

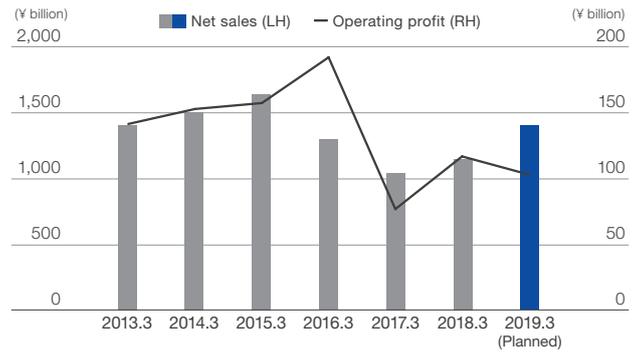
Business overview

Gas business

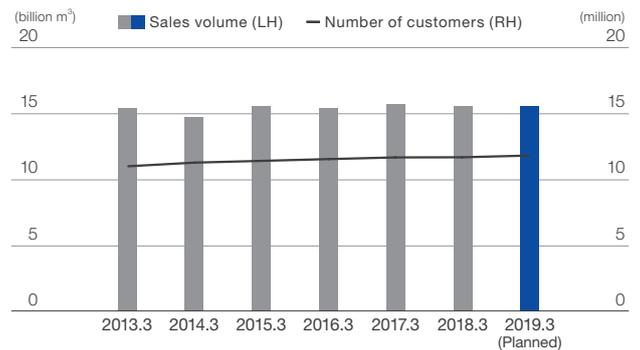
GAS BUSINESS



Net sales and Operating Profit



Gas Sales Volume and Number of Customers



Factors affecting revenues and expenses ▶ P59

Case Study (Materials Procurement)

Cove Point LNG Project



In May 2018, Tokyo Gas began receiving its first shipments of LNG in Negishi LNG Terminal from the Cove Point LNG Project, our first project procuring LNG from a gas-rich shale source in the United States.

Based on the memorandum of understanding on a strategic alliance signed with Centrica (Centrica LNG Company Limited, a subsidiary of leading UK-based energy and services company Centrica plc) — one of the UK's leading energy companies—in November 2016, Tokyo Gas will aim to create a framework to exchange its LNG with LNG procured by Centrica in the Asia-Pacific region, and enable cost reductions by improving efficiency in the transportation of LNG.

Project Benefits

- 1 Diversify resource suppliers**  
The Cove Point project is our first project to procure LNG from a gas-rich shale source in the United States
- 2 Diversify contract terms and conditions**  
Linked to the U.S. natural gas prices, no restrictions on shipping destinations
- 3 Diversify our LNG network**  
We are developing an LNG value chain linking Asia, North America and Europe (aiming to achieve the concrete realization of the memorandum of understanding on a strategic alliance signed with Centrica (UK))

City Gas and LNG sales

Outline

Applications of gas from the Tokyo Gas Group span a wide range, from household cooking, heating, and hot water, to commercial 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 | Gas sales volume   | Segment profits |
|---------------------|--|-----------------|
| 11,678 thousand     | 15.57 billion m³   | ¥116.6 billion  |
| FY2017              | FY2017<br><small>Equivalent to approximately 45% of total nationwide gas sales volume in Japan</small> | FY2017          |

Strengths

- Customer base of over 11 million customers and the trust relationship with customers who have close ties with local communities
- Delivery of safety and reliability to customers for many years
- 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 technology capabilities

Risks

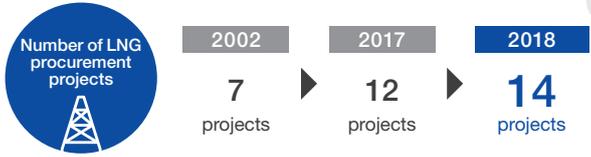
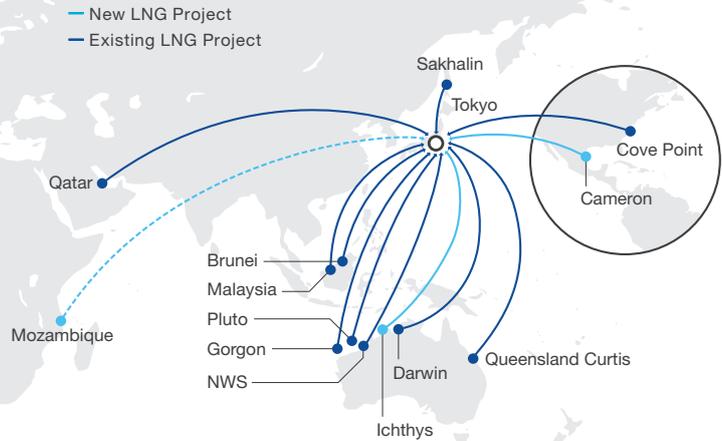
- Difficulties in raw materials procurement due to the impact of geopolitical risks, etc., with regard to raw materials imports
- Supply issues due to damage to production and supply facilities stemming from a large-scale disaster
- Intensified competition driven by market deregulation; decline in demand caused by changing lifestyle

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

### Diversification 1

## Resource suppliers (procurement sources)

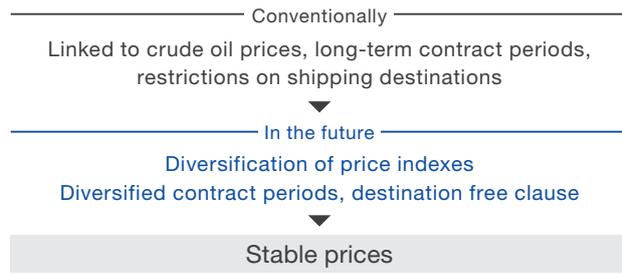
In addition to its conventional procurement sources in Southeast Asia, Australia, and Sakhalin (Russia), Tokyo Gas has also begun receiving LNG from the Cove Point LNG Project in the United States. Upon commencing receipt of LNG from the Ichthys Project in Australia (scheduled to commence during fiscal 2018), the Group will have increased its number of LNG suppliers to 14 projects in 6 countries. We have also reached a basic agreement on joint procurements with Centrica (UK) in Mozambique, Africa. Through efforts such as these, we are working continuously to enhance the stability of our LNG supply, by considering LNG procurement from a wide range of areas and regions.



### Diversification 2

## Contract terms and conditions

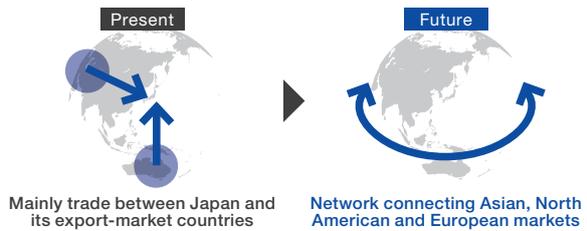
By adding contracts linked to US natural gas prices and other benchmark indicators, in addition to conventional crude oil price-linked contracts, we aim to stabilize our procurement costs. We also plan to increase the number of contracts with no restrictions on shipping destinations and other matters, 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, reduce cost differentials in market prices among regions, and increase our flexibility; which will contribute to making supply and demand adjustments.



With the full deregulation of the electric power and gas markets, uncertainty with regard to demand for city gas is increasing, and there is a growing need for more flexible handling of demand fluctuations and more competitive LNG procurement. In order to tackle issues such as these, Tokyo Gas is expanding the scale of its LNG trading activities.

As a concrete example, we are engaged in initiatives to increase options for making flexible adjustments to supply and demand, such as by aiming to reduce raw material costs (such as by reducing shipping distances and Panama Canal transit tolls) by exchanging cargo-unit volumes of LNG procured by Tokyo Gas in the United States with LNG procured by the Centrica Group (UK) in the Asia-Pacific Region.

Moving forward, we will aim to further improve our competitiveness and flexibility by continuing to increase trading with alliance partners both in Japan and overseas.

### Sustainable Development Goals

#### Initiatives Towards Achieving the Sustainable Development Goals (SDGs)

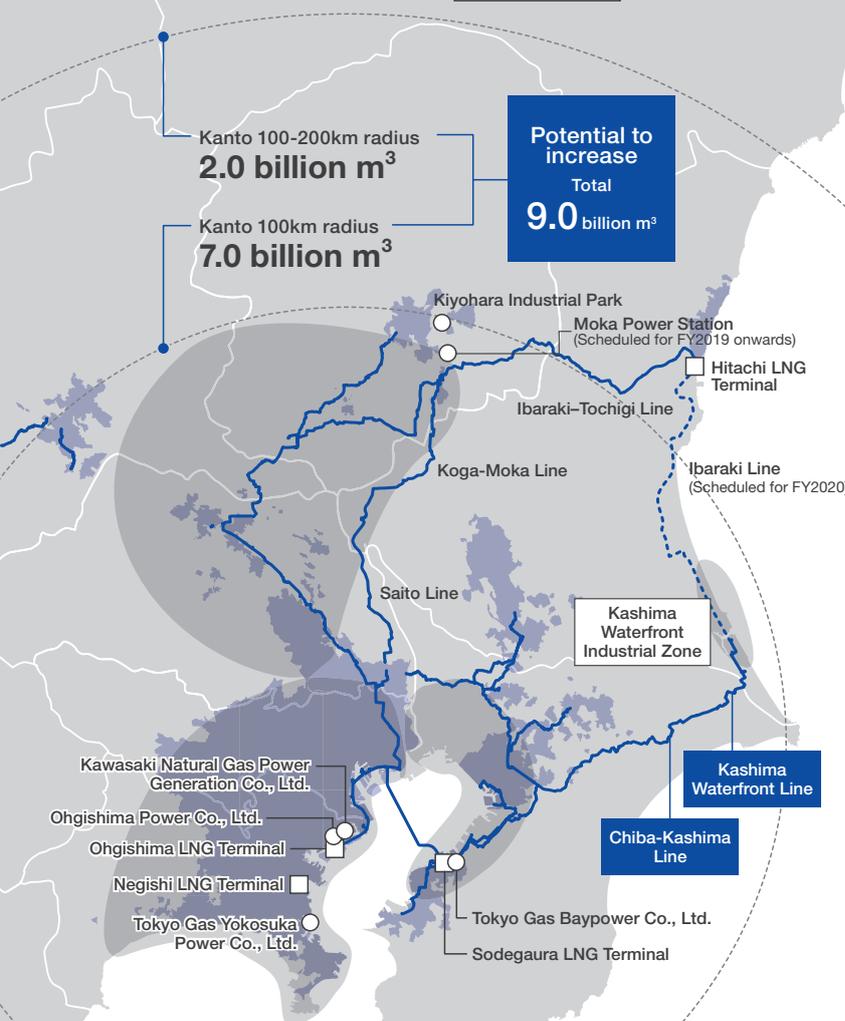
Further diversification of our LNG network beginning with the Cove Point Project

- In May 2018, Tokyo Gas began receiving shipments of LNG produced at Cove Point, Maryland, United States.
- During fiscal 2018, Tokyo Gas plans to begin procuring LNG from the Ichthys Project in Australia, and has also reached a basic agreement on joint procurements with Centrica (UK) in Mozambique, Africa. With the inclusion of these and various other projects, Tokyo Gas is advancing the diversification of its procurement 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



### 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 CO<sub>2</sub> 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.

### Expansion of Natural Gas Usage through Infrastructure Development

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

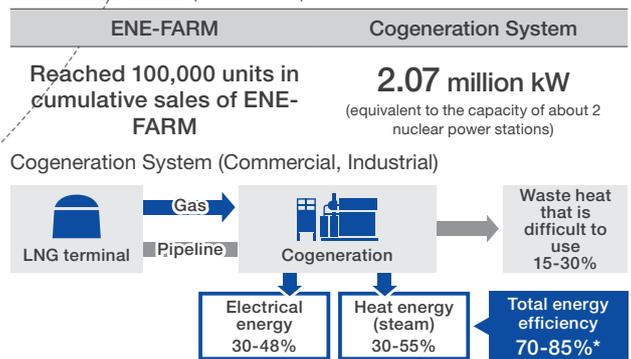
Under the GPS2020 management plan, Over a period of three years (FY2018-2020), Tokyo Gas plans to invest ¥500 billion, equivalent to approximately half of the total amount of investments for the overall plan, to enable the safe and stable delivery of city gas to customers.

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 m<sup>3</sup> in fiscal 2017 (forecast at the time of formulation of GPS2020) to 20.7 billion m<sup>3</sup> 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, CO<sub>2</sub> reductions and cost reductions via the use of natural gas and gas appliances.

Installation Results (March 2018)



\*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

We are proceeding with construction of an energy center, mainly consisting of a 30 thousand kW-class cogeneration system, to supply electricity and heat to multiple 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 trunk lines in our primary supply area, and improved the stability of our supply infrastructure.

Capitalizing on our infrastructure development efforts, Kobelco Power Moka 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.

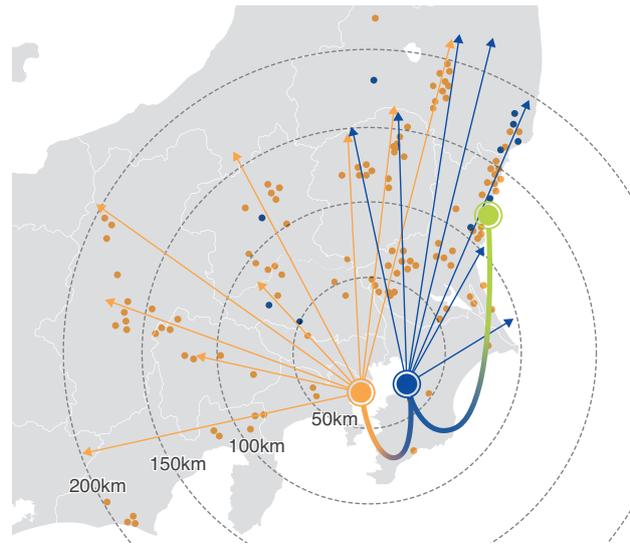
Additionally, we are constructing a new Ibaraki Line that will connect the cities of Hitachi and Kamisu in Ibaraki Prefecture,

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.

### 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 over 40 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



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

By forming alliances and collaborating with various LPG industry players, Tokyo Gas will seek to achieve highly-efficient delivery and improve maintenance and customer service levels, to achieve a business scale of around 1 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.

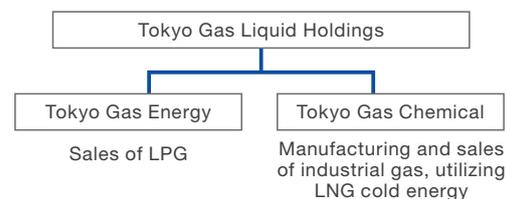
## Liquid gas business

### 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                   |  | Segment profits        |
|---------------------------------------|--|------------------------|
| Direct sales<br>60 thousand<br>FY2017 | Distributors<br>240 thousand<br>FY2017 | ¥1.7 billion<br>FY2017 |

### Structure of Tokyo Gas Liquid Holdings



### 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.