

**2010**

OSAKA GAS GROUP

# **CSR REPORT**

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# Editorial Policy

## Editorial Policy

This report presents the Group's Corporate Social Responsibility (CSR) activities within the organizational framework of the "Osaka Gas Group CSR Charter."

Within this context, we attempt to disclose not only indicators that are a focus of the CSR Charter but as much information as possible in response to demands for disclosure expressed in dialogues with stakeholders and reader questionnaires.

We also provide a special report on preventing global warming (long-term measures to reduce greenhouse gas emissions), a particularly important topic.


To ensure reliability, third parties have verified the environmental performance data of this report. In fact, the report incorporates a third party review of its entire content focusing on evaluation and recommendation. We have edited this report in compliance with the "Environmental Reporting Guidelines 2007" of the Ministry of the Environment and in reference to the third version of the "Sustainability Reporting Guidelines (G3)" of the Global Reporting Initiative.

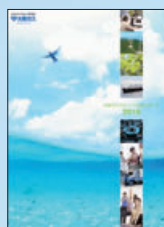
## Scope of This Report

**Organization** This report covers the Osaka Gas Group consisting of Osaka Gas Co., Ltd. and its affiliated companies. Some information, as noted in this report by phrases such as "Osaka Gas" or "the company," refers exclusively to Osaka Gas Co., Ltd. Environmental performance data represents Osaka Gas and 82 affiliated companies. Overseas and tenant locations where it is difficult to collect data are not included.

**Reporting Period** While the most recent data covered in this report represents FY2010 (from April 1, 2009 to March 31, 2010), some sections refer to efforts in FY2011.

**Publication** August 2010 (Next edition is scheduled for August 2011.)

 The content of this report can also be viewed on our Web site.  
[http://www.osakagas.co.jp/csr\\_e/index.html](http://www.osakagas.co.jp/csr_e/index.html)



**CSR Report**  
Report of CSR activities undertaken by the Osaka Gas Group



**Corporate Profile**  
An introduction to the businesses of the Osaka Gas Group



**Annual Report**  
A summary report of the businesses and financial results of the Osaka Gas Group



**Website**  
Comprehensive report on CSR efforts by the Osaka Gas Group (English/Japanese)



**CSR Report: digest version**  
An easy-to-read, abridged version of the CSR report for the public (Japanese version only).

## Inclusion in SRI Indices

As of the end of March 2010, Osaka Gas is included in the following socially responsible investment (SRI) indices.

- Dow Jones Sustainability Asia Pacific Index
- FTSE4Good Index Series
- ECPI Ethical Index Global (E. Capital Partners Indices)
- Ethibel Sustainability Index
- KLD Global Climate 100 Index (KLD Research & Analytics, Inc.)
- Morningstar Socially Responsible Investment Index (MS-SRI)

## Performance in CSR rankings in FY2010

Medium	Result
Carbon Disclosure Project	Selected as an advanced company in climate change-related information disclosure
Nippon Foundation CANPAN (November 2009)	CSR Award (Grand-Prix)
Nikkei Environmental Management Survey (December 2009)	2nd (Electricity/Gas sector)
Toyo Keizai Inc's CSR Ranking (May 2010)	39th (among 1,104 companies)

See Web site for details of the Awards in FY2010  
[http://www.osakagas.co.jp/csr\\_e/beginning/policy.html#a04](http://www.osakagas.co.jp/csr_e/beginning/policy.html#a04)

## Response to Suggestions and Feedback from the 2009 CSR Report

Readers would like to know more about CSR Indicators. An at-a-glance comparison and listing CSR indicator data over consecutive years side-by-side to facilitate comparisons would be helpful.


This year we have included a page describing the CSR Indicators and major CSR initiatives in FY2010, results for FY2010, and targets through FY2012. In addition, at the beginning of sections I-V, we have included CSR indicators and detailed explanations of results.

Readers want to know what contribution the Osaka Gas Group can make for reducing greenhouse gas emissions long term and why natural gas is being utilized to reduce GHGs.

We have included a special feature on long-term measures to reduce GHG emissions with the use of natural gas through 2020. The start of this section features an at-a-glance overview of the Group's long-term approach in order to facilitate easy comprehension.

Technical terms and foreign loaned phrases are confusing.

We have tried to express information as simply and plainly as possible. Starting with the previous report, we have included a glossary of technical terms.

 For an explanation of words marked with this symbol, see the Terminology inserted in this report.



## Feature Preventing Global Warming

### Continuing to Reduce CO<sub>2</sub> Emissions throughout Society ..... 11

The Osaka Gas Group is making a long-term effort to use natural gas to reduce emissions of greenhouse gases at customers' businesses, in its business activities, and in its overseas energy business.

### Reducing Customers' CO<sub>2</sub> Emissions



#### Generating Energy Where It's Needed – Distributed Energy Systems ..... 13

We are striving for spreading the cogeneration systems and fuel cells which generate both electricity and heat where it's needed.



#### Combining Gas and Renewable Energy ..... 16

We're starting to combine renewable energy such as photovoltaic power and biogas with gas appliances and natural gas.



#### Developing Next-Generation Energy Systems ..... 17

We hope to contribute to the realization of a society in which energy is used to the maximum efficiency in each home and in each region.

### Reducing CO<sub>2</sub> Emissions from Osaka Gas Business Activities



#### Generating Energy in the Natural Gas Processing, Making Gas Power Generation More Efficient ..... 18

We strive to use energy resources to the maximum efficiency—wasting nothing—at LNG terminals and gas power plants.

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## Major Activities in FY2010

CSR Charter



### Creating value for customers

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CSR Charter



### Contributing to harmonizing with the environment and to realizing a sustainable society

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CSR Charter



### Being a good corporate citizen contributing to society

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CSR Charter



### Complying with laws and regulations and respect for human rights

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CSR Charter



### Management policy of human growth

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# Outline of the Osaka Gas Group



## International Energy Businesses

Expansion by using know-how and skills

## Business Field



## Environment and Non-Energy Businesses

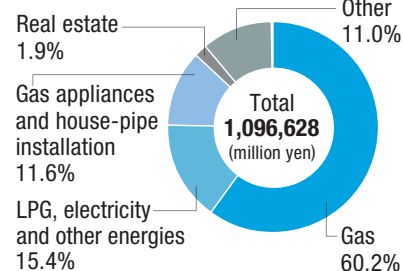
Greater scale and scope of strong environment/non-energy businesses



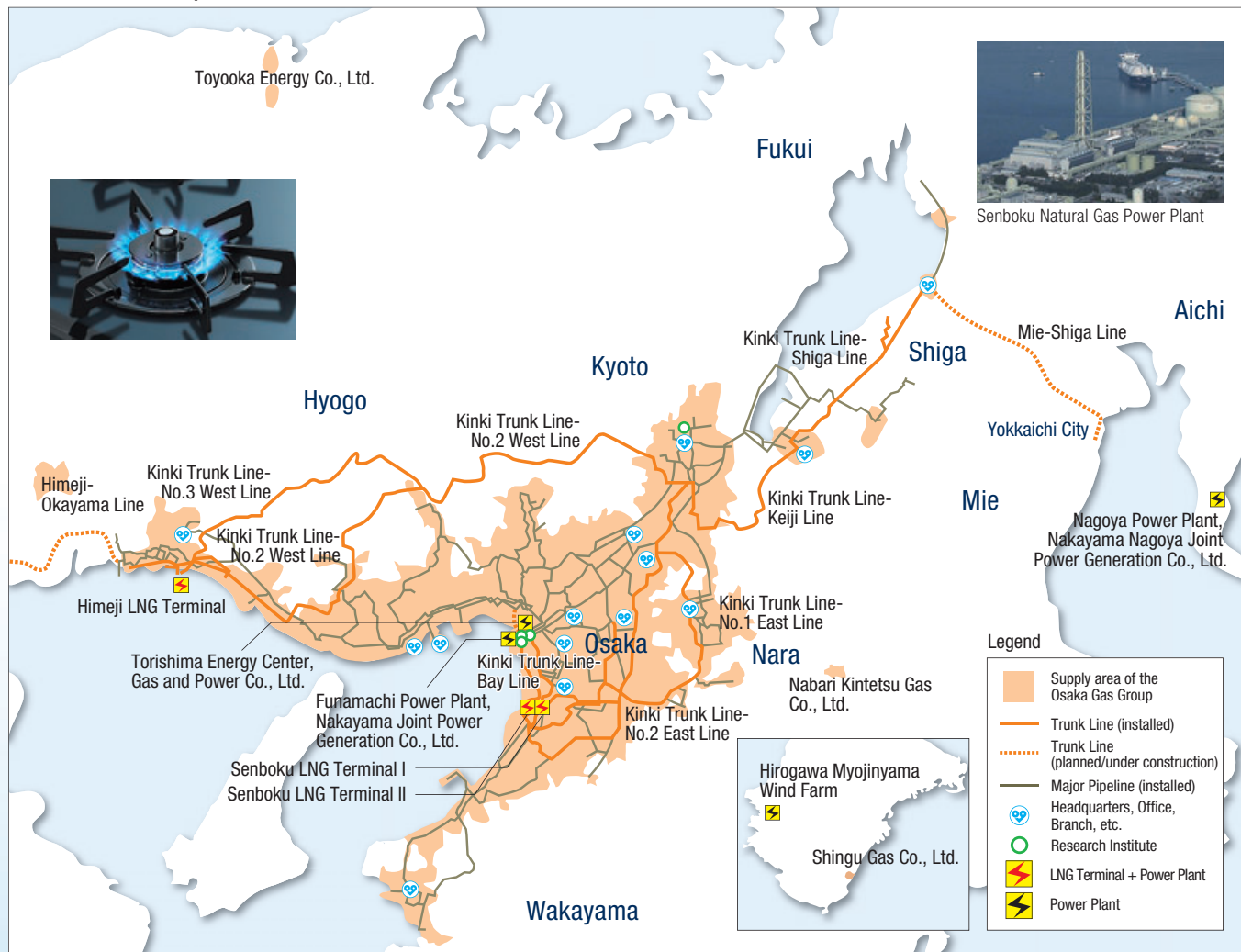
## Domestic Energy Businesses

Gas/energy business in the Kansai Region with greater scale and scope

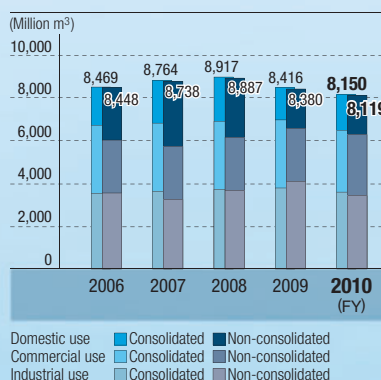
## Sales by Segment



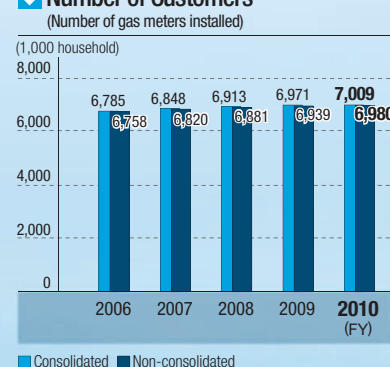
## Osaka Gas Group Business Area



## Gas Sales by Volume



## Number of Customers





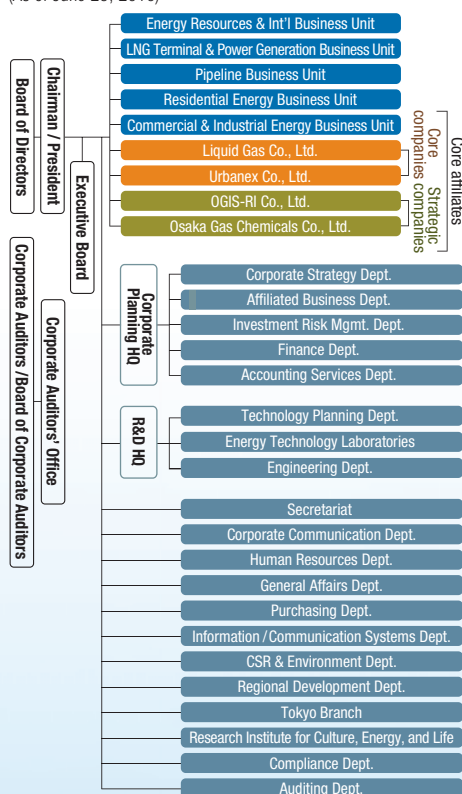
## Corporate Profile of Osaka Gas

(As of March 31, 2010)

Head Office	4-1-2, Hiranomachi, Chuo-ku, Osaka 541-0046, Japan
Establishment	April 10, 1897
Commencement of operations	October 19, 1905
Number of employees	(Non-consolidated) 5,588 (including operating officers, directors and temporary employees, and excluding employees temporarily transferred to affiliated companies) (Consolidated) 19,268
Capital	132,166 million yen
Major business fields	(1) Manufacture, delivery and sale of gas (2) Delivery and sale of LPG (3) Generation, delivery and sale of electric power (4) Sale of gas appliances (5) Installation of gas pipes

## Osaka Gas Group Management Structure

(As of June 29, 2010)



Note: Organizations other than core affiliates are Osaka Gas Co., Ltd. organizations.

## Business Fields of Affiliated Companies

### Industrial gas/LPG/LNG business (Liquid Gas Group)

Involved in the production and sale of various types of high-pressure gas and high-purity methane, the on-site hydrogen business, the transport and sale of liquefied natural gas (LNG), and the sale and maintenance of liquefied petroleum gas (LPG). The group is also steadily expanding into new business fields, such as low-temperature grinding using ultra-cold liquefied nitrogen and the development of industrial gas application technologies.



LPG business



Low temperature grinding business

### Real estate business (Urbanex Group)

This group meets customer expectations by leveraging and increasing property value through development, operation and management of real estate including office buildings, rental/condominium apartments, commercial facilities with ample amenities, and large-scale urban development projects.



Rental offices



Utility and energy management

### IT business (OGIS Research Institute Group)

Drawing upon expertise gained through supporting the IT strategy of the Osaka Gas Group as well as survey and development capabilities for advanced technologies including Object/UML, this group offers proven service capabilities, from consulting and computerization strategy planning to the design, development, operation and management of information systems and seamlessly delivers optimal solutions to customers as a total solutions provider.



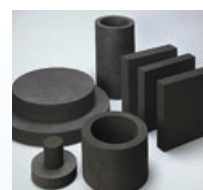
Call center



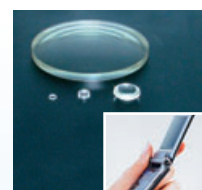
Server room

### Advanced materials business (Osaka Gas Chemicals Group)

Exploring the infinite possibilities in developing new materials and discovering new applications in the field of carbon and chemical materials, this group supplies a broad range of customers with fine materials used for liquid crystal displays and camera lenses for cell phones and other devices, carbon fiber, activated carbon, and preservatives as well as products that use these materials.



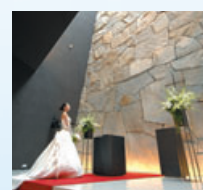
Preformed insulation materials



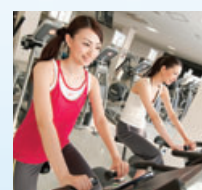
OKP Lenses employed for mobile phones

### Life service and outsourcing service business

We pursue comfort and security by taking on diverse roles in consumer and industrial settings, including security services, temporary staffing, commissioned research and consulting, market research, leasing and credit, and operation of wedding halls, fitness clubs, private nursing homes and group homes.

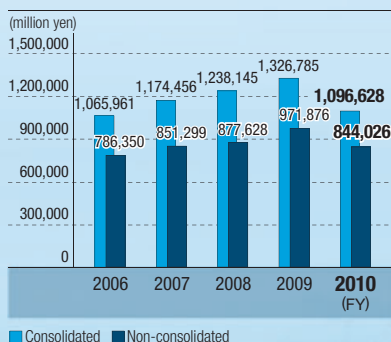


Bridal business

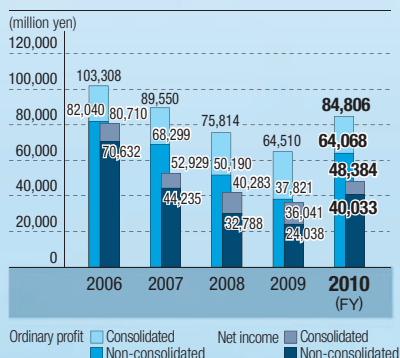


Fitness club COSPA

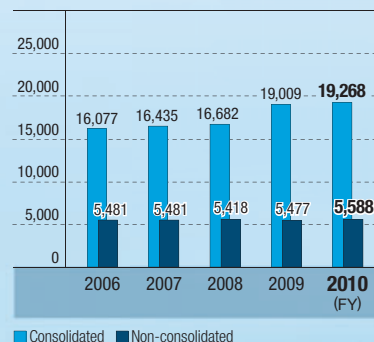
## Operating Revenues



## Ordinary Profit and Net Income



## Number of Employees





# Continue to be the Company of Choice by Achieving Our “Field of Dreams 2020”

### **“Field of Dreams 2020” Long-Term Management Vision and Medium-Term Management Plans**

Our “Field of Dreams 2020” Long-Term Management Vision and Medium-Term Management Plans (established in March 2009) are the basis for continuing efforts aimed at making the Osaka Gas Group the company of choice for customers, the society, and all of our other stakeholders.

Under “Field of Dreams 2020”, we will deepen existing businesses and broaden our reach into new business fields and locations. This will allow us to grow our (1) domestic energy businesses, (2) international energy businesses along the energy value chain, and (3) environment and non-energy businesses.

### **Fiscal 2011: A Year to Take Action**

Although an economic recession made fiscal 2010 a challenging year for business, we got a strong start on our “Field of Dreams 2020” thanks to efforts like the start of operations at the Senboku Natural Gas Power Plant and the release of the ENEFARM residential fuel cell cogeneration system.

Still, the lightning-fast pace of environmental change makes it increasingly difficult to do business, what with continuing economic uncertainty, fluctuating energy prices, and the move towards a low-carbon society. The

Osaka Group will respond quickly and flexibly to problems as it continues to create advanced and environmentally friendly new value that meets the needs of both customers and our changing times, and strives for the highest standards in its CSR. We believe such efforts will make us an indispensable part of the lives of our stakeholders.

With this in mind, we are implementing three key initiatives towards Field of Dreams 2020 in fiscal 2011: Boost the level of service and advance toward realization of a low-carbon society; broaden our business fields; and fulfill our corporate social responsibility. Of these, contributing to the realization of a low-carbon society is a top priority for the Osaka Gas Group, and we will continue to do all we can to help make this a reality.

To give some concrete examples, we will spread the use of environmentally friendly natural gas, as well as offer advanced and energy-efficient uses of natural gas through appliances such as high-efficiency industrial furnaces and burners, residential fuel cells, and natural gas cogeneration systems. All of these will contribute to the shift to natural gas, one of the provisions in Japan's Basic Energy Plan approved by the Cabinet in June 2010. We are also helping customers reduce their energy consumption and CO<sub>2</sub> emissions; for example, through IT-driven systems that allow monitoring of energy use and through optimal energy control methods; and through financial incentives for the installation and maintenance of energy-efficient equipment. We are also positively developing renewable energy business such as photovoltaic power and biogas.



**Hiroshi Ozaki**  
President, Osaka Gas Co., Ltd.



The foundational principle of the Osaka Gas Group is Value Creation Management to enhance value for all our stakeholders, including customers, shareholders, employees and society at large. The Group established The Osaka Gas Group CSR Charter based on this principle to provide guidelines for executive officers and employees of the Group.

## Group Management Principles

### Value Creation Management

#### —Enhancing the four values

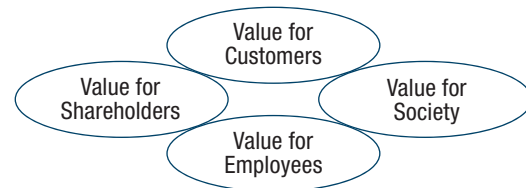
Giving top priority to maximizing the value for customers, the Osaka Gas Group, will pursue Value Creation Management to enhance value for all our stakeholders through fair and transparent business activities.

### Osaka Gas Group CSR Charter (Established in April 2006)

In order for the Osaka Gas Group to fulfill its full corporate social responsibilities and to achieve its sustainable development, we hereby set forth the Charter as the guiding principle for the management and the employees of the Group to observe in their conduct of business.

The management of the Osaka Gas Group, its subsidiaries and affiliates, and managers of respective divisions, are determined to implement the spirit of the charter in their business initiatives.

Should any infringement of the charter occur, the management acts immediately to identify and resolve problems, and to take strict corrective actions.



- I** Creating value for customers
- II** Contributing to harmonizing with the environment and to realizing a sustainable society
- III** Being a good corporate citizen contributing to society
- IV** Complying with laws and regulations and respect for human rights
- V** Management policy of human growth

### Code of Conduct of the Osaka Gas Group

- I** Code of conduct as a good corporate citizen
- II** Code of conduct in production, supply and services
- III** Code of conduct in business transactions
- IV** Code of conduct in information management
- V** Code of conduct in workplace
- VI** Code of conduct in working with society

## Efforts for Higher Standards of CSR

Besides fulfilling the duties of an energy provider—a reliable and safe supply of energy—the Osaka Gas Group will abide by the five provisions of the Osaka Gas Group CSR Charter:

- I** Creating value for customers
- II** Contributing to harmonizing with the environment and to realizing a sustainable society
- III** Being a good corporate citizen contributing to society
- IV** Complying with laws and regulations and respect for human rights
- V** Management policy of human growth

In April 2010, we established the CSR and Environmental Department, which will lead the Group in efforts to raise the standards of our CSR.

The United Nations has declared 2010 the International Year of Biodiversity. Through efforts like protecting rare plant species at our LNG terminals, we are striving to support biodiversity and sustainable use of natural resources as we work towards the creation of a society where people and nature coexist.

## Conclusion

In fiscal 2010, the Osaka Gas Group's report on activities in line with the principles of the UN Global Compact was selected as a "Notable COP<sup>1</sup> (Communication on Progress)." We will continue to listen closely to the needs of all our stakeholders and abide by the ten principles in four fields (human rights, labor standards, the environment, and anti-corruption) of the Global Compact as we carry out measures that will make us a corporate group that contributes to the betterment of business, society, and people's lives.

Thank you for taking the time to read about our CSR efforts, and I look forward to your honest feedback.

August 2010

**Hiroshi Ozaki**  
President, Osaka Gas Co., Ltd.

<sup>1</sup> Notable COP: Companies taking part in the UN Global Compact are required to submit a Communications on Progress (COP). Notable COPs are selected for outstanding results over a one-year period. As of April 2010, there were 342 Notable COPs selected from the 8,183 organizations from approximately 137 countries taking part in the Global Compact. In 2008 and 2009, 25 organizations were selected each year from around the world as "Leaders" based on their outstanding COPs.

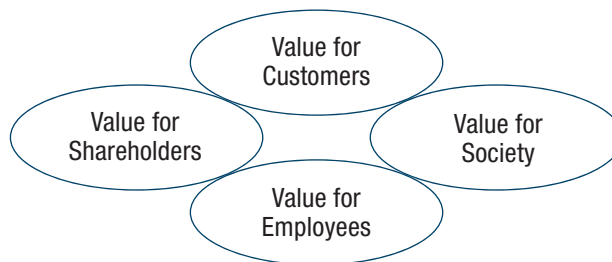


# Management and CSR of the Osaka Gas Group

## Raising Corporate Value for All Stakeholders

### Group Management Principles Value Creation Management

Giving top priority to maximizing the value for customers, the Osaka Gas Group pursues its management principle, Value Creation Management, to enhance value for all stakeholders, including customers, shareholders, society, and employees through fair and transparent business activities.



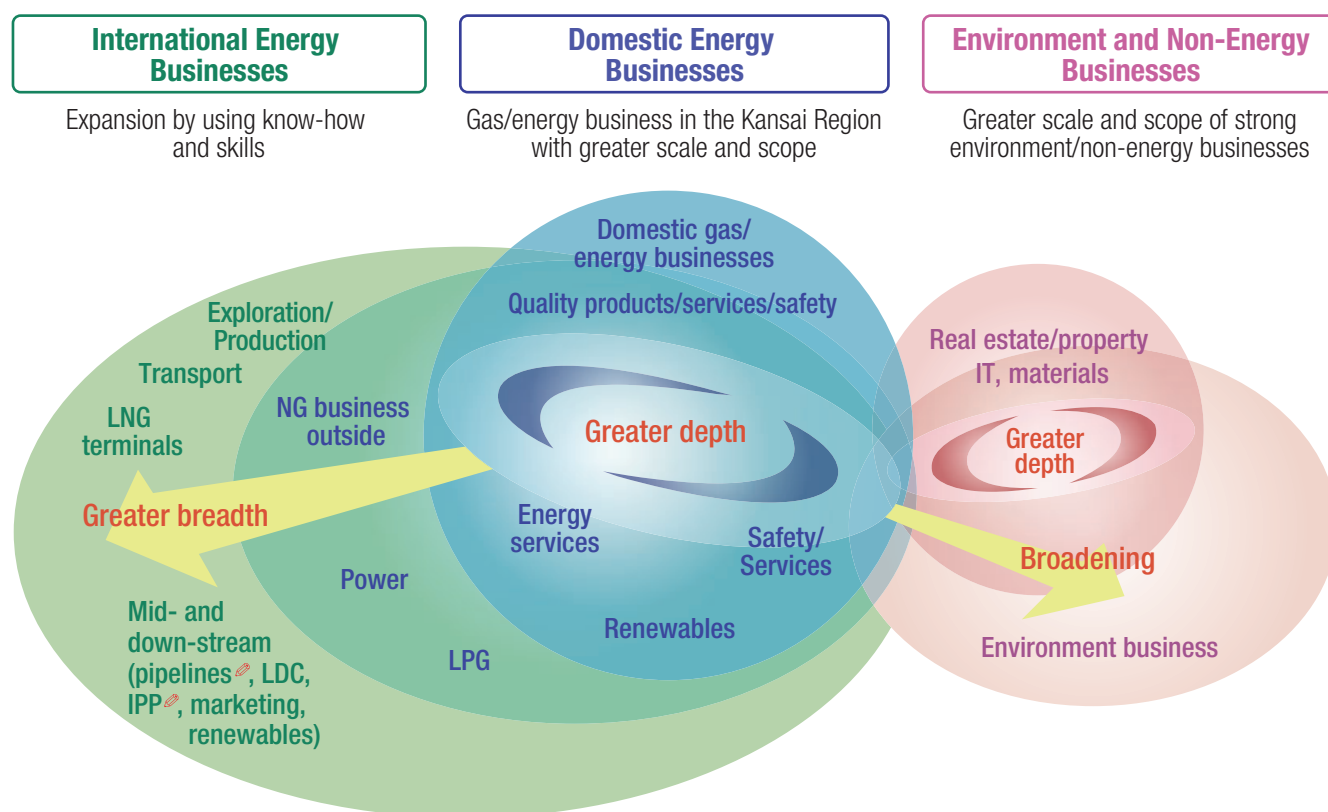
## Focus on Environmental Contribution and Higher Corporate and Business Quality

In March 2009, Osaka Gas announced its “Field of Dreams 2020” Long-Term Management Vision and Medium-Term Management Plans. Based on our fundamental principle of Value Creation Management, our “Field of Dreams 2020” is aimed at making the Osaka Gas Group a quality entity of choice for all stakeholders by deepening existing businesses and broadening our reach into new business fields and locations. By 2020, we aim to be an international energy and environment business group active in the areas of domestic energy businesses, international energy businesses, and environment and non-energy businesses.

To make this vision a reality, the Osaka Gas Group is focusing on protecting the environment through numerous measures: spreading the use of environmentally friendly natural gas; making and selling highly efficient products and systems such as fuel cells and cogeneration systems; providing services for saving energy; and making use of renewable energy.

We are also focusing on raising our corporate and business quality by disclosing all activities and information. This will raise the standards of our CSR and help us meet the ever-higher expectations of society.

## Long-Term Management Vision and Medium-Term Management Plans Field of Dreams 2020





## Setting CSR Indicators

In 2006, the Osaka Gas Group formulated the five principles of the Osaka Gas Group CSR Charter to ensure sustainable development through fulfilling our CSR. In 2009, the “Field of Dreams 2020” was established and CSR indicators were set for each of the five principles.

These indicators are meant to be standards for evaluating the targets and achievements of each of the principles. The opinions of external stakeholders were taken into account in identifying these indicators.

The Osaka Gas Group is working to expand its activities beyond the indices and this report includes newly released and expanded information on those activities (See page 56).

## Adherence to the Principles of the UN Global Compact

The UN Global Compact encompasses 10 principles for enterprises to observe in four fields: human rights, labor standards, the environment, and anti-corruption. Osaka Gas fully agrees with these principles and in June 2007 became the first utility in Japan to join the Global Compact.

In May 2008, Osaka Gas revised its Code of Conduct to incorporate all 10 principles of the Global Compact, and in doing so clearly prohibited activities such as bribes to foreign officials and the use of child labor. In 2009, we revised our CSR-based Purchasing Guidelines (see page 48) to describe the adherence of Osaka Gas and its business partners to the 10 principles of the UN Global Compact.

In 2009, the Osaka Gas Group’s report on activities in line with the principles of the UN Global Compact was selected as a “Notable COP (Communication on Progress)” for 2009 (see page 6). And in 2010, a group of investors on the signatory list of the Principles for Responsible Investment (PRI) selected Osaka Gas as one of the “Leaders” because of the high level of its COP.



### The Ten principles of the UN Global Compact, and sections of this report related to it

Principle	UN Global Compact	Related pages
1	Businesses should support and respect the protection of internationally proclaimed human rights; and	45-52
2	make sure that they are not complicit in human rights abuses.	
3	Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;	51
4	the elimination of all forms of forced and compulsory labor;	49-52
5	the effective abolition of child labor; and	
6	the elimination of discrimination in respect of employment and occupation.	
7	Businesses should support a precautionary approach to environmental challenges;	11-18 27-40
8	undertake initiatives to promote greater environmental responsibility; and	11-18 37-38
9	encourage the development and diffusion of environmentally friendly technologies	
10	Businesses should work against corruption in all its forms, including extortion and bribery.	45-48

## CSR Indicators Aligned with the CSR Charter

CSR Charter



**Creating value for customers**

Target by FY2012

**Customer Satisfaction Level Survey:**  
Level of satisfaction  
Over 82%

CSR Charter



**Contributing to harmonizing with the environment and to realizing a sustainable society**

Target by FY2012

**Environmental Management Indicators:**  
Environmental Management Efficiency  
91yen/1,000m<sup>3</sup> or less

CSR Charter



**Being a good corporate citizen contributing to society**

Target by FY2012

**Number of contacts and communication events:**  
At least 1% of total customers;  
at least 365 communication events

CSR Charter



**Complying with laws and regulations and respect for human rights**

Target by FY2012

**Employee scores on compliance awareness:**  
Higher than the previous year

CSR Charter



**Management policy of human growth**

Target by FY2012

**Employee opinion survey (job satisfaction and dedication):**  
Maintain sufficient level



# Management and CSR of the Osaka Gas Group

## Major Initiatives in FY2010 (Summary)

CSR Charter	CSR Indicators and FY2010 Results	
<div>I</div> <div>Creating value for customers</div> <div>➔ See page 21 for details.</div>	<div>Customer Satisfaction Level Survey: Level of satisfaction</div> <div>Target by FY2012</div> <div>Over 82% ➔ 89.2%</div> <div>Satisfaction increased</div> <div>The result of the Customer Satisfaction Level Survey showed that we have already exceeded the satisfaction target we set for fiscal 2012.</div>	<div>● Overall satisfaction rate (%)</div> <div>Over 82% 89.2%</div> <div>2012 Target 2010 Result (FY)</div>
<div>II</div> <div>Contributing to harmonizing with the environment and to realizing a sustainable society</div> <div>➔ See page 27 for details.</div>	<div>Environmental Management Indicators: Environmental Management Efficiency</div> <div>Target by FY2012</div> <div>91 yen/1,000m<sup>3</sup> or less ➔ 77 yen/1,000m<sup>3</sup></div> <div>Efficiency improved</div> <div>Environmental management efficiency improved for reductions of CO<sub>2</sub> emissions and the disposal of excavated soil.</div>	<div>● Environmental management efficiency (yen/1,000 m<sup>3</sup>)</div> <div>91 or less 77</div> <div>2012 Target 2010 Result (FY)</div>
<div>III</div> <div>Being a good corporate citizen contributing to society</div> <div>➔ See page 41 for details.</div>	<div>Number of contacts and communication events:</div> <div>Target by FY2012</div> <div>Total contacts: At least 1% of total customers; at least 365 communication events ➔ 1.3% of total customers; 900 communication events</div> <div>Expanding outreach</div> <div>Through around 900 communication events, we were able to communicate with a total of roughly 90,000 people (1.3% of all customers).</div>	<div>● Customers contacted (% of total customers)</div> <div>1 or more 1.3</div> <div>2012 Target 2010 Result (FY)</div>
<div>IV</div> <div>Complying with laws and regulations and respect for human rights</div> <div>➔ See page 45 for details.</div>	<div>Employee scores on compliance awareness:</div> <div>Target by FY2012</div> <div>Higher than the previous year ➔ Higher than the previous year</div> <div>Awareness increased</div> <div>All categories saw an increase: Code of Conduct awareness level was 86.7%, understanding of Code of Conduct was 61.7%; and knowledge of work-related laws was 83.9%.</div>	<div>● Key questionnaire results (%)</div> <div>85.4 86.7 58.3 61.7 83.3 83.9</div> <div>2009 2010 2009 2010 2009 2010 (FY)</div> <div>Do you keep the corporate Code of Conduct in mind? Do you comprehend the corporate Code of Conduct? Do you know the laws relating to your work?</div>
<div>V</div> <div>Management policy of human growth</div> <div>➔ See page 49 for details.</div>	<div>Employee opinion survey (job satisfaction and dedication):</div> <div>Target by FY2012</div> <div>Maintain sufficient level ➔ Maintained sufficient level</div> <div>Job satisfaction and dedication increased</div> <div>Results for the targets of job satisfaction and dedication to company were higher than those of the last survey (fiscal 2008).</div>	<div>● Trends in satisfaction (excerpt)</div> <div>4.07 4.36 3.74 3.80</div> <div>2008 2010 (FY)</div> <div>5: Satisfied 4: Somewhat satisfied 3: Neither satisfied nor dissatisfied 2: Somewhat dissatisfied 1: Dissatisfied</div>





Domestic energy businesses



International energy businesses  
along the energy value chain



Environment and  
non-energy businesses

## Major Initiatives

### Providing Customers with Safety and Peace of Mind

Participation in upstream businesses such as the Gorgon Project in Australia to ensure stable resource procurement and energy supply.

New gas supply monitoring and control systems LUNASOLA start operations.

- Aiming for rock-solid security with the establishment of the Four Safety Provisions.

### Incorporating Customer Comments into our Products and Services

Expansion of the Web page where commercial users can check their gas bills

### Creating New Value for Customers



Start of commercial operations at the Senboku Natural Gas Power Plant and expansion of the base of the multi-energy proposal.

- Introduced the Rakutoku Lease system for Si sensor equipped cooking stoves and other equipment to promote widespread use.
- Opened My Osaka Gas membership site (in Japanese) to achieve improved customer satisfaction.
- Applied behavior observation method (Service Science) to contribute to improving customer service in hospitality and hotel businesses.



Photo: Courtesy of Royal Dutch Shell plc.

Participation in Australian project to ensure stable resource procurement.

➡ See page 24 for details.



Introduction of the Rakutoku Lease system for cooking stoves and other equipment.

➡ See page 26 for details.



Held the Environmental Symposium 2010.

➡ See page 36 for details.



Held The Green Wave 2010 event for World Biodiversity Day at an LNG terminal.

➡ See page 39 for details.

### Reducing Greenhouse Gas Emissions



Utilizing cryogenic energy from LNG at LNG terminals.

### Reducing Customers' CO<sub>2</sub> Emissions



Commercialization of fuel cells and promoting the sale of double power generation in combination with photovoltaic power generation.



Conducted smart energy house and smart energy network demonstration trials.

### Reducing Resource Consumption and Promoting Recycled Materials Use



Effective utilization of excavated soil from pipeline construction.

### Renewable Energy



Japan's first utilization of biogas mixed into natural gas started in Kobe City.



Developed polylactate garbage bags, which make it possible to completely convert organic waste to biogas.



Participated in Hallett 4 wind farm project, Australia.

### Conserving Biodiversity



Created and published the Biodiversity Policy and promoted the conservation of rare plants at LNG terminals.

### The Small Light Campaign

- Staff contributed benefits points through the Osaka Gas Tomoshibi Club.
- Started the recycled PC donation program, "Hajimaru-kun," which leads to job creation for people with disabilities.

### Developing the Next Generation

- Held the NOBY T&F (Track & Field) Club hosted by Osaka Gas track team coach Nobuharu Asahara.

- Started the children's support project Energizing Kids.
- Started a new CO<sub>2</sub> emissions reduction program within our energy and environment education, where employees go out and teach at elementary and junior high schools.

### Contribution to Local Communities

- Introduced fair trade products at the Midosuji Neighborly Bazaar.
- Conducted coastal cleanup activities through an affiliated company on Guam.



Holding sports club activities to support children's development.

➡ See page 41 for details.



The Hajimaru-kun program for sales and donations of recycled PCs.

➡ See page 42 for details.



Manager training during Compliance Boosting Period.

➡ See page 46 for details.



6th meeting of the Corporate Ethics Committee.

➡ See page 47 for details.

### Compliance Promotion

- Conducted training for all employees throughout the Group during Compliance Boosting Period (July-September).

- Held the 6th meeting of the Corporate Ethics Committee and, after recapping the initiatives to date and confirming the results, the committee was dissolved.

### Action on Human Rights

- Conducted human rights lectures aimed at the level of organization leaders and management. 470 people participated.

- Conducted a total of 13 human rights training tours for each business division, subsidiary and affiliate. Around 400 people participated.

### Efforts throughout the Supply Chain



An survey was conducted to determine whether human rights were taken into account at LNG suppliers in their corporate policies, etc., with a particular focus on nine companies.

### Maintain Employee Numbers and Diversify Our Workforce

- The average length of employees at Osaka Gas is 21 years. The turnover for employees under the age of 50 is 0.33%, indicating a workplace where it is easy to continue to work.
- There are 101 female employees in supervisory or management positions at Osaka Gas.

### Balancing Work and Family

- Introduced a special leave system, Nurturing Leave, allowing employees to take one day of paid leave from the day their child is born until they turn three months old.

### Human Resource Development

- Held the first joint new employee training. 37 new employees from 13 Group companies participated.

### Communication Between Employees and Company

- Extended the President's tours of workplaces to affiliated companies.

### Improving Occupational Health and Safety

- Task Force for the New Strain of Influenza established and initiatives carried out to prevent infection and spreading.



Held the first joint new employee training.

➡ See page 52 for details.



The President's tours of workplaces have been extended to affiliated companies.

➡ See the web site for details.



# Continuing to Reduce CO<sub>2</sub> Emissions throughout Society

In January 2010, the Japanese Government announced its target of reducing CO<sub>2</sub> and other greenhouse gases that cause global warming by 25% by 2020 against 1990 levels. In June 2010, the Japanese cabinet approved the Basic Energy Plan, which positioned and encouraged natural gas as an energy source key to the early achievement of a low-carbon society. Amidst these developments, Osaka Gas is proceeding with numerous measures to reduce CO<sub>2</sub> emissions.

## At Customers' Sites

### Helping Prevent Global Warming with Natural Gas, a Clean Energy Source

Natural gas is a clean energy source that emits the least CO<sub>2</sub> of any fossil fuel. Osaka Gas has proclaimed its contribution to reducing environmental impact as part of its Field of Dreams 2020 Long-Term Management Vision and Medium-Term Management Plans. To reduce our customers' CO<sub>2</sub> emissions by 13 million tons by 2020, we will accelerate the switch to natural gas as a fuel in the commercial and industrial sectors, improve the energy efficiency of gas appliances, develop and spread the use of distributed energy systems using gas, combine gas and renewable energy, and develop next-generation energy systems.

➡ See pages 13-17 and 33-34.

## Efforts at Osaka Gas

### Creating Energy during Gas Processing, Making Natural Gas Power Generation More Efficient

To reduce CO<sub>2</sub> emissions from business activities, we are striving to create energy using cryogenics during the process of LNG gasification. As a provider of multiple energies, we are providing highly efficient thermal power driven by natural gas.

➡ See pages 18 and 33.

## Overseas

### Developing Technologies to Use Untapped Resources

To help reduce CO<sub>2</sub> emissions overseas, we are developing a number of technologies; for example, for taking crude oil associated gas, which used to be a waste product of combustion, and making it into liquid fuel; and for taking low-concentration methane gas emitted from coal mines and using this for fuel as well. We are also aggressively pursuing wind power business.

➡ See page 37.

## Proper Evaluation for Reduced CO<sub>2</sub> Emissions

➡ See page 19.

## Distributed Generation Using Gas

### Generation by gas engine and turbine



Gas engine



ECOWILL for residential use:

➡ See page 34.

Approx. 32% drop in CO<sub>2</sub> emissions<sup>1</sup>

エコウィル  
ECOWILL®



GENEBO system for commercial use:

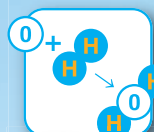
➡ See page 15.

Approx. 26% drop in CO<sub>2</sub> emissions<sup>1</sup>



Gas turbine

### Generation by fuel cell



ENEFARM for residential use:

➡ See page 13.

Approx. 40% drop in CO<sub>2</sub> emissions<sup>1</sup>

エネファーム  
ENE·FARM



Solid oxide fuel cell (SOFC)

➡ See page 14.

Approx. 50% drop in CO<sub>2</sub> emissions<sup>1</sup>

## Reducing Customers' CO<sub>2</sub> Emissions



Hot water (heat)



Electricity

## Making Gas Appliances More Energy Efficient

### Recover and use exhaust heat ➡ See page 34.



Eco-Jozu® high-efficiency water heater

Approx. 13% drop in CO<sub>2</sub> emissions<sup>1</sup>

省エネ給湯器  
eco-Jozu®



Regenerative burner system for high-efficiency industrial furnaces

Approx. 50% drop in CO<sub>2</sub> emissions<sup>1</sup>

## Switching to Natural Gas for Commercial and Industrial Fuel

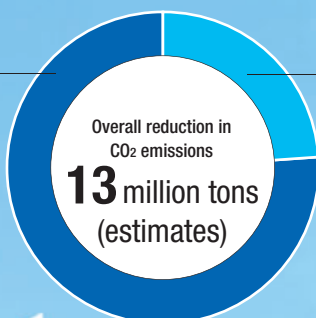
Commercial gas air conditioning systems offer superior energy savings and are effective for easing electricity use during the summer peak.

As well, switching from heavy oil to natural gas to run industrial furnaces and boilers, which require large amounts of heat, can dramatically reduce CO<sub>2</sub> emissions. Osaka Gas is thus promoting the switch to natural gas fuel by providing both the hardware and the expertise: highly efficient, energy-saving equipment and systems, as well as suggestions on how to use these to maximize energy efficiency and savings.



## ↓ Reductions in Customer CO<sub>2</sub> Emissions from Fiscal 2010-2021 (Estimates)

Commercial and industrial use  
**10 million tons**  
Reductions from spread of natural gas use and services for energy saving



Residential use  
**3 million tons**  
Reductions by spread of residential cogeneration and Eco-Jozu®

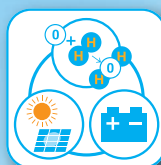
## R&D for Hydrogen Society



- Hydrogen generator “HYSERVE”
- Hydrogen filling station ➡ See page 37.



## Developing Next-Generation Energy Systems



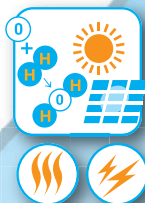
- Smart Energy House ➡ See page 17.
- Smart Energy Network ➡ See page 17.



Generator laboratory of Osaka Gas, which is developing the elemental technologies

## Combined Use of Gas with Renewable Energy

### Photovoltaic power ➡ See page 16.



Double power generation: Photovoltaic power and ENEFARM  
Approx. **63%** drop in CO<sub>2</sub> emissions<sup>1</sup>



Double power generation: Photovoltaic power and ECOWILL  
Approx. **54%** drop in CO<sub>2</sub> emissions<sup>1</sup>



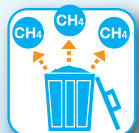
### Solar heat ➡ See page 16.



SOLAMO® water heating system using solar heat



### Biogas ➡ See page 16 and 38.



## Managing Energy Use



### “Motto Save” energy saving support ➡ See page 15.



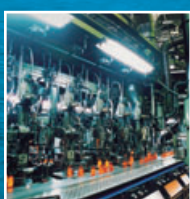
<sup>1</sup> For details of how the CO<sub>2</sub> emission reductions were calculated, see the insert that came with this report.

Note: SOLAMO® and Eco-Jozu® are registered trademarks of Tokyo Gas.

## Reducing CO<sub>2</sub> emissions by switching to clean-burning natural gas fuel



Heat processing

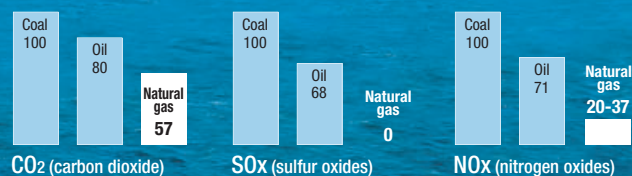


Glass processing



Gas air conditioning systems

## ↓ Comparison of emissions levels of combustion products of fossil fuels (Coal = 100)



Sources: •International Energy Agency (IEA): Natural Gas Prospects to 2010 (1996)

•Institute of Applied Energy (IAE): Report on Thermal Power Plant Atmospheric Impact Assessment Technology Demonstration Surveys (March 1990)



# Generating Energy Where It's Needed – Distributed Energy Systems

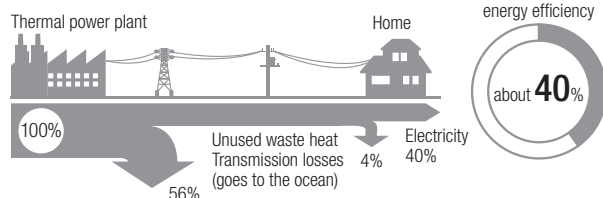
## Creating Energy Where It's Needed Means Greater Efficiency

In conventional centralized power systems, large power plants generate electricity that goes to homes and businesses. The alternative to this is a distributed generation system, such as a cogeneration system<sup>1</sup>, in which electricity is generated only for the home, businesses, or district it is needed for.

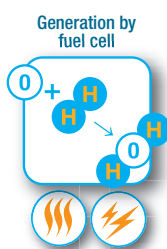
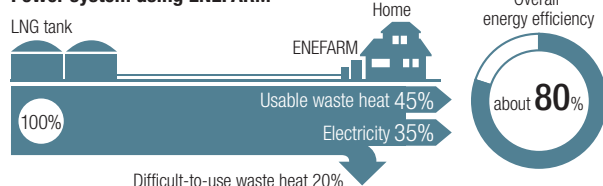
When generating electricity with conventional thermal power plants, only about 40% of the primary energy put into the system is used for generation while 56% ends up as unused waste heat, and 4% is transmission losses. This means overall energy efficiency is just 40%<sup>1</sup>. Osaka Gas's ENEFARM residential fuel cell, on the other hand, generates energy only where it is used, so there are no transmission losses. Approximately 35% of the primary energy is used as electricity and approximately 45% is used as heat energy: this is an overall energy efficiency of approximately 80%.

<sup>1</sup> Power generation efficiency calculated based on figures from fiscal 2004. All figures are based on LHV<sup>2</sup>. Source: Japan Gas Association

### Conventional Power System



### Power system using ENEFARM



## ENEFARM

### Residential Fuel Cell

**The Ultimate in Distributed Generation Systems**  
**CO<sub>2</sub> Reductions Equivalent to Planting Approx. 120,000 Trees**

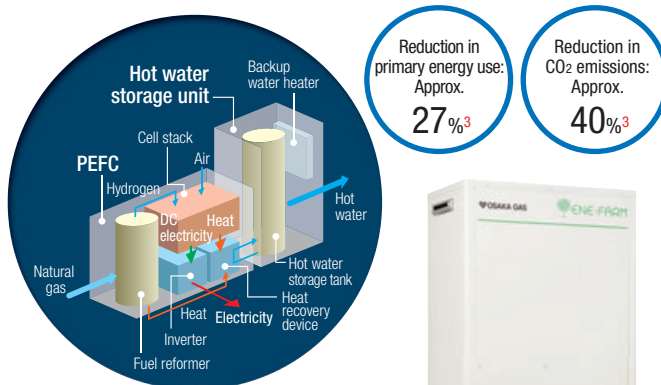
In June 2009, Osaka Gas released ENEFARM, a polymer electrolyte fuel cell (PEFC) cogeneration system for residential use.

ENEFARM extracts hydrogen from natural gas and reacts it with oxygen in the air to generate electricity. Because of its high power generation efficiency and effective use of heat during power generation, ENEFARM uses about 27% less primary energy and gives off about 40% fewer CO<sub>2</sub> emissions compared to conventional thermal power systems<sup>3</sup>. These benefits are attracting plenty of attention and making ENEFARM a promising source of clean power generation for the future.

The ENEFARM, which offers safe independent power through clean-burning natural gas, has been popular among environmentally conscious housing companies and customers. As of November 2009, we had already achieved our first-year sales target of 1,000 units for ENEFARM— just five months after its release. Sales continued after that, and as of March 2010 we had surpassed our revised one-year target of 1,300 units. Using these ENEFARM units has the effect of reducing annual CO<sub>2</sub> emissions by approximately 1,700 tons<sup>4</sup>. This is the amount of CO<sub>2</sub> that is absorbed by approximately 120,000 cedar trees<sup>5</sup>.

We will continue to reduce the cost of ENEFARM and make it easier to install so that more people can enjoy the environmental and comfort benefits it brings.

### Mechanism and energy efficiency of ENEFARM



ENEFARM, a polymer electrolyte fuel cell (PEFC) cogeneration system for residential use



<sup>2</sup> LHV = Lower heating value. The amount of heat generated by complete combustion of the combustion gas, minus the latent heat of vaporization of the water vapor generated in the process.

<sup>3</sup> For calculation conditions of primary energy use and CO<sub>2</sub> emissions, see the insert that came with this report.

<sup>4</sup> Detached house, four family members, using gas water and space heater, gas hot water floor heating system (in living and dining room), gas hot water bathroom heater and dryer with mist sauna function, gas cooker; heating and cooling for all rooms besides living and dining room is by electric air conditioner. CO<sub>2</sub> emission factor is 0.69 kg-CO<sub>2</sub>/kWh (average for thermal power source) for electricity and 2.29 kg-CO<sub>2</sub>/m<sup>3</sup> for gas (Osaka Gas calculations).

<sup>5</sup> Each tree absorbs 13.9 kg-CO<sub>2</sub>/year, trees are 50 years old; from Ministry of Agriculture, Forestry and Fisheries White Paper, 1997.



Obtaining electricity for the home by a fuel cell using gas



Enjoy cooking with gas while also heating water for the kitchen



Plenty of hot water for the bath



The ENEFARM remote controller is easy to operate, and it shows how much power you're generating and using

## ENEFARM Wins Minister of the Environment Prize in Eco-Product Awards, Also Wins New Energy Foundation Chairman's Prize

At the 6th Eco-Products Awards in November 2009 sponsored by the Eco-Products Promotion Council, the ENEFARM was awarded the Minister of the Environment Prize in the Eco-Products category. At the New Energy Awards sponsored by the New Energy Foundation in January 2010, ENEFARM won the New Energy Foundation Chairman's Prize (Outstanding Products category). (Osaka Gas and Tokyo Gas Co., Ltd. were among the six companies that jointly won the awards.)

### A Word from a Housing Company Saving the Environment by Spreading ENEFARM

Koichi Segawa  
Osaka Branch, Sekisui House, Ltd.



We offer our environmentally conscious customers an eco-housing concept we call "Green First."

When building a new house, we meet customers needs for comfort, economy, and environmental friendliness by combining ENEFARM with solar power. We tell our customers to think long term when choosing their energy source; in other words, not just in terms of startup costs but running costs as well. In this sense, ENEFARM is a perfect fit.

### ENEFARM Maintenance

#### Dedicated Teams Help Boost Reliability

Osaka Gas's dedicated teams first give workshops at maintenance service providers before releasing the ENEFARM. After the release, these teams share valuable information they have built up with the service providers.



## Solid Oxide Fuel Cell (SOFC) Cogeneration System

### Compact, High Power Generation Efficiency

Osaka Gas's residential solid oxide fuel cell (SOFC) cogeneration system boasts a high power generation efficiency of 45% (LHV basis<sup>2</sup>), so it offers environmental and economic benefits to homes that demand relatively low amounts of heat for hot water and space heating. And it can reduce CO<sub>2</sub> emissions by approximately 50%<sup>3</sup> compared to conventional systems (combining thermal power and conventional hot water heaters), so it contributes to preventing global warming. Also because the generating unit and waste heat recovery unit are compact, this SOFC system is ideal for small homes and housing complexes.

In fiscal 2005, we began joint development of SOFCs with Kyocera Corporation. In fiscal 2008, we began taking part in a pilot project conducted by NEDO<sup>6</sup> aimed at achieving the reliability and durability required of such cogeneration systems through trial operation.

In March 2009, Toyota Motors Corporation and Aisin Seiki Co., Ltd. joined to bring the number of companies to four, with each providing its particular technologies and know-how in order to accelerate development.

The goal is to have residential SOFC cogeneration products on the market shortly after 2010.



Solid oxide fuel cell (SOFC)

<sup>6</sup> New Energy and Technology Development Organization



## Feature Preventing Global Warming Reducing Customers' CO<sub>2</sub> Emissions

Generation by  
gas engine



### GENEBO System Commercial System

**Powered by Gas, Highly  
Efficient, and Plenty of  
Hot Water**

Osaka Gas has highly energy efficient gas appliances for commercial and industrial customers. One of these is the GENEBO, a water boiler with a cogeneration system for heating water using waste heat. It was developed in conjunction with Tokyo Gas Co., Ltd., Toho Gas, Co., Ltd., Tomoe Shokai Co., Ltd., and Yanmar Energy System Co., Ltd. The GENEBO System, which combines this with the Gene-Light mini cogeneration system, went on sale in December 2009.

The energy-efficient Gene-Light uses a gas engine to generate power and the waste heat to boil water. Facilities requiring large amounts of hot water have previously had to take waste heated hot water and mix it with water, then reheat this with a gas water heater. But this puts excess load on the water heater and lowers energy efficiency. So, instead of using a water heater, the GENEBO, which is a water boiler with a waste heat recovery function, takes the waste heat directly from the Gene-Light and uses it to boil water. The result is approximately 23% less use of primary energy and approximately 26% fewer CO<sub>2</sub> emissions<sup>1</sup>.

The GENEBO System is thus ideal for senior citizens' homes, public baths, hotels, fitness clubs, and other facilities that require large amounts of hot water.

<sup>1</sup> For calculation conditions of primary energy consumption and CO<sub>2</sub> emission reductions, see the insert that came with this report.



Senior citizens' homes requiring large amounts of hot water for assisted bathing

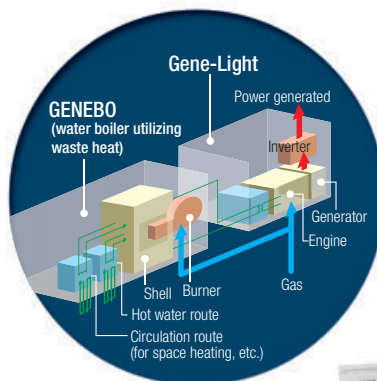


Indoor pools



Spas and public baths

### Mechanism and energy efficiency of the GENEBO System



Reduction in  
primary energy use:  
Approx.  
**23%<sup>1</sup>**

Reduction in  
CO<sub>2</sub> emissions:  
Approx.  
**26%<sup>1</sup>**

### GENEBO System

Combines the Gene-Light mini cogeneration system (right) and the GENEBO hot water boiler (left)



Energy Use  
Management



### Helping Save Energy for Commercial- and Industrial-Use

#### "Motto Save" — Save More Energy

Energy-efficient equipment shouldn't just be used—it should be used effectively.

Creative Techno Solution Co., Ltd. and Osaka Gas offer a service which provides energy measurement and control services for mid-size buildings, hospitals, and universities. For example, GPI analyzes the amount of electricity and gas used and then offers the customer energy-saving solutions. Customers can also monitor their energy use in real time with their computers. Because this service is built from open source software and products, data can be exchanged with other companies' systems, measuring equipment can be easily upgraded, and a range of system expansion options are available.

#### Comment from a User

We started using Motto Save, and with the data collected and used to improve operations, we ended up saving approximately 17,000 m<sup>3</sup> of gas compared to the previous year. As well, the system helped by reminding us to turn off the power for the electric air conditioning (heat pump type) installed in separate rooms. This allowed us to save 16,000 kWh of electricity during the five months of the summer.

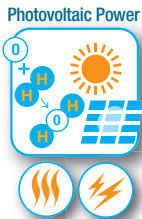
Although we had tried to save energy before, this system saves us even more. Plus, it has made our job of checking the gas meters and other patrol work much more efficient.



Head of Materials and  
Equipment  
Hokusetsu General Hospital



# Combining Gas and Renewable Energy



## Double Power Generation Gas and Photovoltaic Power

**40% of ENEFARM Customers  
Use Double Power**

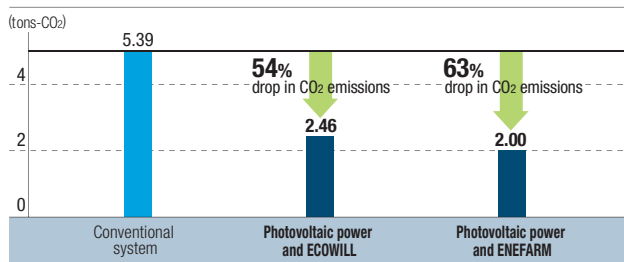
Osaka Gas is working to spread the use of what we call “double power generation”: a system combining the ENEFARM residential fuel cell (which went on sale in June 2009) with a photovoltaic power generation system.

Although photovoltaic power generation has the benefit of not requiring any fuel, it can be unreliable since it depends on the weather. But ENEFARM, which runs on gas, continues to generate power whatever the weather. Double power generation combines these two. Since the system uses ENEFARM as the primary energy source, even during cloudy periods, the user needs only purchase minimal electricity, while during sunny periods the photovoltaic power portion of the system can generate excess electricity that can be sold back to the power company. And double power generation reduces CO<sub>2</sub> emissions by approximately 63%<sup>1</sup>.

These benefits have prompted about 40% of ENEFARM users to go with double power generation.

<sup>1</sup> For calculation conditions of CO<sub>2</sub> emission reductions, see the insert that came with this report.

### Annual CO<sub>2</sub> emissions for combined gas and photovoltaic power generation



## SOLAMO®

Water and Space Heater using Solar Heat

**Uses Solar Heat Collected with  
Heat Collecting Panels**

Osaka Gas, Takagi Industrial Company, Ltd., and Asahi Kasei Homes Corporation jointly released the SOLAMO® gas water heating system in May 2010. This system involves installing heat collecting panels on the roof of a detached house to collect solar heat to use for water and space heating. When there is insufficient sunshine, the Eco-Jozu® (see page 34) high-efficiency water heater supports to heat water.

Compared to conventional water heaters, this system dramatically reduces annual CO<sub>2</sub> emissions.



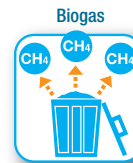
Double energy savings by combining photovoltaic power with on-site power generation



Heat collecting panels on roof gather solar heat for use



Biogas digestion tank (treatment plant in Higashinada-ku, Kobe)



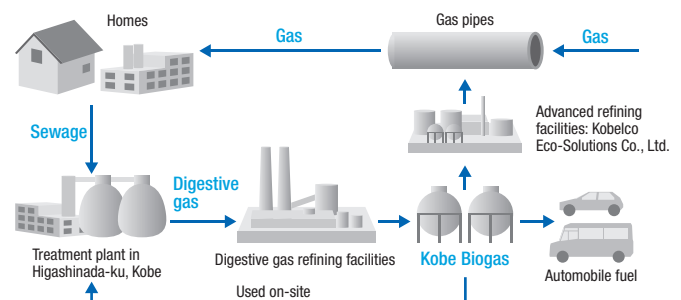
## Biogas

Supplied via Gas Pipes

**Advanced Refining of Biogas  
from Sewage Sludge**

In September 2010, Osaka Gas, Kobe City, and Kobelco Eco-Solutions Co., Ltd. will begin trial operation of a project to take biogas produced at a treatment plant in Higashinada-ku, Kobe and mix it with gas for provision to customers. This biogas comes from sewage sludge, and it is refined so that it can be used the same as regular gas. This is the first time in Japan that such gas will be supplied directly through gas pipes. This project will help determine the economic feasibility and operation methods of such a business, and will lead to the more effective use of biomass resources. (See page 38 for more on biomass.)

### Trial project for supplying both gas and biogas via gas pipes



**Note:** Digestive gas is made by anaerobic fermentation in sewage sludge where no oxygen exists. It is mainly composed of methane and CO<sub>2</sub>.



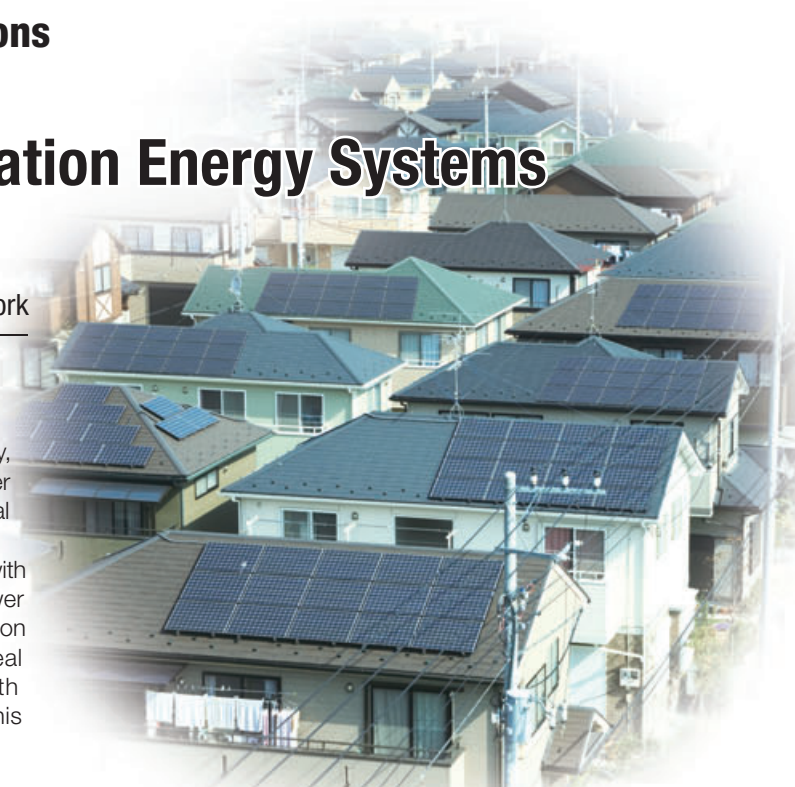
# Developing Next-Generation Energy Systems



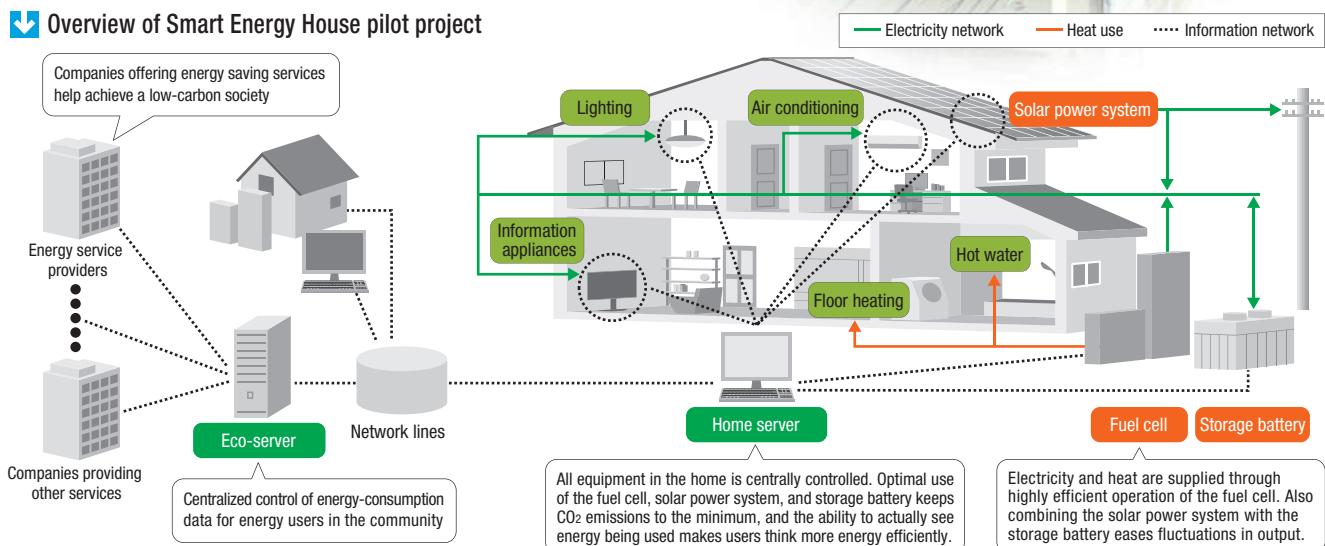
## Smart Energy House Uses 3 Batteries and Information Network Optimizing Energy Use at Home

In fiscal 2010, Osaka Gas joined the Ministry of Economy, Trade and Industry's Smart House Pilot Project, and together with Sekisui House, Ltd. has embarked on the experimental Smart Energy House.

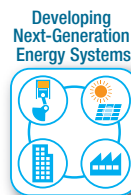
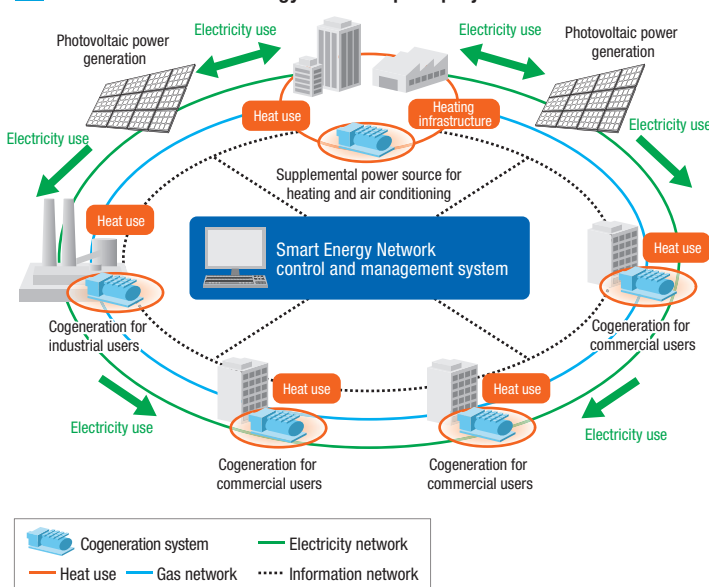
This experiment involves building a house equipped with (1) an energy system that combines a fuel cell, solar power system, and storage battery, and (2) an in-house information network. This smart house is being used to test for ideal energy management in the home, including use of both electricity and heat energy, and to predict what effect this has on the amount of CO<sub>2</sub> emissions.



### Overview of Smart Energy House pilot project



### Overview of Smart Energy Network pilot project



## Smart Energy Network Distributed Energy Networks Optimizing Energy Use across All Sectors of Society

Energy use can be optimized by flexibly accommodating energy to those that need it; for example, by using a combination of electricity from power companies with heat, renewable energy, and unused forms of energy such as waste heat from factories. This will make the most efficient use of renewable energy and dramatically reduce CO<sub>2</sub> emissions. Osaka Gas conducts a pilot project which includes using a gas cogeneration system to ease the



Generator laboratory of Osaka Gas, which is developing the elemental technologies

output fluctuations from solar power generation. We are also taking part in a pilot project with Tokyo Gas Co., Ltd. to optimize the combination of multiple energy sources through distributed energy systems.



## Reducing CO<sub>2</sub> Emissions from Osaka Gas Business Activities

# Generating Energy in the Natural Gas Processing, Making Gas Power Generation More Efficient

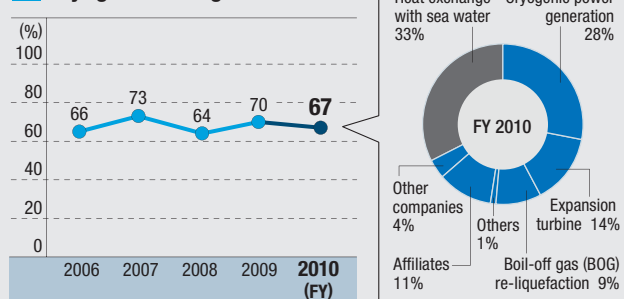
Increase the Use of Cryogenics from the LNG Gasification

### Contribute to Energy Creation and Energy Savings for Factories and Local Companies

In the LNG production process, -160°C LNG is warmed up with sea water to gasify it. Osaka Gas has developed the world's first cryogenic energy generation facility for extracting electricity from this process. This system is in use at our LNG terminals. At this facility, the intermediate medium, condensed fluid as a result of exchanging heat with LNG in the LNG gasifier, is sent to the intermediate vaporizer by a pump, and then gasified through heat exchange with sea water. The energy at the time of expansion of the gasified medium is recovered and used as electricity inside the plant site.

Cryogenic energy from LNG is used for manufacturing liquefied nitrogen, liquefied oxygen, and liquid argon by freezing air, as well as liquefied carbon and dry ice by freezing highly pure carbon gas. At adjacent petrochemical plants, cryogenics is supplied to the cooling process. This means the system creates and saves energy for both the plant itself and neighboring facilities. Efforts like these have made it possible to use almost 70% of cryogenics, and this helps reduce CO<sub>2</sub> emissions.

#### ↓ Cryogenics usage rate



### Start of Operations at the Senboku Natural Gas Power Plant

### High-Efficiency Power Generation with Combined Cycle Method

Approximately seven years after the idea was first conceived, in 2009, Osaka Gas started operations at its Senboku Natural Gas Power Plant as a core part of our power generation business. With an overall power generating capacity of 1.109 million kW, this cutting-edge, environmentally friendly thermal power plant runs on natural gas and is powered by four turbines using the combined cycle method for high energy efficiency.

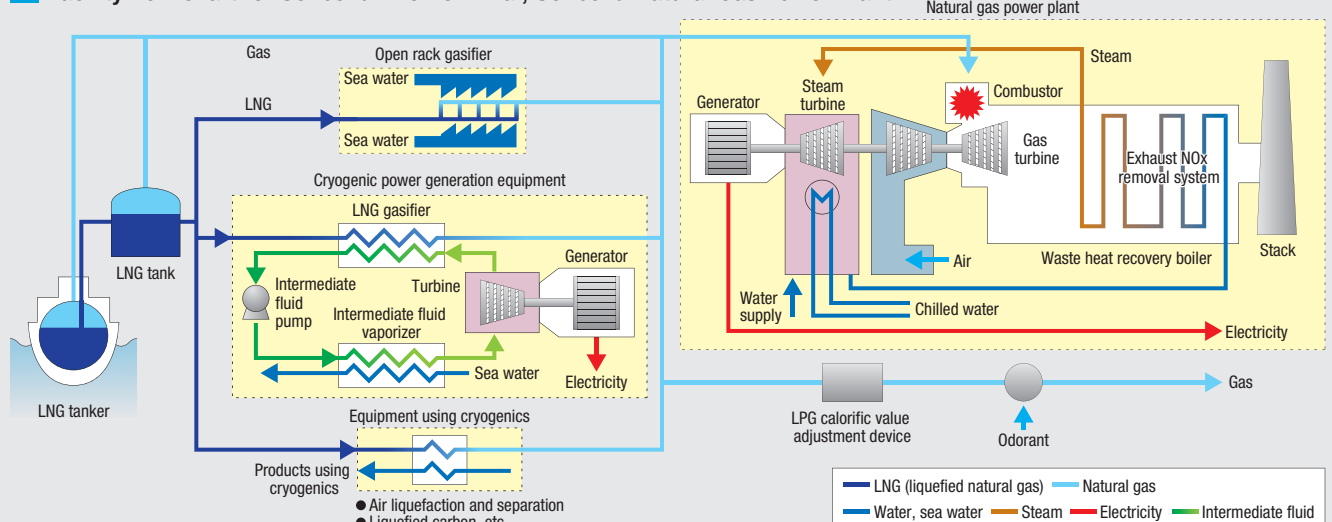
The plant uses natural gas, the fossil fuel that results in the fewest CO<sub>2</sub> emissions, to drive turbines using the combined cycle method. In this method, natural gas is combusted to power the turbines, and the heat of the exhaust gas from the turbine is used to generate steam, which drives a steam turbine to generate electricity. This method gives an extremely high power generating efficiency of 57% (LHV basis<sup>1</sup>), which results in energy savings and lower CO<sub>2</sub> emissions.

<sup>1</sup> LHV = Lower heating value. The amount of heat generated by complete combustion of the combustion gas, minus the latent heat of vaporization of the water vapor generated in the process.



Senboku Natural Gas Power Plant

#### ↓ Facility flow chart for Senboku LNG Terminal, Senboku Natural Gas Power Plant





# What is the most appropriate method for evaluating CO<sub>2</sub> reductions thanks to energy conservation efforts?

## — Proper evaluation using the marginal emission factor —

Do you know how changes in CO<sub>2</sub> emissions from electricity consumption by customers are calculated? As CO<sub>2</sub> is not emitted when electricity is being used, the CO<sub>2</sub> emitted at the power plant is calculated as being emitted by the customer. This also applies in cases where the customer engages in energy conservation initiatives to reduce energy use and it is necessary to evaluate the CO<sub>2</sub> reductions at the power plant.

To do this, it is necessary to identify the power sources for electricity that is subject to demand fluctuations and hence variable throughout the year. These are known as marginal power sources.

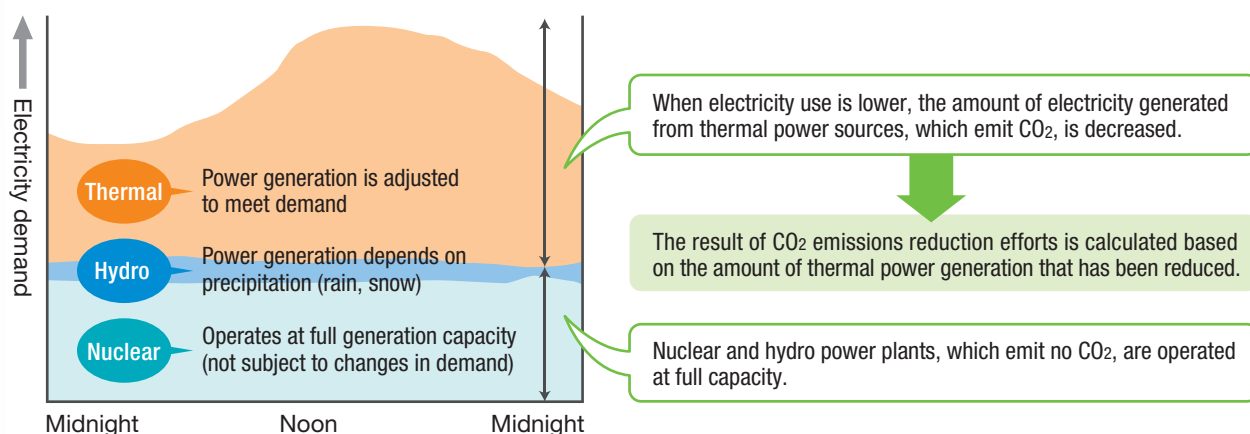
CO<sub>2</sub> reductions are evaluated based on the volume of electricity that is reduced from these sources.

### What is the marginal power source in Japan?

The power sources of Japan include thermal, nuclear and hydro power generation. Nuclear power plants continually generate power except for occasions such as periodical inspections. Due to their low operational costs, hydro power plants are operated to the fullest extent possible and the amount of power generated annually is determined

by changes in the amount of precipitation (rain and snow). On the other hand, the amount of power generated by thermal power is adjusted to meet demand and so the marginal power source in Japan is considered to be the thermal power.

#### Electricity production by type of power source



#### Formula for calculating CO<sub>2</sub> emissions reductions

The following formula demonstrates the proper method for calculating CO<sub>2</sub> emissions reductions due to reduced electricity consumption using the thermal power factor as the CO<sub>2</sub> emissions factor (marginal emission factor) of the marginal power source.

$$\begin{array}{|c|} \hline \text{Reduced electricity use} \\ \text{(kWh)} \\ \hline \end{array} \times \begin{array}{|c|} \hline \text{Marginal emission factor} \\ \text{(0.69kg-CO}_2\text{/kWh}^1\text{)} \\ \hline \end{array} = \begin{array}{|c|} \hline \text{Reduced CO}_2\text{ emissions} \\ \text{(kg-CO}_2\text{)} \\ \hline \end{array}$$

<sup>1</sup> Source: Interim Report, Sub-Committee on Scenarios to Achieve the Target, Global Environmental Committee, Central Environmental Council (2001)



## Average Emission Factor (AEF) for all power sources and the marginal emission factor

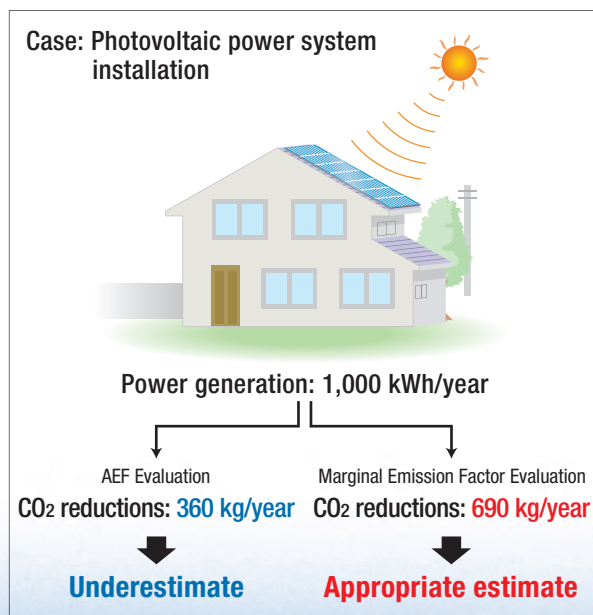
Generally, CO<sub>2</sub> emissions are estimated using the average factor for CO<sub>2</sub> emissions for all types of power sources, known as the Average Emission Factor (AEF), including nuclear, hydro and thermal generation. However, if AEF is used to estimate CO<sub>2</sub> emissions reductions, nuclear and hydro generation, which do not change with fluctuations in demand, are included in the sources of reduced electricity generation. As a result, proper evaluations of CO<sub>2</sub> emissions reductions should use the marginal emission factor, which in Japan is the CO<sub>2</sub> emissions factor of thermal power generation at thermal power plants.

These two factors differ significantly as outlined below and it is possible that CO<sub>2</sub> emissions reduction evaluations based on AEF will underestimate mitigating effects on global warming due to the introduction of solar, wind, biomass, and other alternative energy sources.

Average Emission Factor (AEF)	Marginal Emission Factor (Thermal Power Factor)
0.36 kg-CO <sub>2</sub> /kWh	0.69 kg-CO <sub>2</sub> /kWh

Source: Interim Report, Sub-Committee on Scenarios to Achieve the Target, Global Environmental Committee, Central Environmental Council (2001)

### Example of underestimation of CO<sub>2</sub> emissions reductions when using AEF



## International/Domestic standards for CO<sub>2</sub> reduction assessments

International standards dictate that assessments of CO<sub>2</sub> reductions as a result of reduced electricity purchased should be calculated using the marginal emission factor (in Japan, the thermal power factor). This practice is employed in the Clean Development Mechanism (CDM) process, one of the mechanisms of the United Nation's Kyoto Protocol, as well as international standards such as the Guidelines for Quantifying GHG Reductions from Grid-Connected Electricity Projects, part of the Greenhouse Gas Protocol Initiative. In Japan, the government guidelines for energy conservation include information regarding this method.

### CO<sub>2</sub> reduction assessment under the Guidelines for Quantifying GHG Reductions from Grid-Connected Electricity Projects (GHG Protocol Initiative)

The Operating Margin (OM) emission factor (marginal emission factor) is used to calculate CO<sub>2</sub> reductions due to the effect of energy-saving efforts. The marginal emission factor is obtained by identifying the power source of the electricity that has been reduced.

### Government guidelines employing the marginal emission factor (the average factor of thermal power sources)

- ◆ **Interim Report**, Sub-Committee on Scenarios to Achieve the Target, Global Environmental Committee, Central Environmental Council (2001)
- ◆ **Environmental Reporting Guidelines 2007**, the Ministry of the Environment (2007)
- ◆ **The standard for green government building and its practical manual**, edited by the Ministry of Land, Infrastructure, Transport, published by Public Buildings Association (2005)
- ◆ **The standard for environmental performance examination/retrofit design and its practical manual**, edited by the Ministry of Land, Infrastructure, Transport, published by the Building Maintenance & Management Center (2006)

Here is a link to a video with an explanation of the proper evaluation of CO<sub>2</sub> emission reductions. (Japanese only)

<http://www.osakagas.co.jp/company/csr/co2movie/index.html>



# Creating value for customers

The Osaka Gas Group is committed to making its positive contribution to realizing higher level of comfort and development of business activities of its customers. The group intends to achieve this objective through its provision of reliable and safe supply of natural gas and other energy services with improved level of services for its customers. We also seek to grow together with customers and society at large by creating new products and services to enhance our value for customers and pursuing opportunities for further growth of our businesses.

## CSR Indicator – Target and Result

### Customer Satisfaction Level Survey: Level of satisfaction

Target by FY2012

FY2010 Result

Over 82%



89.2%

Satisfaction  
Increased

The result of the Customer Satisfaction Level Survey showed that we have already exceeded the satisfaction target we set for fiscal 2012.

● Overall satisfaction rate (%)



## Opinions and requests from the FY2010 survey

### From “Sales of gas alarms” survey

#### Customer comments

Osaka gas representatives gave a thorough explanation about lease payment system and laws regarding installation of gas alarms.

Staff explained laws regarding fire alarm installation, but it would be helpful if it is explained in the catalogs.

Senior citizens should be constantly reminded of the importance of alarm systems.

### Improvements Based on Customer Comments

#### Catalogs and the Important Reminders document were improved

On the cover of the catalog, we explained that fire alarms are mandatory, along with points to keep in mind regarding gas alarms. We have also improved the terms and conditions on leasing contract, Important Reminders, to be more comprehensible.



Alarm catalog



Important Reminders document

## Definition of Indicator

Items covered in the survey are those in which Osaka Gas deals directly with end users: “opening of gas lines,” “repair of gas appliances,” “regular security inspections (gas facilities inspections),” “response to telephone inquiries,” “replacement of gas meters upon expiration of validity period,” “sales of appliances,” “sales of gas alarms,” and “sales of ST24<sup>1</sup>.” The written survey, which contains questions on overall satisfaction and quality of service, will be mailed

to customers after completion of the service concerned.

Overall satisfaction is rated on a six-point scale, with the top two, “very good” and “good,” meaning overall satisfaction was achieved. In quality of service, customers assess the main elements of service, and contribution of each to customer service is converted into a score out of 100.

## Overview of FY2010 Result

Osaka Gas has been conducting customer satisfaction surveys since 1988. We originally set targets of at least an 80% rate of overall satisfaction and at least 84 points in quality of service, targets we have easily achieved in recent years. The scope of the survey was expanded in fiscal 2010, at which time we made a score of at least 82% overall satisfaction a key CSR indicator for Osaka Gas.

In fiscal 2010, overall satisfaction





The Customer Center hears opinions and requests from customers

#### From "Opening of gas lines" survey

##### Customer comments

I was worried about living on my own for the first time. However, I felt much more at ease after I called Osaka Gas to inquire about opening a gas line and speaking with the kind service staff.

There was so much to do and think about when I moved to my new residence, but the down-to-earth explanation by Osaka Gas really helped make the move easier.

#### From "Sales of appliances" survey

##### Customer comments

The service person's uniform and manners made a good impression, and I feel I can trust Osaka Gas with future work.

When visiting for indoor work, I would like the service person to wear clean clothing.

#### From "Repair of gas appliances" survey

##### Customer comments

When fixing up the equipment, the person in charge adequately explained the problem, so I feel I can continue using gas without anxiety.

I would like Osaka Gas to give my wife, who is the one using the products, a clear explanation.

All we did was explain the problem over the phone and the service person brought all the necessary parts and finished the job quickly.

#### ➡ Improvements Based on Customer Comments

##### The quality of work during service calls is constantly being improved

We make sure that work clothes are clean after one service call before going to the next one. We continue to work on improving not just the appearance of service people, but also their politeness, technical expertise, and quality of work.



#### New Survey Method, Extended Scope

In fiscal 2007, we made it easier to answer questions by switching from a phone survey to a written survey. We get approximately 50,000 responses annually: a 30% return rate.

We have also extended the scope of the survey to improve the quality of work. In fiscal 2009, we added the items "sales of appliances," "sales of gas alarms," and "sales of ST24<sup>1</sup>," and in fiscal 2010 we added "emergency response to gas leaks."

rate was 89.2% and quality of service marked 90.7 points.

These survey results reflect constant changes to the way we work and improvements to our manuals and customer documentation. We are also improving our response to telephone inquiries through regular training sessions and the sharing of information whenever possible.

<sup>1</sup> Station 24 business: A 24-hour IT monitoring system to ensure customer safety and security.



#### Cooperative Efforts by Affiliates Help Customer Company Move Into the Tokyo Area

Kairikiya is a ramen (noodle soup) chain centered in the Kansai region of Japan. The LPG for its cooking and air conditioning equipment used to be supplied by Osaka Gas affiliate Liquid Gas Group. When Kairikiya decided to open up shops in the Tokyo area in 2009, Liquid Gas Group introduced it to an Osaka Gas affiliate with extensive experience in the area, Nissho Gas Supply. Nissho Gas then advised Kairikiya how to set up the

gas valvesto best match the way it operates its shop.

Thanks to this cooperation among our affiliates, Kairikiya, which was unfamiliar with the area, expressed their appreciation that it was able to procure LPG without delay and successfully open up in Tokyo.

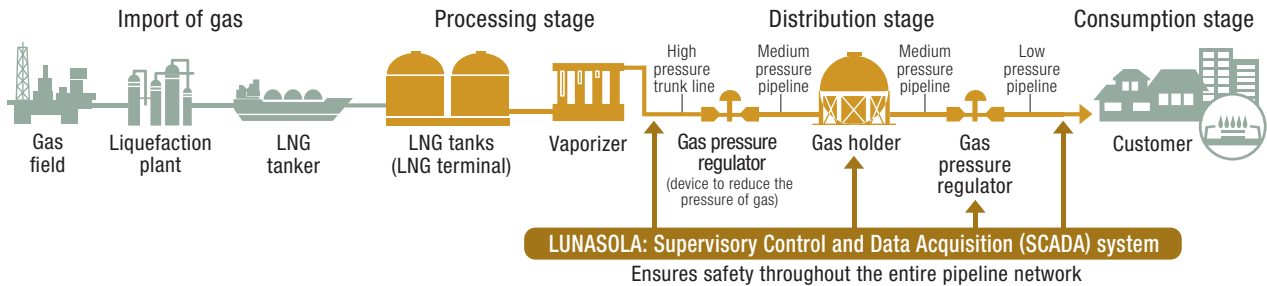




## Providing Customers with Safety and Peace of Mind

### In Procurement, Manufacturing, and Supply

#### 📌 The pursuit of safety—From gas fields to customers' sites



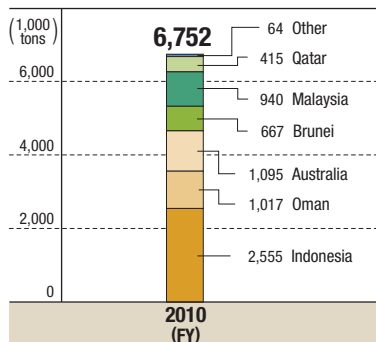
### Stable Procurement

While reserves of oil are concentrated in the Middle East, natural gas, the raw material for the gas Osaka Gas provides to customers, can be found around the world. Natural gas's reserve-production ratio is also much longer<sup>1</sup> than that of oil. These factors make natural gas an advantageous source of energy.

In 1972, Osaka Gas began importing LNG (liquefied natural gas) from Brunei, and today we also import from Indonesia, Malaysia, Australia, Qatar, and Oman. And new contracts with suppliers in Russia (Sakhalin) and Papua New Guinea diversify our sources even more, which ensures stable procurement. We are also entering the upstream stage of the natural gas business by acquiring drilling rights to overseas gas fields and obtaining the rights to LNG receiving terminals.

<sup>1</sup> Source: BP Statistical Review of World Energy 2009

#### 📌 Amount imported by Osaka Gas (including for power generation)



### Safety Measures During Production

The total of 30 LNG tanks at our LNG terminals have advanced earthquake-proof construction including foundation piles driven deep into solid ground. There are also gas and flame detectors located in key areas of the LNG terminals.

Because natural gas is odorless, it is odorized so that it can be detected in case of a gas leak. From central control rooms, the LNG terminals are monitored and operated 24 hours a day, 365 days a year so that irregularities and accidents can be prevented or detected early on before they spread.

### Safety Measures During Supply

Osaka Gas delivers gas to its customers via pipelines<sup>②</sup>. This means that it is crucial to keep these pipes safe and properly maintained.

We are constantly replacing old metal pipes with pipes made of polyethylene<sup>③</sup>, which is durable and earthquake resistant.

If by any chance a gas pipe<sup>④</sup> should be damaged by an earthquake or other causes, devices installed in each block of the pipeline network (a small area within a district of the network) automatically shut off the gas to the damaged block.

### TOPICS

#### LUNASOLA Gas Supply Monitoring and Control System Commenced

In December 2009, Osaka Gas put into operation a new gas supply monitoring and control system called LUNASOLA, also known as the Supervisory Control and Data Acquisition (SCADA) system. LUNASOLA integrates previous multiple systems into one and allows for monitoring and control of every inch of pipeline right from the terminal, 24 hours a day, 365 days a year. Emergency response teams are immediately sent out—around the clock—if a gas leak is detected.

The name LUNASOLA is a combination of the Latin words for moon (luna) and sun (sola) and represents the system's stable supply of gas day and night.





## TOPICS Osaka Gas in Two LNG Development Projects in Australia

To ensure an economic and stable supply of LNG, Osaka Gas is taking part in two LNG development projects in Australia.

One is the Gorgon Project, which will supply gas mainly from the Gorgon and Jansz gas fields off the northwest coast of Australia. In September 2009, we signed a contract to purchase about 1.375 million tons per year for 25 years starting in 2014, the year production begins under the project, and a contract for a stake in the project. Osaka Gas's 1.25% share in the project will allow it to sell approximately

187,500 tons of LNG annually.

The other project is the Sunrise LNG development project, an international joint venture with Osaka Gas and three other companies off the north coast of Australia. In April 2010, the four participants agreed on development methods and are currently looking into how to implement the project.

These are just some of the ways Osaka Gas is strengthening its international energy businesses along the energy value chain.



Floating production facility in the Sunrise gas field  
Photo courtesy of Royal Dutch Shell

### Consumption Stage

#### Products and Services Ensure Safe Use by Customers

Osaka Gas strives to bring customers products and services that ensure they are using gas safely.

Osaka Gas would like to take out of use all old gas appliances with no safety mechanisms from the market. In particular, we are visiting customers using old appliances without incomplete combustion prevention devices, such as small tankless gas water heaters and wire-mesh gas stoves, and recommending they upgrade to safer gas appliance. We also offer to bear a part of the cost to ease the financial burden on the customer.

We also provide gas alarm systems that warn of gas leaks and carbon monoxide emissions caused by incomplete combustion, and we have a range of services that dispatch staff to a home when trouble

is detected.

With the aim of eradicating gas fires originating from gas stoves, starting in April 2008 we have equipped all products with a function that automatically turns off the flame when the user forgets to. We have been working to spread the use of this product, called the "Si Sensor-Equipped Cooking Stove".

In Osaka Gas's service territory, 86.9% of gas stoves had this safety feature in 1999, and in 2009 this figure was 94%. Almost all newly sold models have this feature, but some users have not yet upgraded from their old models.

Water heaters  
with  
incomplete  
combustion  
prevention  
devices

Usage rate:  
**99.6%**

Gas stoves  
with function  
for  
automatically  
turning off the  
flame

Usage rate:  
**94.0%**

### When Problems Occur

When there is a product accident or other problem with a gas appliance that Osaka Gas sold, installed, or repaired, we immediately inform the media and place notices in newspapers and on our Web site. And we inspect the product in question and if necessary repair it or replace parts.

In fiscal 2010, there were problems with the startup of the gas engine power generation unit of the ECOWILL, and with our "Kuru Piko" gas leak/fire detection and emergency response service. These were solved through inspections and parts replacement.

### Quality Control of Appliances

To ensure that our gas appliances are completely reliable, we are constantly improving their quality based on an ISO 9001- quality management system.

First, to prevent problems from occurring, we have strengthened our design safety standards, as well as our review of the design and development stages. We also look at gas appliances that customers are actually using by monitoring use and gathering and analyzing quality data. Any problems discovered are immediately fed back into the design and development process in order to improve the products.

**暖房器具（ガストーブ等）をご使用のお客さまへ**

**暖房中は、30分に1回、1分程度、必ず換気をお願いします。**

※ガスファンヒーターは、1時間に1回、1分程度、必ず換気をお願いします。

お部屋を閉め切ったまま暖房を続けていると、不完全燃焼による一酸化炭素中毒を起こし、死亡事故に至る恐れがあります。

ご使用中に、ひとつでも下記のような異常に気づかれましたら、ただちに  
ご使用を中止して、大阪ガスまでご連絡をお願いします。

<input type="checkbox"/> いやなニオイ	<input type="checkbox"/> ススの付着
<input type="checkbox"/> 炎のあふれ	<input type="checkbox"/> 燃焼部分の変形

Newspaper ad informing customers how to use gas appliances safely and recommending they replace older appliances



# I Creating value for customers

## Safety Activities

### Regular Safety Inspections Expanded

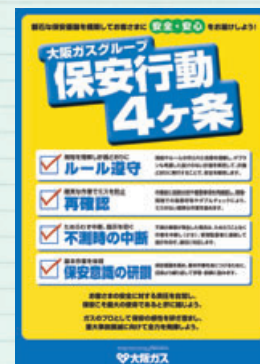
We are expanding our regular safety inspections<sup>1</sup>, in which we survey gas equipment as required by law; for example, checking that equipment is properly functioning and that there are no gas leaks, and conducting spot checks to ensure appliances are igniting properly and that concentration levels of carbon monoxide in exhaust fumes are low and within the range required by law. We also point out the major precautions to take so that customers can use these appliances safely.

For commercial users of gas appliances, we conduct inspections required by law, inform them of

## TOPICS Four Safety Provisions

At Osaka Gas, our ultimate mission is to ensure that customers can use gas safely and with peace of mind. To this end, in November 2009 we established the Four Safety Provisions to strengthen actions we had previously been taking.

The aim is to reduce accidents and problems by meticulous following four universal codes of conduct: adherence to rules, re-confirmation, work stoppage when encountering contingencies, and safety awareness training. We will follow these provisions to help make ourselves continuously aware of our responsibility to customer safety.



precautions to take, and conduct custom-made security checks based on customer requests.

<sup>1</sup> Osaka Gas Safety inspections for regular buildings are carried out at least once every 40 months and every 14 months in the case of designated underground shopping areas and other facilities.

## Incorporating Customer Comments in Products and Services

### Information Sharing System

#### Share Customer Comments throughout the Osaka Gas Group

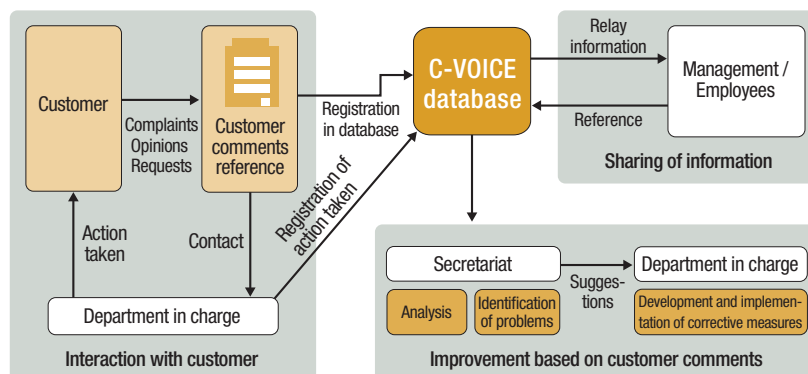
C-VOICE is a database for gathering customer opinions and requests and sharing them across the company to improve our work processes, products and services.

Whether it's a customer complaint or frustration, or praise for an individual employee, any comment from customers is relayed the same day to employees and the relevant departments, as well as to company management. This allows everyone to get the facts and learn how problems are dealt with, but also to share information on how we are improving our services in response to complaints and thus making dissatisfied customers happy again.

### Examples of Product and Service Improvements Based on Customer Comments

At Osaka Gas, we have been able to improve numerous products and services thanks to comments

#### Overview of C-VOICE



from our customers.

One example is the one-stop service (that covers everything from checking of gas leak location and cause of leak, to replacement of alarms) provided when we send an emergency response upon receiving a notice of a gas leak. Another example is a method for replacing gas meters without having to go into the customer's home.

In fiscal 2010, we upgraded the Web page where commercial users can check their gas bills. While the previous page allowed customers to check bills for the past three months, the new page allows them to check gas bills for the past 13 months.

We will continue to listen closely

to customers so that we can make them even more satisfied with our products and services.



Web page where commercial users can check their gas bills



# Creating New Value for Customers

## Keep Blue with Gas

### Keep the Earth Healthy, Enhance Customers' Lives

In April 2009, Osaka Gas adopted a new slogan, "Keep Blue with Gas." This represents our desire to ensure that the Earth continues to be blue and beautiful, and that our customers continue to enjoy a comfortable life.

Osaka Gas will contribute to environmental protection and more comfortable lifestyles by not only providing the clean energy of natural gas, but also by offering new ways to use it, such as through distributed energy systems such as the ENEFARM residential fuel cell, and through double generation systems that combine gas and solar power.



## Customers Can Sign Up for Web Site

### One-Stop for Online Registration and Range of Information

In 2009, we opened the "My Osaka Gas" web site to further customer satisfaction and convenience.

After customers sign up for the site, they can check their gas bills and service appointment dates online, as well as read a wide range of information provided by Osaka Gas.



"My Osaka Gas" Web site

## Service Shops

### Serving Customers through Kurashi (Living) Plus Service Shops

The Kurashi (living) Plus Osaka Gas service shops partner with us to act as the contact point between Osaka Gas and its end users. These shops carry out a wide range of services including sales and repair of gas appliances, renovation of kitchens and bathrooms, sales of home fire alarm systems, and even home cleaning.

In 2009, these shops began selling solar power generation systems and offering the Kuru Piko service for dispatching staff to the site when gas leaks or fires are detected.



## Making It Easier to Install Equipment

### Rakutoku Lease Brings Customers the Latest Gas Stoves and Ovens

In March 2010, Osaka Gas began the "Rakutoku Lease" service, which allows customers to lease the latest SI Sensor Equipped Cooking Stove (built-in type) for just 1,390 yen a month, or a gas oven (built-in type) for just 2,050 yen a month.

By offering customers the convenience of cooking with gas, while relieving them of the need to pay the regular start-up costs involved in a purchase, we've made cooking with gas a more economical choice.



## TOPICS

### Behavior Observation: Boosting Service Quality through Science

Osaka Gas developed a scientific method, called "service science," that analyzes and improves service by observing human behavior during interaction between Osaka Gas and customers.

In fiscal 2010, Osaka Gas took part in the Project to Improve Service through Behavior Observation, part of the Kansai Service Innovation Creation Conference, which is operated by the Kansai Bureau of Economy, Trade and Industry, and the Osaka Chamber of Commerce and Industry. This is a joint effort by industry, academia, and government to reform the service industry, and Osaka Gas's behavior observation method was used in the project's first

demonstration experiment. Observation was conducted at points of service in three fields of hospitality—restaurants, railroads, and hotels—with project staff analyzing how customers are being dealt with and induced to action. The result of the experiment led to improvement of the quality of service.



Scientifically analyzing service





# Contributing to harmonizing with the environment and to realizing a sustainable society

Addressing the issues of the environment both at regional and global levels is of paramount importance for the Osaka Gas Group, which is engaged in wide-ranging energy services. The Group, being seriously aware of the impacts of its business activities on the environment, seeks to harmonize its businesses with the environment and to realize efficient utilization of energy resources, thereby contributing to achieving a sustainable society.

## CSR Indicator—Target and Result

### Environmental Management Indicators: Environmental Management Efficiency

Target by FY2012

91<sup>yen</sup>/1,000 m<sup>3</sup>  
or less



FY2010 Result

77<sup>yen</sup>/1,000 m<sup>3</sup>

Efficiency  
improved

Environmental management efficiency improved as a result of reductions of CO<sub>2</sub> emissions and the disposal of excavated soil.

### ● Environmental Management Efficiency (yen/1,000 m<sup>3</sup>)

91 or less

77

2012  
Target

2010  
Result

(FY)

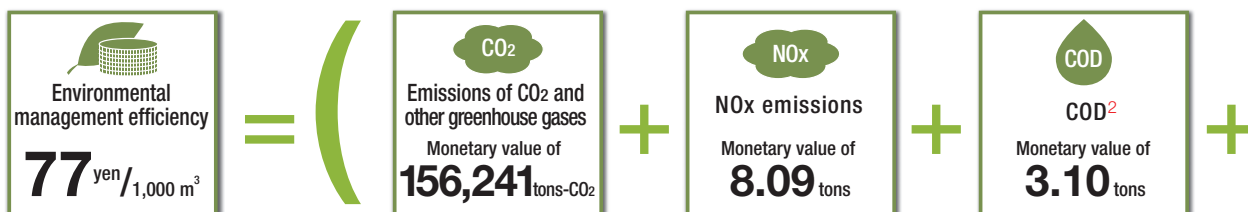
### Calculating Environmental Management Efficiency:

As shown in the equation below, environmental management efficiency is the total monetary value of all environmental impacts divided by the amount of gas sold. It is expressed in yen/1,000 m<sup>3</sup>. As well, the monetary

value of environmental impact will use data of LIME 2<sup>1</sup>, developed by Japan's National Institute of Advanced Industrial Science and Technology (AIST).

<sup>1</sup> Life Cycle Impact Assessment Method based on Endpoint Modelling: a damage-calculated impact assessment method [http://www.jemai.or.jp/lcaforum/db/01\\_06.cfm](http://www.jemai.or.jp/lcaforum/db/01_06.cfm)

### 📌 FY2010 breakdown of environmental management efficiency



### Definition of Indicator

Osaka Gas uses environmental management efficiency as an indicator to assess progress in environmental management in a continuous, integrated manner.

This indicator, environmental management efficiency, is the total monetary value (against the base year, fiscal 1999) of six environmental impacts: greenhouse gas emissions, NO<sub>x</sub> emissions, COD<sup>2</sup>, final disposal of general and industrial waste, final disposal of excavated soil<sup>3</sup>, and chemical substance emissions.

This allows us to quantitatively measure how much we are reducing environmental impact.

In fiscal 2010, we added chemical substance (xylene, toluene) emissions to the previous five impacts, bringing the total to six, and we added methane<sup>4</sup> to a category called greenhouse gas emissions, which previously includes only CO<sub>2</sub>.

The smaller the figure for environmental management impact, the greater the reduction of environmental impact per amount of gas sold.

### Overview of FY2010 Result

Environmental management impact in fiscal 2010 was 77 yen/1,000 m<sup>3</sup>, already well below our target for fiscal 2012 of 91 yen/1,000 m<sup>3</sup>. A major contributor to this improvement was a large reduction in the final disposal of excavated soil.

We were able to reduce the amount of excavated soil from gas pipeline construction by making maximum use of the Vermeer method<sup>5</sup> and the shallow pipe installation method<sup>6</sup>. And the



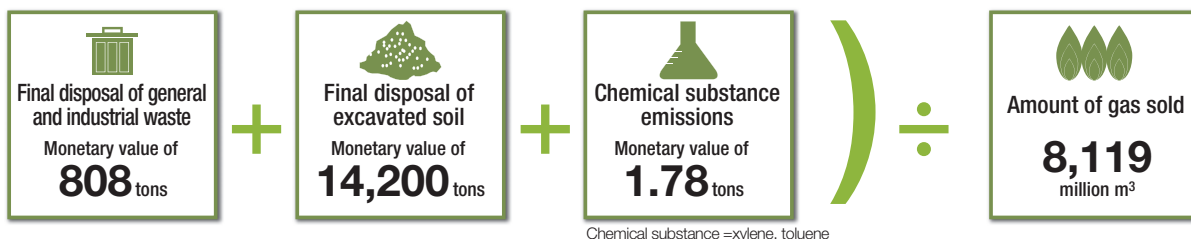


The environmental data indicated with the mark on the left has undergone third-party verification by Bureau Veritas Japan.

	FY2009		FY2010	
	Environmental impact (tons)	Monetary equivalent (million yen) <sup>3</sup>	Environmental impact (tons)	Monetary equivalent (million yen)
GHG (Greenhouse Gas) emissions	160,378	514	156,241	501
NOx emissions	5.90	0.45	8.09	0.62
COD <sup>2</sup>	3.39	0.00	3.10	0.00
Final disposal of general and industrial waste	795	24	808	24
Final disposal of excavated soil	32,700	235	14,200	102
Chemical substance (xylene, toluene) emissions	1.49	0.24	1.78	0.29
<b>Total</b>	—	774	—	629
<b>Amount of gas sold</b> (million m <sup>3</sup> )	8,380		8,119	
<b>Environmental management efficiency</b> (yen/1,000 m <sup>3</sup> )	92 <sup>3</sup>		77	

<sup>2</sup> COD: Chemical oxygen demand. An indicator of water quality. Increase in COD indicates an increase in the amount of pollutants in the water.

<sup>3</sup> In setting new targets from fiscal 2010, the unit of monetary equivalent of environmental impact for environmental management efficiency will use data of LIME 2. Therefore, results for fiscal 2009 have been recalculated using the new unit of monetary equivalent, and the values in the CSR Report 2009 differ from this year's report.



excavated soil generated was used in construction work or used for agricultural purposes. As a result, we reduced the final disposal of excavated soil by approximately 57% over the previous year.

We also managed to reduce greenhouse gas emissions by approximately 3% over the previous year; this was thanks to efforts such as making maximum use of cryogenic power generation<sup>②</sup> at LNG terminals and thus cutting the amount of electricity purchased.

We will continue to reduce the various environmental impacts.

## Osaka Gas Group Environmental Activities Policy

- I** Reducing Environmental Impacts of Our Business
- II** Reducing Environmental Impacts of Our Products and Services
- III** Contributing to Environmental Conservation Locally, Nationally and Internationally

The Osaka Gas Group carries out environmental protection activities based on the CSR Charter and the Environmental Activities Policy. We are working towards medium-term environmental targets in areas like greenhouse gas reductions from business activities and maximum implementation of the 3Rs (reduce, reuse, and recycle), and under our Field of Dreams 2020 Long-Term Management Vision and Medium-Term Management Plans we are working to reduce our customers' CO<sub>2</sub> emissions by 13 million tons by 2020. We aim to achieve this by spreading the use of natural gas and the use of highly efficient fuel cells, by offering customers energy-efficient solutions, and by using more renewable energy<sup>③</sup>.

We are also working to preserve biodiversity based on the Osaka Gas Group Biodiversity Policy. Furthermore, we will continue to develop and spread the use of new technologies that contribute to a better environment both locally and globally.



## II Contributing to harmonizing with the environment and to realizing a sustainable society

# Medium-Term Environmental Targets and FY2010 Results

### Action Proceeding Smoothly on Way to Achieving Targets

To reduce environmental impact across the entire Group, the Osaka Gas Group has set the Medium-Term Environmental Targets and is working to achieve these targets by the final year of the plan, fiscal 2012, through efforts focused on the gas business. Targets for Osaka Gas's power generation

business are set to be achieved by 2020, since more time is needed to adjust the make-up of our power source portfolio<sup>1</sup>.

In fiscal 2010, we made progress in all areas. CO<sub>2</sub> emissions per unit of gas sales stayed at about the same level: although we were able to cut back CO<sub>2</sub> emission per gas sold due to the boost of cryogenic power generation<sup>2</sup>, a recession resulted in decreased gas sales for

the year. We will continue to find ways to reduce CO<sub>2</sub> emissions.

In our power generation business, we were able to achieve our target thanks to the start of operations of the Senboku Natural Gas Power Plant. We will work to maintain our emissions levels.

<sup>1</sup> Power source portfolio: The ideal mix of power generation fuels throughout all of society.

### Reduction of Environmental Impact at Osaka Gas: Targets and Results

Item	Indicator	FY2012 Targets	Notes	FY2010 Results	Notes
Reduction of environmental impact [In the gas business]					
Improvement of Environmental Management Efficiency	Cash equivalent of total environmental impact · GHG emissions · NOx emission · COD · Final disposal of general/industrial waste · Final disposal of excavated soil · Chemical substance emissions /Amount of gas sold (yen/1,000 m <sup>3</sup> )	91or less	Total individual environmental impacts in cash value per 1,000 m <sup>3</sup> of gas sold is calculated.	77	Major improvement is due to decrease in cash equivalent of environmental impact, a result of recycling of excavated soil and reducing CO <sub>2</sub> emissions
Reduce CO <sub>2</sub> emission	CO <sub>2</sub> emission per 1 m <sup>3</sup> gas sold <sup>1</sup> (g-CO <sub>2</sub> /m <sup>3</sup> )	17.9		18.9	
Waste reduction and recycling promotion	LNG terminals	Percentage of final disposal (general and industrial waste)		0.3%	
	Offices and laboratories	Percentage of final disposal (general waste)		6%	
		Percentage of final disposal (industrial waste)		2%	
Reduce final disposal of excavated soil	Percentage of final disposal (improved percentage of recycling and efficient utilization)	4%		2%	
Efficient utilization of water	Water usage (general and industrial water) (10,000 m <sup>3</sup> )	160		157	

### Reduction of Environmental Impact in the Osaka Gas Group: Targets and Results

Item	Indicator	FY2012 Targets	Notes	FY2010 Results	Notes
Reduce CO <sub>2</sub> emission	Electricity business	Strive to reduce CO <sub>2</sub> emission intensity at transmission point by about 15% of FY2009 level in FY2021.	Covers grid-connected power source owned by Osaka Gas and affiliated companies in Japan.	-24.6%	Achieved our target thanks to the start of operations of the Senboku Natural Gas Power Plant, and will work to maintain our emissions levels
	District cooling/heating business	Energy efficiency <sup>2</sup> (reduce energy intensity from base year, FY2009)	Reduced by about 1%	2.6%	Energy intensity worsened due to decrease in demand for heat
	Other businesses	CO <sub>2</sub> emission factor <sup>3</sup> (CO <sub>2</sub> emission/sales) (tons-CO <sub>2</sub> /million yen)	0.75	0.59	
Waste recycling promotion	Percentage of final disposal (general waste, industrial waste)	10%	Covers core affiliates <sup>4</sup>	23%	

Note: Targets for FY2013: <sup>1</sup> 17.8g-CO<sub>2</sub>/m<sup>3</sup> <sup>2</sup> Reduced by about 4% <sup>3</sup> 0.75tons-CO<sub>2</sub>/million yen <sup>4</sup> Liquid Gas, Urbanex, OGIS Research Institute and Osaka Gas Chemicals.



# Environmental Management

## Environmental Management System

### Osaka Gas Continues Certification for Company-Wide Integrated ISO 14001

In fiscal 1998, business units of Osaka Gas started efforts to acquire certification for ISO14001, an international environmental management systems (EMS). As a result, the entire company was covered by seven EMSs by fiscal 2006. From fiscal 2007, we started integration of all the EMSs across the company to enhance company-wide environmental management. Osaka Gas was accredited integrated certification in December 2007.

In fiscal 2010, based on the integrated company-wide system, we boosted legal compliance, revised beneficial environmental action criteria, and worked towards a “paper-less office” through use of IT. We also conduct ISO renewal audits once every three years, and on the most recent audit, the auditors praised the effectiveness of the aforementioned efforts.



ISO 14001 certification



OGEMS® review

### Osaka Gas ISO 14001 certification dates

Business unit	Date
LNG Terminal & Power Generation Business Unit	October 1997
Engineering Department (Construction sector)	March 2001
Head Office Building	September 2001
Energy Technology Laboratories	July 2002
Pipeline Business Unit	May 2005
Commercial & Industrial Energy Business Unit	February 2006
Residential Energy Business Unit	March 2006
Integrated certification accredited	December 2007

### EMS standards Osaka Gas Group certified for

(As of June 30, 2010)

Standard	Feature	Total
ISO 14001	An international EMS standard set by the ISO (International Organization for Standardization). The aim of the standard is to continuously improve the level of environmental management through the PDCA cycle of Plan, Do, Check, and Act.	18
Eco Action 21	A standard for EMSs based on the Eco Action 21 Guidelines of Japan's Ministry of the Environment. By integrating an EMS, environmental performance evaluation, and environmental reporting, Eco Action 21 makes it possible for even SMEs to voluntarily carry out aggressive environmental efforts and to make and publicly release environmental activity reports on the results of these efforts.	3
Kyoto Environmental Management System Standard	Standard aimed mainly at SMEs, established by the Kyoto Local Agenda 21 Forum, which is made up of municipal government, businesses, and citizens. The content is expressed in simple language and achieving the standards is a straightforward, two-step process.	4
Osaka Gas Environmental Management System (OGEMS®)	Based on Eco Action 21, this standard was established by Osaka Gas in 2005 for its affiliates. The secretariat is represented by Osaka Gas's CSR and Environment Department, and it carries out all procedures from consultation on system introduction to certification.	64
Cumulative total		89 (85 companies)

## 85 Affiliates in Japan Complete EMS Building and Certification

As of the end of June 2010, all 85 affiliates in Japan had received certification for 89 EMS.

The EMSs introduced by Osaka Gas are based on the standards of ISO 14001 and the Eco Action 21 Guidelines of Japan's Ministry of the Environment, as well as on the Osaka Gas EMS (OGEMS®), a voluntary EMS that functions similar to Eco Action 21. We also have group-wide rules related to the introduction and implementation of EMSs.

## Support for EMS Introduction General Training and E-Learning

In fiscal 2007, the Osaka Gas Group started e-learning to give all employees the necessary knowledge on basics of environmental issues, and on Group environmental measures, targets, and activities. There is also group training, divided by job description and company division, for raising employees' environmental awareness.

In fiscal 2010, about 7,500 employees took e-learning and about 5,400 participated in the group training.



## II Contributing to harmonizing with the environment and to realizing a sustainable society

# Environmental Impact from Business Activities (Fiscal 2010)

### Overseas [LNG imported by Osaka Gas]

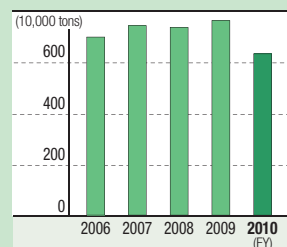
Efforts for environmental impact reduction at the extraction sites of natural gas fields and liquefaction facilities

- Natural gas, which has a low environmental impact, is the fuel used to generate electricity needed at the extraction sites of natural gas fields.
- Using waste heat recovery to raise power generating efficiency and thus reduce environmental impact per unit of power

#### In shipping

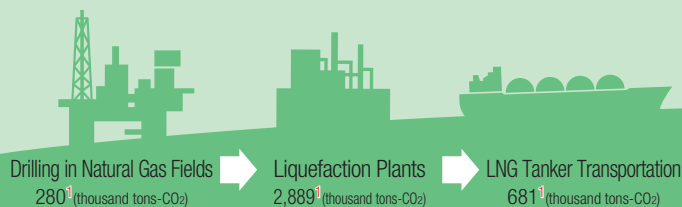
- Low-environmental-impact natural gas is used as the fuel for shipping.

#### LNG imports 6.34 million tons



Calorific value of LNG: 54.5 GJ/ton

(Value specified by ministerial ordinance under the Law concerning the Promotion of the Measures to Cope with Global Warming)



<sup>1</sup> These values are estimated using the table below as reference.

### LCA comparison of GHG emissions among fossil fuels

The table below compares total greenhouse gas emissions (specifically CO<sub>2</sub> and methane, expressed in CO<sub>2</sub> equivalent), from drilling to combustion, for various fossil fuels according to the LCA method<sup>2</sup>. LNG is clean energy that emits less GHG than any other fossil fuel.

#### Comparison of greenhouse gas emissions (g-CO<sub>2</sub>/MJ, HHV)

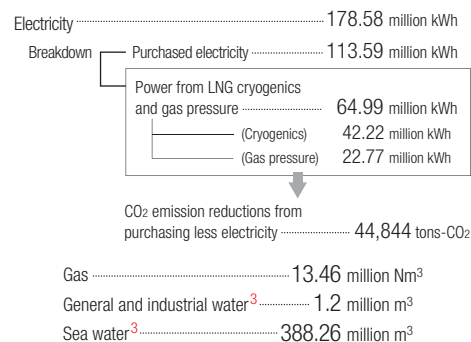
	Coal	Oil	LPG	LNG
Production	4.58	4.06	4.94	9.17
Transportation	1.71	0.79	1.80	1.97
Infrastructure	0.11	0.08	0.11	0.04
Combustion	88.53	68.33	59.85	49.40
Total	94.93	73.26	66.70	60.58
Ratio	157	121	110	100

<sup>2</sup> LCA (Life Cycle Assessment): A comprehensive quantification method of survey, analysis, and evaluation of the amount of environmental impacts of products and services. The assessment covers all the related processes from resource extraction to waste disposal including production, transportation, consumption, and recycling for the products and services.

Sources: Future Forecast for Life Cycle Greenhouse Gas Emissions of LNG and City Gas 13A (Energy and Resources, Vol. 28, No. 2, March, 2007)

### Japan [Osaka Gas]

#### Energy consumption at LNG terminals



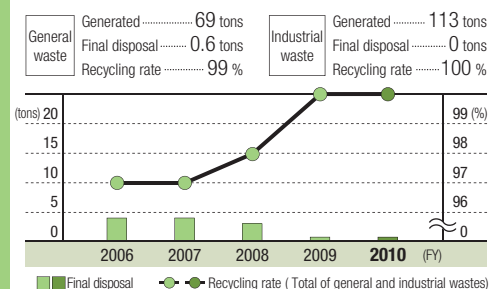
#### INPUT



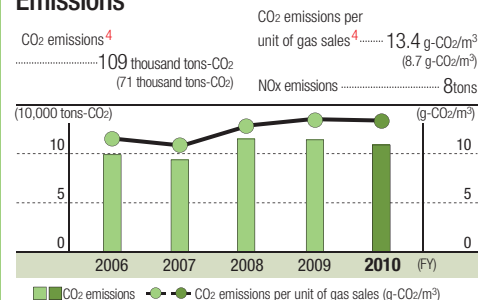
#### LNG Terminals

#### OUTPUT

#### Waste



#### Emissions



#### Chemical substance

Xylene handled/released ..... 1.75 tons  
 Toluene handled/released ..... 0.03 tons

#### COD

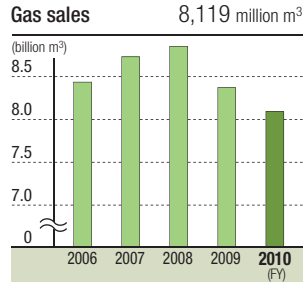
COD ..... 3.10 tons



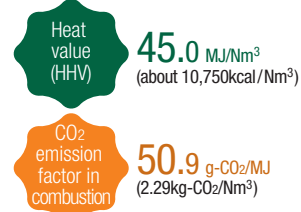
## Energy consumption at business locations

Purchased electricity	35.72 million kWh
Natural gas	7.19 million m <sup>3</sup>
Vehicle fuel	
Gasoline	1,027 kℓ
Natural gas	420 thousand m <sup>3</sup>
Diesel	14 kℓ
General water <sup>3</sup>	370 thousand m <sup>3</sup>

## Gas sales



## Quality of the gas supplied by Osaka Gas



Note: Figures applied since March 2003

Business offices

Gas Pipes

Customers (Gas consumers)

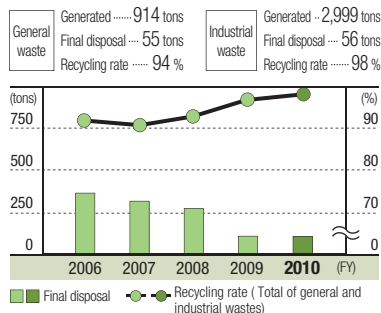
Natural gas

OUTPUT

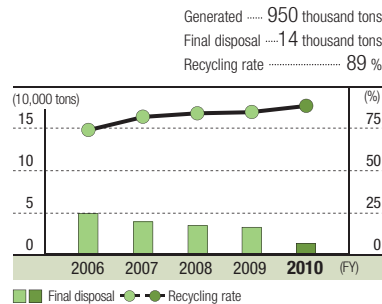
OUTPUT

OUTPUT

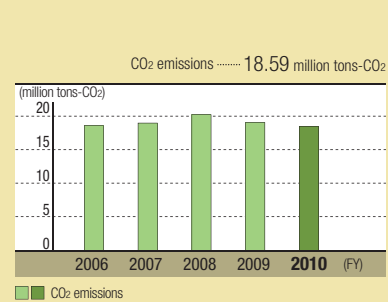
## Waste



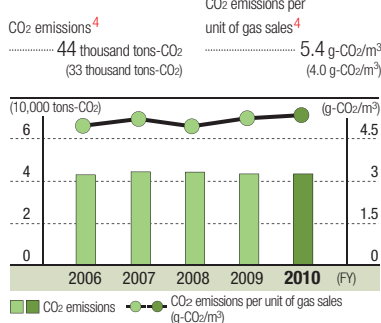
## Excavated Soil



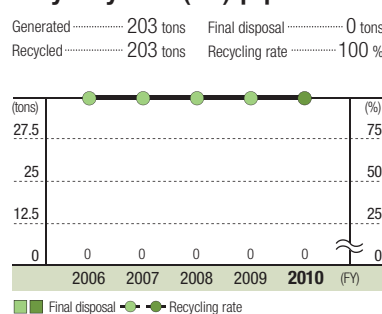
## CO<sub>2</sub> emissions at customers sites



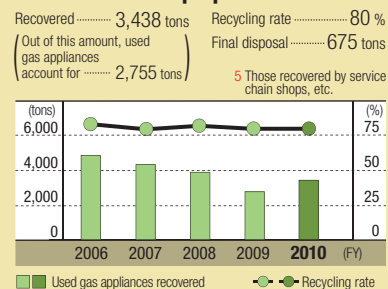
## CO<sub>2</sub> emissions



## Polyethylene (PE) pipes



## Used gas appliances and residential equipment<sup>5</sup>



<sup>3</sup> Because general and industrial water is used for businesses, the amount of input and wastewater is the same. For sea water, after it is used to gasify LNG, the same amount becomes wastewater.

<sup>4</sup> At Osaka Gas, CO<sub>2</sub> emission subject to control is calculated using the average factor of thermal power plants (0.69 kg-CO<sub>2</sub>/kWh) so that we can precisely assess how reduction of purchased electricity has contributed to a reduction in CO<sub>2</sub> emission. The figures in ( ) show CO<sub>2</sub> emission calculated using the average emission factor of all power sources in FY2009 announced by Kansai Electric Power Co., Inc. (0.355 kg-CO<sub>2</sub>/kWh) for the purpose of comparison.





## Contributing to harmonizing with the environment and to realizing a sustainable society

### Reducing Greenhouse Gas Emissions

#### GHG Emissions of Osaka Gas Group

##### CO<sub>2</sub> Emissions from the Gas Business of Osaka Gas

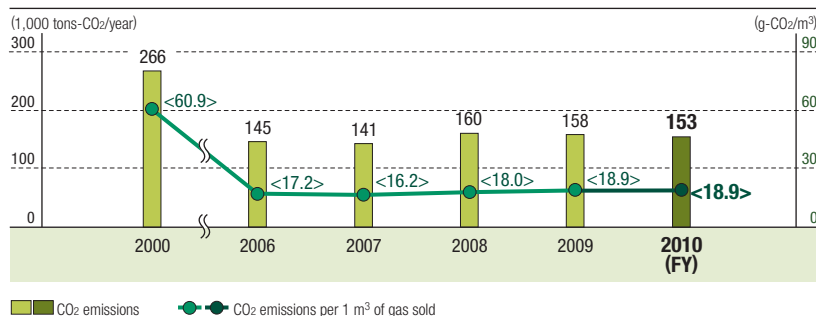
In fiscal 2010, CO<sub>2</sub> emissions from energy consumption<sup>①</sup> in Osaka Gas's gas business were 153,000 tons, a decrease of about 5,000 tons (3%) compared to the previous year. Compared to 1990, the base year of the Kyoto Protocol, this figure is down 42% in terms of CO<sub>2</sub> emissions, and down 69% on a per-unit basis. Reasons for this decrease include an increased production ratio of cryogenic power operation<sup>②</sup> (which meant that purchased electricity decreased), and aggressive efforts to conserve energy in office buildings.

We will work towards further emission reductions by aggressively using electricity produced by unused energy<sup>③</sup> such as LNG cryogenics and gas pressure of gasification, as well as by reducing energy use in offices.

##### Methane Emissions

In the gas business of Osaka Gas, methane gas (CH<sub>4</sub>)<sup>④</sup> is emitted during measurement of gas quality and gas fitting work. We therefore strive to reduce emissions by switching to measurement instruments that emit

#### CO<sub>2</sub> emissions from the gas business of Osaka Gas



At Osaka Gas, CO<sub>2</sub> emission subject to control is calculated using the average factor of thermal power plants (0.69 kg-CO<sub>2</sub>/kWh) so that we can precisely assess how reduction of purchased electricity has contributed to a reduction in CO<sub>2</sub> emission.

less CH<sub>4</sub> and performing gas fitting work in a more environmentally friendly manner.

Methane gas emissions were 148 tons in fiscal 2010.

##### District Cooling/Heating

District cooling/heating is a system in which air conditioners/heaters and hot water heaters are jointly owned and used in a specific area. In 1970, the Osaka Gas Group became the first in Japan to implement district cooling/heating, in the Senri-chuo district of Toyonaka City, Osaka Prefecture. Since then, we have offered such systems in the most optimal form for a number of urban development projects in Japan. We continue to ensure a stable supply of heat,

advanced use of energy, efficient energy management, and cost savings.

##### Green Gas Buildings

The Osaka Gas Group is carrying out the Green Gas Building Project to save energy in its company office buildings.

An example of the project is the Yodogawa Gas Building in Osaka City, a small-scale building completed in March 2009 that boasts superb energy efficiency and low utility costs.



Yodogawa Gas Building

### Reducing Customers' CO<sub>2</sub> Emissions

#### Developing Energy-Efficient Products

##### Commercial Customers' CO<sub>2</sub> Emissions curbed by 2.46 million tons

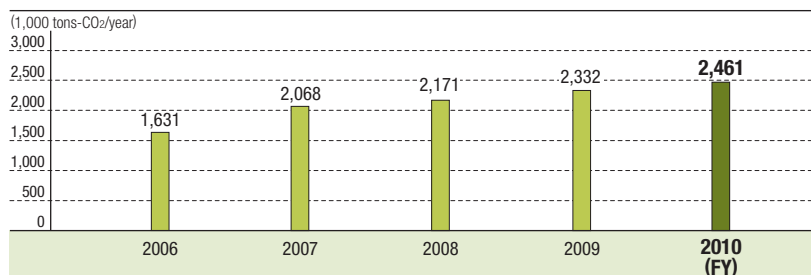
The Osaka Gas Group strives to help commercial and residential customers reduce their CO<sub>2</sub> emissions and energy use by providing them with a variety of energy-efficient products and services and by developing and spreading the use of renewable energy<sup>⑤</sup> solutions.

By providing commercial

customers with energy-efficient equipment such as cogeneration systems<sup>⑥</sup>, gas air conditioners, and high-performance industrial furnaces, we have helped them curb CO<sub>2</sub> emissions by approximately

2.46 million tons between fiscal 1999 and fiscal 2010 (increased by 6% from previous year). (See page 11 for efforts on realizing a low-carbon society.)

#### Customer CO<sub>2</sub> reductions (against FY1999) (excluding residential use)





## Commercial and Industrial Cogeneration Systems

### Spreading the Use of Commercial and Industrial Cogeneration Systems

The Osaka Gas Group strives to spread the use of commercial- and industrial-use cogeneration systems, which can contribute to dramatic energy savings and CO<sub>2</sub> emission reductions. These highly economic and environmentally friendly systems use natural gas, which has a relatively low environmental impact, to supply customers with electricity where they need it. These systems also make effective use of exhaust heat by using it to heat water.

Since releasing the first commercial-use micro-cogeneration system<sup>1</sup> in 1998, we have expanded our commercial- and industrial-use product lineup and today have systems in public welfare facilities, hospitals, restaurants, spas, shops, factories, and hotels.

As of the end of March 2010, there were 3,964 cogeneration systems in the Osaka Gas service area.

<sup>1</sup> Micro-cogeneration: Gas cogeneration system of up to 100 kW.

## Residential Cogeneration Systems

### ECOWILL Reduces CO<sub>2</sub> Approx. 32%, ENEFARM also Available

The ECOWILL residential gas cogeneration system uses natural gas to generate power and utilizes the exhaust heat for water and space heating. ECOWILL is designed to automatically achieve the most energy-efficient modes of operation to meet the daily needs of individual households for power and hot water. It can reduce primary energy consumption by about 21% and CO<sub>2</sub> emissions by about 32%<sup>2</sup> (per kWh) compared to a system<sup>3</sup> combining thermal power and conventional hot water and space heaters. As of the end of March 2010, Osaka Gas had sold a total of approximately 64,000 ECOWILL, of which 2,100 employed gas and photovoltaic power in "double power" generation.

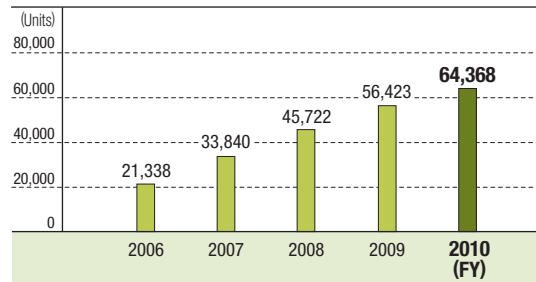
In June 2009, we introduced

### Commercial and industrial cogeneration systems: cumulative total of installed capacity and No. of units



Micro-cogeneration system  
Photo courtesy of Yanmar Energy Systems Co., Ltd.

### Number (cumulative) of ECOWILL in the Osaka Gas service area



エコウィル  
ECOWILL

the ENEFARM residential fuel cell cogeneration system. (See page 13.)

Purchasers of ECOWILL and ENEFARM in Japan are eligible for a government subsidy.

<sup>2</sup> For calculation conditions of primary energy consumption and CO<sub>2</sub> emission reductions, see the insert that came with this report.

<sup>3</sup> Gas hot water and space heating system: Gas hot water and space heater, gas hot water floor heater, gas hot water bathroom heater and dryer with mist sauna function, gas stove

conventional water heaters. This cuts unnecessary heat emissions, saves energy, and reduces CO<sub>2</sub> emissions, all of which help mitigate global warming. And because it is installed outside, it frees up more space inside the home.

The water heating efficiency of Eco-Jozu® is 95%, compared to 80% for conventional water and space heaters, and space heating efficiency is 89%, compared to 80% for conventional systems. These dramatic energy savings lead to an approximate 13% reduction in CO<sub>2</sub> emissions over conventional systems<sup>3</sup>.

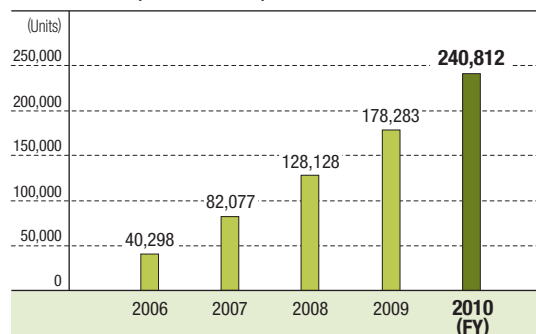
Like the ECOWILL and ENEFARM, purchasers of the Eco-Jozu® are eligible for a government subsidy.

## High-Efficiency Residential Hot Water Heaters

### Eco-Jozu® Gives High-Efficiency Water and Space Heating

The Eco-Jozu® residential high-efficiency water heater takes the heat previously wasted in

### Number (cumulative) of Eco-Jozu® in the Osaka Gas service area



省エネ給湯器  
Eco-Jozu



## II Contributing to harmonizing with the environment and to realizing a sustainable society

### Reducing Resource Consumption and Promoting Recycled Materials Use

#### Osaka Gas Efforts

##### Medium-Term Targets for Waste Reduction Achieved Ahead of Schedule

In fiscal 2010, the rate of final disposal of waste<sup>1</sup> at LNG terminals was 0.3% (amount generated: 181.35 tons, final disposal: 0.58 tons); we thus achieved our medium-term target (see page 29) of zero emissions (final disposal of less than 0.5%) ahead of schedule.

Osaka Gas waste other than that at LNG terminals was 2,999 tons generated and 56 tons of final disposal, about the same as the previous fiscal year and a 2% rate of final disposal. The amount of general waste generated (914 tons) represented a 35% increase due to reorganization at Osaka Gas offices, but the final disposal amount (55 tons) was about the same as last year thanks to waste separation and recycling efforts. The result was a 6% rate of final disposal of waste, down from 9% and helping us achieve our medium-term targets for general and industrial waste ahead of schedule.

<sup>1</sup> Final disposal of waste: Waste disposed of at authorized landfill sites.

#### Recycling Excavated Soil

##### Reused 89% of Excavated Soil from Gas Pipeline Construction

The Osaka Gas Group works to reduce the amount of excavated soil<sup>①</sup> and waste asphalt generated as a result of gas pipe<sup>②</sup> installation. Ways to achieve this include the Vermeer method<sup>③</sup>, which requires soil excavation of only two points, and the shallow pipe installation method<sup>④</sup>. In fiscal 2010, these methods allowed us to reduce the amount of excavated soil generated by 680,000 tons compared to what would have been generated using conventional methods.

We use our Simplified Sieving Method<sup>⑤</sup> to determine if excavated soil can be put back into the ground. Our Soil and Asphalt Recycling System facilitates the reuse of waste asphalt and excavated soil as either regenerated roadbed material or

#### Recycling of generate waste and industrial waste



improved soil. These efforts allowed us to reuse 89% of material excavated during gas pipeline construction in fiscal 2010 and send to final disposal just 14,000 tons, down by 19,000 tons from fiscal 2009.

2010 was 84% (minimum legal requirement: 70%) for residential gas air conditioners (272 tons collected) and 81% (minimum legal requirement: 65%) for clothes dryers (15 tons collected).

#### Recycling of Used Gas Pipes

##### Recycling 100% of Used PE Pipe Waste

The polyethylene (PE) pipes<sup>①</sup> waste material generated at work sites is mainly used as covers to protect gas pipes and as post markers to indicate the location of supply pipes. In fiscal 2010, 203 tons of PE pipe waste was generated and all was reused.

Metal pipes, such as steel and cast-iron pipes, are sold to electric furnace manufacturers and recycling companies, who use them as raw materials for products.

#### Reusing Gas Meters

##### Repairing Gas Meters More Often to Get 60 Years of Use

After 10 years in use, gas meters are repaired (taken apart, inspected, and fixed) to make them perform as well as new ones. They are then installed at customer sites.

In the past, this type of repair was conducted a third time to give the gas meters a total lifespan of 40 years. After conducting evaluations including durability tests jointly with the gas meter manufacturers, it was determined that these gas meters can be used another 20 years if repaired a fourth time.

This has resulted in an 80% reduction in CO<sub>2</sub> emissions compared to manufacturing new gas meters. It will also reduce the waste from used meters over the next 20 years by 80,000 tons.

#### Product Recovery and Recycling

##### 90% of Used Gas Appliances Recycled

In fiscal 2010, 2,755 tons of used gas appliances were collected and 90% of this was used as recycled metal. Some of the used gas appliances were residential gas air conditioners and clothes dryers, which were collected and recycled under the Home Appliances Recycling Law, which was enacted in April 2001.

The recycling rate in fiscal



Gas meters are reused after being taken apart, inspected, and fixed



# Environmental Risk and Chemical Substance Management

## Chemical Substance Management

### Legal Compliance and Proper Management

There are very few hazardous chemicals handled by Osaka Gas during the processing and supply of natural gas. Regarding the paint components (organic solvents) covered by the PRTR (Pollutant Release and Transfer Register) Law, we have tried as much as possible to switch to water solvent paints.

The Osaka Gas Group will continue to manage and reduce the amount of chemicals it uses under the policies shown below.

1. Comply with laws and environmental regulations

concerning the use of chemical substances.

2. Use ISO14001-compliant and other environmental management activities to step up management and decrease emissions of chemical substances.
3. Disclose information on chemical substance management in the CSR Report and on our Web site.

## Soil and Groundwater Conservation

### Inspecting Soil and Groundwater on Former Coal Gas Production Sites

Osaka Gas conducts continuing voluntary inspections of former coal

gas production sites to determine the risk of soil pollution.

Up to 2004, we conducted surveys to determine environmental risk. When substances (cyanide, benzene, etc.) were discovered that exceeded the standards of the Soil Contamination Countermeasures Law, we followed the guidance of the local government in disposing of contaminated soil and cleaning up the site as necessary.

To modify the soil, we conducted surveys based on relevant laws, and took appropriate measures including disposing of the contaminated soil and carrying out on-site encapsulation of the contaminated soil. We will continue to take necessary measures based on the Soil Contamination Countermeasures Law.

No legal violations occurred in fiscal 2010.

# Green Purchasing and Green Distribution

## Green Purchasing

### Furthering Green Purchasing through Cooperation with Business Partners

Based on its Green Purchasing Guidelines (formulated in 2000, revised in 2005), Osaka Gas strives to work with its business partners in purchasing products and installation contracts that have minimal impact on the environment.

In fiscal 2010, we began purchasing carpets and other items for our offices that are designated as carbon offset products; which

means they balance out CO<sub>2</sub> emissions. We are also starting to purchase other environmentally friendly products, such as Forest Stewardship Council (FSC) certified paper.

In fiscal 2006, we launched the Green Partner Initiative to evaluate the environmental efforts (such as development/certification of an EMS and development of environmentally friendly products) of suppliers of our piping material. Companies that meet our evaluation standards are registered as Green Partners. As of fiscal 2010, all 18 relevant suppliers are registered.

## Green Distribution

### Low-Pollution Vehicles Reduce Air Pollutant Emissions

Osaka Gas established its Green Distribution Policy in 2001. Through the use of natural gas vehicles, hybrid cars, and other low-pollution vehicles in business activities, we are reducing the amount of air pollutants we emit.

We are also asking our business partners and affiliates to use low-pollution vehicles when delivering or making sales calls to Osaka Gas bases.

# Communicating Our Environmental Efforts

## Communicating Environmental Efforts to the Public

### 2010 Environmental Symposium

As part of its Environmental Month, Osaka Gas holds the Environmental Symposium at the beginning of June each year for educational purposes.

On June 1, 2010, the auditorium

of the Osaka Gas head office (in Chuo-ku, Osaka) was the site of the 2010 Environmental Symposium, where approximately 200 participants, including from outside the company, gathered under the theme "Social Business in the Field of Environment."

We implemented the carbon offset for consumed electricity (about

16,000kWh) of the building through the Green Power Certificate (wind power electricity).



Keynote speech





## Contributing to harmonizing with the environment and to realizing a sustainable society

### Developing Environmental Technologies

#### Curbing Global Warming through Effective Use of Unused Energy

##### Coal Mine Methane Gas Concentration Technology

To ensure the safety of people working in mines, the coal mine methane gas (CMM) from the coal layer must be moved out of the mine. Until now, low-concentration CMM with less than 30% methane has normally been pumped into the atmosphere without being used for anything. Methane gas has a global warming potential 21 times that of CO<sub>2</sub>; on the other hand, if used as a fuel, it emits less CO<sub>2</sub> than other fossil fuels.

Osaka Gas thus came up with the idea of developing a technology, called low-concentration CMM concentration technology, for using this low-concentration CMM as fuel for gas engines and boilers. In April 2009, we successfully concentrated this gas in a pilot plant. We are currently working to get this technology on the market.

Using the standard model (CMM flow of 2,000 m<sup>3</sup>/h), it is possible to reduce the equivalent of approximately 40,000 tons-CO<sub>2</sub> a year (CO<sub>2</sub> conversion). If we can successfully get this technology to market, effective utilization can be made of unused energy.

**Note:** The research in the pilot plant was carried out as a cooperative research project with the New Energy and Technology Development Organization (NEDO).

#### Making Liquefied Fuel out of Associated Petroleum Gas, Formerly Combustion Waste from the World's Offshore Oil Fields

Associated petroleum gas has conventionally been let off as combustion waste at oil fields around the world because it is too difficult to collect and use.

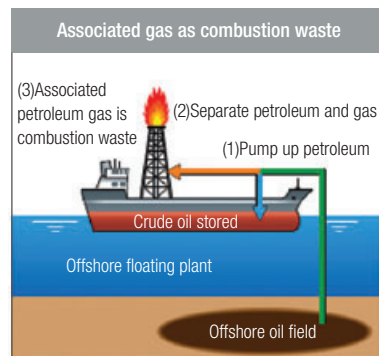
Osaka Gas therefore decided to develop a technology to make effective use of this associated petroleum gas. In this technology, a ship is equipped with a compact device that carries out the AATG

(Advanced Auto Thermal Gasification) process, under which synthetic gas (whose main components are hydrogen and carbon monoxide) is made from associated petroleum gas, after which liquefied fuel is produced through the Gas to Liquids (GTL) process. This allows for the effective use of resources and the reduction of CO<sub>2</sub> emissions.

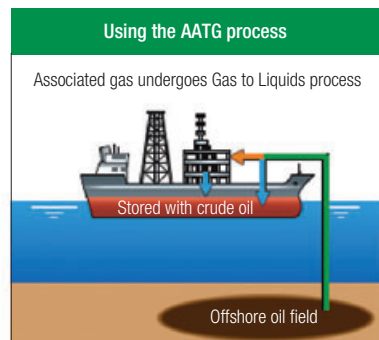
Osaka Gas and JGC Corporation have jointly developed the AATG process, and are currently testing a pilot device with a capacity of 2,000 Nm<sup>3</sup>/h. Since the eventual commercial product will be between 10 and 100 times as large, scale-up technology is being developed.

**Note:** This research is sponsored by the Japan Oil, Gas and Metals National Corporation (JOGMEC).

#### Technology for making effective use of associated petroleum gas



Annual CO<sub>2</sub> emissions **600,000 tons-CO<sub>2</sub>**  
(Per each offshore floating plant)



Annual CO<sub>2</sub> emissions **300,000 tons-CO<sub>2</sub>**  
**(reduction of 300,000 tons-CO<sub>2</sub>)**

GTL production (added to crude oil production)  
**+3,000 barrels/day**

**Note:** When the oil field produces between 10,000 and 100,000 barrels/day.



AATG field test

#### Developed for Hydrogen Suppliers

##### Osaka Gas Selling Its HYSERVE Compact Hydrogen Generator

Hydrogen offers high power generating efficiency and overall efficiency when used as a fuel for fuel cells, which provide power through an electrochemical reaction. Since all that is left after the chemical reaction is water, it is said to be the ultimate clean energy source.

Osaka Gas, Liquid Gas Co., Ltd., and Osaka Gas Engineering Co., Ltd. jointly developed the HYSERVE, a compact hydrogen generator that makes hydrogen from natural gas. Two models of HYSERVE are currently being sold. We also have an on-site hydrogen generating system in which we install a HYSERVE at the plants of semiconductor and sell them only the hydrogen that is produced.



HYSERVE compact hydrogen generator



## Producing Low-Cost, Next-Generation Solar Cells

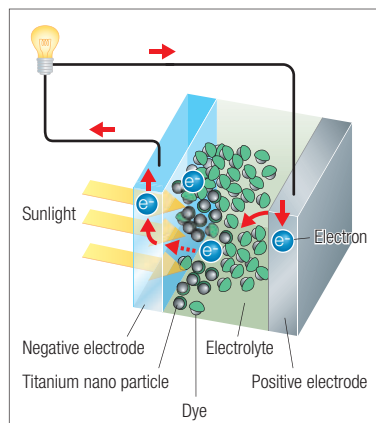
### Osaka Gas Develops Dye-Sensitized Solar Cell, Which Works Like Photosynthesis

Osaka Gas is working on development of a dye-sensitized solar cell, a technology garnering significant attention as a low-cost successor to silicon solar cells. In this type of solar cell, the incoming light generates electrons, which pass through the electrolyte to generate electricity. This type of solar cell generates electricity using a mechanism similar to photosynthesis in plants.

Conventional silicon solar cells use high-cost silicon as the substrate material and require expensive semiconductor equipment for production. But dye-sensitized solar cells use inexpensive and plentiful titanium as the electrode material. Because conventional ceramics technology can be employed in production, costs are significantly lower.

Osaka Gas uses a proprietary nano-material technology to develop cells with the primary focus on making high-performance titanium electrodes.

#### How Dye-Sensitized Solar Cells Work



## Development of High-Efficiency Methane Fermentation System

### Solving the Problems of Waste and Resource Exhaustion

Osaka Gas is helping solve the problems of waste and resource depletion by developing a high-efficiency methane fermentation system driven by biotechnology.

With this technology, garbage and other types of biomass are broken down at a high temperature of 80°C, resulting in the generation of 20% more methane gas. As well, this technology reduces the amount of sediment and wastewater generated during methane fermentation, which was previously difficult. This revolutionary technology thus makes it possible to manufacture biogas, a renewable energy source, from unused biomass, through a process with minimal environmental impact.

In fiscal 2010, Osaka Gas took part in the Ministry of the Environment's Kyoto Bio-Recycle Project, in which we worked to prove the effectiveness of ultra-high temperature solubilization of leftover school lunches and household garbage under guidance from local governments and universities. We plan to put this success to practical use in methane fermentation of household garbage, that the government is currently studying.

## Wind Power Business

### Pursuing Wind Power Business in Japan and Other Countries

In Japan, Osaka Gas runs the Hayama Wind Farm in Kochi Prefecture (20,000 kW) and the Hirogawa Myojinyama Wind Farm in Wakayama Prefecture (16,000 kW). These wind farms combine to contribute to about 60,000 tons-CO<sub>2</sub> emission reductions a year.

In Australia, a country that is aggressively adopting renewable energy, we are investing in the Hallet 4 wind farm. The project will have 63 wind turbines (with a combined capacity of 132,000 kW) in South Australia and is scheduled to go into operation in June 2011.



The Hirogawa Myojinyama Wind Farm in Wakayama Prefecture

## TOPICS

### Developing Polylactate Garbage Bags

#### Turns into Biogas Along with Garbage

The household garbage bags in general use today cannot be broken down into biogas, so they have to be separated and removed before the garbage enters the plant. Osaka Gas looked at a number of materials to solve this problem, and we discovered that polylactate, a resin made from plants, can be broken down into biogas quickly using a high-efficiency methane fermentation system by our proprietary ultra-high temperature solubilization technology. We are currently in the process of developing a polylactate

garbage bag.

If we succeed in this development, it will be possible to ferment all garbage and garbage bags together and convert them to biogas in a short time period, thus achieving an approximate 10% increase in the amount of energy recovered.





## II Contributing to harmonizing with the environment and to realizing a sustainable society

### Conserving Biodiversity

#### Osaka Gas's Biodiversity Policy

##### Biodiversity Policy Formulated in April 2010

The Osaka Gas Group has been striving to protect and promote biodiversity: it has raised rare native plants in the green areas of its LNG terminals, built multi-level gardens at the NEXT 21 experimental residential complex (see page 44), and planted trees in Japan and around the world. After Japan's Ministry of the Environment released the Guidelines for Private Sector Engagement in Biodiversity in 2009, Osaka Gas came out with the Osaka Gas Group Biodiversity Policy in April 2010. On May 22, World Biodiversity Day<sup>1</sup>, we held events to teach children about biodiversity.

Future plans include creating green belts at our LNG terminals for the purpose of recreating regional native mountain and plain vegetation and wildlife, and introducing native Japanese plants described in ancient literature to gardens on the sites of our affiliates.



World Biodiversity Day event in the green space of our LNG terminal

#### Osaka Gas Group Biodiversity Policy (excerpt)

##### Statement

We at Osaka Gas Group, will contribute to the realization of a sustainable society in harmony with nature by cooperating with various constituents, proactively undertaking initiatives for conserving biodiversity and using resources sustainably, and educating our customers through products and services that take biodiversity into consideration. To that end, we will carry out the two ongoing initiatives outlined below.

- (1) We will endeavor to grasp the connections between business activities and biodiversity (the gifts of nature and impacts).
- (2) By engaging in business activities that take biodiversity into consideration and other activities, we will reduce our impact on biodiversity and endeavor to use resources sustainably.

Specifically, we will engage in activities based on the following seven perspectives.

- |   |   |
|---|---|
| 1) Ongoing Initiatives  | 5) Connections with Environmental Measures Including the Prevention of Global Warming |
| 2) Regional Importance and Broad Global Awareness                           | 6) Supply Chain Considerations  |
| 3) Cooperating with and Taking into Consideration a Variety of Stakeholders | 7) Reducing and Mitigating Impacts on Biodiversity                                    |
| 4) Philanthropy   |   |

**Note:** See Web site for details.

#### Greening of Osaka Gas Terminals

##### Making Terminal Green Belts a Refuge for Rare Species

At Osaka Gas LNG terminals, we are conducting afforestation activities that recreate the area's original ecosystems<sup>1</sup> and are capable of supporting a high level of biodiversity. At the Senboku LNG Terminal, we are hoping to create an environment of primeval forests dense with huge trees by planting native seedlings<sup>1</sup>. At the Himeji LNG Terminal, we took part in an experiment by the Museum of Nature and Human

Activities, Hyogo in which we help preserve rare plants native to the area of Nishi Harima, Hyogo Prefecture. We are currently growing rare plants including *Gardneria multiflora* Makino and the Honshu wood mint (both rated level 2 endangered on the Ministry of the Environment's endangered species list).

This unusual project to create a refuge for valuable genetic resources on industrial land has won accolades from environmental experts.

<sup>1</sup> Native seedlings are those that have been grown from locally gathered seeds. One of the important points is that their production process is clarified.

#### Comments from Key Figures

##### Looking Forward to Osaka Gas's Biodiversity Efforts

**Reina Kikuchi**  
President, Yui Social Design Office



"Biodiversity" is still far less familiar a word to most people than "global warming." Plants and animals common not so long ago are disappearing at alarming speed. Osaka Gas's efforts, which include using LNG terminals to grow rare plants and recreating plants described in ancient literature, send a crucial message about biodiversity and provide us with a valuable opportunity to think about how we can create a

society in which people and nature coexist.

The company recently formulated the Osaka Gas Group Biodiversity Policy, through which it will leverage its business to take multifaceted, comprehensive biodiversity and environmental protection initiatives from their local beginnings to all around the world.

#### Environmental Efforts in Developing Resources and Procurement

##### Policy and Survey of Biodiversity at Suppliers

The Osaka Gas Group conducted a survey of the environmental protection policies and activities of the operators and majority owners of the overseas LNG projects from which it procures its LNG, with a total of nine companies being surveyed.

The survey covered climate change, water resources, environmental risk management, and biodiversity.



# Environmental Accounting

## Overview of FY2010

### Environmental Investment and Expenses Increased

Regarding the environmental conservation cost, the amount of both investment and expense increased, as a result of reviewing the coverage of our environmental

protection efforts.

In internal economic benefits, LNG terminals utilized cryogenic power generation<sup>1</sup>, enabling fewer electricity purchases and resulting in lower expenses.

As for environmental conservation results, less gas pipe construction than last year meant less environmental impact from final

disposal of excavated soil. Since this also meant we had less environmental impact reduction, thus the social benefits of environmental conservation in monetary terms also decreased.

We will continue to ensure we use expenses effectively by following our environmental efforts converted into monetary terms.

### Environmental conservation cost

Item			Investment (million yen)		Expense (million yen)	
Contents			FY2009	FY2010	FY2009	FY2010
In-company activities	Global environment	Energy saving equipment	19	<b>624</b>	409	<b>812</b>
	Pollution prevention	Air and water pollution preventing equipment	11	<b>10</b>	44	<b>73</b>
	Resources recycling	Excavated soil recycling, waste management	135	<b>38</b>	155	<b>239</b>
	Environment management	Green purchasing, environmental education, EMS development, environmental organizations	0	<b>77</b>	5,444	<b>6,019</b>
	Conserving resources, other	Greening at plants, compensation for environmental preservation	2	<b>1</b>	269	<b>363</b>
Environmental impact reduction at customers	R&D	R&D of environmental impact reduction technologies, environment-conscious products	255	<b>610</b>	947	<b>1,012</b>
	Recycling of used gas appliances	Collection and recycling of gas appliances	0	<b>0</b>	73	<b>73</b>
Philanthropic activities			1	<b>4</b>	169	<b>222</b>
Total			423	<b>1,364</b>	7,510	<b>8,813</b>

### Internal economic benefits

	(million yen)	
	FY2009	FY2010
Saving through reduction and recycling of excavated soil	4,667	<b>4,133</b>
Sales of valuable resource (LNG cryogenic energy)	238	<b>172</b>
Cost reduction through energy / resources saving	-224 <sup>1</sup>	<b>311</b>
Total	4,681	<b>4,616</b>

<sup>1</sup> Including the increased cost for purchasing electricity due to lowering the cryogenic power generation

### Environmental conservation results

	Per output <sup>2</sup>			Total amount			Reduction <sup>3</sup>		
	Unit	FY2009	FY2010	Unit	FY2009	FY2010	Unit	FY2009	FY2010
NOx (LNG Terminals) : NOx emissions in the gas business	mg/m <sup>3</sup>	0.70	<b>1.44</b>	tons	5.90	<b>8.09</b>	tons	23.39	<b>24.12</b>
COD (LNG Terminals) : COD for all LNG terminals	mg/m <sup>3</sup>	0.40	<b>0.38</b>	tons	3.39	<b>3.10</b>	tons	14.04	<b>9.71</b>
CO <sub>2</sub> (LNG Terminals) <sup>1</sup>	g-CO <sub>2</sub> /m <sup>3</sup>	13.61	<b>13.38</b>	thousand tons-CO <sub>2</sub>	114	<b>109</b>	thousand tons-CO <sub>2</sub>	14	<b>15</b>
CO <sub>2</sub> (Other sites) <sup>1</sup>	g-CO <sub>2</sub> /m <sup>3</sup>	5.26	<b>5.48</b>	thousand tons-CO <sub>2</sub>	44	<b>44</b>	thousand tons-CO <sub>2</sub>	33	<b>30</b>
Final disposal of excavated soil	tons/km	37	<b>18</b>	thousand tons	33	<b>14</b>	thousand tons	78	<b>68</b>
Final disposal of general waste	g/m <sup>3</sup>	0.01	<b>0.01</b>	tons	58	<b>42</b>	tons	1,203	<b>1,164</b>
Final disposal of industrial waste (including used gas appliances)	g/m <sup>3</sup>	0.08	<b>0.08</b>	tons	686	<b>675</b>	tons	5,012	<b>4,767</b>

### Social benefits

Social benefits (million yen)	
FY2009	FY2010
8	<b>9</b>
21	<b>15</b>
49	<b>54</b>
115	<b>105</b>
1,729	<b>1,503</b>
4	<b>4</b>
154	<b>146</b>
Total	2,080 <b>1,835</b>

(Note) FY2010: The amount of gas sales was 8,119 million m<sup>3</sup> and the total length of newly installed gas pipelines was 770 km.

<sup>1</sup> CO<sub>2</sub> emissions associated with purchased electricity are calculated using the average factor of thermal power plants (0.69 kg-CO<sub>2</sub>/kWh).

<sup>2</sup> NOx, COD, CO<sub>2</sub>, industrial waste, and general waste per 1 m<sup>3</sup> gas sold was calculated. Final disposal of excavated soil per 1 km of new gas pipeline was calculated.

<sup>3</sup> For NOx and COD, the difference from the regulated value was calculated for each facility. For CO<sub>2</sub>, industrial waste and general waste, the difference in the factor (amount per 1 m<sup>3</sup> gas sold) from the FY1999 level was multiplied by the amount of gas sold during the year under review. For final disposal of excavated soil, the reduction in offshore landfill disposal was calculated based on the amount of reduction in excavated soil and the amount of soil recycled.

### (Social benefits of environmental conservation in monetary value)

We converted the social benefits of environmental conservation accruing from the reductions in total environmental impacts into monetary value. We calculated the monetary value of the reduction in final disposal of excavated soil using a factor determined by the Contingent Valuation Method (CVM). (In the CVM, we calculate the value of environmental conservation activities by surveying residents about how much they would be willing to pay for certain environmental conservation benefits). We define the monetary benefit of environmental conservation as this factor multiplied by the amount of reductions. For other environmental impacts, we have suitable factors for the monetary value of environmental values on the basis of some research into the costs of environmental damage etc. We have calculated monetary values for the environmental conservation benefits by multiplying these factors by the reductions in the individual environmental loads of Osaka Gas.





# Being a good corporate citizen contributing to society

The Osaka Gas Group, as a good corporate citizen, strives to maintain communication with society and the communities it serves. Through proactive disclosure of information and improved managerial transparency, we intend to establish favorable relationship with citizens and to make our positive contribution to healthy development of society.

## CSR Indicator – Target and Result

### Number of contacts and communication events

#### Target by FY2012

Total contacts:  
at least 1% of total  
customers; at least 365  
communication events



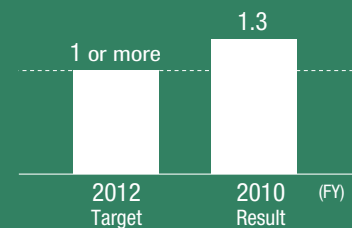
#### FY2010 Result

Total contacts:  
1.3% of total  
customers; 900  
communication events

Expanding  
Outreach

Through around 900 communication events, we were able to communicate with a total of roughly 90,000 people (1.3% of all customers).

### ● Total customers contacted (% of total customers)



## Customer Contact in FY2010

Osaka Gas Group kids support project

### Energizing Kids: Cool activities to power the future!

Osaka Gas Group promotes the children's support project, Energizing Kids, focused on children, the next generation of leaders. We provide a variety of opportunities for children such as learning about energy and the environment, and sports and cooking experience.



Energizing Kids web site (in Japanese):  
<http://www.osakagas.co.jp/e-kids/>



#### Energy and environment education

Osaka Gas conducts energy and environment education at elementary and junior high schools, with current and former employees visiting schools to teach. In fiscal 2010, we started a new CO<sub>2</sub> emissions reduction program and held around 630 sessions for approximately 25,700 students.



#### NOBY T&F (Track & Field) Club

Starting in April 2010, we have held sports lessons hosted by Nobuharu Asahara who is a coach of Osaka Gas Track Team. The club's goal is improving children's wellness and developing the next-generation of top athletes.



#### Food education: Nurturing children's awareness of food

We carry out activities to convey food culture to children, such as the Kids and Parents Cooking Contest for children and their guardians, and food education seminars for educators.

## Definition of Indicator

The first indicator, the number of contacts, represents the total number of customers contacted in fiscal 2010 as a percentage of the total number of customers. This indicator is calculated by summing up the number of visitors to the Gas Science Museum and the Himeji Gas Energy Hall, energy and environmental education (school visits) participants, and attendees of other events and seminars, excluding sales-related events.

The second indicator, number of opportunities, stands for the number

of communication activities and related efforts actually conducted.

## Overview of FY2010 Result

The Osaka Gas Group has established a variety of forums and opportunities to promote communication with the community. These include the Gas Science Museum and the Himeji Gas Energy Hall, food education and energy and environmental education (school visits), and seminars at the Research Institute for Culture, Energy and Life.

In fiscal 2010, as part of the children's support project, Energizing Kids, we started the NOBY T&F (Track & Field) Club coached by Nobuharu Asahara, a bronze medalist in the men's 4x100m relay at the Beijing 2008 Olympic Games.

Although we had to cancel some of our planned communication activities in fiscal 2010 due to concerns regarding a new strain of influenza, we held around 900 communication events, and we were able to communicate with a total of roughly 90,000 people (1.3% of all customers), thus achieving our targets.



# The Small Light Campaign

## The Small Light Campaign

### Engaging in a Variety of Volunteer Activities

We introduced a special initiative during the International Year of Disabled Persons. In 1981, the Small Light Campaign was launched as a corporate volunteer project run by the Osaka Gas Group. The aim of this campaign is that every employee will take a lead role in resolving community problems. In 2010, this campaign reached its 30th year, and in the spirit of with which it was launched, as part of our philanthropic activities we hold events such as bazaars, music concerts, and cooking classes. In addition, we promote a variety of activities to provide support for children, people with disabilities, and the elderly such as visits to orphanages and assistance with outings.



Symbol of the campaign



Tomoshibi Children's Theater

### Examples of volunteer and contribution activities

As a good corporate citizen	Tomoshibi Cooking Class for Children
Charity fundraising calendar	Tomoshibi Musical for Children (Christmas Event)
Disaster relief donations	Volunteer Sweet-making
Osaka Gas Tomoshibi Club	Visits to Children's Homes
Holding concerts	Tomoshibi Children's Theater
Charity Concert by In-house Musical Clubs	Working for the Wellbeing of the Elderly
Recycling used books	The Osaka Gas Suzuran Club
Donations of Used Stamps and Prepaid Cards	Cultural Exhibition Charity Fundraiser
Handmade Dustcloth Volunteer Project	Let's Sing Children's Songs and School Songs
Donation of Unused and Scrap Postcards	Assisting with outings for the elderly
Blood Drive	Working with People with Disabilities
Charity activities by OUD Co., Ltd.	The Midosuji Neighborly Bazaar and Used Book Fair
Contributions to <i>Mottainai</i> (resource-saving) activities	Cross-Cultural Exchange at Welfare Workshops
Hajimaru-kun recycled PC donation program	A Cooking Class for People with Disabilities
Support for fair trade	Osaka Gas Volunteer Club
Working for the Wellbeing of Children	Osaka Gas Sign Language Club "Tablecloth"
The Spring Vacation Nature Class for Parents and Kids	Osaka Gas Braille Club "Tomoshibi"

## Assistance and Contribution Activities

### Employee Contributions through the Small Light Fund and Osaka Gas Tomoshibi Club

We launched the Small Light Fund when the campaign first began. The fund, donated by employees and others, supports organizations such as NPOs and NGOs working to address social issues. In fiscal 2011, this campaign reached its 30th year. In commemoration, we are planning an aid program providing a total of around 10 million yen

through open recruitment focused on organizations supporting children in distress.

In addition to the Small Light Fund, we started the Osaka Gas Tomoshibi Club in 2009 to provide employees with opportunities to donate through the company's benefits program. Under this program, each year individual employees can at their own discretion donate benefits points to organizations working to address social issues. In fiscal 2010, a donation totalling 2,758,000 yen was sent to various organizations, along with the goodwill of employees.

## TOPICS

### Launching the "Hajimaru-kun" Give-away Program donating recycled PCs to children's support organizations

Since April 2005, OGIS-RI Co., Ltd., an Osaka Gas Group company, has collected personal computers that are no longer being used from companies and, after deleting data and performing inspections, prepares them for reuse. Since fiscal 2009, these have been sold as eco-PCs to Group employees.



Philanthropic activities character Hajimaru-kun

In October 2009, cleaning and other refurbishment tasks were outsourced to a facility for people with disabilities and the program was developed into the Hajimaru-kun Program, a philanthropic activity connected with increasing work opportunities for people with disabilities.

In addition, with the cooperation of Osaka Gas Co., Ltd., OGIC Corporation, and the Small Light Campaign run by Group employees, in May 2010 the Hajimaru-kun Give-away Program was launched. In this program, PCs

refurbished at welfare workshops are donated to support groups for children such as NPOs and social welfare organizations mainly operating within Osaka

Prefecture. The recipients of these donations are decided after requests are received and screened with the assistance of the Osaka NPO Center.



**Naoko Morizane**  
Philanthropic Activities  
Promotion Center,  
OGIS-RI Co., Ltd.





## Contribution to and Communication with Local Communities

### Cleanup Projects

#### Taking Part in a Project to Create a Litter-free, Beautiful Town

Osaka Gas Group participates in local cleanup projects to create a litter-free, beautiful town.

Since 2003, Osaka Gas has sponsored the Clean Osaka City Project, and the Osaka Gas Group provided 196 participants in fiscal 2010. In addition, about 25 participants clean the area around the Osaka Gas Building at the beginning of every month. In addition, other business locations in our service area, including LNG terminals and office buildings, also contribute to local beautification campaigns.



Cleanup activities around the Osaka Gas head office building

### Examples of contributions to local communities and communication with society

Interaction with local communities	Communication with society
Community events	Dialogue with consumer groups
Himeji Work Experience Week	Osaka Gas supporters
Volunteer activities in disaster areas	Energy environmental education
Cleanup around the Osaka Gas Building	Osaka Gas's education through cooking
Cleanup activities around LNG terminals	Food allergy seminars
Cleanup activities at overseas business locations	Sports health seminars
<b>Contributing to Kansai culture</b>	Gas Science Museum and Himeji Gas Energy Hall
OMS Drama Award	Information on eco housing and eco lifestyle
The Storyteller of Naniwa	NEXT 21 and U-CoRo initiatives
Providing hands-on vocational experiences at KidZania Koshien	Private sector training for school teachers
Charity concert by in-house musical clubs	Accepting interns from abroad
Healing music concert	NOBY T&F (Track & Field) Club
	Joint researches with universities

### Carrying out Volunteer Cleanup Activities in Guam

On September 19, 2009, 12 employees of our affiliate, Marianas Energy Company, LLC (Guam, U.S.A.) and their families participated in a volunteer cleanup as one of their annual events. The focused was the Fish Eye Marine Park, a coastal area near the company. This was part of the Guam Coastal Clean-up, an event carried out in fall each year involving the whole island.



Volunteer cleanup activities in Guam

### Cultural Activities

#### Introducing the History and Culture of Osaka to the Accompaniment of Music

As a way of contributing to the community, Osaka Gas organizes a project entitled "The Storyteller of Naniwa" to communicate history and culture as well as the status of urban development and possibilities for the future.

Around 750 citizens attended the April 2009 event.

In February 2010, we performed a new act at the Osaka Gas head office and Mengyo Kaikan (one of historic buildings in Osaka) named the Yodogawa Story after the 100th anniversary of the Yodogawa River improvement project.



Presenting research results through "The Storyteller of Naniwa"

### Stakeholders' Opinions

#### Celebrating 30 years of the Small Light Campaign, expectations for the Osaka Gas Group

**Aya Mizutani**

Executive Director, Osaka Voluntary Action Center  
Visiting Professor, School of Human Sciences, Osaka University  
ISO 26000 Japan Committee Member



I was overjoyed to hear that the Small Light Campaign, one of the Osaka Gas Group's philanthropic activities, is now entering its 30th year. Whereas nowadays people tend to ask about short-term benefits, it is impossible not to feel the value from the continuation of these steady, long-term activities aimed at regional communities.

Furthermore, as a supporter of civic activities, I would like to see Osaka Gas Group will communicate their activities not only the Small Light Campaign but also other various philanthropic activities, and I expect the

scope of communication will be broadened in the future. In doing so, Osaka Gas Group will deepen an understanding of a variety of perspectives and regional realities, and evolve its activities to engender empathy from regional communities. I believe this kind of communication and mutual understanding will breed new kinds of philanthropic activities with regional support. I am looking forward to seeing an expansion of activities in the future.



## Community Communication

### The Expansion of Human Networks and Activities Begin at the U-CoRo Project

Since fiscal 2008, the Osaka Gas Research Institute for Culture, Energy and Life has been working on a community communication design experiment in the Osaka Gas Experimental Residential Complex NEXT 21, which is located in the Uemachi Plateau, Osaka City. In a corner of NEXT 21, we

established a small space known as the U-CoRo Uemachi Plateau Communication Room. This program features window exhibitions and networking events related to the exhibitions enabling local residents to discuss among themselves and discover the appeal, possibilities, and issues of the community, and build new networks.

Fiscal 2010 has been designated as the 3rd year of development and through initiatives such as the cultivation of local vegetables, and disaster mitigation and prevention,

the expansion of networks for a variety of activities extended throughout the community and new activities were initiated.



An exhibition of documents related to disaster prevention in the U-CoRo window

## Activities at Affiliated Foundations

The Osaka Gas Group Welfare Foundation  
The Osaka Gas Foundation of International Cultural Exchange

### Assisting the Elderly

#### Contributing to a Vigorous Society with Excellent Longevity

The Osaka Gas Group Welfare Foundation operates in six prefectures of the Kansai region, mainly engaging in 1) funding welfare projects, research, and surveying the elderly population and 2) supporting health-promotion projects to help maintain and improve health for the elderly.

In fiscal 2010, the Foundation provided 16 million yen to 85 welfare projects for the elderly, 14 million yen to 17 research and survey efforts, and carried out 248 health-promotion projects involving 14,800 participants.

### Doing Our Part on the International Scene

#### Working to Deepen Mutual Understanding with Natural Gas-producing Countries

The Osaka Gas Foundation of International Cultural Exchange provides aid services to promote mutual understanding with natural gas-producing countries in the South-East Asia and Oceania region.

In fiscal 2010, the foundation provided total assistance of 16.7 million yen for items such as educational materials, scholarships, experimental research, and training in Indonesia and Malaysia. Total assistance through fiscal 2010, the 18th year since the establishment of the foundation in 1992, reached 319 million yen.

#### Stakeholders' Opinions

#### Thank you for the support for Active Senior Citizens Support Projects

**Masayoshi Takeda**  
Director, Hyogo Prefecture  
Council of Social Welfare

In recent years, active seniors activities have been creating great expectations. In Hyogo Prefecture, for two years the Councils of Social Welfare in both Miki and Shiso cities have carried out Active Senior Citizens Support Projects with support from the Osaka Gas Group Welfare Foundation.

Through initiatives such as the Active Senior Citizens College and



A concert calling for senior citizen activity (Shiso City)

Days of Our Youth Folk Concert, this has created the chance to greatly expand initiatives for community activities for senior generations. We would like to extend our sincere gratitude once again for this valuable assistance.

#### Stakeholders' Opinions

#### Thank You for the Support for Short-term Japanese Language Training

**Dr. Sudung M. Manurung**  
Head of Japanese Area Studies Program,  
University of Indonesia Graduate School

In both fiscal 2009 and fiscal 2010, two students from the Japanese Area Studies Program at the University of Indonesia Graduate School were invited to participate in the Japan Foundation Japanese-Language Institute, Kansai's Japanese language



Dr. Sudung M. Manurung (2nd from right)

training. While improving their Japanese language skills, they were able to achieve meaningful training results by creating connections with the people of Japan. We give our greatest thanks.



## IV

# Complying with laws and regulations and respect for human rights

The management's and employees' compliance with laws and regulations forms a basis of gaining society's trust. Our perspectives on compliance go beyond legal and regulatory boundaries to include decent conduct expected of all citizens. Based on our respect for human rights, we intend to maintain equitable relationship with our customers, business partners, and other parties.

## CSR Indicator – Target and Result

### Employee scores on compliance awareness:

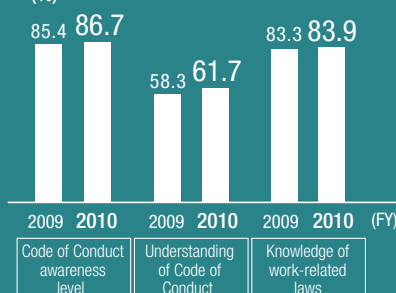
Target by FY2012

FY2010 Result

Higher than  
the previous yearHigher than  
previous yearAwareness  
increased

All categories saw an increase: Code of Conduct awareness level was 86.7%, understanding of Code of Conduct was 61.7%, and knowledge of work-related laws was 83.9%.

### Key questionnaire results (%)



### Breakdown and analysis of FY2010 compliance awareness scores

#### Awareness

Do you keep the corporate Code of Conduct in mind?

Increased from 85.4%  
to **86.7%**

There was only a slight increase in awareness of the Osaka Gas Group Code of Conduct. We will continue education and training to raise this awareness further.

#### Level of understanding

Do you comprehend the corporate Code of Conduct?

Increased from 58.3%  
to **61.7%**

Level of understanding of the Osaka Gas Group Code of Conduct was 25% lower than that of the awareness level, showing that while many are aware of the Code of Conduct, they do not fully understand it. We will continue training aimed at increasing understanding.

#### Knowledge

Do you know the laws relating to your work?

Increased from 83.3%  
to **83.9%**

Although there was a minor increase in knowledge of work-related laws, this is still insufficient. Through education and training, we will spread and increase the level of knowledge of work-related laws among employees.

### Definition of Indicator

Since fiscal 2004, the Osaka Gas Group has been conducting annual surveys to determine how widespread and entrenched compliance awareness is in areas like human rights. The results are reflected in future Group measures. The goal is to have higher scores each year for the key CSR indicators of Code of Conduct awareness level, understanding of Code of Conduct, and knowledge of work-related laws.

The survey is administered to a random group of 4,000 Group employees and responses are anonymous.

### Overview of FY2010 Result

Scores were higher for the key CSR indicators of Code of Conduct awareness level, understanding of Code of Conduct, and knowledge of work-related laws. Overall, there is a high level of awareness and understanding and efforts to this end in the workplace are gradually bearing fruit. Responses in the free answer space of the survey show that education and training are yielding results: "Decision-making standards are clear and I can proceed with confidence," "I discovered risk factors I never knew about and have been able to prevent problems from occurring."

However, employee knowledge of work-related laws must be improved through continuing relevant education and training. As well, a detailed analysis reveals the low level of understanding of the laws and regulations, as well as in-house rules related to individual work. We will therefore step up compliance activities at each workplace geared to the particular needs of each type of work.

We will continue conducting awareness surveys as one form of fixed-point observation of employee awareness and understanding.



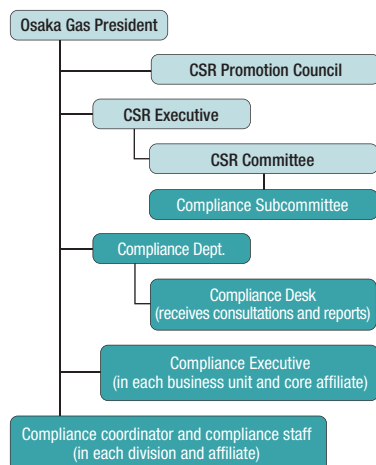
# Compliance Promotion

## Organization for Strengthening Compliance Covering the Entire Group

Measures to promote compliance are deliberated and status of compliance is monitored by the CSR Promotion Council, CSR Executive (chaired by the Vice President), and the CSR Committee, which fall under the supervision of the president of Osaka Gas. The Compliance Subcommittee under the CSR Committee leads cross-organizational study of measures and sharing of information. The Compliance Department is in charge of promoting compliance activities.

Each of the Osaka Gas business units and core affiliates appoint a Compliance Executive. There is also a compliance coordinator and his or her staff in each Osaka Gas division and affiliate.

### Compliance structure



## Compliance Desk Internal Reporting System

The Osaka Gas Group has established Compliance Desks at the Head Office, core affiliates, and law offices outside the company to provide a channel for persons who need a place to seek advice on and report matters of compliance with laws and internal rules. The Compliance Desks are open to Group employees and employees

from business partners. All referrals are anonymous.

In fiscal 2010, the Compliance Desks were contacted a total of 98 times by Group employees and temporary workers. Upon receipt of reporting, an initial examination was made, following which a fair investigation of the facts was conducted and any necessary corrective measures were implemented.



Compliance Desk Information Card distributed to all employees

## Education, Training Three Core Efforts

In fiscal 2010, we continued to focus on three core areas in our training: (1) be aware of legislation and regulations; (2) develop a culture of compliance and mechanisms to avoid violations; and (3) audit and monitor throughout the Group.

For number (1), we expanded and revised the examples of compliance case studies, administered a test of understanding of the Osaka Gas Group Code of Conduct, and held compliance training for supervisors and managers. For number (2), we

established a compliance boosting period (July to September) during which we held training for all Group employees. For number (3), we conducted surveys to determine the state of compliance and what needs to be done, and we had employees conduct self-assessments of compliance with key laws and figure out how to improve this if necessary.

We have had compliance training for all Group employees since fiscal 2005, and as of fiscal 2010 a cumulative total of 100,000 had taken this training.

## Protection of Personal Information Improving Education and Supervision of Affiliates and Their Partners

The Osaka Gas Group is in possession of personal information on a large number of customers, and we have rules and measures in place to protect this information.

These measures have allowed us to reduce the danger of losing important personal information. However, we have not totally eliminated problems: in fiscal 2010, an Osaka Gas affiliate and its outsource partner lost customers' personal information. We investigated the cause and improved our safety measures. We will continue to strengthen our personal information protection measures to prevent this from happening again.

### Participation in compliance training

(Unit: No. of people)

Participants	2005	2006	2007	2008	2009
Lectures for management by outside experts	170	180	170	150	134
Trainings for supervisors and managers	811	1,906 (All managers)	802	4,370	1,516
Group training for compliance staff	110	98	93	325	245
Group training and e-learning for general employees	8,084	16,514	29,487	25,388	14,886

Note: Figures indicate the cumulative number of participants in each category of program. In addition to the above, compliance training is organized by each division/department (at least 4 times a year).



## Preventing Bid-Rigging and Other Illegal Action

### Preventing Reoccurrence of Misconduct

In fiscal 2007, an Osaka Gas affiliate was discovered to have acted in violation of the Anti-Monopoly Law

during construction of a gas station. Despite our implementation of efforts to prevent any reoccurrence, in July 2007 a further example of misconduct was discovered in a subsidized project that included natural gas cogeneration facilities.

The Osaka Gas Group regards it as an extremely important issue that

such a series of circumstances should never happen again, and the entire Group is engaged in measures to prevent such a situation from reoccurring. We will continue to work to strengthen our thorough implementation of compliance, and strive to regain public trust.

### Five Measures to Prevent Reoccurrence of Misconduct

Osaka Gas has implemented the following five measures to prevent the circumstances from reoccurring.

#### 1. Improvement of mechanisms for operating mutual checks

- Responsibility for the management of subsidy projects has been shifted from the Regional Energy Sales Departments to the Planning Department of the Commercial & Industrial Energy Business Unit, which is the body responsible for managing the business unit (September 2007).
- Purchasing functions for subsidy projects across the entire Group have been moved to the Purchasing Department (January 2008).

#### 2. Strengthening internal auditing system

- The Auditing Department has been strengthened by increasing its staff (January 2008).

#### 3. Tightening penalties for compliance violations and increased use of Compliance Desk

- All employees have been instructed again to be rigorous in compliance, and a compliance awareness level survey has been carried out (September 2007-January 2008).
- The Compliance Desk has issued further notifications to employees (September-November 2007).

#### 4. Review of performance evaluation for organizations and individuals

- A work quality element that includes compliance has been incorporated into annual organizational performance evaluation indicators and the mechanisms for target management for individuals (from FY2009).

#### 5. Establishment of Corporate Ethics Committee

- A Corporate Ethics Committee has been established as a consultative group to the Board of Directors, to offer advice from an external perspective on how to improve compliance practices and corporate ethics at the Osaka Gas Group.

### Corporate Ethics Committee Meetings Held

- 4th Corporate Ethics Committee Meeting (May 28, 2009)



- 5th Corporate Ethics Committee Meeting (November 13, 2009)

- 6th Corporate Ethics Committee Meeting (May 27, 2010)

- Review of compliance promotion activities
- Future compliance activities

The meetings confirmed a satisfactory status of implementation of measures for preventing the reoccurrence of non-conformance, and that we have achieved a certain level of

success with spreading compliance activities and awareness in the Group. Committee members acknowledged that they had achieved the desired goal of making proposals from the standpoint of those outside of Osaka Gas. Hence, the committee was dissolved following the final meeting.

The main opinions expressed at the meetings can be found on the following Web site:  
<http://www.osakagas.co.jp/importance/index.html>

## Action on Human Rights

### Systems and Plans for Human Rights Awareness Group-Wide Awareness Activities

To promote human rights awareness throughout the Group, Osaka Gas established the Corporate Human Rights Committee headed by the director responsible for the Human Resources Department. This committee decides all basic policy with regard to human rights.

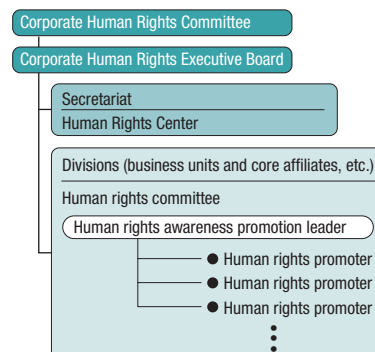
Based on this basic policy, the Human Rights Center of the Human Resources Department plans and runs numerous efforts and events, such as human rights training for all job levels, training at all company

divisions, human rights lectures, and human rights slogan contests. As well, each business unit and affiliate of that business has its own human rights committee, which relays policy and human rights information, encourages participation in outside lectures, and gathers human rights slogans, as well as exchanges information and opinions with other divisions, all in efforts to understand what must be done across the entire Group. Further, each business unit and its affiliate appoints a human rights awareness promotion leader, who is in charge of dealing with daily issues related to human rights.

The Osaka Gas Group's internal reporting system of Compliance

Desks (see page 46) also provides a place for employees to seek advice on and report all matters related to human rights.

### Organization





## Human Rights Awareness Education and Training

### Human Rights Awareness Plans for FY2010

The Osaka Gas Group has a human rights awareness slogan and activities every fiscal year in efforts to build a corporate culture in which human rights are respected.

In fiscal 2010, the slogan once again proclaimed our goal to “respect human rights and build a positive, energetic workplace,” which we strove to achieve with initiatives including the following:

- Enhance and strengthen the human rights awareness structure
- Enhance human rights education and awareness raising activities
- Train human rights awareness promotion leaders within each division
- Gather information on human rights and disseminate it within the company
- Participate in and gather information at private industry human rights associations

## Human Rights Training for All Levels

As shown in the table below the Osaka Gas Group has human rights training for all job levels.

Group training consists of graded education for managers and new recruits. Newly appointed managers go through a process of more detailed understanding, starting with the basics of human rights, a video course of lectures

and discussions, then moving on to case study training on topics such as sexual and power harassment, and discrimination against social minorities.

In fiscal 2010, new human rights lectures were added for division heads and managers at Osaka Gas and affiliates, with 470 taking part. Instructors were also sent to lead training at divisions and affiliates, and the 13 sessions were attended by approximately 400.

### Human rights group training by job level

Participants	Period	No. of participants
Directors	November	21
Division heads, managers	July, November	470
Supervisors and managers	June, July, September, December	174
New recruits	April	165
Corporate Branding Seminars	December	73
Managers, chiefs		93
Managers at affiliates	June, September, December	88
New recruits at affiliates	April	49
Affiliates		998
Steering Committee	March	20
Executive Committee, etc.	July, October	72
Total		2,223
External workshop		77 (cumulative total)

Course name	No. of participants
Anti-discrimination and Human Rights Awareness Raising (managers)	42 (cumulative total)
Human Rights and Anti-discrimination Awareness Raising Course for Businesses	
Buraku Liberation and Human Rights Summer University Course, etc.	

Note: Organized mainly by the Buraku Liberation and Human Rights Research Institute and other organizations.

## Efforts throughout the Supply Chain

### CSR-Based Purchasing Guidelines

#### Purchasing Guidelines Follow the UN Global Compact

Osaka Gas strives to fulfill its corporate social responsibility in purchasing activities by enforcing the seven guidelines of the CSR-based Purchasing Guidelines shown on the right. The first guideline, “Strict Compliance,” means that in purchasing, employees be acting as responsible members of society by following the letter and spirit of all relevant laws, as well as following accepted social norms and corporate ethics. “Relevant laws” means not only the relevant laws of countries where we do business, but also laws and regulations related to fulfilling corporate social responsibility in labor and human rights, including

the 10 principles of the UN Global Compact.

These CSR-based Purchasing Guidelines can be found on the Osaka Gas Web site, and are also explained to all new suppliers we will do business with. We also reinforce these to existing suppliers at yearly get-togethers.

#### CSR-based Purchasing Guidelines

(formulated June 1992, revised June 2009)

1. Strict Compliance
2. Assurance of Quality
3. Fair Price
4. Observance of Delivery Date
5. Environmental Considerations
6. Assurance of Safety
7. Maintenance and After-Sale Services

### Consideration for Human Rights throughout the Overseas Supply Chain

The Osaka Gas Group’s overseas supply chain comprises companies that are mainly operators and majority owners of the overseas LNG projects, as well as the overseas affiliated companies. We examined the Web sites of these companies to ensure that their corporate policy clearly states principles like support for the abolition of child and forced labor, and refrain from giving bribes to government officials.

Group overseas companies have an Employee Handbook that covers all work related rules including the Osaka Gas Group Code of Conduct. This is one of the ways Osaka Gas is ensuring that overseas employees are educated about and aware of human rights issues.





# Management policy of human growth

The Osaka Gas Group strives to become a group of enterprises to realize growth of its employees through work by ensuring employment opportunities and respecting employees' individuality and initiative. With discipline and self motivation, we will charge ourselves with the task of creating new value for customers, shareholders, and society. The group and its employees, through mutual trust and decency, strive to achieve sound growth of the enterprises within the group.

## CSR Indicator – Target and Result

Employee opinion survey  
(job satisfaction and dedication):

Target by FY2012

FY2010 Result

Maintain  
sufficient  
level



Maintained  
sufficient  
level

Job  
satisfaction  
and  
dedication  
increased

Results for the targets of job satisfaction and dedication to company were higher than those of the last survey (fiscal 2008).

### ● Trends in satisfaction (excerpt)



## Definition of Indicator

Osaka Gas conducts an employee opinion survey so it can continuously learn what employees think about their job, workplace environment,

superiors, company systems, and so on.

Employees rate their satisfaction level (choosing from five levels) for 16 categories including “attachment to the company” and “satisfaction with work,” and convey their remarks.

## Overview of FY2010 Result

The fiscal 2010 employee opinion survey was administered to all employees.

The score for the category “attachment to company” has always been high, but this year it was especially high, with an average score of 4.36 out of 5. The score for “satisfaction with work” also scored a high mark.

In the free answer space of the survey, many respondents expressed a number of desires; for example, work process improvement, on-the-job training, and greater teamwork and cooperation among company divisions. These opinions are being reflected into future measures at Osaka Gas.

We will continue to strive to maintain and raise the level of satisfaction among employees. (The next survey is scheduled in fiscal 2013.)

### Employees' Opinions

#### Mutually Supportive Workplace Allowed

#### Me to Return and Pursue a Promising Career

Yuko Kusui

Real Estate Development Team Manager,  
Nanbu Residential Energy B.U.



I think Osaka Gas truly understands that employees want challenges and growth.

I am currently a sales manager in charge of the marketing for new houses. I had a child at age 36, but after coming back to work after five and a half months of childcare leave I was worried about whether I could pick up where I left off. Although it was tough up until my child was 4, my coworkers were very understanding and I was able to continue work by using the flex system. All this made it possible for me to forge a long-term career.

I'm grateful that I have a work environment in which people respect and support each other. I hope that I can use all that I experienced in having and raising a child in my work—the personal growth I achieved, the things I learned about personality development and human psychology, and the friendships I forged with other mothers that allowed me to broaden my views.



# Maintain Employee Numbers and Diversify Our Workforce

## Hiring Efforts

### Match Employees' Aptitude and Aspiration with Company Needs

We strive to maintain our employee numbers and diversify our workforce under our basic policy of hiring and compensating employees with absolutely no discrimination based on race, religion, sex, social status, or lineage.

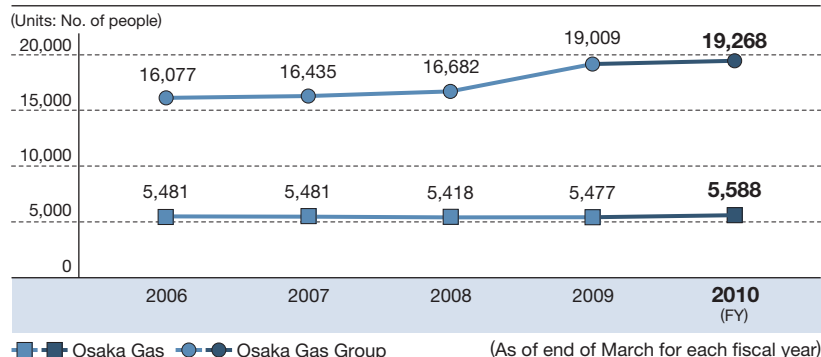
In hiring personnel, we place importance on staffing in the job employees want and that they are qualified for, and matching them to the skills and job requirements of Osaka Gas. Since fiscal 2009, we have held meetings to introduce students to the companies in the Osaka Gas Group. At the fiscal 2010 meetings, approximately 700 students attended and heard nine Group companies explain the nature of their work and the kind of employees they are looking for. In fiscal 2010 we once again held an internship program in which approximately 100 students experienced what it is like to work at Osaka Gas.

## Raising Employee Value

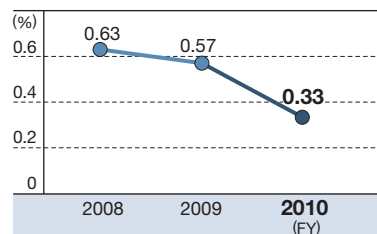
Osaka Gas encourages employees to continuously upgrade their skills so that we can better provide our customers with a stable supply of gas.

As of the end of fiscal 2010, the average length of service at Osaka Gas was 21 years. This is much higher than the 14-year average for companies of at least 1,000 employees (according to a 2008 statistics on wage structure compiled by the Ministry of Health, Labour and Welfare). We also have a low employee turnover rate (0.33%/year) for employees under 50 years of age. We believe this is a result of efforts to increase value for employees, such as by providing opportunities for growth and creating a good work environment.

## Change in number of employees



## Osaka Gas employee turnover rate



employees 60 and older after retirement, under which applicants are placed in jobs that match their skills and desires. In fiscal 2009, we introduced a full-time reemployment system to meet the working needs of a wider range of employees. All Osaka Gas Group companies have similar systems for the reemployment of retirees.

## A Diverse Workforce

### Hiring the Disabled, Rehiring Employees After Retirement

Osaka Gas does all it can to hire the disabled and creates a work environment conducive to the talents of each individual. As a result of these efforts, the disabled made up 2.05% of our workforce as of April 2010, well above the legal minimum of 1.8%.

Osaka Gas has a system, called the Short-Term Contract Reemployment Scheme, to rehire

## Providing Opportunities for Women

We strive to build a workplace in which women can achieve their full potential. We have women working in all facets of our business—gas processing, gas supply, and marketing—according to the employees' desire and suitability. Thanks partly to our various efforts to achieve work-life balance, there were 101 women in supervisor and manager positions as of January 2010, and we are working to increase this number even further.

### Employees' Opinions

#### Back on the Job Thanks to the Full-time Reemployment System

**Hidetoshi Kiriya**

Hokutoku Energy Sales Dept.,  
Commercial & Industry Energy B.U.



I provide support for the offering of gas rate systems that best match the gas appliances and periods of usage of commercial and industrial customers. I'm back to working like I was when

I was a regular employee, and every day is rewarding as I help lead and train younger employees.



## Balancing Work and Family

### Supporting Employees at Work and Home

#### Supporting Childcare through Systems and the Workplace Environment

Osaka Gas has a number of systems to support employees both while they are working and taking care of their families.

We have a system allowing parents to take childcare leave up to the end of the month in which children reach their third birthday, as well as a system for shorter work hours until children finish their third

year at elementary school. We also lend employees PCs so they can check the company intranet and email and thus keep in contact while they are on childcare leave. And we offer employees telephone counseling on matters of childcare and care for the elderly. These are just some of the ways that Osaka Gas labor and management are cooperating to

create a workplace conducive to balancing work and family duties.

In recognitions of these efforts, in April 2007 Japan's Ministry of Health, Labour and Welfare certified Osaka Gas as a company that actively supports childcare for its employees in accordance with the Law to Promote Measures to Support the Next Generation.

#### Number of employees taking childcare and nursing leave

(Units: No. of people)

	FY2009		FY2010	
	Men	Women	Men	Women
Childcare leave	2	29	0	26
Nursing care leave	0	1	0	0
Shorter working hours	1	48	1	36
Nursing care time	0	0	0	1



Logo of certification from the Ministry of Health, Labour and Welfare

### TOPICS Labor-Management Committee Promotes Work-Life Balance

Osaka Gas strives to create a corporate climate where employees can balance a rewarding job with fulfilling personal life and involvement in society to maximize their talents.

In fiscal 2009, a joint labor-management Work-Life Balance Promotion Committee was established to systematize support

measures necessary at each stage of employees' lives and create a work environment conducive to making use of these measures.

For example, in fiscal 2010 we introduced a system we call Nurturing Leave, under which employees can take a day of paid leave up until their child is

three months old. This system is meant to get more male employees as well as female employees taking leave to care for their child. We are working to get this system entrenched among labor and management at Osaka Gas.

## Communication Between Employees and Company

### Labor-Management Relations

#### Labor and Management Cooperate to Resolve Issues

Osaka Gas has a union shop system in which all employees except those in management level are union members. The goal is amicable labor-management relations.

The labor union and company management hold council meetings and review committee sessions at

which they discuss changes in working conditions, management issues, and company business in general. Through opinion exchanges

that build up mutual understanding and trust, the two sides form, maintain, and strengthen solid and amicable labor-management relations.



President Tours Workplaces

#### Labor Union's Opinion

#### Valuing Open Opinion Exchanges with Management

Hiroaki Kuramoto  
Chairman, Osaka Gas Workers Union

The Osaka Gas Workers Union is made up of approximately 6,000 members, including employees on loan to affiliates. One particular focus of the union is to strengthen the capacity to monitor and act in partnership with management, and we achieve this through meetings with the president and executives and through meetings with various divisions throughout the entire company (approximately 60

meetings each year), where we relay employee opinions and make policy recommendations.

The goal is to bring labor and management together as a team by exchanging opinions in freewheeling discussions, in the process boosting company performance and getting employees more actively involved.



# Human Resource Development

## Training System

### Training For All Levels and Job Descriptions

Osaka Gas has training programs for all employee levels that are designed to spur motivation and personal growth.

Our wide range of training for all positions and job descriptions includes programs for new employees, mid-level managers, and executives, as well as leader training, management training, tailor-made courses, and overseas training.

## Employee Performance Evaluation and Interviews

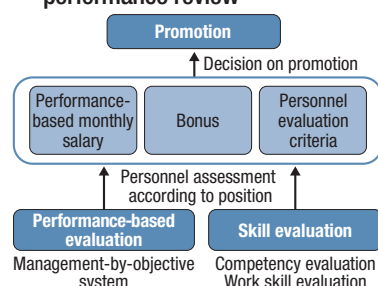
### Evaluating Employees to Help Them Grow

Osaka Gas strives to create a fair system of assessment through meetings between employees and their superiors. The goal is to create a virtuous circle of assessing performance according to clear expectations, giving employees the results of assessment as feedback to foster their growth, and reflecting employee performance in job compensation and benefits.

We also emphasize employees' willingness to take on new challenges

and experiment with new ways to reach their goals. Under our management objective system, employees set and aim for their own targets on the road to greater challenges. They are also evaluated not just on results but on the processes they use to achieve results.

### Judging promotions based on performance review



## TOPICS First Joint New Employee Training Held

From April 5 to 7, 2009, 37 new employees from 13 Osaka Gas Group companies gathered for the first ever joint new employee training at Osaka Gas. Osaka Gas organized this training in response to Group company managers who said they wanted new employees to bond with others starting work at the same time.

The new employees heard lectures

covering the Group Management Principles, CSR activities, compliance, and human rights, learned the business skills necessary to prosper today, and got to know each other at social gatherings. After three days of training, many participants said they were stimulated by the various points of view they heard and that they hoped to keep in contact with their fellow trainees.



# Improving Occupational Health and Safety

## Eliminating Injury in Workplace

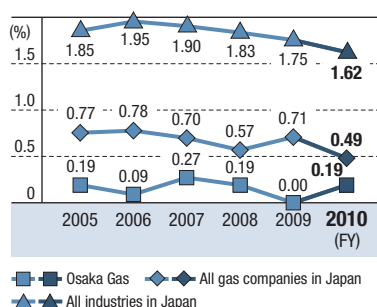
### OSHMS the Basis for Safety Action

Osaka Gas establishes and implements a plan to systematically prevent injury in workplace based on the Occupational Safety and Health Management System (OSHMS), which is established by the International Labor Organization as well as recommended by the Minister of Health, Labour and Welfare. Each business unit and division follows a virtuous circle of setting goals, formulating plans, executing these plans, assessing outcomes, and making improvements.

In fiscal 2010, there were two

accidents resulting in absence from work. Following these accidents, the causes and other details were analyzed, and to prevent their reoccurrence, preventative measures were implemented and shared, and cautions were given at occasions such as daily meetings.

### Workplace injury rate (based on frequency of accidents causing absences from work)



## Maintaining and Improving Health

### Measures for Lifestyle-related Diseases and Mental Health

Osaka Gas established the Health Services Center in the Human Resources Department, where employees undergo health checkups and consultation aimed at preventing and providing support for curing lifestyle-related diseases and mental health problems.

In response to the fiscal 2010 outbreak of a new strain of influenza, a task force was set up in the Human Resources Department to prevent the spread of the virus.



# CSR Management

## CSR Organization

### To Embody the CSR Charter and the Code of Conduct Promotion and Reform in Alignment with Osaka Gas Group CSR Charters I-V

In April 2006, the Osaka Gas Group established the Osaka Gas Group CSR Charter to serve as guidelines for executive officers and employees of the Group enabling it to fulfill its corporate social responsibilities. The CSR Promotion Council, consisting of executives, deliberates CSR plans and reports on results of activities under the supervision of the President of Osaka Gas. From the viewpoint of integrating the promotion of overall CSR activities, we established the CSR Committee to coordinate and advance Group-wide CSR activities. The committee, led by the CSR Executive, is composed of the heads of business units. In fiscal 2011, the committee initiated a new system and established a place for dialogue with internal and external stakeholders as occasion warrants depending on the topic to enable flexible and appropriate responses to the demands of society.

Meetings up to now have focused on the environment and compliance. However, from the current fiscal year, we will be reviewing CSR organization to ensure that it covers all five areas defined in the CSR Charter: creating value for customers, the environment, contributing to society, compliance and human rights, and a management policy of

human growth. The CSR & Environment Department was established to perform administration functions and to act as a hub for CSR activities. With these actions, we will strengthen initiatives under the CSR Charter and aim for achieving CSR that fulfills the demands of society.

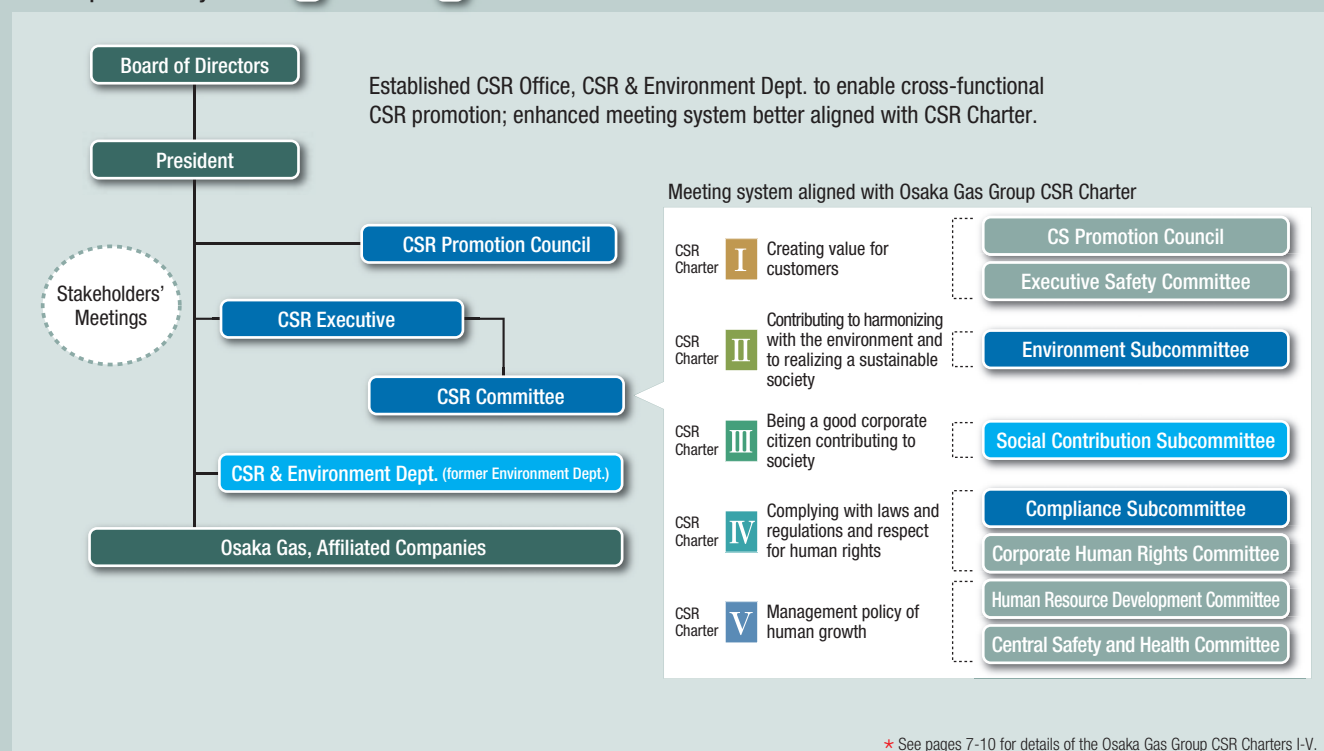
As of fiscal 2011, we will be expanding the current stakeholders' meetings in line with the five domains defined in the CSR Charter and we plan to hold meetings twice a year.

#### CSR related management level meetings

Fiscal 2010	Meetings under the previous system CSR Promotion Council: 2 CSR Committee: 3
Fiscal 2011	Meetings under the previous system CSR Promotion Council: 1 (April)
	Meetings under the new system CSR Promotion Council: 2 CSR Committee: 3

#### CSR promotion system

■ New CSR body ■ Existing CSR body



★ See pages 7-10 for details of the Osaka Gas Group CSR Charters I-V.



# Corporate Governance

## Business Operation and Auditing System

### We Have Established a System to Ensure Accurate and Timely Decision-Making, Execution and Audit

In its decision-making process, Osaka Gas follows a set of company regulations defined by the Board of Directors and other responsible parties. Important decisions are only made after careful, technical scrutiny by the Executive Board, which is comprised of executive directors and executive officers, and after full discussion by the Board of Directors. The Board of Directors comprises thirteen directors, including two outside directors. The Board of Directors makes accurate and speedy business decisions and works to improve operational oversight across the entire Group. Osaka Gas has also introduced an operating officer system in which each executive officer is engaged in business execution as determined by the Board of Directors. At the same time, the President and some directors double as executive officers to further strengthen the oversight and the executive responsibilities of the Board of Directors.

Osaka Gas is a company with a Board of Corporate Auditors. Four corporate auditors, including two outside auditors, monitor the actions of the directors of the Osaka Gas Group. In addition, the Corporate Auditors' Office, composed of three staff members not under the direct control of the directors, has been established to support the auditors and thereby improve the audit system. Osaka Gas has retained KPMG Azsa & Co. as the independent auditor.

## Internal Governance

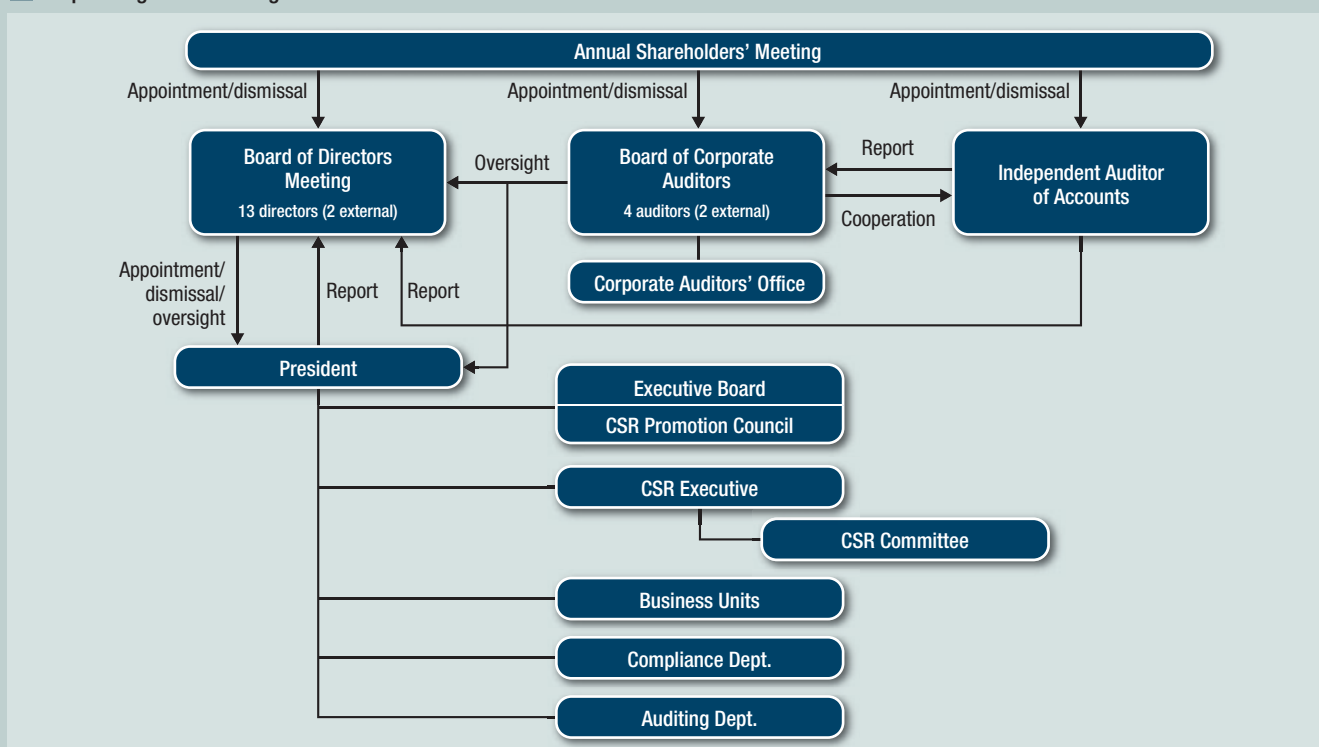
### Ensuring Fair Business Operations and Reliable Financial Reporting

As an internal auditing unit, Osaka Gas maintains the Auditing Department (21 staff members) to oversee the fairness and efficiency of corporate business operations based on the annual audit plan and other guidelines. The department advises and makes recommendations to respective divisions within the company as necessary. Additionally, each Business Unit within the company maintains its own auditor who works to enhance and complete internal control and auditing functions. The Auditing Department, auditors and independent auditors meet on a regular basis to discuss annual audit plans and audit reports, and also convene as required to exchange audit information to ensure the effectiveness of auditing activities.

In April 25, 2006, we established our Internal Regulations ensuring the Business Appropriateness as the fundamental principles of the Osaka Gas Group's internal control system. These were partially revised on April 28, 2010.

The Osaka Gas Group has taken positive steps to establish and strengthen its internal control system to conform with the Companies Act, and fully complies with the stipulated Internal Control Reporting System. To guarantee reliability, the Auditing Department and the auditors of each Business Unit within the company perform evaluations of the status of internal controls. After confirming the effectiveness of its internal controls, the company submitted its internal control report to the Prime Minister in June 2010.

## Corporate governance organization





# Risk Management

## Risk Management Principles of the Osaka Gas Group Clarifying Organizational Responsibility for Risk Management in Internal Rules

The internal regulations of the Osaka Gas Group clarify the organizational structure for promoting and confirming the effectiveness of risk management. Furthermore, the management organization for risk management common to the Group supports the implementation of risk management tasks in each division and business unit for the whole group.

## Organizational Risk Management Structure Each Business Division and Subsidiary or Affiliate of Osaka Gas Serves as the Basic Organizational Unit for Risk Management

The basic unit for risk management in the Osaka Gas Group is each business division, subsidiary or affiliate. The head of each unit is responsible for managing risks of loss and conducts relevant checks on a regular basis.

### ↓ G-RIMS (Gas Group Risk Management System) check list

1.	Financial risks
2.	Credit management risk
3.	Purchase, accounting, tax risks
4.	Risks from electronic banking <sup>1</sup>
5.	Information management risks
6.	Personal information management risk
7.	Information disclosure management risk
8.	Personnel management risks
9.	Disaster prevention and safety risks
10.	Product safety risks
11.	Report-related risks
12.	Lawsuit risks
13.	Environmental problem risks
14.	Risks concerning unfair trading and subsidy
15.	Risks of inappropriate contact
16.	Risks of insider trading
17.	Risks of compliance violation in business execution
18.	Business risks
19.	Other risks on business practices
20.	Intellectual properties management risks
21.	Risks due to deficient internal control

<sup>1</sup> Electronic banking: Financial services carried out over the Internet or via telephone.

## Regular Reviews and Monitoring Operating G-RIMS, Our Own Self-Assessment System

Risks must first be properly recognized. Then, after assessing the current status of risk management and remaining risks, actions must be planned.

G-RIMS (Gas Group Risk Management System) was established and used as a common platform for identifying and managing risks since FY2007. Following the annual self-assessment by each division, the secretariat (Auditing Department, Compliance Department, Corporate Strategy Department and Affiliated Business Dept.) holds discussions with each division to monitor implementation. In the course of this process, the results of reviews are analyzed to identify issues requiring response while important risks unique to the individual divisions are distinguished from those common to the Group. The results of G-RIMS and issue identification are reported to the management.

## Ongoing Improvement and Regular Reviews Reinforcing Internal Management Initiatives

Each division head and manager is responsible to take action for problems identified in the course of risk management reviews and to provide periodic follow up on improvement processes. In addition, the auditor in each business unit and major affiliated company serves as a focal point for discerning issues for internal audit and promote managers' self assessment to reinforce internal risk management initiatives. We ensure an effective PDCA cycle (plan, do, check, act) through these activities for risk management across the entire group.



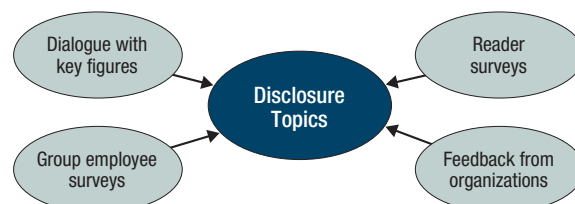
We selected feature topics for this report based on feedback from the dialogue with key figures, survey results, and other sources. We also report on new disclosure items for topics of particular importance to society.

In the course of compiling the CSR Report 2010, Osaka Gas examined the results of the dialogue with key figures, the Web survey for employees of the Osaka Gas Group, and the reader survey attached to the 2009 CSR Report, as well as feedback from a variety of organizations, to determine the topics that should be addressed in this report. The major topic this year is CO<sub>2</sub> reduction initiatives towards 2020.

On the title pages for each CSR Charter section, we have included the fiscal 2010 results for CSR Indicators outlined on page 8.

### New Disclosure Information and Expansion of Disclosure

As our resource businesses expand globally, awareness of the need to take suppliers and the whole supply chain into consideration led us to provide new disclosure items regarding human rights initiatives (page 48) and biodiversity concerns at the supply level (page 39).



## Dialogue with Key Figures

On November 6, 2009, we held a stakeholder dialogue session at the Osaka Gas head office. Along with Osaka Gas Group employees, external key figures were invited to share opinions in groups divided among three topics. Here we provide excerpts from their opinions on each of the topics discussed.



**Masayoshi Kusunoki**

Head of CSR Office, Corporate Communications Department, Sekisui House, Ltd.

### Dialogue 1: Creating Value for Customers

#### Technological innovation dedicated to resolving and mitigating social issues related to energy

Going forward, energy suppliers will need to revolutionize technologies such as gas and fuel cells. At the same time, I believe technological developments such as the Smart Energy House (see page 17) to enable comfortable living with as low energy use as possible will become major topics in the near future. We are taking the initiative with the introduction of fuel cells in our Green First environmentally friendly homes. As Osaka Gas is an energy supplier, we hope to see avid technological development for not only gas but also new forms of energy, and we hope you will promote the results of your prior investments in wider society. I believe that by making cutting-edge technologies the standard, this will raise the bar for society as a whole.



**Ryuta Uozumi**

Chief Executive Officer, KPMG AZSA Sustainability Co., Ltd.

### Dialogue 2: Making a Low-Carbon Society into Reality

#### Enabling a highly energy efficient society with flexible electricity and heating

The advantage of local energy production for local consumption is low transmission loss of energy. Looking at electricity and heating, in general there is more demand for electricity so I believe there is scope for more efficient use of heating even for highly energy efficient cogeneration systems. I hope that by enabling flexibility wherever there is an excess or lack of energy, either electricity or heat, with systems such as the Smart Energy Network (see page 17), electricity and gas will complement each other leading to more efficient energy use across the whole society.



**Masahiro Tsuchioka**

Head of Natural Environment Division, Environmental Development Bureau, Agricultural & Environmental Affairs Department

### Dialogue 3: Supporting Biodiversity

#### Aiming for biodiversity conservation through cooperation between governments, businesses, local residents, and NPOs

I hope that companies will think about how they will deal with compromises between business operations and biodiversity. Each industry has different connections with biodiversity so I hope that Osaka Gas will take deeper consideration not only for concerns within the company but also for external connections. It is essential to contribute to biodiversity conservation and spread the concepts of biodiversity conservation by cooperating with local residents and NPOs. Starting next fiscal year, Hyogo Prefecture will be looking to launch these kinds of initiatives and we would be grateful if Osaka Gas took part in and collaborate with us. (See Conserving Biodiversity, page 39.)



# Environmental Performance Data



The environmental performance data on pages 57-60 has undergone third-party verification by Bureau Veritas Japan Co., Ltd..

Item	Unit	FY2006	FY2007	FY2008	FY2009	FY2010	Remarks
Affiliated companies: No. of consolidated companies <sup>1</sup>		81	81	77	87	82	
<b>Environmental impact</b>							
<b>Energy consumption<sup>2</sup></b>							
<b>Consumption in crude oil equivalent</b>		kℓ	877,169	960,074	912,889	929,581	<b>1,342,356</b>
<b>Electricity and fuel consumption</b>	Osaka Gas	kℓ	118,581	118,361	118,963	120,235	<b>115,319</b>
	LNG terminal	kℓ	42,249	39,879	46,075	45,439	<b>43,757</b>
	Power plant	kℓ	51,376	52,223	47,083	48,789	<b>45,824</b>
	District heating and cooling	kℓ	6,444	6,557	6,982	7,113	<b>6,783</b>
	Offices	kℓ	18,511	19,702	18,823	18,894	<b>18,956</b>
	Affiliates	kℓ	758,588	841,714	793,926	809,346	<b>1,227,037</b>
	Power generation	kℓ	440,358	497,368	444,600	479,556	<b>1,058,687</b>
	District heating and cooling	kℓ	235,026	260,200	255,780	247,688	<b>88,887</b>
	Other	kℓ	83,205	84,146	93,547	82,102	<b>79,463</b>
	<b>Electricity consumption</b>	1,000 kWh	466,523	450,874	512,982	477,519	<b>485,984</b>
	Osaka Gas	1,000 kWh	141,673	132,596	167,763	165,397	<b>154,536</b>
	LNG terminal	1,000 kWh	104,441	95,801	124,970	125,429	<b>113,585</b>
	Power plant	1,000 kWh	830	787	664	1,124	<b>1,058</b>
	District heating and cooling	1,000 kWh	4,301	4,343	4,463	4,299	<b>4,170</b>
	Offices	1,000 kWh	32,101	31,665	37,667	34,545	<b>35,722</b>
	Affiliates	1,000 kWh	324,851	318,278	345,219	312,122	<b>331,448</b>
	Power generation	1,000 kWh	5,947	6,033	6,754	5,896	<b>22,693</b>
	District heating and cooling	1,000 kWh	97,197	97,809	95,620	93,716	<b>88,617</b>
	Other	1,000 kWh	221,706	214,436	242,845	212,511	<b>220,139</b>
	<b>Natural gas consumption</b>	1,000 m <sup>3</sup>	409,644	474,545	445,455	457,702	<b>840,161</b>
<b>Vehicle fuel consumption</b>	Osaka Gas	1,000 m <sup>3</sup>	69,548	71,362	64,886	66,577	<b>66,766</b>
	LNG terminal	1,000 Nm <sup>3</sup>	13,219	13,104	12,792	12,229	<b>13,464</b>
	Power plant	1,000 Nm <sup>3</sup>	44,068	44,807	40,407	41,774	<b>41,192</b>
	District heating and cooling	1,000 m <sup>3</sup>	4,598	4,686	5,025	5,174	<b>4,918</b>
	Offices <sup>5</sup>	1,000 m <sup>3</sup>	7,663	8,766	6,662	7,400	<b>7,193</b>
	Affiliates	1,000 m <sup>3</sup>	340,096	403,184	380,570	391,125	<b>773,395</b>
	Power generation	1,000 m <sup>3</sup>	148,211	189,730	168,338	187,531	<b>705,905</b>
	District heating and cooling	1,000 m <sup>3</sup>	180,887	202,444	199,119	192,576	<b>56,885</b>
	Other	1,000 m <sup>3</sup>	10,998	11,010	13,112	11,018	<b>10,605</b>
	<b>Other fuel consumption (coal, heavy oil, etc., in crude oil equivalent)</b>	kℓ	276,964	288,162	259,305	271,426	<b>240,405</b>
	Osaka Gas	kℓ	19	3	17	5	<b>11</b>
	LNG terminal	kℓ	19	3	17	5	<b>11</b>
	Power plant	kℓ	0	0	0	0	<b>0</b>
	District heating and cooling	kℓ	0	0	0	0	<b>0</b>
	Offices	kℓ	0	0	0	0	<b>0</b>
	Affiliates	kℓ	276,946	288,158	259,288	271,421	<b>240,394</b>
	Power generation	kℓ	266,737	275,526	247,410	260,300	<b>233,278</b>
	District heating and cooling	kℓ	14	3	6	1	<b>11</b>
	Other	kℓ	10,194	12,630	11,872	11,121	<b>7,105</b>
	<b>Gasoline</b>	kℓ	3,809	3,663	3,676	3,369	<b>3,175</b>
<b>Vehicle fuel consumption</b>	Osaka Gas	kℓ	1,046	1,058	1,016	1,011	<b>1,028</b>
	LNG terminal	kℓ	1	1	1	1	<b>1</b>
	Other	kℓ	1,044	1,057	1,015	1,010	<b>1,027</b>
	Affiliates	kℓ	2,764	2,605	2,660	2,358	<b>2,147</b>
	Power generation	kℓ	1	0	1	1	<b>1</b>
	District heating and cooling	kℓ	0	1	1	0	<b>43</b>
	Other	kℓ	2,762	2,604	2,659	2,357	<b>2,104</b>
	<b>Natural gas<sup>5</sup></b>	1,000 m <sup>3</sup>	474	424	509	520	<b>481</b>
	Osaka Gas	1,000 m <sup>3</sup>	367	380	430	453	<b>429</b>
	LNG terminal	1,000 m <sup>3</sup>	11	12	12	11	<b>11</b>
	Other	1,000 m <sup>3</sup>	356	368	419	442	<b>419</b>
	Affiliates	1,000 m <sup>3</sup>	107	44	79	68	<b>52</b>
	Power generation	1,000 m <sup>3</sup>	0	0	0	0	<b>0</b>
	District heating and cooling	1,000 m <sup>3</sup>	0	0	0	0	<b>0</b>
	Other	1,000 m <sup>3</sup>	38	44	79	68	<b>52</b>

<sup>3</sup> Data on power generation by district cooling/heating companies now falls under power generation.

<sup>4</sup> Including the gas before adding LPG for calorific value adjustment.

<sup>5</sup> In the gas consumption calculations, some of the figures for offices and vehicle fuel are figures announced by Osaka Gas.

Figures in the table do not appear to add up to the totals due to rounding.



Item			Unit	FY2006	FY2007	FY2008	FY2009	FY2010	Remarks	
	Diesel oil		kl	369	664	1,064	823	579		
		Osaka Gas	kl	15	14	11	6	17		
			LNG terminal	kl	4	4	3	3		4
			Other	kl	11	10	8	2		14
		Affiliates	kl	354	651	1,054	817	561		
			Power generation	kl	17	13	11	15		0
			District heating and cooling	kl	0	0	0	0		0
			Other	kl	337	637	1,042	802		561
	LPG		1,000 m³	144	186	167	164	305		
		Osaka Gas	1,000 m³	0	0	0	0	0		
			LNG terminal	1,000 m³	0	0	0	0		0
			Other	1,000 m³	0	0	0	0		0
		Affiliates	1,000 m³	144	186	167	164	305		
			Power generation	1,000 m³	0	0	0	0		0
			District heating and cooling	1,000 m³	0	0	0	0		0
			Other	1,000 m³	144	186	167	164		305
	Heavy oil, etc. (in crude oil equivalent)		kl	0	91	63	130	115		
		Osaka Gas	kl	0	0	0	0	0		
			LNG terminal	kl	0	0	0	0		0
			Other	kl	0	0	0	0		0
		Affiliates	kl	0	91	63	130	115		
			Power generation	kl	0	0	0	0		0
			District heating and cooling	kl	0	0	0	0		0
			Other	kl	0	91	63	130		115

#### Atmospheric emissions

<b>CO<sub>2</sub> emissions<sup>2</sup></b>		1,000 tons-CO <sub>2</sub>	2,226	2,398	2,270	2,316	3,104	
Osaka Gas		1,000 tons-CO <sub>2</sub>	260	258	267	268	261	
	LNG terminal	1,000 tons-CO <sub>2</sub>	102	96	115	114	109	
	Power plant	1,000 tons-CO <sub>2</sub>	101	103	93	95	94	
	District heating and cooling	1,000 tons-CO <sub>2</sub>	13	14	15	15	14	
	Offices	1,000 tons-CO <sub>2</sub>	43	45	45	44	44	
	Affiliates	1,000 tons-CO <sub>2</sub>	1,966	2,140	2,003	2,048	2,843	
	Power generation	1,000 tons-CO <sub>2</sub>	1,280	1,406	1,258	1,347	2,451	
	District heating and cooling	1,000 tons-CO <sub>2</sub>	481	531	522	506	192	
	Other	1,000 tons-CO <sub>2</sub>	205	203	222	195	200	
<b>CO<sub>2</sub> emissions (Reference: Data for comparison)<sup>6</sup></b>		1,000 tons-CO <sub>2</sub>	2,070	2,248	2,089	2,161	2,941	
Osaka Gas		1,000 tons-CO <sub>2</sub>	213	214	208	214	209	
	LNG terminal	1,000 tons-CO <sub>2</sub>	67	64	71	73	71	
	Power plant	1,000 tons-CO <sub>2</sub>	101	103	93	95	93	
	District heating and cooling	1,000 tons-CO <sub>2</sub>	12	12	13	13	13	
	Offices	1,000 tons-CO <sub>2</sub>	32	35	31	33	33	
	Affiliates	1,000 tons-CO <sub>2</sub>	1,857	2,034	1,881	1,947	2,732	
	Power generation	1,000 tons-CO <sub>2</sub>	1,278	1,404	1,256	1,345	2,444	
	District heating and cooling	1,000 tons-CO <sub>2</sub>	449	499	488	475	162	
	Other	1,000 tons-CO <sub>2</sub>	131	132	137	126	126	

Figures in the table do not appear to add up to the totals due to rounding.

1 Affiliates' data indicates the total for the companies, excluding overseas and tenant locations where data is difficult to collect. The number of the companies surveyed differs by year and by item.

2 The following per-unit calorific values and emission factors are used for the calculation of energy consumption and CO<sub>2</sub> emissions.

	Purchased electricity	Gas	Before adding LPG for calorific value adjustment	Gasoline	Diesel oil	LPG	LNG	Heavy fuel oil A	Kerosene	Coal
Per-unit calorific value	9.97	45.0	40.9	34.6	37.7	104.3	54.6	39.1	36.7	25.7
	GJ/1,000 kWh	GJ/1,000 Nm <sup>3</sup>	GJ/1,000 Nm <sup>3</sup>	GJ/kℓ	GJ/kℓ	GJ/1,000 m <sup>3</sup>	GJ/ton	GJ/kℓ	GJ/kℓ	GJ/ton
Emission factor	* 0.69	2.29	2.23	2.32	2.58	6.17	2.70	2.71	2.49	2.33
	tons-CO <sub>2</sub> /1,000 kWh	tons-CO <sub>2</sub> /1,000 Nm <sup>3</sup>	tons-CO <sub>2</sub> /1,000 Nm <sup>3</sup>	tons-CO <sub>2</sub> /kℓ	tons-CO <sub>2</sub> /kℓ	tons-CO <sub>2</sub> /1,000 m <sup>3</sup>	tons-CO <sub>2</sub> /ton	tons-CO <sub>2</sub> /kℓ	tons-CO <sub>2</sub> /kℓ	tons-CO <sub>2</sub> /ton

\* CO<sub>2</sub> emission of purchased electricity subject to control is calculated using the average factor of thermal power plants so that the Osaka Gas Group can precisely assess how the reduction of purchased electricity has contributed to a reduction in CO<sub>2</sub> emission.

Sources:

Emission factor of purchased electricity (average factor of thermal power sources): Please refer to July 2001 Target Achieved Scenario Subcommittee Interim Summary, Global Environmental Committee, Central Environmental Council.

Per-unit calorific value and emission factor of gas are as per the announcement of Osaka Gas.

Other values are as per the ministerial ordinance under the Law concerning the Promotion of Measures to Cope with Global Warming.

6 Following factors are used for calculation of the CO<sub>2</sub> emission of purchased electricity.

FY		2006	2007	2008	2009	2010
Emission factor	kg-CO <sub>2</sub> /kWh	0.356	0.358	0.338	0.366	0.355

The yearly CO<sub>2</sub> emission of purchased electricity is calculated by multiplying the year's electricity consumption by the year's emission factor, which means the emission factor used for the calculation varies from year to year. Therefore, the year-to-year difference in CO<sub>2</sub> emission does not necessarily reflect the effect of emission control measures.



Item		Unit	FY2006	FY2007	FY2008	FY2009	FY2010	Remarks			
Environmental impact											
Methane emission		tons-CH <sub>4</sub>	129	115	109	110	148	Discharges are the same as consumptions of general, industrial water, and sea water.			
		Osaka Gas	tons-CH <sub>4</sub>	129	115	109	110		148		
Nitrogen oxide emission		tons-NOx	469	521	343	186	503				
		Osaka Gas	tons-NOx	17	24	24	20		23		
		Affiliates	tons-NOx	452	497	319	166		480		
Sulfur oxide emission		tons-SOx	172	190	151	146	94				
		Osaka Gas	tons-SOx	0	0	0	0		0		
		Affiliates	tons-SOx	172	190	151	146		94		
Water usage											
General and industrial water consumption <sup>7</sup>		10,000 m <sup>3</sup>	675	842	771	736	1,135	Discharges are the same as consumptions of general, industrial water, and sea water.			
		Osaka Gas	10,000 m <sup>3</sup>	151	145	150	190		157		
			LNG terminal	10,000 m <sup>3</sup>	110	107	117		157	120	
			Other	10,000 m <sup>3</sup>	41	37	34		32	37	
		Affiliates	10,000 m <sup>3</sup>	525	698	621	546		978		
			Power generation	10,000 m <sup>3</sup>	147	177	162		170	488	
			District heating and cooling	10,000 m <sup>3</sup>	171	200	208		203	118	
			Other	10,000 m <sup>3</sup>	206	321	251		173	372	
Sea water consumption <sup>7</sup>		10,000 m <sup>3</sup>	62,259	59,916	59,951	57,265	59,425				
		Osaka Gas	10,000 m <sup>3</sup>	41,782	38,208	38,827	38,504	38,826			
		Affiliates	10,000 m <sup>3</sup>	20,477	21,708	21,125	18,760	20,599			
Chemical substances (Osaka Gas)											
Xylene	Handled	tons	8.40	4.50	3.45	1.44	1.75				
	Released	tons	8.40	4.50	3.45	1.44	1.75				
	Transferred	tons	0.00	0.00	0.00	0.00	0.00				
Toluene	Handled	tons	5.00	2.58	1.49	0.05	0.03				
	Released	tons	5.00	2.58	1.49	0.05	0.03				
	Transferred	tons	0.00	0.00	0.00	0.00	0.00				
Waste											
General waste	Generated		tons	2,207	2,240	1,962	1,459	2,286			
			Osaka Gas	tons	1,120	1,177	1,126	750		982	
				LNG terminal	tons	34	33	65		75	69
				Other	tons	1,086	1,145	1,061		675	914
				Affiliates	tons	1,086	1,062	836		709	1,303
			Power generation	tons	7	29	11	17		2	
			District heating and cooling	tons	12	8	2	7		3	
			Other	tons	1,068	1,025	823	685		1,298	
	Recycled		tons	1,180	1,251	1,300	944	2,066			
			Osaka Gas	tons	943	962	1,004	691		927	
				LNG terminal	tons	32	30	64		74	68
				Other	tons	911	932	940		617	859
			Affiliates	tons	237	289	296	253		1,139	
				Power generation	tons	0	0	0		0	2
				District heating and cooling	tons	1	2	1		2	2
				Other	tons	235	288	295		251	1,136
	Final disposal		tons	1,027	988	662	515	220			
			Osaka Gas	tons	177	215	122	59		55	
				LNG terminal	tons	2	3	1		1	1
				Other	tons	175	212	121		58	55
				Affiliates	tons	850	773	540		456	164
			Power generation	tons	7	29	11	17		0	
			District heating and cooling	tons	10	6	1	5		1	
			Other	tons	833	738	528	434		163	
	Recycling rate		%	53	56	66	65	90			
			Osaka Gas	%	84	82	89	92		94	
				LNG terminal	%	95	91	99		99	99
				Other	%	84	81	89		91	94
				Affiliates	%	22	27	35		36	87
			Power generation		%	0	0	0		0	94
			District heating and cooling		%	12	20	50		29	51
			Other		%	22	28	35		37	87

Figures in the table do not appear to add up to the totals due to rounding.





Item		Unit	FY2006	FY2007	FY2008	FY2009	FY2010	Remarks
Industrial waste	Generated	tons	78,805	80,839	95,616	84,242	66,462	<p><sup>8</sup> In addition to gas appliances collected through Osaka Gas dealers, also included are used bathtubs and other household equipment.</p> <p><sup>9</sup> Estimated amount of soil generated: The amount that is believed to be generated when doing pipe installation without using current methods for reducing the amount of excavated soil. The difference between this figure and the actual amount generated is the reduced amount.</p> <p><sup>10</sup> Amount utilized: The amount used outside of Osaka Gas, such as for improving farmland soil. Final disposal is the amount generated minus the amount recycled and the amount utilized.</p> <p><sup>11</sup> When reliquefying BOG (boil-off gas), which has been gasified in the LNG tank, LNG cryogenics is used instead of electricity.</p> <p><sup>12</sup> With FY1999 as the base year, a calculation of the amount of CO<sub>2</sub> reduced as a result of employing high-efficiency equipment and systems, such as cogeneration systems, gas air conditioners, and high-performance industrial furnaces.</p>
	Osaka Gas	tons	3,358	2,913	2,938	3,065	3,112	
	LNG terminal	tons	115	175	124	135	113	
	Other	tons	3,243	2,738	2,814	2,931	2,999	
	Affiliates	tons	75,447	78,286	92,679	81,177	63,350	
	Power generation	tons	36,223	34,956	32,080	36,838	33,154	
	District heating and cooling	tons	60	22	25	17	59	
	Other	tons	39,163	43,307	60,574	44,322	30,138	
	Recycled	tons	70,738	71,981	85,412	75,534	61,099	
	Osaka Gas	tons	3,160	2,782	2,780	3,010	3,056	
	LNG terminal	tons	112	171	121	135	113	
	Other	tons	3,048	2,610	2,659	2,876	2,943	
	Affiliates	tons	67,578	69,199	82,631	72,524	58,043	
	Power generation	tons	35,913	34,685	31,766	36,271	32,659	
	District heating and cooling	tons	0	13	11	11	18	
	Other	tons	31,665	34,502	50,854	36,242	25,367	
	Final disposal	tons	8,067	9,218	10,204	8,708	5,363	
	Osaka Gas	tons	198	131	157	55	56	
	LNG terminal	tons	3	4	2	0	0	
	Other	tons	195	128	155	55	56	
	Affiliates	tons	7,869	9,086	10,047	8,652	5,307	
	Power generation	tons	310	272	314	566	495	
	District heating and cooling	tons	60	10	14	6	41	
	Other	tons	7,498	8,805	9,719	8,080	4,771	
	Recycling rate	%	90	89	89	90	92	
	Osaka Gas	%	94	95	95	98	98	
	LNG terminal	%	98	98	98	100	100	
	Other	%	94	95	94	98	98	
	Affiliates	%	90	88	89	89	92	
	Power generation	%	99	99	99	98	99	
	District heating and cooling	%	0	57	45	64	30	
	Other	%	81	80	84	82	84	
Used gas appliances, etc. (Osaka Gas) <sup>8</sup>								
	① Collected	tons	5,523	4,786	4,327	3,470	3,438	
	② Recycled	tons	4,570	3,900	3,541	2,784	2,763	
	③ Final disposal (①-②)	tons	953	887	786	686	675	
	④ Recycling rate (③÷①)	%	83	81	82	80	80	
Polyethylene pipes (Osaka Gas)	Collected	tons	152	155	152	145	203	
	Recycled	tons	152	155	152	145	203	
	Recycling rate	%	100	100	100	100	100	
Excavated soil (Osaka Gas)	① Amount during installation	km	961	902	909	886	770	
	② Estimated amount of soil generated using conventional method <sup>9</sup>	10,000 tons	183	184	183	180	163	
	③ Reduced	10,000 tons	85	83	83	78	68	
	④ Generated (②-③)	10,000 tons	98	101	100	102	95	
	⑤ Recycled	10,000 tons	76	83	84	87	85	
	⑥ Recycling rate (⑤÷④)	%	78	82	84	85	89	
	⑦ Utilized <sup>10</sup>	10,000 tons	18	14	13	12	9	
	⑧ Final disposal (④-⑤-⑦)	10,000 tons	5.5	3.9	3.5	3.3	1.4	
Copy paper	Osaka Gas	10,000 sheets	3,608	3,851	4,004	4,044	4,875	
	Affiliates	10,000 sheets	—	—	—	—	5,994	

#### Environmental impact reduction (Osaka Gas)

Use of LNG cryogenics		1,000 tons	4,194	4,085	3,391	3,678	3,398
	Cryogenic power generation	1,000 tons	2,445	2,453	1,546	2,006	1,860
	Expansion turbine	1,000 tons	1,000	1,036	1,143	1,039	960
	BOG re-liquefaction <sup>11</sup>	1,000 tons	749	596	702	633	578
CO <sub>2</sub> emission reduction at customer sites <sup>12</sup>		1,000 tons-CO <sub>2</sub>	1,631	2,068	2,171	2,332	2,461

#### Environmental management indicators (Osaka Gas)

Environmental management efficiency	yen/1,000 m <sup>3</sup>	103	90	91	92	77
Monetary value of environmental impact reduction	100 million yen	3.8	4.3	3.9	3.5	3.3
Environmental impact reduction efficiency	yen/1,000 m <sup>3</sup>	46	49	43	42	41
Monetary value of environmental impact reduction at customer sites	100 million yen	57	73	76	82	87
Environmental impact reduction efficiency at customer sites	yen/1,000 m <sup>3</sup>	680	833	860	980	1,067

#### Gas sales by volume (Osaka Gas)

Gas sales by volume	million m <sup>3</sup>	8,448	8,737	8,887	8,380	8,119
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Figures in the table do not appear to add up to the totals due to rounding.



# Third Party Review

The Osaka Gas Group contracted with the Institute for Environmental Management Accounting (IEMA) for a third party review, including assessment and recommendations as well as simple audits.

IEMA interviewed the managers of our front-line departments on the planning and implementation of social and environmental management activities at the Osaka Gas Group. An overall evaluation and feedback based on these interviews and other reviews were then presented during a subsequent conversation with the CSR Executive.



**Masashi Kuroda**  
Executive Vice President and  
CSR Executive, Osaka Gas  
Co., Ltd.



**Yuichiro Yamaguchi**  
Manager, CSR & Environment  
Department, Osaka Gas  
Co., Ltd.



## Assessment and Opinion of CSR Management at Osaka Gas Co., Ltd.

July 30, 2010  
Eriko Nashioka,  
Certified Public Accountant and  
Certified Tax Accountant, and Director,  
Institute for Environmental  
Management Accounting (IEMA)

### Purpose of the Review and Overview of Procedure

We express our opinion to help enhance the reliability of the Osaka Gas CSR Report 2010 by assessing its CSR initiatives, with the exception of those related to environmental management, from our position as a third-party that maintains no business relationships with Osaka Gas. We interviewed Masashi Kuroda, CSR Executive and Executive Vice President, as well as other responsible personnel to clarify the planning and implementation of CSR management (excluding environmental management) at Osaka Gas as well as the evaluation and utilization of environmental performance data, which indicates the results of these activities and serves as the basis of disclosed information.

### Assessment and Opinion

In March 2009, the company announced its "Field of Dreams 2020" Long-term Management Vision and Medium-Term Management Plans, which details the direction Osaka Gas will take and its vision of the ideal future. Taking the Osaka Gas Group CSR Charter as its foundation, it outlines the strengthening of its core domestic energy businesses and the expansion of international energy businesses along the energy value chain, environmental businesses, and other non-energy businesses. Reading this report, it is clear that work is steadily progressing toward the achievement of this vision. The Group has completed the establishment of its domestic CSR management system and has reached the stage of strengthening its initiatives. Management utilizing CSR Indicators gives a very good impression.

In future, we hope to see the company establish these high level CSR activities as a foundation and at the same time as being a community-based company develop into a global enterprise that utilizes these common foundations. For management at domestic affiliated companies it is necessary to manage existing systems and work unceasingly toward ensuring that obvious solutions become the standard. While they are difficult to evaluate, it is hoped that indicators for even the extremes of the value chain will also be utilized. The Osaka Gas Group should be aware of the societal role that it is expected to take on the global scene. The next step will be turning this idea into action. As a public utility, the company must fulfill the need to constantly evolve in order to ensure the continuity of stable management. It is likely that implementation of CSR management is not yet complete and I hope to see further actions toward become a sustainable company.

### Opinions on CSR Activities

Osaka Gas engages in management utilizing quantitative indicators for its CSR goals. These kinds of leading organizations that undertake management based on key indicators for goals are few and far between. Currently the company discloses a single indicator for each of the five goals within the CSR Charter. However, the implementation and disclosure of several quantitative summary indicators, as per the environmental management indicators, will facilitate deeper understanding of the status of each activity and activities overall. While it is difficult to create indicators for goals regarding compliance management, it is important to continue to spread compliance to every part of the Group. Currently the company is working hard to foster deeper comprehension based on the Code of Conduct of the Osaka Gas Group. However, for each and every individual to fully absorb all of this, it is necessary to condense and rewrite the contents.

The company must continue to carry out highly effective initiatives in future thereby ensuring growth by responding to the demand of society, such as the provision of stable energy supplies, and regional revitalization and contributions. As an energy supplier, the company must ensure stable supplies of resources from overseas and, therefore, we believe it is essential to have a global perspective. From here on, we hope to see consideration for the Osaka Gas Group's international CSR program with a foothold in the foundations of its domestic CSR management. We hope to see the Osaka Gas Group receive higher acclaim by clearly defining its core CSR activities taking into account its role in society as a global business.

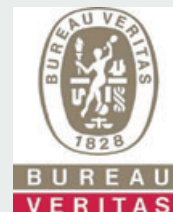
### Opinions on Stakeholder Communication

Osaka Gas maintains communication with the various stakeholders defined in its CSR Charter and this report provides a compilation of these opinions. The report provides easy-to-understand figures and notation throughout, facilitating comprehension on behalf of each of the stakeholder groups, and the photos of employees and third parties lends an air of familiarity.



# Third Party Verification

Bureau Veritas Japan Co., Ltd. provided a third party verification of the environmental performance data of the Osaka Gas Group to be included in its CSR Report 2010. The verification was conducted to confirm the data were sufficiently reliable and consistent for the purpose of the Report.



## Locations

Head Office: Functions for data aggregation

Himeji LNG Terminal, Osaka Gas Co., Ltd.: LNG processing

Funamachi Power Plant, Nakayama Joint Power Generation Corp.: Gas-fired power plants

Nagoya Power Plant, Nakayama Nagoya Joint Power Generation Corp.: Coal-fired power plants

OG Sports Co., Ltd.: Amenities businesses



## Content of the Verification

Head Office:

1. Reliability of data collection and compilation system, adequate operation of system and effectiveness of internal verification
2. Accuracy of the compiled data for FY2010 (April 2009 to March 2010)
3. Validity of conclusions derived from compiled data

Individual business locations:

1. Adequateness of the scope of data collection
2. Effectiveness of data measurement, collection and compilation methods and effectiveness of internal verification
3. Reliability of measurement data and collected data and accuracy of compiled results

This verification was conducted according to Bureau Veritas Japan's CSR Report Third Party Inspection Procedures and Guidelines, which is based on outstanding case studies. In addition, Bureau Veritas Japan provided limited warranty for this verification with reference to ISAE (International Standards on Assurance Engagements) 3000 (revised in December 2003 by the IFA (International Federation of Accountants)).

## Opinion

The environmental performance data in CSR Report 2010 are free of serious errors and sufficiently reliable for use in the report.

Although minor errors were found in some data in the process of examination, all errors were corrected prior to publication of the report.

## Pursuing Effective Synergies in Group Activities with the Establishment of the CSR & Environment Department

**Masashi Kuroda**

Executive Vice President and  
CSR Executive, Osaka Gas Co., Ltd.

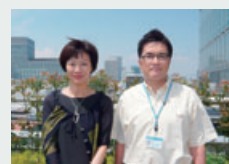


The Osaka Gas Group is inherently disposed to take on new challenges. For CSR as well, without any particular awareness, the Group has undertaken initiatives within its daily business operations focused on the environment and compliance. It has made progress toward achieving the CSR Indicators disclosed in summer of 2009. However, rather than resting on its laurels, the Group is working toward new approaches building on its base and ensuring the Group as a whole is aligned in its resolute philosophy. To this end, in April 2010, the CSR & Environment Department was formed to work on the goals defined in the CSR Charter from a cross-sectional approach. The department will work to create effective synergies by examining, understanding and compiling the individual activities of each business division, subsidiary and affiliate within the Group.

In the field of CSR activities, environmental measures are particularly important for energy suppliers. Just as in the

June 2010 cabinet decision referring to the Basic Energy Plan for the early realization of a low-carbon society, in which natural gas takes a highly important place, the Osaka Gas Group has taken proactive measures in its upstream businesses. Taking these kinds of steps toward stable supplies as a foundation, by combining gas with renewable energy sources such as solar and biogas, and with the use of IT enabling the most efficient use of energy with not just electricity but also heat, the Group will continue to pursue both the mitigation of global warming and comfortable lifestyles.

In the future as well, in order to ensure that we continue to be the corporate group of choice for our customers, we must take the customer's perspective and think about how to respond to the customer's demand. We must be open to all opinions and feedback, including negative points, and continue our dialogue with all stakeholders.



We made this report. We look forward to hearing your feedback and opinions.



Design Your Energy 夢ある明日を



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