



GAS BUSINESS

City Gas and LNG sales

Outline

Applications of gas from the Tokyo Gas Group span a wide range, from household use such as cooking, heating and hot water supplies, to commercial use including air conditioning, industrial use, power generation, and other uses. The Tokyo Gas Group has also extended its coverage from the Kanto region encompassing Tokyo and its adjacent three prefectures (Kanagawa, Chiba, and Saitama) to North Kanto (Ibaraki and Tochigi), by lengthening its pipeline network to serve more customers and cater to more demand.

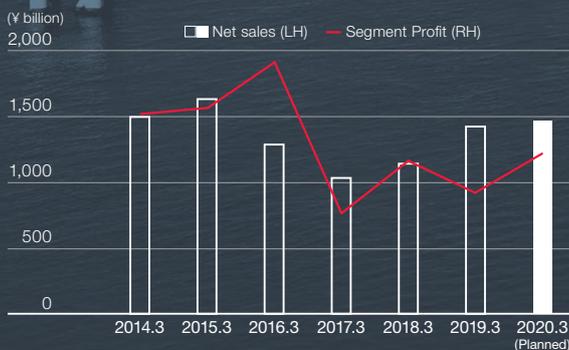
Number of customers (with city gas meters)	11.818 million	FY2018
City gas sales volume	15.19 billion m ³	FY2018 Equivalent to approximately 40% of total nationwide gas sales volume in Japan
Segment profits	¥92.2 billion	FY2018

- Customer base of over 11 million customers and a relationship of trust with customers through close ties with local communities
- Established history of providing a safe and reliable supply of gas amongst our customers
- The Kanto region centered around Tokyo, with its high concentration of production and consumption, as our primary sales area (the Kanto region accounts for around 40% of Japan's total GDP)
- Safety-related know-how and energy solution capabilities

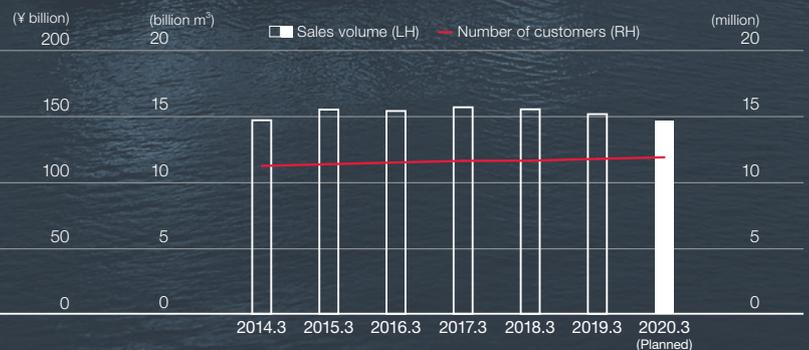


- Difficulties in LNG procurement due to the impact of geopolitical risks, etc., regarding imports
- Potential supply issues due to damage to production and supply facilities caused by a large-scale disaster
- Intensified competition driven by market deregulation; decline in demand caused by changing lifestyle

Net sales and Segment Profit



City gas sales volume and Number of customers (with city gas meters)



Factors affecting revenues and expenses ▶ P65

New Procurement



Mozambique LNG Project

In February 2019, Tokyo Gas and Centrica LNG Company Limited in the UK concluded a sale and purchase agreement with Mozambique LNG1 Company Pte. Ltd. for the offtake of liquefied natural gas (LNG) from the Mozambique LNG Project. This agreement paves the way for the revolutionary and innovative joint procurement of LNG between Japanese and European companies. Tokyo Gas and Centrica will, as foundation buyers, continue to support to the early launch of the project with abundant reserves, and proactively manage demand fluctuations across regions in Japan and Europe by taking advantage of different market circumstances.

Project Benefits

- Diversify resource suppliers** Tokyo Gas' first procurement from Africa based on a long-term contract
- Diversify contract terms and conditions** Introducing multiple price indices and destination free clauses
- Diversify our LNG network** Constructing an LNG network that links between Asia and Europe, aiming to proactively manage demand fluctuations based on different market circumstances and to improve the liquidity in the LNG market

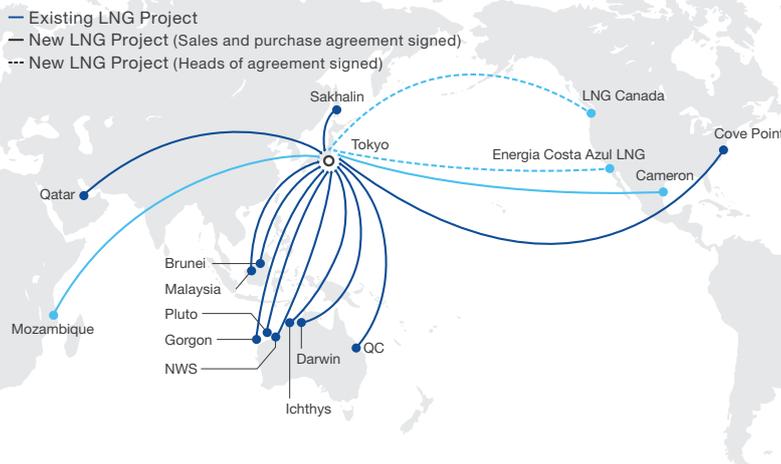
Japan relies heavily on LNG imports for procuring natural gas, and LNG import prices are generally determined by a mechanism linked to crude oil prices. With the aim of achieving stable and affordable LNG procurement under these conditions, the Tokyo Gas Group strives to achieve three types of diversification: diversification of supply sources, contract terms and conditions, and its LNG network.

Diversification 1

Supply sources

In 2018, we started to procure LNG from the US, while continuing to acquire supplies from existing sources, including Southeast Asia, Australia and Sakhalin (Russia). Now we have long-term offtake contracts with 14 projects in 6 countries, including the Ichthys Project in Australia, which we began receiving LNG shipments from in 2018. In addition to the sale and purchase agreement with the Mozambique LNG Project, we signed heads of agreements with the LNG Canada Project and the Energia Costa Azul LNG Project in Mexico in continuous pursuit of diversification of procurement supply sources. Through efforts such as these, we are working to enhance the stability of our LNG supply.

Tokyo Gas' long-term contracts



Diversification 2

Contract terms and conditions

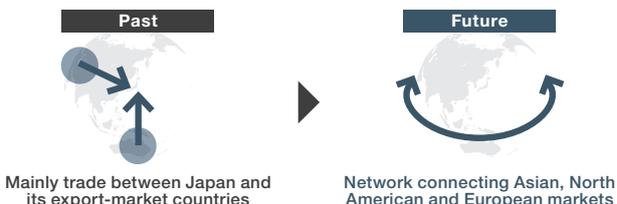
In addition to conventional crude oil price-linked contracts, we will conclude contracts under which the prices are based on natural gas prices in the US and coal prices in a bid to increase price stability. We also plan to increase the number of contracts with no restrictions on shipping destinations and other matters, and increase our ratio of short-term "spot" procurements, in order to enhance our flexibility.



Diversification 3

LNG Network

By establishing an LNG network that connects the markets in Asia, North America and Europe, we aim to improve LNG transportation efficiency and reduce regional price differences, which will increase our flexibility to proactively manage demand fluctuations.



For innovative LNG procurement

We have had continued success procuring a stable supply of LNG over the past half century, however, following full deregulation of the electricity and gas markets, it is also necessary to take flexible action in response to the fluctuation and uncertainty of demand and for more competitive LNG procurement. To address these issues, it is vital to capitalize on our experience, past achievements and alliances we have formed with Japanese and non-Japanese companies to take the lead in changing this LNG industry without being constrained by past norms.

One specific example comes from our revolutionary joint procurement between a Japanese and European company from the Mozambique LNG Project. The joint procurement came about from our long-term collaboration and a strong relationship with Centrica. This procurement is intended to secure high competitiveness and an ability to respond to demand fluctuations through flexible LNG transactions that combine two different markets in Asia and Europe.

Subsequently, we have continued talks for procurement from Canada and Mexico. We will continue to exhibit our strengths in LNG procurement including transport and trading globally, and will continue to further implement innovative procurement aiming to increase our competitiveness and flexibility. With our efforts we will contribute to the further development of the LNG industry.



Initiatives Towards Achieving the Sustainable Development Goals (SDGs)

Diversification of supply sources leading to the expansion of the LNG network

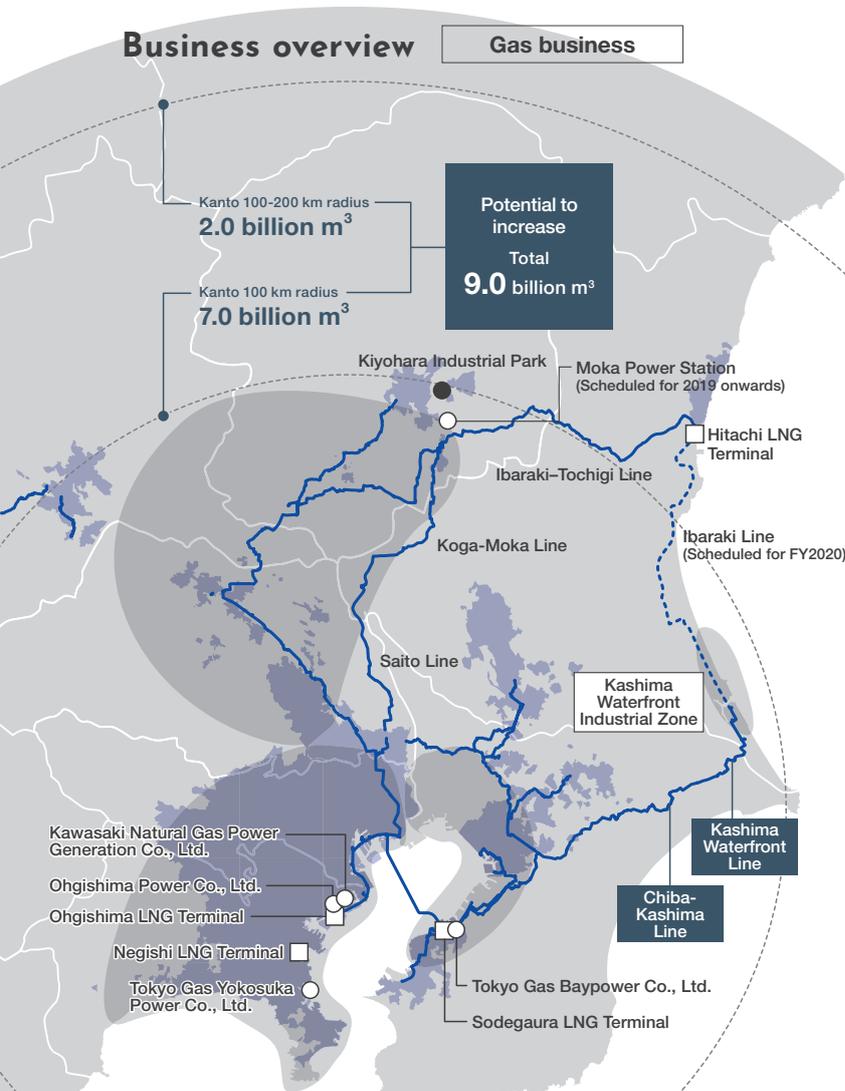
- In May 2018, Tokyo Gas began receiving shipments of LNG produced at Cove Point, Maryland, United States.
- During FY 2018, Tokyo Gas began receiving LNG shipments from the Ichthys Project in Australia, and jointly signed a sale and purchase agreement regarding the Mozambique LNG Project with Centrica. With the addition of these and various other projects, Tokyo Gas is advancing the diversification of its supply sources.
- In addition, by driving three types of diversification in procurement, such as in its initiative to exchange LNG in cargo-unit volumes based on the memorandum of understanding on a strategic alliance signed with Centrica, Tokyo Gas is accelerating the construction of an LNG network connecting Japan to the rest of the world.





Business overview

Gas business



Promotion and Expansion of Natural Gas Usage through Infrastructure Development

Plans to invest ¥500 billion in gas business over a three-year period (FY2018-2020)

Under the GPS2020 management plan, Over a period of three years (FY2018-2020), Tokyo Gas plans to invest ¥500 billion, equivalent to approximately half of the total amount of investments for the overall plan, to enable the safe and stable delivery of city gas to customers. In addition to investments for security, stable supply, and promotion and expansion of city gas usage (maintenance and improvement of pipeline facilities, etc.), we will also carry out large-scale improvements to equipment and facilities, including the completion of the Ibaraki Line, expansion of the Hitachi LNG Terminal, and the construction of a customer information management system.

Significant potential demand in the Northern Kanto area

Tokyo Gas puts particular strategic emphasis on the Northern Kanto area, which has strong potential demand for natural gas owing to its numerous large-scale industrial districts. We aim to expand gas sales volume from 19.1 billion m³ in fiscal 2017 (forecast at the time of formulation of GPS2020) to 20.7 billion m³ by promoting and expanding the widespread use of natural gas by extending the length of our pipeline network and lorry supply; and providing energy solutions including energy conservation, CO₂ reductions and cost reductions via the use of natural gas and gas appliances.

Promoting the widespread use and expansion of distributed energy systems

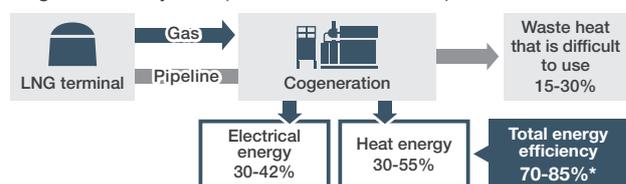
Cogeneration systems supply electricity and heat by using city gas as fuel. In addition to the installation of facilities at the point of demand, cogeneration systems help enhance energy efficiency, reduce the amount of CO₂ emissions, and improve economic efficiency through the conservation of energy by effectively utilizing both electricity and waste heat.

Having identified cogeneration system as a strategic product, Tokyo Gas is promoting adoption of the residential fuel cell system ENE-FARM and, for commercial and industrial customers, optimal cogeneration systems matching their demand.

Installation Results (March 2019)

ENE-FARM	Cogeneration System
Reached 110,000 units in cumulative sales of ENE-FARM in December 2018	2.29 million kW (equivalent to the capacity of about 2 nuclear power stations)

Cogeneration System (Commercial, Industrial)



* Energy efficiency stated above is calculated based on certain assumptions made by Tokyo Gas.

Wider Energy Supply Business

Area-wide Energy supply to Kiyohara Industrial Park

An energy center mainly consisting of a 30 MW-class cogeneration system will come into operation in fiscal 2019 to supply electricity and heat to facilities (three companies and seven facilities) in the Kiyohara Industrial Park in Utsunomiya City, Tochigi Prefecture.

The Tokyo Gas Group, to achieve maximum efficiency in serving these customers, will monitor the fluctuating load of each facility and engage in optimally balanced operation to supply energy. This will be one of the largest area-wide energy supply undertakings in an inland industrial park in Japan. We are promoting widespread use and expansion of distributed energy systems and tapping industrial demand.



Promoting and expanding the widespread use of gas in the Northern Kanto area

Achievements of the Chiba-Kashima Line

The Chiba-Kashima Line commenced operation in March 2012, and has succeeded in dramatically increasing our gas sales volume in Kashima waterfront industrial zone. As a result, our gas sales volume in that area has grown to such an extent that it now accounts for approximately 10% of our total consolidated gas sales volume.

Securing Potential Demand in the Kanto Area

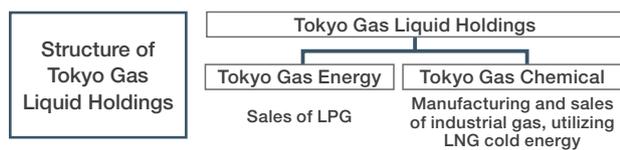
In October 2015, Tokyo Gas commenced operation of its Saito Line (connecting Soka, Saitama and Koga, Ibaraki). This was followed by the opening of our Hitachi LNG Terminal and the Ibaraki-Tochigi Line (between Hitachi, Ibaraki and Moka, Tochigi) in March 2016; and the Koga-Moka Line (between Koga, Ibaraki and Moka, Tochigi Prefecture) in October 2017. By linking our three LNG terminals in Tokyo Bay and our existing trunk line network, we have completed a loop of high-pressure pipelines in our primary supply area, and improved the stability of our supply infrastructure. Capitalizing on our infrastructure development efforts, Kobelco Power Moka Inc. is constructing a natural gas-fueled thermal power plant in Moka City, Tochigi Prefecture. In addition to an expected increase in gas sales volume by supplying gas to this power plant, we are also working to further develop potential demand. Additionally, we are constructing a new Ibaraki Line that will connect the cities of Hitachi and Kamisu in Ibaraki Prefecture, aiming to commence operation in fiscal 2020. The completion of this line will enable even greater widespread promotion and expansion of natural gas usage in the Kanto region.

Expanding business operations through alliances with other LPG business operators, etc.

In July 2018, we set up Gas Crew Co., Ltd. It operates LPG filling and distribution services in the Kanto region. In collaboration with various LPG industry players, we will work to enhance efficient delivery and improve safety and customer services. We will thus aim to deliver LPG to one million customers by fiscal 2020.

Utilizing LNG cold energy to manufacture and supply industrial gases

We make effective use of LNG cold energy, to manufacture and supply affordable high-grade industrial gas. We are also seeking to enhance our sales capabilities by offering one-stop solutions to large-account customers by combining LNG, engineering, and other Tokyo Gas services.



Examples of alliances with LPG business operators

- Established Gas Crew Co., Ltd. logistics management company (July 2018)
- Astomos Energy Corporation, ENEOS GLOBE Corporation

Comprehensive alliances

- Astomos Energy Corporation (October 2016)
- Saisan Co., Ltd. (February 2017)

Test project to validate IoT-based remote meter-reading/telemetry (June 2017)

Azbil Corporation, Azbil Kimmon Co., Ltd.

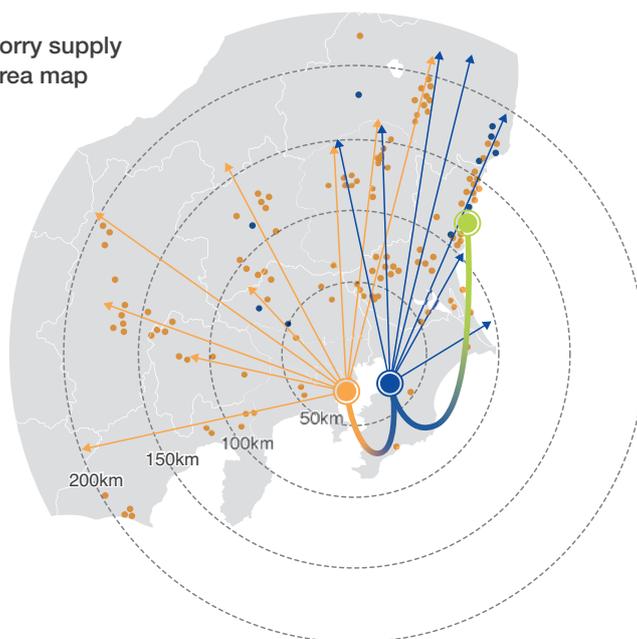
Release of an LPG container delivery plan optimization system using AI (April 2019)

Azbil Kimmon Co., Ltd., Lyna Logistics, Inc.

Lorry-based LNG sales

Even in regions where gas pipelines have not been laid, Tokyo Gas is enabling the use of natural gas by transporting LNG using lorries. We have a track record of 50 years transporting LNG in this way since 1969, and have the largest scale lorry-based supply business in Japan, with over 190 vehicles.

Lorry supply area map



Liquid gas business

Outline

Tokyo Gas operates a liquid gas business, in which it sells LPG to customers in locations outside its city gas supply area and/or those who otherwise do not use Tokyo Gas gas, and utilizes LNG cold energy to manufacture and sell industrial gases.

Number of customers (LPG)	
Direct sales	60 thousand FY2018
Distributors	230 thousand FY2018

Segment profits
¥0.3 billion FY2018

