



広島ガス

Hiroshima Gas 2016 CSR Report

Corporate Social Responsibility Report

Digest



Working toward a sustainable society





How is natural gas delivered to customers?

City gas supply flowchart

Raw material procurement and transport

City gas production

Natural gas is extracted overseas, cooled to approximately -160°C, liquefied, and then imported as LNG (liquefied natural gas).



Russia, Prigorodnoye facilities

[Natural gas extraction] [LNG transport ship]

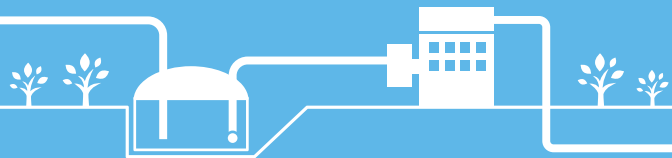


LNG is placed into storage tanks and vaporized according to demand. It then undergoes calorific value adjustment and is supplied as city gas.



Hatsukaichi LNG terminal

[In-pit method LNG storage tank] [LNG vaporizer]



Supply area and organization

(As of March, 2016)

Supply area (10 locations within Hiroshima prefecture)

Number of customers

Hiroshima, Kure, Onomichi, Mihara, Hatsukaichi, Higashi-hiroshima, Aki-gun Kaita-cho, Saka-cho, Fuchu-cho, Kumano-cho

408,000

Hiroshima district

Number of customers

343,000



Kabe office



Kaita facilities



Higashi-hiroshima plant



Head office



Hatsukaichi LNG terminal

Kure district

Number of customers

48,000



Kure branch



Kumano office

Safe and environmentally friendly for the future of the earth and humanity

City gas supply

Delivery to customers

Gas is supplied to customers through 5,070km of underground piping (supply and service pipelines).



Gas pipe bridges

[Gas holder]



Natural gas is an environmentally friendly type of energy!



Hiroshima prefecture



Bingo plant

Wholesale supply

(Hiroshima Gas)
Wholesale supply utilizing equipment from Setouchi Pipeline Co., Ltd., a consolidated subsidiary



Mizushima station (Setouchi Pipeline Co., Ltd.)



Mizushima LNG terminal (Mizushima LNG Co., Ltd.)

Okayama prefecture

Mizushima station
Mizushima LNG terminal

Fukuyama Gas Co., Ltd.

Energy plays an important part in every part of our lives.



Onomichi/Mihara district

Number of customers
17,000



Mihara sales office



Onomichi branch

The gas that we supply can be used in a variety of applications.



Factories, etc.



Hotels, buildings, schools, etc.



Kitchens, hot water supply, etc.

[Industrial use]



[Commercial use]



[Residential use]



Legend		
Supply area (Hiroshima district)		Gas holder
Supply area (Kure district)		Gas production plant
Supply area (Onomichi/Mihara district)		Head office/Branch office/Sales office
Pipeline (Hiroshima Gas)		Proposed pipeline
		Pipeline (Setouchi Pipeline)

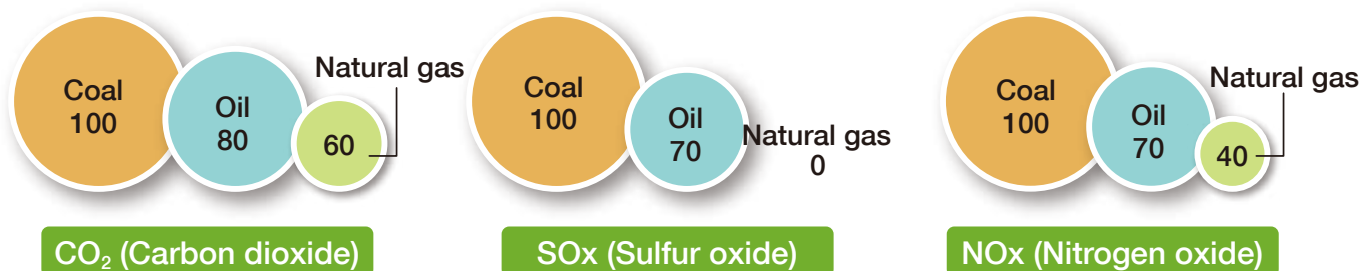
Q What kind of energy is environmentally friendly natural gas?

Characteristics of natural gas

Natural gas is a type of fossil fuel that was created when ancient flora and fauna were buried underground for many thousands of years. It is mainly composed of methane which contains only a small amount of carbon. This means that it is a relatively clean form of energy that emits only a small amount of CO₂ or other pollutants during combustion.

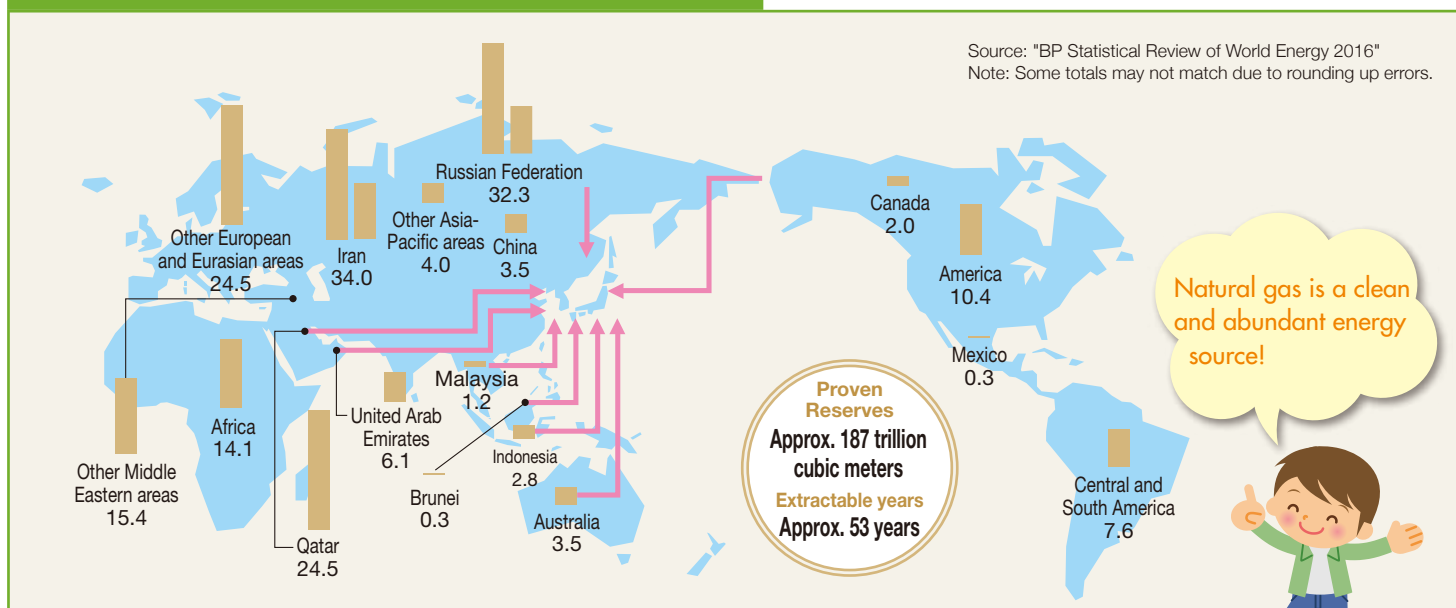
Unlike oil, which is mainly concentrated in the Middle East, natural gas is distributed all around the world and has excellent supply stability.

Environmental impact of natural gas A comparison of emissions during combustion. Coal has been given a reference value of 100.



Source: "Energy White Paper 2013", Agency for Natural Resources and Energy

Natural Gas Proven Reserves (Unit: Trillions of cubic meters)



Natural gas is a clean and abundant energy source!



Supply stability

Natural gas is abundant around the world. We import LNG (liquefied natural gas) extracted, refined, and liquefied in areas such as Russia (Sakhalin) and Malaysia, and receive it at our Hatsukaichi LNG terminal. With the improvement of mining technology in recent years, unconventional natural gas sources that have traditionally been difficult to extract such as shale gas, coalbed methane, and tight sand gas can now be produced and stable supply is expected.

In addition, there are methane hydrate deposits in the coastal waters of Japan equivalent to around 100 years worth of Japan's annual consumption amount. Government-led initiatives for development of these resources are currently being carried out.

Composition of city gas

We use liquefied natural gas to produce city gas which is delivered to customers through the gas piping network.

Characteristics of city gas

Composition and content (Natural gas supply area)

Components		Composition
Name	Chemical formula	% (By volume)
Methane	CH ₄	91
Ethane	C ₂ H ₆	5
Propane	C ₃ H ₈	2
Butane	C ₄ H ₁₀	2

Gas type	13A
Standard calorific value	45MJ/m ³
Specific gravity (Air = 1)	0.638
CO ₂ emission coefficient	2.29kg-CO ₂ /m ³

Note: Gas composition shows a representative value.

Q What activities is Hiroshima Gas actively involved in?

Management

Delivering safe, stable, and clean natural gas

Company performance information

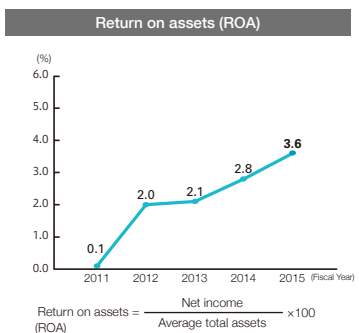
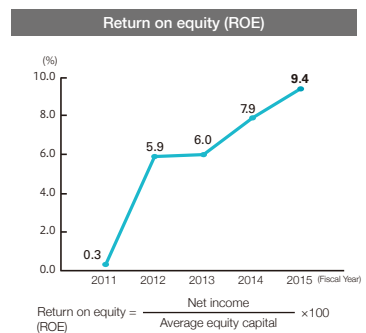
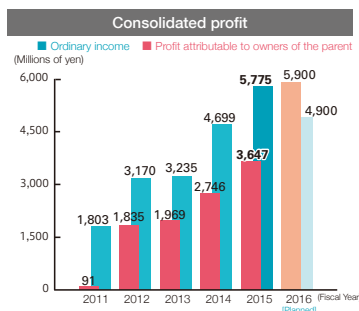
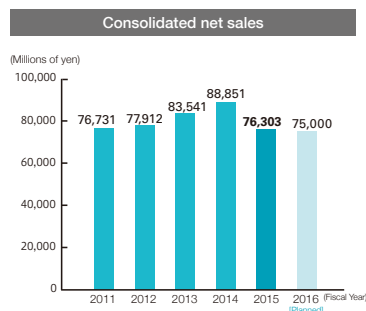
First decline in revenue after six years, four consecutive years of ordinary income increase

Due to a decrease in the unit sales price based on the raw material cost adjustment system, consolidated net sales in FY2015 totaled 76,303 million yen. This is a decrease of 12,548 million yen (14.1%) when compared with the previous fiscal year.

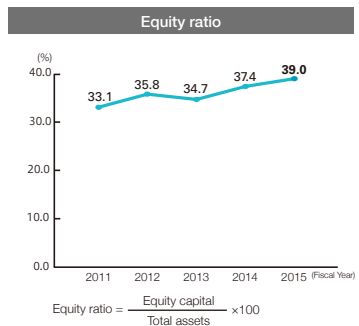
In regard to profits, ordinary income was 5,775 million yen and profit attributable to owners of the parent* was 3,647 million yen. When compared with the previous fiscal year, this was an increase of 1,075 million yen (22.9%) and 901 million yen (32.8%) respectively.

* In 2015, the term "net income" was changed to "profit attributable to owners of the parent".

The "net income" up to FY2014 has been recategorized under that account item.



[FY2015]	Net sales	Operating income
Gas business	61,802 (Δ13.6%)	4,341 (21.9%)
LPG business	13,810 (Δ15.5%)	609 (74.4%)
Other	3,721 (Δ5.0%)	Δ72 (-)
Adjusted values	Δ 3,031	597
Consolidated	76,303 (Δ14.1%)	5,475 (33.2%)



*As figures for each segment are rounded down to the nearest million yen, there may be small discrepancies in the grand total values of each segment.
Note: Figures in parentheses indicate relative change from the previous fiscal year.

Business activities

LNG procurement and production

Based on long-term contracts with Sakhalin, Osaka Gas Co., Ltd., and Malaysia, it is possible to source 400,000 tons of LNG per year. This is the raw material used to create city gas.

City gas is produced at the Hatsukaichi LNG terminal, the Bingo plant, and the Higashi-hiroshima production plant. Liquefied natural gas reception and the entire gas production process at these locations are tightly controlled via the central control room.



Standard LNG transport ship



Hatsukaichi LNG terminal

Supply and distribution plants

In order to reliably supply customers with city gas produced in our factory, the security command center constantly monitors the gas pressure and supply state.

To ensure adequate response in an emergency situation, we have established a system that allows quick 24-hour response and dispatch even during night hours and holidays.



Security command center



Emergency vehicles



Gas piping work

Business

We have established a system to allow more customers to safely and reliably use environmentally friendly natural gas.



Meetings with developers



Maintenance of an "Ene-Farm" household fuel cell

Yearly overview

Number of customers

(Unit: Individual customer locations)

Fiscal Year	Number of customers
FY2011	416,205
FY2012	412,793
FY2013	410,353
FY2014	409,185
FY2015	408,490
Average growth rate	Δ0.5%

Gas sales volume

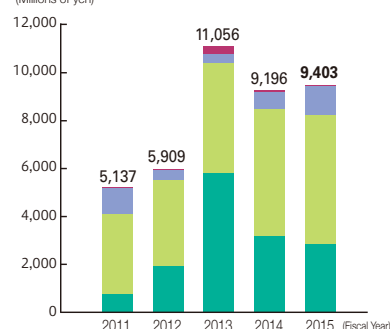
(Unit: Thousands of cubic meters, 45MJ/m³ conversion)

Fiscal Year	Residential use	Commercial use	Industrial use	Other	Total	Wholesale supply, etc.	Grand total
FY2011	107,654	49,303	273,683	37,883	468,525	55,628	524,153
FY2012	105,486	48,244	262,078	37,857	453,666	60,142	513,808
FY2013	103,130	47,728	258,695	38,890	448,445	61,292	509,737
FY2014	103,866	45,389	242,213	37,264	428,733	62,918	491,651
FY2015	100,244	43,871	242,183	36,264	422,565	60,456	483,021
Average growth rate	Δ1.8%	Δ2.9%	Δ3.0%	Δ1.1%	Δ2.5%	2.1%	Δ2.0%

Note: As sales volume figures are rounded down to the nearest thousand cubic meters, there may be small discrepancies in the grand total value.

Amount of capital investment

(Millions of yen)



Environment

Actively working toward an expanded use of clean natural gas

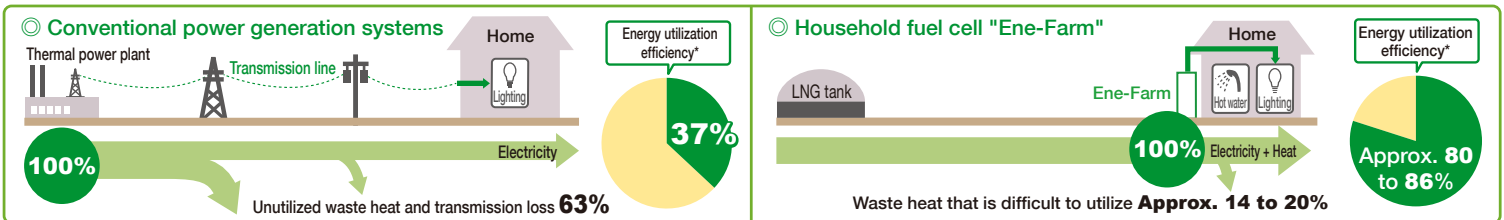
We are striving to create a sustainable society.



Promotion of high-efficiency natural gas applications

Rather than simply generating heat, natural gas can be used in gas cogeneration systems, highly efficient gas equipment, and natural gas vehicles. It can be used in a wide range of applications such as power generation, air conditioning and automobiles.

Comparison of energy utilization efficiency Heat generated by power plants is discarded. Power transmission losses also occur during transmission to far away homes. "Ene-Farm" allows the user to create energy at the same location where it is used. This reduces loss and utilizes excess heat. With an expected energy utilization efficiency of around 80%, it has superior energy savings and environmental friendliness.



* Based on HHV (Higher Heating Value: Calorific value including latent heat of condensation of water vapor generated during fuel combustion) criteria. Thermal power generation energy utilization efficiency and transmission losses are calculated based on reference materials (9. FY2003 Operation Results of Power and Wholesale Electric Utilities) from the Energy Efficiency Standards Subcommittee in September of 2005. "Ene-Farm" numerical performance information may vary depending on the model.

Source: The Japan Gas Association

Residential use

While working to spread the use of natural gas, we are creating initiatives that can further conserve energy and reduce CO₂ to improve the standard of living for all people. These initiatives include promoting the full utilization of energy, promoting multi-energy systems to meet the needs of customers, and using natural gas to compensate for fluctuations in the output of renewable energy sources such as solar power.

The spread of highly efficient household equipment

Proposal for an environmentally friendly futuristic "Smart energy house"

— Gas — Electric power — Hot water

Double power generation "The evolution from energy-efficient houses to energy-creating houses"

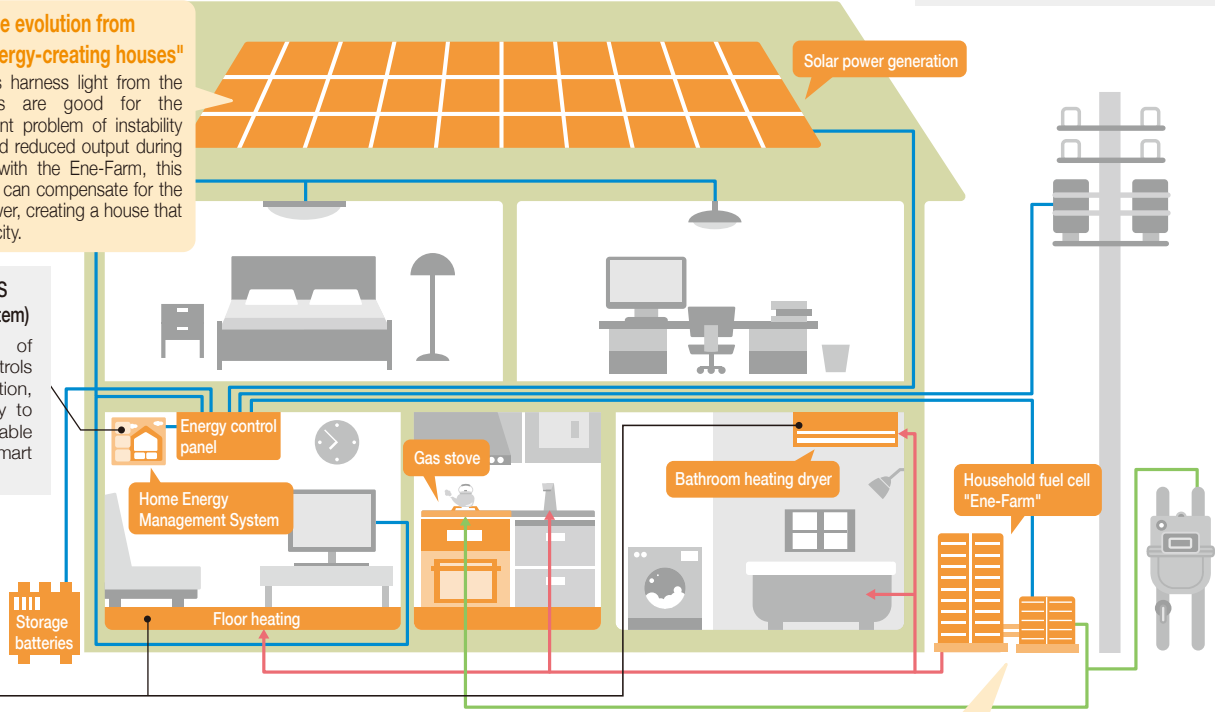
Solar power generation systems harness light from the sun. Although such systems are good for the environment, there is the inherent problem of instability due to non-operation at night and reduced output during bad weather. When combined with the Ene-Farm, this double power generation system can compensate for the inherent weaknesses of solar power, creating a house that is able to generate its own electricity.

Optimal use of energy with HEMS (Home Energy Management System)

HEMS allows visualization of energy use in the home. It controls home systems to optimize creation, storage, and usage of energy to realize the goal of a comfortable and environmentally friendly "smart house".

Gas hot water underfloor heating and bathroom heating dryers

This system circulates hot water for heating and clothes drying. As it uses a very small amount of electricity, it can significantly reduce peak power usage.



High efficiency water heater "Eco-Jozu" (Cumulative sales of 32,137 units)

(As of March 31, 2016)



This highly efficient water heater uses condensing technology to take advantage of previously unutilized waste heat in order to raise thermal efficiency from 80% to 95%.

High efficiency water heater "Eco-Jozu"

Household fuel cell "Ene-Farm"



Made by company "P" (Polymer electrolyte type)

Made by company "T" (Polymer electrolyte type)

Made by company "A" (Solid oxide type)

Household fuel cell "Ene-Farm" (Cumulative sales of 1,110 units)

(As of March 31, 2016)

An "Ene-Farm" is a device that reacts hydrogen extracted from sources such as natural gas with oxygen in the air to generate electricity. The heat from this chemical reaction is then utilized to make hot water. When compared with conventional water heating systems, this cutting-edge power generation and water heating system can reduce annual CO₂ emissions in standard homes by around 1.2t.

Industrial use

Around 50% of our natural gas sales are for industrial customers. The transition from petroleum-based fuel to natural gas enables a 25% reduction in CO₂ emissions.

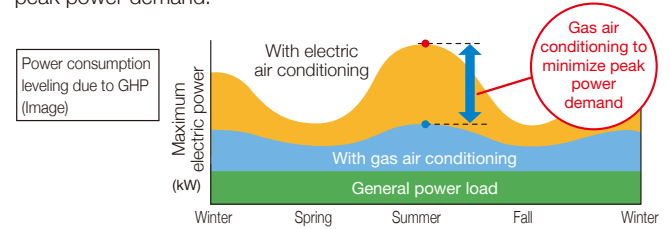


Gas industrial furnace

Commercial use

● Promotion of gas heat pumps (GHP) and gas absorption chillers (natural chiller)

Gas heat pumps and gas absorption chillers for gas-powered air conditioning systems have a big impact in cutting summer and winter peak power demand.



● Natural gas vehicles for city driving



Natural gas truck



Natural gas bus



Gas heat pump (GHP)



Gas absorption chiller (natural chiller)

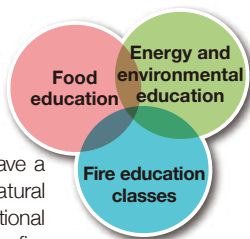
Society

We cherish the connections with our community.

Relationship with local communities

▶ Educational support (Commitment to the next generation of education)

In order to help children have a better understanding of natural gas, we carry out educational activities regarding fire education, food education, and energy and environmental



Next-generation educational programs

[Fire education]

- Fire education classes

[Food education]

- Eco-cooking* classes
- Tasting classes

[Energy and environmental education]

- Science show
- Technical Research Institute science experiment lessons

We have all kinds of programs!



Eco-cooking* classes

Note: "Eco-cooking" is a registered trademark of Tokyo Gas Co., Ltd.

▶ Promotion of arts, culture, community, and sport

We have a strong relationship with the Hiroshima area and conduct a wide range of social contribution activities throughout the area.



● Holding the 29th Hiroshima Symphony Orchestra Concert



Concert stage

● Participating in the Hiroshima flower festival



Hiroshima flower festival "Gasland" booth

Management philosophy

Striving to be a company
trusted by the community

Based on our management philosophy that aims to create a company that is trusted by the local community, Hiroshima Gas wishes to continue carrying out business activities emphasizing the stable supply of energy and ensuring the safety of all as our corporate social responsibility.



Head office address: 2-7-1, Minamimachi, Minami-ku, Hiroshima
TEL: 082-251-2151 (Switchboard)

Established: October 1909

Capital: 5.181 billion yen

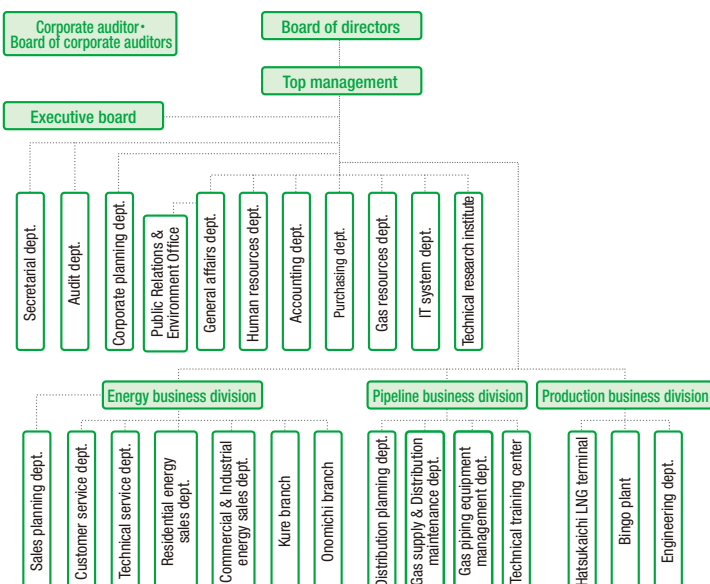
Number of employees: 676

Business field:
1. Gas business
2. Sales of gas appliances
3. Sales of liquefied natural gas

(As of March 31, 2016)

Hiroshima Gas organizational chart

(As of April 1, 2016)



Regional service representatives

Gas shop

Gas shop business hours: 9am to 7pm (Monday to Saturday)
* The Mihara shop is open 9am to 5:30pm (Monday to Friday)

1 Fuchu Gas Shop	TEL: 082-282-3359	3-4-26, Hamada, Fuchu-cho, Aki-gun
2 Aki Gas Shop	TEL: 082-821-1055	3-1-14, Funakoshiminami, Aki-ku, Hiroshima
3 Ujina Gas Shop	TEL: 082-253-1261	2-12-19, Ujinakanda, Minami-ku, Hiroshima
4 Itsukaichi Gas Shop	TEL: 082-922-3670	2-7-43, Kairoen, Saeki-ku, Hiroshima
5 Furue Gas Shop	TEL: 082-272-0050	6-4, Furueshinmachi, Nishi-ku, Hiroshima
6 Takanoashi Gas Shop	TEL: 082-243-7520	5-10-19, Otemachi, Naka-ku, Hiroshima
7 Hakushima Gas Shop	TEL: 082-228-1000	17-17, Higashi-hakushima-cho, Naka-ku, Hiroshima
8 Gion Gas Shop	TEL: 082-850-3505	5-13-1, Nishihara, Asaminami-ku, Hiroshima
9 Koyo Gas Shop	TEL: 082-842-4433	1-3-10, Ochiaiminami, Asakita-ku, Hiroshima
10 Kure Gas Shop	TEL: 0823-23-5050	1-6-16, Chuo, Kure
11 Onomichi Gas Shop	TEL: 0848-22-4378	3-2, Tenma-cho, Onomichi
12 Mihara Gas Shop*	TEL: 0848-62-7108	2-7-5, Shiromachi, Mihara
13 Kabe Gas Shop	TEL: 082-814-3322	9-13-7, Kameyama, Asakita-ku, Hiroshima
14 Saijo Gas Shop	TEL: 082-493-8801	4-38, Saijogojo-cho, Higashi-hiroshima

Showroom

Experience the latest gas equipment and the sheer warmth provided by gas.

Examples of exhibition equipment

- Household fuel cell "Ene-Farm" ● Household cogeneration "Ecowill"
- Floor heating and bathroom heater comparison rooms ● Mist sauna experience room
- Try it! Kitchen activities (Kitchen comparison) ● Solar power generation



Gastopia Center
1-30, Minamitakeya-cho, Naka-ku, Hiroshima
TEL: 082-240-8888



Gastopia Itsukaichi
2-7-43, Kairoen, Saeki-ku, Hiroshima
TEL: 082-240-8888



Gastopia Gion
5-13-1, Nishihara, Asaminami-ku, Hiroshima
TEL: 082-240-8888



Gastopia Aki
3-1-14, Funakoshiminami, Aki-ku, Hiroshima
TEL: 082-821-1130



Gastopia Kure
1-6-16, Chuo, Kure
TEL: 0823-22-1234



Gastopia Onomichi
3-2, Tenma-cho, Onomichi
TEL: 0848-22-2104

Overview of main subsidiaries

(As of March 31, 2016)

HIROSHIMA GAS PROPANE Co., Ltd.

•Capital: 300 million yen •Established: March 1969 •Sales: 9,972 million yen •Number of employees: 89

HIROSHIMA GAS TECHNO-SERVICE Co., Ltd.

•Capital: 80 million yen •Established: June 1998 •Sales: 10,272 million yen •Number of employees: 198

HIROSHIMA GAS MATE Co., Ltd.

•Capital: 20 million yen •Established: April 1975 •Sales: 1,070 million yen •Number of employees: 157

RUNET Co., Ltd.

•Capital: 30 million yen •Established: October 2000 •Sales: 313 million yen •Number of employees: 6

BE-SMILE Co., Ltd.

•Capital: 50 million yen •Established: June 2001 •Sales: 190 million yen •Number of employees: 46

SETOUCHI PIPELINE Co., Ltd.

•Capital: 150 million yen •Established: May 2003 •Sales: 1,078 million yen •Number of employees: 9

HG LNG SHIPPING CORPORATION

•Capital: 1 million yen •Established: February 2005 •Sales: 2,382 million yen

HIROSHIMA GAS Co., Ltd.

2-7-1, Minamimachi, Minami-ku, Hiroshima, 734-8555

General Affairs Department, Public Relations & Environment Office:
082-252-3154 (Direct line)

Hiroshima Gas Website

<http://www.hiroshima-gas.co.jp/>