nikkei Newspaper

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.

Once JERA establishes the value-chain, the Tepco Group's business in the residential city-gas market in the Tokyo Metropolitan area is expected to have two main lines: [1] TepcoEP's direct retail sales to residential customers; and

[2] Tokyo Energy Alliance's wholesale to new entrants in the residential city-gas market.

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 Power²⁰ 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

^{20 &}quot;Tepco plans to procure gas from Kansai Electric Power - collapsing competition in the wake of liberalisation" (22 July 2018), Nikkei Newspaper

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 venture²¹. 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.

3.2 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? Figure 15 shows partnerships by Tokyo Gas in different segments of the value-chain. 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.

Figure 13 Tokyo Gas' Partnerships in Different Segments of the Value Chain

Procurement Kansai Electric Power Kyushu Electric Power Centrica Power Generation JXTG Energy (kawasaki Natural Gas Power) LNG Terminal Shikoku Electric Power / Sumitomo Chemical / Shikoku Gas City-Gas Retail No entry in other geographical areas

(Source) Compiled by the authors based on company announcements

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

²¹ "Electric power companies compete with each other in their home grounds while partners with each other in their gas businesses" (24 July 2018) Denki Shimbun

partnership agreement. Tokyo Gas agreed with Kyushu Electric Power in April 2017 to discuss strategic partnership in LNG procurement and transportation. By utilising the two companies' resources in more flexible manners, they would like to achieve more responsive LNG procurement and cost reductions.

To swiftly cope with demand and supply fluctuation caused by energy market liberalisation and other factors, partnering with other domestic players may not be good enough. Tokyo Gas announced in June 2018 that the company will procure LNG from Mozambique jointly with Centrica of the United Kingdom. Tokyo Gas said that the deal was in line with the recommendation released by Japan's Fair Trade Commission (JFTC) in June 2017, suggesting that it did not include any destination restrictive clauses²². 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, requiring new power supply sources. There was a newspaper report in August 2018 that Tokyo Gas had begun to consider switching from coal to LNG to fuel the proposed new thermal power plant that the company is developing in Sodegaura, Chiba Prefecture, jointly with Kyushu Electric Power with which Tokyo Gas is partnering in LNG procurement²³.

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.

²² A "destination clause" in an LNG sale and purchase agreement (SPA) specifies places of cargo discharge (destination) and does not allow resale of the commodity. In the latest joint procurement deal from Mozambique, Tokyo Gas and Centrica should deal with cargo flows both procurement status of both companies and spot market conditions, sometimes considering resale to third-party buyers.

²³ "Tokyo Gas and Kyushu Electric Power consider switching from coal to LNG to fuel their planned thermal power plant" (10 August 2018) Nikkei Newspaper

3.3 Other Partnership Arrangements in the Value-Chain

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.

4. 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 citygas 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. The industry should make sure that cooperation between companies ensuring stable supply and appropriate levels of infrastructure investment should be maintained under fiercer competitive city-gas and electric power markets in the future.

The authors would like to look at relation between liberalisation and stable supply, specifically regarding investment in new natural gas liquefaction projects. Figure 16 shows that new investment in liquefaction projects has slowed down since 2016. The International Energy Agency (IEA) pointed out in July 2018 in its "World Energy Investment 2018" report that with LNG demand growing around the world if new investment in liquefaction facilities did not pick up, global LNG demand and supply balance could be tight from 2023.

While the biggest factor that has slowed new investment in LNG projects have been low crude oil prices, difficulties in securing long-term LNG offtake contracts, which are often necessary to ensure recovery of billion-dollar initial investment, have been also cited as a major factor of the stalled activities. The reluctance to have long-term LNG purchase commitment may be partly caused by uncertain long-term outlook of gas demand for individual LNG buyers in Japan in the wake of liberalisation in the domestic market. Innovative approaches and ideas toward new LNG investment taking into account of new realities in consuming markets need to be developed. In that sense, the slower LNG investment activities may have been partly by-products of liberalisation of Japan's city-gas and electric power markets.



Figure 14 LNG Production Projects with Final Investment Decisions

(Source) Compiled by the authors based on company announcements

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.

Contact: report@tky.ieej.or.jp