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TOKYO GAS ENVIRONMENTAL REPORT

2002

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Editorial policy for the Tokyo Gas Environmental Report 2002

At Tokyo Gas, environmental reports are regarded as important tools of corporate communication and have been published on an annual basis since fiscal 1994.

While trying to maintain the level of understandability established in previous editions, the format of the Environmental Report 2002 differs in that it presents environmental performance data in terms of performance category instead of business field. In addition, the reports on the environmental communication field and social aspects under the heading of "labor safety and health", begun in fiscal 2001, have been integrated into a single report on social activities.

Notation

Guideline

This indicates that the item is a subject to the Guidelines for Environmental Conservation.

Review

This indicates that the item is a subject to independent review.

Tokyo Gas Environmental Report 2002

Subject year:

FY2001 (April 1, 2001 – March 31, 2002)

Scope of data presentation:

Tokyo Gas Co., Ltd.

(use of estimates for some items in the case of the Shinjuku Park Tower section)

The 13 affiliated companies included in consolidated statements:

Tokyo Gas Energy Co., Ltd.; Tokyo Gas Chemicals Co., Ltd.; Tokyo Oxygen and Nitrogen Co., Ltd.; Tokyo Gas Urban Development Co., Ltd.; Park Tower Hotel Co., Ltd.; Kanpai Co., Ltd.; Gastar Co., Ltd.; TG Credit Service Co., Ltd.; Chiba Gas Co., Ltd.; Tsukuba Gakuen Gas Co., Ltd.; Tokyo Gas Engineering Co., Ltd.; TG Information NETWORK Co., Ltd.; TG Enterprise Co., Ltd.

The 6 affiliated companies not included in consolidated statements:

Tokyo Carbonic Acid Co., Ltd.; Japan Super Freeze Co., Ltd.; Tokyo Gas Building Service Co., Ltd.; Tosetz Co., Ltd.; Tokyo Gas Housing Co., Ltd.; TG Automobile Service Co., Ltd.

Fields of data presentation:

- (1) Environmental conservation
- (2) Social activities

Month and year of publication: July 2002

Scheduled month and year of publication of Environmental Report 2003: July 2003

Outline of Tokyo Gas Co.,Ltd.(independent of affiliated companies)

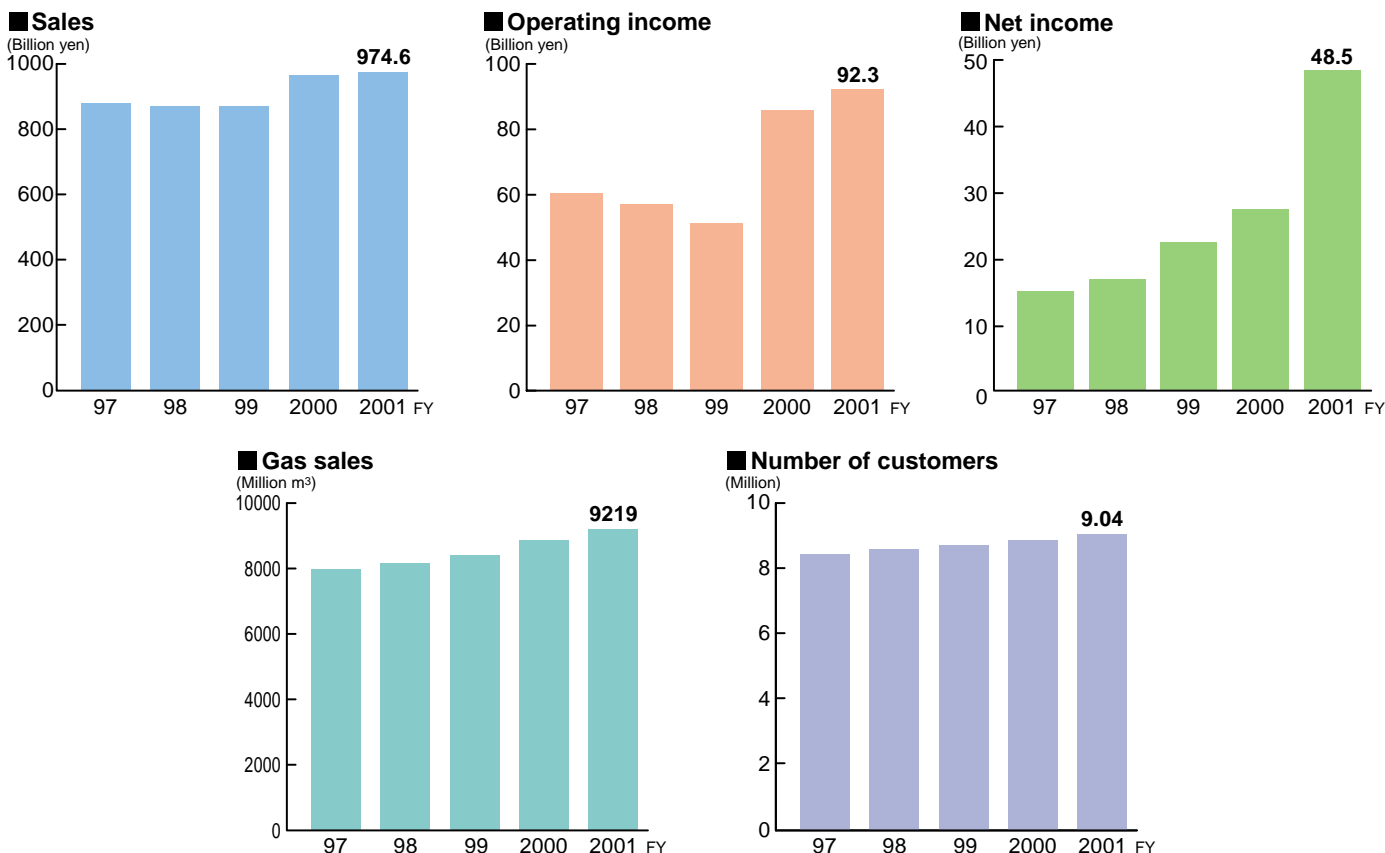
1. Date of establishment: October 1, 1885

2. Capital: 141.8 billion yen (as of March 31,2002)

3. Major business: (1) Manufacture, supply, and sales of gas
(2) Sales of gas appliance and related construction work
(3) Supply of heat
(4) Supply of electricity

4. Supply area: Major cities in the Metropolis of Tokyo and the prefectures of Kanagawa, Saitama, Chiba, Ibaraki, Gunma, Tochigi, Yamanashi, and Nagano

5. Key data:



About natural gas

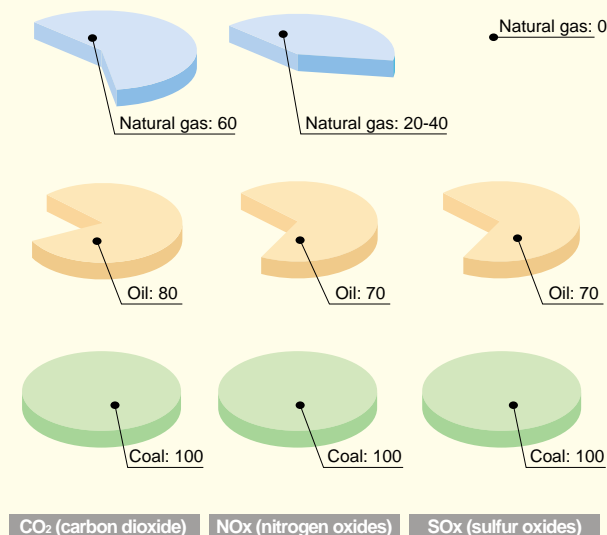
Natural gas is the main feedstock for city gas. It has the reputation of being a clean energy because its controlled combustion releases lower levels of substances that cause global warming or air pollution.

Carbon dioxide (CO₂), a major cause of global warming, is emitted when carbon combines with atmospheric oxygen in the air during combustion. Natural gas consists mainly of methane (CH₄), and has a smaller proportion of carbon atoms in its molecules than do either oil or coal. As a result, of all fossil fuels, Natural Gas releases the least CO₂ when combusted.

Nitrogen oxides (NO_x) pollute the air. A major cause of NO_x emissions is the combustion of fuels containing nitrogen, because the nitrogen contained in a fuel and that in the air react with oxygen during combustion. Fuel made from natural gas, however, has almost no nitrogen content. Moreover, because it is a gas, its combustion can easily be controlled by burner design and therefore very low NO_x emissions, compared to other fossil fuels, can be obtained. Similarly, virtually no emissions of sulfur oxides (SO_x) because sulfur-containing impurities, such as hydrogen sulfide (H₂S), are removed at the time of liquefaction.

Ever since 1969, Tokyo Gas has been importing liquefied natural gas (LNG) as a feedstock for its manufacture of city gas (see page 35).

Comparison of emission levels (coal = 100)



Source: IEA Natural Gas Prospects (1986), Natural Gas Prospects and Policies (1991)

Pursuing Corporate Management in Harmony with the Environment

上原英治

Hideharu UEHARA
President
Tokyo Gas Co., Ltd.



With the start of the new century, we find ourselves in a world that is more complex and diverse than ever before. When considering environmental issues as well, observers have pointed out all sorts of problems on both global and regional levels, with complicated causality and widening influence. Although most parties have recognized the need to address these problems, approaches to solving these problems have not exactly been making rapid headway, partly because of conflicting national interests as well as environmental versus economic considerations. A case in point is the problem of global warming. Last autumn, an agreement was finally reached on the rules for the implementation of the Kyoto Protocol. Japan decided in favor of ratification this June. Nevertheless, there remains some doubt about actual efficacy of the protocol because of disengagement by the United States and the lack of participation by developing countries.

The same applies to the problems of waste disposal, air pollution, and soil contamination. In Japan, a succession of laws have been enacted in these areas, but actual countermeasures have not yet taken root. To achieve breakthroughs in this situation requires positive-minded action to improve the environment to be taken by national and local governments, companies, and citizens, with each party doing what it can and coordinating their actions with the others. Companies have a particularly vital role to play in mitigating the environmental impact of their production/manufacture of goods, and services. This is the major factor behind the growing tendency to rate companies in terms of their environmental friendliness and to consider this rating when selecting goods and services.

Under these circumstances, we added a pledge to make contributions toward the alleviation of global environmental problems to our Management Philosophy last year, and have pledged vigorous and ongoing promotion of environmental conservation activities by all members of the Tokyo Gas Group. We also reaffirmed our dedication to the three main tasks set up by the Company: (1) full-

fledged environmental management, (2) positive environmental partnership with all of our stakeholders, and (3) the development of environmental businesses. On the environmental management front, we have launched a Group-wide effort, with the participation of all employees, toward the goal of having the departments in our gas business, our consolidated affiliates, and other affiliates with a potentially great environmental impact win certification under ISO14001, the international environmental standard. We believe that, through ISO14001 certification, we can raise the level of environment-conserving measures even higher and thereby increase our corporate value. I, for one, am convinced that management with concern for the environment can enhance the value of our company, benefit our sales and fund-raising efforts, and lead to our continued advancement and growth.

The energy field appears to be heading for more intense competition for market share as newcomers enter from various industries, and expanded deregulation. While we aspire to evolve into a total energy supplier to survive in this age of megacompetition, we must take a proactive approach to environmental conservation issues while continuing to achieve solid results. This will be appreciated by our communities, customers, and shareholders, who will recognize the Tokyo Gas Group as an extremely environment-conscious organization and prefer it over our competitors. This is why I think environmental management is nothing less than a fundamental strategy for our sustained advancement.

To these ends, we must fulfill our role as a good corporate environmental citizen by measures including a further reduction of the environmental burden associated with our corporate activities, the promotion of the more efficient utilization of natural gas, the development of a diverse environmental business that will expand the sphere and profits of the Group, and the promotion of "Eco-life" activities in Japan and technical cooperation in other countries.

July 2002

A Look Back at the Environmental Activities in fiscal 2001

In its status as a leader in Japan's energy industry, Tokyo Gas has taken conservation of the environment as one of its top priorities. Besides executing multiple measures for this purpose, we have made provisions for the wide-spread disclosure of information about our efforts and their results. Information has been disseminated through both these environmental reports and the Internet, with a view to gaining the understanding and support of all. The major achievements of our environmental activities in fiscal 2001, from this perspective are outlined as follows.

FY2001 targets and achievements

In accordance with the medium and long-term goals noted in our Guidelines for Environmental Conservation posting, we set targets for fiscal 2001 and worked to attain them through the "plan-do-check-action" (PDCA) cycle. As a result, we were able to assist our customers to cut their CO₂ emissions by 2.34 million tons-CO₂, and also to reduce the basic units of energy use in our business activities. The development and increased use of low-NO_x burner technology enabled us to cut the average NO_x concentration of emissions from city gas equipment to 80% of fiscal 1990 levels. Meanwhile, in the area of resource recycling, more rigorous sorting of industrial waste reduced the final disposal volumes to about 10% of the amount generated. We also made efforts to reduce the generation of waste paper, and were able to achieve a 9% reduction from fiscal 1999 levels. More extensive use of shallow pipe installation and trenchless construction methods made it possible to decrease the off-site disposal volumes of residual soil from construction for gas pipelines to 37% as much as would have been generated under the conventional methods.

Promotion of environmental management

In the area of environmental management, we hope to win ISO14001 certification for the entire Group. As a first step, we initiated efforts to this end in all divisions of Tokyo Gas and the offices under its direct jurisdiction in September. At the same time, we began providing full support for the use of environmental management systems at our 19 affiliates (i.e. our consolidated affiliates and affiliates with the greatest potential environmental impact). In this way, we assisted the further spread of environmental management throughout the Group. To encourage "green purchasing," we sought the cooperation of our transaction partners with "green delivery" (the switch to low-emission delivery vehicles and rules against engine idling when stopped), and conducted a question-

naire survey with them regarding their concern for the environment. In addition, we furnished our employees with systematic instruction under our program of environmental education, and conducted an employee questionnaire survey on environmental awareness, knowledge, and action. We plan to use the results in our future environmental activities.

Reinforced environmental partnership

In the area of environmental partnership, we furnished assistance in all aspects to the "Forum for Lifestyle Review," an event sponsored by government, citizens, and companies to prevent global warming. Our wide-ranging activities of environmental information dissemination encompassed the dispatch of experts from within the company to make presentations on all kinds of environmental topics to parties outside the company and the development of information exchange initiatives with environmental non-governmental organizations (NGOs) and non-profit organizations (NPOs). Because of the addition of national requirements for general environmental instruction initiative in elementary, middle, and high schools, Tokyo Gas decided to support this education and educational materials on environmental and energy issues by developing and supplying various tools to schools. It should also be noted that, in our pursuit of full information disclosure, we are voluntarily providing information on even negative subjects, such as the restoration of contaminated soil.

We sincerely hope that this report will provide you with a good understanding of the approaches for environmental conservation being taken by the Tokyo Gas Group. We would appreciate your feedback and frank opinions to help us make our future environmental activities even more fruitful.

July 2002

鳥原光憲

Mitsunori TORIHARA
Senior Executive Officer and
Chairman of the Environment Conference



Management Philosophy, Environmental Policy and Results of the FY 2001 Environmental Activities

Management Philosophy

As a total energy industry, the Tokyo Gas Group shall make an active contribution to pleasant living and the development of environmentally friendly cities, and also pursue ongoing advancement together with the rest of society, as a corporate group that earns and maintains the trust of its customers, shareholders, and communities through its various activities.

- 1 Tokyo Gas shall strive to evolve into a new utility that simultaneously satisfies the goals of contribution to customers and communities as a public-minded enterprise and increases its corporate value as a joint-stock corporation.
- 2 Tokyo Gas shall observe the letter and spirit of laws and regulations, and work for socio-economic advancement through business activities that are both fair and transparent.

- 3 Tokyo Gas shall contribute to the alleviation of global environmental problems as a leading practitioner of environmental management.
- 4 Tokyo Gas shall remain keenly aware of its obligations to be a good corporate citizen and assist the emergence of a more fulfilling society through contributing to community activities.

- 5 Tokyo Gas shall pursue innovation on an ongoing basis to promote a cost effective business approach and a flexible but resilient disposition.
- 6 Tokyo Gas shall aspire to build organizations that are brimming with vitality based on the full exercise of and respect for the talents, desires, and creativity of each and every employee.

Environmental Policy

The Tokyo Gas Group will promote the harmonious use of energy to contribute to the conservation of regional and global environments as well as to the sustainable development of society.

Philosophy

Policies

1 Reduce the environmental impact of customers' energy use

Tokyo Gas will actively and on an ongoing basis attempt to reduce the environmental impact of customers' energy use. We will do this by promoting the use of environmentally friendly natural gas and providing highly efficient products and systems with minimal environmental impact.

2 Reduce the total environmental impact of Tokyo Gas' business activities

Tokyo Gas will continuously reduce the basic units of energy and resource use in its business activities through the development of increasingly efficient and effective environmental management activities to contribute to the realization of a sustainable society. At the same time, Tokyo Gas will reduce overall environmental impact by aggressively promoting "green purchasing" and the reduction, reuse and recycling of industrial waste.

3 Strengthen environmental partnerships with local areas and the international community

Tokyo Gas will strengthen its environmental partnerships with both the local areas in which it operates and the international community by engaging in a wide variety of activities. These activities will range from participation in regional environmental activities to international sharing of technological developments, starting with strategies to prevent global warming.

4 Promote environment-related technology R&D

Tokyo Gas will proactively research and develop environmental technologies, including renewable energy, to conserve regional and global environments.

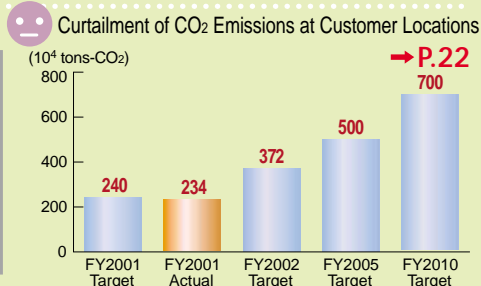
Guidelines for Environmental Conservation

* The Guidelines for Environmental Conservation are applied solely to the activities of Tokyo Gas Co., Ltd. alone.

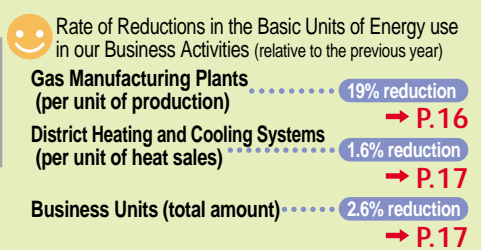
☺ Hitting our Targets! ☹ Doing our Best

1 Global Warming Prevention Guidelines

Review
Reduction of the total quantity of CO₂ emissions from customer sites by 5 million tons in fiscal 2005 and 7 million tons in fiscal 2010, by increasing the efficiency of their utilization of city gas and by the increased use of natural gas as a primary energy source.



Review
Average annual reduction of at least 1% in the basic units of energy use in our business activities, over the medium and long-term.



Medium/long-term Target → average annual reduction of 1%

Help for prevention of global warming through assistance with the development of, and technical support for, projects for the reduction or absorption of greenhouse gases in other countries.

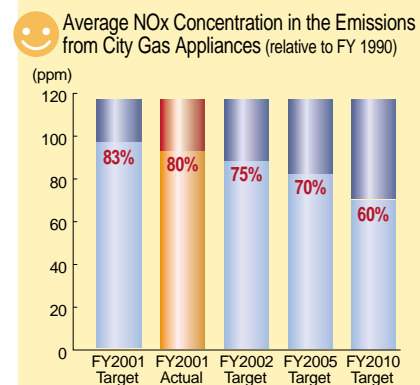
Overseas Cooperation with Environmental Technology → P.32



The installation of a centralized district cooling and power supply system in Manila, the Philippines, is under study

2 NOx Reduction Guidelines

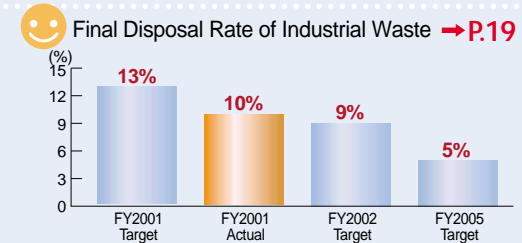
Review → P.24
Reduction of the average NO_x concentration in the emissions from city gas appliances to 70% of fiscal 1990 levels in fiscal 2005 and to 60% in fiscal 2010.



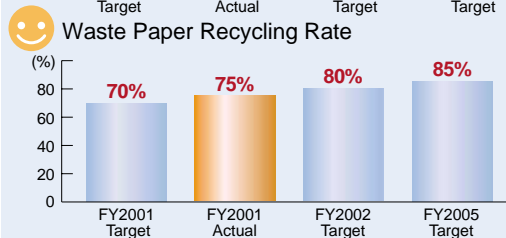
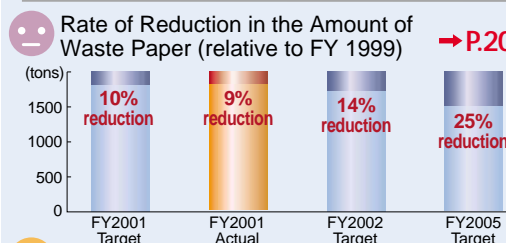
A natural gas vehicle with very low NO_x emission levels (community bus in Setagaya Ward, Tokyo)

3 "Reduce, Reuse and Recycle" promotion guidelines

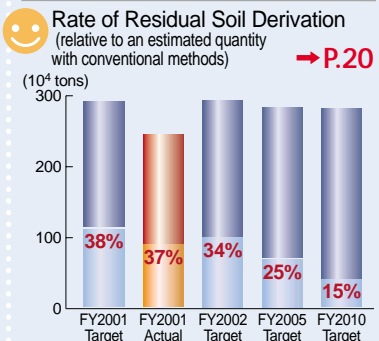
Review
Reduce, to no more than 5% of the original amount, the share of non-recyclable industrial waste derived from our business activities, i.e., a 95% recycle rate, in fiscal 2005.



Review
Reduce the amount of waste paper derived in offices by 25% in fiscal 2005 relative to the fiscal 1999 level, while also recycling at least 85% of the total.



Review
Reduce the amount of residual soil derived in pipeline construction to 25% (relative to an estimated amount if conventional methods had been used) in fiscal 2005 and to 15% in fiscal 2010 through promotion of reduction, reuse, and recycling.



* Figures indicate the quantity of residual soil hauled off the site for disposal as a percentage of a corresponding estimated quantity, if the construction had been executed by the conventional method.

4 Green Purchasing Guidelines

Promote green purchasing in all divisions by placing environmental friendliness alongside cost, quality, delivery speed, and other conditions to be considered when contracting for construction and services, or when purchasing products and materials.

Purchase through the Internet

Green Purchasing Expenditures

169 million yen

Number of Designated Items

416 items

Green Purchasing Rate

71%



Samples of items designated for green purchasing

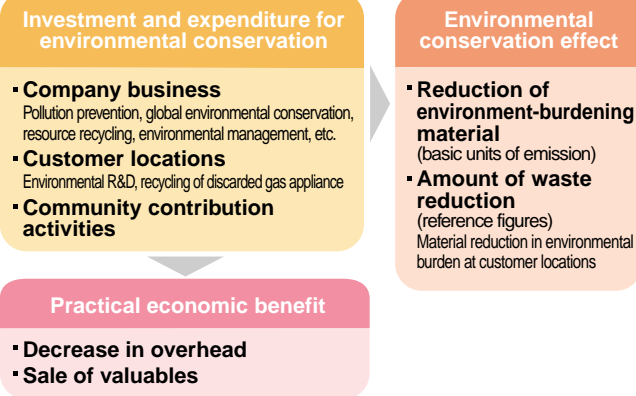
Environmental Accounting and Environmental Conservation Efficiency

Environmental Accounting

Review

Beginning with its first environmental report issued in November 1994, using its own standards, Tokyo Gas has calculated the costs of environmental conservation, mainly in terms of investments made, and published the results. With the preparation of Environmental Report 2000 (which covered fiscal 1999), it started publishing environmental accounting data as part of its promotion of information disclosure. With a view to raising the level of transparency and facilitating comparison, the data calculation and publication for fiscal 2001, like that for fiscal 2000, applies standards from the Manual for the Incorporation of Environmental Accounting in the City Gas Business, prepared by the Japan Gas Association.

Concept of Environmental Accounting at Tokyo Gas



Environmental Accounting at Tokyo Gas (fiscal 2001)

Date period: April 2001-March 2002
Data scope: Tokyo Gas Co., Ltd.(independent of affiliated companies) (Millions of yen)

Environmental conservation cost items			Investment		Cost		Level of environmental burden			
Major content (examples)			FY2001	FY2000	FY2001	FY2000	Item	FY2001	FY2000	FY1990
Company business	Pollution prevention	Amount of capital investment, maintenance expenses, depreciation costs, personnel expenses, etc., for prevention of air pollution, water pollution, noise pollution, etc.	9	27	96	100	NOx (plants) mg/m ³	1.6	2.4	28.0
	Global environmental conservation	Amount of capital investment, maintenance expenses, depreciation costs, personnel expenses, etc., for energy conservation, effective use of energy, protection of the ozone layer, etc.	241	113	733	628	NOx (district heating and cooling) g/GJ	16.6	18.7	31.7
	Resource recycling	Amount of capital investment, maintenance expenses, depreciation costs, personnel expenses, etc., for reduction/recycling of residual soil, waste control, etc.	176	203	799	822	COD (plants) mg/m ³	0.1	0.2	1.2
	Environmental management	Costs of green purchasing, environmental education, EMS construction, environmental organizations, etc.	13	—	357	330	CO ₂ (plants) g-CO ₂ /m ³	12.2	15.2	46.1
	Other	Costs of related to greening of plants and remediation of soil in accordance with plant sitting laws and ordinances.	125	170	1,569	780	CO ₂ (district heating and cooling) kg-CO ₂ /GJ	67.0	68.0	84.7
Customer locations	Environmental R&D	Costs for R&D of burden-mitigating technology, high-efficiency appliance and systems, etc.	555	540	1,141	1,426	CO ₂ (business units) g-CO ₂ /m ³	8.3	8.8	10.6
	Recycling of discarded as appliance	Costs for recovery and recycling of gas appliance, packaging, etc.	—	—	5	3	Residual soil(10 ³ tons)	901	1,213	—
Community contribution activities			85	64	607	517	Industrial waste(tons)	3,930	4,491	—
total			1,204	1,117	5,309	4,606	General waste(tons)	2,468	2,591	—
							(Reference figures)			
							CO ₂ emission curtailment(10 ⁴ tons-CO ₂)	234	181	for FY1990
							Average NOx concentration(ppm)	93	101	117
							(Reference figures)			
							Recovery of discarded gas appliance and scrap metal by SRIMS(tons)	5,033	5,522	—

* Depreciation costs included in figures for cost of 635 million yen in fiscal 2001 and 702 million yen in fiscal 2000.

Economic benefit		FY2001	FY2000	FY2001	Total capital investment	92,555	Millions of yen
Cost reduction due to operation of energy-saving facilities		626	515		Environmental capital investment	1.3	%
Cost reduction due to reduction of residual soil generation		6,916	6,719				
Sales of valuables		470	526		FY2001 Total sales	974,566	Millions of yen
Other		161	148		Environmental costs	0.5	%
total		8,173	7,908				

Notes about how the data was compiled

- The decrease in investment for "pollution prevention" is due to the reduced investment for deodorization facilities and other such equipment.
- The increase in investment for "global environmental conservation" came from the acquisition of cogeneration facilities, absorption refrigerators, and absorption-type chiller/heaters. Cost increases were also the result of a rise in leasing fees because of an increase in the number of natural gas vehicles in the company fleet.
- The decreases in investment and costs for "resource recycling" stemmed from the reduction in expenditures for R&D related to pipeline installation methods and materials.
- The investment for "EMS" refers to the acquisition of an environmental accounting system.
- The increase in costs in the "other" category came mainly from expenditures for soil restoration.
- The decrease in costs for "environmental R&D" resulted from reduced expenditures for testing and research related to gas appliances and systems.
- The increases in investment and costs for "activities of social contribution" came from the inclusion of costs for education about energy and the environment, eco-cooking classes, and greening of business units.
- When calculating of "cost reduction due to the reduction of residual soil generation" among the economic benefits, a switch was made from progress relative to the previous year to comparison with the open-cut method. In addition, the fiscal 2000 economic benefit was recalculated by the new method. The "other" category includes the decrease in costs due to the reduction of waste generated at and to the water-conserving activities implemented at business units. The fiscal 2000 economic benefit was recalculated with the inclusion of these items.

Activities for Fiscal 2002

- Continue and broaden the collection of environmental accounting data from affiliated firms with the future implementation of these standards on a consolidated basis as the goal.
- Firmly root the "Tokyo Gas Environmental Accounting System", which was constructed for automatic extraction and totaling of non-consolidated data for finances, energy utilization, waste, etc., within the company.
- Continue the use of the "Tokyo Gas Environmental Accounting System" as a management tool for the analysis of plants, district heating and cooling centers, and other such sites, as well as for energy-saving remodeling and other projects.

Environmental Conservation Efficiency

Review

Tokyo Gas decided to establish a new indicator entitled "Environmental Conservation Efficiency" in order to ascertain

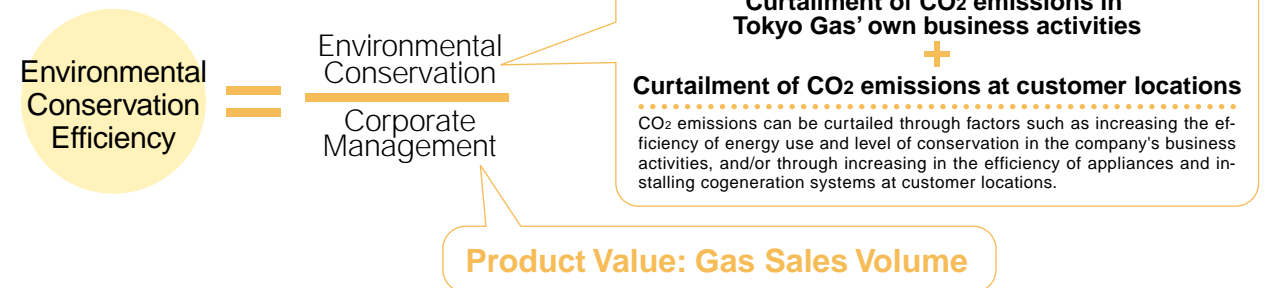
and disclose its degree of contribution to a sustainable society through its management and environmental activities.

Environmental Conservation Efficiency Indicator

World Business Council for Sustainable Development proposed the idea of environmental efficiency in its exploration of approaches to minimize the environmental impact of corporate activities and maximize the value created by companies. In accordance with this idea, Tokyo Gas is attempting to establish indicators that integrate corporate management (gas sales volume) and environmental conservation (guidelines for environmental conservation to produce company-wide targets).

For this report, as the initial indicator, Tokyo Gas decided to select global warming countermeasures (as opposed to other items contained in the Tokyo Gas' guidelines for environmental conservation) and to make calculations for an indicator established for the curtailment of CO₂ emissions. In the future, Tokyo Gas intends to disclose the results of additional calculations for indicators that can be applied to items other than countermeasures for global warming.

Rationale Behind the Calculation of the Environmental Conservation Efficiency Indicator



Results of Environmental Conservation Efficiency Calculation (CO₂ indicator)

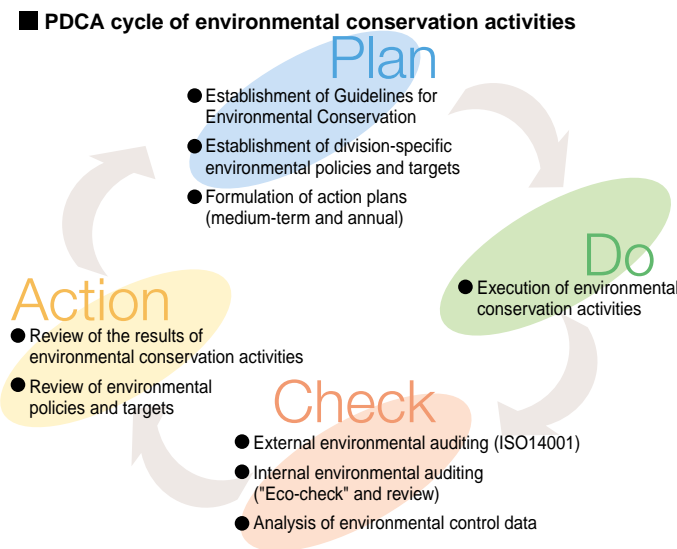
Item	Units	FY1997	FY1998	FY1999	FY2000	FY2001
Curtailment of CO ₂ emissions at customer locations (relative to FY1990)	10 ⁴ tons-CO ₂	136	143	160	181	234
Curtailment of CO ₂ emissions in business activities (relative to FY1990)	10 ⁴ tons-CO ₂	3	0	0	▲2	2
Gas sales volume	10 ⁴ m ³	799,468	815,825	841,758	887,214	921,898
Environmental conservation efficiency (CO ₂ indicator)	g-CO ₂ /m ³	174	176	190	202	257

* The calculation of the CO₂-curtailing effect due to the reduced use of electrical power was based on the CO₂ emission factor (CO₂-equivalent) of the average thermally generated electric power at the user end.

Environmental Management

Environmental Management System

In accordance with its Management Philosophy and Environmental Policy, Tokyo Gas has established an environmental management system for the promotion of its environmental conservation activities. This system is based on performance of the "plan-do-check-action" (PDCA) cycle. We also conduct environmental audits ("Eco-checks" and reviews) in conformance with the ISO14001. Tokyo Gas's three city gas manufacturing plants (at Negishi, Sodegaura, and Ohgishima) and its two district heating and cooling centers (at Shinjuku and Makuhari) have already obtained ISO14001 certification.

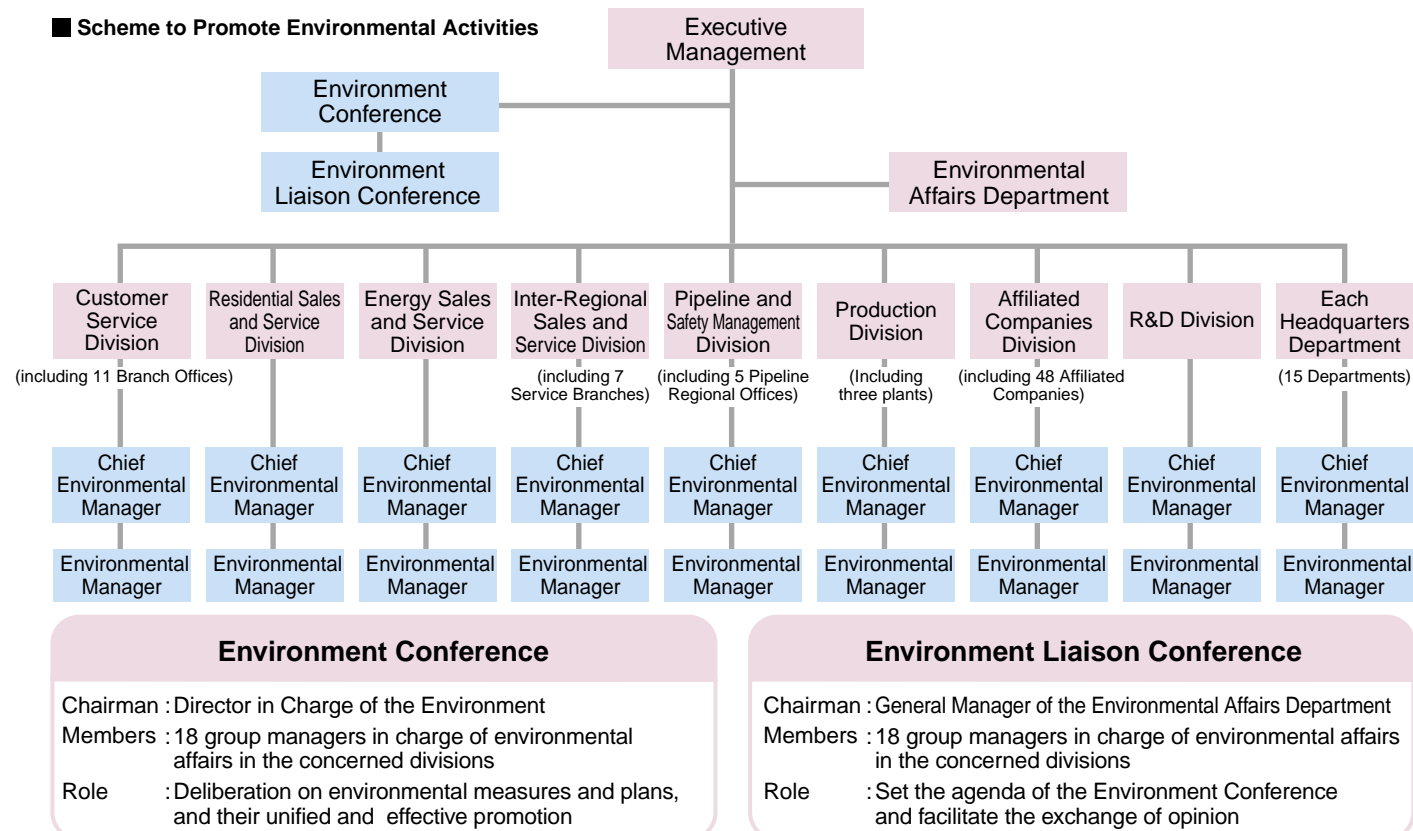


Environmental Management Organization

To promote activities of environmental conservation, Tokyo Gas has instituted an organization consisting the Environmental Affairs Department and an interdivisional unit (the Environment Conference). In addition, in each division, environmental activities are promoted

under the leadership of personnel appointed to act as environmental managers. The actual efforts in each establishment are led by "Eco-leaders" (46), personnel responsible for environmental matters (103), and "Eco-check" leaders (85).

Scheme to Promote Environmental Activities



Environmental Management Based on ISO14001

In March 1997, Tokyo Gas obtained ISO14001 certification at two of its LNG terminals, Negishi and Sodegaura, becoming the first city gas company in Japan to be so certified. In January 2001, its Ohgishima LNG Terminal was certified. As a result, all three of its LNG terminals have been certified ISO14001. Similarly, in March 2000, its Shinjuku District Heating and Cooling Center became Japan's first district heating facility to obtain ISO14001 certification. Its Makuhari District Heating and Cooling Center was certified in January 2002. In September 2001, Tokyo Gas launched efforts aimed to obtain ISO14001 certification for the entire company.

Business units with ISO14001 certification

Name	Business	Date of certification	Date of renewal
Negishi LNG Terminal	Gas manufacture	March 1997	March 2000
Sodegaura LNG Terminal	Gas manufacture	March 1997	March 2000
Ohgishima LNG Terminal	Gas manufacture	January 2000	—
Shinjuku District Heating and Cooling Center	District heat supply	March 2000	—
Makuhari District Heating and Cooling Center	District heat supply	January 2002	—

"Eco-check" and Review (Internal Environmental Audit)

In February 2002, Tokyo Gas implemented an "Eco-check" system for all of its business units excluding those currently with ISO14001 certification. "Eco-checks" are a type of internal environmental audit devised independently by Tokyo Gas, and have been carried out since fiscal 1993. The "Eco-check" covers a total of 96 items, 71 deal with the observance of laws and regulations, and 25 cover voluntary standards. Also in fiscal 2001, Tokyo Gas implemented a cross-checking format, whereby the "Eco-check" leaders visit business units other than those in which they are employed. This approach ensures high levels of reliability, fairness, and objectivity.

"Eco-check" Results and Review

At 93.5%, the overall rate of compliance in fiscal 2001 was up 2.4 points from fiscal 2000. The compliance rates for items concerned with the observance of laws and regulations and those dealing with voluntary standards both increased from fiscal 2001. Specifically, they came to 99.7 and 88.5%, respectively, as compared to the corresponding figures of 98.8 and 84.7% in fiscal 2000.

Subject sites

Subject sites	Number
Customer Service Division	41
Residential Sales and Service Division	23
Energy Sales and Service Division	19
District heating and cooling centers	14
Inter-Regional Sales and Service Division	11
Pipeline and Safety Management Division	13
Production Division	3
Affiliated Companies Division	1
R&D Division	4
Headquarter divisions	6
Total	135

Survey items

	Items	Number
Observance of laws and regulations	Management of general waste	16
	Management of industrial waste	13
	Management of specially controlled industrial waste	10
	Management for prevention of air pollution	18
	Management for energy conservation	14
Voluntary standards	Formulation and execution of action plans	15
	Management for energy and resource conservation	4
	Promotion of green purchasing	1
	Waste Management	5
Total		96

Environmental Management in Affiliated Companies

The Tokyo Gas Group consists of ten business fields (headed by energy sales) in 48 companies. In its Environmental Policy, Tokyo Gas has made a clear commitment to promote environmental conservation on the Group level. As a first step, in fiscal 2000, Tokyo Gas began providing strong support for the establishment of environmental management systems (EMS) at its 13 consolidated affiliates and the 6 non-consolidated affiliates with the greatest potential environmental impact. In fiscal 2001, it furnished assistance for the implementation of "Eco-check" and

reviews (internal environmental audit) at these affiliates, and, as in fiscal 2000, Tokyo Gas also compiled data on environmental performance indicators supplied by them (see page 21). ISO14001 certification was obtained by Gastar Co., Ltd. in October 2001 and Kanpai Co., Ltd. in March 2002. Preparations are being made to obtain ISO14001 certification at four other affiliates, i.e., Tokyo Gas Energy Co., Ltd. Tokyo Gas Urban Development Co., Ltd. Chiba Gas Co., Ltd. and Tsukuba Gakuen Gas Co., Ltd.

Education and Consciousness-raising

In fiscal 2001, Tokyo Gas augmented its arrangements for environmental education by carrying out a variety of instructional and consciousness-raising programs in order to enhance awareness of the environment, impart environmental knowledge required for work, and improve levels of related expertise.

Environmental Education

In line with its philosophy of environmental education, Tokyo Gas systematically implemented many types of training and enlightenment programs. It also encourages employees to obtain various environment-related qualifications in order to deepen their expertise in this area.

Seminar for middle-ranked employees

In fiscal 2001, a training seminar was conducted for middle ranked employees, which included workshops on the topics of reducing waste paper and saving energy in the office. These workshops were staged in the second half of the seminar for the purpose of making the training participation-oriented and interactive in addition to the one-way transmission of knowledge.

Consciousness-raising activities

Tokyo Gas stages campaigns and events during a month-long series of environment-related programs. At the environmental symposium held on June 4th, Mr. Saburo Kato, Chairman of the Japan Association of the Environment and Society for the 21st Century, was invited to speak on the topic "Corporate Management in the Age of the Global Environment - Toward Environmental Management". His lecture was attended by Company directors and about 400 employees of Tokyo Gas and its affiliates. Beginning in fiscal 2001, Tokyo Gas also instituted an environmental program for its employees, including those from affiliates and cooperating companies, and their families. The program was held twice, in October and February, and attracted about 90 participants. It provided hands-on learning experiences and was applauded for its "education with enjoyment for the whole family" style.

Seminar for environmental personnel

A seminar was held in December to ensure proper compliance with newly amended versions of Japanese laws and regulations, and was attended by about 200 personnel from Tokyo Gas and its affiliates. In October and February, a total of about 200 employees, in eight groups, toured other environmentally progressive firms and facilities for the disposal of industrial waste.

Internal Provision of Environmental Information

To elevate the environmental awareness of its employees, Tokyo Gas disseminates information to them through channels including the company Intranet, the company newsletter, and internal video news reports. In fiscal 2001, Tokyo Gas also began posting manuals of the "Eco-checks" and reviews, along with auditing data sheets, on the Intranet. It also sends related information to affiliated companies via e-mail, as necessary.

Environmental Commendation

In June, in conjunction with its Environmental Symposium, Tokyo Gas staged a ceremony to present the Third Chairman's Prize of the Environment Conference and held a meeting for presentations by the winning entrants. The Chairman's Prize was instituted to recognize companies, departments, and individual employees of Tokyo Gas and its Group for outstanding achievements in the areas of environmental improvement in the context of gas business, "Eco-office" activities, research and development of environmental technology, or environmental activities that made a community contribution. In fiscal 2001, there were 15 candidates, and awards were given to eight, consisting of three in the area of environmental improvement in the gas business, two for "Eco-office" activities, one for environmental technology and R&D, and two in the area of community contribution.

Environmental education programs

Level-specific training	Consciousness-raising	Training
<ul style="list-style-type: none"> Newly hired employees Middle-ranked employees 	<ul style="list-style-type: none"> Monthly events Correspondence courses Family environmental program 	<ul style="list-style-type: none"> Internal environmental auditors "Eco-check" leaders Seminar on revised laws and regulations Facility tour group

Events during month-long programs(FY2001)

Month	Program	Outline
Apr	Green Week	"Green" fund-raising drive
Jun	Environmental Month	Environmental symposium
Aug	Energy Conservation Month	Campaign to promote energy-saving in the office
Oct	Recycling Promotion Month	Campaign for rigorous reduction of waste
Dec	Prevention of Global Warming Month	Provision of information related to the prevention of global warming
Feb	Energy Conservation Month	Campaign to promote energy-saving in the office

Number of employees who acquired environmental qualifications(FY2001, cumulative)

Qualification	Number
Environmental pollution control operator	1,035
Water quality controller	80
Operations chief of work on Special Chemical Substances, etc.	1,387
Energy managers	377
Environmental measures	57
International environmental advisor	1
Green saver	8
Environmental counselor	4
Special controlled industrial waste manager	15
Assistant EMS auditor	8
Internal EMS auditor	173

Family environmental program: Donguri Korokoro Exhibit



Commendation ceremony



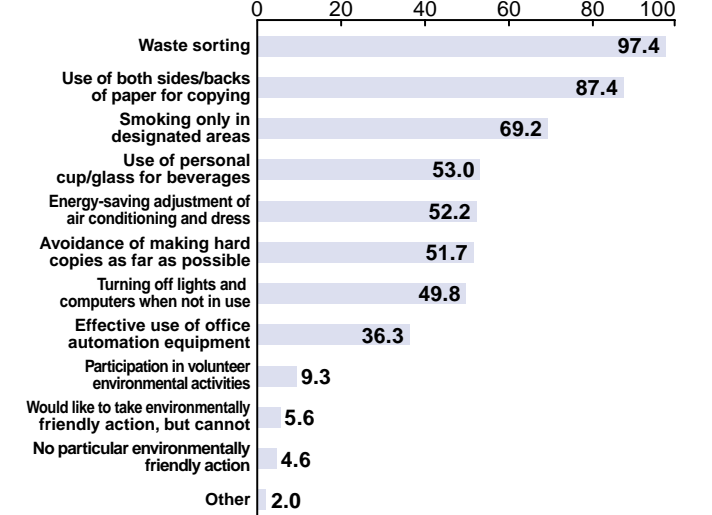
Environmental Questionnaire Survey

Tokyo Gas Group employees participated in an environmental questionnaire survey at P-JAM (a questionnaire survey Internet web site) in October 2001. The survey site was open for about three weeks, and completed forms were received from 1,782 employees (for a participation rate of about 9%). It concerned mainly environmental awareness, knowledge, and action.

The survey found that about 97% of the respondents were sorting waste in their workplace, and 87%, making an effort to conserve paper. Some 68% rated the goal of being the vanguard of environmental management as "important."

The survey findings will assist future planning for and improvement of environmental education.

Sample questionnaire item: action in the workplace (n=1,782; multiple response permitted)



Green Purchasing

Guideline

Tokyo Gas has been promoting "green purchasing" since fiscal 1996. Its green purchasing guidelines, established in fiscal 2000, expanded the scope from the conventional office supplies to construction work, services, and materials. In addition to selecting environmentally friendly items, the provisions call upon personnel to encourage business partners to establish environmental management systems and otherwise show more concern for the environment.

In fiscal 2001, Tokyo Gas sought the cooperation of business partners with "green delivery" (i.e., a switch to low-emission delivery vehicles and the pledge to turn off the ignition of stopped vehicles). It also conducted an environmental questionnaire survey with them. In addition, it prepared a uniform environmental management specification sheet setting forth the tasks to be undertaken by contractors in order to minimize the environmental impact of their construction work.

In October 2000, Tokyo Gas began purchasing office supplies via the Internet in the interest of higher efficiency. It also extended the list of subject items and encouraged their adoption in affiliated companies as well. As of the end of fiscal 2001, green purchasing covered a total of 416 items and was being practiced by 20 affiliated companies. Green purchasing via the Internet is steadily spreading within the Tokyo Gas Group.

Tokyo Gas is also promoting a shift to low-emission (natural gas) vehicles for its own use. It added 212 such vehicles in fiscal 2001, and this brought the cumulative total to 986.

Tokyo Gas is also supporting the green purchasing movement outside the company by, for example, serving as the secretary of the Green Purchasing Network (GPN).

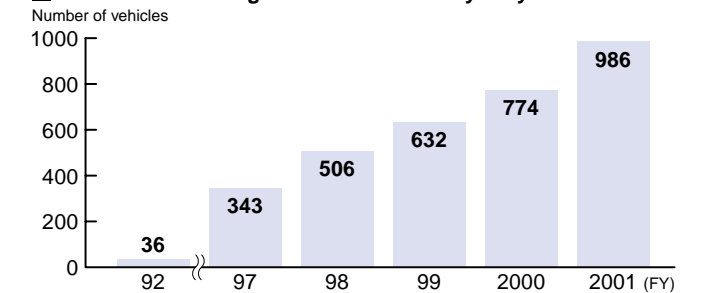
Green purchasing: placement of priority on the purchase of goods and service which impose the least burden on the environment.



Green purchasing via the Internet (actual, FY2001)

Item	Unit	Actual data
Number of Items designated	items	416
Purchase of "green" items	thousand yen	169,275
Green purchasing rate	%	71

Number of natural gas vehicles owned by Tokyo Gas



Reducing Environmental Risk

In its business, Tokyo Gas has positioned the Groups active efforts to mitigate environmental problems, on both the regional and global levels, as one of its top priorities. On its own initiative, it is studying the environmental pollutants and contamination that may

have resulted from its past activities, announcing the findings, and taking prompt countermeasures, in the conviction that such action is essential for environmental conservation.

Soil Studies and Contamination Countermeasures

In fiscal 1999, Tokyo Gas voluntarily launched studies of the land-use history of former plant sites and all other company locations where there was a possibility of soil contamination. These studies are being conducted in compliance with the standards and guidelines established by Ministry of the Environment for testing, and recommended countermeasures, for contamination of soil and groundwater.

The first such announcement (for four sites) in January 2001 was followed in fiscal 2001 by eight more for a total of 15 sites. In each case, Tokyo Gas has notified the proper authorities and residents, and mounted the requisite countermeasures.

Soil studies and contamination countermeasures (FY2001)

Date of announcement	Site	Location	Area (10 ³ m ²)	Contamination Situation (maximum multiplier relative to environmental standard values)			Countermeasures	
				Soil elution	Groundwater			
04/23/2001	Hitachi Works	Hitachi, Ibaraki	16	Total cyanic compounds	28	Benzene	22	Removal by excavation, Water barrier, Pumping up
	Utsunomiya	Utsunomiya, Tochigi	7	Benzene	47	—	—	Removal by excavation
	Hiratsuka	Hiratsuka, Kanagawa	11	Arsenic	3.3	Total cyanic compounds	1.0	Removal by excavation
07/04/2001	Kofu Service Branch	Kofu, Yamanashi	5	Benzene	1,900	Benzene	1,400	Removal by excavation, Water barrier, Pumping up
	Kofu Works	Kofu, Yamanashi	11	Benzene	280	—	—	Removal by excavation
07/26/2001	Tsurumi	Yokohama, Kanagawa	180	Arsenic	710	Arsenic	1,400	Removal by excavation, Water barrier, Pumping up
	Suehiro	Yokohama, Kanagawa	39	Total cyanic compounds	39	Benzene	390	Pumping up
	Yokohama	Yokohama, Kanagawa	171	Benzene	9,300	Benzene	3,500	Water barrier, Pumping up
09/26/2001	Hiranuma	Yokohama, Kanagawa	32	Benzene	77	Benzene	180	Removal by excavation, Water barrier, Air sparge
11/07/2001	Fukagawa	Koto Ward, Tokyo	31	Benzene	1,300	Benzene	1,500	Removal by excavation, Water barrier, Pumping up, Air sparge
12/25/2001	Kumagaya	Kumagaya, Saitama	3	Lead	1.4	—	—	(Countermeasures to be taken at the time of soil improvement)
03/13/2002	Chiba Minato-machi	Chiba, Chiba	10	Total mercury	5.4	Nitrate nitrogen and nitrite nitrogen	1.5	Removal by excavation
	Kisarazu	Kisarazu, Chiba	12	Benzene	8.5	Benzene	4.0	Removal by excavation, Pumping up, Insolubilization
03/28/2002	Maebashi	Maebashi, Gunma	3	Total cyanic compounds	18	Total cyanic compounds	5.7	Removal by excavation, Water barrier, Pumping up
	Takasaki	Takasaki, Gunma	4	Total cyanic compounds	6.5	Total cyanic compounds	4.9	Removal by excavation, Water barrier, Pumping up

Management of Chemical Substances

Conformance with PRTR Law

Although there are only a few applicable chemical substances in the gas business, Tokyo Gas is working to manage and reduce the use of pollution-causing chemicals in compliance with the Pollutant Release and Transfer Register (PRTR) Law. In accordance with

the PRTR Law, which concerns the determination of environmental emissions of specific chemical substances and improvement of their management, Tokyo Gas made required notifications for all relevant facilities by the end of June 2002.

Release and Transfer of substances designated in PRTR Law (actual, FY2001)

Units	Substance number	Class 1 designated chemical substances	Handling volume (see Note) (tons/year)	Release volume (atmospheric) (tons/year)	Transfer volume (tons/year)	Comments
Negishi LNG Terminal	63	Xylene	4.0	4.0	0.0	Coating of manufacturing facilities, etc.
	40	Ethyl benzene	2.4	2.4	0.0	Coating of manufacturing facilities, etc.
Sodegaura LNG Terminal	63	Xylene	6.9	6.9	0.0	Coating of manufacturing facilities, etc. (notification subjects)
	227	Toluene	1.3	1.3	0.0	Coating of manufacturing facilities, etc.

(Note) This table presents data only for annual volumes of at least 0.5 tons for Class 1 substances and 1 ton for other designated substances.

PCB Countermeasures

Based on the results of the fact-finding study of the use of polychlorinated biphenyl (PCB) throughout the company conducted in fiscal 2000, Tokyo Gas replaced all fluorescent lamp ballasts that contained PCB (approximately 1,700 in a total of 44 buildings). These ballasts and other waste PCB articles are being centrally stored under strict control, mainly at the Negishi LNG Terminal. The Company intends to dispose of them as soon as arrangements are made for their consignment to an outside business for disposal.



Replacement of a PCB-containing fluorescent lamp ballast

Recovery of CFCs

Tokyo Gas began recovering chlorofluorocarbons (CFCs) from gas heat pumps (GHPs) in fiscal 1998, and recovered a total of 17.9 tons in fiscal 2001. It also recovered 5.4 tons of CFCs from gas air

conditioners in accordance with the Law for Recycling of Specified Kinds of Home Appliances enacted in April 2001.

Environment-related fines

There were no environment-related fines or other penalties imposed on Tokyo Gas in fiscal 2001.

Safety Measures

Many gas-related accidents occur due to inattention during its use as opposed to during manufacture or supply. To eliminate such accidents, Tokyo Gas has taken measures in all aspects of its business to improve safety.

Safety Measures at the Stage of Use

At all customer sites, Tokyo Gas is installing microcomputer-controlled meters, which automatically shut off the flow of gas upon sensing abnormalities such as leaks, neglecting to turn off gas appliances, and earthquakes. Besides notifying customers how to use gas correctly and carrying out periodic checks of their facilities, Tokyo Gas has also implemented a program for emergency mobilization around-the-clock, 365 days a year, to prevent accidents.

Earthquake/Disaster-prevention Measures

Tokyo Gas has mounted three stages of counter measures to prevent disaster from earthquakes: damage prevention, emergency response, and safe restoration. For the first stage, damage prevention, it has applied the latest in seismic technology to its gas production and supply facilities in order to hold any earthquake damage to a minimum. In the second stage, emergency response, in order to prevent the outbreak of secondary disasters such as conflagrations and explosions, it has made preparations to swiftly shut off the gas supply to extensively damaged districts by remote control from the control center in the head office. For the third stage, safe restoration, Tokyo Gas stages regular drills for both the safe and swift resumption of supply to all districts where gas service was suspended, and has constructed a support system to determine the most efficient gas-restoration work plan. In July 2001, it started up the Super-dense Real-time Monitoring of Earthquakes System (SUPREME), which offers even higher levels of precision in providing disaster-prevention information than the previous system.

Microcomputer-controlled meter



Microcomputer-controlled meter: a safety system made by installing gas meters with microcomputer-control devices

Emergency response vehicle



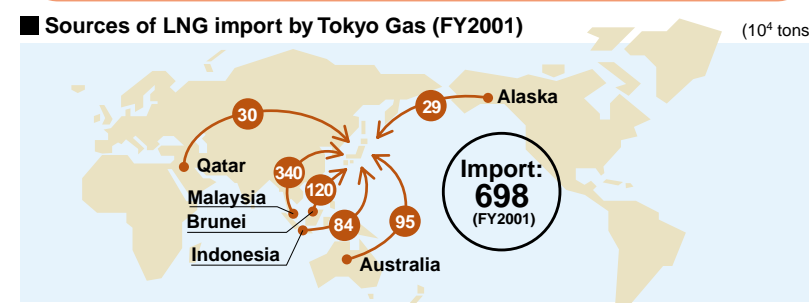
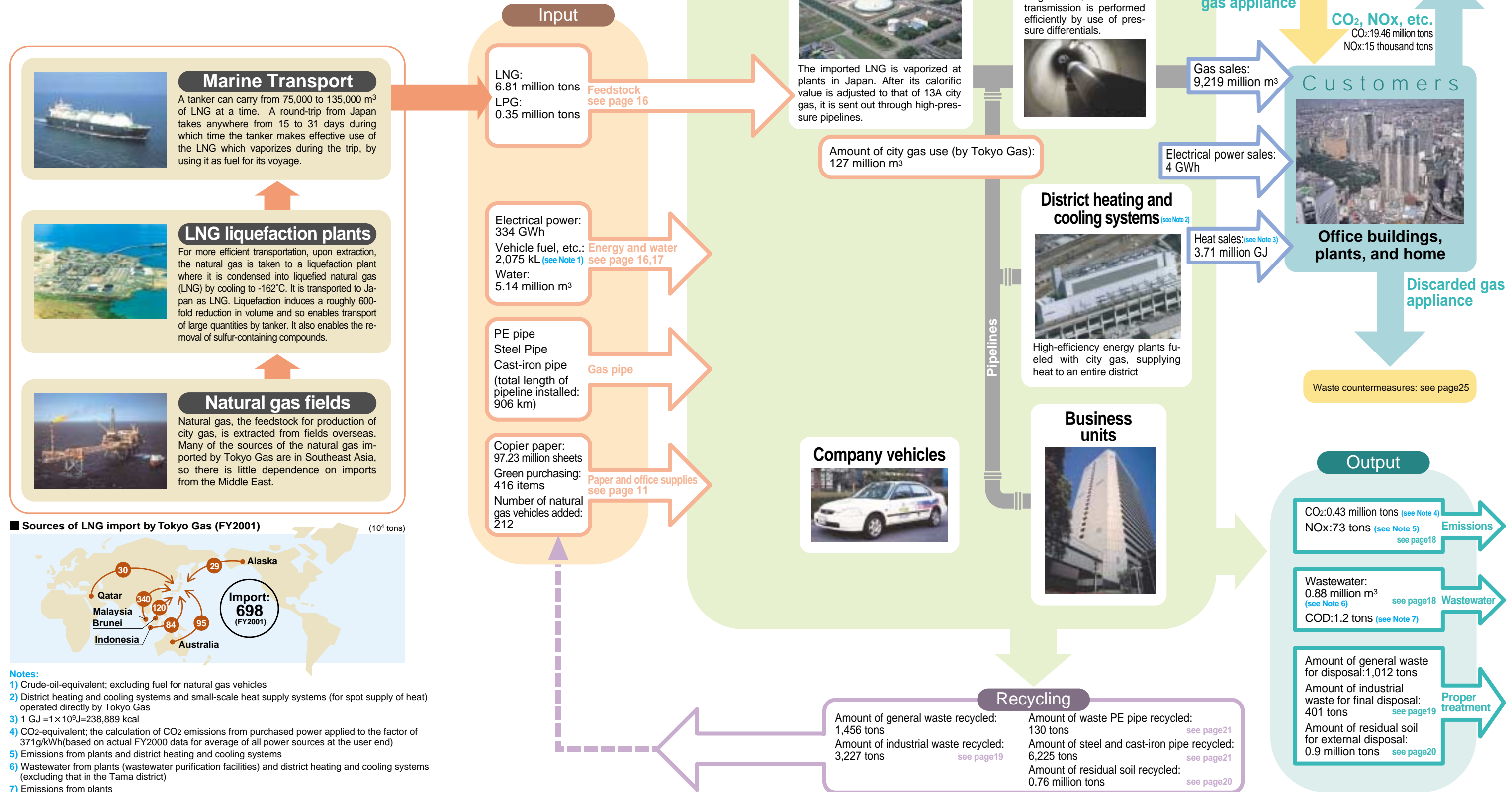
Control center in the Tokyo Gas head office



An Environmental View of Tokyo Gas Business Activities in 2001 Review

For environmentally friendly utilization of resources and energy

Natural gas, which is produced overseas, is transported by LNG tanker to the city gas manufacturing plants of Tokyo Gas. After conversion into city gas through adjustment of its calorific value, it is delivered to our customers by pipelines. This section presents an environmental view of the entire process, from receipt of the feedstock to its use as city gas, in the form of a material flow chart showing the input of resources and energy and the resultant CO₂ emissions and waste generation in business activities.



Use of Energy and Water

Guideline Review

One of the objectives for the global warming prevention guidelines is to reduce the basic unit of energy use of Tokyo Gas by an annual average of at least 1% over the medium and long term. In fiscal 2001, this target was attained at all gas manufacturing plants, district heating and cooling centers, and business units. Company-wide energy use for the year came to 241,676 kL of crude-oil-equivalent. The corresponding figure for water use was 5.139 million m³.

■ Amount and basic units of energy use (crude-oil-equivalent, FY2001)

Field	Amount (kL)	Basic units	Rate of reduction (relative to FY2000) (%)	Reduction rate target (relative to the previous year) (%)
Gas manufacturing plants	69,925	7.7 kL/million m ³	18.9	1
District heating and cooling systems	133,485	35.9 L/GJ	1.6	1
Business units	38,266	—	2.6	1
Total	241,676			

City Gas Manufacturing Plants

The LNG imported by tankers is stored in tanks before being sent to gasification facilities. These facilities transform the LNG back into a gas through heat exchange with sea water. After admixture of liquefied petroleum gas (LPG) to adjust the calorific value to the proper level for 13A-city gas (see Note), it is supplied to customers.

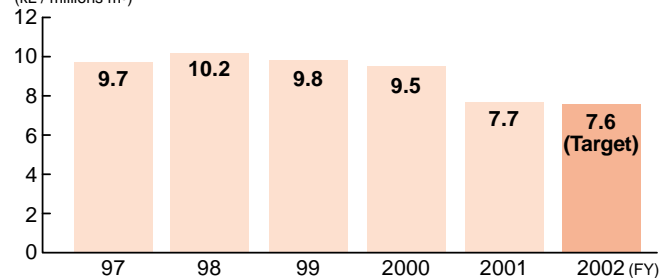
Because the process of gas manufacture is simple and requires little energy consumption, as described above, energy efficiency at the stage of gas manufacture is extremely high, on the order of 99%. The plants also operate environmental management systems in compliance with ISO14001 and are making effective use of energy. They are working for further energy savings by use of the cryogenic energy of LNG to generate electrical power, for example.

Thanks to these activities, the basic unit of energy use (per unit of production) in fiscal 2001 was 7.7 kL/million m³.

This represented a remarkable reduction of almost 19% from fiscal 2000.

(Note) There are 13 groups of city gas, and each group is referred to by a number and letter of the alphabet, e.g., 6B and 13A.

■ Trend of energy use per unit of gas production (kL / million m³)



■ Use of energy and water at gas manufacturing plants

Item	Unit	FY1997	FY1998	FY1999	FY2000	FY2001	
Feedstock LNG	10 ³ tons	5,941	6,026	6,159	6,469	6,808	
Feedstock LPG	10 ³ tons	224	254	322	355	351	
13A city gas production	10 ⁶ m ³	7,893	8,041	8,281	8,688	9,081	
Use of energy	Electrical power (purchased)	MWh	155,892	185,011	192,755	197,440	174,933
	Gas	10 ³ m ³	29,842	27,552	25,521	25,326	19,854
	Other fuels	kL	2	1	6	6	4
	Total (crude-oil-equivalent)	kL	76,732	81,729	81,376	82,386	69,925
	Basic unit (per unit of production)	kL / million m ³	9.7	10.2	9.8	9.5	7.7
	Rate of reduction in the basic unit	%	—	▲4.6	3.3	3.5	18.9
Use of water	LNG cryogenic energy	10 ³ tons	1,348	1,472	1,781	1,759	2,048
	Water (tap and industrial)	10 ³ m ³	1,592	1,664	1,714	1,761	1,647
	Seawater	10 ³ m ³	260,750	290,888	299,430	296,073	282,815

Use of LNG Cryogenic Energy

LNG is transported at a very low temperature (-162°C) and turned back into a gas at the gas manufacturing plant. In the liquid state, it has a cryogenic energy of about 870 kJ/kg. The term "use of LNG cryogenic energy" refers to the recovery and effective use of this energy as opposed to its waste. Practical technology is now available for use of this energy at all temperature levels. In fiscal 2001, Tokyo Gas made use of the cryogenic energy of 2.048 million tons of LNG.

■ Actual use of cryogenic energy (fiscal 2001)

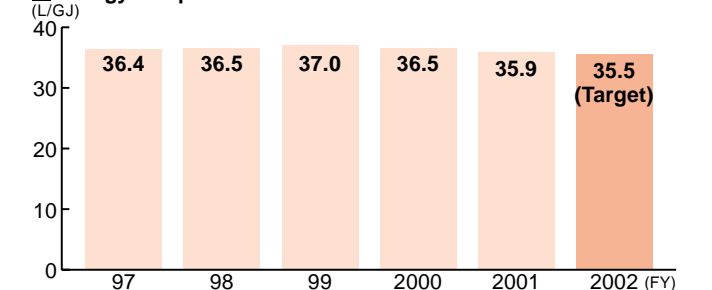
Applications	Amount of LNG whose cryogenic energy was used (10 ³ tons)
Cold storage	49
Production of liquefied carbonic acid gas and dry ice	47
Cryogenic power generation	784
Liquefied oxygen and nitrogen	539
Production of ¹³ C-methane	15
BOG treatment	613
Total	2,048

BOG: Boil-off gas; gas deriving from the vaporization of liquid in LNG tanks due to heat infiltration from outside

District Heating and Cooling Systems

District heating and cooling systems provide the total supply of heat (and/or cooling, depending on climate) needed in entire districts with high efficiency by consolidating its generation into a single energy plant. A total of 80 such systems, including 33 operated directly by Tokyo Gas, have been installed in the Tokyo Gas service area. Among them is the Shinjuku District Heating and Cooling Center, which was the first such system to obtain ISO14001 certification. In fiscal 2001, their basic units of energy used (per unit of heat sales) came to 35.9 L/GJ, down 1.6% from fiscal 2000.

■ Energy use per unit of heat sales (L/GJ)



■ Use of energy and water at district heating and cooling systems operated directly by Tokyo Gas

Item	Unit	FY1997	FY1998	FY1999	FY2000	FY2001	
Heat sales	10 ³ GJ	3,332	3,482	3,592	3,821	3,713	
Energy use	Electrical power (purchased)	MWh	89,149	97,144	100,872	108,974	101,391
	Gas	10 ³ m ³	82,142	85,357	89,262	93,171	89,745
	Total (crude-oil-equivalent)	kL	121,210	127,147	132,774	139,565	133,485
	Basic units (per unit of heat sales)	L/GJ	36.4	36.5	37.0	36.5	35.9
	Rate of reduction in basic units	%	▲0.2	▲0.4	▲1.2	1.2	1.6
Use of water	10 ³ m ³	1,966	2,062	2,115	2,243	2,158	

Business Units

In fiscal 1996, Tokyo Gas launched a campaign for "environmentally friendly office living" to step up the various energy-saving activities already being undertaken at its business units. Over the succeeding years, it conducted studies and measurements to ascertain the facts of energy use. The results were com-

pared into leaflets for distribution, to raise consciousness in this area. In fiscal 2001, it took measures such as changing the air-conditioning temperature setting at its headquarters building and many other business units. As a result, energy use in these office buildings fell by 2.6% from fiscal 2000.

■ Use of energy and water at Tokyo Gas' business units

Item	Unit	FY1997	FY1998	FY1999	FY2000	FY2001		
Energy use	Electrical power (purchased)	MWh	63,373	65,759	63,490	59,788	57,292	
	Gas	10 ³ m ³	19,537	18,469	17,085	17,545	17,402	
	Fuel for vehicles	Gasoline	kL	2,659	2,538	2,219	2,266	2,152
		Diesel oil	kL	39	38	29	26	22
		Natural gas	10 ³ m ³	Included in the figure for gas noted above		188	228	284
Other fuels	kL	—	—	—	230	90		
Total (crude-oil equivalent)	kL	42,462	41,714	39,393	39,279	38,266		
Reduction rate	%	▲8.2	1.8	5.6	0.3	2.6		
Use of water	Shinjuku Park Tower - electrical power (reference)	MWh	—	—	—	2,551	3,048	
	Shinjuku Park Tower - water (reference)	10 ³ m ³	1,526	2,190	1,989	1,684	1,334	
					2	2		

(Note 1) Figures for use of energy include energy used to generate power sold to electric power companies.

(Note 2) Only for Tokyo Gas offices in Shinjuku Park Tower

Example of Approaches at Business Units

The building managers of the Oji Building in Tokyo's Kita Ward are working to reduce energy and are vigorously pursuing other Eco-activities. They put out a monthly publication entitled "Me de Miru Eko Jisseki News" (News of Tangible Eco-results), prepare graphs showing the trend of electric power use, and have a strict rule for turning lights off when not in use. These efforts enabled the building's energy use to be reduced by 4.2% in fiscal 2001 compared with fiscal 2000.



"Turn off lights when not needed" signs in the Oji Building

Green Energy Procurement

In April 2001, Tokyo Gas joined the Green Power Certification System (operated by the Japan Natural Energy Company Limited) to promote use of renewable energy. Members pledge to purchase at least 1 million kWh per year of "green power" generated by windmill plants. In April 2002, facilities such as the Energy & Earth Exploratorium began to make use of this power.



Green Power Certification System mark

Noshiro Wind Power station



Environmental Performance in Business Activities.....

Emissions into the Atmosphere and Water System

Review

As part of its efforts to mitigate global warming, Tokyo Gas has been working to conserve energy in its business activities. In fiscal 2001, company-wide CO₂ emissions amounted to 428 thousand tons-CO₂. This represented a decrease of 34 thousand tons-CO₂ from fiscal 2000 in spite of increases in gas production and heat sales. Emissions of NO_x, which is an air pollutant and a cause of acid rain, came to 73 tons or 16 tons less than in fiscal 2000.

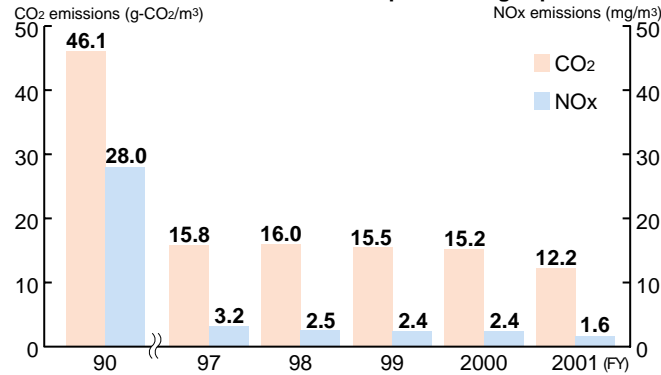
■ CO₂ and NO_x emissions (fiscal 2001)

Field	CO ₂ emissions (10 ³ tons-CO ₂)	NO _x emissions (tons)
Gas manufacturing plants	111	14
District heating and cooling systems	249	59
Business units	68	—
Total	428	73

Gas Manufacturing Plants

City gas used to be produced from coal and oil. The increased import of LNG as the main feedstock for city gas production and overall efficiency gains have dramatically reduced the environmental burden of gas manufacturing plants. The CO₂ emissions associated with city gas production, which amounted to 247 thousand tons-CO₂ in fiscal 1990, have consequently been reduced to less than half as much by fiscal 2001, despite the steady increase in the production volume. The level of CO₂ emissions per unit of gas production has also been steadily falling and in fiscal 2001 came to only 12.2 g-CO₂/m³, or about one-fourth as much as in fiscal 1990. Per-unit NO_x emissions, too, are very low, and amounted to 1.6 mg/m³ of gas produced in fiscal 2001. It should be added that city gas production has little impact on the level of chemical oxygen demand (COD) in water systems.

■ Trends of CO₂ and NO_x emissions per unit of gas production



■ CO₂, NO_x, and COD emissions and wastewater at gas manufacturing plants

Item		Unit	FY1997	FY1998	FY1999	FY2000	FY2001
Atmosphere	CO ₂ emissions (see Note 1)	10 ³ tons-CO ₂	125	128	128	132	111
	NO _x emissions	tons	25	20	20	21	14
Water system	Wastewater (see Note 2)	10 ³ m ³	—	—	—	680	555
	COD emissions	tons	1.0	2.4	1.8	1.7	1.2

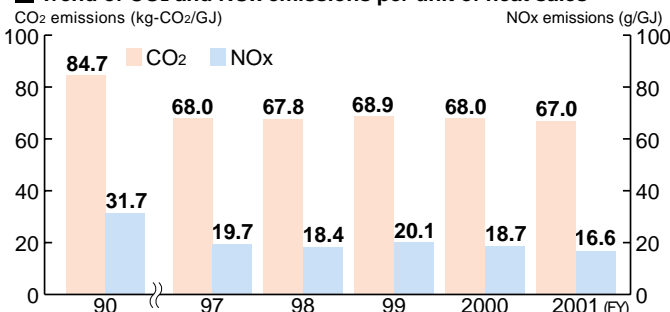
(Note 1) CO₂ emission factors per unit of purchased electrical power are based on values for average of all power sources at the user end in each fiscal year (fiscal 2000 values were also used for fiscal 2001).

(Note 2) Wastewater from wastewater purification facilities

District Heating and Cooling Systems

In fiscal 2001, the total amount of CO₂ and NO_x emissions from district heating and cooling systems operated directly by Tokyo Gas were lower than in fiscal 2000. In addition, thanks to effective use of energy, CO₂ emissions per unit of heat sales came to 67.0 kg-CO₂/GJ, and have stayed at roughly the same level since 1995. NO_x emissions per unit of heat sales were 16.6 g/GJ.

■ Trend of CO₂ and NO_x emissions per unit of heat sales



■ CO₂ and NO_x emissions and wastewater at district heating and cooling systems operated directly by Tokyo Gas

Item		Unit	FY1997	FY1998	FY1999	FY2000	FY2001
Atmosphere	CO ₂ emissions (see Note 1)	10 ³ tons-CO ₂	226	236	248	260	249
	NO _x emissions (see Note 2)	tons	63	61	69	68	59
Water system	Wastewater (see Note 3)	10 ³ m ³	—	—	—	325	328

(Note 1) CO₂ emission factors per unit of purchased electrical power are based on values for average of all power sources at the user end in each fiscal year (fiscal 2000 values were also used for fiscal 2001).

(Note 2) Emissions from smoke generating facilities.

(Note 3) Excluding the Tama District Heating and Cooling Center.

Business Units

CO₂ emissions have been also decreasing from Tokyo Gas' own business units, in parallel with the decline in energy use. In fiscal 2001, CO₂ emissions from office buildings and other operations amounted to 68 thousand tons-CO₂. They are expected to fall further with the switch to natural gas vehicles and spread of energy-saving equipment.

■ CO₂ emissions at Tokyo Gas business units

Item	Unit	FY1997	FY1998	FY1999	FY2000	FY2001
CO ₂ emissions (see Note)	10 ³ tons-CO ₂	76	73	69	70	68

(Note) CO₂ emission factors per unit of purchased electrical power are based on values for average of all power sources at the user end in each fiscal year (fiscal 2000 values were also used for fiscal 2001).

Countermeasures for Industrial Waste

Guideline Review

One of the objectives of the "Reduce, Reuse and Recycle" promotion guidelines is to reduce the final disposal rate for industrial waste in business activities to no more than 5% in fiscal 2005. In fiscal 2001, industrial waste sent out for final disposal company-wide amounted to 401 tons, for a rate of 10%. This met the target for fiscal 2001 (13%).

■ Generation of industrial waste (fiscal 2001)

Field	Amount Generated (tons)	Amount to Final Disposal (tons)	Final Disposal Rate (%)	FY2002 Final Disposal Rate Target (%)
Gas Manufacturing Plants	467	42	9	—
Business Facility Installation	2,289	50	2	—
Business Units	1,188	309	26	—
Total	3,944	401	10	9

Gas Manufacturing Plants

To lower the environmental impact at the stage of gas production, Tokyo Gas is striving to curtail the generation of industrial waste at gas manufacturing plants. In fiscal 2001, the industrial waste from plants amounted to 467 tons, slightly more than in fiscal 2000. As a result of efforts to reduce waste volume and recycle waste by transforming it back into usable resources, the final disposal amount fell to 42 tons, for a final disposal rate of 9%.

■ Generation of Industrial Waste at Gas Manufacturing Plants

Item	Unit	FY1997	FY1998	FY1999	FY2000	FY2001
Amount Generated	tons	2,768	1,243	842	432	467
Amount Recycled (see Note)	tons	526	343	163	217	150
Amount to Final Disposal	tons	2,242	900	679	141	42
Final Disposal Rate	%	81	72	81	33	9

(Note) Figures for fiscal 2000 do not include reduction of waste volume.

Sales Facility Installation

The installation of gas equipment, heating and cooling systems, and water heaters undertaken by Tokyo Gas itself generates waste in the forms of rubble, scrap metal, and waste plastic. This waste is recycled and otherwise properly treated in accordance with the company rules for the disposal of industrial waste. In fiscal 2001, rigorous sorting enabled recycling of 2,239 tons representing 98% of the total amount generated; only 50 tons or 2% of the total was sent out for final disposal.

■ Generation of Industrial Waste in Sales Facility Installation

Item	Unit	FY1997	FY1998	FY1999	FY2000	FY2001
Amount Generated	tons	—	—	2,369	2,228	2,289
Amount Recycled (see Note)	tons	—	—	2,291	2,156	2,239
Amount to Final Disposal	tons	—	—	78	71	50
Final Disposal Rate	%	—	—	3	3	2

(Note) Figures for fiscal 2001 do not include reduction of waste volume.

Business Units

The main types of industrial waste generated at business units are scrap metal and waste plastic. In response to the stricter obligations imposed on source business units by the amended version of Waste Disposal and Public Cleaning Law and other such legislation, Tokyo Gas is stepping up its activities to ensure proper sorting, recycling, and disposal for such waste. In fiscal 2001, the industrial waste generated by business units amounted to 1,188 tons, a decrease of 643 tons from fiscal 2000. Of this total, 838 tons (71%) were recycled, and 309 tons (26%) were sent out for final disposal.

■ Generation of Industrial Waste at Business Units

Item	Unit	FY1997	FY1998	FY1999	FY2000	FY2001
Amount Generated	tons	1,866	1,905	1,773	1,831	1,188
Amount Recycled (see Note)	tons	466	710	898	1,345	838
Amount to Final Disposal	tons	—	—	—	487	309
Final Disposal Rate	%	—	—	—	27	26

(Note) Figures for fiscal 2001 do not include reduction of waste volume.

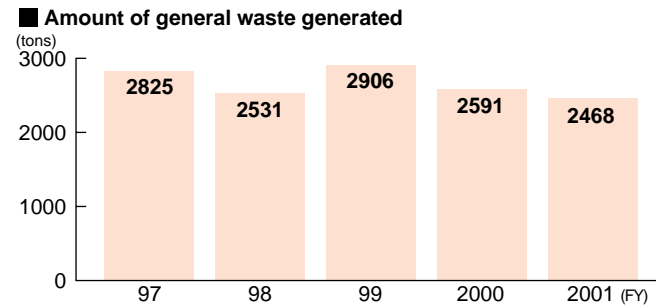
Environmental Performance in Business Activities

Countermeasures for General Waste

Review

In fiscal 2001, Tokyo Gas continued its hard-hitting campaign to reduce amounts of waste paper and other general waste. General waste amounted to 2,468 tons, for a reduction of about 5% from fiscal 2000.

A total of 28 garbage disposal units, of both the high-temperature biological and dry types, fueled with city gas have been installed in the Company to transform organic waste from employee cafeterias into compost.



Curtailed and Recycling of Waste Paper

Guideline

In accordance with its "Reduce, Reuse and Recycle" promotion guidelines, Tokyo Gas is working to reduce the amount of waste paper, which accounts for almost all of the general waste generated at its offices. The guidelines call for a reduction of 25% (relative to fiscal 1999) in fiscal 2005, and therefore a corresponding target of 10% was set for fiscal 2001. Actual results fell slightly short of this target; waste paper amounted to 1,827 tons, for a reduction of 9% relative to fiscal 1999.

At 75%, the recycling rate was above that of 70% targeted for fiscal 2001.

Item	Unit	FY1999	FY2000	FY2001	FY2002 Target	FY2005 Target
Amount of generation (see Note)	tons	2,000	1,917	1,827	1,720	1,500
Amount of reduction	tons	—	83	173	280	500
Reduction rate	%	—	4	9	14	25
Recycling rate	%	—	65	75	80	85

(Note) The fiscal 1999 amount is the guideline standard.

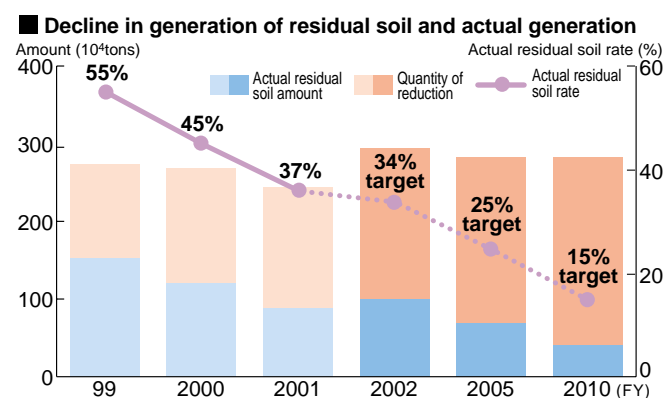
Countermeasures for Waste in Gas Pipeline Installation

Review

Curtailed of Residual Soil Generation and Promotion of Reuse and Recycle

Guideline

The installation of gas pipelines under roads generally results in the generation of residual soil and chunks of asphalt and concrete. Tokyo Gas is reducing the generation of residual soil by the installation of pipes at shallow depths and by applying the trench-less method. It is also expanding the reuse of residual soil and soil that has been improved. In fiscal 2001, the residual soil sent outside the Company for disposal came to 0.9 million tons, or 37% as much as the potential 2.46 million tons that would have been generated by the use of conventional installation methods. The Company therefore met its target of 38% for reduction of this waste. And because of the corresponding decline in operation of trucks to transport the soil, these activities are also helping to curtail CO₂ and NO_x emissions.



Reduction and recycling of residual soil

Item	Unit	FY1999	FY2000	FY2001	FY2002 target	FY2005 target	FY2010 target
Total length of pipeline installed	km	865	857	906	956	—	—
Residual soil	Potentially generated amount	10 ⁴ tons	274	268	246	295	—
	Reduced generation	10 ⁴ tons	46	76	81	86	—
	Reuse	10 ⁴ tons	50	38	44	57	—
	Recycling	10 ⁴ tons	27	32	32	52	—
	Total reduction amount	10 ⁴ tons	123	147	156	194	—
Actual residual soil amount	10 ⁴ tons	152	121	90	100	—	—
Actual residual soil rate	%	55	45	37	34	25	15

Recycling of Waste Gas Pipe

As in fiscal 1999 and 2000, Tokyo Gas attained a recycling rate of 100% for waste gas pipe derived from pipeline installation in fiscal 2001, thanks to its steady promotion of recycling.

In fiscal 1994, Tokyo Gas established a system for recycling polyethylene (PE) pipe scraps and excavated sections. In fiscal 2001, it recycled a total of 130 tons of such pipe. Besides being put to in-house reuse as gas construction material (labels, marker tape for underground pipes, etc.), waste pipe is increasingly being transformed into commercial products by other firms and offered for sale to the general public. Shopping bags, document holders, ball-point pens, and other articles made from recycled PE pipe are used extensively in Tokyo Gas offices as part of the green purchasing program.

In fiscal 2001, Tokyo Gas also recovered 6,225 tons of obsolete steel and cast-iron pipe. Steel makers, etc., recycled this entire amount as raw material, for a recycling rate of 100%.

Recycling of waste gas pipe

Items	Unit	FY1997	FY1998	FY1999	FY2000	FY2001
PE pipe	Recovered amount	tons	109	118	103	129
	Recycled amount (see Note)	tons	67	72	103	129
	Recycling rate	%	61	61	100	100
Steel and cast-iron pipe	Recovered/recycled amount	tons	—	5,552	5,332	6,225
	Recycling rate	%	—	100	100	100

(Note) FY1999 figures is calculated using a method based on the actual situation.

List of articles made from recycled PE pipe

Type	Articles
Commercial products	Shopping bags, Garbage bags, Document holders Office files, Ball-point pens Mechanical pencils, Chairs for office use, etc.
Gas works materials	Explanatory labels on gas meters Tape for marking buried gas pipe Materials for hot-water system piping

Examples of articles made from recycled PE pipe



PE pipe: Polyethylene (PE) gas pipes offer excellent resistance to earthquakes and corrosion, and their installation has rapidly spread in the wake of the Great Hanshin Earthquake. At present, more than 95% of the low-pressure lines newly installed under roads are made of PE.

Environmental Performance in Affiliated Companies

Review

In fiscal 2001, Tokyo Gas again collected data on indicators of environmental performance (such as energy use) from its affiliated companies, in keeping with its goal of promoting environmental conservation at the Group level. The collection began in fiscal 2000, and again in fiscal 2001, the subjects were the 13 consolidated companies and the 6

non-consolidated companies with the greatest potential environmental impact.

Tokyo Gas is also furnishing extensive support for the establishment of environmental management systems (EMS) at affiliated companies (see page 9).

Use of energy, water, and copy paper, and generation of general and industrial waste, at affiliated companies

Item	Unit	13 consolidated companies		6 non-consolidated companies			
		FY2000	FY2001	FY2000	FY2001		
Use of energy	Electrical power (purchased)	MWh	88,083	80,293	7,858	8,666	
	Gas	10 ³ m ³	1,027	1,409	106	100	
	Vehicle fuel	Gasoline	kL	486	939	239	148
		Diesel fuel	kL	16	93	15	15
Total (crude-oil-equivalent)	kL	25,020	23,898	2,441	2,564		
CO ₂ emissions	10 ³ tons-CO ₂	36	36	4	4		
Use of water	10 ³ m ³	187	238	11	10		
Use of copy paper (A4 size)	10 ³ sheets	18,546	29,453	4,437	4,575		
Generation of general waste	tons	1,362	1,125	97	129		
Generation of industrial waste	tons	1,447	15,237	90	112		

* Beginning in fiscal 2001 there was a great increase in the number of business units covered.
* Amounts at Tokyo Gas Building Service Co., whose environmental management is integrated with that of the business units of Tokyo Gas, are included in those for Tokyo Gas, except for copy paper.
* The method of data collection for electrical power and water was partially revised beginning in fiscal 2000.



▲ Example of efforts at affiliated companies: Very-low-temperature cold storage applying LNG cryogenic energy



▲ Example of efforts at affiliated companies: Production of dry ice utilizing LNG cryogenic energy

Environmental Performance in Products

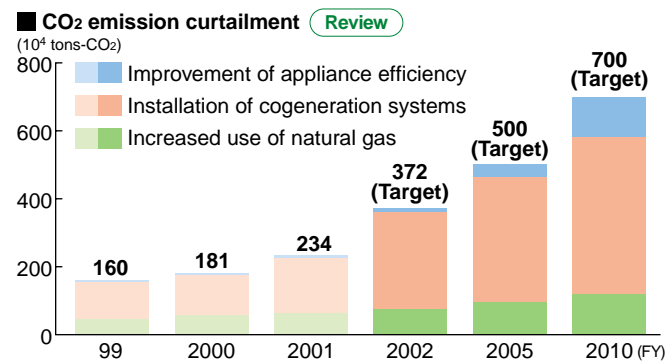
The city gas sent to customers is utilized in a variety of gas equipment and systems. Tokyo Gas is working to mitigate the environmental impact of energy utilization by our customers through measures including

the promotion of natural gas use, which has excellent environmental features, the use of high-efficiency equipment and systems, and the recycling of used gas appliances.

Countermeasures for Global Warming at Customer Locations Guideline

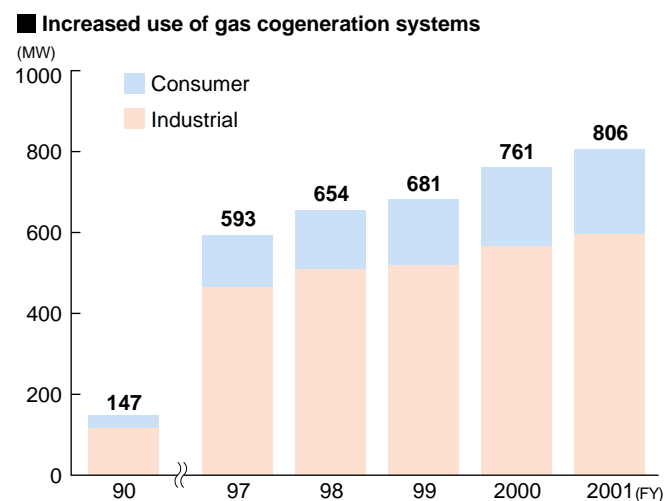
Tokyo Gas's of global warming prevention guidelines post the target of curtailing CO₂ emissions at customer locations by more than 5 million tons-CO₂ in fiscal 2005 and 7 million tons-CO₂ in fiscal 2010. In fiscal 2001, CO₂ emissions accompanying gas utilization came to some 19.46 million tons-CO₂, and this represented a curtailment effect of 2.34 million tons-CO₂. The latter figure consisted of 0.1 million tons-CO₂ from improvement of the efficiency of city gas appliance and systems, 1.62 million tons-CO₂ from the diffusion of cogeneration systems, and 0.63 million tons-CO₂ from increased use of natural gas.

* The calculation of the CO₂-curtailing effect due to the reduced use of electrical power was based on CO₂ emission factors (CO₂-equivalent) of the average thermally generated electric power at the user end.



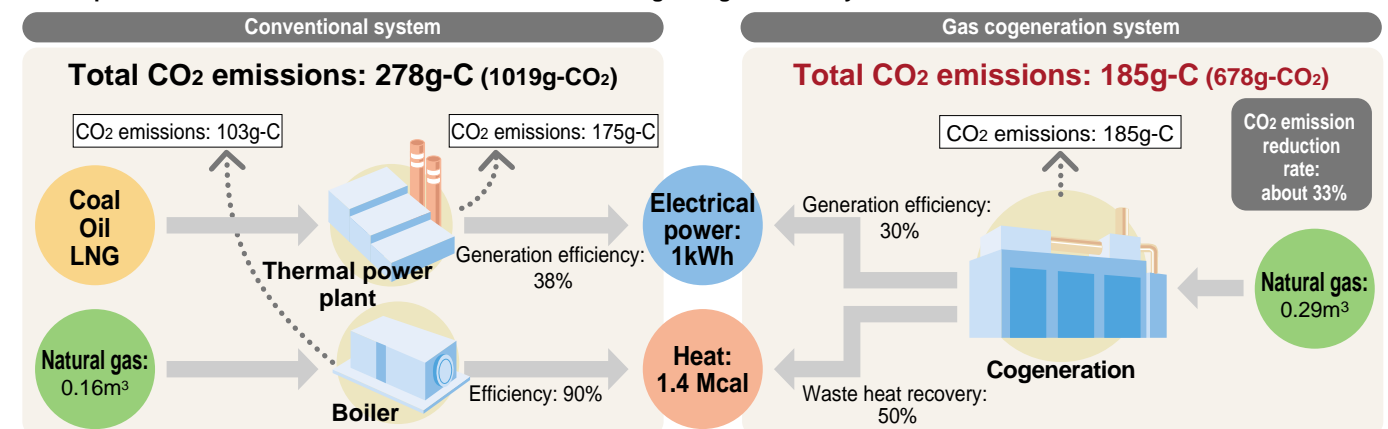
Spread of Gas Cogeneration Systems

Gas cogeneration systems generate electricity with turbines or engines fueled with city gas, and use the waste heat derived in the process for air conditioning and water heating. With their "cascade use" of energy, they efficiently extract electrical and thermal energy and attain a total energy efficiency in the range of 70 - 80%. The high total efficiency for gas cogeneration systems helps to curtail CO₂ emissions. A cumulative total of 772 gas cogeneration systems with a combined capacity of 806 MW kilowatts had been installed as of the end of fiscal 2001. (Of this total, industrial systems accounted for 251 with a combined capacity of 598 MW, and consumer systems, 521 systems with a combined capacity of 208 MW.)



Cascade use: Efficient energy utilization requires not only an increase in the efficiency of the equipment per se, but also a multistage use of energy, i.e., at all levels of temperature (from high to low) and from the top to the bottom of the entire energy cascade. Such utilization of energy is referred to as "cascade use".

Comparison of the CO₂ emission levels of conventional and gas cogeneration systems



Source: "Planning and Design Manual for Natural Gas Cogeneration 2002," a separate volume of "Clean Energy"

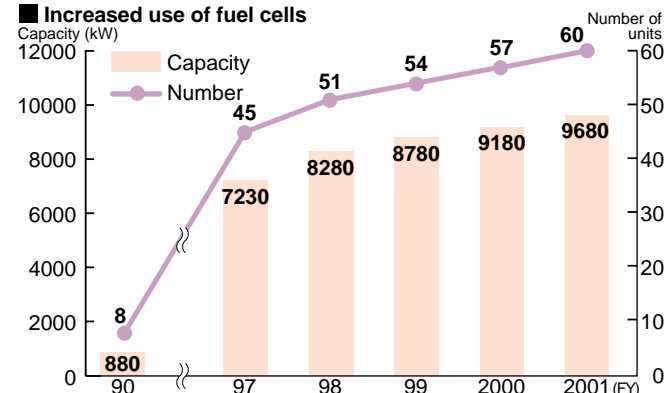
Third-party Verification of CO₂ Emissions Reduction

In December 2001, Tokyo Gas joined with the Chuo Sustainability Research Institute Corporation in conducting Japan's first third-party verification of CO₂ emissions reduction due to the installation of gas cogeneration systems. With the cooperation of Morinaga Milk Industry Co., Ltd., which has installed such systems within the Company's service area, the verification checked the reduction realized at its plant in Tokyo's Tama district in fiscal 2000. This plant first used a steam turbine cogeneration system that was later replaced with a gas cogeneration system for further conservation of energy. The check found that the gas cogeneration system reduced CO₂ emissions by 5,940 tons in fiscal 2000.

Fuel Cells

Fuel cells are systems for generation of electrical power through the chemical reaction between hydrogen produced from substances such as natural gas and the oxygen in the air. They have excellent environmental features, including a high generation efficiency, minimal emissions of CO₂ and NO_x, and absence of vibration and noise.

Increased use of fuel cells



Baselines and estimates of CO₂ emission reduction

Hypothetical baseline	CO ₂ emission reduction (tons-CO ₂)
Case 1 Purchased electrical power plus gas boiler	9,540
Case 2 Steam turbine cogeneration system, operation in proportion with the increase in the steam turbine cogeneration system demand	3,750
Case 3 Steam turbine cogeneration system, steam cogeneration system working rate equal to the average over the last five years, and coverage of shortage through use of purchased power and gas boilers	5,940

(Note) Case 3 was selected as the baseline because it is based on conventional facilities and assumes realistic handling of shortages.

Phosphoric acid fuel cell

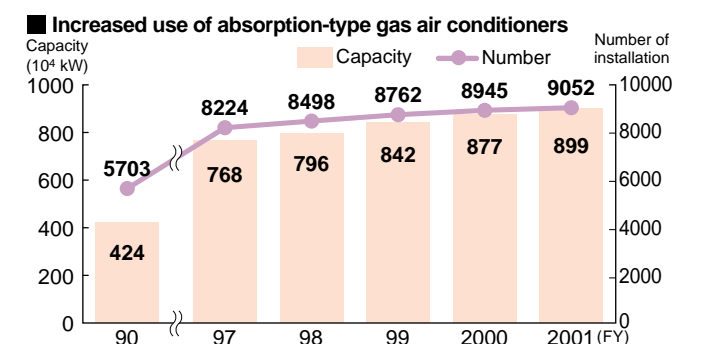


The phosphoric acid type of fuel cell is already in practical use. It has been installed at various sites as the generation unit in gas cogeneration systems. As of the end of fiscal 2001, a cumulative total of 60 units with a combined capacity of 9,680 kW had been installed in the service area of Tokyo Gas. In preparation for the age of distributed power generation, Tokyo Gas is also promoting the development of home-use cogeneration systems applying fuel cells of the polymer electrolyte type (see page 26).

Protection of the Ozone Layer

Increased Use of Absorption-type Gas Air Conditioners

Absorption-type gas-fueled air conditioners do not use chlorofluorocarbons (CFCs) for refrigerant, and are therefore extremely valuable for protection of the ozone layer. As of the end of fiscal 2001, a combined capacity of 8.99 GW had been installed at a total of 9,052 locations. To expand the use of these highly environmentally friendly air conditioners, Tokyo Gas collaborated with Osaka Gas and Toho Gas in inaugurating a "green system" especially for the absorption AC's. Under this system, which is aimed at encouraging the increased use of absorption-type gas air conditioners in particular, the three companies set new standards for reduction in environmental burden and pledged to jointly promote absorption-type chiller-heaters that meet these standards.



Switch of GHP Refrigerant

In order to protect the ozone layer, use of hydrochlorofluorocarbon (HCFC) refrigerants is to be reduced worldwide beginning in 2004 and completely phased out by 2020. For refrigerant, the gas heat pumps (GHPs) sold by Tokyo Gas thus far have made

use of either a HCFC type (R22) or a hydrofluorocarbon (HFC) type (R407C). In January 2002, however, a complete switch was made to R407C, which has a zero coefficient of ozone layer destruction.

NOx Emission Countermeasures at Customer Locations

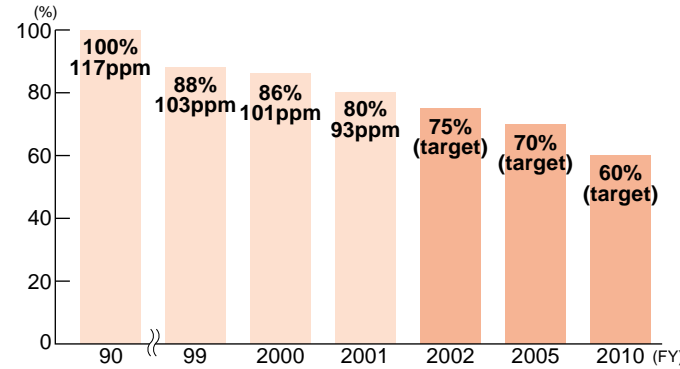
Guideline

◎ Promotion of Low-NOx Emission Gas Appliance

Review

In fiscal 2001, the average NOx concentration of emissions from all gas appliance was 93 parts per million (ppm), or about 80% as high as in fiscal 1990. This reduction is being driven by the development and increased use of low-NOx emission technology for cogeneration systems and GHPs, and enabled Tokyo Gas to meet its fiscal 2001 target of holding these emissions to no more than 83% of the fiscal 1990 total. In fiscal 2001, NOx emissions from all gas appliances totaled about 15.4 thousand tons.

■ Average NOx concentration of emissions from all gas appliance (as percentage of the fiscal 1990 level)



Increased use of Natural Gas Vehicles

Natural gas vehicles (NGVs) are a practical type of low-emission automobile fueled with clean natural gas instead of diesel fuel or gasoline. They do not emit any black smoke or SOx and have much lower emission levels for NOx. They are found in all vehicle categories, from light cars and utility trucks, to large buses and trucks, and even forklifts. In the Tokyo Gas service area, a total of 1,926 natural gas vehicles were added in fiscal 2001 with a combined NOx-emission-reducing effect, as estimated by Tokyo Gas, of about 80 tons per year. The cumulative number of natural gas vehicles on the road in Japan topped 10,000 in November 2001 and reached 12,012 (including 4,690 in the Tokyo Gas service area) at the end of fiscal 2001.

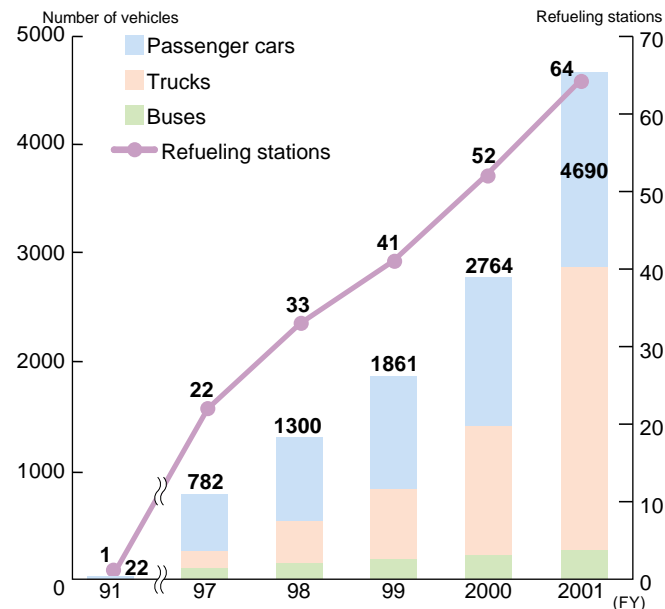
The Tokyo Gas service area contained 64 high-speed refueling stations especially for natural gas vehicles as of the end of March 2001 including those under construction. This number includes 12 exclusively for buses and delivery trucks. These stations can refuel the vehicles with compressed natural gas in a matter of minutes. Small refueling units that can be readily installed in parking lots and other such places numbered 156.

Special-purpose refueling stations:

The Tokyo Metropolis, City of Yokohama, Ministry of the Environment, major transport companies, and other parties promoting the diffusion of natural gas vehicles are installing refueling stations on their grounds especially for these vehicles.

Small refueling units: Units designed for installation at business units, parking lots, etc., for on-site refueling.

■ Increased use of natural gas vehicles and refueling stations (within the Tokyo Gas service area)



▼ Kasai truck terminal



▼ Keisen University school bus



■ Estimate of NOx emission reduction due to NGVs (FY2001)

Type	Number of units	NOx emission reduction (tons per year)
Passenger cars	67	0.04
Lightcars	238	0.27
Vans	124	0.07
Trucks	1,178	67.74
Buses	58	4.62
Garbage trucks	241	7.71
Other	20	—
Total	1,926	80.45

Waste Countermeasures at Customer Locations

Review

◎ Response to the Home Appliance Recycling Law

In April 2001, Japan enacted Law for Recycling of Specified Kinds of Home Appliances, which covers the residential-use gas air conditioners bearing the Tokyo Gas brand. In response, Tokyo Gas joined the Home Appliance Recycling System (commonly referred to as the "A Group") organized mainly by Matsushita Electric Industrial Co., Ltd., to ensure proper recovery and recycling of these products. In fiscal 2001, it recycled approximately 76% of the entire weight, of units recovered, back into products (as compared to the legal standard of 60%), and destroyed the entire amount of CFC refrigerants, except for the stock in treatment plants.

■ Response to Law for Recycling of Specified Kinds of Home Appliances (residential-use air conditioners)

Item	Unit	FY2001
Number of items received at designated handling sites	Units	13,111
Number of items hauled away to processing plants	Units	12,956
Recycling (retransformation into products)	Processing volume for recycling	Units
	Processing weight for recycling	tons
	Recycled weight	tons
	Recycling rate	%
CFCs	Recovery weight	kg

◎ SRIMS, the Recovery and Recycling System for Discarded Gas Appliances and Other Waste

In August 1994, Tokyo Gas developed its own system for recovery and recycling of discarded gas appliance. Known as the Saving & Recycling Innovative Model System (SRIMS), this system is applied for the recovery of gas appliance and materials that are handled by cooperating firms (franchised service outlets and construction companies, such as Enesta and Enefit) and subsequently discarded on the occasion of the purchase of new models or gas construction and renovation work at customer locations. In fiscal 2001, the scope of SRIMS was expanded from gas appliances and the conventional discarded articles, to also include products covered by Law for Recycling of Specified Kinds of Home Appliances. Under it, Tokyo Gas recovered a total of 10,633 air conditioners, 80 TV sets, 90 refrigerators, and 81 washing machines, and hauled them off to designated handling sites.

Enesta and Enefit: Tokyo Gas sales networks

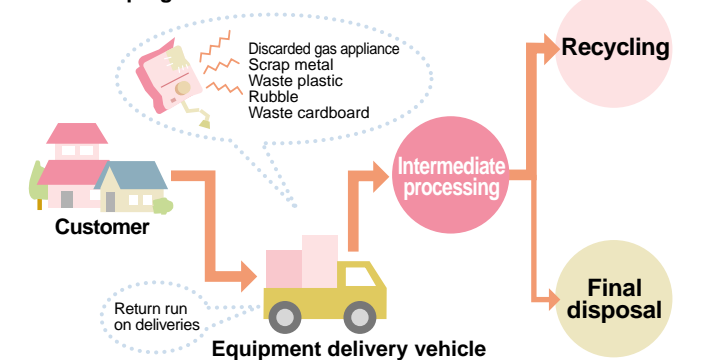


◀ Recovery under SRIMS

Mitigation of Environmental Burden under SRIMS

Treatment of discarded gas appliances necessarily entails hauling by vehicle. Tokyo Gas conducted studies and checks to determine the degree of reduction in environmental burden induced by the differences between SRIMS (use of vehicle on their return trips to pick up used appliances for recycling) and the conventional approach in respect of vehicle use (send a vehicle and driver to a location specifically to pick up a used appliance). These studies found that SRIMS reduced levels of CO₂, NOx, and SOx emissions by about 15% relative to the conventional vehicle use. They also showed that SRIMS was more economical, in that it reduced processing costs by 20 - 30%. Tokyo Gas intends to make SRIMS even more environmentally friendly by switching to natural gas vehicles for delivery and operating them more efficiently.

■ SRIMS program



■ Waste recovery under SRIMS

(Unit: tons)

Item	FY1997	FY1998	FY1999	FY2000	FY2001
Gas appliance (see Note) and scrap metal	2,000	2,770	5,278	5,522	5,033
Waste plastic	310	470	1,128	1,275	1,376
Rubble	91	210	354	337	414
Cardboard	129	260	636	730	747
Other	160	50	0	242	266
Total	2,690	3,760	7,396	8,106	7,836

(Note) Figures for fiscal 2001 do not include the kinds of home appliances specified under the recycling law.

Environmental Technology Development

In its pursuit of more effective use of energy and the conservation of the global environment, Tokyo Gas is developing technology with an emphasis on gas cogeneration systems. In particular, it is

conducting research and development programs aimed at developing practical systems that apply fuel cells and micro gas turbines to the dispersed energy supply system of the next generation.

Development of Micro Cogeneration Systems

Conventionally, cogeneration systems have been installed only for large-scale structures. In light of their exceptional energy-saving qualities, the need to install them in medium and small structures

as well is rising. In response, Tokyo Gas is working on the development of smaller systems adapted for use in homes and other facilities.

◎ Fuel Cell Cogeneration System for Home-use

Tokyo Gas is currently engaged in the development of polymer electrolyte fuel cells (PEFC) cogeneration systems for home use. The systems have a capacity on the order of 1 kW, and are targeted for commercialization in fiscal 2004. In fiscal 2001, a PEFC cogeneration system manufactured by Ebara Ballard Corporation, that was integrated with the high-efficiency fuel processing technology developed by Tokyo Gas achieved an electrical generation efficiency of 34% and total efficiency of 81% (in LHV terms). These figures reach the targets for initial commercialization. Tokyo Gas' fuel processing technology was essential in attaining this efficiency. Test operation of two PEFC cogeneration systems installed in actual homes was initiated to test their operation based on the optimal control system for power and heat output. This control system was developed by Tokyo Gas.

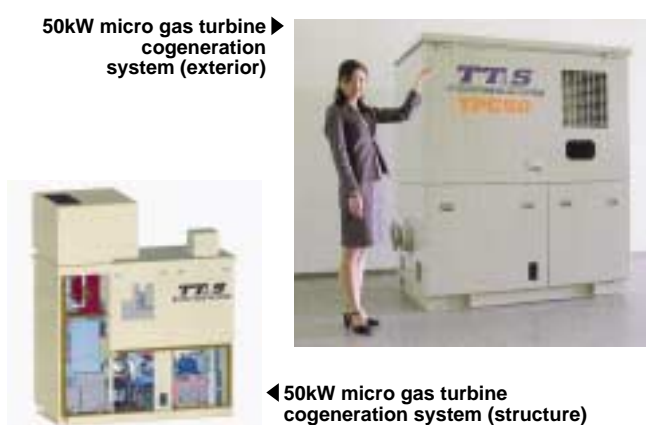


◎ Micro Gas Turbine Cogeneration System

Since fiscal 1999, Tokyo Gas has been vigorously promoting the commercialization of micro gas turbines. In fiscal 2001, it initiated field demonstration of a 28 kW micro turbine cogeneration system. Ten such systems are in regular operation at stores and other locations.

We also conducted a proving test of a 50 kW class micro gas turbine and has commenced test operations aimed at commercialization.

In addition, we developed a 270 kW micro gas turbine cogeneration system incorporating a low-NOx combustor. This system produces only two-thirds as much NOx emission as the former one. It also offers a lower cost and size reduction of about 40% in compared with other units in its capacity class.



◎ Small Gas Engine Cogeneration System

Tokyo Gas developed a small gas engine cogeneration system with a 6 kW output. This system is designed to generate power and hot water for customers in business sectors using a lot of hot water (such as homes for the aged, restaurants, and public baths). For a small system of this type, it delivers a high electrical generation efficiency (26.5%) and has a total efficiency (inclusive of waste heat recovery) of 86%.

We launched sales of this system in February 2002.



Further Increase in the Efficiency of Gas Cogeneration Systems

◎ High-efficiency Miller-cycle Lean Combustion Gas Engines

The attainment of higher levels of energy conservation and economic performance with gas cogeneration systems demands the development of gas engines with a higher thermal efficiency. The gas engine newly developed by Tokyo Gas applies Miller-cycle technology to a lean-combustion gas engine. It features a higher expansion ratio, better combustion characteristics, and advanced control technology to suppress knocking and other such phenom-

ena. It attained a thermal efficiency of 43%, the highest in the world (with a rated generation output of 350 kW). Tokyo Gas is going to develop a cogeneration package utilizing this engine.

Miller-cycle engine: As compared to the conventional Otto-cycle engines, Miller-cycle engines have a higher expansion ratio but about the same compression ratio, and make it possible to extract more of the energy released by the combustion of gas.

◎ Technology Using Thermoelectric Materials

Thermoelectric materials have a high thermoelectromotive force when subjected to a high temperature difference. Their application to power generation is referred to as "thermoelectric power generation." Such technology enables the direct conversion of thermal energy to electrical energy. Moreover, it does not have a drive unit (rotating generator), and therefore makes less noise and requires no maintenance. Its application to recover of the (otherwise wasted) heat of combustion from exhaust streams is expected to increase the generation efficiency of gas cogeneration systems. In

1997, Tokyo Gas discovered an excellent thermoelectric material in Na_xCoO₂, which does not contain any toxic or rare elements. In 2001, it developed a synthesis method for Na_xCoO₂ single crystals which delivered the world's best performance for an oxide. The agenda for the future includes the preparation of thermoelectric modules (devices) and studying methods to apply them to the exhaust system of gas cogeneration units. The recovery of electricity from the heat of automobile exhaust will also be investigated.

Other Environmental Technology Development

◎ Latent Heat Recovery-type Bath Water Heater (TES Boiler)

Tokyo Gas is developing high efficiency water heater models. Since developing and commercializing the Model 20, a business-use high efficiency water heater (which won the Ministry of International Trade and Industry's Prize at the 10th Energy Conservation Grand Prix) in fiscal 1999, Tokyo Gas has developed and commercialized other high efficiency water heaters for both business and home use. In fiscal 2001, it expanded the line by developing the TES boiler, a high efficiency water heater based on recovery of latent heat.

Latent heat recovery-type bath water heater (TES boiler)



◎ Absorption-type chiller-heaters

Tokyo Gas is developing high efficiency absorption-type chiller-heaters, which do not use any CFC refrigerant. In fiscal 2001, it achieved a coefficient of performance (COP) of 1.35 (in HHV terms; the highest in the world for gas-fueled absorption equipment) with one such model, and is planning to come out with a commercial version in the near future. It is also developing models that apply a triple-effect cycle and have a COP of more than 1.6. Furthermore, since partial loads account for most of a system's operation time, it is working to integrate the components to raise the energy efficiency of the entire system by 15% (as opposed to just concentrating on the air conditioning unit proper).

High-efficiency absorption-type chiller-heater



COP: Coefficient of Performance, an indicator of the level of cooling and heating performance per kilowatt-hour of energy consumed; a higher COP indicates higher efficiency.

◎ Combustion-type Exhaust Gas Treatment Unit

Tokyo Gas developed a combustion-type gas treatment unit that is capable of decomposing carbon tetrafluoride (CF₄) with a high efficiency of more than 99%. CF₄ has a global warming coefficient that is 6,500 times that of CO₂. It is a very stable compound and conventional anti-pollution equipment is not able to decompose it

completely. This unit, which treats the process exhaust gas from semiconductor plants by means of combustion, has high energy efficiency, a high level of safety and can be used with many different kinds of fuel.

Community Contribution

"Eco-life" Proposals

For many years, Tokyo Gas has been advocating environmentally friendly living under the banner of "Eco-life". Besides offering "Eco-life" tips in "Midori's Eco-life Calendar" (a brochure which we have published each year since 1996) and through our website, we have

participated in environmental lectures staged by municipalities and seminars held by various organizations in order to provide information for and make presentations on "Eco-life" promotion.

◎ Eco-cooking

People are apt to regard environmental problems as complicated and remote ones. To stimulate learning about them in an enjoyable fashion and with familiar items, Tokyo Gas has been holding "Eco-cooking" classes since fiscal 1995. The classes propose environmentally friendly culinary practices in all areas, from shopping and cooking to tidying up after meals. In addition to those held at Tokyo Gas showrooms and cooking classrooms, we are increasingly staging classes for municipalities, education groups, consumer groups, and even other companies. Since fiscal 2001, we have also been sending "Eco-cooking" instructors to elementary schools for programs there. As this indicates, the classes are steadily becoming established as venues for raising environmental awareness. In fiscal 2001, "Eco-cooking" classes were held in conjunction with Environment Month (June), Recycling Promotion Month (October), and Energy Conservation Month (February), as well as events such as Earth Day 2001 Tokyo and the Life Style Review Forum. In all, they numbered 250 and attracted a total of 4,700 participants. This brought the cumulative number of class participants to some 16,000.

■ "Eco-cooking" class data

Item	Unit	FY1997	FY1998	FY1999	FY2000	FY2001
Sessions	times	67	105	94	200	250
Participants	persons	1,800	2,000	1,900	3,500	4,700

"Eco-cooking" Reader



"Eco-cooking" at the Life Style Review Forum



Life Style Review Forum

The Life Style Review Forum 2001 was staged as a part of Global Warming Prevention Month in December. This event, which rests on collaboration among government, business, non-governmental organizations (NGOs), and citizens, was initiated in 2000 for the purpose of encouraging a switch to environmentally friendly life styles. We support this aim, and held "Eco-cooking" classes at our Shinjuku show room to propose ways of putting culinary life more at harmony with the environment. Ms. Daniela Ozik, who is an expert in Italian cuisine, was invited to give demonstrations and speak on the secrets to preparing delicious waste-free dishes and the sensible culinary habits found in Europe. The two-day program drew a total of 72 participants.

Support for Environmental Education

◎ Support for Education about the Environment and Energy in General Education Classes

Elementary and middle schools recently invested class time for free learning about things in the world around them. To aid with this initiative, in June 2001 Tokyo Gas established a new section to support education about the environment and energy, and prepared many tools for education, including a work sheet entitled "Let's Learn about the Environment and Energy!", the videos "Let's Build New Communities" and "The Earth: BOOO!", and the "Midori" series of Eco-life booklets. These tools were distributed to boards of education and elementary schools in Tokyo Gas' service area. It also launched a website entitled "Energy Plaza for All" and began supplying a program for research-type learning for students in the upper grades of elementary school.

Tokyo Gas has prepared eight programs for classes on subjects such as "Eco-cooking" and natural gas vehicles. Tokyo Gas sends its employees to teach these classes to schools which request them.

▼ Let's Learn about the Environment and Energy!



▲ "Midori's Eco-life booklets"



◎ Corporate Pavilions

Tokyo Gas has established three pavilions to provide accurate information and stimulate thought about energy and environmental issues which are closely bound up with contemporary life. Offering first-hand experience of environmental problems, the Energy and Earth Exploratorium has been widely praised as an excellent venue for environmental education. In 2001, its third year, the cumulative number of visitors topped 300,000.

■ Outline of Tokyo Gas Pavilions and number of visitors (fiscal 2001)

Name	Location	Features	Year of opening	Number of visitors
Energy & Earth Exploratorium	Tsurumi-ku, Yokohama	The Exploratorium allows children to experience environmental facts in a playful atmosphere of learning through the senses.	FY1998	98,319
Gas Science Center	Koto-ku, Tokyo	The Center is a venue of enjoyable education about gas through experiments, demonstrations, videos, and models.	FY1986	106,795
Gas Museum	Kodaira, Tokyo	The Museum houses exhibits on the history of gas and the changes in lifestyle over time.	FY1967	21,461

Support for Volunteer Activities

Tokyo Gas supports employees engaged in volunteer activities making a vital contribution to society. Besides holding experience-oriented classes (four times a year) and providing information to a related employee organization (Tokyo Gas Volunteer Network), it

provides paid leaves of absence for volunteer activities. In fiscal 2001, 46 employees took leave to engage in volunteer work (see page 33).

Other Community Contribution Activities

Tokyo Gas actively provides support and cooperation for environmental activities of all types, from those conducted as part of the

corporate policy of community contribution to those for voluntary participation by individual employees.

▼ Prize-winning film of the 10th EARTH VISION "Frontiers of Dreams and Fears" (56min/Palestine, U.S.A.)



▼ Acorn tree-planting festival



▼ Charity flea market



■ Examples of community contribution activities (fiscal 2001)

type	Activity	Description
Support for environmental events	EARTH VISION The Tokyo Global Environmental Film Festival	It has been held annually in Tokyo since 1992 to understand our environment better through moving images and photographs from Asia, Oceania and Polynesia.
Greening and nature conservation	Acorn tree-planting festival	It drew about 200 people for planting in the Mount Fuji area in May 2001, about 40 for tending to the planted seedlings in June, and about 150 for gathering acorns for production of seedlings in October.
	"Green" fund-raising drive	In fiscal 2001, it collected contributions of 836,933 yen for a cumulative total of over 5 million yen.
	Tokyo Gas Forestry Group	This group has been engaged in planting, brush-clearing, and trimming activities since 1993.
Recycling activities	Flea market	As part of its "Heartful Program" Tokyo Gas held a charity flea market in November.
Provision of low-emission vehicles	Tokyo International Women's Marathon	Tokyo Gas supplied one natural gas truck to carry the camera covering the race and one medium-sized natural gas bus to pick up runners who dropped out before finishing.

Environmental Communication

Information Disclosure

Environmental Report and Environmental Website

Tokyo Gas has published the Environmental Report every year since 1994. As of the end of May 2002, it had distributed about 10,000 copies of the 2001 edition (Japanese version). Beginning with the 2000 edition, Tokyo Gas has inserted a questionnaire to obtain the opinions of readers for consideration in preparing the next edition. Since fiscal 1996, it has been presenting information about its environmental efforts on its Internet website.



Environmental Report

Provision of Information on Energy Conservation

For more skillful, waste-free use of our finite energy resources, Tokyo Gas provides information on energy conservation. Besides offering the booklets "Ultra Energy-Saving Reader" and "Pleasant Eco-life with Gas," Tokyo Gas provides information on the Internet and assists in the preparation of specials on the subject on TV and in magazines. Its meter-reading slips, distributed to customer homes once a month, show the amount of gas used in both the current month and the preceding one to enable comparison.

Ultra Energy-Saving Reader



Participation in Exhibitions

Tokyo Gas presented its environmental activities and related technology at exhibitions held at various venues.

Major exhibitions in which Tokyo Gas participated (fiscal 2001)

Event	Sponsor	Month	Place	Description
Earth Day 2001 Tokyo	Earth Day 2001 Tokyo executive committee	April	Yoyogi Park and other locations	Staging of "Eco-cooking" classes
Eco Car World 2001 (Low-emission vehicle fair)	Ministry of the Environment, Tokyo Metropolitan Government, and other entities	June	Yoyogi Park	Display of natural gas vehicles
Exhibition of New Technology Toward a Recycling-Oriented Society	TEPIA Foundation	September ~ March	TEPIA	Display of products made of recycled scrap PE pipe, "Eco-cooking" instruction, etc.
Life Style Review Forum	Life Style Review Forum 2001 Executive Committee, Ministry of the Environment	December	Shinjuku Park Tower	Staging of "Eco-cooking" classes, etc.
Eco-Products 2001	Japan Environmental Management Association for Industry and Nihon Keizai Shimbun, Inc.	December	Tokyo Big Sight	Presentation of environmental measures and Eco-products, and "pellet class"
ENEX 2002	Energy Conservation Center	January ~ February	Tokyo Big Sight	Display of energy-saving and environmental technology

Eco-Products 2001



ENEX 2002



Participation in Community Environmental Events

Tokyo Gas is an enthusiastic participant in environmental events held by local communities. At such events, it profiles its environmental activities, displays products made of recycled gas pipe, and introduces visitors to natural gas vehicles.



Kawasaki Environmental Day (June)

Environmental Expo Sugunami 2001 (October)



Dispatch of Instructors to Lectures and Seminars

Tokyo Gas sends instructors to lectures and seminars to speak on issues related to energy and the environment.

Partial list of lectures/seminars to which Tokyo Gas sent speakers (fiscal 2001)

Event	Sponsor	Month	Place	Subject
Shinshu Environmental Fair 2001 Third Global Environmental Convention	Nagano Employer's Association	September	Yamabiko Dome (Shinshu Sky Park)	Approaches to the environment at Tokyo Gas
National/Panasonic Environmental Forum	Matsushita Electric Industrial Co., Ltd.	October	Multimedia Center, Matsushita Electric Industrial Co., Ltd.	"Environmental Management and Human Resources Development," a panel discussion at the Environmental Forum 2001 LE symposium
Kanagawa Chapter Boiler Day Convention	Japan Boiler Association, Kanagawa Chapter	November	Hotel Rich Yokohama	Measures to prevent global warming and energy-saving systems
The 5th International Workshop on Geo-Environmental Restoration - IWGER 2002	Geo-Environmental Protection Center	January	Tokyo International Forum	Countermeasures for soil contamination at former sites of Tokyo Gas coal gas plants as an example of efforts in this area in Japan
First Shibuya Ward Environment Conference	Shibuya Ward	February	Shibuya ward office	Promotion of energy-saving action

* Tokyo Gas has also sent instructors to many other events related to technology development.

Tours of Facilities

Tokyo Gas has made facilities at gas manufacturing plants and district heating and cooling centers available for tours. These tours give visitors a deeper understanding of Tokyo Gas' environmental protection and energy conservation measures.

Outline of facilities and number of visitors (fiscal 2001)

Facility	Description	Number of visitors
Negishi LNG terminal	Tour of facilities for manufacturing city gas (LNG tanks, vaporizers, etc.), demonstration of LNG cryogenic energy, etc.	3,717
Sodegaura LNG terminal		3,160
Ogishima LNG terminal		2,770
Shinjuku District Heating and Cooling Center		2,234
Saitama New City Center District Heating and Cooling Center	Highly environmentally friendly facilities fueled with city gas	1,730
Other district heating and cooling centers		1,230

Commendation by Outside Parties

Tokyo Gas has been selected by outside parties for various awards and commendations in recognition of its environmental

efforts and development of related technology.

Major awards received (fiscal 2001)

Commendation	Sponsor	Subject	Reason
General Award - Agency of Natural Resources and Energy Director's Award, 11th Energy Information Facility/Activities Commendation	Information Center for Energy and Environment Education, Japan Productivity Center for Socio-Economic Development	Energy & Earth Exploratorium	Valuable contribution to understanding of energy and environmental issues among members of the next generation and local communities with a view to promoting education in this area
Chairman's Award, 11th Energy Information Facility/Activities Commendation - Divisional Award (Event Division)	Information Center for Energy and Environment Education, Productivity Center for Socio-Economic Development	Science Squad Eco-Rangers (event at the Energy & Earth Exploratorium)	Stimulation of interest in and understanding of energy and the environment among children, using mascot characters popular with them
Chairman's Award, Excellent Energy-Saving Equipment Commendation Award	Japan Machinery Federation	Chiller that is a hybrid of the ammonia and lithium bromide absorption types	Highly efficient and environmentally friendly system using a natural refrigerant with zero coefficients of ozone layer destruction and global warming
Energy Conservation Center Chairman's Prize, 12th Energy Conservation Grand Prix	Energy Conservation Center	Tough Jet, a high-efficiency gas water heater for business use	Major increase in thermal efficiency through recovery of latent heat in exhaust gas
Japan Institute of Energy Progress Award (Technical Division)	Japan Institute of Energy	Development of an air conditioning system driven by an environmentally friendly gas engine	Simultaneous attainment of the world's highest energy-saving rate (COP of 1.8) and prevention of global warming (use of a natural refrigerant)
Excellent Award, 3rd Consumer Education Material Commendation (Printed Matter Division)	National Institute on Consumer Education	Midori's Eco-Life Calendar	Simple description of environmental problems using data and a quiz format
Excellent Award, 2nd JIA Environmental Architecture Award	Japan Institute of Architects	Earth port	Architecture built with a rich creativity and outstanding technology, grounded in a distinct philosophy about environmental conservation and development
Grand Technical Award, Fiscal 2001 Technical Award	Japan Gas Association	Development of a condensing water heater and a hot water generator for room heating and hot water supply	Instantaneous water heating by gas, with a thermal efficiency of up to 95% and ultra-low NOx emissions (30 ppm)
Technical Award, Fiscal 2001 Technical Award	Japan Gas Association	Development of a high-efficiency range burner	Burner delivering a roughly 25% increase in efficiency as well as convenience and safety assurance
Technical Award, Fiscal 2001 Technical Award	Japan Gas Association	Development of a Miller-cycle cogeneration system	Application of a Miller cycle to a three-way catalyst gas engine for high efficiency and ultra-low emissions

Overseas Environmental Cooperation and Workplace Conditions

Overseas Environmental Technology Cooperation

As part of its activities of cooperation with other countries in the area of environmental technology, Tokyo Gas carried out three feasibility studies in the Philippines in fiscal 2001.

■ Feasibility study areas (Philippines)



◎ Study Concerning a Project for a Centralized District Cooling and Power Supply System in the Philippines

In the Philippines, there are plans to supply Manila with natural gas beginning around 2006. Natural gas, from deposits beneath the sea-bottom off Malampaya in the western part of the country, will be used. The Department of Energy has made the development of the natural gas industry a pillar of the Philippine national energy policy. Tokyo Gas has conducted a feasibility study for the installation of a centralized district cooling and power supply system fueled with natural gas in Global City, in southeastern Manila. Global City is the subject of a large-scale redevelopment project, and is projected to have an immense demand for power and air conditioning. The study found that the simultaneous supply of thermal energy (cold

water) and electrical power would assist energy conservation, reduce emissions of environmental pollutants, and save space through energy plant centralization. It also showed that the system would be more economical than installation of separate plants and confirmed its feasibility.



► Feasibility study site for the installation of a centralized district cooling and power supply system in Manila

◎ Feasibility Study for a Natural Gas Pipeline in Southern Luzon, the Philippines

In order to expand utilization of the country's natural gas resources, the Philippine Department of Energy is planning to construct a pipeline to carry natural gas produced at the Malampaya gas field to Manila. Tokyo Gas has studied related matters, such as the projected gas demand, pipeline route, environmental impact, and economic merit.

The study demonstrated that a switch from oil fuels to natural gas in the markets of power generation and industrial use, where substantial demand growth is expected, would curtail air pollution and bring other environmental benefits as well as economic ones.

◎ Feasibility Study for a Project for Conversion to Compressed Natural Gas (CNG) Vehicles for Public Transport in the Manila Metropolitan Area

About 80% of the air pollution in the area surrounding Manila, the national capital, is reportedly caused by diesel vehicles. The Philippine government is considering the conversion to condensed natural gas (CNG) for public transport in the area, for reasons of both energy security and environmental improvement. Tokyo Gas conducted a feasibility study premised on operation of 310,000 NGVs for public transport (e.g., taxicabs and buses) and installation of CNG refueling stations at 500 locations. The study divided the project into four phases, including funding with official development assistance (ODA) and execution on the private-sector (commercial) basis.

It found that the project would have far-reaching benefits for the environment, health, and society, because the resultant reduction of environmental pollutants (including CO₂, NO_x, SPM, and SO_x) would help to prevent global warming and lessen adverse effects on health and crops.



► Natural gas vehicle in trial operation

Workplace Conditions

◎ Hiring and Training

Tokyo Gas uses impartial and fair assessments to hire people who have the capabilities and aptitude that it seeks. Because Tokyo Gas expects all of its employees to act in an effective, systematic, and strategic manner, it provides training in accordance with its fundamental principle of developing personnel who are professionals and can think and act for themselves in their respective fields.

■ Hiring (newly graduated personnel who joined the Company in April 2001)

Category	Number of new hires	Details
University graduates	36	male: 28, female: 8
Technical school graduates	2	male: 2
High school graduates (see Note)	32	male: 32
Total	70	

(Note) there were no female applicants.

◎ Programs Supporting Motivation and Morale

In January 1992, Tokyo Gas instituted a program of leave for long-term care of a dependant and parental leave. This will allow employees, with the will and talent, to continue making the full and efficient use of their capabilities on the job instead of being compelled to quit, for such reasons. Beginning in July 1991, to enrich company life, it also made provisions for long-term leave to enable employees to refresh their energies at major junctures in their career. In addition, in January 1992, Tokyo Gas instituted a support program for employee's volunteer activities. (see page 29) Other measures in this area include providing post-retirement job-

search assistance to help former employees remain active in society and a program for rehiring retirees (especially those who have passed the age of retirement) on the basis of one-year contracts.

■ Programs supporting motivation and morale (fiscal 2001)

Program	Number of users
Leave for long-term care of a dependant	5
Leave for child rearing	52
Leave for volunteer work	46

◎ Human Rights and Workplace Communication

Tokyo Gas conducts systematic, ongoing programs of training for all employees to enhance awareness of human rights issues, such as discrimination against the descendants of "burakumin" (people engaged in "outcast" occupations during the medieval period). In fiscal 2001, it held such seminars not only for specific employee strata and positions but also for each workspace. In addition, it supported similar programs at affiliates and other companies. Through an ad-hoc, in-house unit (the Communication Support Office), it is supporting efforts to develop workspaces that motivate employees, help them to concentrate, and let them work with peace of mind.

Tokyo Gas has also taken measures for, and is actively promoting, the prevention of sexual harassment and the emergence of societies open to full and equal participation by men and women.

■ Major training in human rights awareness (fiscal 2001)

Seminar	Number of sessions	Number of participants
For specific classes	25	717
For specific positions	51	482

* Seminars were also held in each workspaces.

◎ Labor Safety and Health

Tokyo Gas has developed an in-house system to prevent workplace and traffic accidents and to maintain a pleasant workspace environment. It also conducts campaigns for dealing with specific safety and health issues.

Safety Management Activities

Tokyo Gas' safety campaigns, which also involve its affiliate companies, promote the goal of workplaces that are accident- and disaster-free, and that facilitate work. It is also taking active steps to prevent and reduce the occurrence of traffic accidents. Tokyo Gas has about 4,000 company cars, and employees must first undergo instruction to raise levels of skill and awareness and then obtain a special Tokyo Gas driver's license before driving them. About 7,000 employees now have taken the training and have obtained these in-house licenses.

■ Accident incidence rate (calendar years)

	1997	1998	1999	2000	2001
Rate	0.62	1.08	0.79	0.99	1.67

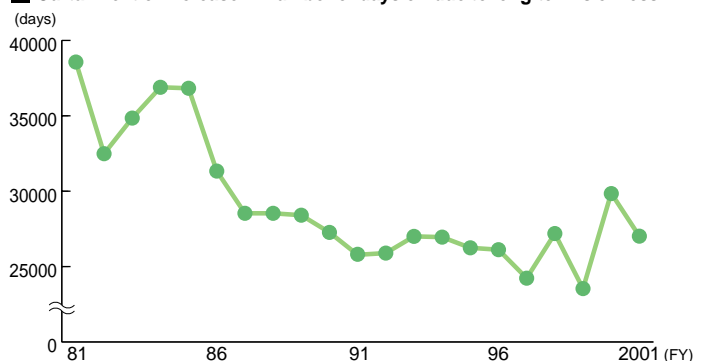
The accident incidence rate is calculated as follows:

$$\text{Accident incidence rate} = \text{number of injuries} / \text{total number of working hours} \times 10^6$$

Health Management Activities

In keeping with its goal of maintaining workplaces that are healthy, motivating, and pleasant, Tokyo Gas has been running employee health programs since fiscal 1978. The programs revolve around health maintenance and promotion of healthy lifestyles (i.e., primary prevention), and complete health exams to prevent diseases arising from lifestyle (secondary prevention).

■ Curtailment of increase in number of days off due to long-term sickness



Tokyo Gas Co., Ltd. (independent of affiliated companies)		Unit	FY1997	FY1998	FY1999	FY2000	FY2001	Notes	
Feedstock and manufacturing	Feedstock LNG	10 ³ tons	5,941	6,026	6,159	6,469	6,808		
	Feedstock LPG	10 ³ tons	224	254	322	355	351		
	Gas production	million m ³	7,893	8,041	8,281	8,688	9,081		
	Gas sales	million m ³	7,995	8,158	8,418	8,872	9,219		
	Heat sales	10 ³ GJ	3,332	3,482	3,592	3,821	3,713		
	Electrical power sales	10 ³ kWh	-	-	-	-	4,327		
Energy use (crude-oil-equivalent)	Gas manufacturing plants	kL	76,732	81,729	81,376	82,386	69,925		
		District heating and cooling systems	kL	121,210	127,147	132,774	139,565	133,485	
		Business units	kL	42,462	41,714	39,393	39,279	38,266	
		Total	kL	240,404	250,590	253,543	261,230	241,676	Excluding the space leased in Shinjuku Park Tower
	Electrical power	Gas manufacturing plants	10 ³ kWh	155,892	185,011	192,755	197,440	174,933	
		District heating and cooling systems	10 ³ kWh	89,149	97,144	100,872	108,974	101,391	
		Business units	10 ³ kWh	63,373	65,759	63,490	59,788	57,292	
		Total	10 ³ kWh	308,414	347,914	357,117	366,202	333,616	Excluding the space leased in Shinjuku Park Tower
	Gas	(Space leased in Shinjuku Park Tower)	10 ³ kWh	-	-	-	2,551	3,048	
		Gas manufacturing plants	10 ³ m ³	29,842	27,552	25,521	25,326	19,854	
		District heating and cooling systems	10 ³ m ³	82,142	85,357	89,262	93,171	89,745	
		Business units	10 ³ m ³	19,537	18,469	17,085	17,545	17,402	
	Total	10 ³ m ³	131,521	131,378	131,868	136,042	127,001		
	Other fuel	Gas manufacturing plants	kL	2	1	6	6	4	Fuel oil and kerosene
		Business units	kL	-	-	-	230	90	Fuel oil
	Vehicle fuel	Total	kL	2	1	6	236	94	
		Gasoline	kL	2,659	2,538	2,219	2,266	2,152	
		Diesel oil	kL	39	38	29	26	22	
	Use of LNG cryogenic energy	Natural gas	10 ³ m ³	Included in the amount of gas use noted above		188	228	284	
		Portion sent to affiliated companies	10 ³ tons	590	606	627	666	635	
Cryogenic power generation		10 ³ tons	758	616	756	587	784		
Production of ¹³ C -methane BOG treatment		10 ³ tons	-	-	15	15	15		
Water use	Tap water and industrial water	Gas manufacturing plants	10 ³ m ³	1,592	1,664	1,714	1,761	1,647	
		District heating and cooling systems	10 ³ m ³	1,966	2,062	2,115	2,243	2,158	
		Business units	10 ³ m ³	1,526	2,190	1,989	1,684	1,334	
		Total	10 ³ m ³	5,084	5,916	5,818	5,688	5,139	Excluding the space leased in Shinjuku Park Tower
	Seawater	(Space leased in Shinjuku Park Tower)	10 ³ m ³	-	-	-	2	2	
		Gas manufacturing plants	10 ³ m ³	260,750	290,888	299,430	296,073	282,815	
Emissions into the atmosphere and water system	Atmosphere CO ₂	Gas manufacturing plants	10 ³ tons-CO ₂	125	128	128	132	111	
		District heating and cooling systems	10 ³ tons-CO ₂	226	236	248	260	249	Excluding emissions from intake vapor
		Business units	10 ³ tons-CO ₂	76	73	69	70	68	
		Total	10 ³ tons-CO ₂	427	437	445	462	428	
	NOx	Gas manufacturing plants	tons	25	20	20	21	14	
		District heating and cooling systems	tons	63	61	69	68	59	Emissions from smoke-producing facilities
		Total	tons	88	81	89	89	73	
	Water system Wastewater	Gas manufacturing plants	10 ³ m ³	-	-	-	680	555	Waste water from wastewater purification facilities
		District heating and cooling systems	10 ³ m ³	-	-	-	325	328	Excluding the Tama District Heating and Cooling Center
		Total	10 ³ m ³	-	-	-	1,005	883	
COD	Gas manufacturing plants	tons	1.0	2.4	1.8	1.7	1.2		
Others	General waste	Generation Total	tons	2,825	2,531	2,906	2,591	2,468	Excluding the space leased in Shinjuku Park Tower
		Wastepaper	tons	2,164	2,017	2,212	1,917	1,827	The guideline standard is 2,000 tons (FY1999).
		Recycling Total	tons	1,438	1,388	1,608	1,346	1,456	
		Wastepaper	tons	1,398	1,279	1,489	1,246	1,363	
	Industrial waste	Generation Gas manufacturing plants	tons	2,768	1,243	842	432	467	
		Sales facility installation	tons	-	-	2,369	2,228	2,289	
		Business units	tons	1,866	1,905	1,773	1,831	1,188	
		Total	tons	4,633	3,148	4,984	4,491	3,944	
	Recycling	Gas manufacturing plants	tons	526	343	163	217	150	Excluding the amount of reduction from FY2000
		Sales facility installation	tons	-	-	2,291	2,156	2,239	Excluding the amount of reduction from FY2001
		Business units	tons	466	710	898	1,345	838	Excluding the amount of reduction from FY2001
		Total	tons	992	1,053	3,352	3,718	3,227	
	Final disposal	Gas manufacturing plants	tons	2,242	900	679	141	42	
		Sales facility installation	tons	-	-	78	71	50	
		Business units	tons	-	-	-	487	309	
	Total	tons	2,242	900	757	699	401		
	Gas pipe PE pipe	Recovery	tons	109	118	103	129	130	
		Recycling	tons	67	72	103	129	130	Calculated by a method better reflecting the realities beginning in fiscal 1999
	Steel/cast-iron pipe	Recovery and recycling	tons	-	5,552	5,332	5,419	6,225	
		Actual residual soil	10 ⁴ tons	140	171	152	121	90	Figures for fiscal 1997 are for district mains only.
Residual soil	Reduction	10 ⁴ tons	62	113	123	147	156		

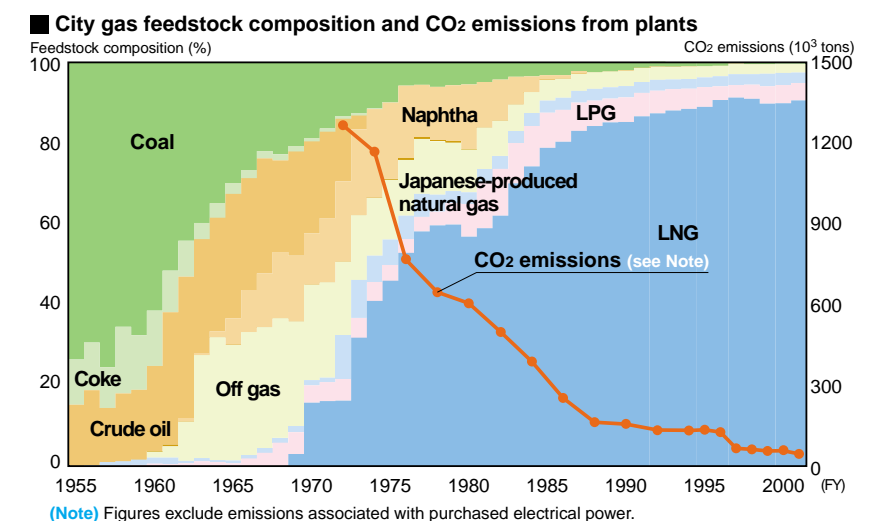
Affiliated companies		Unit	FY1997	FY1998	FY1999	FY2000	FY2001	Notes	
Energy use (crude-oil-equivalent)	13 consolidated companies	kL	-	-	-	25,020	23,898		
	6 non-consolidated companies	kL	-	-	-	2,441	2,564		
	Electrical power	13 consolidated companies	10 ³ kWh	-	-	-	88,083	80,293	Calculated with a partial revision of the compilation method
		6 non-consolidated companies	10 ³ kWh	-	-	-	7,858	8,666	
	Gas	13 consolidated companies	10 ³ m ³	-	-	-	1,027	1,409	
		6 non-consolidated companies	10 ³ m ³	-	-	-	106	100	
Vehicle Gasoline	13 consolidated companies	kL	-	-	-	486	939		
	6 non-consolidated companies	kL	-	-	-	239	148		
Diesel oil	13 consolidated companies	kL	-	-	-	16	93		
	6 non-consolidated companies	kL	-	-	-	15	15		
Water use Water	13 consolidated companies	10 ³ m ³	-	-	-	187	238	Calculated with a partial revision of the compilation method	
	6 non-consolidated companies	10 ³ m ³	-	-	-	11	10		
Atmospheric emissions CO ₂	13 consolidated companies	10 ³ tons-CO ₂	-	-	-	36	36		
	6 non-consolidated companies	10 ³ tons-CO ₂	-	-	-	4	4		
Others General waste	Generation	tons	-	-	-	1,362	1,125		
	6 non-consolidated companies	tons	-	-	-	97	129		
Industrial waste	Generation	tons	-	-	-	1,447	15,237		
	6 non-consolidated companies	tons	-	-	-	90	112		

Customer locations		Unit	FY1997	FY1998	FY1999	FY2000	FY2001	Notes	
Number of customers		10 ³ customers	8,451	8,583	8,715	8,872	9,044		
Atmospheric emissions CO ₂	Total	10 ⁴ tons-CO ₂	1,705	1,732	1,782	1,869	1,946		
		Curtailed amount	136	143	160	181	234		
	NOx	Total	10 ³ tons	15.8	15.7	15.6	16.0	15.4	
		Average concentration	ppm	109	106	103	101	93	
Waste Specified home appliances	Home air conditioners	Number recovered	units	-	-	-	-	13,111	
		Processing volume for recycling	units	-	-	-	-	12,465	
	CFCs	Processing weight for recycling	tons	-	-	-	-	569	
		Recycled weight	tons	-	-	-	-	437	
	SRIMS recovery	Recovered weight	kg	-	-	-	-	5,376	
			tons	2,690	3,760	7,396	8,106	7,836	

CO ₂ emission Factors		Unit	FY1990	FY1997	FY1998	FY1999	FY2000	FY2001	Source	Notes
Purchased electricity	Average for all power sources	g-CO ₂ /kWh	420	370	360	370	371	371	*Measures for Prevention of Global Warming in Electric Power Companies 2001; Federation of Electric Power Companies of Japan	The fiscal 2000 values were used because actual values for fiscal 2001 have not yet been released.
City gas	13A	Unit		Basic units				Source	Notes	
		g-CO ₂ /m ³	2,355					Calculated on the basis of the standard constitution of city gas (13A) (at 0 °C and 1 atmosphere)		
Other fuels	Fuel oil A	Unit		Basic units				Source	Notes	
		g-CO ₂ /L	2,698					*Guidelines for Preparation of Plans for Local Measures to Prevent Global Warming,* Environment Agency		
		g-CO ₂ /L	2,644							
g-CO ₂ /L	2,359									

History of City Gas Feedstock

Following the Industrial Revolution, coal has long remained the major fuel in Japan. Up to 1955, it was also the major feedstock for the production of city gas. Thereafter, a feedstock switch was made to petroleum products, which contained less sulfur. In 1969, Japan's first imported liquefied natural gas (LNG) from Alaska arrived at Tokyo Gas' Negishi LNG Terminal. Today, this clean-burning natural gas is the main feedstock for city gas.



Asahi & Co

Independent Review Report on “TOKYO GAS ENVIRONMENTAL REPORT 2002”

To the Board of Directors of Tokyo Gas Co., Ltd.

1. Purpose and Scope of our Review

We have reviewed the “TOKYO GAS ENVIRONMENTAL REPORT 2002” (the “Environmental Report”) of Tokyo Gas Co., Ltd. (the “Company”) for the year ended March 31, 2002. The review consisted of performing certain procedures as described below in relation to the collection, compilation and calculation of the environmental performance indicators on pages 34 and 35 (the “Environmental Performance Indicators”), the environmental accounting indicators on page 6 (the “Environmental Accounting Indicators”) and any relevant indicators marked with Review symbols (the “Relevant Indicators”) included in the Environmental Report. As this is the fourth year of our review, any indicators for years prior to the year ended March 31, 1999 were not subject to these procedures.

Our work does not constitute an audit or examination. We therefore do not express an opinion on the accuracy or completeness of the indicators or databases used to compile the information or the representations made by the Company in the Environmental Report.

2. Procedures Performed

We have performed the following review procedures agreed to by the Company’s management;

- 1) Obtained the environmental information supporting the Environmental Performance Indicators, the Environmental Accounting Indicators and the Relevant Indicators for the purpose of understanding the processes and the procedures of the Company for collecting the data information used to compile the Environmental Report.
- 2) With respect to the Environmental Performance Indicators, the Environmental Accounting Indicators and the Relevant Indicators in the Environmental Report, tested quantitative accuracy of the indicators on a sample basis and compared them on a sample basis with the supporting data compiled from the information collected by the Company.

3. Results of the Procedures Performed

As a result of the procedures performed, we are not aware of any material modifications that should be made to the Environmental Performance Indicators, the Environmental Accounting Indicators, or the Relevant Indicators in the Environmental Report in order for them to comply with the Company’s policies and procedures for gathering and reporting such information.

Asahi & Co

Tokyo, Japan
June 28, 2002

Asahi & Co., acting in co-operation with member firms of KPMG International

The Environmental Report was reviewed by an auditing firm (Asahi & Co.) about its credibility. The review procedure and results are noted in the firm’s independent review report, which is reproduced at left. Apart from this review report, the firm also submitted a report on its implementation of the reviews noted in the Environmental Report. In this report, it made observations, for reference purposes, on matters such as improvement of

methods for presentation of environmental performance indicators and environmental accounting indicators. In consideration of these suggestions as well as the results of the questionnaire survey of our readers, Tokyo Gas is determined to make further improvements in its environmental activities and future Environmental Reports, through action on the tasks noted below.

Ongoing Tasks

- 1 Reader-centered perspective and emphasis on ease of comprehension in Environmental Report editing.
- 2 Preparation of spreads showing the entire flow from the Management Philosophy to the Environmental Policy, Guidelines for Environmental Conservation (targets), and results of environmental conservation activities (environmental performance) for better understanding of the degree of target attainment.
- 3 Presentation of business activity input and output in easy-to-understand figures and graphs
- 4 Provision of detailed information on the status of, and measures taken to mitigate environmental risks (soil/groundwater contamination, PCB-use devices, etc.)
- 5 In addition to the indication of environmental performance (including fuel use, water resource input, CO₂ and NO_x emission levels, and waste generation) in absolute value, presentation of relative indicators for CO₂, NO_x, and COD emission levels per unit of gas production, to give readers a better grasp of efficiency and change over time.
- 6 Presentation of Group-level data for environmental conservation activities and their impact on affiliated companies.
- 7 Appropriate use of both paper media and the Company Internet website for the provision of environmental information.
- 8 Fuller presentation of information regarding the social dimension, in response to mounting desires for the same in environmental reports.

Future Challenges

- 1 Periodic compilation of data from affiliated companies during the year (as opposed to only once a year) could add impetus to the environmental conservation activities by the entire Group.
- 2 Indicators of environmental conservation efficiency are calculated as original integrated barometers for environmental conservation activities. The Company would like to endow them with more practical effect that will allow their utilization in determining in-house investment for environmental conservation and assessing the business results in the Company.
- 3 The Company intends to augment the environmental accounting data to serve as a tool for internal business management.
- 4 The Report began presenting environmental impact data for affiliated companies last year. A further aim is the implementation of Group-wide, consolidated environmental accounting.

Afterword by the Editors

This is the 9th edition of the Environmental Report, which it was first published in 1994. Like previous editions, it is a carefully crafted culmination of the expertise and hard work of the editorial staff. In the interest of better readability, we organized the Report in terms of performance instead of business fields, and also indicated degrees of fiscal year target attainment by marks. To ensure credibility and the ability for comparison, which are of particular importance, we clearly denoted the scope of review by a third party and also endeavored to increase the number of data items disclosed based on its advice and views expressed in this review. On both the global and local levels, environmental problems are becoming more serious. Companies are increasingly being asked to disclose and explain their efforts on behalf of environmental conservation to the community. To fulfill these demands of accountability, more and more companies are putting together reports of their own style and design. A recent estimate has it that such reports are being prepared by about 30% of all listed compa-



Hiroshi HIRAI
Executive Specialist and
General Manager
Environmental Affairs Department

nies. Those reaching our hands from other companies now number over 100. Many of them are elaborate compilations that genuinely impress us. We intend to learn from the strengths of these other reports as we strive for even higher levels of excellence in our report. As such, we would like to ask all those who read this report to give us their comments and thoughts on it. Please do not hesitate to give us your frank views.

July 2002

The pictures on the cover are the winning entries of the "We Love the Earth - Mail Art Contest" for children which was held at the Tokyo Gas Energy & Earth Exploratorium. We would like to thank all of the contestants for their participation.

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Production and printing: Urban Communications, Inc.
and Dai Nippon Printing Co., Ltd.

http://www.tokyo-gas.co.jp/env/index_e.html



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