



# Domestic Energy Business

Positioning the supply of gas as its core business, Osaka Gas provides a diverse range of energy and energy-related services. The Company's domestic energy business extends over a wide range of spheres including its Kansai region gas business, broad-area energy business, LPG business, industrial gas business, and electric power business.

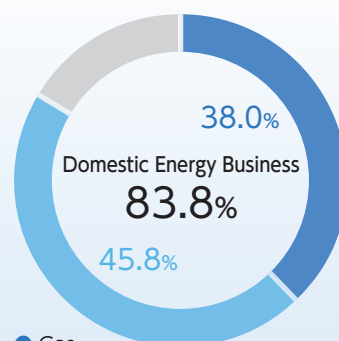


In the fiscal year ended March 31, 2015, net sales from domestic energy business were ¥1,380.7 billion. Segment income came in at ¥91.9 billion, accounting for around 83% of the Group's overall income.

Heightened interest among customers with regard to saving energy and protecting the environment, combined with lower crude oil prices, depopulation in the Kansai region, and the upcoming full liberalization of the electricity and gas markets are all factors that will keep conditions in the energy business in constant flux.

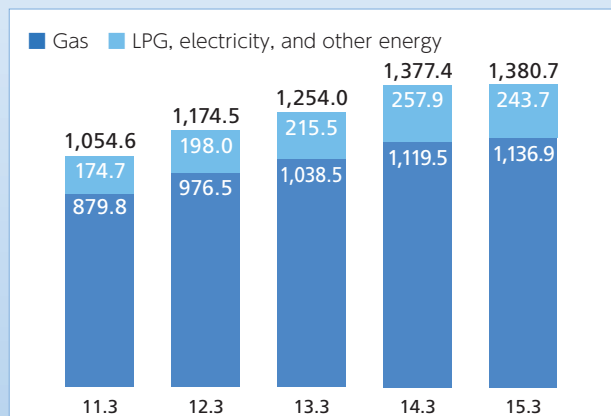
Osaka Gas sells energy in forms including city gas, LPG, and electricity. We also offer provisions that integrate gas equipment such as ENE-FARM, and other services to save energy and improve energy security. Through this mixture of businesses we are meeting the diversifying needs of customers.

Segment Income\* (2015.3)

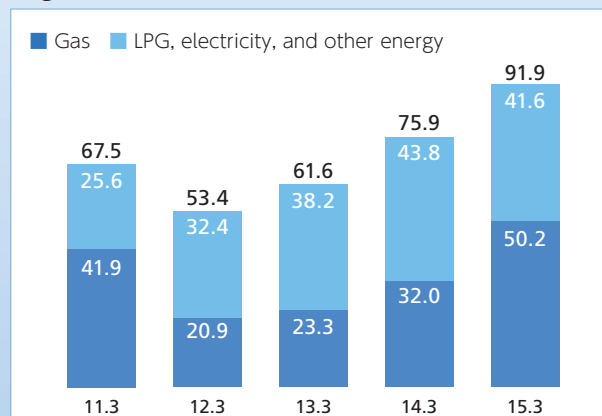


● Gas  
● LPG, electricity, and other energy

Net Sales (Billions of yen)



Segment Income\* (Billions of yen)



Note: Starting in the fiscal year ended March 31, 2015, Osaka Gas repositioned the renewable energy business from the environment/non-energy segment to the LPG/electricity/other energy segment or to the international energy segment according to the details of individual business activities. For this reason, figures from the fiscal year ended March 31, 2015 on include the domestic renewable energy business.

\* Segment income = Operating income + Equity in earnings of affiliates

## Kansai Region Gas Business

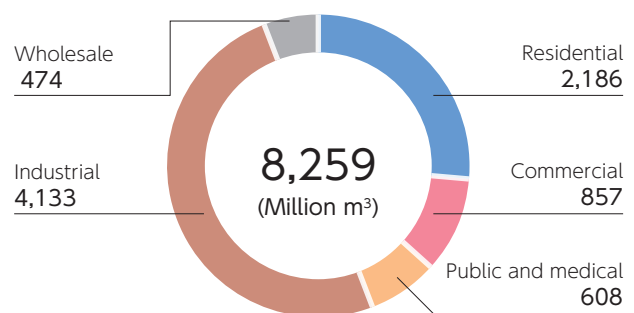
As a core pillar of the Osaka Gas Group's business, we provide comprehensive gas-related services to customers in the Kansai region, ranging from the production, supply and sale of gas to the installation of gas pipes and the sale of gas appliances.

### Overview of Gas Sales in the Fiscal Year under Review

In the fiscal year ended March 31, 2015, the gas sales volume declined 3.1% year on year to 8,259 million m<sup>3</sup> on a non-consolidated basis. The sales volume of gas to industrial customers decreased 4.5% year on year to 4,133 million m<sup>3</sup> due to a switch by some independent power producers to internal power sources\* and a downturn in operations at customers' facilities. Meanwhile the sales volume of gas to residential customers declined 0.5% compared with the previous fiscal year, to 2,186 million m<sup>3</sup>.

The sales volume of gas for commercial use decreased 3.7% to 857 million m<sup>3</sup>, meanwhile, the sales volume of gas for public and medical use dropped 4.7% to 608 million m<sup>3</sup>, both primarily owing to lower demand for air conditioning because of lower summer temperatures than in the previous year. On a wholesale basis, the volume of gas sold to other gas providers was 474 million m<sup>3</sup>, up 1.0%.

#### Gas Sales Volume by Use (Non-Consolidated) (Million m<sup>3</sup>) (2015.3)



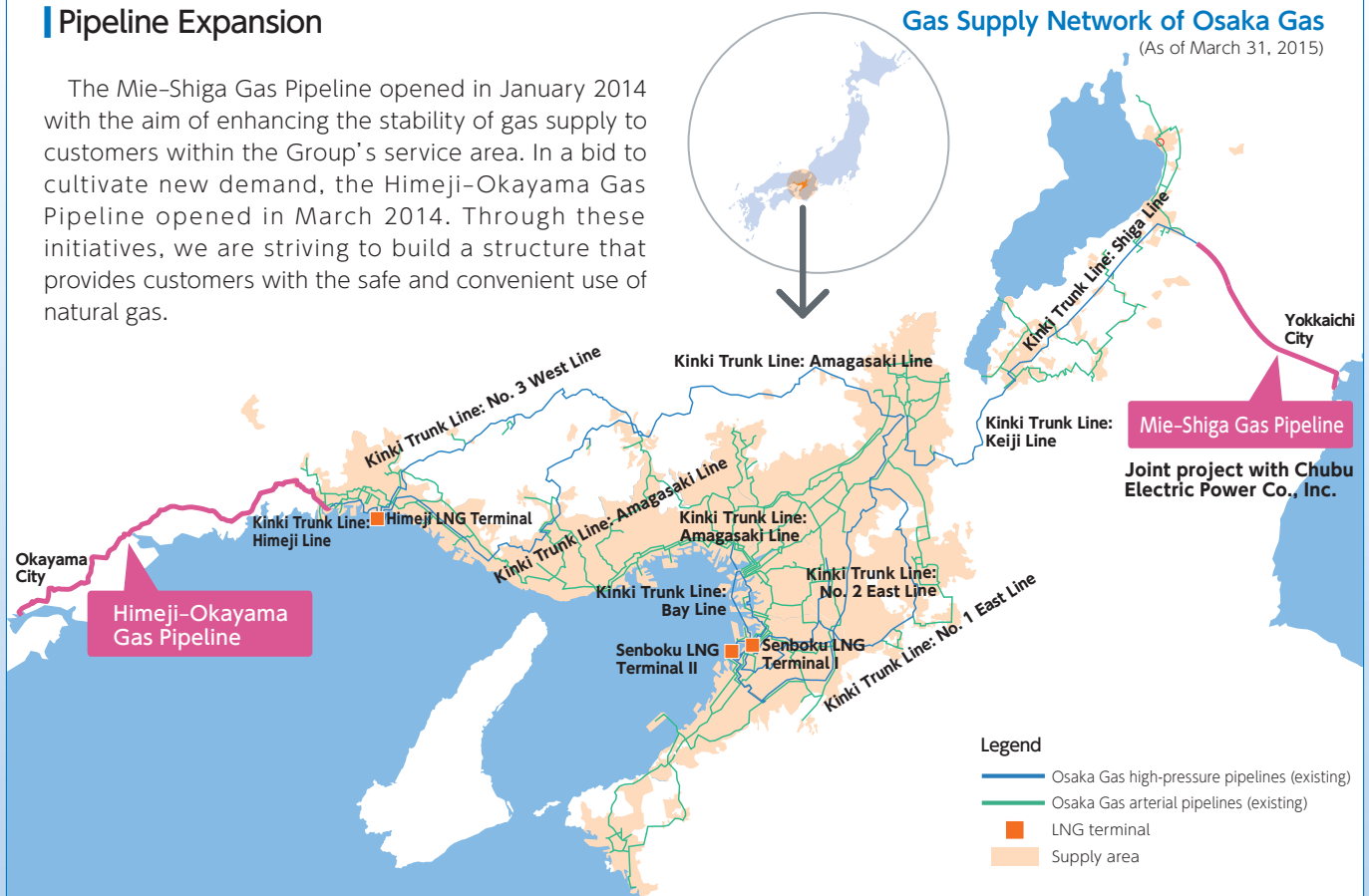
\* With the expiration of contracts, the handling of gas use shifted to internal use

### Pipeline Expansion

The Mie-Shiga Gas Pipeline opened in January 2014 with the aim of enhancing the stability of gas supply to customers within the Group's service area. In a bid to cultivate new demand, the Himeji-Okayama Gas Pipeline opened in March 2014. Through these initiatives, we are striving to build a structure that provides customers with the safe and convenient use of natural gas.

#### Gas Supply Network of Osaka Gas

(As of March 31, 2015)



## Kansai Region Gas Business | Residential Gas Sales

### Business Overview and Characteristics

In the residential sector, we provide homes with a stable and safe supply of gas and also sell various gas appliances with the aim of encouraging increased gas usage. Recently, the population has been declining in the Kansai region and natural gas has continued to face increased competition from rival energy sources. In this challenging environment,

we are taking steps to help create a low-carbon society through the efficient use of energy. We are also targeting higher levels of energy security through the increased usage of distributed power generation systems. In these ways, Osaka Gas is working to expand gas demand in the residential sector.

### Initiatives Aimed at Promoting the Installation of the Residential Fuel Cell Cogeneration System “ENE-FARM”

Since the release of our residential gas engine cogeneration system “ECOWILL” in 2003, we have worked diligently to promote more widespread use of distributed power generation in the residential sector. After launching our residential fuel cell cogeneration system “ENE-FARM” in 2009, we have been advancing optimal cogeneration system proposals that are designed to enhance customers’ lifestyles.

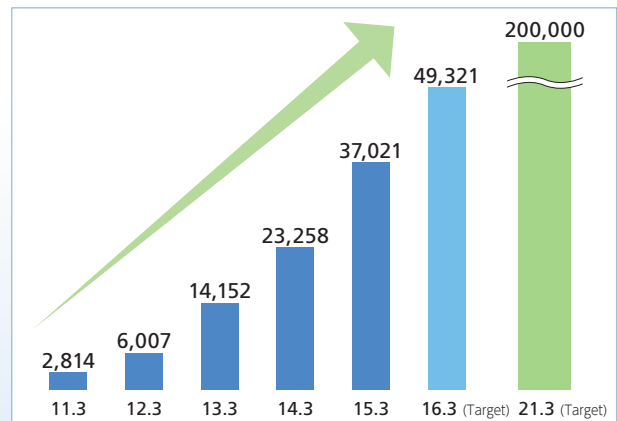
The installation of cogeneration systems expands the use of natural gas to the generation of power to cover a portion of the electricity consumed by households, joining the main use of natural gas to heat water and home spaces, thereby contributing to reductions in both energy consumption and CO<sub>2</sub> emissions.

Interest in distributed power generation systems has risen in recent years due to concerns over energy security. Against this backdrop, the Osaka Gas Group has commercialized its ENE-FARM system, which continues to operate during power outages, and is working to address the broad demands of customers.

In the fiscal year ended March 31, 2015, ENE-FARM sales exceeded 13,000 units bringing cumulative sales to a total of around 37,000 units. Osaka Gas is looking to achieve a cumulative sales total of 200,000 units in the fiscal year ending March 31, 2021.

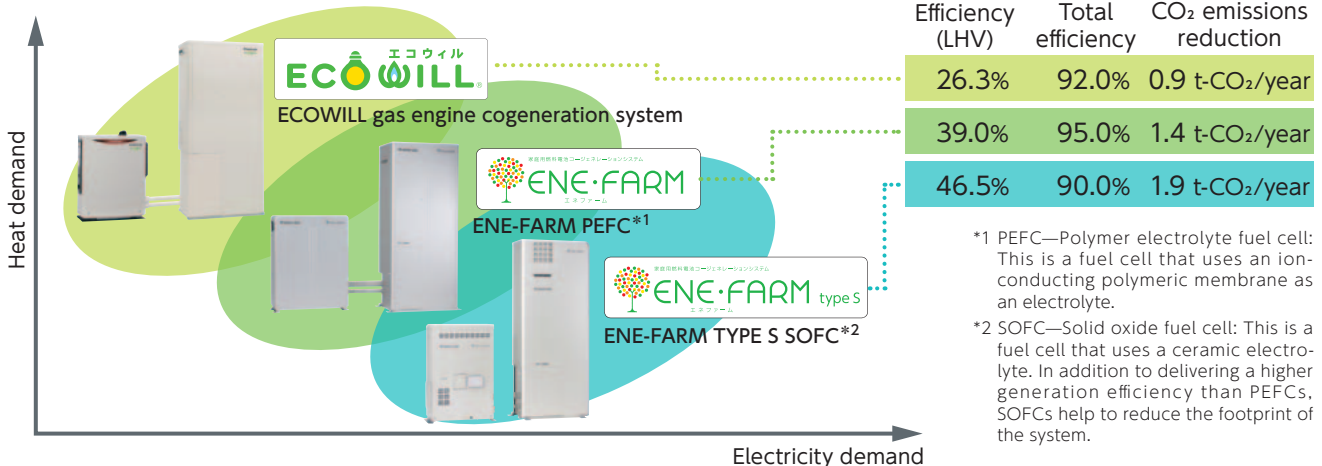
Moving forward, we will continue to develop innovative technologies that help to increase the efficiency, decrease the size, and lower the price of products and systems. We will work to encourage the widespread adoption of our products in apartment buildings and other types of residences to help customers realize more comfortable lifestyles, reduce environmental load, and enhance energy security.

Growth in Cumulative Number of ENE-FARM Units Sold



Note: Up until last year, figures for the year ended in March 2013 covered April—December 2012, and for the year ended in March 2014 covered January 2013—March 2014. Starting this year, figures reflect sales corresponding to the fiscal period.

### Residential Cogeneration System Lineup





## ENE-FARM Power Generation Mechanism

ENE-FARM is a system that generates electricity from hydrogen extracted from city gas and oxygen in the air.



## Supplying and Developing Services

Osaka Gas works diligently to provide and develop high-quality services to maintain support for customers.

### ■ RAKU-TOKU Lease (Gas Equipment Leasing)

This equipment lease system allows customers to use the latest built-in gas cooking stoves, water and air heaters, and bathroom heating and drying equipment (KAWACK and MIST KAWACK brands) and other gas equipment for a monthly leasing fee. The lease period is 6–10 years, during which time customers can take advantage of a free repair service. This affordable lease system allows customers to safely use and enjoy the latest gas equipment.

Currently, approximately 30,000 households have signed up for the lease system as of March 31, 2015.



### ■ “RAKU-TOKU” Warranty Service

By paying a set monthly fee, customers can have their gas water heaters and built-in gas cooking stoves repaired for free. This service also includes periodic inspections free of charge. Moreover, the service is available even for customers using gas water heaters and built-in gas cooking stoves made by other manufacturers. In this manner, Osaka Gas provides warranty services to a broad spectrum of customers.

Currently, around 300,000 households have contracted to receive this warranty service as of March 31, 2015.

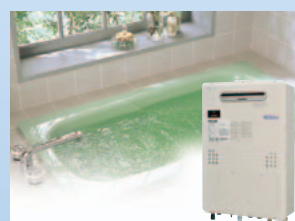


### ■ Rururu Call M (Gas Safety & Peace of Mind Service)

Rururu Call is a service that monitors gas usage at a customer's home 24 hours a day via the gas meter. Launched in October 2014, Rururu Call M represents an evolution of this service, offering email notifications if the customer forgets to turn off the gas or leaves the gas on for an extended period of time, allowing remote shut-off of the gas from wherever the customer is at the time, as well as integrating other features leveraging mobile phone and email technology. As a means of looking out for family members living apart or alone, a service has been newly added that contacts the family if no gas is used the previous day. The service thus contributes to customer safety and security.

As of March 31, 2015, services from the Rururu Call series are provided to 210,000 households.

るるるコールM



# Kansai Region Gas Business | Commercial and Industrial Gas Sales

## Business Overview and Characteristics

In the commercial and industrial sectors including public and medical institutions, Osaka Gas supplies gas to its customers for such wide-ranging applications as gas cogeneration systems and gas air conditioning systems. Harnessing its engineering capabilities, where the Company's strengths lie, Osaka Gas strives to enhance the efficiency of

customers' gas usage by developing custom burners and proposing business solutions tailored to the specific needs of each customer.

In line with the opening of the Himeji-Okayama Gas Pipeline in March 2014, we are taking steps to propose conversion to natural gas to factories and other facilities in the area along the pipeline.

## Expanding the Use of Gas Cogeneration and Air Conditioning Systems

Osaka Gas offers gas cogeneration systems and gas air conditioning systems that can help to conserve energy and reduce electricity consumption at peak hours.

The cumulative capacity of gas cogeneration systems sold stood at 1.58 GW as of March 31, 2015. This is helping to alleviate the imbalance between electric power supply and demand. Looking ahead, we will work diligently to expand the use of cogeneration systems to meet our cumulative capacity target of 2 GW for the fiscal year ending March 31, 2021.

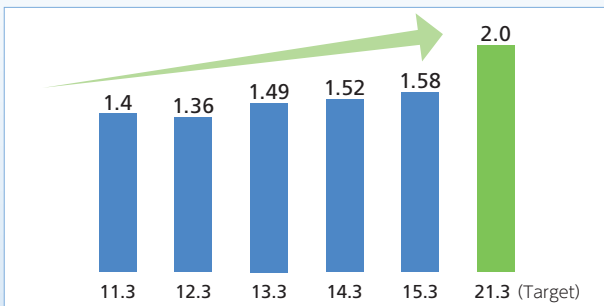
With robust sales of gas air conditioning systems including gas heat pumps and natural chillers (gas absorption water heater-coolers), cumulative capacity

sold stands at 4.6 million refrigeration tons (RT) as of March 31, 2015. Osaka Gas is looking to reach a cumulative total of 5.5 million RT in the fiscal year ending March 31, 2021.

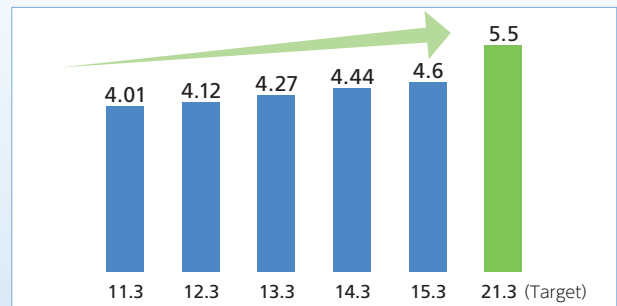


Gas cogeneration system

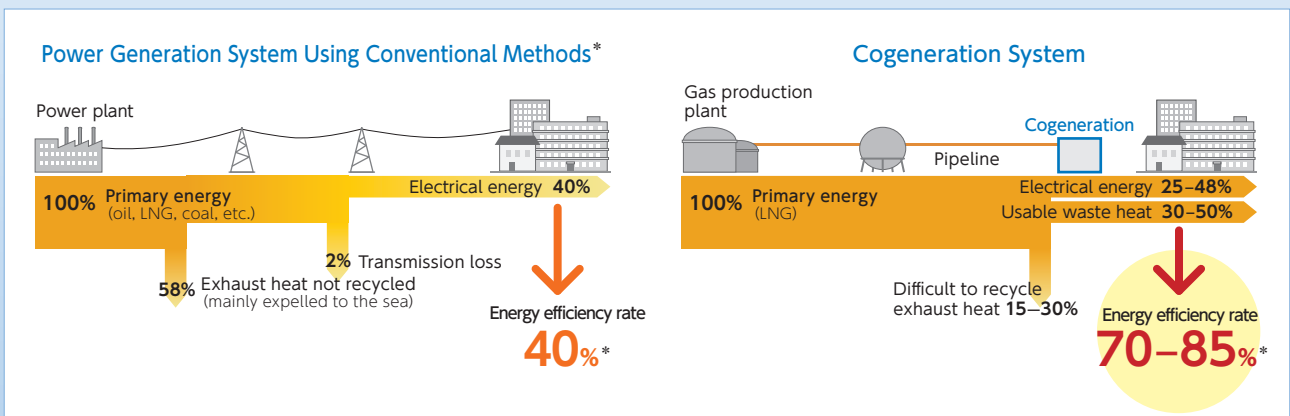
**Cogeneration**  
Cumulative Capacity (GW)



**Gas Air Conditioning System**  
Cumulative Shipped Capacity (Million refrigeration tons)



## Differences between Conventional Generation Systems and Cogeneration Systems



\* LHV standard thermal power plant thermal generation efficiency and integration loss are computed based on the operating results of nine electric utilities and power wholesale companies.  
Source: The Japan Gas Association

## New Products

### GHP XAIR II—A Gas Air Conditioning System That Conserves Electricity and Saves Energy

The GHP XAIR II is a second-generation modular air conditioning system that uses a super-efficient gas engine heat pump. Featuring improved annual operational efficiency, the system was developed by Osaka Gas jointly with Aisin Seiki Co., Ltd., Panasonic Corporation, and Yanmar Energy System Co., Ltd. The new system will reach the market in October 2015.

The lowered speed of the gas engine boosts efficiency by an average of 40% when operating at low loads. This means a

\* Comparison to previous model with the same cooling capacity (45–85 kW (16–30 horsepower)) (Osaka Gas trial calculations for office building use)

significant boost to annual operational efficiency, reducing primary energy consumption by an annual average of about 20%\* over the previous model.



## Cultivating Demand Along the Route of the New Himeji–Okayama Gas Pipeline

We estimate that the latent demand for natural gas along the Himeji–Okayama Gas Pipeline that links Himeji City, Hyogo Prefecture with Okayama City, Okayama Prefecture stands at around 400 to 500 million m<sup>3</sup>. We will aggressively put forward proposals to encourage the use of city gas among potential

customers along the route of the pipeline, including large-scale factories.

In the fiscal year ending March 31, 2017, we will commence city gas supply to Units 1 and 3 of the Aioi Power Plant of the Kansai Electric Power Company, each with a rated output capacity of 375 MW.

## Customized Solutions for the Industrial Market

To design optimal energy systems for customers, Osaka Gas analyzes how each customer can save energy and proposes facility improvements. We also have the capability to develop technologies and products required to respond to the needs of customers and provide maintenance.

In particular, we began developing burners for industrial furnaces in the 1950s and 1960s, and have developed a vast range of burners at our experimental facility.

With our unique engineering expertise we supply optimal solutions that boost customer satisfaction and help develop further demand.

### Energy Diagnoses and Facility Improvement Proposals

Using cutting-edge measurement technologies and our specialized know-how, we perform thorough surveys of customer's equipment. We then propose optimal gas systems that can save energy and improve product quality.



### Technology and Equipment Development Using Unique Engineering Strengths

Osaka Gas develops technologies and equipment for the systems we propose. We reproduce the customer's furnace at our experimental facility and conduct repeated testing and analyses to meet the needs of the customer.



### Maintenance

We employ information technologies to provide fast and detailed service. We handle troubleshooting and also propose facility improvements to save energy and improve the quality of products.



### Engineering Solutions, Fuel Conversion

We offer systems to meet the specific needs of each customer. When installing, we strive to shorten the construction period to minimize impact on the customer's production activities. We conduct fuel conversion and install new gas equipment.



Boost Customer Satisfaction

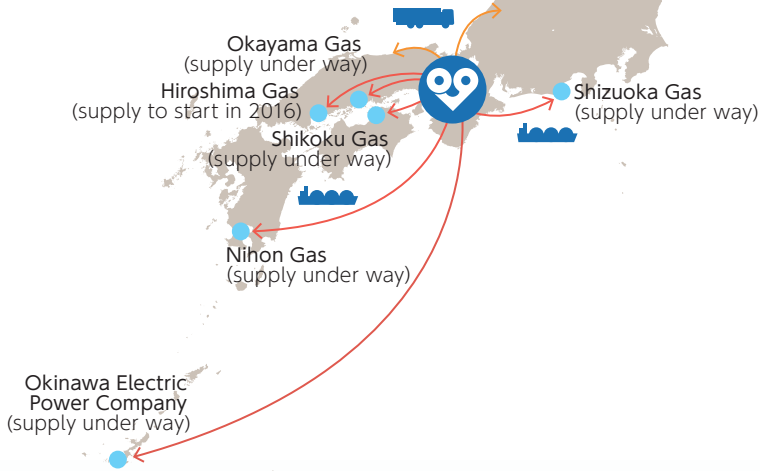
Develop Demand

# Broad-Area Energy Business

## Business Overview and Characteristics

In addition to supplying city gas to customers within its service area, the Osaka Gas Group sells a portion of the LNG it procures to large-scale customers outside of the Kansai region and to other utilities, transporting the gas by tanker truck or ship. LNG supply using large-scale LNG carriers to Okinawa Electric Power Company, Inc. and Shizuoka Gas Co., Ltd. During 2016 we will also

begin supplying LNG to Hiroshima Gas Co., Ltd. Going forward, we will expand the volume of LNG we handle to enhance competitiveness from a resource procurement standpoint, and will continue to provide energy solutions that address the needs of customers while pursuing alliances with regional utilities.



# LPG Business and Industrial Gas Business

## Business Overview and Characteristics

The Osaka Gas Group's LPG business mainly serves customers outside its city gas service area by providing retail and wholesale supplies of LPG. The Group takes full advantage of its city gas operating know-how as well as its nationwide sales network to enhance competitiveness in its LPG business. At the same time, the Group is working to provide multi-energy services that combine gas and electricity

for a wide range of applications from residential to industrial use.

Moreover, in the industrial gas business, the Group utilizes cryogenic technologies to engage in such businesses as air separation as well as the manufacture and sale of liquefied carbon dioxide and dry ice. We are also expanding our business using proprietary low-temperature crushing technologies.



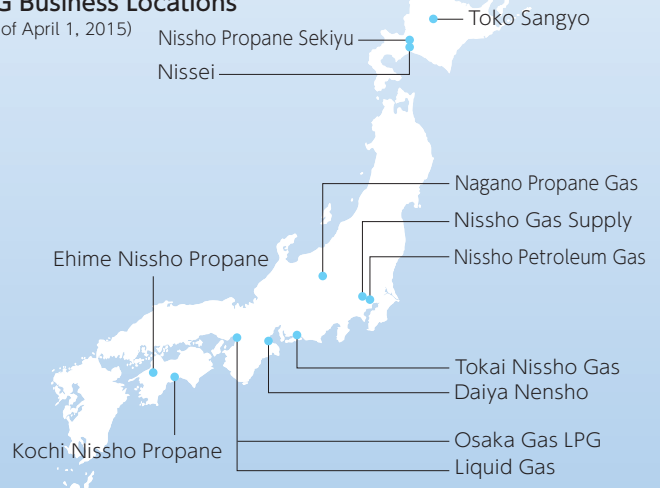
LPG business



Industrial gas business (low-temperature crushing technologies)

### LPG Business Locations

(As of April 1, 2015)



# Procurement of Energy Resources

## Business Overview and Characteristics

The city gas supplied by the Osaka Gas Group to customers is produced from LNG, which is imported entirely from overseas. Taking into consideration growing global demand, the Group's ability to secure stable and competitive supplies of LNG is a critical issue for business management.

Under these circumstances, the Osaka Gas Group

is making every effort to lower the procurement cost of energy resources by diversifying its suppliers and procuring new natural gas resources, including shale gas, as well as diversifying the terms and conditions of contracts, including the pricing mechanisms of LNG.

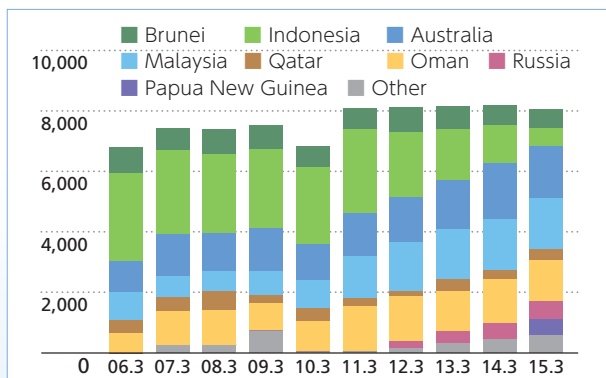
## Diversifying Sources of Supply

Currently, the Osaka Gas Group procures supplies of LNG under long-term agreements concluded with producers from the eight countries of Brunei, Indonesia, Malaysia, Australia, Qatar, Oman, Russia, and Papua New Guinea.

Looking further into the future, we are pursuing opportunities to source supplies from the United States.\*

\* Please refer to "Status of Main Upstream Investments" on page 38.

LNG Purchase Volume (Thousand tons)



## Status of Energy Resource Procurement



## Use of Osaka Gas Group LNG Carriers

In order to further stabilize the procurement of energy resources while reducing the costs of transportation, as well as expand trading in LNG, the Osaka Gas Group is building a fleet of LNG carriers. Its seventh carrier entered service in 2014 and the eighth is scheduled to go into service in 2016. These carriers are new models that incorporate an innovative steam turbine engine, and are expected to cut fuel costs by 20% compared to

existing vessels. Thus reducing emissions of CO<sub>2</sub> and sulfur oxides (SO<sub>x</sub>), our new carriers will help in addressing environmental concerns.

Venus,  
the 7th Osaka Gas carrier



## Diversifying the Terms and Conditions of Agreements

In Japan the system is such that LNG procurement prices are generally linked to the price of crude oil. For this reason, when crude oil prices rise, the price of LNG in Japan also rises, creating a situation which easily leads to a price discrepancy between Japan and the West.

The Osaka Gas Group is striving to establish new pricing mechanisms in LNG procurement. As one

example, the Group has introduced pricing mechanisms indexed to Henry Hub\* prices instead of crude oil prices for procurement from the United States. By diversifying pricing mechanisms in agreements, we are working to stabilize and reduce the price of LNG.

\* The name given to an index widely used as a reference for natural gas prices in the United States



## Electric Power Business

### ■ Business Overview and Characteristics

The electric power business is mainly conducted across two business domains: power generation and electricity sales. The electric power business is growing into a second core business after city gas. In its power generation activities, the Group relies heavily on the use of natural gas-fired thermal power plants. At the same time, we are actively involved in renewable energy operations encompassing a wide range of areas including wind and solar power generation. In electricity sales, we are working to build a well-balanced optimal marketing portfolio that combines retail sales via ENNET Corporation, a joint venture between Osaka Gas and other companies, and wholesaling to electric power companies and the Japan Electric Power Exchange (JEPX).

The total power generation capacity of our domestic power resources currently amounts to approximately 1.8 GW, with our flagship power plant being the Senboku Natural Gas Power Plant, which has a capacity of approximately 1.1 GW. Combining our domestic capacity with our overseas capacity, Osaka Gas boasts a total power generation capacity of approximately 2.8 GW. Including domestic power sources currently under construction brings this figure to 3.15 GW. Taking into consideration a variety of factors including continued liberalization of the electricity market, we are looking to double our capacity to 6.0 GW by the 2020s.

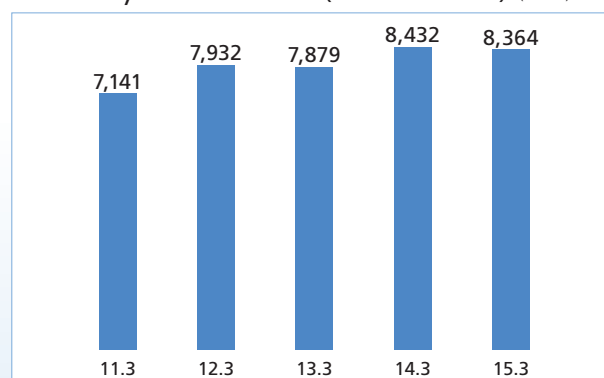
The retail electricity sales business is expected to grow with the expanded scope of liberalization of the electricity market to take place in April 2016.

### I Overview of the Fiscal Year under Review

In the fiscal year ended March 31, 2015, the Osaka Gas Group's electricity sales volume dropped 1% year on year to 8,364 GWh. This helped to partially alleviate the tight supply-and-demand situation across the nation.

While providing a stable power supply, the Osaka Gas Group will work to expand its electric power business.

Electricity Sales Volume (Consolidated) (GWh)



### I Electricity Industry Reform

The full liberalization of the electricity market in Japan will take place in April 2016, aimed at promoting cost-competitive, stable power supply. Electricity supply has already been liberalized for large-scale consumers, but the low-pressure small customer

market is still being served by the regional power companies (general electric utilities). Starting in April 2016, it will become possible to purchase electricity from retailers newly entering the electric power market.

### I Efforts to Expand the Electric Power Business

The Osaka Gas Group is developing power sources on a nationwide scale. In addition to the natural gas-fired power plants that play a central role in the Group's power supply ownership, coal-fired power and renewable energy also help make up the optimal portfolio needed for properly meeting diversifying customer demand.

In March 2015, with the liberalization of the

electricity market oncoming, Osaka Gas has completed registration as a PPS. In FY2015 we will set up a business structure that includes managing electrical power supply and demand by supplying power to meet demand within the Group. We are also working to develop a system for managing customers' power usage and rates in preparation for the full liberalization of the electric power market in April 2016.

## Expanding Electric Power Business Nationwide

### Power Source Development

Adjacent to the Nakayama Nagoya Joint Power Generation Plant currently in operation, a coal-fired power station is now under construction. This power station partially uses biomass fuel to generate power, thereby reducing environmental load.

In March 2015, we established Yamaguchi Ube Power Generation Co., Ltd. as a joint venture with The Electric Power Development Co., Ltd. and Ube Industries, Ltd. to review and prepare to set up a coal-fired power plant in the Nishiokinoyama district of Ube, Yamaguchi Prefecture.



Expansion of Nakayama Nagoya Joint Power Generation Coal-Fired Power Plant (under construction)  
Generation capacity: 110 MW / Generation facilities: sub-critical pressure boiler (biomass multi-fuel combustion) / Start of operations: Second half of FY2016



Yamaguchi Ube Power Coal-Fired Power Plant  
Generation capacity: 1.2 GW (planned) / Generation facilities: ultra supercritical pressure boiler / Start of operations: early 2020s

### Power Sources Owned by the Osaka Gas Group

(As of June 30, 2015)

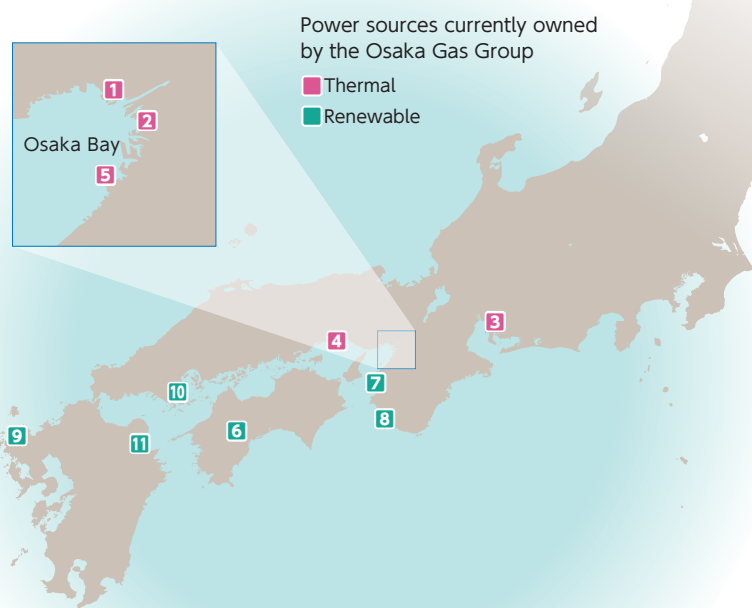
Domestic power plant	Capacity
1 Torishima Energy Center (natural gas)	150 MW
2 Nakayama Joint Power Generation (natural gas)	149 MW
3 Nakayama Nagoya Joint Power Generation (coal)	149 MW
4 Himeji Power Plant (natural gas)	55 MW
5 Senboku Natural Gas Power Plant (natural gas)	1,109 MW
6 Hayama Wind Farm Power Plant (renewable energy)	20 MW
7 Hirogawa Myojin-yama Wind Power Plant (renewable energy)	16 MW
8 Yura Wind Power Plant (renewable energy)	10 MW
9 Hizen Wind Power Plant (renewable energy)	30 MW
10 Hirao Wind Power Plant (renewable energy)	9 MW
11 Nikki Mirai Solar Plant (renewable energy)	27 MW
Others	116 MW
<b>Total</b>	<b>1,840 MW</b>

Company share of capacity: 1,812 MW

In addition to the above, the Osaka Gas Group owns stakes totaling 1,050 MW in power sources outside of Japan.

Data in parentheses indicate the fuel used for power generation.

### Power Facilities of the Osaka Gas Group



### Initiatives Aimed at Expanding the Use of Renewable Energy

The Osaka Gas Group is actively engaged in solar and wind power generation projects in Japan and overseas. These initiatives reflect the Group's commitment to expanding the use of renewable energies that are easy on the global environment and help to bring about a low-carbon society.

The Osaka Gas Group maintains five wind power generation installations in the prefectures of Wakayama, Kochi, Yamaguchi, and Saga, and six solar power generation plants in the prefectures of Osaka, Wakayama, Okayama, Mie, and Oita.



7 Hirogawa Myojin-yama Wind Power Plant (Wakayama Prefecture)