The Earth, People & Energy

TEPCO Environmental Action Report
2002

TOKYO ELECTRIC POWER COMPANY

CONTENTS

To Our Readers 1
TEPCO's Basic Policy for Sustainable Development 2
Summary of Actual Performances in FY2001 4

Part 1 Text

I. Environmental

Environmental Management 8
Environmental Indicators 19
Environmental Protection 24
Global Environment 24
Local Environment 33
Resource Recycling 43
Development of Technology 48
Efforts of Group Companies 51

II. Economic

Current State of Electricity Demand and TEPCO's Revenues 53
Earnings and Financial Structure 54
Promotion of Development of New Businesses 55

III. Social

Ensuring a Stable Supply of Electricity and Regional Safety 56
Vitalization of Employees and Assurance of Safety and Health 58
Activities Supporting Education on the Environment and Energy 62
Community Relations Activities 64
International Cooperation 66

IV. Integrated

Improvement of Equipment Efficiency 67
Environmental Accounting 68
Improvement of Energy Efficiency in Society 71

Views of the TEPCO Advisory Committee on Environmental Affairs 75

Feature Story: TEPCO Starts Japan's First Full-Scale Treatment Project Aimed at Zero PCB 77

Part 2 Materials and Data
Leading Examples in Fiscal Year 2001 82
Reference 85
Data 111
Glossary and Index 119
Chronology 127
Corporate Organization Chart 128
TEPCO Overview 129

Scope of Environmental Action Report

○This report mainly deals with the results of activities by TEPCO in fiscal year 2001.

○It focuses on our commitment to environmental protection but it also provides information on our commitments to economic efficiency and social responsibilities. Beginning with the 2002 issue, it contains an "Integrated" that recapitulates our commitment to the simultaneous attainment of goals in various areas and the results of our activities for this purpose.

○In another newly added section, it also discusses commitments and achievements by the following major companies of the TEPCO Group in some categories of the relevant topics:

TEPCO Group Companies Providing Information for the Report

The Tokyo Electric Power Real Estate Maintenance Co., Inc., The Tokyo Electric Generation Company, Incorporated, Toden Kogyo Co., Ltd., Tokyo Electric Power Environmental Engineering Company, Incorporated, Tokyo Electric Power Services Company, Limited, Oze Ringyo Co., Ltd., TEPCO SYSTEMS CORPORATION, Tokyo Densetsu Service Co., Ltd., Toshin Building Co., Ltd., Tokyo Living Service Co., Ltd., Tokyo Electric Power Home Service Co., Ltd., TEPCO PUBLIC RELATIONS CO., LTD., Tokyo City Service Co., Ltd., Tokyo Keiki Kogyo Co., Ltd., Toden Kokoku Co., Ltd., TEPCO LOGISTICS CO., LTD., Nanmei Kosan Co., Ltd., TEPCO-Yu Co., Ltd., Tepster Co., Ltd., Tokyo Records Management Co., Inc., Environmental Beautification Center Co., Ltd.

○TEPCO has annually published the Environmental Action Report since 1992, the last issue of which was published in July 2001.

○The next issue of the report will be published in July 2003.

Information on Other Reports by TEPCO

The following reports are available at the head office of Tokyo Electric Power Co., Inc. (+81-3-4216-1111). TEPCO's information is also provided in our web site (www.tepco.co.jp/index-e.html).

TEPCO CORPORATE BROCHURE (FY 2001)

TEPCO ILLUSTRATED (FY2001)

ANNUAL REPORT 2001 Year Ended March 31

(The Annual Report 2001 is available in PDF format on our web site.)

Simultaneous Achievement of Environmental Protection, Economic Efficiency and Social Responsibilities – Essential Elements of the Corporate Mission

We have entered upon a new century in which sustainability is considered a common ideal, highly regarded by all humans. In the prelude to such new development however, we are in a situation far from the actual realization of sustainability, as many incidents affecting people's trust and safety have occurred both in Japan and abroad.

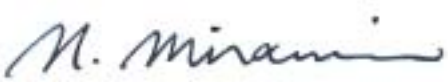
Amid the deepening social confusion, business enterprises – important members of the communities around them – are asked what they can do for society. I believe that the ultimate mission of businesses is to bring true affluence and happiness to all people through their business activities. Clearly, now is the time for them to fully demonstrate their worth to society.

In an effort to survive in the Japanese electricity market, which is entering a period of full-scale competition, Tokyo Electric Power Company aims to realize attractive prices and services by taking all necessary measures to improve the efficiency and quality of its business operations with the spirit of a challenger. At the same time, we are taking a positive approach to various themes that will lead to public trust and safety. Among these themes are the need to secure a stable supply of electricity in both day and night, consideration to energy security in Japan – a resource-poor country, and measures regarding environmental problems, particularly the reduction of CO_2 emissions and the promotion of resource recycling. In this respect, I am proud of TEPCO's employees, every one of whom, with a strong sense of duty and responsibility, seeks economic efficiency and does his or her utmost to reconcile it with public interest requirements, such as environmental protection and stable electricity supply, in a bid to achieve the sustainable development of society as well as of the company itself.

This report has been published yearly since 1992 as a systematic medium of disclosing information of our environmental activities. In order to provide more extensive and comprehensive information on our endeavors regarding sustainable development, the contents of the report were expanded in 2001 in an effort to develop it into a "sustainability report" with the economic and social aspects of our activities added to the environmental aspects contained in this report.

As a step towards further enhancement of the report, an "Integrated" was newly added to the 2002 issue to emphasize our commitment to the simultaneous achievement of goals in the environmental, economic and social aspects of our corporate mission. The report contains another new section that discusses commitments and achievements by member companies of the TEPCO Group, especially in the area of environmental protection, to provide more diverse and upgraded information on our activities.

The value of the Environmental Action Report depends on its evaluation by our readers and, in this context, communication with you will provide a motivating force for further improvement of the report. We would appreciate your unreserved comments and opinions on the report at any time.



Nobuya Minami
President
Tokyo Electric Power Company
July 2002

TEPCO's Basic Policy for Sustainable Development

Sustainable Development – the Main Theme of the 21st Century

Achievement of development which meets the needs of the present generation without compromising the ability of future generations to meet their own needs

Necessity of efforts by all components of society for simultaneous achievement of the Triple Bottom Line (comprising economic efficiency, environmental protection and social responsibility)

Changes and advancements in the Triple Bottom Line for our business operations

Economic Efficiency	• The oncoming period of full-scale competition resulting from the recent deregulation of the Japanese electricity market • Improvement of our growth potential and profit performance by securing customers' satisfaction (smiling face) • Establishment of a desirable earning and financial structure through further enhancement of our service facilities and business operations
Environmental Protection	• People's soul-searching with respect to the 20th-century economic and social systems which have caused global environmental problems • Seeking a new form of abundance that is not confined to the material and economic aspects of human activities • Basic principle in further promoting our business activities so that positive steps be taken to solve environmental problems
Social Responsibility	• New condition for the survival of corporations in which action be taken to realize a wide range of values from social and ethical points of view • Continued fulfillment of our responsibility to secure a stable supply of electricity • Various other social duties, including the establishment of partnerships with local communities and the enhancement of our employees' motivation

Simultaneous achievement

The Three Es, the basis of our business activities, represent the Triple Bottom Line from the viewpoint of the energy service industry.

Simultaneous Achievement of the Three Es as an Electric Utility

TEPCO has pursued the corporate task of simultaneously achieving the three Es – economy, environment and energy aspects – of the electric utility industry.

<Economic Efficiency>
- Achieving both the curtailment of costs and the mitigation of environmental load at the same time by significantly improving the efficiency of service facilities, specifically the thermal efficiency of thermal power generation and the transmission and distribution loss rate.

<Environmental Protection>
- Attaining the world highest level of environmental protection, especially in the area of air-quality preservation, by promptly taking positive measures to reduce the environmental load from power generation, etc.

<Stable Supply of Energy>
- Realizing very high service reliability compared with electric utilities in other countries.
- Pursuing an optimal generating configuration, which is well-balanced among available primary energy sources, including nuclear power, liquefied natural gas, oil and hydropower, in an effort to avoid risks resulting from sharp increases in oil prices, attain energy security by diversifying plant fuels, and reduce the environmental load of our operations, particularly in terms of CO_2 emissions.

TEPCO's Management Vision

The management vision (formulated in March 2001) sets forth our business philosophy that aims to create an affluent society suitable for the 21st century, i.e., sustainable development in the new century, through various aspects of our activities, including the introduction of lower prices, the stabilization of energy supply, the enhancement of customer service and harmony with the natural environment.

Business Philosophy

With the optimal energy service, we can offer our customers a better lifestyle and more comfortable environment.

Corporate Image

The Top-Runner in Energy Services
– Our delight lies in customer satisfaction –

Corporate Goals: Three Main Targets

Increased Profitability and High Value Added

Aiming to increase the corporate value through the pursuit of customer satisfaction by realizing efficient business operations and high-value-added energy services.

Improved Living Environment/Lifestyle

Promoting global and local environmental protection including, among others, the reduction of CO_2 emissions, while creating a safe and comfortable environment by joint efforts with customers and local communities.

Taking on the Challenge of Great Change

Continuing self-reformation, always from the standpoint of customers, by taking a positive stance on rapidly changing society.

These three targets, which serve as our corporate goal of becoming the top-runner in energy service, offer a fundamental proposition toward sustainable development in accordance with the Triple Bottom Line.

Simultaneous attainment of these elements of our corporate goal is by no means an easy task, but we will turn this difficulty into a springboard for our future progress and continue our utmost effort to find optimal solutions to environmental, economic and social issues in the 21st century through a process of trial and error.

In December 2001, we formulated the corporate slogan "SMILE ∞ ENERGY: Forward into thr Future. All for You." by condensing the sense of values at the basis of the management vision described above. With this in view, we declared our determination to deal with energy problems earnestly and willingly, making infinite (∞) efforts for this purpose, in a bid to realize a society filled with satisfaction and happiness.

Summary of Actual Performances in FY2001

(Major Topics and Actual Results of Our Activities in FY2001)

Environmental

1 Ecologically-Minded Management

Eco-Efficient Business Activities

In fiscal year 2001, TEPCO added environmental indicators, such as waste recycling rates and reduction of energy and natural resources for internal use, to the business performance evaluation items for its branch offices, power stations and other establishments (see pages 12, 22-23).

In April 2002, we carried out an organizational reform and positioned the "Environmental Department" as a management planning division in an effort to establish a system to reinforce and practice our ecologically-minded management, and also to raise the level of environment management of our group firms. We formed the "Environmental Information Liaison Committee for the TEPCO Group" in June 2001, aiming at periodical information exchange, and reorganized the committee as the "Environmental Committee for the TEPCO Group" in June 2002, and formulated the "Environmental Philosophy and Environmental Action Guidelines of the TEPCO Group" as the basis of efficient environmental protection measures of the group firms (see pages 8-9).

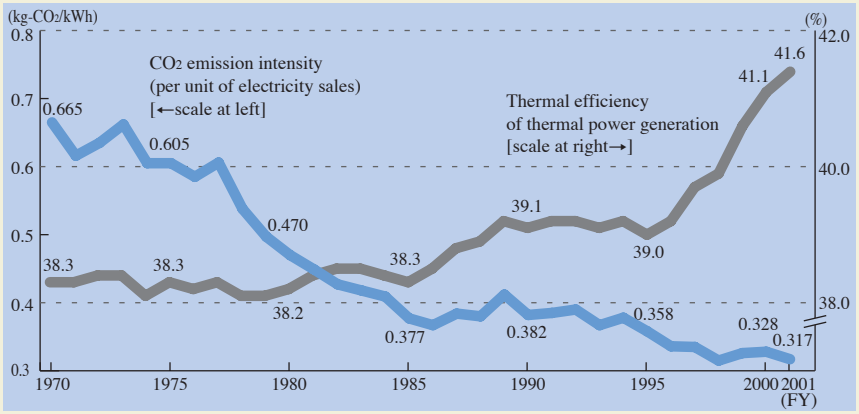
2 Global Environmental Protection

Reduction of CO_2 Emissions

In fiscal year 2001, our carbon dioxide (CO_2) emissions decreased by approximately 4.8 million tons from the preceding year, achieving the target of reduction in CO_2 emissions per kWh of electricity sales (i.e., emission intensity), which fell below the year-earlier level to 0.317 kg-CO_2/kWh (see page 24).

Under the circumstances of a prolonged economic recession and other factors, our electricity sales in fiscal year 2001 declined to 275.5 TWh, down 1.8% from the preceding year, while nuclear power generation, which is free from CO_2 emissions, increased as a percentage of the total from 42% in fiscal year 2000 to 44% in fiscal year 2001 and thermal power generation further improved in thermal efficiency, mainly through the additional installation of a high-efficiency, advanced combined cycle power generation system. These improvements combined to reduce our CO_2 emission intensity in the fiscal year under review.

■ CO_2 Emission Intensity and Thermal Efficiency of Thermal Power Generation



Further Diffusion of Natural Energy

We established the Green Power Fund a few years ago to provide financial assistance for the installation of power generation facilities using natural energy sources, specifically wind power and photovoltaic power generation systems. Total participation in the fund reached 15,190 customers (18,399 contracts) in our service area at the end of March 2002. In fiscal year 2001, contributions from interested customers totaled approximately 108 million yen and TEPCO contributed the same amount to the fund (see pages 28-29).

TEPCO's plantation (eucalyptus)

Efforts in View of the Kyoto Mechanism

We have tree planting projects under way in Australia in view of Joint Implementation (an arrangement for industrialized nations to jointly take measures to reduce greenhouse gas emissions and share the amount of emissions thus reduced, i.e., the results of the joint measures, among the countries involved). Of these projects, the one we are carrying out in New South Wales will be expanded to some 3,000 hectares in total plantation area by September 2002 (see page 30).

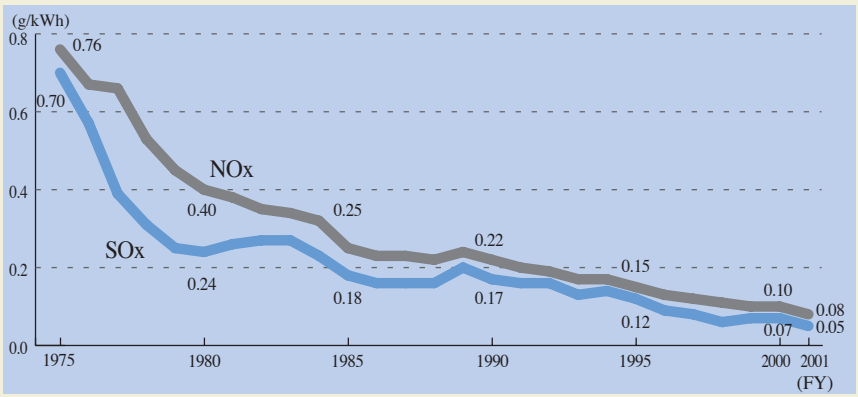
3 Local Environmental Protection

Air Quality at World Highest Level

Our sulfur oxide (SOx) and nitrogen oxide (NOx) emissions in fiscal year 2001 remained as low as 0.05 g/kWh and 0.08 g/kWh (average of all power stations), respectively, which were comparable to the world's cleanest levels of air quality.

In addition to positive steps to increase the use of environmentally acceptable fuels, specifically liquefied natural gas (LNG) that is free from SOx, soot and dust emissions and also effective in holding down NOx emissions, we take all necessary measures to reduce greenhouse gas emissions, including the improvement of combustion methods and the installation of flue gas denitrification facilities (see pages 33-34).

■SOx and NOx Emission Intensity (Average of All Power Stations)



Use of Low-Emission Vehicles for Entire Fleet

Of some 8,600 vehicles (including those on lease) possessed by TEPCO as of fiscal year 2001, 600 are low-emission vehicles. As vehicles are replaced in the years ahead, we will acquire low-emission vehicles for all units of our fleet, except some special vehicles for which low-emission vehicles are not available on the market (see page 35).

■Number of Low-Emission Vehicles (LEVs) in TEPCO's Fleet

	LEVs in FY2001	Total fleet
LEVs designated by the Ministry of Land, Infrastructure and Transport	339	569
Electric vehicles (reproduced)	16	137

Third-generation electric vehicle (Nissan Hyper Mini)

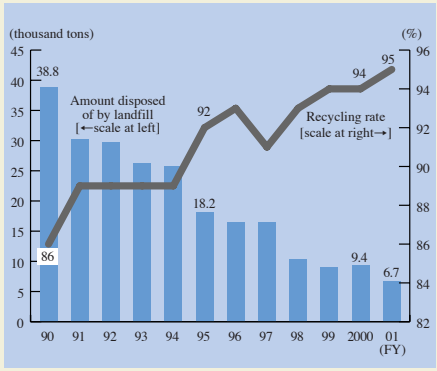
4 Resource Recycling

Steps toward 100% Waste Recycling

In fiscal year 2001, the recycling rate of industrial waste at TEPCO reached 95%, up one percentage point over the preceding year. Meanwhile, the amount of industrial waste we disposed of by landfill decreased to 6,700 tons, down 2,700 tons.

In order to attain a 100% of total recycling rate for all industrial wastes by fiscal year 2005, steps were taken in fiscal year 2001 to conduct a survey on the actual condition of waste recycling at TEPCO and identify the problems involved (see pages 43-44).

■Recycling Rate of Industrial Waste



Full Utilization of Recycled Resources

In February 2002, TEPCO established Cycle, Inc., a new affiliated company specializing in the recycling of galvanized metal materials used mainly for the crossarms of utility poles.

In April this year, we established another new affiliate, Nature Craft Corporation, to recover such natural resources as driftwood and felled lumber in dams and make gardening materials and furniture from them for sale on the market (see page 45).

Startup of Full-Scale PCB Treatment

TEPCO Chiba Recycling Center, which decomposes and recycles insulating oil containing PCB, came into commercial operation in March 2002. The new center, along with TEPCO Yokohama Recycle Center which was put into commercial operation in October 2001, will steadily promote full-scale treatment of PCB-containing insulation oil (see page 46 and pages 77-80 "Feature Story").

TEPCO Chiba Recycling Center

5 Development of Technology

While pursuing the latest environmental technology, we also promote effective utilization of research results.

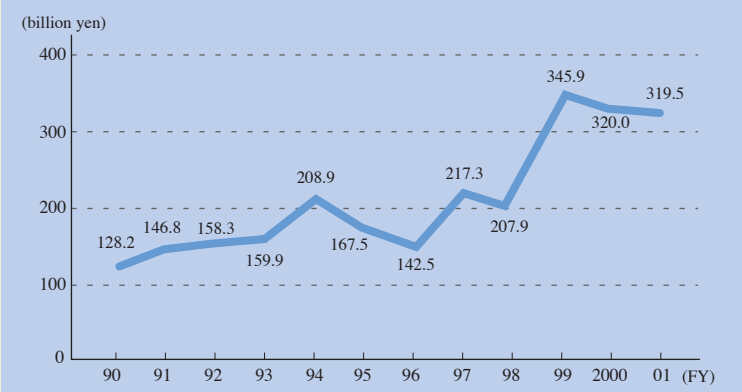
In fiscal year 2001, we conducted studies for the improvement of accuracy in forecasting global warming and for the assessment of the carbon absorption capacity of the forest ecosystem (see pages 48-50).

Economic

Improvement of Earnings and Financial Structure

Amid adverse business conditions as reflected in our decreased sales (operating income from electricity service), down 1.8% from the preceding year resulting from a fall in electricity sales below the year-earlier level, we secured an ordinary income of 319.5 billion yen in fiscal year 2001 as a result of continued efforts to further improve the efficiency of business operations and cut back costs. In addition, we pushed forward with the improvement of our financial structure by reducing the outstanding amount of interest-bearing debt by 436.1 billion yen from the year-earlier figure (see page 54).

■**Ordinary Income**



Social

1 Stable Supply of Electricity

Maintenance of Service Reliability

Compared with electric utilities in other major industrialized countries, we have attained very high service reliability with the advantages of an integrated framework for the operation of power generation facilities and transmission and distribution networks. Our annual service interruption time caused by accident per customer is very short compared with that of other major developed countries (see page 56).

Preparations against All Disasters

We are enhancing crisis management systems for various aspects of business operations.

For instance, we are building a back-up facility to substitute for our head office in case of disasters (scheduled to be completed in September 2003) which is designed to provide the Company's central functions if and when the head office is damaged in an earthquake or some other disaster.

We have made all necessary arrangements, including the enhancement of checkups on electrical facilities and the establishment of countermeasures headquarters, to support FIFA World Cup™ matches held in May and June 2002 (see page 56).

2 Measures for Employees

Improvement of Employees' Motivation and Abilities

TEPCO offers various self-development programs for its employees to promote their motivation and abilities.

In October 2001, we started a Plus One Qualification Campaign under which 32,475 employees declared by the end of March 2002 the qualifications they respectively intend to obtain and are now preparing for the examinations (see page 60).

Measures to Secure Employees' Safety and Health

In order to secure the safety and health of employees, we endeavor to perfectly implement various working safety measures and traffic safety guidance while taking positive steps to carry out health care programs, including the implementation of regular medical checkups and the improvement of workplace sanitation. To further strengthen traffic safety measures, we introduced a set of new programs, including a Driving Record Certification system, in fiscal year 2001 for all employees who are assigned to drive motor vehicles for business use (see page 61).

3 Social Contributions

Support for Environmental and Energy Education

TEPCO offers a training program for teachers in order to have its own nature observation method adopted for school education. In fiscal year 2001, a total of some 250 teachers from local schools participated in the program (see page 62).

The Environmental Education Materials, teaching materials prepared by TEPCO for elementary and lower secondary school curricula, has been adopted at some 500 schools (see page 63).

Environmental education workshop for teachers at Sodegaura Thermal Power Station

Cooperation as Member of Local Community

As part of various activities for environmental protection, TEPCO promotes communications with local communities. Among the typical examples of these activities are cleaning services and the planting of young flowering plants, both of which have been maintained for many years. In addition, we hold events with special features, including those for interchanges with host communities of our nuclear power stations.

The Environmental Action Report begins to deal with our activities in the "Culture and Welfare" area from its 2002 issue. We have periodically held concerts and seminars, aiming at creating the culture that deserves affluent society (see page 65).

TEPCO-sponsored concert with 10,000 participants

International Cooperation

We have a program to receive training participants from and send Japanese experts to overseas partners, particularly those in developing countries, to offer our know-how on the improvement of electrical facilities' efficiency and environmental preservation measures.

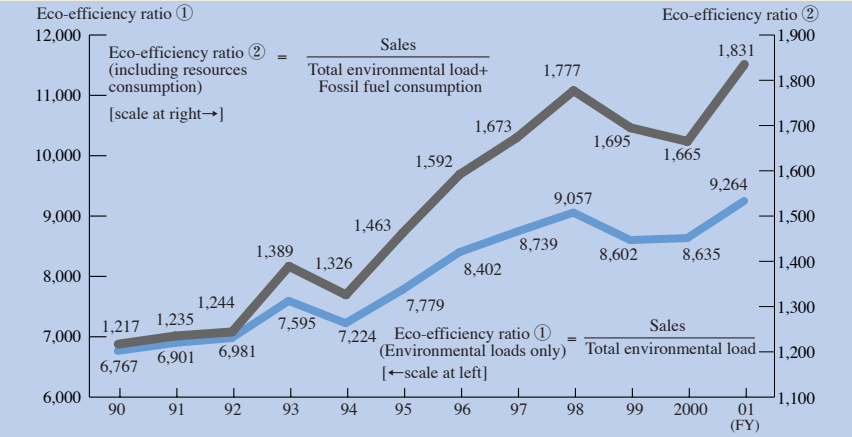
Under the program, we received more than 150 trainees and research groups, mainly from Asian countries, in fiscal year 2001 (see page 66).

Integrated

1 Efficiency of Service Facilities

We are pushing forward with the improvement of service facility efficiency that is conducive to the simultaneous achievement of environmental preservation capabilities and economic efficiency. The capacity utilization rate of our nuclear power plants in fiscal year 2001 increased by 0.7% from the previous fiscal year to 80.1%, as a result of our efforts such as the improved efficiency of our periodical inspections. In addition, the thermal efficiency of thermal power generation was further upgraded to 41.6% in fiscal year 2001 due chiefly to the introduction of an advanced combined cycle (ACC) power generation system (see page 67).

■ **Eco-Efficiency Ratios**



2 Environmental Accounting

TEPCO carries out extensive research activities to establish and utilize an environmental accounting system as an effective tool to analyze and assess the compatibility between environmental preservation and economic efficiency.

In fiscal year 2001, we further improved the accounting system, mainly by adding "resources consumption" to the items of assessment covered by eco-efficiency ratios. Efforts are also exerted to assess the environment-improving effect of environmental preservation measures, including that of afforestation at power station sites, in terms of monetary value (see pages 68-70).

3 Energy-Saving Society

Development of High-Efficiency Equipment and Systems

We are promoting the development and diffusion of new equipment and systems that have great energy-saving effects and high environmental protection capabilities. Among our recent developments in this field, Eco Cute, the world's first natural refrigerant (CO_2) heat pump water heater for residential use, is rated high for its great energy-saving and environmental-protection capabilities (see page 72).

We are also developing other new products, including HEMS, a system intended to attain energy conservation by measuring, controlling and managing energy consumption in houses by effectively utilizing information technology (see pages 72, 110).

Enhancement of Electricity Rate Options

TEPCO offers diverse electricity rate options to promote the diffusion of high-efficiency electric equipment and appliances and the more efficient use of energy. In April 2002, we added to our electricity rate system some new options, including a discount for customers using IH cooking heaters (see page 73).

Environmental Management

1 Environmental Policy

TEPCO's Management Vision

Business Philosophy: With the optimal energy service, we can offer our customers a better life-style and more comfortable environment.

Corporate Goals: Three Main Targets
Increased Profitability and High Value Added
Improved Living Environment/Lifestyle
Taking on the Challenge of Great Change

- Actively promoting the effective use of natural resources and waste recycling as well as contributing to the solution of global environmental problems, including the reduction of CO_2 emissions.
- Endeavoring to promote sustainable development of local communities by taking measures for better community relations, including the construction of facilities harmonized with the natural environment.
- Endeavoring to create a desirable environment in cooperation with customers and local communities and sharing the results with these partners.

Basic Environmental Philosophy of TEPCO Group

The TEPCO Group will:

- Fulfill social responsibilities as a business enterprise to pave the way for sustainable development in the 21st century by taking positive measures for the solution of environmental problems, including global warming;
- Endeavor to achieve the reduction of environmental risks, including air pollution control, by continually improving the environmental management system, while carrying out eco-efficient business activities with consideration given to the reduction of CO_2 emissions, waste recycling, and energy and resource conservation; and
- Aim to create a society suitable for the 21st century by increasing the transparency of corporate activities through extensive information disclosure while repeatedly holding an interactive dialogue with customers, investors and other people interested in our business operations (stakeholders).

Environmental Action Guidelines of TEPCO Group

○Environmental Management
- Establishment and continual improvement of an environmental management system
- Compliance with the applicable laws and ordinances
- Implementation of educational programs for employees
- Promotion of green procurement

○Environmental Preservation
- Reduction of greenhouse gas emissions
- Promotion of waste recycling
- Promotion of energy and resource conservation

○Environmental Communication
- Establishment of an environmental partnership with society

Implementation of measures common to all member companies under the Basic Environmental Philosophy and Environmental Action Guidelines of the TEPCO Group

Check-and-review at the environment committee of the group

In order to implement efficient environmental measures at the TEPCO Group as a whole, we took action in June 2002 to have the basic principle of TEPCO's Environmental Policy adopted for the Basic Environmental Philosophy of the TEPCO Group and to share the philosophy with 21 major subsidiaries which are members of the group.

In addition, we formulated Environmental Action Guidelines of the TEPCO Group that set forth priority items of implementation common to all member companies. Under the guidelines, the TEPCO Group is now implementing environmental management with the united efforts of the member companies.

TEPCO's Environmental Policy

Environmental Management

- Continuous improvement of the environmental management system to facilitate flexible and appropriate responses to the diverse environmental aspects of business activities.
- Regular "check and review" and environmental audits on our environmental management system and performance at the management level.
- Periodical review of the environmental policy to ensure that it is properly reflecting both business and environmental considerations, and announcement to all employees and to the general public.
- Observance of environmental regulations prescribed by laws and ordinances, and achievement of voluntarily set objectives and targets.
- Provisions for employee education and training programs that help to raise awareness of environmental responsibility in job performance.
- Priority on environmentally acceptable resources in our business activities, environmental protection and resources recycling in cooperation with our customers and clients.

Environmental Protection, Energy Saving and Resource Conservation

- Continued implementation of measures for prevention of air pollution and promotion of nature conservation with particular emphasis on maintaining our internationally lowest emission levels of SOx and NOx.
- Further improvements in lowering emissions of CO_2 and other greenhouse gases for mitigation of global warming with priority on promoting nuclear power, which enables the company to attain the objectives of economic efficiency, environmental preservation and stable supply of electricity.
- Conservation of energy and resources with particular focus on maintaining the world's highest level of thermal efficiency of thermal power generation.
- Maintaining the high recycling rates for industrial wastes to contribute to building a recycle-oriented society.
- Constant effort in advanced technology, making use of the results and resources which will contribute to environmental protection and conservation of energy and resources in collaboration with the international community on a global level.
- Active support to customers taking measures for efficient energy use with a view to contributing to building a society blessed with highly efficient energy such as electricity.

Communications

- We endeavor to provide appropriate information to the people interested in our business operations (stakeholders) in response to a public demand for the objectivity and transparency of corporate activities. For this purpose, we will continue to publish the Environmental Action Report, a yearly publication that systematically and comprehensively describes our commitments to environmental protection and other activities aimed to attain sustainable development.
- Making the most of various opportunities, including business activities, social contributions and international cooperation, we will strengthen the ties of environmental partnership with interested people (stakeholders) while maintaining an open channel of communication with them.

Environmental Policies of Member Companies

The 21 member companies of the TEPCO Group (as shown in the list of below) formulate their respective environmental policies under the Basic Environmental Philosophy and Environmental Action Guidelines of the TEPCO Group.

Member companies (21) subject to environmental management

Power generation
The Tokyo Electric Generation Company, Incorporated

Fuel supply
Nanmei Kosan Co., Ltd.
TEPCO-Yu Co., Ltd.
Tepster Co., Ltd.

Construction and maintenance of facilities
Toden Kogyo Co., Ltd.
Tokyo Electric Power Environmental Engineering Company, Incorporated
Tokyo Electric Power Services Company, Limited
Tokyo Densetsu Service Co., Ltd.
Tokyo Electric Power Home Service Co., Ltd.

Materials and equipment supply
Tokyo Keiki Kogyo Co., Ltd.

Transport and services
Tokyo Living Service Co., Ltd.
Toshin Building Co., Ltd.
Toden Kokoku Co., Ltd.
TEPCO LOGISTICS CO., LTD.
Environmental Beautification Center Co., Ltd.

Real estate management
The Tokyo Electric Power Real Estate Maintenance Co., Inc.
Oze Ringyo Co., Ltd.
Toshin Building Co., Ltd.

Energy and environment related business
Tokyo City Service Co., Ltd.

Information and telecommunication services
TEPCO SYSTEMS CORPORATION
Tokyo Records Management Co., Inc.

2 Environmental Management Organization

Under the Environmental Management Regulations (enacted in November 1996), TEPCO maintains an organization for environmental management, with the President of the Company serving as Chief Operating Officer for Company-Wide Environmental Management.

Comprehensive Environment Committee

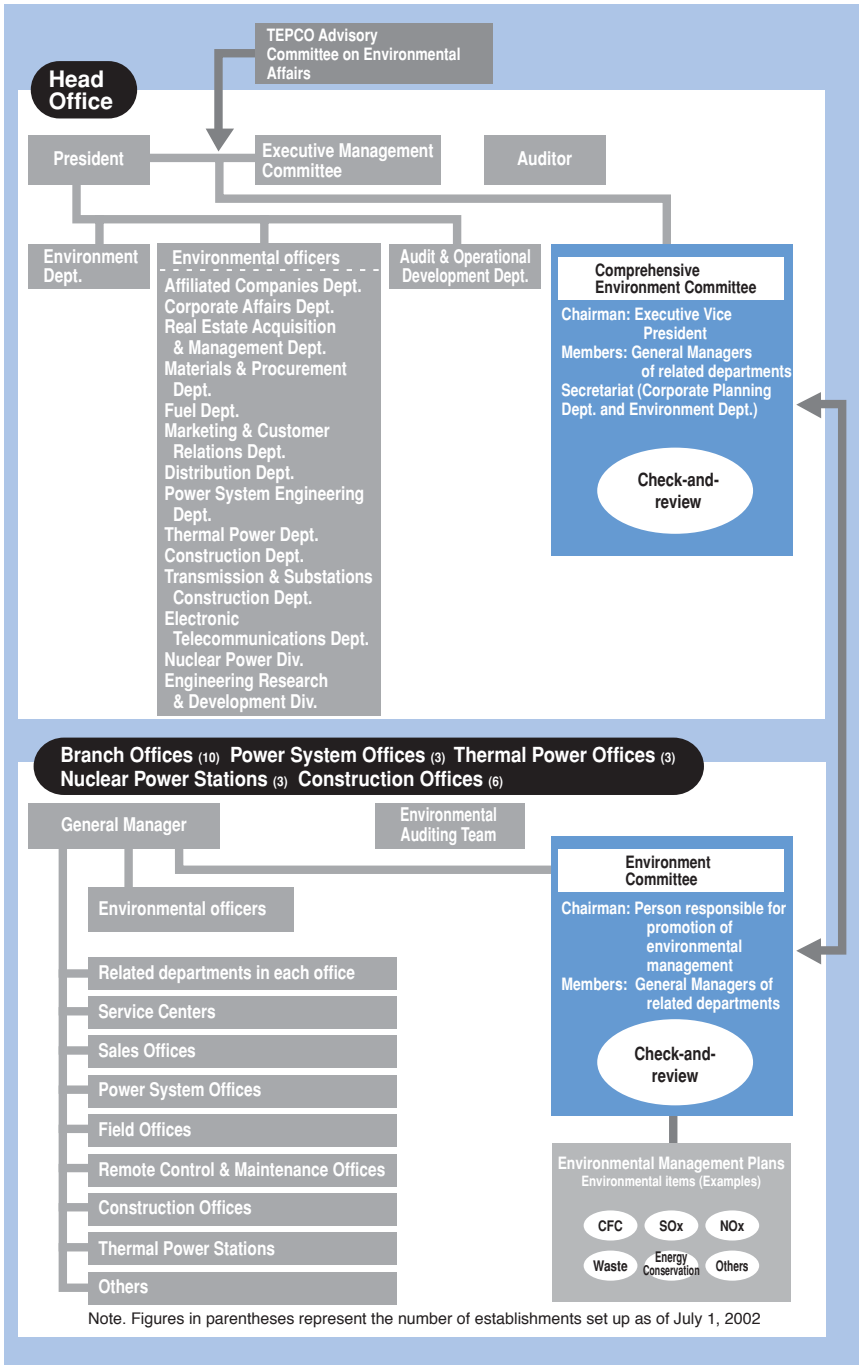
The Comprehensive Environment Committee, established in January 1993, is an interdivisional panel chaired by the Executive Vice President and composed of 20 officers and department heads. The committee is responsible for comprehensively discussing and promoting company-wide environmental management measures.

The committee sets targets relating to environmental issues, makes a check-and-review on the achievement of the targets, and reports the results of the review to the President of TEPCO (the Executive Management Committee), so that the results will be properly reflected in the Company's business management. Compilation of the Environmental Action Report is another important task of the committee.

TEPCO Advisory Committee on Environmental Affairs

In order to further improve environmental management, it is important for the corporation to make voluntary efforts for this purpose and, in addition, seek opinions from outside third parties. Based on this concept, the TEPCO Advisory Committee on Environmental Affairs was established in April 1993, with its membership consisting of outside persons of learning and experts. The advisory committee meets every year to provide us with useful guidance and advice on what we should do to deal with environmental problems. These valuable opinions and suggestions set forth by the committee members are published in the Environmental Action Report (see "Views of the TEPCO Advisory Committee on Environmental Affairs" on pages 75-76).

■Environmental Management System



Note. Figures in parentheses represent the number of establishments set up as of July 1, 2002

Checks by Auditors and the Audit & Operational Development Department

Auditors officially examine how environmental management is carried out and how company-wide efforts are made to solve environmental problems.

In addition, the Audit & Operational Development Department examines all units of the Company to checks up on how each of them carries on business operations, including activities for environmental protection.

3 Environmental Management Systems (Branch Offices, etc.)

Environment Committees

The environment committees at our business establishments, such as branch offices, power system offices, thermal power offices, nuclear power stations, and construction offices, are responsible for drawing up and discussing environmental policies and environmental management programs for their respective establishments and conducting a check-and-review of environmental management there. These committees, which may be considered a regional version of the Comprehensive Environment Committee at the Head Office, play a key role in the operational aspects of TEPCO's environmental management system.

Internal Environmental Audit

The auditing team, which is made up of personnel from our business establishments, conducts an internal environmental audit at least once a year, as a general rule. This is done in order to check and verify that environmental management activities are being undertaken according to environmental management programs, with the environment committee playing a central role, and that systems are properly and efficiently built and operated. Members of the auditing team are elected from among personnel other than those directly in charge of environmental management affairs, so as to ensure objectivity and impartiality in the auditing process.

An internal environmental audit is conducted to check whether the environmental management system is properly arranged and operated. Therefore, the internal auditing scheme consists primarily of an environmental management system audit that examines various aspects of environmental management, such as provisions on responsibilities and arrangements; how documents are prepared and kept; and how well informed employees are of environmental policy. In addition, audits are conducted on compliance with laws and ordinances, as well as on performance regarding waste disposal and recycling.

■Implementation of Internal Environmental Audit (FY2001)

Category of auditing / Type of establishment (number)	System audit	Performance audit	Compliance audit
Branch Offices (10)	10	6	6
Power System Offices (3)	2	1	0
Thermal Power Offices (3)	17	5	5
Nuclear Power Stations (3)	5	1	1
Construction Offices (6)	4	0	0

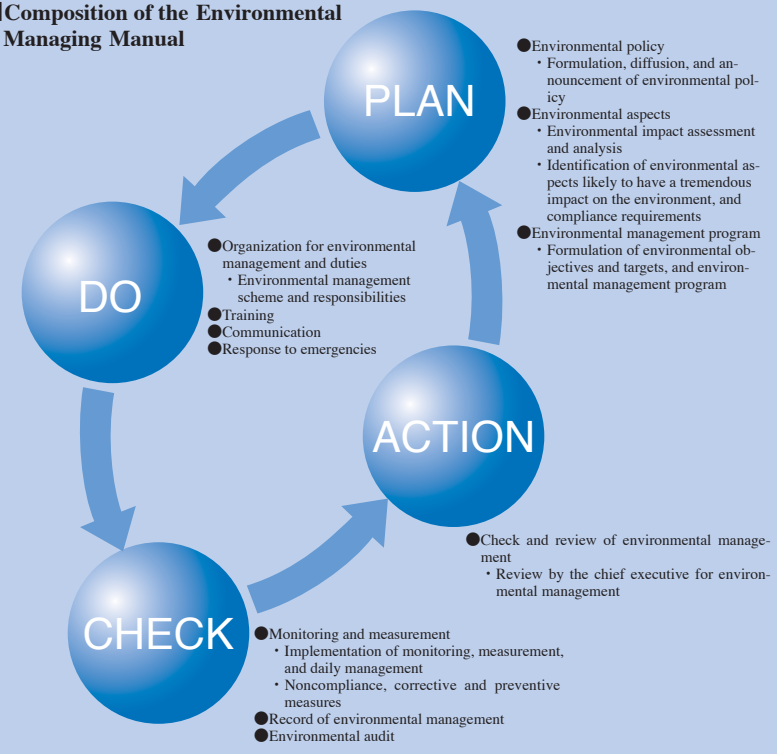
Note: Figures in the table represent the number of business establishments that conduct an internal environmental audit. Figures for thermal power offices include the frequency of auditing conducted at thermal power stations.

Environmental Management and Auditing Manuals

Our branch offices, power stations and all other establishments which carry out activities for environmental protection prepare their own environmental management manuals and environmental auditing manuals under the company-wide Environmental Management Regulations. Based on these manuals, the business establishments build and operate environmental management systems in accordance with ISO 14001 standards.

Each of these establishments appoints persons responsible for promoting environmental management under the top management, specifically the branch office general manager or the power station superintendent, who acts as the chief operating officer for environmental management. An environment committee and an environmental auditing team are also set up at the business establishment. With the organization thus prepared, steps are taken to promote and enhance environmental management by repeatedly performing the basic cycle of "Plan-Do-Check-Action."

■Composition of the Environmental Managing Manual



■TEPCO's Establishments Holding ISO Certificates

Name of establishment	Coverage of registration	Date of registration
Kannagawa Hydro Power Plant Construction Office	Construction office and three offices under its control	November 1, 1999
Yamanashi Branch Office	All business establishments in service territory	December 27, 1999
Kanagawa Branch Office	Yokosuka Service Center	January 25, 2000
Chiba Branch Office	Headquarters of the branch office and the Chiba Service Center (in part)	March 29, 2000
Tokyo Branch Office	Shibuya Service Center	May 25, 2001
Kashiwazaki-Kariwa Nuclear Power Station	Premises of the Kashiwazaki-Kariwa NPS	August 20, 2001
Higashi Thermal Power Office	Headquarters of the thermal power office and the Chiba Thermal Power Station	February 25, 2002

Note: These certificate-holding establishments received regular reviews by an external inspecting organization between October 2001 and June 2002, and all of them were found to maintain compliance with the ISO 14001 standard and continue to operate the standard effectively.

Continual Improvement

We use ISO 14001 certification, which represents a third party objective evaluation, as an effective means of further upgrading our environmental management system. From November 1999 through February 2002, a number of our business establishments acquired certificates of the ISO 14001 standard (as shown above).

4 Environmental Officers and Environmental Conference

Environmental Officers

Currently we have a total of 90 environmental officers posted at our business establishments, specifically branch offices and power stations, as well as at the appropriate departments of the Head Office.

While assisting the general managers of branch offices or the superintendents of power stations and promoting environmental protection measures and symbiotic activities in the local communities, the environmental officers posted at these establishments play a leading role in implementing the environmental management systems at their respective branch offices or power stations.

The responsible departments of the Head Office and business establishments closely cooperate with one another, mainly through their environmental officers, in formulating plans for the construction and operation of electricity service facilities with careful consideration given to their possible environmental impact and in promoting proper management of these facilities.

■No. of Environmental Officers

Type of establishment (number)	No. of establishments	No. of persons
Head Office	1	16
Branch Offices (Note)	10	46
Power System Offices	3	3
Thermal Power Offices (Note)	3	16
Nuclear Power Stations	3	3
Construction Offices	6	6
Total		90

Note: The number of branch offices includes service centers, and the number of thermal power offices includes thermal power stations (as of March 31, 2002).

Environmental Conference

We hold a company-wide environmental conference twice a year, with the participation of all environmental officers, to exchange information on the latest situation of environmental issues and organize workshops on relevant topics.

In fiscal year 2001, conference participants reported and discussed such topics as the setting of new company-wide targets in recycling wastes and reducing the internal consumption of energy and other natural resources, the latest trends of activities in Japan and abroad concerning environmental problems, specifically global warming, and a plan for events to be held during Environment Month.

In addition, local environmental conferences are held at regular intervals (five conferences were held in fiscal year 2001) to exchange information among participants on the latest situations in Japan and abroad and on regional environmental trends.

5 Environmental Performance Evaluation and Awards

Performance Evaluation

We have arrangements for branch offices, power stations and other business establishments to formulate their own business operation plans, set specific targets and endeavor to attain them (a performance evaluation system).

The performance evaluation consists mainly of items in business performance, including income and expenditure, costs, facilities, and services. In fiscal year 2001, the performance evaluation was amended to require that targets also be set for environmental performance as a basic infrastructure supporting the continuance of business operations and that the achievement of these new targets be examined.

In other words, efforts are being exerted to attain company-wide targets with arrangements for discussing the targets and actual results at each business establishment with respect to its waste recycling rate, the reduction of internal energy and resource consumption, and the number of licensed managers in environment-related sectors, in a bid to provide reference data for performance evaluation.

Commendation System

TEPCO has an in-house commendation system designed to promote the motivation of every one of its employees to progress toward higher targets set in view of his or her assigned task. The system also aims to standardize and spread the successful results of employees' improvement and reform activities.

In the environmental aspect of our business operations, employees are commended under the system every

Commendation by the President of TEPCO

year for leading examples of improvement or reform activities resulting in the reduction of costs or environmental load.

In fiscal year 2001, the president's commendation was awarded to four leading examples, including the achievement of a 100% waste-recycling rate at the Hirono Thermal Power Station of the Chuo Thermal Power Office.

6 Compliance with Laws and Ordinances

During fiscal year 2001, we did not receive any recommendations or orders to improve, nor did we face punishment for violations of the environmental provisions of laws, ordinances or regulations.

Main Environment-Related Laws

- ○Environmental Impact Assessment Law and Electricity Utilities Industry Law
- ○Air Pollution Control Law and Water Pollution Control Law
- ○Noise Regulation Law, Vibration Regulation Law, and Offensive Odor Control Law
- ○Factory Location Law and Industrial Water Law
- ○ Waste Management and Public Cleansing Law
- ○Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management
- ○ Law for the Establishment of Organization for Pollution Control in Specified Factories
- ○Law Concerning the Rational Use of Energy
- ○ The Law for the Regulation of Nuclear Source Materials, Nuclear Fuel Materials, and Nuclear Reactors

Note: In some areas regulated by the laws and ordinances of the central government, local governments are enforcing more stringent standards than the national ones in accordance with their own prefectural ordinances.

Voluntary Agreements for Environmental Pollution Control

A voluntary agreement for environmental pollution control is an arrangement representing mutual consent between a corporation and a local public body. Under this agreement, the enterprise pledges to take extensive measures in line with the characteristics of the locality and take positive and voluntary actions beyond the regulations prescribed by laws and local ordinances. TEPCO concluded a Memorandum of Pollution Prevention at the Ohi Thermal Power Station with the Tokyo Metropolitan Government in September 1968. With this as the start, we have concluded separate voluntary agreements on environmental pollution control with the governments of Chiba, Ibaraki and Fukushima prefectures and other localities where our power stations are sited. Under these agreements, TEPCO has pledged to take extensive environmental protection measures at existing and new thermal power stations and exerts itself for environmental preservation suitable to the actual conditions of local communities.

■Contents (Examples) of Voluntary Agreements for Environmental Pollution Control

- ・Air pollution control
- ・Water pollution control
- ・Soil contamination control
- ・Noise control
- ・Prevention of land subsidence
- ・Offensive odor control
- ・Waste management
- ・Measures for environmental protection against chemical substances
- ・Measures for global environmental protection

7 Procurement of Materials and Equipment

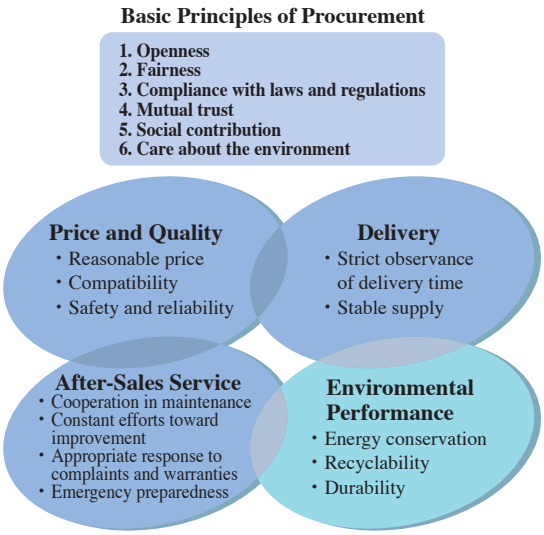
TEPCO has long been pursuing an environment-conscious procurement policy. In 1970, we introduced sulfur-free LNG as fuel for thermal power plants for the first time in the world.

In October 2001, we established Green Procurement and Purchasing Guidelines by systematizing our commitments to environmentally acceptable procurement activities. Under the guidelines, we are further promoting our procurement policy with priority on purchasing those materials which have lower environmental loads. In addition, we endeavor to reduce the environmental load in this respect in cooperation with our affiliated companies and customers.

Green Procurement and Purchasing Guidelines

Basic Principles

The basic principles of the guidelines call for promoting the procurement of materials based on a comprehensive assessment of four elements, with environmental performance newly added to three conventional items of evaluation – prices and quality, after-sales service, and delivery.



Promotion of Green Purchasing

In procuring office supplies, employees' uniforms, business-use vehicles and other major articles that are used for daily business activities, we promote the purchase of eco-efficient products under guidelines separately set for each category of these articles.

■Example of Guidelines

Items	Guidelines
PPC paper	Recycled paper content of 100% and a whiteness of 70
OA equipment and supplies	Priority purchase of products with Energy Star Mark certification or a recycling toner International Energy Star Mark
Stationery and office supplies	Priority purchase of eco-efficient products, especially those with ecomark or green-mark certification Ecomark
Vehicles	Purchase of motor vehicles with the minimum environmental load

In fiscal year 2002, we started company-wide activities to further promote green procurement, mainly by setting the green purchasing ratio as an internal management index in order to sum up the annual purchases of eco-efficient products.

Invitation for Environmental Improvement Proposals

In signing contracts for the procurement of materials and equipment or construction work, we have arrangements for inviting contractors and suppliers to submit proposals for improvements (eco-efficiency proposals) in terms of environmental acceptability at the manufacturing (or construction) and operation stages.

Under the arrangements, we request contractors and suppliers to submit eco-efficiency proposals describing the environmental load-reducing effects of the work or products offered, particularly their energy-saving effects, recyclability, durability, and waste-reducing effects. Orders are placed preferentially with the contractors and suppliers who have submitted successful proposals.

In fiscal year 2001, we received a proposal for the introduction of a polyethylene-based plastic pole number plate that has high recyclability. The proposal was adopted as an eco-efficiency measure in view of its capability to attain both resource conservation and cost curtailment.

Environmental Management Assessment

An environmental management assessment is conducted of contractors and suppliers to determine their commitment to environmental protection.

In fiscal year 2001, an environmental management system check sheet prescribed by TEPCO was distributed to some 400 major contractors and suppliers to assess their activities for environmental management.

Although environmental management assessment is essentially based on self-evaluation, we offer necessary assistance to those contractors and suppliers who are found not to have implemented an environmental management system in accordance with the ISO 14001 standard. The assistance is provided mainly by inviting them to participate in an environmental training course sponsored by TEPCO.

■Major Items of Assessment on Environmental Management System Check Sheet

Items required by TEPCO	
1. Environmental policy	
2. Plan	Purposes and targets Environmental management plan
3. Implementation and operation	Organization and responsibilities Training program (e.g., educational, training and enlightenment courses) Management Operation
4. Checkup and correction	Recording Internal audit Management review

Environmental training for contractors and suppliers

8 Education of Employees

With the aim of developing employees' abilities to always take environment-conscious actions in their daily tasks and social activity, we provide our employees with various education and training courses to help them raise their awareness of environment, and improve their knowledge and expertise in environmental protection activities.

Employee Training

Under our educational program consisting of a newcomer training course, a basic management course for prospective managers, and a WT Course – a management task practicing course designed to train leaders in reforming business operations at work sites, we provide our employees with various training courses to promote their consciousness of environmental protection from the standpoint of people engaged in the energy industry.

In fiscal year 2001, a total of 484 new employees (comprising 214 university graduates and 270 upper secondary school graduates) participated in the newcomer training course and about 1,200 employees participated in the basic management course. The participants took lectures on environmental topics and received relevant lessons through our intranet system.

During the same fiscal year, 140 employees participated in the WT Course in which they took lectures on an "Overview of Environmental Pollution Problems and Recent Environmental Problems" and on "Environmental Protection Activities at TEPCO." The lectures were provided with members of our Environment Department acting as coordinators. In addition, the training participants attended group discussions on such topics as "How Far TEPCO, as a Private Corporation, Should Commit Itself to Environmental Protection" and "How to Apply the Results of Environmental Protection Activities to Business Operations."

TEPCO High School Division

A lecture meeting is held in or around Environment Month (June) every year to raise the environmental awareness of students at the TEPCO High School Division who will become members of the Company in the future. In fiscal year 2001, a total of 326 students attended a lecture on "My Turning Point" delivered by Ken Noguchi, an alpinist noted for his climbing of Mt. Everest for cleaning purposes.

Lecture by Ken Noguchi

First-year students in the High School Division (totaling 60 as of fiscal year 2001) attended lectures on such topics as global environmental problems, energy issues, environmental protection measures taken by the government and the electric utility industry, and environmental technologies (extending over some 19 hours total for the year).

Events During Environment Month

During Environment Month, we hold lecture meetings and workshops for our employees to promote their environmental consciousness and deepen their understanding of environmental problems. In fiscal year 2001, a total of about 10,000 employees attended lecture meetings held at all offices of TEPCO, with seven lecturers invited from inside and outside the Company, including Kenji Yamaji, a professor at the Institute of Industrial Science of Tokyo University, and Takeko Yanase, a journalist.

Efforts are also exerted to promote employees' environmental consciousness in the TEPCO Group as a whole, mainly by holding lecture meetings for members of the group companies. Among the events held in fiscal year 2001 was a lecture on "Global Environmental Problems and the Importance of Environmental Management by Business Enterprises," delivered by Saburo Kato, president of the Research Institute for Environment and Society.

Lecture by Kenji Yamaji

■Examples of Employee Education During Environment Month

Description	No. of events	No. of participants
Technical tours of facilities A tour of a factory free from industrial waste (Chuo Power System Office) etc.	75	664
Workshops and in-house lecture meetings Environmental training courses (Tama Branch Office, etc.) etc.	160	6,619
In-house campaigns, including recycling movements Full implementation of sorted waste collection and a stop idling campaign (Gunma Branch Office, etc.) etc.	94	2,388
Environmental patrols and environmental surveys A follow-up survey on wastes (Nishi Thermal Power Office, etc.) etc.	118	552
Total	447	10,223

In-House Information Service

We provide all employees with news and commentaries on environmental problems through our monthly in-house publication "Toden" and the Intranet.

Intranet homepage

In-house publication "Toden"

Support of Qualification Acquisition

In order to achieve the legal minimum number of persons with environmental qualifications in our workplaces, TEPCO supports employees who intend to obtain relevant qualifications and those qualifications it is desirable for them to acquire in respect of their business functions. For this purpose, we provide pre-examination lectures, financial assistance covering fees for correspondence courses, and rewards for employees who have succeeded in obtaining the specified qualifications, with the objective of developing human resources that have sufficient abilities useful both inside and outside the Company.

In fiscal year 2001, a total of 181 employees, mainly those working at power plants, participated in a four-day special lecture course (consisting of a two-day basic lecture and a two-day pre-examination lecture) provided by TEPCO to help them prepare for a national examination for air pollution control manager qualifications.

Pre-examination lecture meeting for Air Pollution Control Manager qualifications

As a result of these efforts, the number of our qualified personnel in the environmental field, whose assignment to such large facilities as power stations is required by law, reached 1,034 pollution control managers and 841 energy supervisors at the end of fiscal year 2001 (46 of such managers and 70 of such supervisors are required as the minimum numbers by law).

Fifteen qualifications for higher experts, such as consulting engineers, who are required to properly respond to changes in business climate, are designated by TEPCO as "specially recommended qualifications." Employees who intend to obtain any of these qualifications are provided with financial assistance covering expenses involved in taking special preparatory lectures for qualification under certain conditions.

Employees who have obtained these qualifications or those who have great professional abilities and motivation are given extensive opportunities to effectively use their abilities.

■ **Number of Environment-Related Qualification Holders**

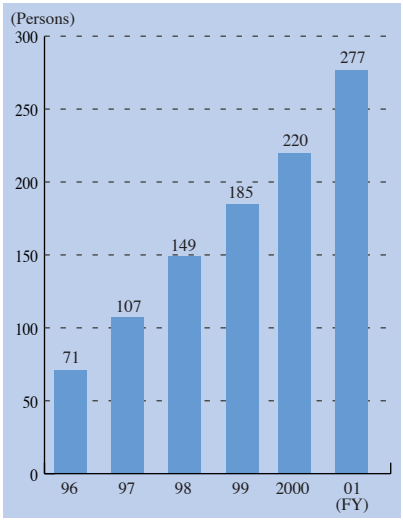
Name of qualification	No. of qualification holders	Legal minimum requirement
Air Pollution Control Managers (1st - 4th classes)	532	46
Water Pollution Control Managers (1st - 4th classes)	162	–
Noise Pollution Control Managers	205	–
General and Specific Dust Control Managers	5	–
Vibration Pollution Control Managers	39	–
Dioxins Pollution Control Managers	26	–
Chief Managers of Pollution Control	65	–
Energy Supervisors (Thermal and Electric)	841	70
Consulting Engineers (Environment, Forestry and Construction Fields)	84	–
Special Industrial Waste Managers	602	134
Total	2,561	–

Training of Professionals

TEPCO has a program for training internal environmental auditors in a bid to implement and enhance an environmental management system that can meet the principles of ISO standards. For this purpose, we provide a three-day, two-night training course designed to help participants acquire the basic knowledge necessary for environmental management and audits, including a case study on how to implement internal environmental audits. Up to fiscal year 2001, a total of 277 employees finished the training course and they are now playing a key role in environmental audits or serving as environmental management system experts at our business establishments.

Training of internal environmental auditors

■ **Cumulative Number of Employees Attending the Basic Training Course on Internal Environmental Auditing**



Environment-Related Qualifications Recommended by TEPCO

Of 225 qualifications TEPCO recommends its employees to obtain, those relating to the environment are specified below. A Plus One Qualification Campaign and other programs are provided to assist employees in obtaining these qualifications (for further details, see page 60).

- Air Pollution Control Managers (1st - 4th classes)
- Water Pollution Control Managers (1st - 4th classes)
- Chief Managers of Pollution Control
- Noise Pollution Control Managers
- General and Specific Dust Control Managers
- Vibration Pollution Control Managers
- Dioxins Pollution Control Managers
- Consulting Engineers and Consulting Engineer Assistants (in Environment, Forestry and Construction Fields)
- Energy Supervisors (Thermal and Electric)
- Landscape Engineering Manager, 1st and 2nd Class
- Biotope Engineering Manager, 1st and 2nd Class (Planning and Engineering Managers)
- Civil Consulting Managers
- Forest Instructors

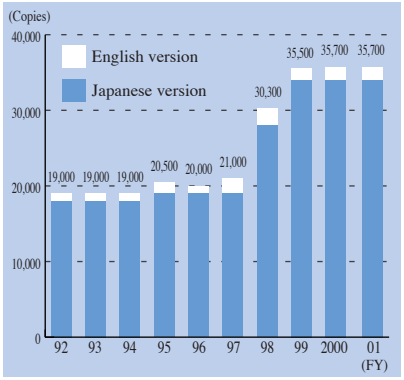
9 Information Disclosure and Communication

Environmental Action Report

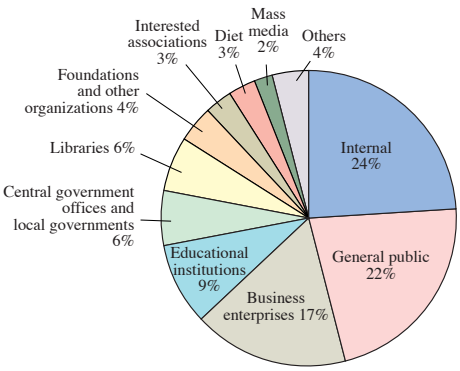
Since 1992, we have published the Environmental Action Report yearly to provide readers in a wide range of social classes with information on the details, targets and achievements of our voluntary activities for environmental protection in order to promote two-way communication with them. Beginning with the 2001 issue, the report discusses our commitments to economic efficiency and social responsibilities as well as to environmental protection.

We endeavor to further improve each new edition of this report, taking into consideration views and comments sent from readers, mainly by questionnaire postcards.

■Circulation



■Breakdown of Distribution (Total in July 2001)



Information Disclosure on Internet

Information on our environmental activities is also provided on our web site (www.tepco.co.jp/index-e.html). The web site receives readers' requests for information on the contents of the Environmental Action Report (both Japanese and English versions), Green Power Fund, and the protection of the natural environment at the Oze marshland. In addition, it accepts requests for and questions about related materials.

Page on environmental information

Information Disclosure for Shareholders

Through our pamphlet to shareholders, we provide information about all aspects of our business activities. A contact address is stated in the pamphlet to receive opinions and suggestions from shareholders. Also, we set up a page on our Internet web site providing IR information to shareholders and investors. In addition, we set up a mail box (admin-ir@tepco.co.jp) for Internet users.

Investor relations bulletin

Communication

In addition to the Advisory Committee on Environmental Affairs mentioned above (see page 10), we have a number of round-table conferences and workshops to seek opinions and requests from a wide range of social classes, including persons of learning and experience, people on the forefront of mass media, nongovernmental organizations and some other sectors, opinion leaders representing local communities, and customers in each of these communities, so that their opinions and requests will be reflected in our future business management and service activities.

Echo System

This system is designed to realize services that meet customer requirements by collecting extensive opinions and requests from customers concerning all sectors of our business operations and reflecting these opinions and requests in our business management and operations. Since its startup in 1984, the system has received opinions and requests from some 62,400 customers, of which those from about 11,700 customers have been used for reviewing new services and business operations.

Public Relations Study Committee

The committee, consisting mainly of persons of learning from diverse sectors, is intended to collect opinions on our business management and publicity issues.

Urban Life and Energy Workshop

The urban life and energy workshop, which is composed of energetic commentators on urban and social issues, gives us advice on various aspects of people's lives and energy services.

Energy Service Round-Table Conference

The conference seeks opinions and requests from opinion leaders who are active in local communities. (In fiscal year 2001, it received opinions and requests from a total of 1,113 people.)

Energy Service Monitors

Energy service monitors offer useful opinions and requests about the contents of our services which may lead to the improvement of our daily business activities. (In fiscal year 2001, we received such opinions and requests from a total of 2,860 monitors.)

Readers' Opinions

We received readers' opinions and impressions with respect to the 2001 issue of the Environmental Action Report through 355 questionnaire postcards sent back to us (at a return rate of 1.1% as of the end of March 2002).

By occupational category, 39% of the respondents were company employees, 11% were students, 8% were housewives and 7% were self-employed persons. The report was rated high on the whole, as 91% of the respondents said either "very good" or "good."

Meanwhile, some respondents replied that the report was "average" (8% of respondents) or "not very good" (1%). One of these respondents (a male company employee living in Yamato City, Kanagawa Prefecture) commented, "I found the report technical and difficult. Although graphs and diagrams are provided, I could not read it through."

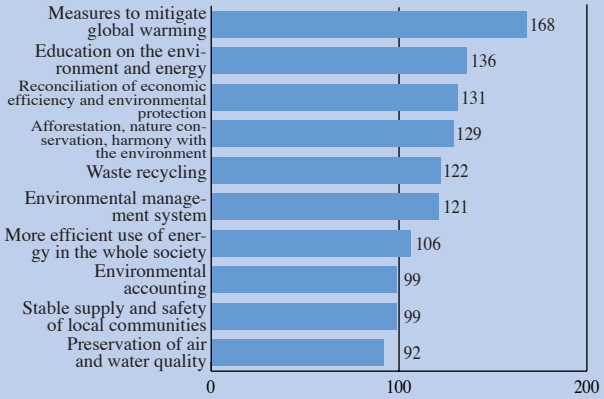
Topics of Special Concern and Readers' Comments

In response to a multiple-choice question, the largest percentage of respondents selected "measures to mitigate global warming" as a topic of special concern to them, as in the preceding year. This was followed by "education on the environment and energy" (a social responsibility) and the "reconciliation of economic efficiency and environmental protection" (economic efficiency) in the order mentioned, indicating that readers had a great interest in all the three elements – environmental protection, economic efficiency and social responsibilities – which are considered necessary for sustainable development.

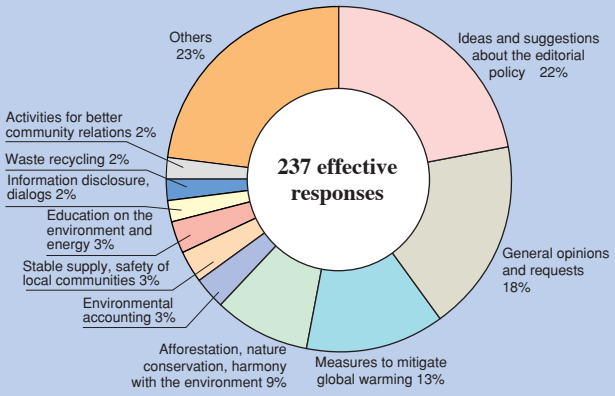
Examples of Readers' Comments

- Previously, the report focused on environmental protection activities. The expansion of its contents over a wider range of topics has further improved the latest issue of the report. (A male company employee living in Ashikaga City, Tochigi Prefecture)
- I think the use of some color pages in the text would make the report easier to read. (A female company employee living in Minato Ward, Tokyo)
- Having read this report, I have come to respect TEPCO for its extensive activities. I intend to use some of the data contained in the report for educational purposes. (A male reader living in Machida City, Tokyo)
- In dealing with environmental problems, I suggest that TEPCO take not only a direct approach to these problems as a business enterprise but also an approach inducing citizens to participate in its activities. (A male company employee living in Ohta Ward, Tokyo)
- I suggest that the report discuss how inexpensively TEPCO supplies electricity, in connection with its environmental protection measures. (A self-employed man living in Kokubunji City, Tokyo)
- I think that activities for better community relations are of significance not only to grownups but also to children, and contribute a great deal to the communities. (A housewife living in Chiba City, Chiba Prefecture)

■Topics of Special Concern to Readers (Multiple Responses Accepted)



■Classification of Opinions



Editors' Notes

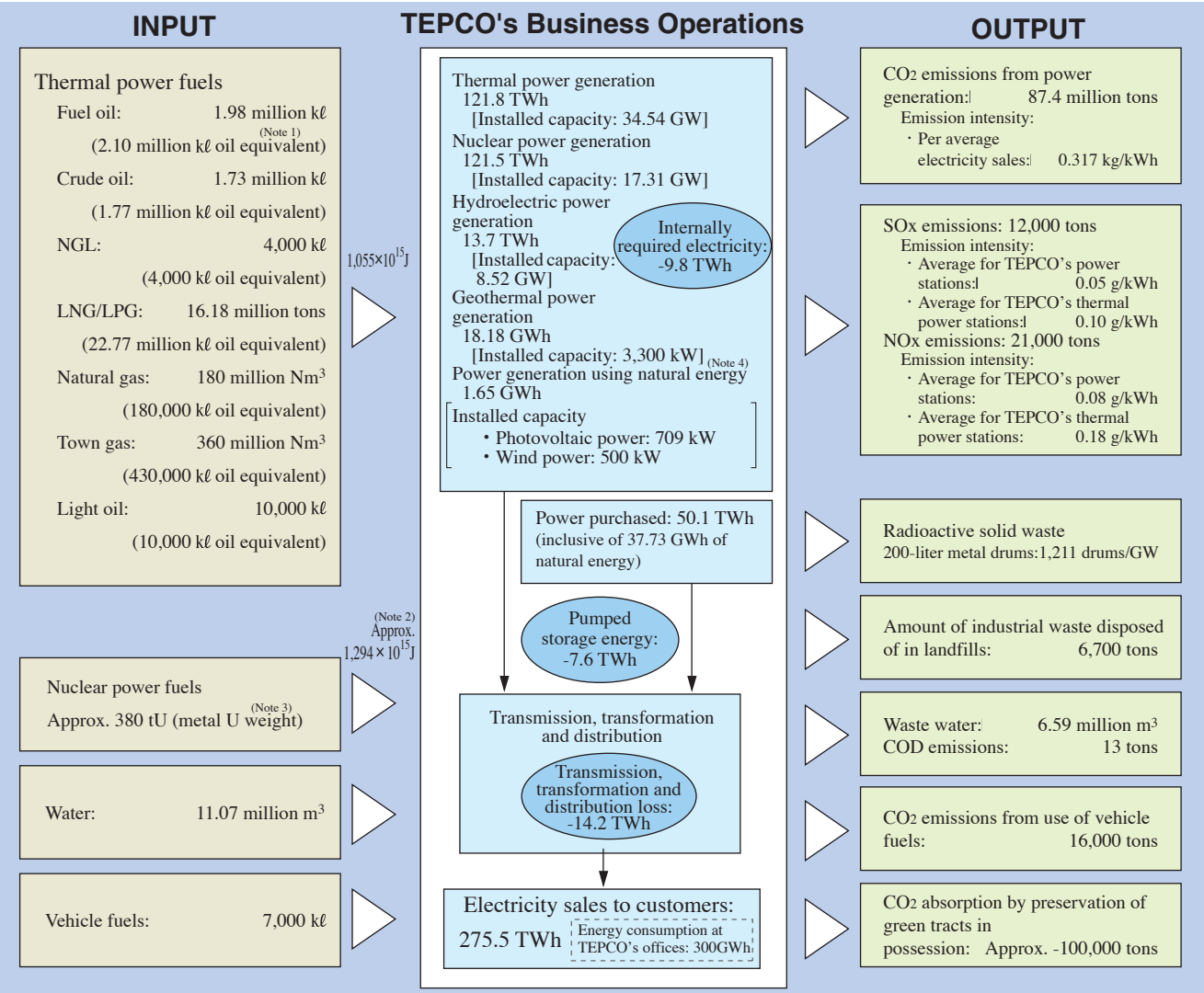
In compiling the 2002 edition of the Environmental Action Report, we tried to describe the results of TEPCO's commitments plainly and simply by newly adding an Integrated to the three existing sections, Environmental, Economic, and Social. An attempt was also made to give variety to the report by adding feature-article and color pages to the text.

We will continue our effort to further improve the contents of the report and discuss relevant topics in an easy-to-understand manner. We would appreciate your giving us your comments and impressions by returning questionnaire postcards. The full text and a summary of this report are also available on our web site (www.tepco.co.jp/index-e.html).

Environmental Indicators

1 Contents of Environmental Indicators

■ **Input-Output Flow in TEPCO's Business Activities (FY2001)**



Note 1: The heating value of oil is 38.7 MJ/ℓ. Note 2: Trial calculation based on electricity generated and design values.
Note 3: The amount of uranium fuel required in proportion to energy input. (Trial calculation based on design values.)
Note 4: In addition to commercial power generation facilities, research power generation facilities are also included.

TEPCO, the world's largest private electric power company, inputs a large quantity of resources into its power generation process to make a product (i.e., electric power) in a quantity sufficient to supply about 30% of total electricity requirements in Japan or the whole of such requirements in the Republic of Korea or Italy and, at the end of the process, it outputs environmental load substances. For example, the consumption of fuel for thermal power generation, which is a major input resource, accounts for about 6% of the primary energy supplied in Japan, but the CO_2 emissions from power generation account for about 7% (or about 30% from the electric utility industry as a whole) of Japan's total CO_2 emissions.

We have aggressively promoted far-sighted environmental measures since the early times, focusing on the improvement of power generation efficiency and removal of pollutants to minimize such resource consumption and emissions of environmental load substances. However, it is essential to identify more precisely the reality of the environmental impact, and set and manage appropriate targets in order for us to maintain and improve the successful outcome of such measures.

Therefore, we have set our "environmental indicators" for major environmental aspects, on which our efforts have to be focused. In addition to assessing the changes in actual values of the indicators, we have quantified the targets as much as possible, and regularly check and review not only the achievement of our targets, but the selected environmental indicators themselves.

2 Environmental Indicators (Actual Values and Targets)

Indicators concerning main environmental impact

Environmental indicators	Unit	*1 Management classification	Actual values			
			FY1990	FY1995	FY2000	FY2001
Indicators concerning CO_2						
CO_2 emission intensity (average of all power sources)	kg-CO_2/kWh sales	◎	0.382	0.358	0.328	0.317
CO_2 emissions (all power sources)	million t-CO_2	○	84.10	91.00	92.20	87.40
〈TEPCO's operational power stations〉			〈71.00〉	〈67.60〉	〈61.80〉	〈55.40〉
Indicators concerning SOx and NOx						
SOx emission intensity (average of TEPCO's operational power stations)	g/kWh	◎	0.17	0.12	0.07	0.05
〈average of TEPCO's operational thermal power stations〉			〈0.28〉	〈0.23〉	〈0.14〉	〈0.10〉
NOx emission intensity (average of TEPCO's operational power stations)	g/kWh	◎	0.22	0.15	0.10	0.08
〈average of TEPCO's operational thermal power stations〉			〈0.36〉	〈0.29〉	〈0.20〉	〈0.18〉
Indicators concerning radioactive substances and radioactive waste						
Evaluated value of radiation exposure doses for people living near nuclear power stations	mSv/yr	◎	Below 0.001	Below 0.001	Below 0.001	Below 0.001
Amount of solid radioactive waste produced *2 (Number of 200L-drums per GW)	drums/GW	○	913 *4	409 *4	868	1,211
Indicators for waste and resource recycling						
Overall recycling rate of industrial waste	%	◎	86	92	94	95
Recycling rate of specific waste *3	%	◎				
• Group A waste (waste concrete poles, etc.)			—	—	100	100
• Group B waste (sludge, shellfish, rubble, etc.)			—	—	79	79
• Group C waste (scrap metals, waste plastics, etc.)			—	—	91	92
Amount of used paper collected	thousand t	○	0.5	3.0	3.7	4.0
Indicators for management of chemicals						
Status of possession and management of PCB equipment		○				
• High-voltage transformers, capacitors	unit		—	—	3,479	3,679
• Pole transformers	million units		—	—	1.10	1.10
Quantity of PCB treated		◎				
• High-voltage transformers, capacitors	unit		—	—	—	—
• Pole transformers	kℓ		—	—	—	38
Indicators concerning regulated chlorofluorocarbons (CFCs)						
Consumption revised with consideration to the ozone depletion potential (ODP)	ODP-t	◎	37.3 *4	24.3	4.3	9.6
(Actual consumption)	(t)		〈54.4〉 *4	〈49.3〉	〈25.7〉 *4	〈12.3〉

*1 : ◎ : Target management items (items for which quantitative targets have been set, and various measures introduced to achieve the targets).
○ : Actual values management items (items used to identify and analyze levels of and changes in actual values, and supplement the target management).

Target in FY2001		Future targets		Analysis ◇：Evaluation of actual values in FY2001 ◆：Concept for setting future targets	Reference page
Target value	Achieved or not	FY2002	FY2011		
0.33	Achieved	FY2010 targets vs. FY1990 figures 20% reduction [approx. 0.31] Approx. 0.31	FY2010 Approx. 0.31	◇Electricity sales decreased from the previous fiscal year (from 280.7 TWh in FY2000 to 275.5 TWh in FY2001). Thanks to an increase in the ratio of nuclear power generation to the total electricity generated and improved thermal efficiency of thermal power generation, our emission intensity fell below the year-earlier level and met the target for FY2001. ◆TEPCO intends to attain the target of reducing its CO_2 emission intensity for FY2010 to 20% below the FY1990 level.	p.24 | p.31
Approx. 0.1	Achieved	Less than 0.1	Less than 0.1	◇With a decrease in electricity generated by thermal power, the emission intensity decreased from the preceding year and met the target, as LNG-fired thermal power generation, which involves no SOx emissions, further increased as a percentage of the total. ◆We will aim at maintaining the world's lowest levels of emission intensity.	p.33 | p.34 p.91
Less than 0.2	Achieved	Approx. 0.1	Approx. 0.1	◇The emission intensity fell below the year-earlier level to meet the target, mainly because LNG-fired thermal power generation, which has low NOx emissions, increased as a percentage of the total. ◆We will aim at maintaining the world's lowest levels of emission intensity.	
Below 0.001	Achieved	Below 0.001	Below 0.001	◇Each of TEPCO's nuclear power stations not only maintained the regulatory value (1 mSV/yr), but also a level well below the dose target value (0.05 mSV/yr) prescribed by the guidelines of the Nuclear Safety Commission, achieving the target. ◆We will maintain the present low value.	p.37 | p.38 p.92
Aiming at 100% by FY2005		Aiming at 100% by FY2005		◇Our overall recycling rate rose one percentage point over the preceding year due chiefly to an increase in the shellfish recycling rate and a rise in the composition ratio of the scrapped concrete pole recycling rate that has already reached 100%. ◆TEPCO will focus its efforts on improving the recycling rates of Group B and Group C wastes, aiming to attain a 100% overall recycling rate by FY2005.	p.43 | p.44
100	Achieved	100	100		
Aiming at 100% by FY2005		Aiming at 100% by FY2005			
To be completed in approx. 10 years from start of treatment.		Start of treatment 700	To be completed in approx.10 years 3,000	◇Equipment is properly managed based on the Waste Management Law, etc. ◇In October 2001, TEPCO Yokohama Recycle Center came into commercial operation to treat these wastes and, in March 2003, TEPCO Chiba Recycle Center started up the same treatment.	p.39 p.46
To be decreased to as low a level as possible.	Achieved	To be decreased to as low a level as possible.	To be decreased to as low a level as possible.	◇The actual consumption of CFCs fell below the year-earlier level due to a decrease in their consumption for clothes cleaning and as a refrigerant, but their consumption revised with consideration to ODP increased over the preceding year, mainly because of the consumption of halon for fire extinguishers. ◆We will reduce consumption as much as possible.	p.32

*2：Annual production: In addition to the amount of solid wastes newly arising from the operation of power plants, annual production includes stored waste packages, the restored by-product of the waste packages, and the ash through incineration of stored wastes.
*3：A Group: the wastes that have already been 100% recycled. B Group: the wastes that have not been adequately recycled. C Group: the mixed wastes that can hardly be separated.
*4：From this fiscal year, the figures were corrected by tracing back to the values of FY1990 and FY2000 based on the results of review of past data.

Indicators concerning environmental preservation measures

Environmental indicators	Unit	*1 Management classification	Actual values			
			FY1990	FY1995	FY2000	FY2001
Indicators concerning the effective use of energy						
Capacity utilization rate of nuclear power stations	%	◎	71.3	83.2	79.4	80.1
Thermal efficiency of thermal power plant (gross)	%	◎	39.1	39.0	41.1	41.6
Transmission and distribution loss rate (rate of power loss from transmission and distribution lines)	%	○	5.4	5.2	4.9	4.7
Status of development and introduction of natural energy (on a cumulative basis)*3	kW (no. of locations)	◎				
・Photovoltaic power generation			0	479 (40)	709 (57)	709 (57)
・Wind power generation			0	300 (1)	800 (2)	500 (2*5)
・Geothermal power generation			0	0	3,300 (1)	3,300 (1)
Amount of power purchased from natural energy sources	MWh (kW)	○				
・Photovoltaic power generation			—	447 (1,944)	18,487 (62,064)	30,892 (96,519)
・Wind power generation			—	122 (250)	4,398 (2,550)	6,043 (4,693)
・Fuel cells			—	3,186 (2,795)	305 (800)	799 (802)
Internal energy and resource consumption						
・Electricity consumption for offices	GWh	◎			305	298
・Consumption of tap water	Million m³	◎			2.22	1.94
・Specific fuel consumption for vehicles (fuel consumption per unit distance covered)	ℓ/km	◎			0.112	0.109
・Purchases of copier and printer paper	Billion sheets (in A4 equivalent)	◎			0.40	0.36
Indicator concerning afforestation and nature conservation						
Greenery rate at power stations (thermal power and nuclear power)	%	○				
・Thermal power stations				27	27	28
・Nuclear power stations				62	65	66
Other indicators						
Total no. of persons holding certificates or licenses in the environmental field	No. of persons	○				
・Pollution control managers				1,209	1,002	1,034
・Energy supervisors				575	689	841
No. of electric vehicles introduced (cumulative total)	No. of units	○	45	130	132	137

*1：◎：Target management items (items for which quantitative targets have been set, and various measures introduced to achieve the targets).
○：Actual values management items (items used to identify and analyze levels of and changes in actual values, and supplement the target management).

Target in FY2001		Future targets		Analysis ◇：Evaluation of actual values in FY2001 ◆：Concept for setting future targets	Reference page
Target value	Achieved or not	FY2002	FY2011		
80.6*2	Not achieved	82.9	85.0	◇The figure increased by 0.7% from the year-earlier level, because of a decrease in the duration of unplanned outages, but failed to achieve the target as a result of the extended periodical inspection needed to repairs of shrouds, etc. ◆We will address safe operation at higher capacity utilization rates by improving the efficiency of periodical inspection activities.	p.27 p.67
41.2 5.2*2	Achieved	41.7	41.7 or more	◇We increased the thermal efficiency by 0.5% from the previous fiscal year as a result of increased electricity generated by advanced combined cycle (ACC) power generation, and satisfied the target set. ◆We will further improve the thermal efficiency by starting gradual operation of ACC power generation equipment. ◇We continued to maintain a low loss rate as a result of the improved efficiency of load adjustment operations.	p.30 p.67 p.30
722 800 (2) 3,300 (1)	Not achieved Not achieved Achieved	653*4 500 (2) 3,300 (1)	679 500 (2) 3,300 (1)	◇We failed to meet the target for photovoltaic power generation because the plan for additional capacity installation was postponed until FY2002 or later. ◇We failed to meet the target for wind power generation facilities because our research facility (300 kW) was removed in February 2002 for the reason that we could adequate results of research on system interconnection, etc. ◆We will try to promote the introduction of natural energy, with consideration given to the cost and natural conditions. ◇The amount of power purchased from photovoltaic power generation increased about 70% over the preceding year because of the increased introduction of photovoltaic power generation equipment resulting from reduced introduction costs. We will continue our effort to support the further diffusion of natural energy through the effective use of the Green Power Program.	p.28 p.86 p.28 p.29 p.90
		Compared with FY2000	FY2005 Compared with FY2000		
295 2.15 0.107 0.35	Not achieved Achieved Not achieved Not achieved	6% reduction 6% reduction 8% improvement 24% reduction	15% reduction 15% reduction 20% improvement 50% reduction	◇As a result of company-wide efforts for various measures in the hardware and operational aspects, we reduced the internal consumption of energy and resources from the preceding year. As we started company-wide efforts in the second half of FY2001, we failed to meet the targets set for the fiscal year, except for that of tap water consumption.	p.96
				◇We fully achieved the greenery rates (15-25%) that are required for newly constructed factories as specified in the Factory Location Law and other ordinances.	p.40 p.93
				◇As the number of newly qualified persons (86 pollution control managers and 179 energy supervisors) exceeded that of qualified persons who resigned (54 pollution control managers and 27 energy supervisors), the total number of qualified persons increased from the previous fiscal year (32 pollution control managers and 152 energy supervisors). The number of qualified persons is much greater than the legal number required (46 pollution control managers and 70 energy supervisors).	p.16 p.35

*2：Planned value of supply in FY2001.
*3：Including research power generation facilities as well as commercial facilities.
*4：The capacity is expected to decreases mainly because of the removal of research power generation facilities (at the end of the research period).
*5：No change is recorded in the number of places because a very small-scale facility (0.4 kW) was introduced.

1 Global Environment

In June 2002, Japan ratified the Kyoto Protocol. Japan finds it very difficult to achieve the greenhouse gas reduction target imposed by the protocol. Still, while fulfilling our responsibility as a public utility to provide an inexpensive, stable energy supply, TEPCO is working to implement a variety of measures aimed at accomplishing the CO_2 emission intensity reduction target it has set.

1. Reduction of CO_2 Emissions

CO_2 Emissions

In fiscal year 2001, CO_2 emissions from electric power generation amounted to 87.4 million tons. This represents more than 99% of the total amount of greenhouse gases emitted from TEPCO's business activities (on the CO_2 basis).

Reduction of CO_2 Emission Intensity

The CO_2 emissions from electric power generation can be calculated by the following expression:

CO_2 emissions =
CO_2 emission intensity × electricity consumed

The CO_2 emission intensity is the amount of CO_2 emitted to generate 1 kWh of electricity. The electricity consumed is in the hands of our customers; it cannot be controlled by electric power companies. On the other hand, the emission intensity represents the value that can be controlled by electric power companies and it directly reflects the efforts of electric power companies.

In our management vision, therefore, we set a target of "reducing the emission intensity in fiscal year 2010 by 20% from the 1990 level." In order to accomplish this target, we are striving to decrease the emission intensity primarily through supply-side measures, including increasing the use of non-fossil energy sources, with nuclear power playing a central role, and enhancing the thermal efficiency of thermal power generation. Our CO_2 emission intensity in fiscal year 2001 decreased to 0.317 kg-CO_2/kWh from the previous fiscal year.

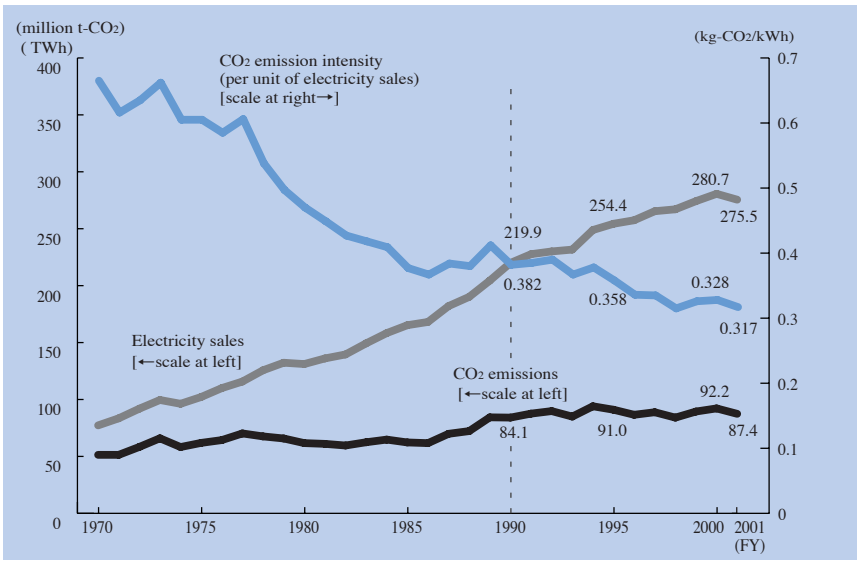
As for changes in CO_2 emissions to date, while electricity sales by TEPCO increased by nearly threefold from the oil crisis in the 1970s to fiscal year 2001, our CO_2 emissions increased by only 1.5 times as a result of our efforts to reduce the CO_2 emission intensity by about 50%. During about ten-year period from 1990, electricity sales by TEPCO increased by about 30%, but our CO_2 emissions increased by just less than 10%.

Compared with major European and American countries, we have also kept our CO_2 emission intensity at a relatively low level, although our levels are behind Canada, which has a very high ratio of hydroelectric power generation to overall power generation, and France which has promoted nuclear power generation.

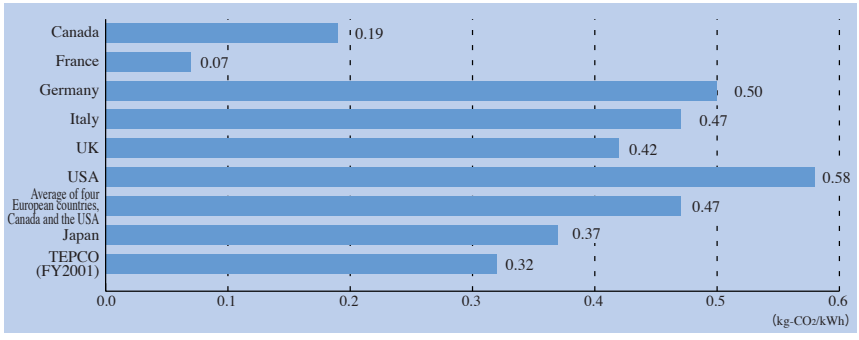
Besides emissions from electric power generation, CO_2 emissions from the operation of vehicles in fiscal year 2001 amounted to 16,000 tons. By setting a target of increasing specific fuel consumption (raising the specific fuel consumption for vehicles in fiscal year 2005 by 20% from the 2000 level), we are promoting a series of measures, including encouraging the introduction of electric vehicles and hybrid cars, and raising the consciousness of drivers to energy efficiency.

On the other hand, the amount of CO_2 sequestration and absorption by forests in our possession was estimated to be about 100,000 tons.

■ CO_2 Emissions and CO_2 Emission Intensity



■ International Comparison of CO_2 Emission Intensities



Note: Japan is represented by data from FY2000. The four European countries, Canada and the USA are represented by Data of 1999 all in terms of generating end.
Sources: Estimates based on the ENERGY BALANCES OF OECD COUNTRIES 1998-99. Estimates for Japan based on a survey of the Federation of Electric Power Companies.

2. Promoting Voluntary Commitment

Voluntary commitment is our basic policy toward environmental protection. Since forty years ago, when solving pollution problems (the negative legacy of Japan's high economic growth) was a matter of national concern, we have been voluntarily working to cope with environmental problems.

Voluntary commitment is an environmental improvement mechanism by which implementing entities of environmental measures including business enterprises, with ambitious goals, plan and carry out cost-effective measures on their own in overall consideration of technology trends and other management tasks. Voluntary commitment is an approach that allows implementing entities which carry out the measures to achieve greater environmental improvements of their own volition by devoting their ingenuity and resources. Totally different from so-called regulatory approaches, voluntary commitment is an environmental problem-solving strategy that is appropriate to the century of the environment. In order to carry out voluntary commitment, an absolute requisite is to create a system that strictly operates the plan-do-check-action (PDCA) cycle on the principle of self-management including establishment and operation of an environmental management system.

TEPCO checks and reviews the achievement of actual values and targets every year through the Comprehensive Environment Committee (see page 10) according to company-wide common targets (see pages 20-23). At the same time, the committee discusses and examines the appropriateness of future targets for the following fiscal year and five to ten years ahead. The results of discussion at the committee are referred to the Executive Management Committee, TEPCO's chief decision-making body, and reported to the President, the chief executive for environmental management. In this way, the efforts toward environmental protection are left to the management's judgment.

Moreover, ensuring transparency and objectivity is an essential condition for properly carrying out voluntary commitment. At TEPCO, we hold a meeting of the TEPCO Advisory Committee on Environmental Affairs (see pages 10, 75-76) every year, where well-informed persons from many fields make a review of the efforts we made during the previous fiscal year to come to grips with general environmental problems, and our people, including the President, exchange views with members of this committee. The views and suggestions presented by the members of the Advisory Committee on Environmental Affairs and the results of our internal check and review are announced both at home and abroad in our Environmental Action Report and our Internet web site in a bid to provide verification materials to multi-stakeholders.

In this way, we achieve strict management through the operation of the check-and-review and transparency-securing mechanisms based on the Environmental Management Regulations (see page 85).

Contribution of the Residential/Commercial and Transport Sectors to Reductions in CO_2 Emissions

●CO_2 Emissions from the Residential/Commercial and Transport Sectors Are Increasing

Looking at changes in CO_2 emissions in recent years by sector, emissions from the industrial sector, which has taken the initiative in carrying out voluntary commitment approaches, have remained almost unchanged, whereas emissions from the residential/commercial and transport sectors, which fall behind in action programs, have continued to rise.

In order to reduce emissions from the residential/commercial and transport sectors, each one of us must change our lifestyles from the mass consumption pattern to one of resource and energy conservation.

●Role of Business Enterprises

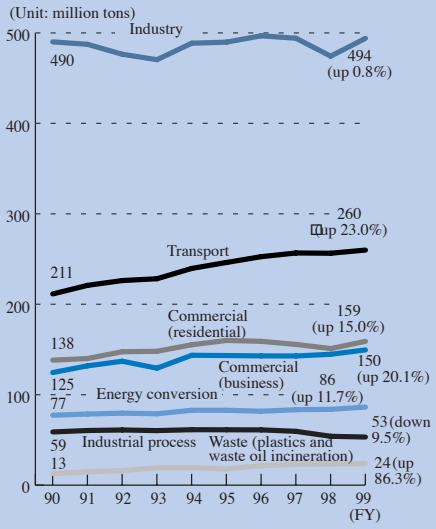
Business enterprises are contributing to reductions in CO_2 emissions from the residential/commercial and transport sectors by indirectly holding down emissions from customers with the environmentally acceptable goods and services they offer to customers. Automobile manufacturers, for example, develop and sell fuel-efficient vehicles, such as hybrid cars, and household electrical appliance manufacturers develop and market highly energy-efficient consumer electronics, thereby giving support to the transport and residential/commercial sectors in reducing emissions, respectively.

●TEPCO's Product Representing Environmental Advantage of Electricity

As an electric power company, TEPCO has lowered the CO_2 emission intensity by nearly 17% over the past ten years through various voluntary efforts. By delivering our environmentally acceptable product called electricity, we are contributing to reducing emissions from customers. We will continue our voluntary efforts to decrease the CO_2 emission intensity, thereby contributing to reductions in emissions from customers as well as emissions from the residential/commercial sector.

Furthermore, we are assisting customers in energy conservation by providing information about efficient ways of using electricity (for details, see pages 71-74).

■CO_2 Emissions by Sector



Note: Figures in parentheses represent the rate of increase from the fiscal year 1990 level as a reference fiscal year.
Source: Ministry of the Environment

3. Measures to Mitigate Global Warming

TEPCO is engaged in carrying out concrete measures on the supply side, including promoting nuclear power that does not emit CO_2 in the power generation process. At the same time, we are also pressing forward actively with measures on the demand side by providing support for customers. Moreover, we are aggressively enforcing various measures designed to mitigate global warming, including the use of the Kyoto mechanisms as supplements to national measures and the development of integrated coal gasification combined cycle power generation technology.

Measures on the supply side	Expanded use of non-fossil energy sources Wider use of nuclear power generation, expanded use of LNG, and development and diffusion of natural energy
	Effective energy uses Improvement of thermal efficiency of thermal power generation and reduction of the transmission and distribution loss rate
Measures on the demand side	Energy conservation Promotion of improvement of customers' efficient use of energy
Other measures	International cooperation Utilization of Kyoto mechanisms
	Technology developments Development of integrated coal gasification combined cycle power generation technology, etc.
	Cutback of greenhouse gases other than CO_2

Expanded Use of Non-Fossil Energy Sources

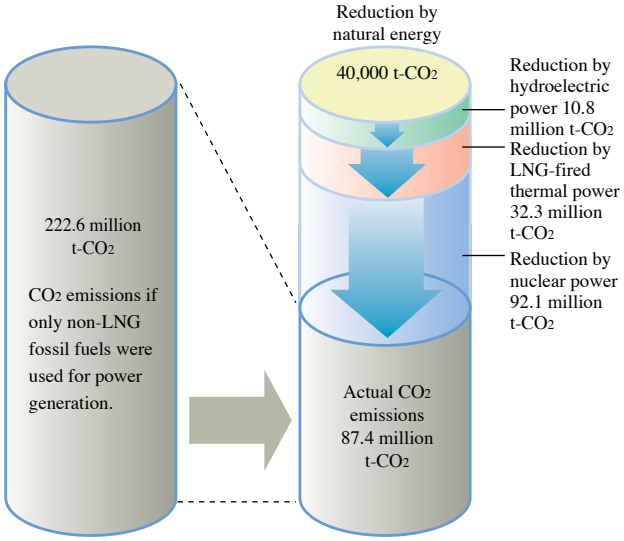
TEPCO is engaged in promoting the expanded use of non-fossil energy sources that do not emit CO_2 in the power generation process, such as nuclear energy, natural energy, and so forth. Moreover, expanding the use of LNG that contains few air pollutants is also an effective means of reducing CO_2 emissions.

As a result of the positive effect of nuclear power generation and natural energy, the amount of CO_2 emissions which were restricted in fiscal year 2001 reached about 140 million tons, which is about 1.5 times greater than TEPCO's actual emissions.

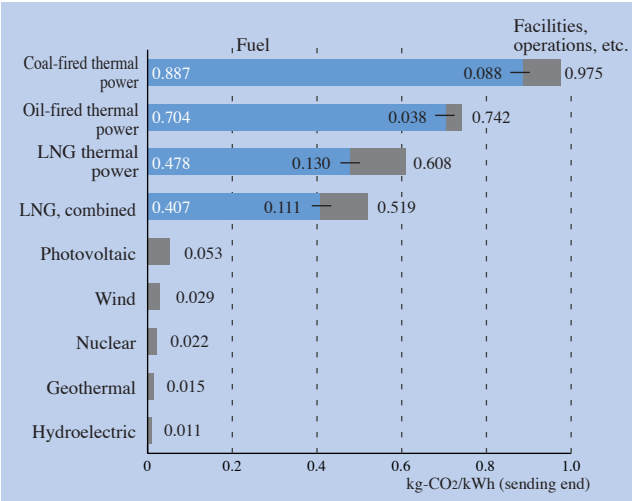
Environmental Advantage of Nuclear Power

Nuclear power generation does not emit CO_2 in the power generation process, and is characterized by very small CO_2 emissions, even when evaluated from an overall point of view, including the construction and operation phases. Moreover, it does not emit air pollutants such as sulfur oxides (SOx) and nitrogen oxides (NOx). Thus, nuclear power generation is an environmentally acceptable power generation method.

■ **Reduction of CO_2 Emissions by Expanded Use of Non-Fossil Energy Sources**



■ **Life Cycle of CO_2 Emissions by Type of Power Generation**



Note: In addition to combustion of power generation fuel, the calculation of CO_2 emissions includes all energy consumed for mining of raw materials, construction of various equipment and facilities, transportation and refinement of fuels, operation, and maintenance. The CO_2 emissions from nuclear power generation are calculated on the assumption that the planned recycling of nuclear fuel would be used (including reprocessing of spent fuel in Japan, plutonium for thermal use (recycled once), and high-level radioactive waste disposal).

Source: Report of the Central Research Institute of the Electric Power Industry (CRIEPI)

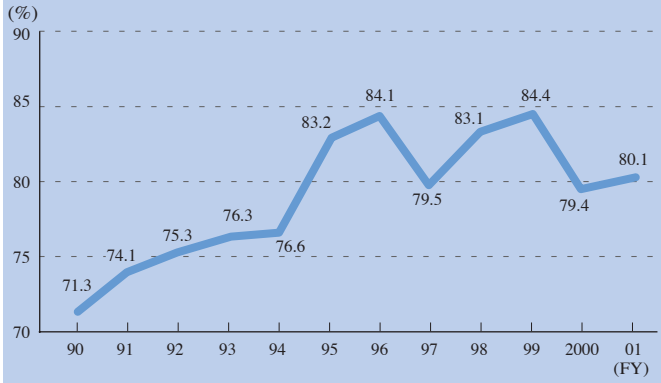
Our nuclear power generation maintains a high capacity utilization rate as a result of safe and stable operation and well-planned periodical inspections. In fiscal year 2001, the capacity utilization rate rose by 0.7% to reach 80.1% due, among others, to a decrease in the duration of unscheduled outages.

If the capacity utilization rate of nuclear power generation decreases by 1%, the thermal power output increases by about 1.4 TWh a year (which is equivalent to about 300,000 kℓ of fuel oil), and CO_2 emissions increase by about 650,000 tons.

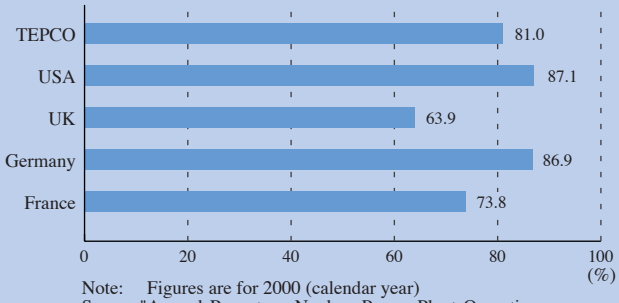
Promoting nuclear power is a realistic and essential measure in order for Japan to achieve its international commitment on CO_2 reductions while avoiding a serious impact on the still fragile Japanese economy. It is also an important policy for Japan as a resource-poor nation to ensure its energy security.

Public trust in nuclear power has been lost due to unfavorable events, including the September 1999 JCO accident. In a policy designed to restore public confidence in nuclear power, we will continue to make double assurances of safety so as to never allow the occurrence of a nuclear accident to be actualized by encouraging each and every employee to ensure safety in day-to-day operations. While insuring complete day-to-day management of radioactive material, we will make our utmost efforts to realize the disposal of high-level radioactive waste and work to operate nuclear power plants at a high capacity factor and develop new power plants.

■Capacity Utilization Rates for Nuclear Equipment



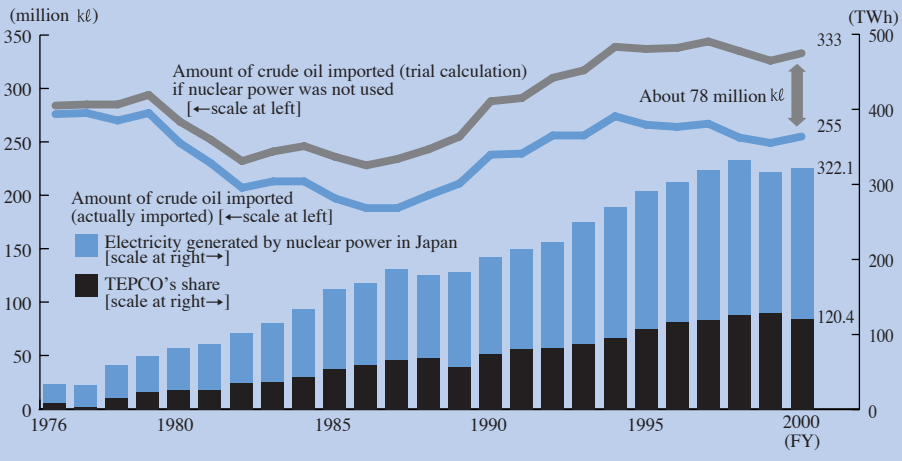
■Capacity Utilization Rates for Nuclear Equipment in Major Industrial Countries



Note: Figures are for 2000 (calendar year)
Source: "Annual Report on Nuclear Power Plant Operation Management" published by the Thermal and Nuclear Power Engineering Society for data on the United States and European countries.

Contribution of Nuclear Power to Energy Security

Nuclear power generation is making a great contribution to Japan's energy security by reducing the need to import crude oil. If it were not for nuclear power generation, it is estimated that the amount of crude oil imported into Japan in fiscal year 2000 would have increased by about 30% (or approx. 78 million kℓ).



Utilization of Natural Energy

The electricity generated by natural energy sources varies with natural conditions, and their energy densities are low. For such reasons, natural energy sources can hardly be expected to become major power sources. However, because natural energy sources contribute to the reduced use of fossil fuels, TEPCO actively promotes the development and introduction of natural energy sources and supports their diffusion depending on their respective characteristics.

①Development and Introduction

Wind Power Generation

As a result of technology developments and the increased size of equipment in recent years, it has become possible for wind power to generate electric power at a relatively low cost under favorable wind conditions, and the quality of electricity generated by wind power has become stable.

Our Hachijojima Wind Power Plant (installed capacity of 500 kW) started commercial operation in March 2000. We will analyze and evaluate the operational data to examine the possibility of installation of additional wind power plants on the island or installation in other areas, and the commercial feasibility of wind power plants.

Hachijojima Wind Power Plant

Geothermal Power Generation

Geothermal power generation utilizes the energy of high-temperature and high-pressure hot water located deep underground.

TEPCO has been operating a 3,300-kW geothermal power station on Hachijojima Island since March 1999. In fiscal year 2001, this power station produced 18.18 GWh of electricity. The waste heat produced by the geothermal power station is supplied to the greenhouse complexes on the island.

Photovoltaic Power Generation

TEPCO has installed photovoltaic power generation facilities at 57 locations (total capacity of 709 kW), including its own establishments, and is collecting various data from them.

■Locations of Photovoltaic Power Generation Systems

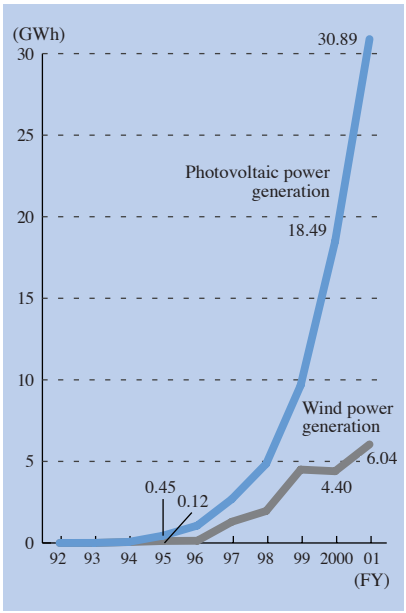
②Support for Diffusion

Purchase of Surplus Power

TEPCO actively purchases surplus power from natural energy power generation facilities. We purchase the power generated by photovoltaic power and wind power generation facilities at the same unit price as TEPCO's energy charge. For wind power generation, we also offer the wind power optional menu for industrial use to purchase the power generated by wind power on a steady, long-term basis (see page 90 "Purchasing Prices for Surplus Electricity from Photovoltaic and Wind Power Generation Facilities"). Moreover, we introduced in fiscal year 2001 the bidding system for purchasing electricity generated by wind power generating facilities with a combined rated capacity of more than 2,000 kW.

We are also purchasing surplus power produced by fuel cells, one of the so-called new energy sources. In fiscal year 2001, we bought 799 MWh of surplus power from four customer facilities.

■Surplus Power Purchases



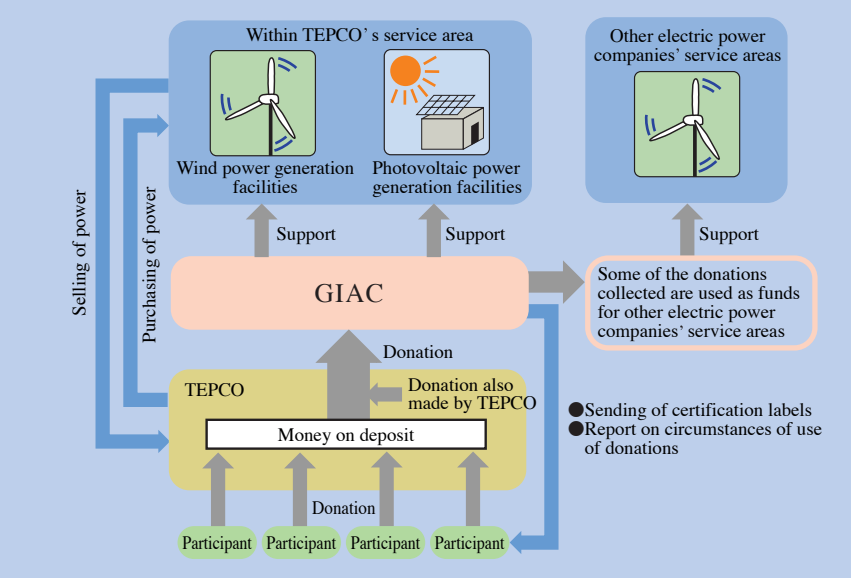
Green Power Program

As part of our efforts to support the diffusion of natural energy, we started the "Green Power Fund" that is financed by contributions from customers, and the "Green Power Certification System" designed to help corporations and organizations use natural energy.

[Green Power Fund]

TEPCO and the Greater-Kanto Industrial Advancement Center (GIAC) jointly established the "Green Power Fund" in October 2000. Under the fund system, a ¥500 contribution a month per share is raised from customers, and TEPCO adds the same amount (matching gift) as that contributed by customers. Customers' contributions and TEPCO's matching gifts are entrusted to the GIAC as funds for activities to support the diffusion of natural energy. In our service areas (as of end-March 2002), the Green Power Fund received contributions from 15,190 customers (18,399 shares). In fiscal year 2001, we received a total of ¥108 million in contributions, and contributed ¥108 million as the matching gift.

■**Green Power Fund**



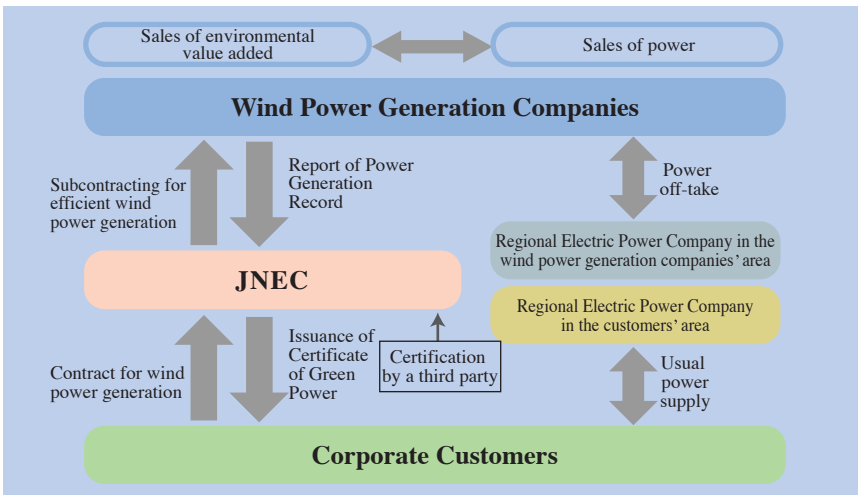
Furthermore, we decided in fiscal year 2001 to provide grants-in-aid out of the contributions we received during fiscal year 2000 to finance one wind power facility, twelve photovoltaic power facilities, and the funds in other electric power companies' service areas endowed with favorable wind conditions. (Grants-in-aid amounted to approximately ¥62.5 million.)

[Green Power Certification System]

In November 2000, with funds contributed by other electric power companies, TEPCO established the Japan Natural Energy Company Limited (JNEC), which mediates between corporate customers that cooperate in power generation by natural energy and power generators using natural energy to develop Japan's first "Green Power Certification System." JNEC purchases electric power from power generators using natural energy under a power purchasing agreement with corporate customers with about ¥4 premium per 1 kWh. Those corporations that have paid this premium are considered to use electricity produced by natural energy. JNEC issues "Certificates of Green Power" to participating corporate customers. The certificate of green power states the power generation period, power output, and type of power generation. In April 2001, TEPCO concluded a contract to purchase 1 GWh of electricity over a 15-year period. Twenty-eight corporate customers and organizations(*) have already concluded contracts to purchase a total of 35.15 GWh from power generators using natural energy (as of the end of March 2002). These contracts have made it possible to undertake projects to construct 34 wind power generating units in three areas. In this way, the Green Power Certification System contributes to the development of natural energy in Japan.

(*)Sony Corp., Asahi Breweries, Ltd., NGK Insulators, Ltd., Seiko Epson Corp., Toyota Motor Corp., Fuji Xerox Co., Ltd., DyDo DRINCO, INC., Eisai Co., Ltd., Hazama Corp., Hitachi, Ltd., Kandenko Co., Ltd., Koshigaya City (Saitama Prefecture), Maeda Corp., Mitsubishi Estate Co., Ltd., Mitsubishi Heavy Industries, Ltd., Mitsui & Co., Ltd., Nihon Unisys, Ltd., Ricoh Co., Ltd., Seiyu, Ltd., Sumitomo Corp., Sumitomo Metal Mining Co., Ltd., Sumitomo Mitsui Banking Corp., Tokio Marine and Fire Insurance Co., Ltd., Tokyo Electric Power Co., Inc., Tokyo Gas Co., Ltd., Ikeuchi Towel Co., Ltd., Daidenko Corp., Japan Wind Development Co., Ltd. (arranged in order of contract size and according to the alphabetical order)

■**Green Power Certification System (in the case of wide power generation)**



Note:Only the implementation of power generation by natural energy is entrusted, with no connection to customers' power supply contracts (nothing is added to customers' power supply contracts).

Sample of the Green Power Certificate

Efficient Use of Energy

Improvement of Thermal Efficiency of Thermal Power Generation

The average thermal efficiency in fiscal year 2001 increased by 0.5% from the previous fiscal year to 41.6% as a result of the introduction of Advanced Combined Cycle (ACC) power generation facilities.

The amount of CO_2 emissions reduced by the improvement in thermal efficiency from the efficiency in fiscal year 1990 (39.1%) is equivalent to about 3.5 million tons. (A 1% increase in thermal efficiency of thermal power generation saves about 600,000 kℓ of fuel oil a year, and reduces CO_2 emissions by about 1.3 million tons.)

In the years ahead, TEPCO will continue to improve thermal efficiency through the introduction of ACC power generation facilities, and aim to reduce CO_2 emissions, while pursuing higher economic efficiency through the efficient use of resources.

Reduction of Transmission and Distribution Loss

TEPCO is trying to reduce the transmission and distribution loss rate, which is also important from the viewpoint of the efficient use of resources.

In fiscal year 2001, the transmission and distribution loss rate came to 4.7%. The amount of CO_2 emissions reduced by the improvement in the transmission and distribution loss rate from the rate in fiscal year 1990 (5.4%) is equivalent to about 650,000 tons.

International Cooperation (Application of Kyoto Mechanisms)

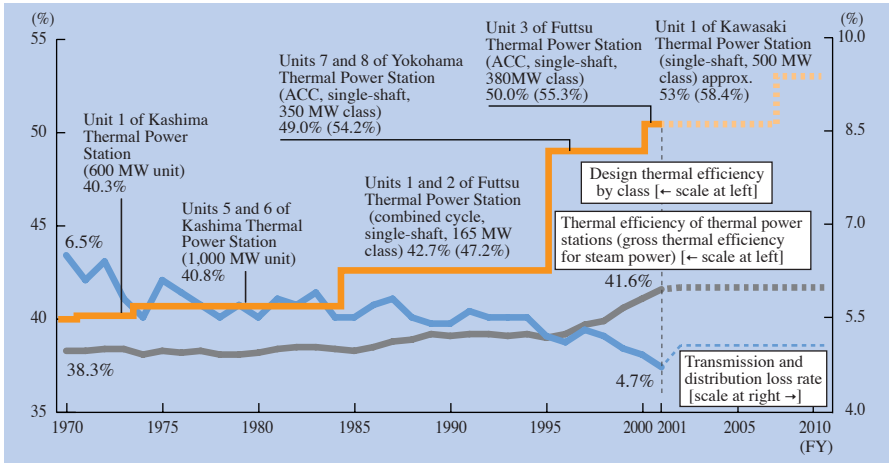
The Kyoto mechanisms, such as Joint Implementation, the Clean Development Mechanism (CDM) and international emissions trading, are expected to become important commitments as the tools to supplement domestic measures for the reduction of CO_2 emissions. We intend to positively use project-based joint implementation and CDM because both mechanisms allow us to directly employ our expertise and know-how and enable us to contribute to international cooperation. As part of this effort, we have already undertaken plantation projects in Australia and participated in the World Bank's Prototype Carbon Fund. We will continue to positively consider carrying out new projects.

Overseas Plantation Project

In February 2000, TEPCO founded TEPCO Forests Australia Pty. Ltd. as a wholly-owned subsidiary in New South Wales (NSW), Australia, and started plantation projects for CO_2 sequestration in NSW. TEPCO is now planning to carry out plantation of about 3,000 hectares by September 2002, and expand its plantation area to 10,000-40,000 hectares by 2010. Plantation of 10,000 hectares, for example, can absorb about 100,000 tons of CO_2 a year over a 30-year period.

TEPCO has also invested and participated in a plantation project that has been implemented in Tasmania, Australia, since 1996 and has carried out plantation of about 9,000 hectares

■ **Thermal Efficiency of Thermal Power Generation (Higher Heating Value), and Transmission and Distribution Loss Rate**

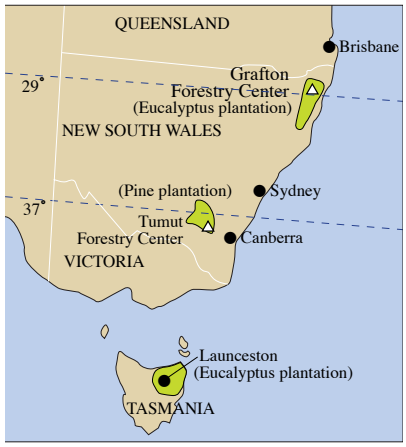


Lower heating values (LHV) standards in parentheses

■ **Introduction of Advanced Combined Cycle Power Generation**

Power station	Output capacity	Type	Thermal efficiency (Note)	Launching
Units 7 and 8 of the Yokohama Thermal Power Station	2.8GW	1,300℃ class	49.0% (54.2)	FY1996 - 1997
Units 1 and 2 of the Chiba Thermal Power Station	2.88GW	1,300℃ class	49.0% (54.2)	FY1998 - 2000
Unit 1 of the Shinagawa Thermal Power Station	1.14GW	1,300℃ class	50.0% (55.3)	FY2001 - 2003
Unit 3 of the Futtsu Thermal Power Station	1.52GW	1,300℃ class	50.0% (55.3)	FY2001 - 2005
Unit 4 of the Futtsu Thermal Power Station	1.52GW	1,450℃ class	52.8% (58.4)	FY2008 - 2010
Units 1 and 2 of the Kawasaki Thermal Power Station	3.0GW	1,450℃ class	52.8% (58.4)	FY2007 - 2009 FY2011 and after

Note: Higher heating values (HHV) standards, and lower heating values (LHV) standards in parentheses.



Location of Plantations

TEPCO's plantation in NSW, Australia

under this project. As a target, the project aims at plantation of a total of 25,500 hectares (or about 1,700 hectares a year on average).

World Bank's Prototype Carbon Fund (PCF)

The World Bank has started the "Prototype Carbon Fund" (PCF), which is aimed at investments in projects to reduce greenhouse gases through the application of the Kyoto Mechanisms. TEPCO also participates in PCF as an investor.

The PCF is making preparations to carry out approximately 20 qualified projects, including those for promoting the use of renewable energy sources, enhancing the energy utilization efficiency, fuel switching, and absorption and sequestration of CO_2 by plantation. The fund intends to invest in a total of 30 projects, including those under contemplation.

At present, the negotiations with host countries for purchases of carbon credits have been completed in respect of the projects such as: power generation for recovered methane from waste landfill disposal sites in Latvia; construction of small hydroelectric power plants in Chile and Uganda; and replacement of coke with biomass (charcoal).

Moreover, the Prototype Carbon Fund is promoting other projects with consideration to regional distribution and technological balance; among these are a project to build large wind power generation facilities in Morocco, smaller-scale projects for energy utilization efficiency enhancement and fuel switching in the Czech Republic and Poland, and oil-well drilling gas recovery and power generation projects in the former Soviet Union.

Based on expertise gained from preparations for projects, the Fund is contributing to the clarification and simplification of procedures of the Kyoto mechanisms.

By investing and participating in the PCF, we expect we will be able to acquire carbon credits amounting to approximately one million t-CO_2 by 2012.

Activities Implemented Jointly (AIJ) by the E7

A local electrification project in Indonesia, completed in March 2001, was designed to promote sustainable electrification in unelectrified rural areas in that country through the use of renewable energy sources, such as photovoltaic power, wind power and micro hydroelectric power. In September 2001, this project contributing to greenhouse gas reductions was approved by the Japanese government as an activity implemented jointly (AIJ). We are in the process of registering the project as an AIJ with the United Nations Framework Convention on Climate Change. In order to verify the effect of sustainability, the E7 is now carrying out a program to collect data directly from the project areas, such as how power plants are operated and how people's lives have been changed as a result of electrification.

Micro hydroelectric power plants built in Indonesia have a combined generation capacity of 146 kW, supplying electricity to 585 households (as of January 2002). According to the data-collecting program, each household is consuming 6 to 12 kWh of electricity every month on average.

Local electrification project in Indonesia

Improvement of Customers' Efficient Use of Energy

We are actively pushing ahead with various measures to provide support for enhanced energy utilization efficiency and to promote the development and diffusion of high-efficiency systems and equipment contributing to CO_2 emission reductions. For further details, please see pages 71-74 "Improvement of Energy Efficiency in Society."

Development of Technology

We are engaged in the development of technologies including the integrated coal gasification combined cycle (IGCC) power generation technology that contributes to control of global warming.

Please see pages 48-50 "Development of Technology," and pages 86-87 "Current State of Research and Development (on a Continued Basis)" in Part 2. Materials and Data.

4. Measures to Reduce Greenhouse Gases Other Than CO_2

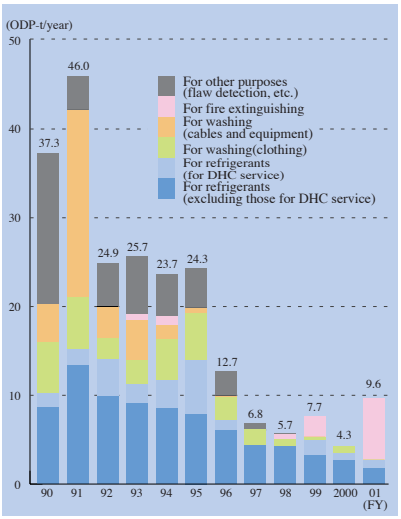
Compared with CO_2 emissions, the emissions of other greenhouse gases are very small. Nevertheless, TEPCO is also engaged in the reduction of emissions of greenhouse gases other than CO_2, as shown in the table below:

Sulfur hexafluoride (SF_6)	As an insulating medium for gas-insulated equipment, SF_6 is essential for the stable supply of electric power. As no substitute gas has been developed at present, it is necessary to continue to use SF_6 for the time being. Therefore, we have decided to adopt the "Voluntary Action Plan on Reduction of SF_6 Emissions by the Japanese Electric Power Industry" (worked out by the Federation of Electric Power Companies in April 1998) to promote the reduction of SF_6 emissions at the time of equipment inspection (of which the emission control rate is expected to be reduced to some 3% by 2005) and at the time of equipment disposition (of which the emission control rate is expected to be reduced to about 1% by 2005) through the establishment of recovery and recycling systems. SF_6 emissions in fiscal year 2001: 8.3 tons (emissions in consideration of global warming potential: 198,000 tons)
Hydrofluorocarbons (HFCs)	HFCs are used as refrigerants for air-conditioning equipment, and the regulated HFCs are expected to continue to be replaced by substitutes. TEPCO will promote the prevention of leakage of HFCs at the time of installation and repair of equipment, and in the recovery and recycling of HFCs, to reduce their emissions to as low a level as possible. HFCs emissions in fiscal year 2001: 3.8 tons (emissions in consideration of global warming potential: 5,000 tons)
Perfluorocarbons (PFC)	TEPCO used PFC in the past, but does not possess any PFC at present.
Nitrous oxide (N_2O)	The N_2O emissions from fuel combustion at the thermal power stations of the Japanese electric power industry are estimated to account for about 2% of Japan's overall N_2O emissions. TEPCO will reduce N_2O emissions to as low a level as possible through improvements in power generation efficiency.
Methane (CH_4)	The concentration of CH_4 contained in exhaust gas from thermal power stations is lower than the normal concentration in the atmosphere. Therefore, there are no substantial CH_4 emissions.

5.Measures for Protection of the Ozone Layer

TEPCO is working to reduce CFC emissions in an effort to protect the ozone layer. In fiscal year 2001, TEPCO's actual consumption of regulated CFCs decreased by 13.4 tons from fiscal year 2000 to reach 12.3 tons. But the consumption (*) of regulated CFCs in consideration of the ozone depletion potential (ODP) increased by 5.3 ODP-t to reach 9.6 ODP-t due, among others, to the consumption of halon in fire extinguishers. From now onward, we will consider carrying out measures designed to increase the quantity of CFCs recovered from machines and appliances during inspection and scrapping, and promote efforts not to use CFCs in washing clothes.

■Consumption of Regulated CFCs



Note: From this fiscal year, the figures were corrected by tracing back to the values of fiscal years 1990-1992 and 1996-1997 based on the results of review of past data.

■Measures to Reduce Consumption of Regulated CFCs

Uses	TEPCO's measures
For refrigerants	・Use CFC substitutes which do not deplete the ozone layer or to ones with a lower ODP in the construction of office buildings and district heating and cooling service facilities and in the replacement of refrigerants ・Remodeling of facilities to switch to the CFC substitutes, which do not deplete the ozone layer, or which have a lower ODP. ・Destruction of unnecessary CFCs generated during equipment inspection ・Study of technologies designed to improve the rate of recovery of CFCs from equipment during routine checkups and scrapping ・Reduction in consumption of refrigerants through the introduction of thermal storage systems
For washing (clothing)	・Washing of clothing in water
For washing (cables)	・Switch-over to non-CFC detergents
For fire control	・Introduction of new gas-using (inert gas series) fire extinguishers in new or additional facilities ・Destruction of unnecessary halon during removal of equipment
For other purposes	・Switch-over to flaw-detecting sprays with non-CFCs or CFCs with a lower ODP

(*) Consumption revised with consideration to the ozone depletion potential (ODP-t) = ODP × Actual consumption (tons)

2 Local Environment

TEPCO has been doing its utmost to protect the local environment by carrying out a variety of measures in anticipation of regulatory standards enacted by the central and local governments. Moreover, we have been making it a practice as a means of environmental preservation to survey the potential impact on the surrounding environment of projects for the construction of electric supply facilities. In order to contribute to the sustainable development of the local communities we serve, we are also devoting voluntary and active efforts to the construction of facilities matching with the surrounding environment, the accurate management of chemical substances, and nature conservation.

1. Environmental Impact Assessment

When constructing electric supply facilities, we make it a rule to conduct an environment impact assessment, which consists of surveys, predictions and assessments, to look into the possible impact of each project on the surrounding environment. The results of the assessment are made public to invite views from local citizens and are also subjected to a rigorous environmental review by the central and local governments (see page 101 "Environmental Impact Assessment System for Power Stations" in Part 2. Materials and Data.).

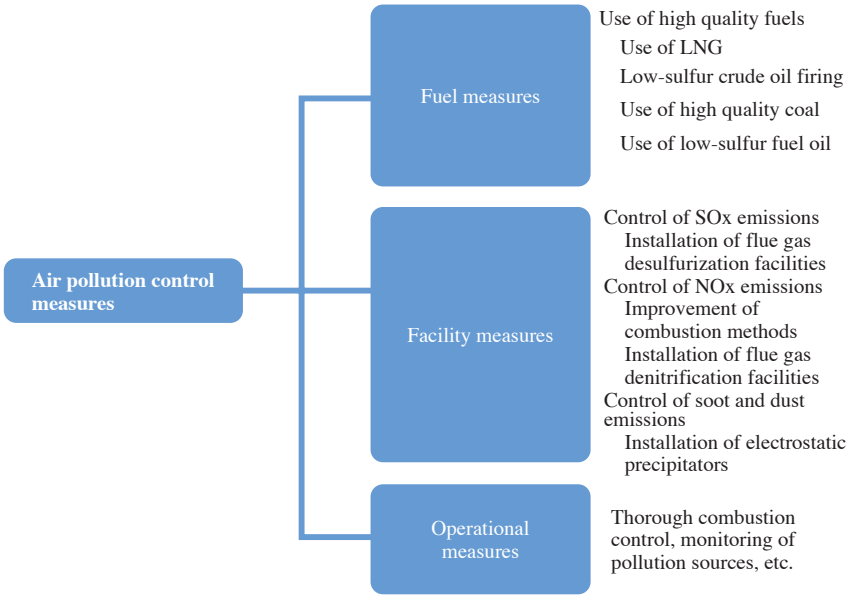
In fiscal year 2001, we carried out a Survey of the Current Environmental Status over a one year period as part of the environmental assessment procedure for a project to build the Units 1 and 2 reactors at our Higashidori Nuclear Power Station.

2. Preservation of Air Quality

Emission Reductions

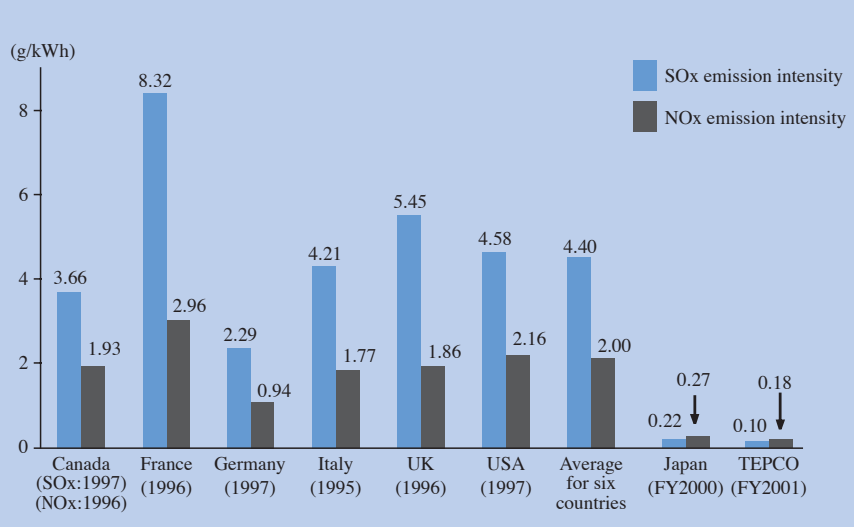
TEPCO holds down the emission of air pollutants from thermal power plants at a very low level compared to world standards through a set of thoroughgoing measures in terms of fuel, facilities and operations.

■ **Outline of Air Pollution Control Measures**



(*) For specific examples of facility measures, see page 91 "Air Pollution Control Measures" in Part 2. Materials and Data.

■ **International Comparison of SOx and NOx Emission Intensity (Average for Operational Thermal Power Plants)**



Source: Estimates are based on the OECD ENVIRONMENTAL DATA COMPENDIUM 1999, and the ENERGY BALANCES OF OECD COUNTRIES 1994-1995 and 1996-1997. Figures for Japan are based on a survey of the Federation of Electric Power Companies.

Fuel Measures

At our thermal power stations, we are using environmentally acceptable fuels, such as low-sulfur crude oil (e.g., Minas crude oil from Indonesia), fuel oil with a sulfur content of less than 0.3%, and NGL (natural gas liquid).

The average sulfur content of fuels used in fiscal year 2001 at our thermal power stations was as low as 0.03%. (This level was due in part to the effect of flue gas desulfurization facilities.)

In 1970, we introduced LNG, which does not produce sulfur oxide (SOx) or soot and dust and is effective in reducing nitrogen oxide (NOx) emissions, to fuel our Minami-Yokohama Thermal Power Station. This was the first instance in the world that LNG was brought into use as fuel for thermal power generation.

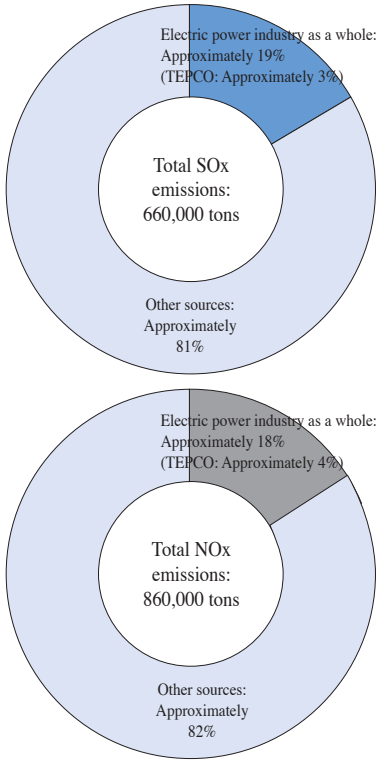
At present, LNG (including unliquefied natural gas) is in use at ten of our thermal power stations, accounting for nearly 80 percent of the fuels being burned for thermal power generation.

Facility Measures

We are also carrying out facilities measures, including installing pollutant-removing facilities such as flue gas desulfurization and denitrification facilities and electrostatic precipitators, and making improvements in combustion methods in boilers and gas turbines. (For specific examples of facilities measures, see page 91 "Air Pollution Control Measures" in Part 2. Materials and Data.)

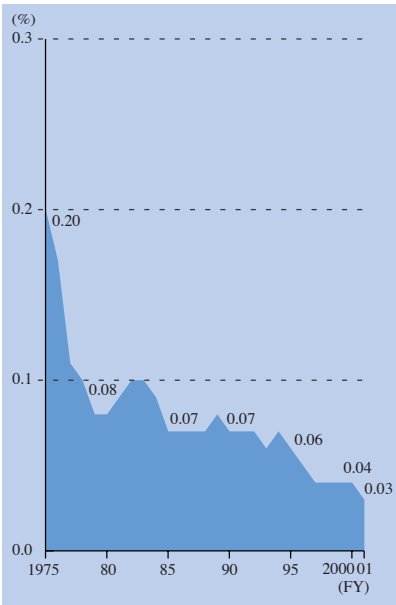
In addition to these air pollution control measures, we have been implementing a wide variety of measures, including the expanded use of non-fossil energy sources. As a result, SOx and NOx emissions produced by our thermal power stations in fiscal year 2001 were 0.05 g/kWh and 0.08 g/kWh respectively on a company-wide average. These levels are the lowest in the world. Moreover, SOx and NOx emissions produced by the Japanese electric power industry (including TEPCO) have been reduced to approximately 20% of the nation's total SOx and NOx emissions (from stationary emission sources in fiscal year 1996).

■ **Japan's SOx and NOx Emissions (FY1996; Stationary Emission Sources)**

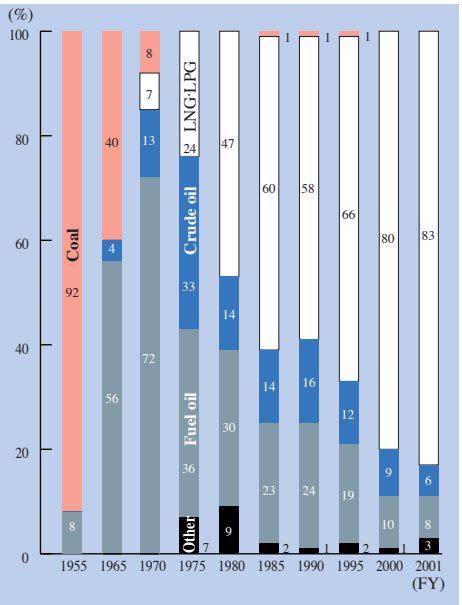


Notes: • Emissions by the electric power industry as a whole do not include those produced by non-utility power producers.
• Emissions produced by unregulated facilities are excluded.
Source: Survey of the Environment Agency (1996)

■ **The Average Sulfur Content of Thermal Power Fuels**



■ **Composition of Thermal Power Fuels (TEPCO)**



Environmental Measures for Coal-Fired Thermal Power Stations

In order to ensure energy security, we are planning to construct power plants fueled by coal, despite the fact that it is less environmentally acceptable. We also intend to make plans conducive to the creation of a resource-recycling society by adopting high-efficiency power generation technologies (with a design thermal efficiency of 42.8%) to control the emission of SOx, NOx, soot and dust, other air pollutants, and CO_2 emissions, as well as by putting coal ash to good use.

Measures to Reduce Automotive Exhaust Emissions

TEPCO now holds about 8,600 vehicles (including those on lease). For this fleet of cars, we have long been carrying out measures to reduce automotive exhaust emissions.

Our fleet of cars includes about 600 low-emission vehicles designated by the Ministry of Land, Infrastructure and Transport. When replacing cars, we will introduce low-emission vehicles, except those special cars for which low-emission models are not available.

Introduction and Use of Electric Vehicles

TEPCO introduced electric vehicles for business use more than 30 years ago. We are using electric vehicles mainly to provide customer services. We carried out a survey on NOx and CO_2 emissions per distance traveled daily by electric vehicles and gasoline vehicles (light and compact cars) under various conditions. The survey found that electric vehicles are better in all respects than gasoline vehicles.

Efforts to Accomplish Vehicle Fuel Efficiency Target

In order to further reduce the environmental burden and resource consumption from the use of vehicles, we have set a company-wide target of improving vehicle fuel efficiency (fuel consumption per distance traveled) by 20% from the fiscal year 2000 level by fiscal year 2005. In an attempt to accomplish this target, we are devoting company-wide efforts to a wide range of measures concerning both vehicles and operations, including actively introducing electric and hybrid vehicles, using smaller cars, carrying out a stop idling campaign, and encouraging economic driving. In fiscal year 2001, the fuel efficiency came to 0.109 ℓ /km on the company average, representing a 3% improvement from the level registered in fiscal year 2000 (0.112 ℓ /km).

■Environmental Protection Measures for TEPCO's Company Fleet (Actual Base in FY2001)

	Number of vehicles introduced in FY2001	Total number of vehicles
Low-emission vehicles	339	569
Electric vehicles (reproduced)	16	137

■Comparison of CO_2 and NOx Emissions for Electric Vehicles and Gasoline-Powered Vehicles

		Energy efficiency (km/kWh)	Fuel economy (km/ℓ)	Emission intensity	CO_2 emissions (kg-CO_2/km)	NOx emission (g/km)
Electric vehicle	Compact car (RAV4 and R'nessa)	3.02	27.3	0.317 (kg-CO_2/kWh)	0.109	0.0331
	Light car (Hypermini)	3.55	32.0		0.092	0.0282
Gasoline-powered vehicle	Compact car (Libero, Corolla, etc.)	—	7.1	2.80 (kg-CO_2/ℓ)	0.325	0.08
	Light car (Minica and Mira)	—	9.7		0.238	0.08

Notes: The emission intensity used here represents those released by the Ministry of the Environment in July1999.
The NOx emissions of gasoline vehicles represent Japan's auto-emission standards in fiscal year 2000.

3. Preservation of Water Quality

Waste Water Treatment

TEPCO has effluent treatment facilities installed all of its thermal power stations. Waste waster from equipment cleaning and cooling, and sewage resulting from employees' daily activities, are properly treated. During fiscal year 2001, the effluent discharge from all of our thermal power stations was again kept well below the regulatory standards set in the Water Pollution Control Law and those specified in the applicable ordinances of local public bodies.

Liquid waste collected in treatment facilities is treated through pollutant removal, filtration and neutralization processes by the coagulating sedimentation method.

Pollutants removed from liquid waste are disposed of as sludge, which is dehydrated, intermediately treated, and recycled as materials for cement, iron and steel. (See pages 43-44 "Resource Recycling.")

Radioactive liquid waste produced by our nuclear power stations is properly treated and the concentration of water contaminants contained in this waste is reduced to a sufficiently low level. Therefore, our nuclear power stations do not discharge any contaminant affecting the quality of water.

Thermal Effluent

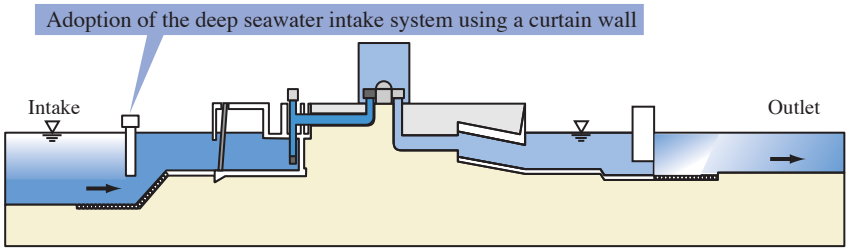
Our thermal and nuclear power stations use seawater as cooling water. This cooling water is warmer when it is discharged than when it was taken in, and it is released into the sea as thermal effluent.

Marine life around our power stations has been monitored over a long period of time to investigate the possible impact of this thermal effluent on the marine environment. So far, however, no particularly significant environmental impact has been observed. Nevertheless, we are carrying out measures to prevent any impact of thermal effluent on the marine environment. One such measure is the deep seawater intake system (see the next page). The temperature difference between seawater taken in and seawater discharged is held down to below 7℃ in our thermal and nuclear power stations which came on line in the 1980s and after.

Improving the thermal efficiency of power generation is also effective in reducing the amount of waste heat from thermal effluent. (For instance, advanced combined cycle power generation technology is decreasing the quantity of thermal effluent to almost 60% of the level recorded at steam power plants with the same capacity.)

■Mechanism of the Deep Seawater Intake System

The deep seawater intake system takes cold seawater from the lower layer and thereby lessens the difference in temperature between seawater taken in and seawater discharged as thermal effluent.



Production of Fish and Shellfish Seeds Using Thermal Effluent

Meanwhile, our efforts to find ways of using thermal effluent for useful purposes are already producing appreciable results. Fish and shellfish seeds are produced in a seed nursery established by Fukushima Prefecture nearby our Fukushima Daiichi Nuclear Power Station. In the local town of Ohkumamachi, the Fisheries Promotion Corporation of Ohkumamachi is marketing young flatfish raised in thermal effluent.

Moreover, the prawn nursery and production facilities, constructed by Chiba Prefecture in Futtsu City have been using thermal effluent from our Futtsu Thermal Power Station since 1996.

Flatfish raised in thermal effluent from the Fukushima Daiichi Nuclear Power Station

A seed nursery in Ohkumamachi, Fukushima Prefecture

4. Noise, Vibration and Offensive Odor Control

Noise and Vibration Control

At TEPCO, we are employing various technical measures to holding down noise and vibration levels at our power stations and substations below the regulatory standards prescribed by laws and ordinances. Also, we are taking steps to meet voluntary standards agreed upon between our thermal power stations and other facilities and local governments.

We are striving to lower the levels of noise and vibration from our thermal power stations and control their adverse effects on the surroundings through the application of technological innovations. These include silencers attached to the air nozzles of safety valves, sound-arresting walls, and low-noise equipment which are fixed to transformers, fans and pumps.

We are working to minimize the environmental impact of the construction of underground transmission lines in urban areas by using advanced construction machines that produce less noise and vibration and by erecting sound-arresting walls around construction bases for shield tunneling.

Offensive Odor Control

At some of our thermal power stations, flue gas denitrification facilities have been installed to remove NOx and ammonia, one of the offensive odor substances specified by government ordinances. At these thermal power stations, we are taking appropriate measures to prevent ammonia from leaking out and exerting adverse effects on the surrounding environment. Measures include periodical inspections, performance tests, and a daily patrol and inspection of facilities that use ammonia.

Measuring noise from the thermal power station

5. Prevention of Soil Contamination and Land Subsidence

Prevention of Soil Contamination

In carrying out our business operations, we seldom handle any of the heavy metals or organic chlorines specified in the environmental standards for soil contamination under the Basic Environment Law. Whenever we have to handle any of these substances, we keep them under strict management so that they will not leak out into the surrounding environment.

Moreover, when agricultural chemicals are needed for the maintenance of greenery on the premises of our facilities, we use them properly in accordance with the Afforestation Management Manual that calls for choosing safe chemicals and minimizing their use, based on the environmental standards noted above and the water pollution control guidelines (set by the Ministry of the Environment).

Prevention of Land Subsidence

Although groundwater is used as emergency feedwater at some of our establishments, we properly control the pumping rate of groundwater according to the applicable regulations set by the local governments.

6. Radioactive Waste Management

Gaseous, liquid and solid low-level radioactive wastes, which are produced from operations of nuclear power stations, are managed and treated with due attention attached to their respective properties.

Emission Control of Radioactive Waste

At our nuclear power stations, some of the gaseous and liquid waste is released into the environment after proper treatment. Nonetheless, the radioactivity of this waste is, for the most part, lower than the threshold levels of detection, falling far below the emission control target value(*).

(*) The emission control target value established for each of our nuclear power stations is the yearly amount released at which the target dose level for residents living around a nuclear power station, which is 0.05 milli-sieverts per year, can be attained. This value was established by the Nuclear Safety Commission.

At our nuclear power stations, solid radioactive waste is condensed by incineration and compression, packed in drums, and stored safely in solid waste depositories. At each one of our nuclear power stations, we are working to curb the output of solid waste newly arising from the operation of plants, while reducing the volume of waste stored in the depositories by incineration and compression. As a result, the cumulative amount of solid waste is decreasing at a steady pace.

Solid waste stored in the depositories is transported in sequence to the Low-Level Radioactive Waste Underground Disposal Center, operated by Japan Nuclear Fuel, Ltd., in the Rokkasho-mura village, Aomori Prefecture as a project to dispose of solid waste safely and efficiently in landfills. (For methods of treating radioactive waste at our nuclear power stations and disposal of radioactive waste in landfills, see page 92 "Treatment of Radioactive Waste" and pages 103- 104 "Disposal of Radioactive Waste" in Part 2. Materials and Data.)

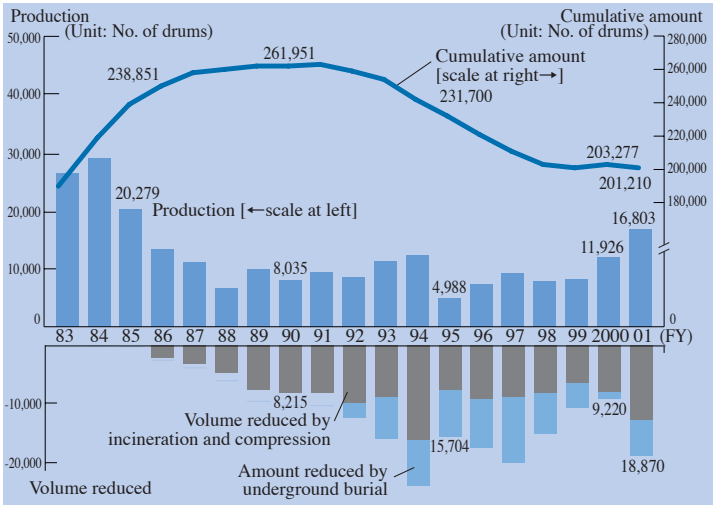
■Emissions of Gaseous and Liquid Radioactive Waste

(Unit: becquerel)

		Nuclear power station	Emission control target value	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001(FY)
Gaseous waste	Noble gas	Fukushima Daiichi	8.8×10^{15}	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	1.0×10^{9}
		Fukushima Daini	5.5×10^{15}	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
		Kashiwazaki-Kariwa	6.7×10^{15}	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
	Radioactive iodine	Fukushima Daiichi	4.8×10^{11}	9.1×10^{6}	7.2×10^{6}	6.7×10^{6}	2.8×10^{6}	3.7×10^{6}	3.2×10^{6}	N.D.	2.2×10^{6}	3.1×10^{6}	9.7×10^{6}	N.D.
		Fukushima Daini	2.3×10^{11}	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	2.1×10^{4}	N.D.	N.D.	N.D.	N.D.
		Kashiwazaki-Kariwa	2.3×10^{11}	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Liquid waste (excluding tritium)		Fukushima Daiichi	2.2×10^{11}	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
		Fukushima Daini	1.4×10^{11}	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
		Kashiwazaki-Kariwa	2.5×10^{11}	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

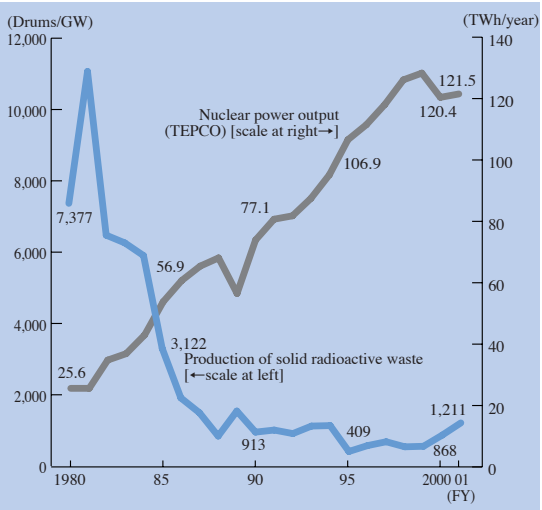
* Becquerel is a unit of the intensity of radioactivity. Sievert is a unit of the effect of radioactivity on the human body.
** N.D. is short for not detectable, indicating that the concentration of radioactive material is lower than the threshold level of detection.

■The Annual Production and the Cumulative Amount of Solid Radioactive Waste



Annual production: In addition to the amount of solid waste newly arising from the operation of power plants, annual production includes stored waste packages, the restored by-product of the waste packages, and the ash through incineration of stored waste.
Volume reduced by incineration and compression: Number of drums carried out of a depository and treated
Amount reduced by underground burial: Number of stored drums carried to the Low-Level Radioactive Waste Underground Disposal Center in the Rokkasho-mura village

■Production of Solid Radioactive Waste per Million kW (No. of 200-liter Drums)



Evaluated Value of Radiation Exposure Doses for People Living near Nuclear Power Stations

The radiation exposure dose (effective dose) for people living around a nuclear power station is evaluated based on the quantities of gaseous and liquid radioactive waste released from that power station. Most radioactive waste released from our nuclear power stations has levels of radioactivity which are lower than the threshold levels of detection, and the resultant evaluated value of radiation exposure doses for people living around these nuclear power stations is below 0.001 milli-sieverts a year.

This value is not only much lower than the regulatory value of 1 milli-sievert per year public radiation exposure dose as specified in laws and ordinances, but also well below the target dose level, which is 0.05 milli-sieverts per year, established by the Nuclear Safety Commission. Furthermore, it is significantly lower than Japanese people's yearly background radiation dose of about 2.4 milli-sieverts.

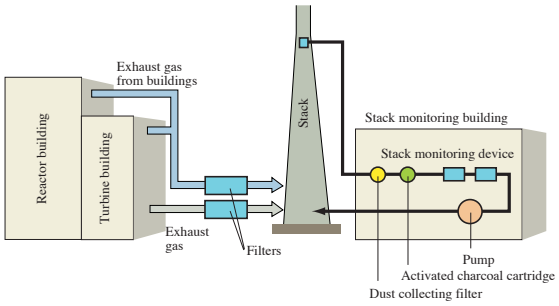
Environmental Monitoring

We make certain that there is no impact on the environment from radioactive substances by continuously measuring and monitoring radiation levels at the monitoring posts set up near the boundary of our nuclear power stations. We are also sampling seawater, agricultural and livestock products, and marine life, and are checking radioactivity levels at regular intervals.

Local (prefectural) governments also measure and monitor radiation and radioactivity around our nuclear power stations. The results are periodically published along with measurements by our nuclear power stations. These levels, which are measured continuously around our nuclear power stations, are displayed in public on a real-time basis, not only at our Public Relations Hall, but also at prefectural governments, municipal town halls and village offices around the stations. Since April 1999, we have been making public data obtained by stack radiation monitors. In April 2001, we began disclosing radiation level data on the Internet.

■Monitoring Posts

■Composition of the Stack Monitoring System



■Evaluated Value of Radiation Exposure Doses for People Living Near a Nuclear Power Station

(Unit: milli-sieverts per year)

	Nuclear power station \ Fiscal year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Effective dose	Fukushima Daiichi	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001
	Fukushima Daini	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001
	Kashiwazaki-Kariwa	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001

■Information Disclosure at the Power Station Internet Web Sites

Fukushima Daiichi Nuclear Power Station:
www.tepco.co.jp/fukushima1-np/

Fukushima Daini Nuclear Power Station:
www.tepco.co.jp/fukushima2-np/

Kashiwazaki-Kariwa Nuclear Power Station:
www.tepco.co.jp/kk-np/

The web sites of Kashiwazaki-Kariwa Nuclear Power Station. →

7. Management of Chemical Substances

Chemical Substance Handling Manual

We are properly using, recording and managing the purchase, consumption and inventory of chemicals used in chemical analyses and water treatment in accordance with the chemical substance handling manual.

PRTR Guidelines (*)

On April 1, 2001, Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management (generally known as the PRTR law) came into force. Under the law, industries which handle chemical substances specified in the law are required to keep a record of these substances and notify the regulatory authorities of them.

We have prepared guidelines to properly comply with the PRTR law and, in accordance with the guidelines, we maintain a record of chemical substances handled and notify the authorities of them. We are working to decrease the consumption of regulated chemical substances by properly handling them and using them in a reasonable manner.

The table at right shows data on the emission of chemical substances regulated by the PRTR law for which more than one ton was handled (more than 0.5 ton in the case of benzene) during fiscal year 2001. (The law requires business operators who have handled more than 5 tons of regulated chemicals annually to give notification to the regulatory authorities.)

(*) While the chemical substance handling manual deals with chemical substances used at our power stations, the PRTR guidelines provide guidance regarding how to record and provide notice of Type 1 designated chemical substances specified in the law.

■TEPCO's Chemical Substance Emissions (FY2001)

Substance	Uses	Amount discharged	Amount transferred (Note)
Hydrazine	Treatment of feedwater	0.1kg/year	0.0kg/year
Boron	Cooling water treatment	51kg/year	0.0kg/year
Tris phosphate	Turbine control oil	0.0kg/year	1,400kg/year
Benzene	Fuel (contained in crude oil)	0.0kg/year	0.0kg/year
Xylenes	Paint, fuel	52,000kg/year	0.0kg/year
Toluene	Paint	8,100kg/year	0.0kg/year
Bisphenol A epoxy resin	Paint	0.0kg/year	0.0kg/year
Ethylbenzene	Paint	6,000kg/year	0.0kg/year
Styrene	Paint	3,300kg/year	0.0kg/year
CFC-11	Air conditioner refrigerant	260kg/year	0.0kg/year
CFC-12	Air conditioner refrigerant	200kg/year	0.0kg/year
HCFC-123	Air conditioner refrigerant	0.0kg/year	0.0kg/year
HCFC-225	Cleaning of clothes	6,400kg/year	0.0kg/year
Dioxins	Incinerators	240mg-TEQ/year	0.17mg-TEQ/year

Note: The amount transferred refers to the amount of Type 1 designated chemical substances transferred to the outside of a business establishment when a business operator disposes of waste produced from its business activities outside of that business establishment.
Of those chemical substances indicated above, tris phosphate and dioxins are included in Type 1 designated chemical substances, and they were treated as waste.

Control of Emissions of Dioxin

Large waste incinerators with a hearth area of over 0.5 m^2 or a throughput of 50 kg/h or more are regulated by the Law Concerning Special Measures against Dioxins. We are operating 11 such large waste incinerators and observing the regulatory standards at all of these facilities.

We have discontinued using smaller waste incinerators that are not regulated by the law by transferring the disposal of waste to facilities operated by local public bodies.

In order to further cut back dioxin emissions from our facilities, we will work to reduce the production of waste, retire some of the existing waste incinerators through promotion of recycling, and properly control combustion in all incinerators in service.

Management of PCB-Containing Electrical Appliances

Since 1972, when a prohibition was placed on the production and additional use of polychlorinated biphenyl (PCB), a substance used as insulating oil in some electrical appliances such as high-voltage transformers and capacitors, and since 1989, when a very small amount of PCB was detected in recycled insulating oil used in pole-mounted transformers, we have been managing these PCB-containing electrical appliances by checking them one by one with the register, and inspecting PCB-containing electrical appliances in service at regular intervals.

We are properly maintaining and controlling PCB-containing electrical appliances in accordance with the Waste Disposal and Public Cleansing Law. We report our inventory of PCB-containing electrical appliances to local public bodies. Appointed controllers are taking care of PCB-containing electrical appliances at special storage facilities. These storage facilities are enclosed with a fence, and a door lock mechanism has been installed to prevent unauthorized persons from entering. In addition, to make provisions against leakage, the storage facility is concrete-paved to prevent PCB from permeating underground or leaking out.

8. Afforestation, Nature Conservation, and Harmony with the Environment

Afforestation of Facilities

In building electrical facilities, we are making every possible effort to preserve the existing green tracts of land and create a natural environment by planting trees in and around these facilities. Moreover, we are working to make environmental improvements that contribute to the preservation of biodiversity with careful consideration to the habitats of birds and insects, including waterfronts, grassland, and miscellaneous small trees, while fully taking into account the characteristics of each electrical facility location.

As of the end of fiscal year 2001, the total area of green tracts (excluding headwaters protection forests) came to around 21 km^2 and the greenery rate stood at 31%. The amount of CO_2 sequestered by approximately 250 km^2 of green tracts, including headwaters protection forests in Oze, an afforested area in Australia, and some other regions, is estimated at somewhere around 100,000 t-CO_2 per year (estimated on the basis of the IPCC guidelines, etc.).

In the green tracts of our power stations, we plant and grow nursery trees of local species in the area, such as Catanopsis cuspidata and Machilus thumbergii.

Bare land usually grows from grassland to shrubbery to a forest of intolerant trees such as pine tree and further to a forest of tolerant trees such as Machilus thumbergii in 300 to 600 years. (This process is referred to as "succession".) In the environmental protection forests near our power stations, where young trees were densely planted in conditioned soil to allow them to form a forest while helping each other, we have confirmed that planted nursery trees grow to form a forest ten to twenty years later. (See page 93 "Environmental Protection Forest Growing and Follow-up Surveys".)

■ **Progress of Afforestation (FY2001)**

Classification	Facilities					
	Hydro-electric	Thermal	Nuclear	Transmission and substation	Offices	Total
Area of TEPCO's total properties (a) (km^2)	36.3	9.6	9.3	11.8	2.0	69.0
Area of green tracts (b) (km^2)	8.9	2.7	6.1	3.3	0.4	21.4
Greenery rate (b/a) (%)	25	28	66	28	19	31

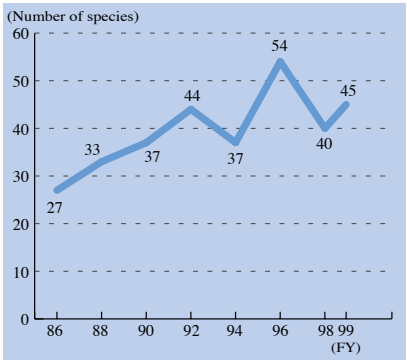
Afforestation of the Sodegaura Thermal Power Station in 1984 (when trees were planted)

1999 (15 years after trees were planted)

In the environmental protection forests, as trees have grown, species of soil animals such as Cryptostigmata(*), an indicator creature of natural prodigality, have increased in number. In the green tracts of our power stations, we have also confirmed that the species and population of wild birds have increased as trees have grown. (See page 93"③ Soil Fauna Survey" and "④ Bird Monitoring" in Part 2 Materials and Data.)

(*) A generic term for acari living in soil. Cryptostigmata are about 0.5 mm long. Living on fallen leaves, they contribute greatly to the decomposition of plants and hence to material recycling in an ecosystem.

■ **Species of Wild Birds Observed at the Futtsu Thermal Power Station (Annual Number of Species)**



Nature Conservation Activities in the Oze Marshland

TEPCO owns land that occupies about 70% of the entire Oze area, which is designated as a special reserved district and a special natural monument in Nikko National Park. We have been promoting positive measures for the protection of precious nature in the marshland for more than 40 years.

Oze Marshland

Maintenance and Management of Wooden Walkways and Facilities

We are maintaining and managing about 20 km of wooden walkways we constructed in the Oze marshland. These wooden walkways cover approximately one third of the marshland.

The wooden walkways are maintained according to a plan, as they must be replaced in about ten years' time. In fiscal year 2001, we replaced nearly 1.6 km of the wooden walkways.

In the Ohshimizu marsh at the entrance of Oze, we have constructed a wide wooden walkway to help hikers on wheelchairs pass through, public lavatories, and a car park.

Replacement of wooden walkways

A brand iron shows that this wooden walkway was renewed in 1996 (Heisei 8 in Japanese calendar).

Regeneration of the Ayame Daira Marshland

In the 1960s, some 10,000 m^2 of the Ayame Daira Marshland were stripped of vegetation due to a drastic increase in the number of hikers. Since 1969, TEPCO has made energetic efforts to restore the marshland. As a result, a considerable portion of the marshland is now covered with greenery once again. In fiscal year 2001, we planted the seeds of michaux's sedges, a plant native to the Oze marshland and resistant to dryness, in areas where greenery is still insufficient (see page 94 "History of Nature Conservation in the Oze Marshland" in Part 2. Materials and Data).

Education for Nature Conservation

Starting in fiscal year 1999, we have assigned environmental protection staff who educate hikers about the nature of Oze and nature observation etiquette as part of our effort to support camp schools' operation and nature experiences. Since fiscal year 2000, we have carried out similar educational activities in five cottages operated by Oze Ringyo Co., Ltd., one of TEPCO's affiliated companies.

In addition, we have started a Green Volunteer Program under which volunteers are requested to collect trash in the Oze area as an easy method for nature preservation.

Participation in the Oze Preservation Foundation

As a landowner, TEPCO has participated in the Oze Preservation Foundation (established in 1995) from the beginning. We have been carrying out effective nature conservation activities in cooperation with the central and local governments.

Forest Conservation

Afforestation in the Tokura Mountain Forest

Starting in fiscal year 1997, we have been planting Japanese beech trees under a plan aimed at improving the headwater protection of the Tokura mountain forest (which is located in Katashina Village, Gunma Prefecture) adjacent to the Oze area.

During fiscal year 2001, 279 volunteers participated and we planted about 2,500 Japanese beech trees in an area of about 5,000 m^2. In addition, 52 volunteers took part in the undergrowth mowing essential to the growth of seedlings.

Moreover, in fiscal year 2001, we mowed the undergrowth in order to enhance forest functions in approximately 58,000 m^2 of natural beech tree forests and beech tree planted areas. We also thinned out about 200,000 m^2 of a Japanese larch tree forest in order to help trees of different species mix together.

Participation in Middle-Term Profit-Sharing Silviculture Program

Since fiscal year 1988, we have participated in a middle-term profit-sharing silviculture program (green owner program) to plant trees in a national forest. Under this silviculture program, TEPCO has planted nearly 270,000 trees, including Japanese cedar trees and Japanese cypress trees, in an area of 1.77 km^2. This forest is sequestering approximately 2,000 t-CO_2 annually.

River Improvements

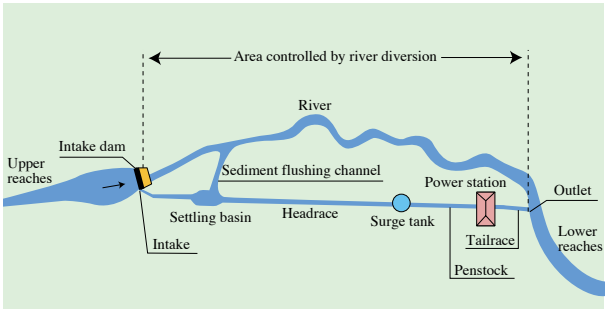
Because hydroelectric power stations use a portion of river water to produce electricity, the flow in the section of the river between the inlet dam and the outlet (called the area controlled by river diversion) is reduced from the level of original river flow. In order to prevent fish and any other aquatic life or the river landscape from being affected by the change in river water flow, we have made arrangements to let water discharge from dams at a rate necessary to maintain the flow of river.

From fiscal year 1987 to fiscal year 2001, these water discharge arrangements were applied to 32 hydroelectric power stations, covering a combined total of approximately 295 km of area controlled by river diversion.

At three of these hydroelectric power stations, we constructed small generation facilities just below the inlet dam in an effort to effectively utilize available water resources for power generation, and consequently this effort contributes to the reduction of CO_2 emissions.

In the middle reaches of the Shinano River, we have undertaken an effort to improve the river environment and make our hydroelectric power station in harmony with the environment. This effort involves increasing the water discharge from the dam in summer when the temperature of the river rises and in autumn when salmon go up the river to lay eggs, while ensuring the flow necessary for the river and increasing water intake into the power station when the river flows affluently due to thawing, in the rainy season, or in the typhoon season. The effort has brought good results, such as an increase in the number of salmon ascending the stream to lay eggs.

■ **Outline of a Hydroelectric Power Station**



Promotion of Measures for Creating Facilities Harmonious with the Landscape

We are building electrical facilities that blend in with the landscape in the surrounding area by adopting ingenious layouts, configurations and color schemes, as well as by taking the landscaping measures described below.

①Landscaping Measures at Thermal Power Stations

At our Hitachinaka Thermal Power Station, which is now being constructed to go into commercial operation in 2003, we have carried out a package of landscaping measures, including using a color scheme to decrease the massive feel of the turbine and other buildings, and adopting an octagonal cross spiral design (a double spiral design) in a steel tower supporting a 230-meter smokestack.

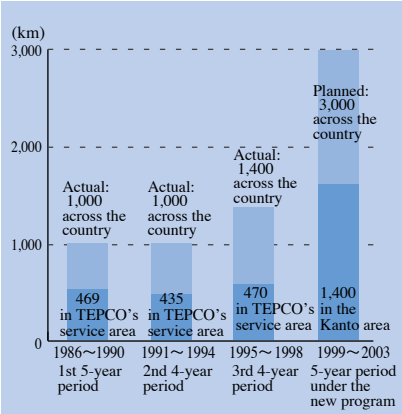
The Hitachinaka Thermal Power Station with an Octagonal Cross Spiral Smokestack

②Progress in the Construction of Underground Distribution Lines

Projects to construct underground distribution lines have been carried out under national underground line construction programs, formulated by the Council for Promotion of the Construction of Underground Lines (*1) with the aim of securing a safe and comfortable traffic space, improving cityscapes, preventing urban disasters, and revitalizing local communities.

During the 13-year period from fiscal year 1986 to fiscal year 1998, 3,400 km of underground lines were constructed throughout the country under the first to third underground line installation programs. The New Program for Underground Line Installation, which started in fiscal year 1999, is aimed at constructing 3,000 km of underground lines throughout the country over a five-year period until fiscal year 2003.

■Implementation of Underground Installation of Distribution Line



Features of the New Program for Underground Line Installation

[Expansion of the Scope of Underground Line Installation Areas]

In addition to the third program which covered relatively large commercial districts, business districts, and areas around railroad stations, the New Program for Underground Line Installation has expanded the scope of underground line installation areas to include medium-size shopping districts and trunk roads in residential districts.

[Trilateral Promotion System]

While underground distribution lines have hitherto been constructed by the road and electric wire administrators, the new program calls for the promotion of underground lines on a trilateral system under which local interested parties (i.e., local public entities and local customers), road administrators and electric wire administrators cooperate closely.

[Adoption of a Soft Underground Installation Method]

When the scope of underground line installation areas is expanded, roads must be wide enough to allow transformers and other appliances to be installed above the ground when distribution lines are constructed underground. Therefore, we have adopted a soft underground installation method(*2) to ensure that underground distribution lines can be constructed above narrow roads or roads without sidewalks.

We plan to complete the necessary arrangements by the end of fiscal year 2001 and start in fiscal year 2002 to apply this method in the construction of underground distribution lines in front of Hirai Station in Edogawa Ward, Tokyo and along National Highway Route 17 in Toda City, Saitama Prefecture.

An example of underground distribution lines installed to beautify a cityscape

TEPCO's Construction of Underground Distribution Lines

As of the end of fiscal year 2001, the underground installation rate of distribution lines in our utility power grid reached 8.9%, with a combined line length of 31,094 km. This is equivalent to approximately 2.6 times the earth's diameter. The underground installation rate of distribution lines in the 23 wards of Tokyo was 43.4%, with a combined line length of 14,704 km, about 1.2 times the earth's diameter.

On the other hand, the unit construction cost and running cost of underground distribution lines are about 10 times and 7 times higher than those of overhead lines. However, TEPCO will continue to steadily promote the installation of underground lines to improve the urban environment through the construction of social infrastructure by reducing their costs and by constructing these lines together with road construction projects, such as the widening of roads and improvements of sidewalks, land readjustment, and the renovation of shopping streets.

(*1) It is composed of government agencies, such as the Ministry of Land, Infrastructure and Transport, the Ministry of Economy, Trade and Industry, and the Ministry of Public Management, Home Affairs, Posts and Telecommunications, power companies and common carriers as electric wire administrators.

(*2) The underground line installation method allows constructing underground distribution lines in a flexible manner to meet conditions of roads and buildings along roads. For example, on narrow sidewalk without space for on-road equipment, transformers can be installed on illumination poles (street lamps).

3 Resource Recycling

In order to contribute to the establishment of a new system, in other words, a resource-recycling society, TEPCO is pushing ahead with its program for the effective use of reclaimed resources, including the recycling of waste and nuclear fuel, while promoting the development of recycling technologies.

Waste Recycling

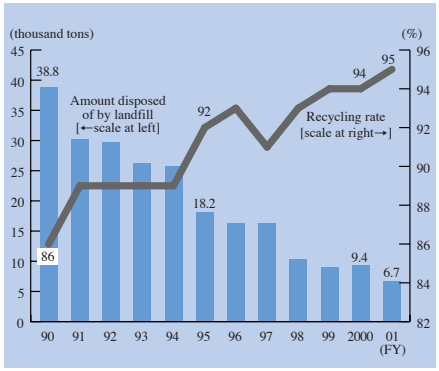
We have set a challenging target to achieve a 100% recycling rate of industrial waste by fiscal year 2005. Our rate of recycling of industrial waste in fiscal year 2001 was 95%, up 1% from the previous fiscal year. The volume of waste disposed of by landfill also decreased by 2,700 tons from the previous fiscal year to 6,700 tons, showing a steady decrease year by year.

In fiscal year 2000, our Hirono Thermal Power Station achieved a 100% recycling rate of industrial waste for the first time among the power stations in Japan.

■ **Breakdown of Industrial Waste Recycling Rates (FY2001)**

	Amount produced (10^3 t/yr)	Amount recycled (10^3 t/yr)	Amount disposed of by landfill (10^3 t/yr)	Recycling rate (unit: %)
Scrapped concrete utility poles	110.2	110.2	0	100
Fuel and crude oil ash	3.3	3.3	0	100
Shellfish	5.1	2.3	0.9	45
Concrete scraps	11.8	10.2	1.6	86
Insulator scraps	3.4	3.4	0	99
Sludge from treatment of effluent	4.0	4.0	0	100
Metal scraps	39.9	39.4	0.5	99
Thermal insulating material scraps	1.6	0.8	0.8	50
Other	11.9	8.0	2.8	67
Total	191.1	181.5	6.7	95

■ **Recycling Rate of Industrial Waste**



Note 1. Recycling rate (%) =

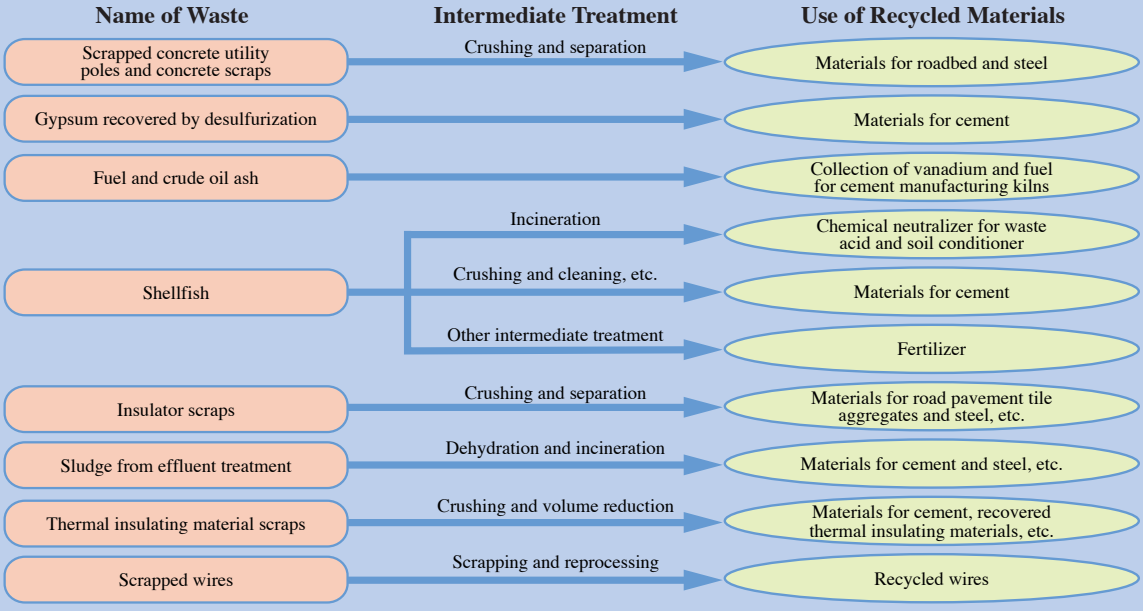
$$\frac{\text{Amount recycled (incl. the amounts of valued items and of materials internally recycled)}}{\text{Amount produced}} \times 100$$

Note 2. Amount produced = Amount of valued items + Amount of materials internally recycled + Amount of industrial waste
(As the handling of radioactive waste is provided for by the laws concerning nuclear power, such waste is not included in the amount of industrial waste produced.
As for the management, treatment and disposal of radioactive waste, see page 37 "Radioactive Waste Management," page 92 "Treatment of Radioactive Waste" and pages 103-104 "Disposal of Radioactive Waste" in Part 2. Materials and Data.)

Note 3. The amount produced minus the amount recycled is smaller than the amount disposed of because intermediate treatment (incineration and dehydration) results in a decrease in volume.

Note 4. Figures in the table do not necessarily add up to the totals because fractions have been rounded off.

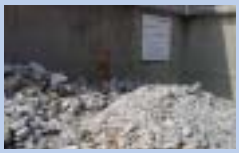
■ **Examples of Recycling**



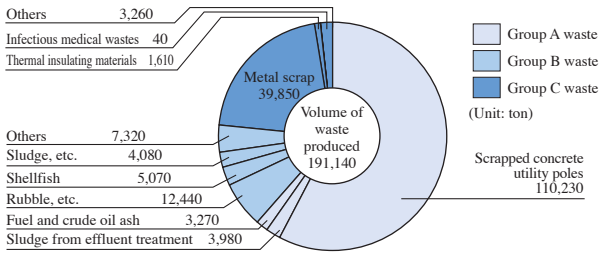
- We are also endeavoring to develop technologies for recycling coal ash that will be output in the years ahead and other waste (for further details, see pages 86-87 "Current State of Research and Development (on a Continued Basis)" in Part 2. Materials and Data).
- Examples of recycling activities are given in page 83 "Resource Recycling" in Part 2. Materials and Data.

Challenge to 100% Recycling Rate

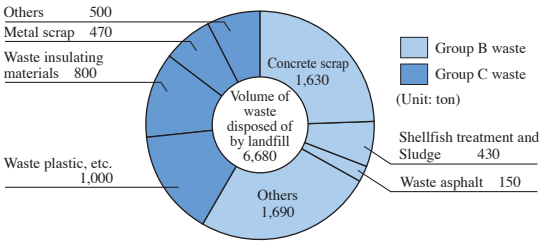
We separate our waste into three groups, i.e., A Group, B Group and C Group, review the recycling measures for each group, and promote appropriate and reasonable methods of recycling, including the cost and energy required for recycling, to achieve our target.

Group A waste	Definition	Waste that has already been 100% recycled.
	Target	To aim at using more favorable recycling method with lower environmental loads, while keeping the current levels
	Typical examples	Scrapped concrete utility poles Fuel and crude oil ash Sludge from effluent treatment
Group B waste	Definition	Waste that has not been adequately recycled.
	Target	To achieve a 100% recycling rate by fiscal year 2005, mainly through the establishment of appropriate conditions to accept recycling
	Typical examples	Sludge Shellfish  Rubble
Group C waste	Definition	Mixed waste which is difficult to separate.
	Target	To achieve a 100% recycling rate by fiscal year 2005, mainly by technology development
	Typical examples	Mixed waste of metal and plastic Thermal insulating materials Infectious medical waste

■Composition of Waste (FY2001)



■Composition of Waste to be Recycled (FY2001)



Note: Figures may not agree with the total due to rounding.

Specific Efforts to Achieve Target

In fiscal year 2001, we carried out preparatory work such as analyses of the current status of internal conditions, sampling of problems, etc.

In and after fiscal year 2002, we will reinforce our management system to promote recycling, and prepare guidelines for recycling, aiming at achieving our target.

Moreover, we will also review the measures for the recycling of waste produced at offices, and the reinforcement of recycling efforts of our TEPCO group companies.

STEP 1: Review of measures (FY2001)	◆ Designation of model offices ◆ Analyses of current status and sampling of problems ◆ Research on actual conditions of recycling
STEP 2: Preparation of conditions (FY2002)	◆ Reinforcement of management system ◆ Preparation of guidelines for recycling
STEP 3: Implementation (FY2002-2005)	◆ Company-wide activities ◆ Target management ◆ Solutions of problems involved in recycling ◆ Application of successful recycling cases to other offices
STEP 4: Establishment (FY2006 -)	◆ Continuous efforts to achieve a 100% recycling rate

New Businesses Contributing to Resource Recycling

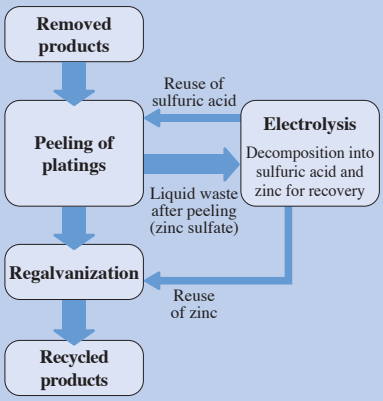
Recycling of Galvanized Iron Products

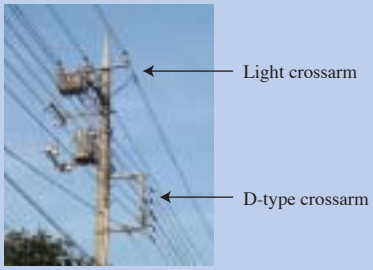
In February 2002, we established "Cycle Inc.," which recovers removed galvanized iron products, sorts out the iron products for which the steel is not damaged, peels their platings, regalvanizes them, and sells the recycled products.

Galvanized iron products are used in a variety of industries, such as electric power, telecommunications, electric railroads, construction, etc. They are removed and replaced due to damaged platings, rust and deformation, all caused by age deterioration. Of these removed iron products, however, only a small percent is recycled after visual inspection. Most of them are disposed of as general iron scrap. TEPCO also removes about 8,000 tons of galvanized iron products a year, such as the crossarms of replaced poles. About 20% of the products, i.e., those with no rust, are recycled, but the remainder is sold as iron scrap.

Cycle Co. decomposes the sulfuric acid liquid waste which is used to peel platings in the recycling process of galvanized iron products into sulfuric acid and zinc through electrolysis, and regalvanizes them for recycling. The energy consumed to peel platings on steel and decompose the liquid waste through electrolysis can be reduced to about one-tenth of the energy consumed to manufacture brand-new iron products from steel materials.

■Recycling Process





Major galvanized iron products used on a pole

Effective Use of Natural Resources

As a result of maintenance work of hydroelectric plants, substations, and transmission and distribution equipment, a large quantity of driftwood, felled trees and stones flock to dams from upstream. In April 2002, we established "Nature Craft Corporation," which effectively uses these natural resources and sells gardening materials and furniture made of them.

Before the commercialization of this idea, we operated since April 2001 a trial shop called "Nature Craft Garden" at our Energy Conservation Eco-house Mitaka housing exhibit site (Jindaiji Higasimachi in Chofu, Tokyo) in cooperation with ThanksNature Inc., a company that has ample know-how of gardening operations. As the results of test marketing at the shop were favorable, we decided to establish the new firm. The trial shop is still in operation as a branch shop of the new firm.

We plan to actively promote this business to contribute to the recycling of waste, and also to help customers realize an affluent lifestyle.

Nature Craft Garden

Furniture made of driftwood collected from dams

Recycling of Transformers and Insulating Oil Containing PCB

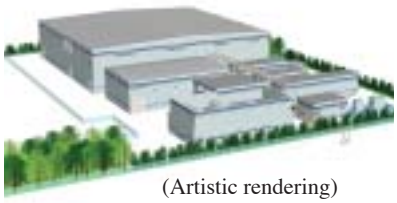
For early disposition of PCB, one of the negative legacies of the 20th century, TEPCO started to build Japan's first complete system to dispose of PCB-containing equipment in a consistent manner, and treat and recycle all of the PCB in its possession in about ten years.

We are promoting the construction and operation of recycling facilities that safely treat the insulating oil containing PCB found in some types of electric equipment with our "chemical extraction/decomposition method" and recycle the insulating oil, and recycling facilities that wash and clean containers for insulating oil containing PCB and recycle them.

Following our "TEPCO Yokohama Recycle Center" that started operation in October 2001 as Japan's first full-scale PCB disposal facility for decomposition and treatment of PCB-containing oil, our "TEPCO Chiba Recycle Center" also started operation in March 2002. The construction of our "TEPCO Kawasaki Recycle Center" started in September 2001 as a facility to wash and clean containers for PCB-containing equipment.

(Details of our efforts for PCB treatment are introduced in the "Feature Story: TEPCO Starts Japan's First Full-Scale Treatment Project Aimed at Zero PCB" on pages 77-80.)

■**Overview of PCB Treatment Facilities**



(Artistic rendering)

TEPCO Kawasaki Recycle Center
PCB container washing and cleaning facility
(located adjacent to Higashi-Ohgishima Thermal Power Station)

Acquisition of approval for construction: May 22, 2001
Now under construction
Start-up: FY2003 (planned)
Capacity: 360 containers per day (equivalent to 110,000 pole transformers a year); and 6,600 liters of insulating oil containing PCB per day.
[TEPCO is building a facility for treatment of insulating oil containing PCB in the same site as for cleaning solvents, which is scheduled to be operational in fiscal year 2002.]

TEPCO Chiba Recycle Center
PCB-containing insulating oil treatment facility
(located adjacent to Chiba Thermal Power Station)

Acquisition of approval for construction: March 30, 2001
Start-up: March 15, 2002
Capacity: 1,000 liters per day (equivalent to 6,000 pole transformers a year).
[TEPCO plans to increase the treatment capacity in or after fiscal year 2003.]

TEPCO Yokohama Recycle Center
PCB-containing insulating oil treatment facility
(located adjacent to Yokohama Thermal Power Station)

Acquisition of approval for construction: September 1, 2000
Start-up: October 16, 2001
Capacity: 1,000 liters per day (equivalent to 6,000 pole transformers a year).
[TEPCO plans to increase the treatment capacity during fiscal year 2002.]

Number of PCB-Containing Equipment in Possession
(Results of FY2001 Survey)

	In storage	In service	Total
Pole transformers (Low-level PCB)	625,000	475,000	1.1 mil.
High-voltage transformers and capacitors (High-level PCB)	3,501	178	3,679

Nuclear Fuel Recycling

Spent fuel from nuclear power generation contains as much as 97% reusable uranium and plutonium. TEPCO effectively recycles such spent nuclear fuel by reprocessing it. The series of operations involved in recycling uranium resources is called the nuclear fuel cycle.(*)

(*) A general drawing of the nuclear fuel cycle is shown on page 103 "Nuclear Fuel Cycle" in Part 2. Materials and Data.

Plan for MOX Fuel Utilization in LWRs

"MOX fuel utilization in light water reactors" refers to the use in existing nuclear power plants of mixed-oxide fuel that is prepared by mixing uranium with plutonium recovered through spent fuel reprocessing.

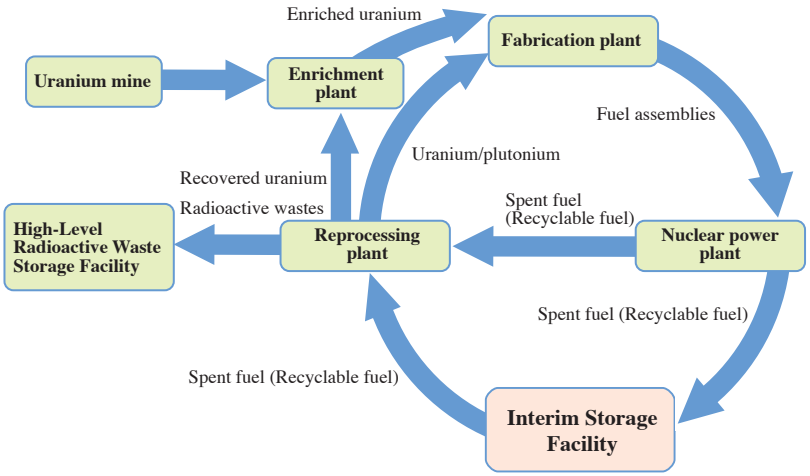
As we are intending to start MOX fuel utilization in Unit 3 of the Fukushima Daiichi Nuclear Power Station and Unit 3 of the Kashiwazaki-Kariwa Nuclear Power Station, we are making an all-out effort to win the understanding of as many people as possible, including local residents.

Interim Storage of Spent Fuel

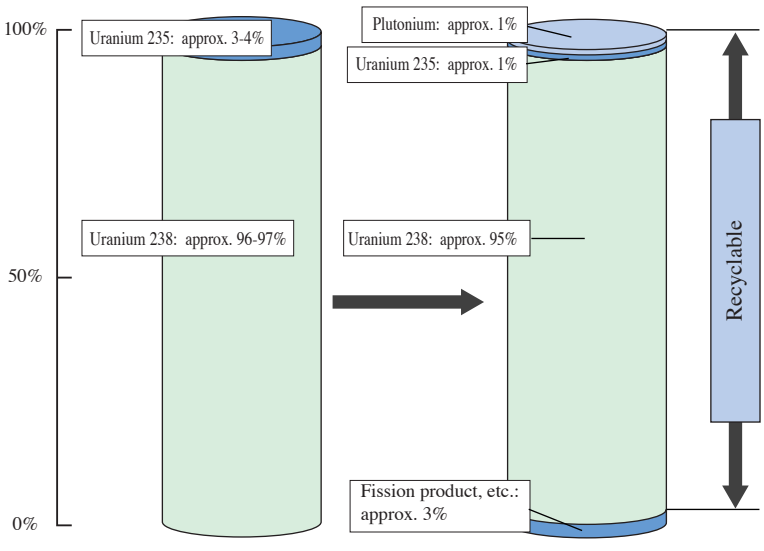
At present, spent fuel is kept in the on-site storage facilities of nuclear power stations until it is reprocessed. However, due to predictions that the output of spent fuel will exceed the scheduled rate of its delivery to reprocessing facilities, in the medium to long range, arrangements will be necessary to build interim storage facilities outside power station sites.

TEPCO is planning to build an Interim Storage Facility for storing spent fuel as a recyclable fuel resource until it is transported for reprocessing. The siting of the facility is being studied now, with a schedule to put it into commercial operation by the year 2010. At request the Mutsu municipal government (in Aomori Prefecture) in November 2000 for technical studies on siting (siting feasibility study), TEPCO opened a "Mutsu Research Office" in Mutsu in January 2001, started on-site studies in April 2001, and completed almost all studies in March 2002. The study results were reported in the form of an interim report to the Mutsu municipal government.

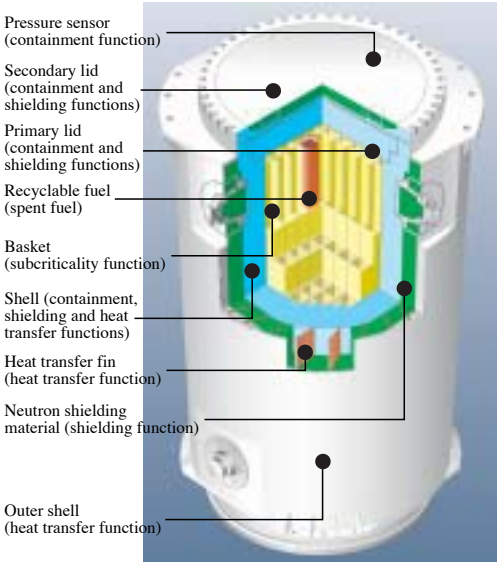
■ **Role of the Interim Storage Facility**



■ **Change in Composition of Uranium Fuel due to Power Generation**



■ **Cask for Storing Recyclable Fuel**



4 Development of Technology

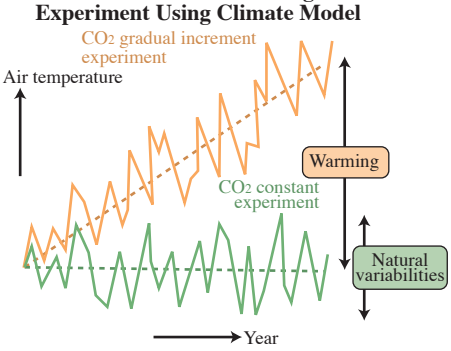
The following paragraphs summarize the development of new technologies at TEPCO, focusing on those topics of study for which desired results have been newly achieved (for continuing research topics, see pages 86-87 "Current State of Research and Development (on a Continued Basis)" in Part 2. Materials and Data).

Research on Forecast of Global Warming

In cooperation with the Meteorological Research Institute of the Meteorological Agency, TEPCO has been engaged since fiscal year 1990 in research on forecasts of global warming based on climate models and simulations in respect to the "climate forecast" that provides the basis for planning and practicing effective measures to prevent global warming. TEPCO used numerical test data gained from 12 major climate models of research institutes from around the world, and conducted inter-comparative analyses between models with attention placed on the relationship between the cyclical variabilities (natural variabilities) inherent in the climate system, and the climate changes due to an increase in greenhouse gases (warming). As a result, it was found that the natural variabilities and warming are not independent of each other, but rather, are closely correlated. With this finding, we believe it is possible to improve the accuracy of the climate-model-based forecast of "warming" by furthering research on the natural variabilities that can be verified in comparison with past observation data.

We have disclosed our findings to international academies in an open manner. As a result, part of our findings was quoted in the Third Assessment Report prepared by the Working Group I of IPCC (Intergovernmental Panel on Climate Change) in 2001.

■Forecast of Global Warming in Experiment Using Climate Model



(CO2 gradual increment experiment) - (CO2 constant experiment) = warming

Assessment of Impact of CO2 Concentration on Plant Growth

To forecast the capability of forests to absorb CO2 and agricultural production in the future, research is under way overseas to find out the impact of the increasing CO2 concentration in the atmosphere on the growth of various species of plants. However, almost no knowledge and information have been accumulated regarding representative plants of Japan. For this reason, TEPCO has assessed Japanese beech trees as a representative species of trees in its company-owned forests in Oze, and other familiar farm products and garden plants.

Assessment Methodology

We installed four plant cultivating units for which control temperatures, humidities and CO2 concentrations can be freely controlled in an artificial lighting room. We set the CO2 concentrations at 200 ppm (the concentration in the period from the glacial period to before the Industrial Revolution), 350 ppm (the present concentration), 550 ppm (the estimated concentration 35 years from now), and 750 ppm (the estimated concentration 70 years from now), respectively, and observed the growth of Japanese beech trees, potatoes, green vegetables, root vegetables, and flowers.

Impact on Seedlings of Japanese Beech Trees

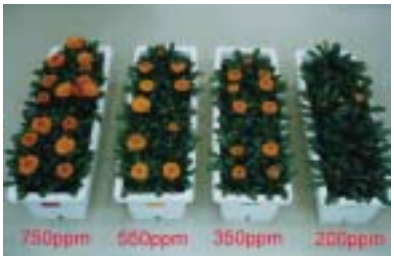
We continuously observed the growth and photosynthesis ability of beech tree seedlings in the first year after budding. We found that the growth increased in proportion to an increase in CO2 concentrations, increasing by 30-40% in the concentration estimated for 70 years from now. As this value is lower than those observed in respect to major species of trees overseas, the responsivity of the seedlings of Japanese beech trees to changes in CO2 concentrations was found to be lower. As a finding to support the increase in growth, an increase in the photosynthesis ability was also observed.

Seedlings of Japanese beech trees after three months after budding

Under conditions of high CO2 concentrations, on the other hand, it was also found that leaves take on color earlier and fall earlier, too. Thus, it was found that the increase in CO2 concentrations has an impact on the aging rate of plants.

Impact on Garden Plants (Marigolds)

The marigolds raised in the highest CO2 concentration (750 ppm) blossomed in about five weeks after seeding, but the marigolds raised in a low CO2 concentration (200 ppm) took two more weeks to blossom. The efflorescence ended earlier in high CO2 concentrations, and the increase in CO2 concentrations improved the productivity of flowers (the number of flowers). At the same time, the size of the corolla (diameter) of the marigolds raised in the highest CO2 concentration was about twice as large as that of the marigolds raised in a low CO2 concentration. Thus the increase in CO2 concentrations



Marigolds seven weeks after seeding

showed an obvious positive effect on the growth of marigolds.

As mentioned above, CO_2 concentrations affect plant growth with quantitative and qualitative changes, and also change their growth cycles. We were able to assess these changes in a quantitative manner. We plan to further consider the physiological factors behind these changes, in addition to their impact on forests and agricultural and gardening production, and consider the potential range of applications for such factors.

Absorption and Accumulation of Carbon by Forest Ecosystem in Oze

Forest ecosystems play an important role in the absorption and accumulation of carbon on terrestrial ecosystem. TEPCO has long been engaged in research to estimate the functions of forests as the site of carbon circulation, and assess quantitatively the volume of carbon absorbed and accumulated by forests at its company-owned forests in Oze.

Methodology and Subjects to be Assessed

The forests owned by TEPCO in Oze are mainly covered by the following three types of trees;

- Natural forests of Japanese beech trees
- Planted forests of Japanese larch trees, and
- Natural forests of fir trees.

We formed survey sections at sites that represent each type of forest, and assessed the volume of carbon absorbed and accumulated there. To calculate the volume of carbon absorbed by the forest ecosystems, we use two methodologies, i.e., a buildup method and a flux method, to measure the volume, and attempted to compare and verify the results of the two methodologies.

Assessment of Volume of Carbon Absorbed ①: Buildup Method

This method is designed to calculate the carbon balance in an ecosystem overall by measuring the volumes of increase (or decrease) in carbon contained in each element that constitutes a forest ecosystem, i.e., trees, lower vegetation (such as bamboo grass, etc.) and soils, and summing them up. Specifically, we started in November 1999 measuring the growth volume of trees, the volume of litter such as fallen leaves and branches, the growth volume of bamboo grass, the volume of dead bamboo grass, and CO_2 efflux on the soil.

Based on the results of measurements conducted to date, we found that the growth volumes of Japanese beech woods and Japanese fir woods are almost equal, and that of Japanese larch woods was about twice as large. This is probably because the Japanese larch trees are as young as 40 years old, as they were artificially planted, and still continue to grow in fine condition.

We summed up the measured volumes of carbon absorbed by trees, lower vegetation (such as bamboo grass, etc.) and soils, and found that the two-year averages of the annual volume of carbon absorbed by the ecosystems in these forests were 0 (inhalation and exhalation are almost equal) to about 15.0 t-CO_2/ha in CO_2 equivalent, showing that the values vary with different species of trees.

Assessment of Volume of Carbon Absorbed ②: Flux Method

This method is designed to quantify the volume of CO_2 (namely carbon) directly moved between forests and the atmosphere by measuring the volume of air moved per unit time (vertical air velocity) at points 5-10 meters above the canopy, and the changes in CO_2 concentrations due to the air movement.

In the survey section of Japanese beech woods, we started continuous observation in August 1999. To date, we have gained reasonable analysis results that show substantial CO_2 absorption by forests during the growing period of trees. The order of the annual volume of CO_2 moved between forests and the atmosphere is also the same as that of the volume calculated by the buildup method in respect to the carbon absorbed by forest ecosystems. Once each season, we also conduct similar flux measurements in the Japanese larch woods and Japanese fir woods, and are now making an analysis of the measurement results.

Tower for flux measurement

Assessment of Volume of Carbon Accumulated

We are assessing the volume of carbon accumulated by forest ecosystems by measuring the volumes of carbon accumulated respectively by trees, lower vegetation and soils, and summing them up, as is the case with the buildup methods used for the assessment of the volume of absorption.

The volume of carbon accumulated by trees together with lower vegetation was estimated to be about 400 t-CO_2/ha in the Japanese beech and the Japanese fir woods, and about 500 t-CO_2/ha in the Japanese larch woods. On the other hand, the volume of carbon accumulated by soils was estimated to be about 700 t-CO_2/ha in all types of forests, showing a much larger value than the total for trees and lower vegetation. The carbon accumulation capacity of our company-owned forests in Oze is estimated to be about 1,000 t-CO_2/ha.

Based on the measured volumes of carbon absorbed and accumulated in each survey section, we plan to assess our company-owned forests in Oze as a whole. Based on the understanding achieved through research in respect to living forests, we plan to estimate new values for the forests in Oze, such as the biodiversity of forest ecosystems and relationships with marshlands.

Development of Technology to Apply Paving Concrete Mixed with Coal Ashes

As a research program publicly solicited by the New Energy and Industrial Technology Development Organization (NEDO) and funded by the Official Development Assistance (ODA), TEPCO has developed technology to mix coal ash in paving concrete in cooperation with the Energy Research Institute of the Vietnam Electricity Authority and the Science & Technology Institute of the Vietnam Construction Ministry.

We produced paving concrete with different mixing ratios of coal ash and applied it for test purposes. We found that the quality of the concrete is highest in terms of finished quality and strength, such as slip resistance on paved surfaces, flatness, etc., when the mixing ratio of coal ash is 20%.

In Vietnam, clouds of dust raised by vehicles worsen the living environment, as many roads are not paved. Moreover, the surfaces of paved roads are damaged by floods, and traffic is interrupted, requiring a huge cost to repair them. Such unpaved roads seriously inhibit economic activities.

The introduction of this technology is expected to reduce construction costs, and promote the pavement of roads with concrete. It will also be possible to recycle the coal ash produced by Vietnam's coal-fired thermal power generation, and improve the environment surrounding power stations.

On-the-spot inspection by Vietnamese government mission including state ministers

"Electricity Museum"

As part of the memorial project of our 50th anniversary of foundation, we opened the "Electricity Museum" on December 15, 2001.

With a basic concept of conveying to the present generation the "spirit of electricity production" that has continued since the Meiji Era, and handing down the spirit to future generations, the museum is aimed at introducing more than 100 years of history of Japan's electric power industry, which has continued to pursue stability and efficiency in the electric power supply, while giving consideration to energy security and environmental protection.

In its exhibition space of about 4,000 m^2, the museum exhibits a variety of impressive heavy-duty equipment, including a transmission steel tower built in the Meiji Era, a 23-meter-long turbine generator used in the former Chiba Thermal Power Station that supported Japan's high growth period after World War II, and about 740 pieces of original historical materials from the middle of the Meiji Era to the present age. We hope that visitors who see these historical materials understand the significance of "manufacturing."

Turbine generator of former Chiba Thermal Power Station

Efforts of Group Companies

Our 21 group companies, which share TEPCO Group's Basic Environmental Philosophy and Environmental Action Guidelines (see page 8), are taking specific measures in accordance with their business characteristics and community relations, while promoting efforts that are held in common among the group companies and appropriate to this philosophy and guidelines.

Group Environment Committee

We formed the "Group Environment Information Liaison Conference" in June 2001 as a place for the periodic provision of information and exchange of opinions within the group.

To further reinforce our systems for mutual support and information cooperation in the group, in June 2002, we reorganized the liaison conference into the "Group Environment Committee" composed of the personnel members in charge of promotion of environment management from the 21 group companies. The members of the new committee are discussing specific efforts and schedules to improve the environment management of the group companies.

Ascertainment of Environmental Load Data

We are also making efforts to ascertain the environmental load data of our group companies as a whole.

In fiscal year 2001, we collected data from the 21 group companies in respect to the following four energy- and resource-saving items, i.e., the electricity consumed in offices, the volume of water consumed, the fuel efficiency of vehicles, and the volume of photocopy paper and printer paper purchased.

Improvement of Environmental Management

The 21 group companies are making voluntary efforts to improve their environmental management. To date, four companies have received ISO 14001 certification, and four companies have introduced environmental management systems that meet ISO 14001.

To support the voluntary efforts of the group companies, TEPCO invites their participation in its in-house workshop called the "Basic Training Course on Environmental Auditing" (see page 16). In fiscal year 2001, 20 middle managers of 18 group companies attended the seminar.

■ISO 14001 Accredited Group Firms

○ 21 group companies

Tokyo Electric Power Environmental Engineering Company, Incorporated (December 1997)
Toshin Building Co., Ltd. (March 2000)
Environmental Beautification Center Co., Ltd. (July 2001)
The Tokyo Electric Power Real Estate Maintenance Co., Inc. (September 2001)

○ Other affiliated firms

KANDENKO CO., LTD. (January 1997)
TAKAOKA ELECTRIC MFG. CO., LTD. (December 1999)
Toko Electric Corp. (July 2000)

Topics in FY 2001

Tokyo Electric Power Environmental Engineering Company Incorporated

Our Environmental Technology Center has conducted environmental analysis tests of dioxins, and its laboratory was registered as an accredited laboratory on December 25, 2001, by the Japan Accreditation Board for Conformity Assessment (JAB) based on the ISO/IEC 17025.

From now on, while promoting our cost reduction efforts, we plan to continuously improve our quality control system, maintain and improve our technical abilities, and educate and train our staff, aiming at increasing orders received from sources other than our group companies.

Our OA Division recycles personal computers that have become unnecessary.

The division buys personal computers that have become unnecessary after use at companies and at home, recycles them, and sells them to other customers. The personal computers that have become unnecessary after use at TEPCO are also bought and recycled by Tokyo Electric Power Environmental Engineering Company Incorporated.

ISO/IEC 17025 Accreditation Registration

■Aggregates of Environmental Load Data of 21 Group Companies

Item	Unit	Results in FY2001
Electricity consumed in offices	kWh	34,674,837
Volume of water consumed for living	m^3	159,694
Specific fuel consumption	ℓ/km	0.102
Volume of gasoline consumed	ℓ	1,927,570
Mileage of vehicle	km	18,805,702
Volume of photocopy paper and printer paper purchased	No. of sheets (A4-size equivalent)	126,785,818

The Tokyo Electric Power Real Estate Maintenance Co., Inc.

Toden Real Estate has promoted efforts to reduce its environmental load, such as by developing a heat supply business that uses clean electric power, and its participation in the Office Neighborhood Association for separation and recycling of waste paper. To systematize such efforts, the company obtained ISO 14001 accreditation on September 25, 2001.

At present, the company promotes a wide range of efforts such as the reduction of electricity and paper usage, recycling of waste in general, green purchasing, etc.

Presentation of ISO 14001 accreditation

Tokyo Electric Power Services Company, Limited

In July 2001, the company newly formed a quality control and environment management department as the unit responsible for the construction and operation of environment management systems.

The company has already completed an environment management system that meets the ISO standards, and is now promoting activities to obtain ISO 14001 accreditation (expected to be obtained in November 2002).

Based on a great store of technology and knowledge accumulated to date in respect to energy conservation and new energy, the company proposes technology to local governments. In fiscal year 2001, the company received an order for "Research to Develop a New Energy Vision for the Futaba Area in Fukushima Prefecture" as a project under the subsidy of the New Energy and Industrial Technology Development Organization (NEDO).

Toden Kogyo Co., Ltd.

Toden Kogyo deals with a variety of paint, varnish and chemicals for the construction, maintenance and operation of electric power equipment and facilities.

Therefore, in response to the enforcement of the Chemical Substances Management Law, the company has prepared the "materials safety data sheet (MSDS)" as its integrated standards for all the Group companies and thoroughly promotes the on-site display of the MSDS to prevent health hazards and occupational accidents for field workers.

Particularly, in view of a variety of chemical substances used in thermal power stations, the company carried out a thorough investigation of chemical substances to be listed in the safety sheet. As a result, it has selected about 200 items for the MSDS, and manages and uses them in the form of electronic data.

Safety data sheet for chemical substances

Tokyo Keiki Kogyo Co., Ltd.

The company's branch office in Kanagawa Prefecture has continued its activities to clean the areas surrounding its establishment (the former Tokai Highway around JR Tsurumi Station).

On the occasion of the National Environment Week in 1999, the company cleaned the sidewalks on both sides of the former Tokai Highway. However, cigarette butts, empty cans and empty bottles are always thrown away during commuting hours almost every morning and evening, worsening the surrounding environment.

Given this situation, seven to eight employees spend about one hour cleaning the surrounding areas on the first day of every month.

At present, the company collects about 150 liters of waste every month, and its cleaning activities are well received by the local communities. The company plans to actively promote such sincere activities to contribute to local society.

Cleaning activities by employees

Tokyo Densetsu Service Co., Ltd.

Since July 2000 TEPCO's Kazunogawa Hydroelectric Power Station has opened to the public a part of the area around the Kami-Hikawa Dam, an upstream regulating reservoir of the power station. More than 10,000 people visit the area every year.

In cooperation with TEPCO, the Yamanashi Branch Office of Tokyo Densetsu Service Co., Ltd. has planted "rosebay" (evening-primrose family) and "dicentra" (poppy family) since April 2001 for the beautification of the waterside landscape around the Kami-Hikawa Dam.

Dicentra planted in the waterside of the Kami-Hikawa Dam

II. Economic

To promote the further development of our business, TEPCO has been trying aggressively to develop new areas of business, while securing a reasonable profit and maintaining a sound financial structure with thorough efforts to improve management efficiency, and reinforcing competitiveness in terms of both price and services in the electric power market.

1 Current State of Electricity Demand and TEPCO's Revenues

Recent Trends in Electricity Demand

The annual system peak load on our utility grid in fiscal year 2001 hit an all-time high record for the first time in five years since fiscal year 1996 because of unusually high temperatures in summer. But, the pace of increase in our system peak load continues to slow because of the changes in the demand structure, such as the progress of energy-saving technology used in household electrical appliances, and intensifying competition among various types of energy, in addition to the prolonged economic slump.

Actual Values of Electricity Demand and Revenue in Fiscal Year 2001

Total electricity sales in fiscal year 2001 decreased by 1.8% from the previous fiscal year to 275.5 TWh as Japan's economic conditions worsened against the backdrop of a worldwide economic recession. As for our revenues, our sales (operating revenues from electricity utilities) decreased by 1.8% from the previous fiscal year to ¥5,129.6 billion because of the decreased electricity sales. Including other revenues, our ordinary revenues totaled ¥5,156 billion, down 1.8% from the year-earlier figure.

Outlook for Future Demand and Improvement of Management Efficiency

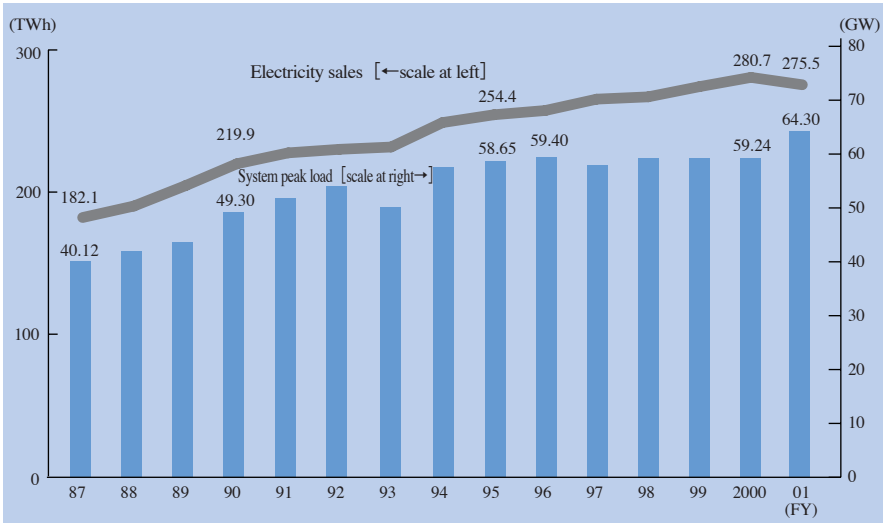
The demand for electricity is expected to increase at a moderate pace over the long run because of a slower rate of economic growth, diffusion of competitive types of energy, and progress in energy conservation. We estimate our electricity sales and system peak load to increase on average by 1.5% and 1.4%, respectively, over the period from fiscal year 2000 through fiscal year 2011. These rates of increase are even lower than the record-low rates previously estimated, representing a downward revision for four years in a row.

Under the circumstances, we will have to further improve our management efficiency to beat the competition in the energy market, which is expected to be further intensified from now on.

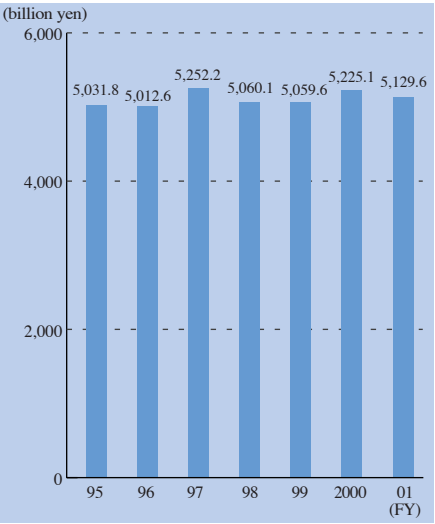
TEPCO lowered its electricity rates by 7.02% on average on April 1, 2002. This rate cutting reflects our plan to save a total amount of about ¥250 billion from management efficiency improvements that are expected to be achieved by the results of our on-going corporate-wide efforts for efficiency improvement, plus our further efforts to be made from now on.

We will continue to promote our efforts to improve efficiency in all aspects, including facility construction and various operations, in a break with past precedents, and effectively use the results of such efforts not only to reduce interest-bearing debts, but also to make investments in new business projects and to pay dividends to our shareholders.

■ **Trends in Electricity Sales and Annual System Peak Load**



■ **Trend in Operating Revenues**



2 Earnings and Financial Structure

Business Performance in Fiscal Year 2001

In fiscal year 2001, we reduced our interest expenses because of lowered interest rates and a decrease in the amount of our outstanding interest-bearing liabilities, and made thorough efforts to improve our overall operations, including a reduction of repair costs. As a result, we earned ordinary profits of ¥319.5 billion, and our return on assets (ROA) and return on equity (ROE) reached 4.5% and 9.5%, respectively.

The outstanding amount of interest-bearing debt decreased to ¥9,425.1 billion, down ¥436.1 billion from the year-earlier figure, raising the equity ratio to 14.1%, up 0.6%.

Future Targets

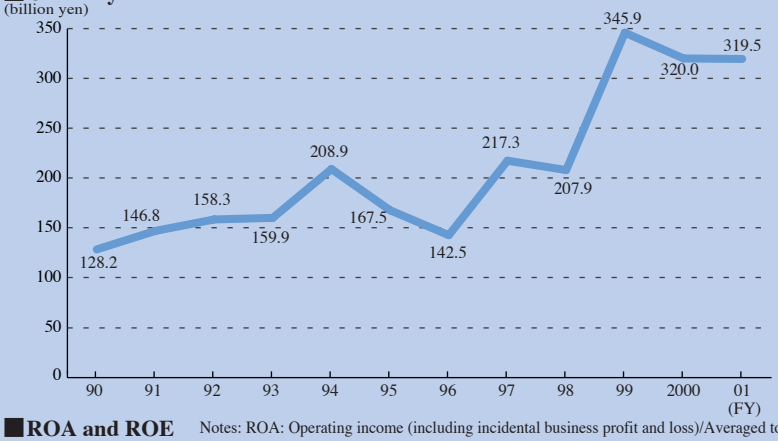
In terms of profit performance, we aim to secure an ordinary income of more than ¥300 billion, an ROA of more than 4% and an ROE of more than 9% on the average during the three fiscal years from 2002 to 2004. Our target for free cash flow(*) is to secure more than ¥550 billion on average in the three-year period.

As for our financial structure, we plan to reduce the amount of our outstanding interest-bearing liabilities by more than ¥400 billion on average over the three-year period from fiscal year 2002 through fiscal year 2004, aiming to achieve a debt-to-equity ratio at the 17% level at the end of fiscal year 2004.

Moreover, we will try to reduce our interest-bearing liabilities by more than 20% (more than ¥2 trillion) from the amount at the end of fiscal year 2000 by the end of fiscal year 2005.

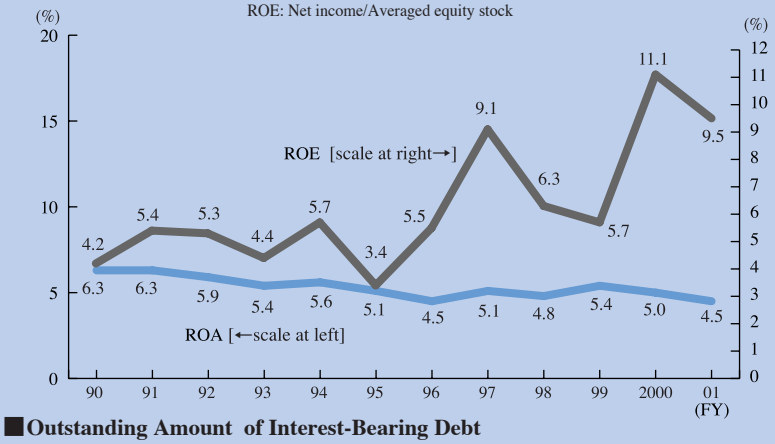
(*)Funds a business enterprise can appropriate for such purposes as the redemption of bonds, the repayment of loans, the payment of dividends to shareholders and investment in new business projects. (In fiscal year 2001, TEPCO's free cash flows amounted to ¥604.5 billion.)
Free cash flow = Cash flows from operating activities − Plant and equipment investment

■Ordinary Income



■ROA and ROE

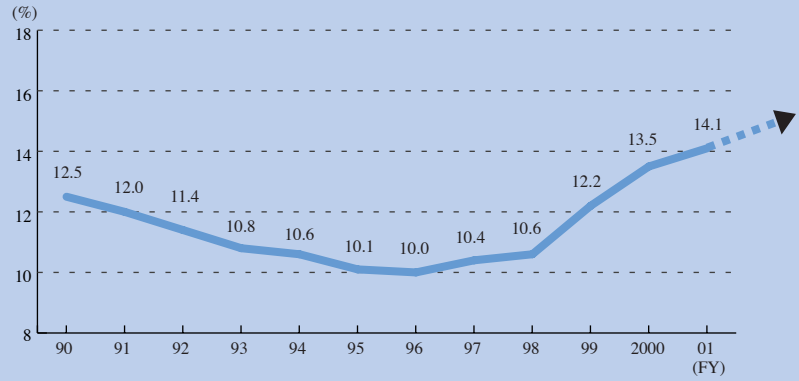
Notes: ROA: Operating income (including incidental business profit and loss)/Averaged total assets
ROE: Net income/Averaged equity stock



■Outstanding Amount of Interest-Bearing Debt

■Equity Ratio

Note: Equity ratio: Shareholder's equity/ Total liabilities and shareholder's equity

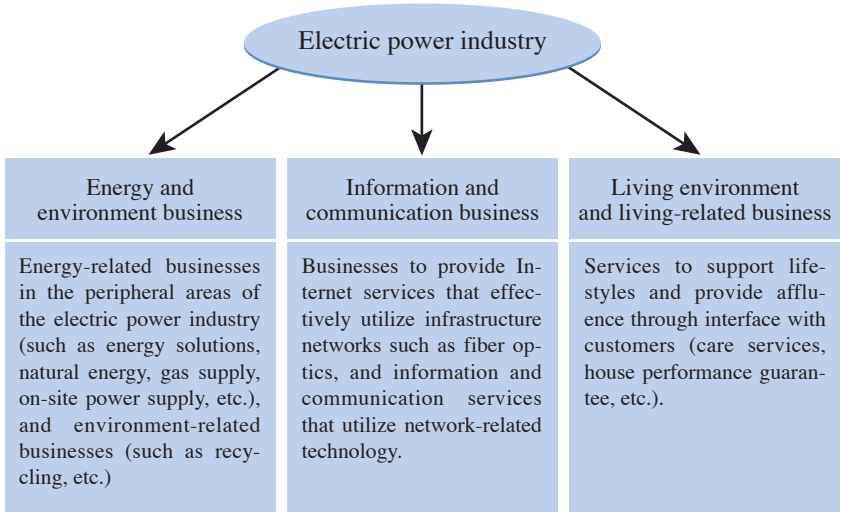


3 Promotion of Development of New Businesses

To increase our revenues under the liberalization of the electricity market, we are promoting the development of new businesses that may lead to further growth and the evolution of our group, with a target specified in our management vision "to increase sales in fiscal year 2005 for new businesses other than those of the TEPCO group by more than ¥500 billion from fiscal year 1999."

We are promoting the development of businesses with emphasis placed on three fields in which we can draw on our accumulated technology and know-how, and earn adequate revenues in competitive markets in the future. These are the energy and environment business, information and communication business, and living environment and living-related business sectors.

■Development of New Businesses



■Major New Businesses Inaugurated (or Invested in Equity) by TEPCO in and after Fiscal Year 1999

Energy and environment business		Information and communication business		Living environment and living-related business	
Name	Business lines	Name	Business lines	Name	Business lines
My Energy Corporation	On-site energy business to provide a package service, ranging from procurement of non-utility power generation systems to their maintenance.	SpeedNet Inc.	Internet service business to provide high-speed and constant Internet access at a low price with wireless LAN and FTTH.	Houseplus Housing Guarantee Corporation Limited	Business to assess and describe house performance, and provide maintenance bond services.
Japan Natural Energy Company Limited	Business to provide the Green Power Certification System that allows corporations, etc., to select natural energy. (See page 29 for details)	POWEREDCOM, Inc.	Business to provide nationwide telecommunication services to corporations, mainly using IP and private lines.	CareerRise Corporation	Business aimed at further improvement of the efficiency and profitability of the TEPCO Group by making good use of the group's human resources.
JAPAN FACILITY SOLUTIONS, Inc.	ESCO business (such as investigation, diagnosis, consulting and renewal in respect to modification of energy-saving equipment and facilities in buildings). (See page 74 for details)	Japan Digital Serve Corporation	Business to distribute digital broadcasting and broad-band contents to CATV operators.	TODEN LIFE SUPPORT CO., LTD.	Nursing home business for senior citizens who need care services.
Gas Business Company (in-house unit)	Business to supply gas to bulk gas customers.	AT TOKYO Corporation	Data center business to collectively provide central control service of information and communication systems.	TEPCO TOWN PLANNING CO., LTD.	Business to advise, design and conduct underground placement of electric wires.
Cycle, Inc.	Business to manufacture and sell recycled products of galvanized ironware. (See page 45 for details)	Japan e-Market Co., Ltd.	Business to operate an electronic market called "e-Market Place" where various equipment and materials for the electric power industry are traded on the Internet.	Weather Line Co., Ltd.	Business to provide weather information services to the media, Internet web sites, and cellular phones.
Nature Craft Corporation	Business to process and sell natural materials that use driftwood at dams and felled trees. (See page 45 for details)	JAPAN CABLENET HOLDINGS LIMITED	Business to control and operate CATV operators, in which the company has made equity investments, and provide the CATV operators with wide-area coordination and total services.		
		HitPops, Inc.	Business to distribute content for broadband Internet services.		
		CASTY, Inc.	Business to collect, develop and provide broadband content.		
		Fiber Optic Network Company (in-house unit)	FTTH (Fiber-To-The-Home) business to extend fiber optics to customers' houses and provide ultra-fast Internet infrastructure to ISPs, and business to lease fiber-optic cables to communication carriers.		

III. Social

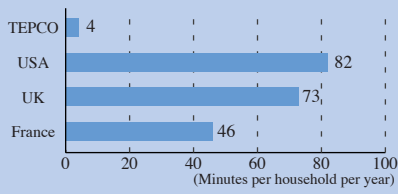
While doing its best to achieve a stable supply of electricity as its social mission, TEPCO, as a member of society, is making efforts to contribute to the sustainable development of society in the fields of safety, health and education, together with local communities, customers, employees and overseas countries.

1 Ensuring a Stable Supply of Electricity and Regional Safety

Ensuring Reliability in the Electricity Supply

While utilizing the advantages of our consistent management of electric power such as integrated operations of power generation facilities and networks and pursuing higher efficiency, we are eager to maintain a stable supply of electric power. Compared to other developed countries, our service reliability is very high.

■ International Comparison of the Duration of Accident-Caused Service Interruptions (FY2000)



Source:
USA: "SAIDI" (System Average Interruption Duration Index) average value of five US electric power companies--Consolidated Edison, Florida Power & Light, NStar (former Boston Edison), Pacific Gas & Electric, and Southern California Edison.
UK: "Ofgem Report on Distribution and Transmission Performance"
France: "EDF Annual Report"

To fulfill our mission of providing a stable supply of electric power, we take disaster prevention measures based on the "Building of Disaster-Resistant Equipment and Facilities" and "Establishment of Restoration Arrangements in Preparation for Occurrence of Disasters" in consideration of earthquakes and typhoons.

For example, in addition to our networked electric power systems through the interconnection of multiple transmission lines and aseismic measures for electric power equipment and facilities, we also take measures such as around-the-clock monitoring systems, improvement of readiness for initial response, regular storage of equipment and materials for restoration of services, establishment of systems to distribute information about disasters, and practical emergency drills.

Construction of Backup Facility to Substitute for the Head Office in Case of Disasters

To further reinforce our crisis-management capability, we have decided to build a "backup facility to substitute for our head office in case of disasters" at the site of the former U.S. military base in Tachikawa, Tokyo, which is designated as one of the national disaster control centers. The construction of the facility has been under way since January 2002 (scheduled for completion in September 2003).

This facility is expected to serve as an emergency measures headquarters in place of our head office, if the present head office (in Chiyoda Ward, Tokyo) is damaged by an earthquake, etc., and substitute for the Central Load Dispatcing Office's functions to control electricity demand and supply, and for the Central Telecommunications Station's functions to monitor and operate the communications networks for electric power.

Artistic rendering of the backup facility to substitute for the head office in case of disasters

Maintenance of Stable Power Supply during the 2002 FIFA World Cup™

To maintain a stable supply of electricity during the 2002 FIFA World Cup™ (from May 31 through June 30, 2002), we took the following measures:

- We inspected the equipment and facilities of the power systems that supply electricity to the football stadiums where the World Cup games were scheduled and other related facilities, and confirmed the conditions around the stadiums. During the World Cup games, we reinforced our patrol activities.
- The International Broadcasting Center (PACIFICO YOKOHAMA) is equipped with a new storage battery (see page 74)

The emergency storage battery install-ed in the International Broadcasting Center (a sodium-sulfur battery with capacity of 2,000 kW)

as an emergency electricity supply unit.
- On the days of the games, we set up temporary emergency headquarters and branches at our head office in Tokyo and branch offices in Ibaraki, Saitama and Kanagawa Prefectures where the football stadiums were located in preparation for quick response to any outages.
- We also kept our personnel for restoration work on standby and parked our power generation vehicles near the stadiums.

With all possible measures mentioned above, there was no accident like those that may hinder our electricity supply, and the World Cup ended without outage.

Measures Taken in Response to Volcanic Eruption on Miyakejima Island

Since all of the islanders on Miyakejima Island were evacuated in September 2000 on the occasion of the eruption of Mount Oyama on the island, the volcano is still belching out volcanic gases.

Since immediately after the disaster, we have been engaged in work to restore the utility poles and distribution line which were damaged by volcanic ashe and mudflow. We resumed power supply to some areas on the island in February 2001, took measures against volcanic gases in August 2001 (such as installation of airtight windows and desulfurizers at the power station on the island), and started around-the-clock power supply with operators stationed full time.

Contributions to Safety in Regional Communities

To contribute to traffic safety and public safety in regional communities, we donate security lights to local communities, and use our bucket trucks to clean traffic signals, curve mirrors and streetlights, mainly during our "TEPCO Environment Month" (June).

In order for customers to safely use electricity in their daily lives, in April 2000, TEPCO started the "Denko-chan Home Consulting Campaign - Electricity Safety Check at My Home" (pay service) to check the interior wiring at customers' homes, and also provides information such as "Denko-chan's Naruhodo Anzen! Nattoku BOOK (Book of Useful Hints on How to Use Electricity Safely from Denko-chan)," which is delivered to customers who wish to read it.

Denko-chan home consultant

Moreover, during the "Month for Safe Use of Electricity" (August) proposed by the Ministry of Economy, Trade and Industry, we prepare posters to promote the safe use of electricity, and distribute them to schools and construction sites. We also promote activities on the street to publicize the safe use of electricity, visit the homes of elderly citizens living alone and the facilities of cultural assets for the diagnosis of wiring, and hold seminars on the safe use of electricity for businesses that use crane vehicles, and civil engineering and construction companies. Through these activities, we are trying to promote the safe use of and diffusion of knowledge about electricity.

Nuclear Disaster Prevention

TEPCO's nuclear power stations make every possible effort to implement and maintain measures under a safety-first policy at all stages of nuclear power generation, from the design and construction of plants to their operation and maintenance, with the primary aim of preventing any accident that may affect local communities. In the unlikely event of a nuclear accident that involves radioactive release affecting the surrounding environment, we maintain emergency plans setting forth all necessary emergency actions, including reports to the competent authorities and other organizations concerned, determination of the situation, and the prevention of the accident from spreading, in order to fulfill our responsibility to carry out measures to prevent the spread of any damage. In addition, educational and training courses are regularly provided for assigned personnel so that they can quickly and properly carry out these actions in the event of an emergency.

Following the criticality accident set off at JCO Co. in the village of Tokai, Ibaraki Prefecture, in September 1999, the Special Law for Nuclear Disaster Prevention was enacted. Under the law, the central and local governments established 21 off-site centers(*) in the vicinity of nuclear power facilities all over Japan by March 2002 (see page 106 "Organizational Setup for Nuclear Disaster Prevention" in Part 2. Material and Data). To reinforce practical cooperation between power stations and off-site centers, TEPCO has also built dedicated communication lines between them, and installed security phones and teleconference systems in off-site centers.

As a member of the Nuclear Safety network (NSnet), TEPCO also actively participates in the activities of the network aimed at promoting a safety culture throughout the entire nuclear power industry.

(*)Facilities that are set up in the vicinity of nuclear power facilities as the place where the representatives of the central and local governments and operators get together in case of an emergency.

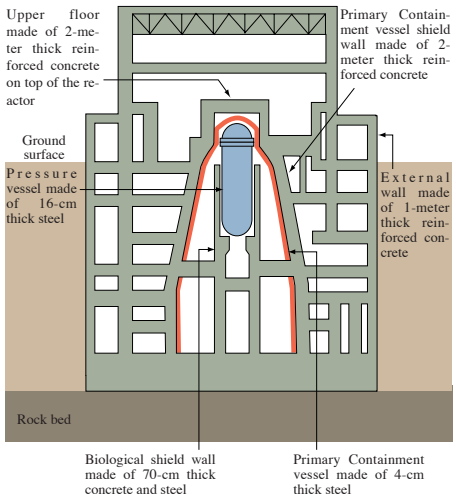
Measures to Protect Nuclear Power Plants

Our nuclear power plants enclose nuclear materials and important facilities within walls, and are equipped with sensors to detect and hold off invaders who may attempt to steal nuclear materials and commit acts of sabotage. In the event of an invasion, we will try to find the invaders as soon as possible, and report them to the security authorities. For this purpose, we have taken the following measures:

①Installation of surveillance cameras and guard fences
②Inspection of hand baggage with metal detecting equipment
③Identification of those who enter power plants with their ID cards
④Close cooperation with the security authorities

Our nuclear power plants are also equipped with functions to resist earthquakes and trap radioactive substances. Their structures are much stronger than those of other buildings. Reactors, as the most important facilities, are covered by the thick walls of buildings and containment vessels. Therefore, we think that even in the event of an aircraft crash, there is no direct impact on the reactors.

■Reactor Building



2 Vitalization of Employees and Assurance of Safety and Health

TEPCO believes that giving consideration to each individual employee leads to sustainable development. Therefore, as a company policy, TEPCO respects the characters and personalities of all individuals and takes pride in the establishment of a free, equal, and fair corporate culture. This corporate culture is the key factor behind the high-level fulfillment and confidence of TEPCO's work force.

1. HR (Human Resources) Management Systems

TEPCO has established various HR systems that allow employees to demonstrate their abilities to the maximum extent and to work enthusiastically, leading to efficiency improvements and the evolution of business.

Systems to Help Employees Demonstrate their Abilities and Achieve Self-Actualization

①Personnel Rating System

The personnel rating system is aimed at evaluating employees' demonstrated abilities and their performance, and identifying the overall character of employees for fair treatment and smooth management, as well as offering deployment and job rotation opportunities for personal growth. The system is composed of the following three schemes:

Competency Evaluation

TEPCO evaluates the abilities demonstrated by employees through their jobs according to company-wide standards. A multiple number of senior employees take part in this evaluation process.

Performance Appraisal

TEPCO evaluates the overall job performance of its employees in two aspects; one is the level of fulfillment of tasks, and the other is the amount of contribution to cooperation.

Career Development Records

TEPCO precisely identifies the character and personality of employees, as well as their job requests, in order to carry out personnel allocation, training and supervision of employees in consideration of their future abilities and long-term growth.

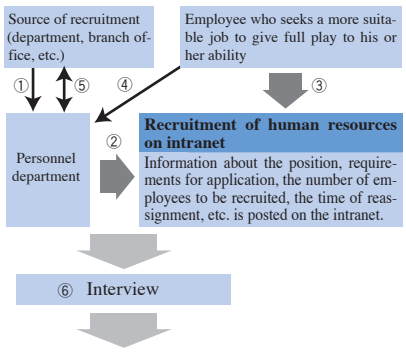
②Intra-Organizational Recruitment System

TEPCO has introduced an in-house staff recruitment system (job offer system) to encourage personnel on a company-wide basis to apply for jobs that require strong will and high ability.

Such recruitment activities are made known through the corporate intranet, and employees who want to apply for the position can apply directly from their personal computers by e-mail to the HR division without going through their superiors. The selection of applicants is done based on documents and interviews. TEPCO informs the applicants and their supervisors of the results, and arranges the new positions. If not selected, notices are given only to the applicants. With this system, TEPCO provides employees who have the desire and ability for particular jobs with an opportunity to play an active part in the company.

In fiscal year 2001, 43 employees used this in-house recruitment system to successfully gain new jobs.

■Flow of In-House Human Resource Recruiting System



Decision on whether or not to recruit

①Request for recruitment of human resources
②Posting on intranet after confirmation of details of recruitment
③Browsing by PC
④Application for job by PC
⑤Appointment of interview
⑥Interview under observation of personnel department

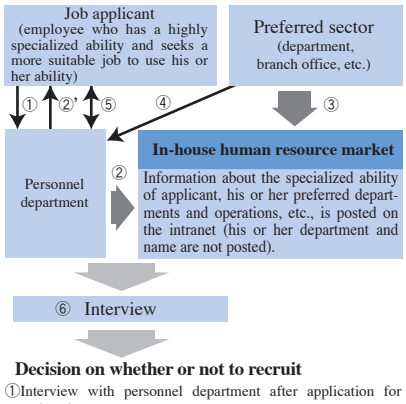
③Intra-Organizational Human Resource Market

TEPCO has introduced an in-house human resource market (in-house job seeking system) to allow employees who have strong expert abilities to actively seek the departments and businesses they want to work for in order to better utilize their abilities.

Applicants who want to register themselves in the in-house human resource market are interviewed by the Personnel Department, and the applicants who have high expert abilities and strong desire are registered in the market. The registered information is checked by persons in charge of personnel affairs, such as the directors of the departments that applicants want to move to, and promising applicants are interviewed by them. If the applicants are selected, they are allocated to the departments and businesses they want to work for. If not selected, notices are given only to the applicants in person, as is the case with the in-house staff recruitment system.

In fiscal year 2000, the initial year of introduction, 31 employees registered their names with the in-house human resource market, and two of them were assigned to the departments or operations they wanted to work for. In fiscal year 2001, 16 employees were registered. (Assignments are scheduled for 2002.)

■Flow of In-House Human Resource Market



Decision on whether or not to recruit

①Interview with personnel department after application for registration
②Registration with in-house human resource market, if his or her ability and enthusiasm are found to be high enough.
②' Advice on skill development, if his or her ability and enthusiasm are found to be inadequate.
③Browsing by PC (accessible only from the person in charge)
④Request for appointment of interview, if applicant is found to be appropriate to recruit.
⑤Appointment of interview
⑥Interview under observation of personnel department

④Measures to Support Life Design

TEPCO has introduced measures to support life design, which are aimed at supporting employees who want to participate in activities outside the company in consideration of their own life design. They are roughly classified into the following three measures:

System of Special Leave of Absence in Preparation for Job Changes

Employees who want to get qualifications in preparation to seek new jobs or change their jobs are allowed to take a leave of absence with pay. In fiscal year 2001, 18 employees used this system.

Dispatch to Reemployment Support Company

Employees who want to further demonstrate their abilities outside the company are dispatched to the reemployment support company, designed to provide them with adequate abilities and skills for a smooth job change.

Allowance to Support Job Changes

Employees who change their jobs in order to give full play to their ability outside the company are granted allowances to support smooth job changes, in addition to the prescribed retirement allowances. In fiscal year 2001, 15 employees used this system.

Equity and Diversity Policy

Employment of Handicapped People

TEPCO's rate of employment of handicapped people is 2.04% (496 persons as of June 1, 2001), exceeding the legally prescribed rate of 1.8%. We are also trying to improve our work environment so that handicapped people can work comfortably, such as the introduction of barrier-free architectural designs in our establishments.

Positive Utilization of Female Employees

TEPCO has long promoted a personnel allocation that treats men and women equally, such as through the positive utilization of female employees for the operation and maintenance of equipment and facilities. Those who have adequate abilities are given management positions regardless of sex. Thirty-one female employees held managerial positions as of March 2002. In addition, many female employees are now playing leadership roles. TEPCO will continue to appoint such female employees to management positions.

Moreover, as female protection rules were removed (in April 1999) under the Equal Employment Opportunity Law between Men and Women and the revised Labor Standard Law, TEPCO has extended night duties and three-shift duties, which were assigned only to male employees in the past, to female employees as well.

In introducing night duties to female employees, TEPCO prepared night-duty rooms for women only.

Maintenance work on distribution equipment by female employees

Creation of a Safe and Fulfilling Company Life

Improvement of Measures to Support Family Care and Child Rearing

TEPCO is trying to improve its measures to support employees' child rearing and family care needs.

TEPCO allows employees to take a leave of absence for child rearing and family care for up to three years, and also to apply for shorter hours of work or staggered hours of work, if necessary. Moreover, TEPCO supports employees in various ways, such as by providing in-house child day-care centers and child-care consulting clinics.

Prevention of Sexual Harassment

Sexual harassment is a serious violation of human rights which discourages employees' desire to work and impairs the dignity and honor of individuals.

Therefore, TEPCO is trying to create a pleasant work environment where every employee respects the human rights of others in an effort to prevent sexual harassment.

Specifically, TEPCO is taking such measures against sexual harassment as consultation by telephone (sexual harassment hot line) and by e-mail, while making the prevention of sexual harassment thoroughly known to all employees and enhancing their consciousness about sexual harassment by calling their attention to the issue through the corporate intranet and distribution of enlightening brochures and videotapes.

Support of Individual Contributions to Society and Communities

Leave for Volunteer Activities

TEPCO is improving its volunteer leave system in order for every employee to deepen his or her partnership with society through volunteer activities.

When employees individually and voluntarily participate in social activity programs (listed below), they are allowed to take volunteer leave for up to five days a year. In fiscal year 2001, a total of 80 employees took volunteer leave for a total of 128 days.

Activities Allowed for Volunteer Leave

- Relief activities in areas damaged by large-scale disasters
- Registration at a bone marrow bank and donation of marrow
- Activities at facilities for handicapped people and home care activities
- Social contribution activities sponsored by the central government, nonprofit organizations, etc. (environmental volunteer activities, etc.)

TEPCO Volunteer Center

We have provided our employees with information about volunteer activities on our intranet. In fiscal year 2002, we opened the "TEPCO Volunteer Center" to reinforce our support to the volunteer activities of our employees.

The center collects and provides information about volunteers, and provides various consulting services. It also invites and manages pre-registration of volunteer activities that employees want to participate in, and supports other activities of each branch office.

Further Promotion of Acquisition of Qualifications

Plus One Qualification Challenge Campaign

We provide financial assistance to our employees for correspondence courses and hold in-house seminars as a means of helping them acquire various qualifications, aiming at improving their ability. Since October 2001, we have been running the "Plus One Qualification Challenge Campaign" to further stimulate the aspirations of our employees to acquire qualifications.

Major Points of Campaign

- Employees declare the qualification that they want to acquire.
  * The qualifications for challenge should be selected, in principle, from those recommended by TEPCO (225 types).
- Employees who have passed various national examinations are honored and awarded special payments.
- Employees are provided, on our intranet, with substantial information about acquisition of qualifications, such as true stories by those who have successfully acquired qualifications, and the status of the campaign being promoted at each branch office.

As of the end of March 2002, 32,475 employees (81% of all employees) had declared the qualifications that they wanted to acquire.

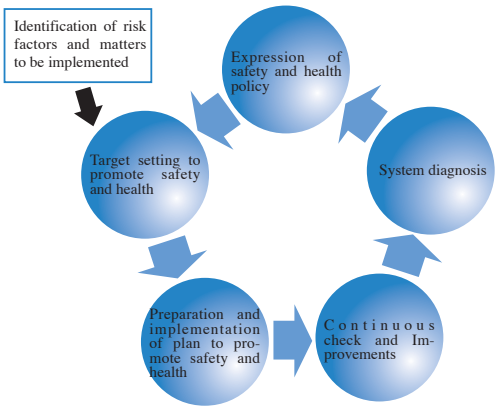
2. Safety and Health

It is also an important social mission of a business enterprise to consider the safety and health of its employees.

Safety and Health Management System

In fiscal year 2000, we introduced a safety and health management system to improve the company-wide management of safety and health of our employees. Under the system, each of our establishments continuously operates the management cycle of "PLAN→ DO→ CHECK→ACTION," and facilitates solid implementation and establishment of various measures for safety and health.

■**Flowchart of Safety and Health Management System**



Commitment to the Safety Management

Work Safety Measures

In fiscal year 2001, we took the following measures to help our supporting companies improve their safety management for construction work, for which we placed orders with them.

- We helped our supporting companies introduce an industrial safety and health management system, and encouraged them to use the human factor analysis techniques that have been developed by TEPCO.
- We provided our supporting companies with substantial backing for the safe management of construction work, for which we placed orders with them.

We also take the following various measures on a routine basis to safely carry out construction and inspection work.

- Safety training for every worker (practical training for basic tasks and work procedures, supervisor training for work site supervisors, general safety training for general workers, etc.)

■**Safety and Health Policy of Ibaraki Branch Office**

茨城支店安全健康方針

茨城支店は、社員の「安全」と「健康」の確保は、企業存在の基盤をなすものであるとの認識から、安全健康管理を事業運営の重要課題として、全員参加のもとに安全健康推進活動を展開・実施する。

従って、安全健康推進活動の一環として、安全と健康に関し、下記の基本理念の基に以下の事項を実施する。

＜基本理念＞

「安全と健康をすべてに最優先させる」

1．安全健康管理体制の維持・充実

労働災害ゼロを目指し、職場のあらゆる危険有害要因を排除するため、職員全員参加の下に、「安全健康マネジメントシステム」に則って、ＰＤＣＡを適切に運用し、継続的な安全健康活動に取り組む。

2．労働安全衛生関係法令、安全健康に関する規程・マニュアル等の遵守

労働安全衛生法をはじめ、関係する法令の遵守はもとより、会社および事業所で定めた、安全と健康に係わる規程・マニュアルや各種標準作業手順に基づき、安全健康の確保に努める。

3．健康管理の取り組みと支援体制の充実

職員の健康確保とストレスを軽減するための、快適な職場環境の形成を促進する。

平成 /3年 / 月 / 日

東京電力株式会社　茨城支店

支店長　山 口 学

- Safety patrols to discover and correct potentially dangerous situations in work sites
- Pre-work meetings, including predictions of danger (T.B.M.)(*1)
- Preparatory safety evaluations for equipment and work processes
- Collection of scientific data on the mental and physiological characteristics of each worker, and work distribution which gives consideration to the skills, experiences, knowledge, physical condition and other factors of workers
- Development and improvement of equipment, machines, instruments, etc.

(*1) T.B.M.: Tool Box Meeting, which is held prior to the start of work to clarify the division of work among members of the assigned team or group and review key points to carry out the work safely and efficiently.

Traffic Safety Measures

Traffic safety is also a very important issue in terms of safety management. In fiscal year 2001, we took the following new measures:

- We posted on our intranet the annual number and ratio of drivers with accident-and-violation-free records by each of our establishment based on the "certificates of operations logs"(*2) of all of the drivers (about 27,000) who operate service vehicles, aiming at raising awareness of traffic safety.
- We introduced the "Safety Recorder"(*3) in our service vehicles (about 8,600) to help our drivers improve their ability to predict traffic danger (505 Safety Recorders have been effectively used in rotation).

Safety Recorder

(*2) The certificates of operations logs are issued by the Japan Safe Driving Center, an external body of the National Police Agency, to certify the records of traffic violations, traffic accidents, and administrative penalties on driver's licenses in the past three years.

(*3) The Safety Recorder is an automobile version of an aircraft's flight recorder, which is designed not only to record the details of braking and steering operations as well as speeds, but also calculate the time of idling and the ratio of waste fuel consumption, and qualitatively assess the levels of safe driving and energy-saving driving.

At present, we mainly take the following routine measures for traffic safety:

- Confirm the drivers' performance for operating service vehicles (traffic safety instructors ride together to check the driving skills and manners of the drivers).
- Give guidance to individual drivers, using the results of vocational qualification tests.
- Provide practical driving skill training to the drivers who operate our service vehicles.

TEPCO also recommends off-duty traffic safety measures for employees who have private cars. In conjunction with the spring and autumn nationwide traffic safety campaigns, TEPCO positively implements its own campaigns.

Among other things, TEPCO is particularly trying to encourage employees to use seat belts, prevent traffic accidents at intersections where most traffic accidents occur, make predictions of traffic danger, and practice "verbal review" driving to prevent accidents.

Status of Personal Injuries Occurred

As for the number of on-the-job accidents and injuries of our employees in fiscal year 2001, 19 injured employees took days off from work and 31 injured employees did not. The frequency rate and severity rate were 0.77 and 0.01, respectively.

TEPCO believes that "ensuring safety" is a social responsibility that cannot be considered separately from the primary productive activities of corporations. Injuries and loss of life of employees due to accidents cause great damage, not only to their families but also to their corporations.

While learning lessons from the past cases of personal injuries, TEPCO is continuing its daily efforts to ensure safety and reduce accidents resulting in injury or death.

■No. of Labor Accidents Occurring by Fiscal Year

	Days off	No days off
FY1999	9	5
FY2000	14	20
FY2001	19	31

Days off: Cases where injured employees took one or more days off.
No days off: Cases where slightly injured employees did not take any days off.

■Frequency Rate and Severity Rate

	Frequency rate	Severity rate
FY1999	0.22	0.12
FY2000	0.53	0.004
FY2001	0.77	0.01

Frequency rate: Represents the number of casualties who took one or more days off due to labor accidents per period of one million labor hours.
Severity rate: Represents the number of labor days lost due to accidents per period of 1,000 labor hours, and the levels of accidents.

Management of Health and Workplace Sanitation

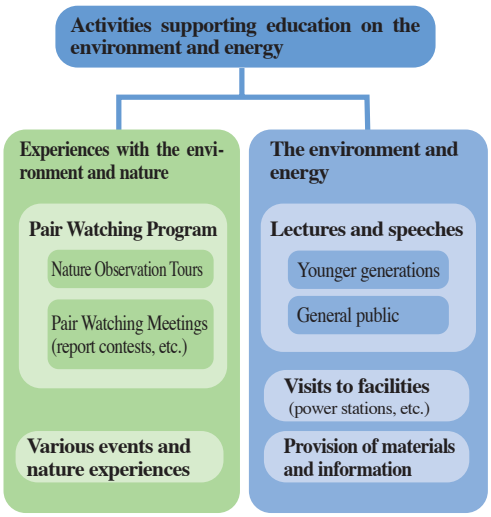
Workers need to be physically and mentally healthy to give full play to their respective abilities. With this in mind, TEPCO conducts industrial health management for its employees, including health care, work management and working environment management, under the Industrial Safety and Health Law. More specifically, we actively implement the following measures:

- Early detection of sickness by regular medical checkups, and health guidance for employees, with particular attention given to lifestyle-related diseases
- Guidance in and management of proper working methodology (e.g., for VDT work(*4))
- Proper management of working environments based on surveys of temperatures, humidity, natural and artificial lighting, etc. at work sites

(*4) The work of operating VDT equipment such as online terminals and personal computers. VDT is abbreviation for Visual Display Terminals.

3 Activities Supporting Education on the Environment and Energy

We support studies through nature-based experience and studies on the environment and energy as major themes prescribed by the "Period for Integrated Study" system that has been introduced into elementary and lower secondary schools. As these activities help us establish environmental partnerships with our customers and residents in local communities, we are actively getting involved in them.



Environment & Nature-Based Experiences

Pair Watching

This is a program for participants to commune with nature by learning the techniques of observing nature under the guidance of expert instructors in greenery tracts on the premises of our power stations. As parent and child or friends participate in pairs in this program, it is called the "TEPCO Pair Watching." In fiscal year 2001, 450 persons (225 pairs) participated in the program (see page 95 "TEPCO Pair Watching Program" in Part 2. Materials and Data).

Pair Watching at Kashiwazaki-Kariwa Nuclear Power Station

Environmental Education Workshops for Teachers

In order for teachers to use TEPCO's unique nature observation techniques that have been developed through our Pair Watching program as nature-observation activities to support environment education, we hold workshops for teachers.

In fiscal year 2001, we provided our programs for workshops hosted by local governments. Some 250 teachers participated in the lectures on how to commune with nature and workshops for field observation, demonstration guidance, and practices for preparing observation classes, etc. (see page 95 "TEPCO Pair Watching Program" in Part 2. Materials and Data).

Environmental education workshop for teachers at Sodegaura Thermal Power Station

The Environment and Energy

Lectures

TEPCO is engaged in various activities for the younger generations in cooperation with regional educational organizations and the general public, such as holding lectures on energy (see page 84 "Environmental and Energy" in Part 2. Materials and Data).

Implementation of Energy Lectures (FY2001)

	Number of students
Elementary schools	89,863
Lower secondary schools	28,459
Upper secondary schools	3,887
Total	122,209

Contents: The mechanism of power generation, limited energy resources, global environmental issues, energy conservation, etc.

Lecture on energy by a TEPCO employee at an elementary school

Opening of TEPCO Nature School

With about 200 participants, mainly parents and children, we hosted a lecture meeting called the "TEPCO Nature School" in January 2002 and introduced the pictures and sounds of field games that can be easily played at neighboring fields and parks, and the points of nature observation.

"TEPCO Nature School" (in Shibuya, Tokyo)

Visits to Facilities

We frequently invite visitors to our power stations as the place of electricity production, and brief them on the power generation mechanism and our consideration for the environment. We believe that many such field trips introduced in school education not only contribute to a deeper understanding of electricity, but also serve as the impetus for starting specific activities on environment protection.

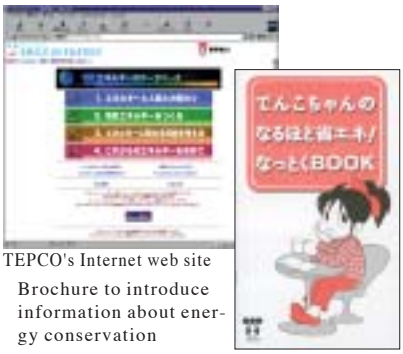
■Number of Visitors to TEPCO Power Stations (FY2001)

	Younger generation	General public	Total
Hydroelectric power stations	12,907	80,633	93,540
Thermal power stations	43,072	98,133	141,205
Nuclear power stations	15,065	112,239	127,304
Total	71,044	291,005	362,049

Provision of Materials and Information

We provide various learning materials for schools, including curriculum materials for elementary and lower secondary schools concerning resources and energy.

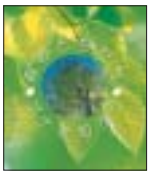
Moreover, we also provide a wide range of information about the environment, energy and energy conservation on our Internet web site (www.tepco.co.jp/index-e.html) and brochures.



TEPCO's Internet web site

Brochure to introduce information about energy conservation

■Main Teaching Materials TEPCO Presented to Schools

Category	Name of teaching material (Description of teaching material)	Recipients in TEPCO's service area
Teaching materials and supplementary readers	**Let's Try to Think About Resources and Energy!** Practical teaching materials on natural resources and energy for use in the Period for Integrated Study	Elementary schools 355 schools Lower secondary schools 136 schools
	HANDBOOK on Nature Observation Activities Text for nature observation instructors Introduction of how to plan nature observation activities and specific activities	Elementary schools Approx. 5,700 schools
	"Friends in Forest" and "Friends in Forest: Let's Know More About Beech"  A picture book titled "Friends in Forest" with beech as a hero (for primary grades of elementary school), and an explanatory book titled "Friends in Forest: Let's Know More About Beech" that details beeches and forests (for higher grades of elementary school).	Elementary schools Approx. 5,300 schools
	Story of Electricity **[published by the Home Electricity Culture Association]** Emphasizes that electricity is indispensable to daily life. Gives explanations on the roles of power equipment and electric power companies' efforts to secure energy resources and protect the environment.	Elementary schools For pupils: Approx. 490,000 copies For teachers: Approx. 38,000 copies
	Resources & Energy **[published by the Home Electricity Culture Association]** (Same as above)	Lower secondary schools For pupils: Approx. 120,000 copies For teachers: Approx. 20,000 copies
CD-ROM	**Environment and Energy Simulation Tour** Made up of questions and essays to help students deepen their knowledge of the global environment, natural resources and recycling	Lower secondary schools Approx. 2,700 schools
	Electric Adventure Introduces basic knowledge of electricity in a quiz format	Elementary schools Approx. 5,700 schools
	Let's Think about our Spaceship "Earth" **Design and production: Japan Scientific Video Association** **Cooperation: TEPCO, Namco Ltd., and Gakken Co., Ltd.** To learn the importance of forests through episodes about forests	Lower secondary schools Approx. 3,000 schools

"Let's Try to Think About Resources and Energy!" Environment Learning Book

This book is composed of three versions, i.e., a book for children and pupils, an explanatory book for teachers, and a separate volume of data for teachers. The book was introduced by 355 elementary schools and 136 lower secondary schools in fiscal year 2001, and is widely used in classrooms. The book titled "Collection of Examples of How to Use," which features practical examples of how to use the environment learning book for actual lessons, introduces ways of preparing instruction plans and proceeding with lessons.

4 Community Relations Activities

While promoting communications with regional communities, we take various measures for environmental protection. Our community cleaning activities, distribution of flower seeds and planting of flower seedlings in regional communities during Environment Month particularly on World Environment Day (June 5) are typical examples of such efforts.

Our events to promote exchanges between the people living in the "places of electricity production" where our nuclear power plants are located and the people living in the metropolitan area as the "place of electricity consumption" are also unique efforts.

Moreover, we have been promoting our efforts over a long period of time to create the culture suitable for the present age of affluence in respect to relations with regional communities, and to foster various welfare activities as well.

Regional Exchanges

High Evaluation of Community Cleaning Activities

Employees of the O-hito Sales Office of the Numazu Branch Office have since 1986 cleaned the riverbeds along the Kanogawa River during our Environment Month. Due to their 15 years of efforts to beautify the scenery of the river, the office was recently honored by the Numazu Construction Office of the Regional Construction Bureau of the Ministry of Land, Infrastructure and Transport.

Community cleaning activities by TEPCO's employees

The employees of the Fuji Field Office have cleaned Buddhist temples and Shinto shrines for 20 years. For their activities, the office was awarded a letter of appreciation by the Shizuoka Prefectural Office of the Association of Shinto Shrines.

Flower Planting in Park Flower Beds

The employees of the Utsunomiya Sales Office of the Tochigi Branch Office built a flower bed (33 square meters) at a corner of Nagaoka Park and have planted flowers there.

They have since 1998 planted marigold and begonia seedlings in spring and fall every year, and their planting activities are encouraged by many people in the regional community. For their activities, the office was awarded a letter of appreciation at the "Citizens' Rally to Promote Community Building with Flower and Greenery."

Planting in Nagaoka Park

Communications between Power Site Regions and Power Consumption Regions

At our PR facilities, we hold the "Electricity Hometown Fair" every year to introduce to the people in the metropolitan Tokyo area the culture and tourist attractions of Niigata, Fukushima and Aomori Prefectures where our power stations are located.

Including the sale of each prefecture's representative products, the fair promotes tourism with posters and brochures, shows local performing arts, and holds a quiz rally to help visitors deepen their understanding of and interest in the areas where our power stations are located.

"Electricity Hometown Aomori Fair" held at TEPCO Ginza Hall (in Ginza, Tokyo)

■ **Community Relations Activities Carried Out during TEPCO Environment Month in FY2001**

Description	No. of events	No. of participating employees	No. of participating customers
Facility visiting tours ・Tours to nuclear power stations (Ibaraki Branch Office, etc.) etc.	181	444	12,835
Exhibitions and events ・Exhibitions of waste-recycled products at city halls (Futtsu Thermal Power Station of Higashi Thermal Power Office) etc.	61	321	16,920
Participation in Environment Month events held by local governments, etc. ・Participation in "Fujisawa Environment Fair" (Fujisawa Sales Office of Kanagawa Branch Office) etc.	133	739	18,321
Meetings with local governments, local businesses and customers ・Meetings with local governments about environment (Gunma Branch Office, etc.) etc.	118	570	2,062
Nature conservation activities ・Planting of Fuji thistle seedlings (Gotenba Sales Office of Numazu Branch Office) etc.	10	125	217
Lectures on environment and energy ・Tours of elementary school pupils to environmental equipment and facilities (Goi Thermal Power Station of Higashi Thermal Power Office) etc.	245	801	35,473
Flowering Campaign (distribution of flower seeds and seedlings, and sowing and planting) ・Donation of flower seeds and seedlings (Fukushima Daini Nuclear Power Station, etc.) etc.	152	847	15,589
Community cleaning activities ・Participation in Citizens' Operations to Clean Up Yatsu Tidal Flat (Narashino Sales Office of Chiba Branch Office) etc.	262	8,293	1,697
Total	1,162	12,140	103,114

Releasing Salmon Fry into River with Elementary School Pupils

The employees of the Kawasaki Regional Office of the Kanagawa Branch Office have since 1998 hatched salmon roes, and raised and released salmon fry into the Tamagawa River in cooperation with the local elementary schools, aiming at providing the children in the regional community with opportunities to learn the workings of nature and river environment.

Salmon roes were transferred from Kidogawa Fishermen's Union in Fukushima Prefecture. The salmon fry that were hatched in the aquariums installed in a local elementary school and TEPCO regional office grew to a size of about 5 centimeters in two and a half months. Then, the fry were distributed into plastic cups by pupils in the fifth grade, and carefully released into the river. A child who seemed reluctant to leave the fry said, "I want to make the river cleaner so that a lot of adult salmon will come back."

Children releasing salmon fry

Culture and Welfare Activities

TEPCO 10,000 Participants' Concert

We have held the "TEPCO Communion Tour Concert," which is organized in cooperation with amateur choral societies in various parts of the Kanto region to support the creation of regional culture through music, and the "TEPCO 10,000 Participants' Concert," as a comprehensive compilation of the Communion Tour Concert, marked the 14th performance on April 27, 2002, since the first concert in 1989.

The concert, a magnificent composite of the performing arts, includes the greatest lineup from the kabuki and operatic worlds, and is performed by orchestra, Japanese drums and 4,000 members of amateur choral societies. It is well received by many customers.

Fantastic stage created by lights and sounds

TEPCO Seminar

The "TEPCO Ladies' Seminar" was first held in 1977 as a lecture by leading experts of various fields in respect to consumers' and women's lives. Since then, we have held the seminar every year.

The name of the seminar was changed to the "TEPCO Seminar" in 1999, and we have held lectures on themes related to the creation of new culture, such as science, arts, health, living and life, without limiting participants. To date, some 60,000 people have participated in about 1,800 lectures. The contents of the lectures have been compiled into the "TEPCO Paperbacks," which are contributed to many public libraries.

TEPCO Paperback

TEPCO Seminar

TEPCO Lecture on FIFA World Cup™ for Parents and Children

As one of the official suppliers of the 2002 FIFA World Cup™, TEPCO held this lecture with the hope of providing children with a grand soccer event.

In fiscal year 2001, we invited Mr. Hisashi Kato, former member of Japan's national squad, to lecture at our "Soccer Clinic for Parents and Children," which was held a total of six times. About 1,000 parents and children attended to learn the basics of soccer.

Soccer Clinic for Parents and Children

Donation of Braille Books

Since the International Year of Disabled Persons was established in 1981, we have donated Braille books and tape-recorded books to welfare facilities and libraries every year. In fiscal year 2001, we donated such books to 86 facilities in various parts of the Kanto region.

Donated books

5 International Cooperation

To transfer our knowledge of highly efficient power equipment and environmental protection, we promote international communication, mainly with developing countries. We receive trainees from developing countries and send specialists and provide electric power equipment and materials to these countries. In fiscal year 2001, we received more than 150 trainees and research groups, mainly from Asian countries.

Moreover, in addition to activities to support developing countries through the international cooperation non-profit organization "E7" formed by the electric power companies of advanced countries, we are also engaged in environmental protection activities as a member of various international organizations formed by the industrial community.

We also participate and cooperate in the development of international guidelines for the sustainability reports prepared by the Global Reporting Initiative (GRI), and the guidelines for the international standardization of calculation of greenhouse gas emissions, which have been addressed jointly by the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD).

Reception of Trainees and Dispatching of Specialists

Executives of Chinese Electric Power Companies Visit Japan for Training

We perform a program that combines the visit-to-Japan training for executives of Chinese electric power companies and the dispatching of our specialists to China, aiming at improving the management of the electric industry in China. The program was carried out 19 times from 1992 through 2001. In fiscal year 2001, we received 23 executives from China and dispatched ten specialists from TEPCO to China.

Cooperation with Japan International Cooperation Agency (JICA)

As part of JICA's training program, we train the personnel and engineers of host countries for electric power projects. In fiscal year 2001, specialists visited Japan from Vietnam, Indonesia, Laos, Bangladesh, Saudi Arabia, etc.

Our employees are also dispatched as JICA specialists to Indonesia, Vietnam, the Philippines and Laos, and are playing an active part in these countries as the specialists for electric power projects.

Selection of site to build a micro hydroelectric power plant in Indonesia

Support to Developing Countries through E7

As a member of the international cooperation non-profit organization "E7," TEPCO provides engineering support to Bangladesh to expand and reinforce the country's transmission and distribution lines, and promote hydroelectric development and make environmental impact assessments in the Mekong region.

As for the micro hydroelectric power plant built by TEPCO in Indonesia, as mentioned on page 31, we continue to collect basic data such as data on the electricity generated after the completion of the project in March 2001.

Cooperation of TEPCO Group

Tokyo Electric Power Environmental Engineering Company, Incorporated and Tokyo Electric Power Services Company, Limited also receive trainees from and dispatch their specialists to Indonesia, Bangladesh, Argentina, etc.

Participation in International Efforts by the Industrial Sector

International Chamber of Commerce (ICC)

The International Chamber of Commerce (ICC), an international business organization, established the Business Charter for Sustainable Development - Principles for Environmental Management. TEPCO has supported the Charter from the beginning. Through participation in ICC Environment and Energy Commissions, we are leading and advocating responsible business actions for environmental protection.

World Business Council for Sustainable Development (WBCSD)

WBCSD is encouraging the voluntary measures taken by the industrial community, including developing countries, to cope with various environmental issues, and is pushing ahead with its international policy. As a member of WBCSD, TEPCO also plays an active part.

World Association of Nuclear Operators (WANO)

WANO, which aims for the internationally sharing of the nuclear safety culture, is joined by nuclear power plant operators in various parts of the world. As a member of WANO, TEPCO is also engaged in activities to contribute to the safety of the world's nuclear power generation.

Ⅳ.Integrated

The key in pursuing the ultimate task of "sustainable development" is the construction of a system that resolves the three basic challenges, i.e., the environment, economy and society, in a comprehensive and integrated manner. While persisting in its efforts for technological innovation and ingenuity, TEPCO will continue to explore and implement measures to simultaneously achieve the three challenges, such as through the improvement of equipment efficiency, energy conservation in conjunction with society, and resource- and energy-saving activities.

1 Improvement of Equipment Efficiency

Improving the availability of electric power equipment for more efficient operations is a very effective approach to improve the cost efficiency of the equipment, and at the same time to save resources and reduce environmental loads as well.

Operation of Nuclear Power Plant at High Availability

Improving the utilization rate (capacity utilization rate) of nuclear power plants that consume no fossil fuels saves fuel costs and contributes greatly to reduction of CO_2 emissions. While giving top priority to the maintenance of safety and reliability, we are trying to keep a high availability of operations (regularly at an 80% capacity utilization rate) by improving the efficiency of periodical inspections and planning periodical inspections at respective nuclear power plants in a well-balanced manner.

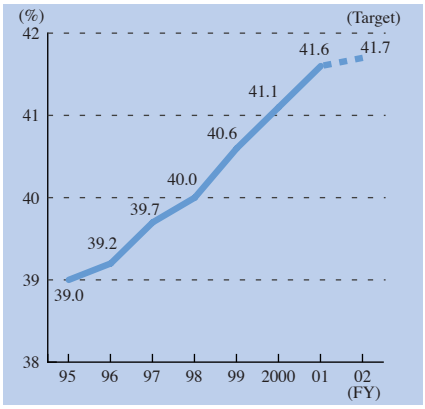
The capacity utilization rate of our nuclear power plants in fiscal year 2001 increased by 0.7% from the previous fiscal year to 80.1% because of a decrease in the number of days that unscheduled outages took place.

Improvement of Thermal Efficiency of Thermal Power Generation

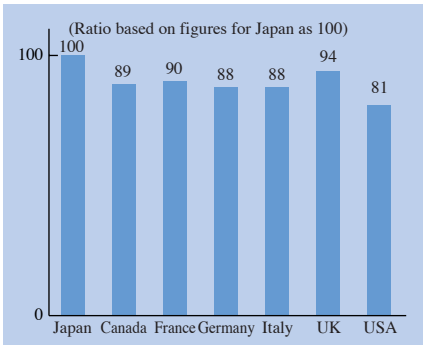
The thermal efficiency of TEPCO's thermal power generation has improved steadily due to the introduction of the highly efficient Advanced Combined Cycle (ACC) power generation system, and is expected to reach 41.6% in fiscal year 2001, exceeding its initial target. The improvement of thermal efficiency contributes directly to the reduction of cost and emissions of environmental loads such as CO_2 and other air pollutants, effectively improving both cost efficiency and environmental protection.

We plan to further improve the thermal efficiency of thermal power generation through the introduction of new ACC power generation equipment and more efficient operations of our existing equipment.

■Thermal Efficiency (Gross) of Thermal Power Generation

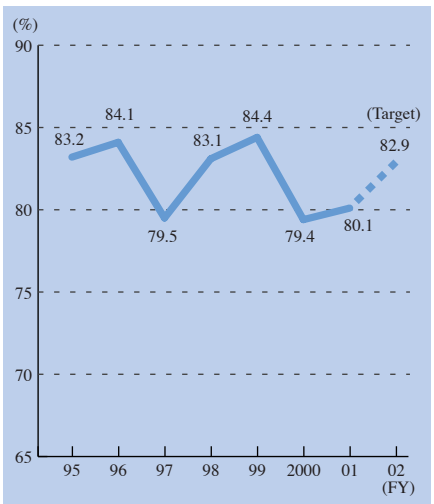


■International Comparison of Thermal Efficiency of Thermal Power Generation (in 1996)

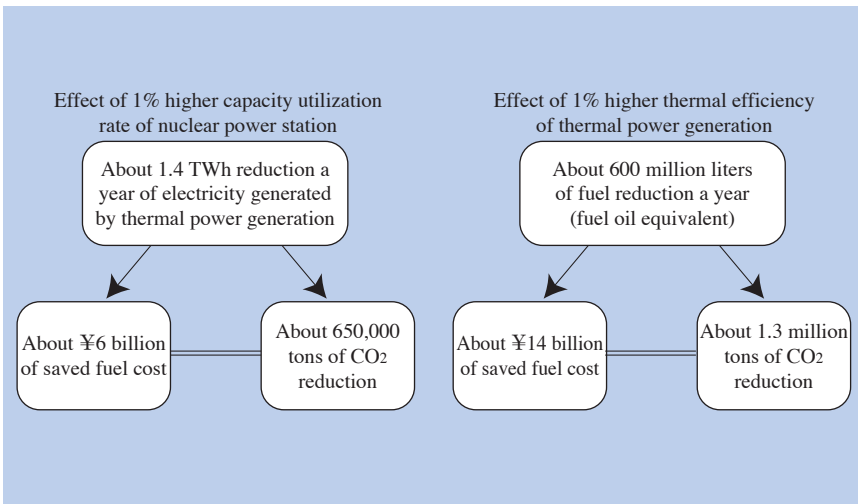


Source: Trial calculation based on "ENERGY BALANCES OF OECD COUNTRIES 1998-1999 (1998)."

■Capacity Utilization Rates for Nuclear Equipment



■Cost Efficiency and Environmental Protection to Be Achieved Simultaneously by Improvement of Equipment Efficiency



2 Environmental Accounting

In Japan, so-called "Environmental Accounting" is now an essential assessment system as a means of corporate disclosure and internal management. TEPCO promotes a wide range of efforts to build and use environmental accounting systems as a tool to evaluate the reconciliation between environmental protection and economic efficiency, including the measurement of total eco-efficiency of overall business activities, the determination of internal economic effects achieved by environmental protection measures, and the monetary assessment of effects of environmental improvement.

Improvement of "Eco-Efficiency Ratio"

To assess the relations between our business activities and environmental impact from an eco-efficiency point of view, we have been engaged since fiscal year 2000 in the measurement and assessment of "eco-efficiency ratio" that put our environmental loads and the quantity of resources we consumed in contrast with economic values such as sales.

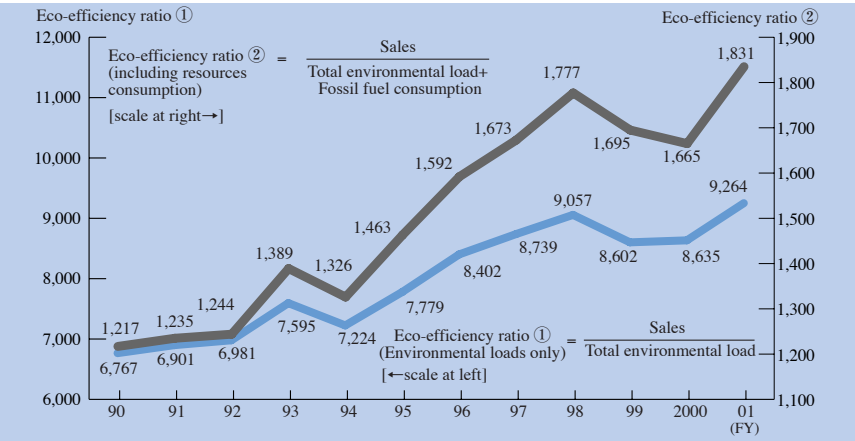
We calculate our environmental impact based on the "Eco-Indicator 99" as one of the impact assessment methods, which assigns weights to more than two types of substances such as CO_2 and SOx in accordance with the degree of environmental impact of each substance, and sums them up. In fiscal year 2001, we added "resource consumption" to our assessment items, which is listed as one of the elements that has an impact on the global environment, and recalculated our eco-efficiency. As a result, our trial calculation found that our eco-efficiency has increased by about 50% over the past ten years or so from fiscal year 1990.

From now on, we plan to promote further improvements in and use of our eco-efficiency ratio, such as the selection and application of the integration method in consideration of Japan's regionality, calculation of predicted values of eco-efficiency ratio in the future, application of eco-efficiency ratio to internal corporate management, etc.

■Integrated Assessment of Major Environmental Loads and Resource Consumption, and Calculation of "Eco-Efficiency Ratio"

Integration items		Emissions (consumption) Unit	FY1990	FY2001	Comparison	Weighting factors (per ton)	Weighted quantity of loads (millions) FY1990	FY2001	Major measures to reduce environmental loads and resource consumption (FY1990→FY2001)
Environmental load substances	CO_2 〈Emission intensity〉	million tons 〈kg/kWh〉	84.10 〈0.382〉	87.40 〈0.317〉	+4% 〈−17%〉	5.45	458.3	476.3	・Increase in share of nuclear power generation (34%→44%) ・Improved thermal efficiency of thermal power generation (39.1%→41.6%)
	SOx	thousand tons	37	12	−68%	1,501	55.5	18.0	・Increased share of LNG in thermal power generation ・Reduction in the sulfur content of fuel ・Installation of flue gas denitrification facilities and electrostatic precipitators
	NOx	thousand tons	47	21	−55%	2,745	129.0	58.5	
	Soot and dust	t	214	34	−84%	18,200	3.9	0.6	
	CFCs	ODP-t	37.3	9.6	−74%	27,300	1.0	0.3	・Shift to substances with lower ozone depletion potential
Resource consumption (fossil fuels)	Coal	million tons	0.38	0	−100%	5.99	2.3	0.0	・Improvement of thermal efficiency and reduction of internal electricity consumption
	Fuel oil	million tons	6.59	1.84	−72%	144	948.4	265.0	
	Crude oil	million tons	4.12	1.43	−65%	140	576.9	200.2	
	LNG·LPG	million tons	13.21	16.50	+25%	108	1,426.5	1,782.4	・Improvement of thermal efficiency by introduction of highly efficient thermal power generation
		(A) Total of substances (millions)			①Environmental loads only		647.8	553.7	
					②With resources consumption included		3,601.8	2,801.3	
		(B) Sales (Electric utility operating revenues)(billion yen)					4,383.6	5,129.6	
		Eco-efficiency ratio (B)/(A)			①Environmental loads only		6,767	9,264	
					②With resources consumption included		1,217	1,831	

■Eco-Efficiency Ratio at TEPCO



■Integration Method, etc.

・The weighting factors are based on the "Eco-Indicator 99" (Pré Consultants of the Netherlands).

・Nuclear fuel resources for power generation cannot be included in the integration items at present because no weighting factors are set for them as to the method mentioned above. Introduction of assessment method for this item will be considered in the future.

・Crude oil includes light oil, and LNG and LPG include NGL, natural gas and city gas.

Internal Environmental Costs

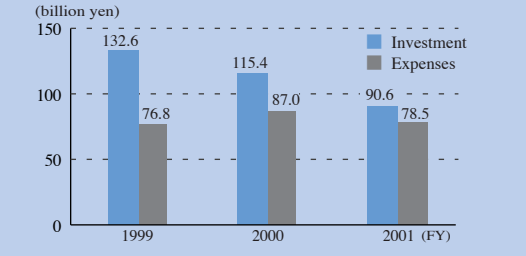
Our internal environment costs in fiscal year 2001 showed no significant changes overall, compared with the previous fiscal year. The shares of the cost of measures to prevent air pollution and preserve landscapes and urban space remained high. The ratio of the internal environmental costs to our total costs was 1.6%, almost the same level as in the previous fiscal year. However, the ratio of our investment in environmental measures to our overall investment decreased from 15.2% in the previous fiscal year to 12.3% because of a decrease in the amount of investment in underground transmission and distribution lines.

Notes:
- Expenses do not include depreciation.
- See pages 88 and 89 in Part 2. Materials and Data for details of the standards for calculation of internal environment cost, classifications of and corresponding relations among costs according to the Environmental Accounting Guidelines prescribed by the Ministry of the Environment.
- Costs for power generation systems for hydroelectric, nuclear and LNG thermal power, which contribute to the reduction of CO_2 emissions, are excluded because they cannot be regarded as an additional cost for environmental protection.

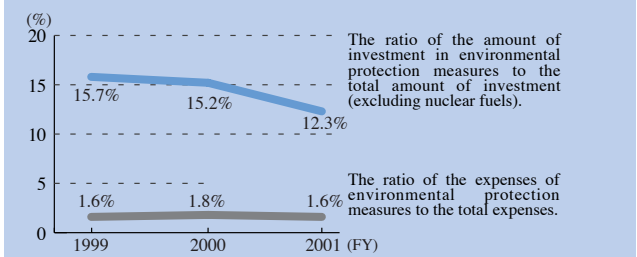
■Internal Environmental Costs (for TEPCO Alone in FY2001)

Environmental preservation measures			TEPCO's internal environmental costs (in billion yen)		
			Investments	Expenses	Major details
Environmental management	Enhancement of the organization and employee education		0	3.8	Personnel expenses, support for employees to obtain qualifications in the environmental field and training
	Improvement of the environmental management system		0	0.1	Acquisition of certificates from outside organizations, and preparation of environment reports.
	Green procurement and purchasing		—	—	Purchase of materials, equipment, products, etc. with consideration given to the environment
Global environmental preservation	Mitigation of global warming		0.9	1.4	Introduction of natural energy and efforts in view of Kyoto Mechanisms
	Protection of the ozone layer		0.5	0	Reduction of regulated chlorofluorocarbons (CFCs)
Regional environmental preservation	Environmental impact measurement and monitoring		0.8	1.4	Environmental impact assessment and environmental load measurement
	Environmental pollution control	Air pollution control	11.8	13.6	Flue gas desulfurization and denitrification, combustion improvement, installation of electrostatic precipitators and fuel measures
		Water pollution control	5.5	2.5	Effluent treatment, prevention of oil leakage and measures to deal with thermal effluent
		Noise and vibration control	0.4	0.1	Facility measures (e.g., installation of inlet silencers) and measures during construction work (e.g., use of innovative engineering methods)
		Soil contamination and land subsidence control, etc.	—	0	Land subsidence measurements and water quality monitoring
	Management of radioactive substances		3.7	31.1	Treatment of radioactive substances, and radiation control and measurement
	Nature conservation and harmony with the environment	Natural environment protection	2.1	3.7	Afforestation of TEPCO's establishments and nature conservation activities in the Oze marshland
		Landscaping and urban space measures	54.7	—	Construction of underground transmission and distribution facilities and consideration to the configurations and color schemes of facilities
Technology developments			—	5.7	Research and development for reducing environmental loads and creating new environmental values
Resource recycling	Reduction in waste production and waste recycling		9.8	8.0	Reduction in quantity, storage, treatment and recycling of waste, and their disposal in landfills
Social contributions	Cooperation with communities		—	1.8	Community beautification and afforestation activities, and environment-related donations and support
	Environmental education support and publicity activities		0.2	1.7	Environmental education-supporting activities and environmental advertisements
Others	Environment-related charges, etc.		0	3.5	Pollution load charges (under the pollution-related health damage compensation program)
Total (reference)			90.6	78.5	(Reference) TEPCO's total investment: ¥733.9 billion (excluding nuclear fuel) Total expenses: ¥4,836.4 billion (ordinary expenses)

■Yearly Changes in Internal Environmental Cost



■Ratio of Internal Environmental Costs to Total Costs



Note: The values for fiscal year 1999 are retrospectively corrected based on the internal calculation standards that were reviewed in fiscal year 2000.

Internal Economic Benefits Associated with Environmental Preservation Measures

In association with our environmental protection measures, we also calculate the internal economic benefits that actually contribute to our balance. The fuel cost savings due to the improvement of thermal efficiency of thermal power generation has had a large economic impact. From now on, we will also promote our active efforts to effectively allow environmental protection to be compatible with cost efficiency, such as the conservation and efficient use of resources, effective use of recycled resources, etc.

■Internal Economic Effects (for TEPCO Alone in FY2001)

(Unit: billion yen)

Affected item	Major details	Monetary benefits
Reduction of fuel used in power generation	Improvement of thermal efficiency of thermal power generation, reduction of the transmission and distribution loss rate (reduced amount from the actual result of FY1990 thanks to improvement efforts), introduction of natural energy, etc.	43.6
Reduction of internal energy and resource costs	Effects of cost reduction of electricity, water, office paper, vehicle fuel, etc., at all of TEPCO's establishments	0.2
Reduction of material procurement cost	Purchasing of repaired products such as meters, and green procurement and purchasing of recycled wires, etc. (the balance from brand new products)	14.9
Proceeds from sales of recycled materials	Proceeds from sale of byproducts (metal scrap, etc.) of recycling	0.5

Notes:
- Potential economic benefits such as the effect of contributions to operating revenues by means of compliance with laws and regulations, and avoidance of environmental risk, are excluded from the calculation because it is difficult to set a reliable basis of calculation.
- See "Principle of Calculations for Environmental Accounting" on page 88 in Part 2. Materials and Data for the details of the calculation standards, etc.

Assessment of Effect of Environmental Improvement

The primary theme that should be addressed by the environmental accounting methodology is how to assess and analyze the environmental impact (externality) borne or enjoyed by society.

The effects of environmental improvements by TEPCO's environmental protection measures are quantitatively identified and assessed in the actual values of environmental indicators (see pages 20-23 "Environmental Indicators". We also promote research on not only the methodology of quantitative assessment but also the methodology of assessing the monetary amount of environmental values.

Economic Assessment of Green Tracts in Power Stations

We are engaged in the economic assessment of the values of the natural environment based on the "Contingent Valuation Method (CVM)."(*1) (We performed an economic assessment of the value of nature in Oze in fiscal year 2000. For details, see page 89 in Part 2. Materials and Data.)

The green tracts in the sites of TEPCO's power stations, to which the access by people is strictly restricted, can be maintained and managed as habitats of various forms of life. In fiscal year 2002, therefore, we tried to make the economic assessments of the functions of such habitats with particular reference to ecosystem among a variety of functions provided by the green tracts in the sites of our power stations.

We carried out the surveys by questionnaires (see the table on the right) to ordinary citizens based on the "Contingent Valuation Method (CVM)" in April 2002. If the results of the surveys are applied, the values of the functions of the habitats in the green tracts on the sites of our power stations are estimated to be about ¥19-28 billion a year in respect to all of our thermal power stations (12 stations)(*2) in the waterfront area of Tokyo Bay, and about ¥22-35 billion a year in respect to other power stations (two thermal power stations and three nuclear power stations)(*3) that have existing forests (*4).

With these results, we believe that we can obtain some effective data to assess the appropriateness of the environmental cost (¥300 million investment and ¥1.3 billion cost) of the green tracts mentioned above.

We plan to widely use this methodology for the assessment of a variety of environmental values.

■ **Outline of CVM-Based Survey**

	Survey 1	Survey 2
Survey covered	Functions of greenery once lost but re-created as habitats of life forms.	Functions of existing forests protected as habitats of life forms.
Description of questions	On the assumption that there is a "citizens' project to create greenery in the waterfront area of Tokyo Bay," we asked citizens about how much money they would pay for the fund to promote the project. <Contents of Project> - Apply the project to about ten reclaimed sites in the coastal industrial zone (the area of each site is about 10-20 hectares, for a total of about 160 hectares). - Cover 60% of each site with a forest in consideration of the surrounding natural environment, and 40% with shrubs, lawns and water's edge. - Limit citizens' access to the sites, preserve and manage the sites as habitats of insects, wild birds, etc.	On the assumption that there is a "citizens' project to protect forests," we asked citizens about how much money they would pay for the fund to promote the project. <Contents of Project> - Apply the project to a couple of sites each in the Pacific coastal region from Kanto to Tohoku and in the coastal region of the Sea of Japan (the total area of each region is about 200-300 hectares, for a total of about 500 hectares). - Forests in each region consist mainly of pinewoods, forming habitats for mammals and birds. - Limit citizens' access to the forests for preservation and management.
Population	TEPCO's service areas: the metropolitan area (Tokyo, Chiba, Saitama and Kanagawa Prefectures); and other areas (Gunma, Tochigi, Ibaraki and Yamanashi Prefectures, and the service area east of Fuji-gawa in Shizuoka Prefecture).	
Survey method	Visit-and-leave-questionnaire method (pollers visit households and leave questionnaires to them, and later visit them again to collect the questionnaires).	
Collection rate in %	50.1%	45.2%
No. of valid responses	500	500
Results of assessment	Willingness to pay per household(*5): Average amount:¥1,290-1,950 per year in the metropolitan area; and ¥350-1,000 per year in other areas.	Willingness to pay per household(*5): Average amount:¥1,450-2,400 per year in the metropolitan area; and ¥380-1,180 per year in other areas.
	Total number of households in TEPCO's service areas: 13.39 million in the metropolitan area; and 3.08 million in other areas.	
	Assessed value (total willingness to pay)(*6): about ¥19-28 billion per year	Assessed value (total willingness to pay)(*6): about ¥22-35 billion per year

■ **Images Used in Survey 1**

Image before project

Image after project

(*1) CVM (Contingent Valuation Method) is a methodology that performs an economic assessment of environmental values by directly asking citizens about how much money they would pay for the virtual modification of environment.
(*2) Applicable to the project of Survey 1.
(*3) Applicable to the project of Survey 2.
(*4) The surveys were carried out under the technical guidance given by Professor Noboru Hitano who is specialized in Department of Social Engineering,Graduate School of Decision Science and Technology,Tokyo Institute of Technology.
(*5) Willingness to pay, which was found by the survey, has an error. The scope of willingness to pay represents the statistical scope of the error.
(*6) The amount assessed was estimated by multiplying the average willingness to pay per household by the total number of households in TEPCO's service areas, and taking the statistical scope into consideration.

3 Improvement of Energy Efficiency in Society

Customers' efficient use of electricity is a very effective approach, of course, to promote their own energy- and cost-saving efforts, and at the same time to control global warming through efficient operations of TEPCO's electric power equipment and facilities. Together with society, including our customers, we will contribute to the construction of a society where electric power and other types of energy are used with high efficiency.

Development and Diffusion of Equipment and Systems

Load leveling (to reduce the gap of electricity demand between daytime and nighttime or seasons) provides us with economic advantages through the reduction of investment in construction of new equipment and efficient operations of existing equipment, and also contributes to resource savings and the reduction of CO_2 emissions.

We promote active efforts to develop the load-leveling and highly energy efficient equipment such as thermal storage air-conditioning systems, including our Eco Ice and electric water heaters (such as our Natural Refrigerant CO_2 Heat Pump Water Heater and electric water heaters), and provide information and proposal consulting services to facilitate the widespread use of such equipment. With such efforts, we will make it possible both to achieve energy and cost savings for customers' equipment and to promote the efficient use of our equipment.

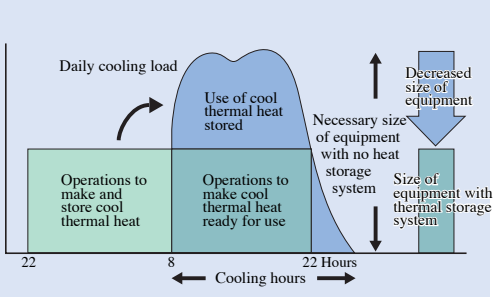
Heat Pump Thermal Storage System

This system uses a highly energy-saving heat pump that, in combination with a thermal storage tank, efficiently utilizes the heat in the air and can extract thermal energy several times greater than in input energy. It can be used for air-conditioning, hot water supply, etc.

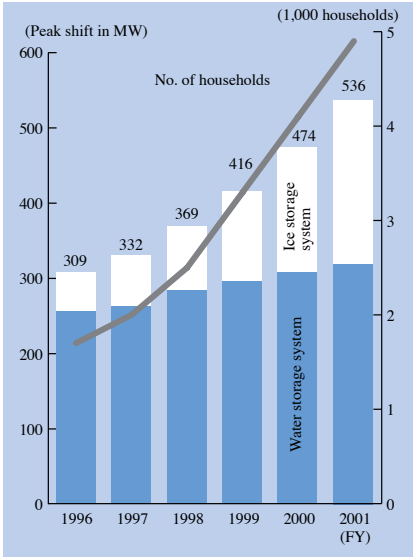
Moreover, as they store heat in the nighttime and use the stored heat in the daytime, thermal storage systems save about 10% more energy per year than non-thermal storage systems, even if the loss of thermal storage is taken into consideration, because of the effect of the rated operation of the heat source units and improved efficiency of thermal storage for cooling, which uses cool outdoor air at night.

In addition, thermal storage systems that use electric power mainly in the nighttime can reduce CO_2 emissions by about 16% compared to non-thermal storage systems. This is due to the smaller share of power generation by fossil fuels such as oil at night, and the more efficient operation of electric power supply equipment.

■Operation Pattern of Thermal Storage System



■Diffusion of Thermal Storage Air-Conditioning Systems



Changes in Major Consumers of Energy

In 1973 when the first oil crisis took place, the industrial sector, mainly the manufacturing industry, accounted for about 70% of the amount of energy consumption. Since the second oil crisis, however, the actual amount of energy consumed by the industrial sector has remained almost unchanged to date as a result of energy-saving efforts in this sector. On the other hand, the energy consumption in the service sector, including passenger cars, has consistently increased under the circumstances of recent lifestyles that pursue affluence, and reached amounts more than twice as high as the level at the time of the first oil crisis. Now, the largest consumer of energy is changing from the industrial sector to the residential and service sectors. Under these circumstances, energy and environmental issues have close relevance to society as a whole. We will promote efforts to improve the efficient use of energy in society as a whole by means of developing highly efficient equipment, providing various information and consulting services, etc.

■Diffusion of High-Efficiency Systems (in TEPCO's Service Areas)

Names of equipment and systems	Actual diffusion
Thermal storage system	Air-conditioning: about 4,900 households Cold and hot water supply: about 570 households
District heating and cooling service using thermal storage system	42 sites (5 sites of which are directly operated by TEPCO)
Eco Vender (energy-conservation vending machine)	About 530,000 units

(As of end of March, 2002)

District Heating and Cooling Service Using Thermal Storage Systems

TEPCO's district heating and cooling (DHC) systems have a very high overall energy efficiency as they use thermal storage systems with highly efficient heat pumps that can effectively utilize the heat of unused energy (such as waste heat from waste incineration plants and substation, and the energy from the temperature difference between river water, sewage and ambient air) as their heat sources.

In the case of utilization of river water, for example, the DHC systems can gain 1.3 times more energy as heat than the primary energy input at a power station.

At the "Harumi Island Triton Square" where TEPCO started its heat supply service in April 2001, about 30% more energy can be saved compared with the case of no thermal storage systems in use.

Eco Cute

In cooperation with Denso Corp. and the Central Research Institute of Electric Power Industry, TEPCO has developed and successfully commercialized the world's first natural refrigerant CO_2 water heater named the "Eco Cute," which has been marketed by several water heater manufacturers since 2001.

The Eco Cute can gain thermal energy three times higher than the electrical energy used, and saves about 30% more energy than conventional combustion-based water heaters. Moreover, as the Eco Cute reuses CO_2 produced in the manufacturing process of industrial products as its refrigerant, instead of conventional chlorofluorocarbon refrigerant, it contributes to the protection of the ozone layer and prevention of global warming.

The Eco Cute has been honored several times for its highly evaluated energy-saving, environmental protection and space-saving performance.

Eco Cute

Space-saving design of Eco Cute

■Awards and Prizes Given to Eco Cute (As of June 2002)

Date	Awards & Prizes
October 18, 2001	"The 11th Nikkei Environmental Technology Awards" sponsored by Nihon Keizai Shimbun
January 30, 2002	"The 44th Top 10 New Product Prizes in 2001" selected by Nikkan Kogyo Shimbun
January 31, 2002	"Economy, Trade and Industry Minister's Prize of the 12th Energy-Saving Grand Prize in FY 2001(Energy-Saving Equipment and Systems)" sponsored by Energy Conservation Center, Japan
March 25, 2002	"The 2002 Climate Protection Awards" sponsored by U.S. EPA
April 8, 2002	"JSME Technology Award" sponsored by the Japan Society of Mechanical Engineers
May 15, 2002	"The 22nd Technology Award and Top Performer's Lecture Award in FY2002" sponsored by the Institute of Refrigeration and Air-Conditioning Engineers of Japan
June 5, 2002	"The 29th Environmental Grand Prize" sponsored by the Hitachi Environment Foundation and Nikkan Kogyo Shimbun, and co-sponsored by the Ministry of Environment
June 6, 2002	"HTSJ Technology Award" sponsored by the Heat Transfer Society of Japan
June 14, 2002	Prize of Director-General of the Agency of Natural Resources and Energy for "The 4th Electric Power Load Leveling Equipment and System" sponsored by the Heat Pump & Thermal Strage Technology Center of Japan

Home Energy Management System (HEMS)

The development of HEMS is now well under way, aiming at saving more energy with the use of information technology (IT) to measure, control and manage the status of energy usage at home.

For the system, we are also considering adding functions to display the quantity of CO_2 produced by use of electricity and gas at home, aiming at encouraging actions that lead to the effective reduction of CO_2. (See pages 109-110 "Energy-Saving Appliances for General Households and Commercial Establishments" in Part 2. Materials and Data.)

Systems and Activities to Support the Efficient Use of Energy

Advantageous Rate Options

TEPCO has offered a variety of rate options to further promote the diffusion of high-efficiency electric appliances and the efficient use of energy.

When our electricity rates were revised in April 2002, we also set new rate options that reflect customers' requests and ways of using electricity, broadening their options. Our rate options allow customers to enjoy greater electricity rate reductions than their current rates, depending on their selection of rate options, and at the same time promote the efficient use of electricity.

Project to Promote the Introduction of Thermal Storage Systems

To help customers introduce thermal storage systems that are superior in economic efficiency and energy-saving efficiency, TEPCO offers the "Eco Pack Service," under which TEPCO designs, installs, operates and maintains heat-source equipment (thermal storage tank and heat pump) on behalf of customers. The service helps customers reduce their initial investment in and labor for operation and management of the equipment. Additionally, the most appropriate operation of the equipment based on TEPCO's know-how further improves the energy-saving efficiency and economic efficiency.

Support Systems for Energy-Saving Appliances

TEPCO offers an incentive system to promote the diffusion of its ice storage air-conditioning systems (Eco Ice). Moreover, the effectiveness of TEPCO's appliances that contribute to energy conservation and the efficient use of energy is also recognized by the central government, and a variety of official systems to support the diffusion of such appliances have been established.

■**Newly Introduced Rate Options**

Rate options	Customer category	Description	Date of introduction
Residential electrified kitchen contract (Smile Cooking Discount)	General customers	Option to give a 3% energy charge discount, except in summer, to customers who use 200-volt rated cooking heaters such as IH cooking heaters.	June 1, 2002
Commercial electrified kitchen contract	Commercial customers	Option to discount energy charges of the kitchens in contract, except in peak hours in summer, for customers who use electrified kitchen equipment of 30 kW or higher.	April 1, 2002
High-load low-voltage contract	General customers	Option to set the rates that more clearly reflect the difference of load factors for the low-voltage customers (whose contract demand is 30 kW and higher to less than 50 kW) who are provided both with lighting and power services, and that become comparatively inexpensive, if the customers use their electricity in an efficient manner throughout the year.	April 1, 2002

Distribution of Information and Advice

Reductions in small amounts of wasted energy consumption that tend to be overlooked in daily life can lead to significant energy conservation from an overall point of view. TEPCO provides useful information about energy conservation in various ways, such as through TV commercials, web sites on the Internet, various brochures, and monthly "notices of energy consumption" (receipts).

Consulting Activities

TEPCO offers an "Energy Consumption Diagnostic Service" of buildings and plants to industrial customers at their request. The service includes activities that diagnose the energy use of buildings in detail based on measured data, and gives customers advice and proposals about the more efficient use of energy and cost reductions.

We also provide an IT-based energy consumption diagnosis service (EsP), and promote activities that contribute to specific and continuous reductions of environmental loads.

Proposals for Energy-Saving Houses

We actively propose our "electrified houses" that are safe, comfortable, and superior in cost efficiency and environmental protection performance. The use of highly energy-efficient electric equipment that consumes energy at home, such as air conditioners, water heaters and kitchens, saves energy, and requires less ventilation than the use of fire in houses. Such electrification is best suited for highly airtight and insulated houses. Our "electrified houses," which combine houses that lose little energy with highly efficient electric equipment to achieve much higher energy-saving performance than that of conventional houses, are highly evaluated for their cost efficiency, safety and comfort.

TEPCO is also actively engaged in residential energy-saving efforts such as the "Comfortable Home Design Contest" that is held in consideration of the efficient use of energy, and the "Housing and Town Planning School" that has been operated since fiscal year 1995 for the purpose of supporting the activities of the architects and builders who are focusing on the construction of "Energy-Saving and Ecology-Minded Houses."

New Businesses and Services to Help Customers Improve Efficiency of Energy Use

ESCO Service

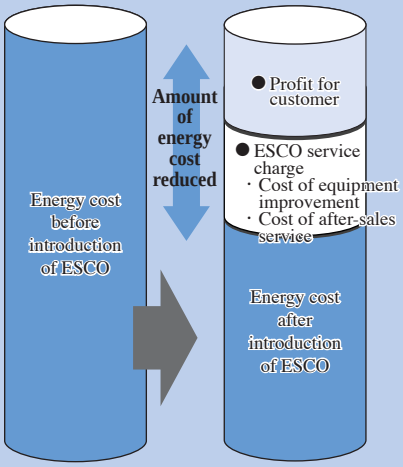
The ESCO(*) service is one of our business models which provides comprehensive services, including procurement of funds needed by the owners of buildings for energy conservation diagnosis and improvement of energy efficiency, improvement work, and measurement and assurance of energy-saving effects. It has received much attention as a business technique to facilitate the improvement of energy efficiency of existing buildings.

Aiming mainly at providing this ESCO service, TEPCO, Mitsubishi Corp., Kandenko Co. and Yamatake Building Systems Co. jointly established JAPAN FACILITY SOLUTIONS, Inc. (JFS) in December 2000.

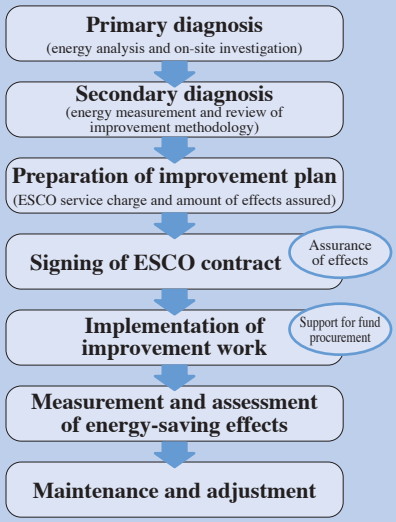
Since its establishment, JFS has offered its ESCO services particularly to office buildings that are rapidly increasing energy consumption, and concluded ESCO contracts with eight buildings as of the end of March 2002 (one university hospital, three commercial establishments, two banks, one sports club, and one education & training facility).

Moreover, as one of the items to be procured based on the Green Purchasing Law (the law on promotion of government's procurement of environmentally acceptable articles, which was promulgated on May 31, 2000), the ESCO service will be introduced in the Joint Office of the Ministry of Economy, Trade and Industry as the first example of procurement by government ministries and agencies. In addition, JFS has also been successful in a competitive bidding and awarded a contract for energy-saving diagnosis services for a building of the Ministry of the Environment in the Shinjuku Imperial Gardens, Tokyo. These two contracts for energy-saving diagnosis are expected to represent an exemplary model for similar services.

■Structure of ESCO Service



■Flow of ESCO service



(*) ESCO stands for Energy Service Company, and represents a generic name for the providers or business model of comprehensive energy-saving services.

Direct Sale of NAS (Sodium-Sulfur) Battery

The NAS battery has a high electric power storage capability (about three times as high as that of a lead-acid battery), and is compact and has a long service life. As it uses low-cost nighttime power, this battery can reduce energy costs, and it can be used as a back-up power supply in case of an emergency such as a momentary voltage drop.

In cooperation with NGK Insulators, Ltd., TEPCO has been engaged since 1984 in the development of the NAS battery. In fiscal year 2002, TEPCO started the direct sale of the NAS battery, and also began one-stop services, including installation, monitoring and maintenance of the battery.

Characteristics of NAS Battery System

①Excellent cost efficiency
Electric power costs can be reduced by storing electricity during nighttime and using the stored electricity during daytime.

②High reliability of power supply
Momentary voltage drops can be prevented. Stable power can be immediately supplied in case of service interruptions.

③Excellent environmental performance
No combustion is required, and no air pollutant is released. Use of low-cost nighttime power with a low ratio of fossil fuels used contributes to CO_2 reduction.

④Space-saving design
The small-size, light-weight and compact design contributes to space saving.

■Case Examples of NAS Battery Systems Installed

	Customer [purpose of installation]	Installed capacity	Date of installation
Japan	Kanagawa Brewery of Asahi Breweries, Ltd. [the system also serves as an emergency electricity supply unit] [test to confirm practical use]	1,000kW	September 2001
Japan	Kasai Sewage Treatment Plant of Tokyo Sewerage Bureau [emergency electricity supply unit/backup power supply]	1,000kW	December 2001
Japan	Ebina Office of Fuji Xerox Co. [test to confirm practical application]	1,000kW	March 2002
Japan	Tokyo Metropolitan Tsubasa Sogo Senior Highschool [test to confirm practical application]	200kW	May 2002
Overseas	Engineering Center of AEP(*) [a power supply unit as a measure against momentary voltage drops, which is also aimed at PR]	100kW	Summer of 2002 (plan)

(*) AEP stands for American Electric Power Co. (headquartered in Ohio).

Views of the TEPCO Advisory Committee on Environmental Affairs

The TEPCO Advisory Committee on Environmental Affairs has set forth various views on the Company's managerial tasks in general, its efforts to tackle environmental problems and its 2002 Environmental Action Report. The views of the committee are summarized below.

Members of the TEPCO Advisory Committee on Environmental Affairs
Mr. FUKAMI Hiroaki, Professor Emeritus, Keio University
Ms. KUROSAKA Miwako, Senior Associate, World Resources Institute
Mr. MORISHIMA Akio, Chair of the Board of Directors, Institute for Global Environmental Strategies
Mr. NAGATA Katsuya, Professor of Science and Engineering, Waseda University
Mr. OKAJIMA Shigeyuki, Executive Director, Japan Environmental Education Forum
Mr. YOKOSHIMA Shoji, Professor of Regional Political Science, Takasaki City University of Economics

1. Liberalization of the Power Market and Social Responsibility with emphasis on Environmental Protection

○In the light of "free riders" who sell products but do not care about what happens later, problems concerning extended producer responsibility in durable consumer product manufacturing industries and difficulties involved in securing stable supply of electricity from a long-term viewpoint have some structure in common. To deal with these problems a number of questions must be answered, such as how response to long-term tasks should be assessed, how long-term tasks should be brought home to citizens, and how uncertain elements should be quantified.

○The present market mechanism basically does not allow a long-term market to exist. The time span concerning the concept of sustainability is very long, as this concept requires consideration for inter-generational equity. Unless the time span is corrected, a number of issues will become a trade-off. Moreover, a system that allows a stable supply of energy to be incorporated in the market mechanism is not existent as yet.

○An earnest discussion is going on about globalization and liberalization. Since long-range stability in power supply is important, electric utilities must have second thoughts about liberalization and work out a logical strategy to make an effective rebuttal against it. For instance, there is an argument that trade and environmental protection are compatible with each other. But trade actually leads to a widening gap between the rich nations and the poor nations and environmental disruption spreads. There is a great gulf between a plausible theory and reality.

○Viewed from an economic perspective, nuclear power is primarily in conflict with the market mechanism and liberalization. Nuclear power requires heavy initial investment and entails a depreciation burden for a long period of time. It cannot be evaluated in the short term accordingly. In addition, an undertaking that involves grave uncertainty about the future is difficult to carry out from the management point of view. The market mechanism alone does not justify such an undertaking.

○Although the reserve-to-production ratio of LNG is believed to be high, there are some who contend that the R/P of LNG is 60 years or so and that of oil is 40 years. While nuclear plant operators are facing various risks, they shoulder a heavy initial investment burden to brace for the future depletion of energy. The market mechanism will never allow them to do so. The electric power industry should clearly inform the public of that fact and gain their understanding.

○Considering the importance of constructing an infrastructure, we are basically opposed to liberalization. The electric power industry is essentially an infrastructure-intensive industry. At present, however, an argument for short-term price cuts based solely on economic principles comes before the business status. In a sense, it is a premature start. It is electric utilities' social responsibility to make clear what the public really wants — a ¥1 reduction in charges for 1 kWh of electricity, or a stable supply of electricity.

○It is far-fetched to argue that every person should be allowed to use power lines just because it is important to consider how essential facilities, such as railways, roads, and electric service facilities, should be used by the general public. It is too simple-minded to contend that power lines should be liberalized and prices should be lowered. If liberalization does not result in lower prices and does not lead to a stable supply of electricity, it will be a total failure. A national discussion should be encouraged as to how essential facilities should be used to promote the public interest.

○The Japanese electric power industry is often said to have a high cost structure. But the general public will understand if the industry takes accountability for its actions by disclosing efforts that it makes to achieve cost reductions. Consumers on the receiving end of this accountability must take a step forward and share the responsibility with the industry.

○Considering Enron's failure, we doubt whether liberalization and the market mechanism are really desirable. When we think about sustainability with particular reference to comparable importance, the lack of a firm policy or strategy about essential necessities, such as food, will put our national interests in jeopardy. The liberalization issue must be considered from this point of view.

2. Corporate Image of TEPCO Concerning the Environment

○A corporation that has a good image carries out effective, plain and specific strategies. We read a newspaper article about TEPCO the other day. The article was very accurate and sincere but it failed to get TEPCO's message across. This does not help create a good image of the company. TEPCO must express itself in ways which are unambiguous and understandable to the public. You must present various aspects of yourself when you act in public.

○The public's main images of electric utilities are nuclear power plants and power lines. You must exercise your ingenuity and resources in order to make public what you are doing behind closed doors in ways which are easy to understand, for example, using illustrations.

○In the evaluation of corporate images, most leading companies are selling tangible products. For electric utilities, product differentiation is difficult. Electric power companies, including TEPCO, have established themselves through their own efforts as business operators who do not interrupt electric service and who ensure a stable supply of electricity as a matter of course. Electric power companies find it difficult to position themselves apart from the rest in these aspects.

○We wonder if an environmental element can be incorporated into a commodity called electricity. TEPCO is carrying out initiatives in this direction, such as the Green Power Fund and the Green Power Certification System, but some measures should be taken to make it clear to general consumers that the value of the environment is incorporated in electricity.

○Corporate image is connected with the main subject and performance. The main subject means that main operations (environmental protection achievements) are satisfactory and these operations must be performed before anything else. Yet another factor is good publicity. Unless efforts are made on the main subject, the general public will not judge accurately, no matter how good publicity may be.

3. Environmental Action Report 2002

○In his message at the beginning of the report, President Minami mentions "true affluence and happiness." His message has made us believe that TEPCO is pushing forward with a movement in a Japanese way by effectively combining its wisdom and technology thus far accumulated with modern science.

○This year's environmental action report newly contains an Integrated section and a feature on PCB. Various ideas, including changes in style, are also included. Overall, the report is worthy of our admiration.

○The report describes all possible measures being taken toward environmental protection. We were impressed but, at the same time, the main points were unclear. The report is neither excellent nor poor. Although it is a good job, the report lacks dramatic variations or attractions.

○The column of this year's report carries a story about CO_2 emission reductions in the transport sector and the commercial sector. We suggest that the report should not only explain TEPCO's efforts but also call upon the readers to work together. In this way, the environmental action report will go beyond the bounds of a mere corporate report to become very good one.

○The report describes the development of energy-saving products to help consumers enhance energy utilization efficiency, but it should inform consumers about the difficulties faced when emissions have increased due to increased demand, even if TEPCO devotes efforts to reduce the emission intensity in order to cope with global environmental problems.

○When it comes to environmental aspect, this report has reached the highest level of accomplishment among business corporations in the world. This is the best report that we know of. But, to go one step further, the report should not only focus on completeness but also it should endeavor to build up greater popularity.

Responding to the Views of the TEPCO Advisory Committee on Environmental Affairs

TEPCO hopes to utilize the precious views of the TEPCO Advisory Committee on Environmental Affairs in future business management decisions and introduce the relevant achievements in future issues of the Environmental Action Report and other publications.

Feature Story
TEPCO Starts Japan's First Full-Scale Treatment Project Aimed at Zero PCB
"TEPCO Yokohama Recycle Center" Starts Operation in October 2001

Challenge to PCB Treatment

As Japan's first full-scale PCB treatment plant, "TEPCO Yokohama Recycle Center" started operation on October 16, 2001. It is a great feat 30 years after 1972, when PCB was found to be harmful and the production and additional use of PCB were banned in principle.

TEPCO's challenge to PCB treatment has played an important role in leading Japan's PCB treatment. This story reviews the implementation process from the development of unique treatment technology to the construction of the treatment plant, and also introduces TEPCO's future vision in this field.

TEPCO Yokohama Recycle Center

What is PCB?

PCB (polychlorinated biphenyl) is superior in heat resistance, stability and insulation. In addition to its use as an insulating oil for transformers, PCB was widely used in paints, plasticizers, carbonless paper, etc.

However, in the wake of the Kanemi Rice-Bran Oil Poisoning Cases(*) in 1968, PCB was found to be harmful to living bodies, and PCB production was prohibited and PCB users were required to safeguard their PCB under administrative guidance.

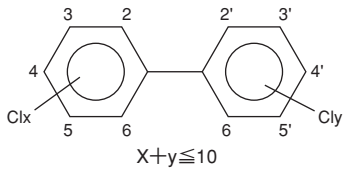
As for power generation and transformer equipment, TEPCO has about 3,700 high-voltage transformers and capacitors which use PCB as their insulating oil. The removed high-voltage transformers have been held and monitored at special storage facilities under heavy security.

From the very start, we have not used any PCB as insulating oil in our pole transformers. However, as recycled insulating oil was found to contain a trace quantity of PCB in 1989, some 1.1 million transformers were found to be so for TEPCO alone.

About half of these pole transformers have been removed to date, and kept and managed at special storage facilities.

* PCB used as a heating medium was mixed into edible rice bran oil in the process of production, and those who consumed the rice bran oil developed numbness in their limbs, eruptions on their skin, and lesion on their livers.

PCB



1-10 hydric atoms of a biphenyl ($C_{12}H_{10}$) are replaced with chlorines (Cl).

Structure of PCB

High-voltage transformer

Pole transformer

Risk of Long-Term Storage

According to the survey carried out by the then Ministry of Health and Welfare in 1993 in respect of the status of PCB-containing equipment in custody all over Japan, it was found that about 7% of the PCB-containing equipment was lost or unknown. Later surveys also found that there were lost or unknown PCB-containing equipment. The possibility has been pointed out that PCB may be inappropriately treated as a result of bankruptcies of businesses and movements of business establishments. Such a risk of long-term storage of PCB is now perceived as an environmental problem.

Why Has PCB Disposal Not Progressed?

The government established the Association for the Treatment of Electric Insulators (liquidated March, 2002) earlier on to take measures for PCB treatment.

In 1985, the then Environment Agency conducted burning tests of liquid waste PCB at the Takasago Plant of Kaneka Corp. Then, about 5,500 tons of PCB possessed by the plant was treated over a two-year period.

But, as the "high-temperature combustion method," which is permitted as a way of PCB treatment by the Waste Disposal and Public Cleansing Law, generates flue gases, it was difficult to win the understanding of local residents for the siting PCB treatment facilities. For these reasons, this was the only case of actual treatment of PCB in Japan.

On the other hand, the PCB treatment by the high-temperature combustion method has been actively under way overseas, particularly in European and American countries, and some of these countries have also introduced a chemical decomposition method, aiming at recycling insulating oil.

TEPCO Starts Efforts for PCB Treatment

Under the circumstances, TEPCO decided to treat its PCB on its own and started research and development on safe and reliable PCB treatment technology, as it determined that starting PCB treatment as early as possible could reduce the risk of long-term storage of PCB.

In other words, we aimed at the development of PCB treatment technology by means of a "chemical decomposition method" featuring lesser load on environment and enabling safe treatment, rather than the conventional high-temperature combustion method for which it is difficult to win the understanding of local residents.

Development of New Treatment Technology

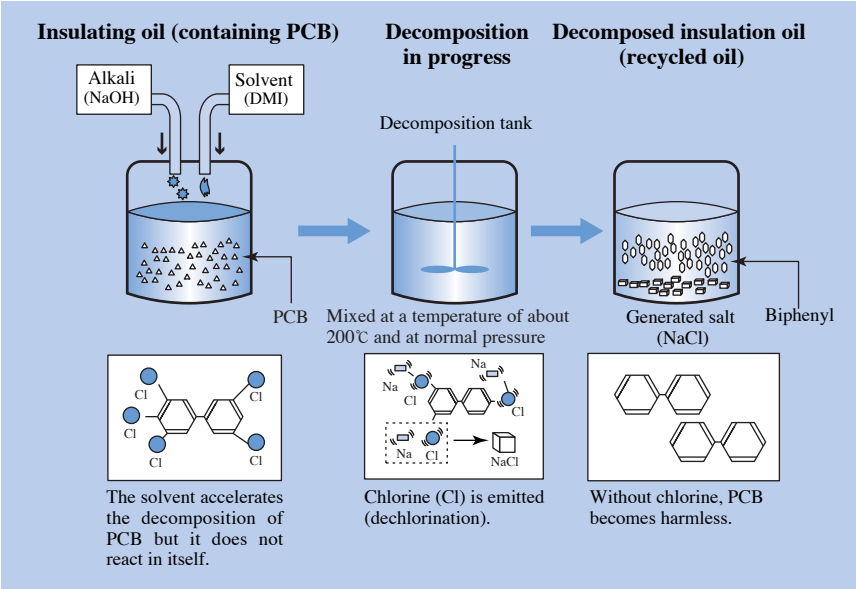
In 1996, three years after we started the development, we developed our "chemical extraction/decomposition method" jointly with Mitsui & Co., etc., in cooperation with the Production, Development and Science Institute.

Under the chemical extraction/decomposition method, PCB-containing insulating oil is added with alkalies (NaOH, etc.) and catalytic solvents (DMI(*)), and they are mixed together in a decomposition tank under moderate conditions of normal atmospheric pressure and temperature of about 200 degrees centigrade. Then, the chlorine of PCB reacts with the alkalies, and PCB is dechlorinated and decomposed into alkalies (NaCl, etc.) and biphenyl.

(*)DMI (1,3-dimethyl-2-imidazolidinone) is an easy-to-handle solvent because of its high boiling point, high flash point, and easy mixing in water and organic solvents. DMI is used in a wide range of areas such as pharmaceuticals, electronic components, etc., because of its superior solvability and stability.

■Characteristics of Chemical Extraction/Decomposition Method

- PCB is safely decomposed under such relatively mild reacting conditions as a temperature of about 200℃ and normal pressure.
- No flue gas is produced because of treatment in a closed system.
- Decomposition results in biphenyls and salt; no dioxins are produced.



Progress in Achieving PCB Treatment

To achieve PCB treatment, the government has also established laws that allow the application of the new treatment technology developed by TEPCO and others such as the chemical decomposition method, and also established standards such as target values for treatment.

Establishment of a system to assess PCB treatment technology (in or after 1995):

The then Environment Agency and the Ministry of International Trade and Industry formed respective committees, and both committees assessed TEPCO's chemical extraction/decomposition method from a technical point of view and evaluated the method as the first practicable treatment system other than the high-temperature combustion method. In the meantime, the then Ministry of Health and Welfare formed a committee to investigate and review technical matters as the basis of working out treatment standards, and collect and organize technical information and data.

Revision of government and ministerial ordinances related to the Waste Disposal and Public Cleansing Law (establishment of PCB treatment standards):

Based on the assessment results of the review committees of the Environment Agency and the Ministry of International Trade and Industry, the Ministry of Health and Welfare revised the government and ministerial ordinances related to the Waste Disposal and Public Cleansing Law in 1997, added the chemical decomposition method in addition to the high-temperature combustion method, and established the PCB treatment standards.

As a result, TEPCO's chemical extraction/decomposition method was officially recognized as a PCB treatment method (dechlorination method) based on the Waste Disposal and Public Cleaning Law. Then, TEPCO announced its plans to build Recycle Centers in Yokohama and Chiba to treat its PCB in possession, and Kawasaki Recycle Center to wash and clean the transformers and other containers from which insulating oil is removed.

Activities to Win Understanding of People to Build Treatment Facilities

TEPCO has made outstanding efforts to win the understanding of the local governments and residents concerned in constructing PCB treatment facilities.

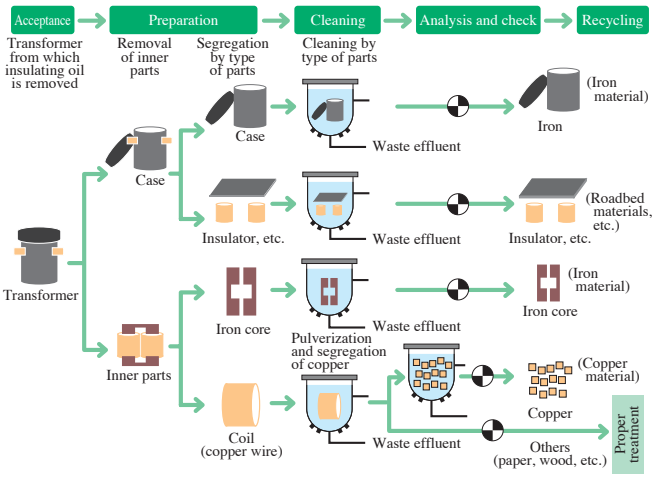
In the case of the Yokohama Recycle Center:

- TEPCO began prior briefing for and consultation with the local government in November 1997; and
- TEPCO prepared voluntary procedures in accordance with an environmental assessment, though it is not a facility subject to the assessment prescribed by the municipal ordinances.

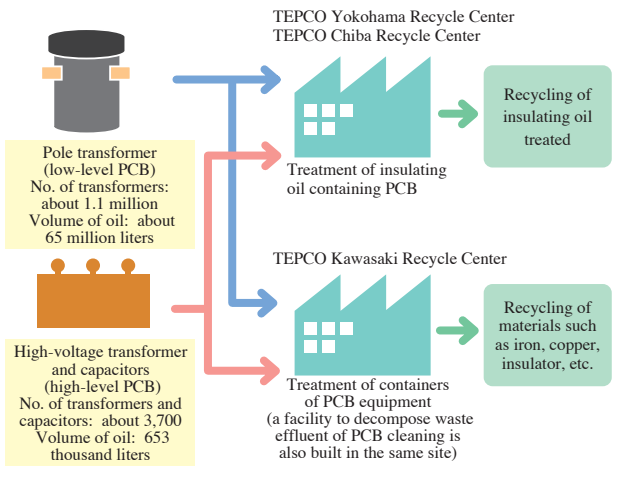
For about three years, TEPCO carried out more than 300 consultations with the local government and residents, and other activities to win their understanding. Such honest efforts worked well, and the Yokohama municipal government approved the construction of the treatment facility on September 1, 2000, based on the Waste Disposal and Public Cleansing Law. In the case of the Chiba Recycle Center, TEPCO also promoted similar activities on a voluntary basis to win the understanding of the local government and residents concerned. As a result, TEPCO was granted approval by the Chiba municipal government to build the facility on March 30, 2001.

The Kawasaki Recycle Center, on the other hand, went through many procedures to build the recycle center from January 2000 as a facility subject to the assessment prescribed by the municipal ordinances in terms of environmental impact assessment, including public inspection of environment impact statements, consideration of opinions, explanation meetings for local residents, public hearings, assessment review meetings, etc. Then, TEPCO was granted approval by the Kawasaki municipal govern-

■Flow of Container Cleaning



■PCB Treatment Plan



ment on May 22, 2001 to build Japan's first facility to treat PCB contaminants.

With these facilities, TEPCO established a system to decompose and recycle PCB-containing insulating oil on its own, and clean and recycle the containers in a consistent manner.

Further Development in PCB Treatment

Full-scale PCB treatment has finally made its first step after 30 years. The central and local governments will finally promote nationwide treatment of PCB in accordance with the "Law Concerning Special Measures for Promotion of Proper Treatment of PCB Waste" (enforced in July 2001).

The focus of PCB issues is now shifting from storage to treatment. Under the circumstances, in order for PCB treatment to be actively promoted from now on, we hope that the PCB treatment activities we have addressed will be of help. Thus, we will continue to address PCB treatment activities, giving top priority to safety.

Environment of and Safety Measures for PCB Treatment Facilities

Measures to Prevent Water Pollution

As for the waste water produced by neutralization washing and oil separation processes after decomposition of low-level PCB, its oil content is removed by the waste water treatment equipment in the treatment facility, and then the waste water is oxidized by catalyst to reduce its PCB concentration lower than the value specified by the restrictions on waste water.

In the case of treatment of high-level PCB, no waste water is produced by the treatment process.

The rainwater in the treatment facility is drained, after it is confirmed that the rainwater in the oily water separating tank has no layer of oil floating on the water surface.

The ocean environment around the treatment facility is also periodically monitored.

Measures to Prevent Air Pollution

The heat source required for treatment uses electricity so that no flue gas is produced. We take specific measures to clean the air exhausted and ventilated from equipment and buildings such as by using an activated carbon absorbing system, and the atmospheric environment around the treatment facility is periodically monitored.

Measures to Prevent Soil Pollution

As part of our effort to prevent oil leakage, pipes of double structure were employed for the PCB insulating oil and they were installed overhead between buildings in the facility.

Moreover, the ground level in the facility is impermeably paved to prevent oil seepage underground in case of oil leakage.

Disaster Measures

We have installed the fire extinguishing and protection equipment in the facility as prescribed by relevant laws and regulations, and also provide in our manuals for the measures to be taken in case of an emergency.

We also exercise periodical emergency drills in preparation for an emergency.

Waste water treatment equipment

Activated carbon filter

Overhead pipes and impermeable pavement

Part 2. Materials and Data

Ⅰ. Leading Examples in Fiscal Year 2001
*Examples not introduced in Part 1. Text.

■Afforestation and Nature Conservation
- Creation of Greenery Using Special Features of Localities 82
- Creation of an Environment that Can Grow Fireflies with Power Plant Water 82

■Resource Recycling
- Effective Use of Coal Ash in Large Quantities 83
- Sale of Recycled Bamboo Scraps 83
- Effective Use of Sludge from Regulating Reservoirs of Hydroelectric Power Stations 83

■Environment and Energy
- Support for "Period for Integrated Study" at Elementary School 84

■Community Relations Activities
- Opening of R&D Center to the Public 84
- Recycled Planters and Flower Gifts 84

Ⅱ. Reference

■Internal Information (Detailed)
- Environmental Management Rules 85
- Current State of Research and Development (on a Continued Basis) 86
- Principle of Calculations for Environmental Accounting 88
- Relations with MOE Environmental Accounting Guidelines 89
- Assessment of the Natural Environment in Terms of Monetary Value at the Oze Marshland 89

■Environmental Measures (Detailed)
- Purchasing Prices for Surplus Electricity from Photovoltaic and Wind Power Generation Facilities 90
- Office Neighborhood Association 90
- Air Pollution Control Measures 91
- Treatment of Radioactive Waste 92
- Environmental Protection Forest Growing and Follow-up Surveys 93
- History of Nature Conservation in the Oze Marshland 94
- TEPCO Pair Watching Program 95
- Reducing the Internal Consumption of Energy and Resources 96
- Programs for Supporting Energy Conservation and Promoting the Efficient Use of Energy 97

■General Information
- Environmental Action Plan for Electric Power Industry 98
- Domestic and Overseas Developments in Global Warming Mitigation Measures 99
- National Systems Related to Measures against Global Warming 100
- Environmental Impact Assessment System for Power Stations 101
- Nuclear Fuel Cycle 103
- Disposal of Low-Level Radioactive Waste 103
- Disposal of High-Level Radioactive Waste 104
- Effects of Electromagnetic Fields 105
- Organizational Setup for Nuclear Disaster Prevention 106
- Community Tank 106
- Effects of Thermal Storage System 107
- Energy-Saving Appliances for General Households and Commercial Establishments 109

Ⅲ. Data
■TEPCO Data 111
■Reference Data 116

Ⅳ. Glossary and Index 119

Chronology (Events Related to Energy and Environmental Protection) 127
Corporate Organization Chart of Tokyo Electric Power Company, Incorporated 128
TEPCO Overview 129

Ⅰ. Leading Examples in Fiscal Year 2001

* Examples not introduced in Part 1. Text.

Afforestation and Nature Conservation

Creation of Greenery Using Special Features of Localities

Kannagawa Hydro Power Plant Construction Office

In afforesting the restored site of the Kannagawa Hydro Power Plant that utilizes a drop in elevation between the Minamiaiki River that flows through Minamiaiki-mura (in Nagano Prefecture) and the Kanna River that flows through Ueno-mura (in Gunma Prefecture), we aim to reproduce a rural mountain covered mainly by deciduous broadleaf trees, which provides, in addition to disaster-preventive functions, opportunities to visitors to enjoy a natural environment where they can gather natural products, take a rest or spend their time learning.

In cold districts rising high above the sea level like the construction sites of hydro power plants, it is difficult to maintain the normal growth of trees after planting, even if the soil and weather of the locality are suitable for afforestation.

Therefore, this construction office collected the seeds of the native trees around the site of the power station, and planted the seedlings raised from these seeds together with the seeds themselves. In planting the seedlings, we modeled after natural forests by growing multi-stratum forests with needleleaf trees and deciduous broadleaf trees living together, and the density of planting in some areas was made low.

Seedlings and seeds are planted together

Satisfactory growth was confirmed
(the seeds 10 months after they were planted)

As a result, these methods have proven to provide the following effects, and we confirmed their favorable growth:

- -Early realization of conditions close to natural forests through the diversification of tree species and ages
- -Improvement of soil environment by utilizing the nature-restoring capabilities of plants
- -Action of seedlings to accelerate the growth of germinated seeds
- -Realization of a abundant ecosystem for shrubby flowering plants and fruit-bearing trees that attract wild birds

Creation of an Environment that Can Grow Fireflies with Power Plant Water

Anegasaki Thermal Power Station,
Higashi Thermal Power Office

Our Anegasaki Thermal Power Station set about activities in 1998 to create an environment that can grow fireflies.

As firefly growing requires clean water, a clean riverbed and the raising of marsh snails (Semisulcospira bensoni) – the staple food for the insect, steps were taken to prepare a desirable environment, including an increase in water flow through the brooklet for circulating power plant water and the improvement of the stream bed by placing a gravel and sand layer on it. In October 1999, after a year of preparations, we stocked the brooklet with about 400 larvae of genjibotaru fireflies (Luciola cruciata) and a sufficient number of marsh snails. In June 2000, we saw fireflies flitting over the stream, showing tiny spots with a fascinating glow. We released larvae of fireflies in October 2000, and we could also identify the flow of fireflies in May 2001.

Larvae of fireflies were released into the improved brooklet.

Resource Recycling

Effective Use of Coal Ash in Large Quantities
Hitachinaka Thermal Power Plant Construction Office

Among major tasks at coal-fired thermal power stations is the effective utilization of coal ash. For many year, our Hitachinaka Thermal Power Station has pushed forward with a technology development project aiming to expand the use of coal ash from the plants in the future. In plant construction works using the technology developed under the project, the power station adopted CA (coal ash) concrete for the foundation of a tank and CA mortar for the root wrapping concrete for circulating water piping. In addition, perforated prestressed concrete (PC) boards(*) made with CA-based artificial multifunctional aggregate were used for the lower part of turbine buildings' external walls. Up to now, the power station has effectively used 4,800 tons of coal ash for its plant construction works.

(*) Concrete panels pre-manufactured at factories, etc.

Tank foundation using CA concrete

Power station facility using PC boards for the external walls

Sale of Recycled Bamboo Scraps
Gunma Branch Office

Common Japanese bamboo grows naturally on a land lot owned by TEPCO in the service territory of the Gunma Branch Office. Sometimes the bamboo leans over the boundaries into adjacent farm roads or farmland due to snow, and the branch office is forced to thin the bamboo thicket at regular intervals. In order to effectively use felled bamboo, the branch office decided to sell it to a charcoal maker and market the recycled product under a TODEN Bamboo Charcoal brand.

The branch office started the full-scale marketing of the "TODEN Bamboo Charcoal" in October 2001, and sold about 20,000 packs of the charcoal up to the end of March 2002.

The branch office will continue to actively promote this business.

TODEN bamboo charcoal

Effective Use of Sludge from Regulating Reservoirs of Hydroelectric Power Stations
R&D Center

Regulating reservoirs of hydroelectric power stations have deposits of sludge at the bottom resulting from the inflow of river water. TEPCO removes sludge from the regulating reservoirs once every few years to maintain the effective depth of water in the reservoirs at the specified level.

No significant progress has been made in recycling sludge from the reservoirs because of its high content of water and organic matter. Since the sources of sludge are farmland and surface soil in the upper reaches of the rivers, we believe that the best way of recycling sludge is to effectively use it in the farmland in the vicinity of the regulating reservoirs. After studying the soil properties, effective content and safety of sludge, we carried out a test on the pot cultivation of cabbage using upland soil mixed with sludge properly adjusted in pH value and grain size. The test findings indicate that cabbage grows better when upland soil is mixed with sludge than when only upland soil is used.

In July 2001, with cooperation from Japan Agricultural Cooperatives (JA) Tsumagoimura Village, we began planting cabbage seedlings in a 300-m^2 bed prepared with upland soil containing 10% sludge from a regulating reservoir. In late September, we gathered cabbage from the test bed that was better than those grown in 100% upland soil, containing no sludge, in terms of growth rate, yield, taste and appearance. We are planning to study some related processes, including technology to apply sludge to suitable farmland according to its characteristics and soil improvement technology that will lead to the further acceleration of crop growth.

Demonstration test in Tsumagoimura Village

Environment and Energy

Support for "Period for Integrated Study" at Elementary School

Nishi Thermal Power Office

During a course of study on the "History of Lighting," some of the sixth-year pupils at an elementary school in Yokohama City wondered what would occur if people continued to use current levels of electricity, an essential source of energy for lighting in the present age. This led us to offer assistance to the elementary school pupils in studying the relevant subjects. After deepening their understanding of electricity service by participation in our Energy Lectures and a technical tour of the Kawasaki Thermal Power Station, the schoolchildren further extended the horizons of their study and set their next theme on what they could do to mitigate global warming. They concluded that they should make a video to provide people with information on the importance of electricity and propose their own ideas. We offered necessary data and materials to assist the schoolchildren in producing the video.

Children eager for video production

Community Relations Activities

Opening of R&D Center to the Public

R&D Center

We opened the TEPCO R&D Center (in Tsurumi-ku, Yokohama, Kanagawa Prefecture) to the general public on three days – December 13, 14 and 16, 2001. For visitors from business enterprises and research institutes, the R&D center displayed an NAS (sodium-sulfur) battery system (for further details, see page 74), a municipal disaster countermeasures support system, and other recent results of research activities that meet customer requirements. In addition, the R&D center made extensive presentations on CO_2 recovery technology, rooftop afforestation experiments, and projects to develop other technologies that will help create a rich global environment.

For elementary school children and lower secondary school students, the TEPCO R&D Center held many events on the theme of "TEPCO Techno Asoboland," including earthquake experiences and lightning experiments, so that visitors could enjoy learning about electric phenomena and wonders of science.

Experience in making motors with stationery items

TEPCO R&D Center

Recycled Planters and Flower Gifts

Yokosuka Thermal Power Station, Nishi Thermal Power Office

During Environment Month in June, our Yokosuka Thermal Power Station has presented flowers to seven institutions in the neighborhood, including a kindergarten, for more than ten years. In fiscal year 2001, with a wish to establish closer relations with the local communities, the power station recycled cable drums used for reeling up electric cables, made planters with the recycled materials, and presented the planters together with flower balls and other potted flowers grown by the personnel of the power station.

Representatives of the institutions thanked for the flower gifts, and called or wrote to the power station to say, "Thank you very much for the beautiful flowers. We are carefully tending them so we can enjoy them for a long time."

Handmade planter

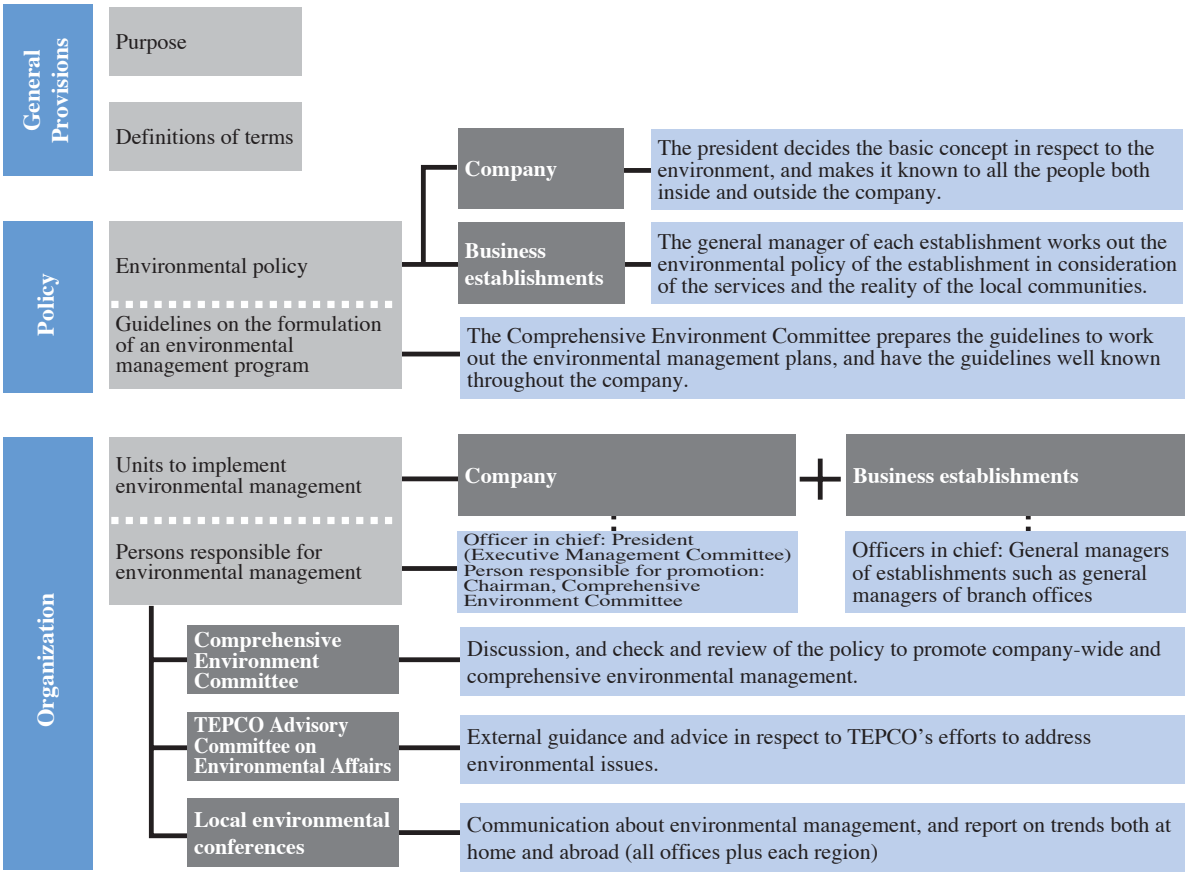
Ⅱ. Reference

Internal Information (Detailed)

Environmental Management Rules

The Environmental Management Rules (consisting of 26 articles) established by TEPCO in November 1996 specify the system of responsibilities for environmental management in the company and the roles of Head Office divisions and business establishments, particularly branch offices and power stations, implementing such management. The rules also prescribe the organizations and operational setups necessary for environmental management systems introduced at the business establishments and the details of relevant company-wide activities, including a check-and-review process by the Comprehensive Environment Committee at the Head Office and the publication of the Environmental Action Report. The rules, which systematically prescribe TEPCO's existing setups for environmental management, were formulated with reference to ISO 14001 – an international standard for environmental management systems.

■Composition of the Environmental Management Regulations



Operation

- Formulation of an environmental management program
- Promotion and implementation of environmental management
- Specification of environmental items and compliance requirements
- Management of documents and records on environmental management
- Corrective and preventive measures on noncompliance matters
- Investigation of causes of emergencies and prevention of recurrence of similar events
- Implementation of internal environmental audit and reporting of results
- Continuous improvement of environmental management

Implementation

- Establishment and implementation of communication means
- Building of an environmental partnership during Environment Month
- Disclosure of information to interested parties (preparation and publication of "Environmental Action Report")
- Planning and implementation of employee environmental education and training courses
- Environmental safeguards in awarding contracts, outsourcing, and procurement of materials and equipment
- Support to affiliated companies

Current State of Research and Development (on a Continued Basis)

Mitigation of Global Warming

Study for Improving the Performance of CO_2 Recovery Technology
1997 -

We are developing technology to recover CO_2 from thermal power plants, using a honeycomb type adsorbent. A series of tests at a small experimental plant (with a flue gas treatment throughput of 10 Nm^3/h) built on the premises of the Yokosuka Thermal Power Station has found that this technology could improve the CO_2 adsorption performance of flue gas treatment facilities. The study will be continued to further improve the energy-saving capability of the CO_2 recovery system and downsize it.

Photovoltaic Power Generation
1990 -

With photovoltaic power units built at TEPCO's establishments for research purposes, studies are conducted to assess the characteristics of various solar cells (at the Yokohama Materials Distribution Center) and examine low-cost installation methods (at the TEPCO R&D Center).

Meanwhile, the Urawa Photovoltaic Power Generation Test Plant had already attained the targets set for its operation, including, among others, the collection of sufficient data relating to the evaluation of system interconnection technologies. (The test plant was removed in 2002.)

■Various Types of Advanced Solar Cells Installed at the Yokohama Materials Distribution Center

	Type	Capacity	Conversion efficiency	Features
①	EFG (Polycrystalline)	5.8kW	12.0%	Low-cost process
②	MIS (Single crystal)	5.6kW	11.9%	Low-cost process
③	Amorphous	4.1kW	6.8%	Heat insulating panel structure adopted to maintain efficiency
④	Single crystal	5.7kW	12.5%	Low-cost product
⑤	Polycrystalline	5.8kW	12.8%	15 by 15 cm square large area cells adopted
⑥	HIT (amorphous plus single crystal)	4.3kW	15.2%	Improved conversion efficiency achieved by a laminated structure consisting of thin-layer amorphous and single crystals

(EFG: Edge-Defined Film-Fed Growth)
(MIS: Metal Insulator Semiconductor)
(HIT: Heterojunction with Intrinsic Thin-Layer)

Wind Power Generation
1993 - 2002

With a 300-kW wind turbine generator system installed at the TEPCO New Energy Park in Futtsu City, Chiba Prefecture (in 1993), we have conducted a study to grasp and analyze the power quality from the wind turbine system as connected with the utility grid. The study has achieved expected results, including the application of its findings to a preliminary examination of plans for interconnecting wind power units with the grid in our service area. (The generator system was removed in 2002.)

Resource Recycling

Research on Expanded Applications of Concrete Using Coal Ash
1992 -

In order to expand the applications of concrete made with coal ash mixed with regular materials, a study is being conducted on quality control methods for this type of concrete which is subject to significant variations in quality.

Development of Macadam Made from Coal Ash for Construction Work
1995 -

A project is under way to develop technology for producing artificial macadam from coal ash as a substitute for conventional macadam that is used in large quantities for road bed materials in civil engineering and other construction work. Up to now, we have rationalized the manufacturing process for artificial macadam and found that the proposed artificial macadam fully meets the specified standards (quality) of roadbed materials and the applicable environmental standards. In addition, we have set about a study on technology for manufacturing artificial macadam with stable quality, while conducting a series of tests on roads experimentally paved with the proposed macadam to prove its workability, long-term performance and other characteristics.

Research on Expanded Use of the Backfilling Method Using Slurry Material
1997 -

To make effective use of excavation-generated soil from such works as the installation of underground power transmission and distribution cables, we have developed slurry material(*1) with improved heat dissipation capabilities for backfilling and formulated guidelines on the selection of mix proportion for the slurry material. These development efforts enabled us to use the slurry-backfill material as a filler for propulsive pipes in installing such underground cables in the service area of the Kanagawa Branch Office. The slurry-backfill material was also used for the seawater inlet and outlet ducts of our Shinagawa Thermal Power Station. The effect of reducing pressure on the piping was proved by measuring the deformation behavior of the piping at the places when these parts were under the load of a heavy vehicle. The slurry was also used to backfill the seawater inlet and outlet ducts of our Kawasaki TPS.

Application to Underground Transmission Line Construction

(*1) Slurry Material: A high fluidity material that is a mixture of excavation-generated soil, water and solidifying materials.

Research on the Effective Use of Accumulated Soil in Ports
1998 -

In order to cut back the cost of dredging and removing soil containing silt(*2) that flows into the onsite ports of power stations as a result of cooling water intake, TEPCO has been pushing forward with a project to develop a technology for effectively utilizing such accumulated soil. Under the project, we have built a total recycling model that separates accumulated soil into sand and silt and recycles the former as aggregate and the latter as base course materials.

(*2) Silt is a category of soil that has a grain size between sand and clay.

Development of Technology for Recycling Concrete Scraps from Demolished Structures
1995 -

TEPCO is developing technology to recycle concrete scraps as aggregate. Based on the results of these development efforts, we have begun to recycle concrete scraps from demolition work at the Chiba Thermal Power Station as materials for foundation work for auxiliary facilities of the main building in the power station. We have also set about a series of tests to prove the long-term performance of materials made from such concrete scraps.

Energy Conservation and Total Efficiency Improvements

Development of Integrated Coal Gasification Combined Cycle (IGCC) Power Generation
1986 -

Integrated coal gasification combined cycle (IGCC) power generation is a technology to effectively utilize coal, an abundant fossil fuel resource, while reducing its environmental impact as much as possible. TEPCO has been working on the development of this technology under a joint project of the electric power industry. In June 2001, the Clean Coal Power R&D Co., Ltd. was established jointly by TEPCO and eight other electric utilities and the Electric Power Development Co., Ltd. to conduct a study on an IGCC demonstration plant efficiently. The R&D institute is responsible for conducting an environmental impact assessment of the demonstration plant and studying its design, construction and operation. The institute is also carrying out tasks involved in the final stage of the IGCC research and development project, such as the proving of the plant's performance, reliability and durability required at the commercialization stage and to collect necessary data on the design, operation and maintenance of commercial plants, including those on a scaleup of their capacity and the securing of their reliability.

○Outline of the Demonstration Plant
Capacity: 250 MW class
Site: Premises of the Nakoso Power Station, Joban Joint Thermal Power Co.
Target thermal efficiency: 40.5% (in higher heating value - HHP)

Development of Methods to Diagnose the Thermal Efficiency of Thermal Power Generation
1998 -

TEPCO has developed a method which, in the case of a decline in the thermal efficiency of a thermal power plant, makes a simple and accurate analysis of measured data at the plant to find the facility or equipment that has caused the efficiency decline. We will further develop the proposed method, along with a high-precision sensor, so that it can be applied to combined cycle power generation systems as well.

Landscaping

Development of a Color Scheme Method for Electric Service Facilities
1998 -

TEPCO developed a system that can choose suitable colors in accordance with a linguistic image in preparing a color scheme for electric service facilities so that the facilities will be harmonized with their surrounding environments. The system provides low-cost design capabilities as it can be operated by workers other than expert designers. We have already begun to use the system for practical purposes, including a review on the internal and external appearances of additions of Units 5 and 6 of the Hirono Thermal Power Station and on an external appearance renewal of the Anegasaki Thermal Power Station.

Principle of Calculations for Environmental Accounting

TEPCO's Basic Policy of Calculating Internal Environmental Costs

■Definition: Internal environmental costs refer to some or all of the additional costs to be borne by TEPCO in implementing any of the measures designed wholly or partially to secure environmental protection in its business activities.

■Costing Period: TEPCO's fiscal year (from April 1 each year through March 31 the following year)

■Form of Costs: Amounts of investments in the construction of equipment and facilities and the expenses involved in diverse activities, including the maintenance and management of the facilities, are included in the internal environmental costs (depreciation expenses for the facilities are not included in the calculation).

■Cost Calculation Standards: One of the four calculation methods shown below is employed to calculate internal environmental costs, depending on the purpose of the cost and functions.

Case	Calculation method	Representative examples
①When the purposes and functions of efforts are restricted to environmental protection	All costs (investments and expenses) involved are regarded as internal environmental costs (all-inclusive formula).	・Installation of environmental pollution control facilities, including flue gas denitrification facilities ・Afforestation in power stations, etc. ・Waste disposal and recycling
②When the purpose of efforts can be restricted to environmental protection, but essential functions are different	Differences between costs intended for environmental protection and anticipated costs not intended for environmental protection are calculated as internal environmental costs (difference formula).	・Introduction of electric vehicles (difference between costs of electric vehicles and those of ordinary vehicles) ・Introduction of low-sulfur fuels (difference between costs of low-sulfur and high-sulfur fuels)
③When some efforts are intended for environmental protection, but they are also intended to serve other purposes	Internal environmental costs are calculated at the proportional rate established according to a proportion of the purposes intended for environmental protection (proportional formula).	・Facilities designed to prevent oil spills, such as oil retaining walls (and also intended to prevent disaster)
④When efforts are intended for environmental protection, but they are also provided as social standards	In principle, costs involved in these efforts are not included in internal environmental costs.	・Installation of copy machines that use recycled materials (typical efforts at present)

TEPCO's Basic Policy on Benefits in Environmental Accounting

■Definitions

①Internal Economic Benefits: These benefits refer to the economic advantages which are actually brought forth inside the Company by the implementation of environmental preservation measures.

The following potential economic benefits, which are unsubstantial, are excluded from the internal economic benefits because it is difficult to calculate these potential benefits with sufficient rationality and social acceptability at the present stage.

(Examples)

・Contributory effects of complying with legal environmental regulations on business earnings
・Risk-avoiding effects of proper environmental management
・Corporate image improving effects of public relations, press releases and other information activities

②Environment Improving Effects: Environment improving effects refer to benefits and environmental load reducing effects resulting from environmental preservation measures. The specific items covered by the assessment of these benefits include the effects of environmental preservation measures in reducing such environmental loads as CO_2 and SOx emissions and in creating new environmental values mainly through nature conservation activities.

■**Assessment Period:** TEPCO's fiscal year (from April 1 each year through March 31 the following year)

■Benefit Assessment Standards

Classification of benefits	Assessment method	Representative examples of benefits and calculation and assessment methods
Internal economic benefits	Determining, calculating and assessing the total amount of cost reductions and business earnings resulting from environmental preservation measures, compared with the case in which none such measures were taken.	Improvement of thermal efficiency through the introduction of the ACC power generation system, etc. ・The amount of fuel cost reductions from the reference fiscal year (FY1990) by the improved thermal efficiency Sale of byproducts resulting from the recycling of industrial waste ・Actual amount of proceeds from sales
Environment improving effects	Assessing these effects based on changes over time in environmental load from the reference fiscal year, assessment of the natural environment in money value, etc.	Reductions of such environmental loads as CO_2 and SOx ・Changes in environmental load emissions and emission intensity (i.e., assessment of environmental indicators) ・Assessment of the "Eco-efficiency ratio" comparing environmental loads with sales Preservation and management of green tracts on the premises of power stations ・Assessment of economic values by a contingent valuation method (CVM)

Relations with MOE Environmental Accounting Guidelines

Environmental Conservation Costs and TEPCO's Internal Environmental Costs

The standards for calculating internal environmental costs in our environmental accounting were set with reference to the applicable guidelines by the Ministry of Environment as well. The table on the right compares the classification of TEPCO's internal environmental costs with the MOE guidelines.

■Comparison of Cost Category under TEPCO Standards and MOE Guidelines

Category under MOE guidelines		Category under TEPCO standards
Business area costs	Pollution prevention costs	Local environmental protection (pollution control)
	Global environmental Conservation costs	Global environmental protection
	Resource recycling costs	Resource recycling
Upstream and downstream costs		Environmental management (green procurement and purchasing)
Management activity costs		Environmental management (e.g., organizational improvement) Local environmental protection (Nature preservation and environmental reconciliation)
Research and development costs		Technology development
Social activity costs		Social contribution
Environmental damage costs		Others (e.g., environment-related charges, etc.)

Environmental Conservation Effects and TEPCO's Environmental Indicators

With reference to the environmental conservation effects set forth in the MOE guidelines, we have arrangements for grasping and assessing the results of improvement efforts as our environmental indicators.

■Relations with Environmental Conservation Effects in MOE Guidelines

Environmental conservation effect indicators in MOE guidelines		TEPCO's environmental indicators
Environmental conservation effects of resources input into business activities	[Energy input] [Water input] [Resources input]	Status of development and introduction of natural energy (see pages 22-23) Amount of power purchased from natural energy sources (see pages 22-23) Internal energy and resource consumption (see pages 22-23)
Environmental conservation effects of environmental loads and waste discharged from business activities	[Emissions into the air, etc.] [Emissions into water and soil] [Discharge of wastes, etc.]	Indicators concerning CO_2, SOx and NOx (see pages 20-21) Indicators concerning radioactive substances and radioactive waste (see pages 20-21) Indicators for waste and resource recycling - e.g., recycling rates (see pages 20-21) Indicators concerning regulated CFCs (see pages 20-21)
Environmental conservation effects relating to goods and services produced from business activities		Electricity sold by TEPCO is not subject to the assessment as it involves no environmental load during its using or used conditions.
Environmental conservation effects in transport, etc.		Internal energy and resource consumption - e.g., specific fuel consumption for vehicles (see pages 22-23)

Assessment of the Natural Environment in Terms of Monetary Value at the Oze Marshland

In March 2001, we assessed the value of nature at the Oze marshland in terms of money value based on a contingent valuation method (CVM).

Outline of the Survey

○Design of the Survey

・A questionnaire was distributed to selected residents of Tokyo, followed by expanded estimations covering the whole Kanto region which coincides approximately with TEPCO's service area.

・With the subject of the assessment "the beautiful natural environment peculiar to the Oze marshland," arrangements were made to clearly indicate the value to be assessed by showing a photograph of the marshland in the present state compared to that of its devastated conditions in the past.

・To improve the reliability of results, the questionnaire used a double-bounded dichotomous choice method that shows respondents a sum of money twice, and requests them to respond with Yes or No, respectively.

○Pretest

・A pretest was conducted of 30 general citizens to check the validity of the questionnaire and, based on the test results, a decision was made on the sums of money and other items to be presented.

○Implementation of the Survey

・The survey covered 1,920 addresses in Tokyo, selected at random.

・To attain higher accuracy of the results, the survey was conducted through interviews with individual respondents, who gave 320 valid returns of statistical significance to the questionnaire.

○Assessment of the Value

・The environmental value of nature in the marshland was estimated by determining the willingness to pay yearly per person from the figures on the questionnaire returns and then multiplying the amount by the appropriate population of the Kanto region as follows:

(A)WTP: ¥1,072/person at the median

(B)Population: approx. 25,940,000
(the number of adults in the Kanto region)

(C)Assessed value (A) × (B) = approx. ¥28 billion

Present state of the Oze marshland (beautiful natural scenery)

The marshland in a state of devastation (deteriorated environment)

Environmental Measures (Detailed)

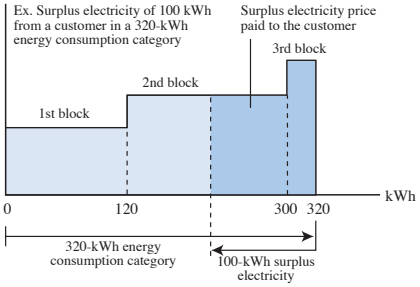
Purchasing Prices for Surplus Electricity from Photovoltaic and Wind Power Generation Facilities

In order to promote the diffusion of natural energy sources, we started a program in fiscal year 1992 to purchase surplus electricity from customers' photovoltaic and wind power generation facilities at their request.

Purchasing Prices

We purchase such surplus electricity at a price equivalent to the energy charge rate at which we offer our electric power service to customers. The purchasing price is adjusted quarterly according to the fuel cost adjustment prescribed for the energy charge in each contract category under the Rules for Supply of Electricity or the Optional Rules for Supply of Electricity.

- For Customers on Meter-Rate Lighting Service Contract B and C
  Based on the three-block energy consumption categories, the purchasing price is determined according to the third-block, second-block and first-block energy charge rates, in the order mentioned.



Electricity Purchase from Commercial Wind Power Generation Facilities

The following are the conditions under which we purchase electricity from those customers who have wind power generation facilities with a total rated capacity of less than 2,000 kW for commercial purposes and wish to sell us electricity generated by these facilities:

- Contract period
  15 years from the date of electricity supply startup
- Purchase price
  ¥11.70/kWh
  At the request of customers, the following purchase prices may be applied to the electricity they offer:

Period of application	Price
1st 5 years	¥14.00/kWh
5 years from the 6th year	¥11.00/kWh
5 years from the 11th year	¥9.00/kWh

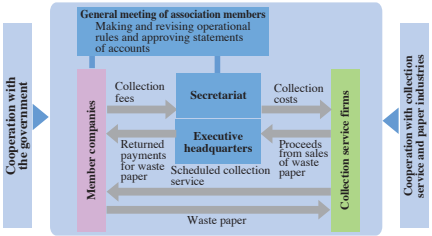
- Eligible facilities
  Wind power generation facilities with a total rated capacity of less than 2,000 kW and starting electricity supply in fiscal year 2002
- The number of wind power facilities from which TEPCO buys electricity (as of the end of March 2002): one

Office Neighborhood Association

In August 1991, TEPCO took the initiative in creating an Office Neighborhood Association, an environmental nongovernmental organization aimed at promoting the efficient and economic recycling of office waste paper. We have since then been rendering cooperation in the management of this organization.

As member corporations share wastepaper recycling know-how and systems, the Office Neighborhood Association is able to collect office waste paper smoothly. The association is disposing of office waste paper at a lower cost than when it is disposed of as general waste. The total quantity of waste paper collected by the ONA in fiscal year 2001 reached 8,756 tons, up 46 tons from the preceding year. The average amount of burden on member companies came to ¥18.4 per kg of waste paper collected in fiscal year 2001, remaining below the charge business enterprises pay to the local government for the collection of general wastes (e.g., a standard charge of ¥28.5/kg by the Tokyo Metropolitan Government).

■Operational Chart of the Office Neighborhood Association



Efforts Toward the Expanded Use of Recycled Paper

The Office Neighborhood Association is selling ONA brand paper products, made fully of waste paper from offices. Among ONA brand paper products on sale are toilet rolls, handy tissues, etc. Under the Change People's Whiteness Consciousness Project, the ONA has held symposiums in Tokyo, Osaka, Sapporo and Kita Kyushu in an effort to expand the use of recycled photocopy paper with a whiteness of 70. In fiscal year 2001, the association held a nationwide summit on the main theme: "Whiteness of 70 Is Proper Whiteness for Photocopy Paper," under joint sponsorship with the Tokyo Metropolitan Government and Japan Junior Chamber, Inc. Thus the association is carrying out positive enlightenment activities for the increased use of recycled paper.

Nationwide summit - "Whiteness of 70 Is Proper Whiteness for Photocopy Paper" held in October 2001

Air Pollution Control Measures

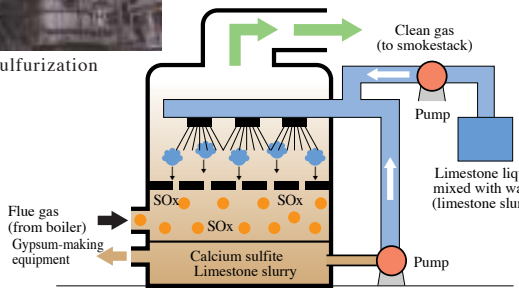
Measures to Control Sulfur Oxide (SOx) Emissions

Flue Gas Desulfurization Facilities

As a hardware solution, flue gas desulfurization facilities built on the wet lime gypsum process (whereby SOx is removed from flue gas by reaction with lime) have been installed in Units 1 and 2 of the Yokosuka Thermal Power Station. The flue gas desulfurization system is intended as a supplement to fuel measures. More advanced flue gas desulfurization systems will be set up at our Hitachinaka Thermal Power Station and Units 5 and 6 of the Hirono Thermal Power Station, which is to be fueled solely by coal.

■Process at a Flue Gas Desulfurization Facility

Flue gas desulfurization facilities



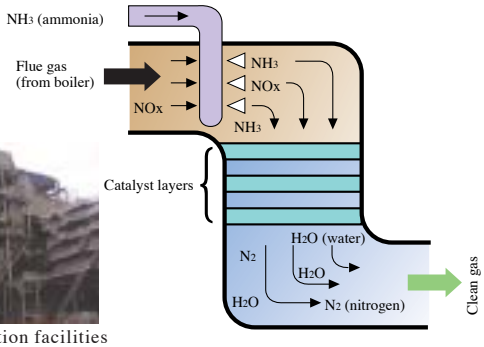
Measures to Control Nitrogen Oxide (NOx) Emissions

Flue Gas Denitrification Facilities

TEPCO has been making the best use of flue gas denitrification facilities (built on the ammonia selective contact reduction process), in which ammonia is injected into NOx-containing emissions to accelerate their reactions with one another in the presence of a catalyst to reduce NOx to N_2 and H_2O. Flue gas denitrification facilities are now set up in several of our thermal power stations, including the Chiba Thermal Power Station and the Yokohama Thermal Power Station.

■Process at a Flue Gas Denitrification Facility

Flue gas denitrification facilities



Combustion Technology Improvements

Below are some typical methods under which NOx production is controlled by restricting working temperatures within the burners of boilers and gas turbines:

①Methods for Improving Combustion by Boilers

・Flue gas recirculation

This method reduces the oxygen content of combustion air by mixing it with a portion of flue gas so as to slow down the combustion process.

・Two-stage combustion

Combustion air is led to the boiler in two stages (burner and over-air port) so that the combustion process can be slowed down.

・Low-NOx burner

Burners which restrict the high-temperature burning zone are being used.

②Combustion Improvement Method for Gas Turbines

・Premixed combustion process

Fuel and air are mixed in advance to achieve uniformity and stability of combustion.

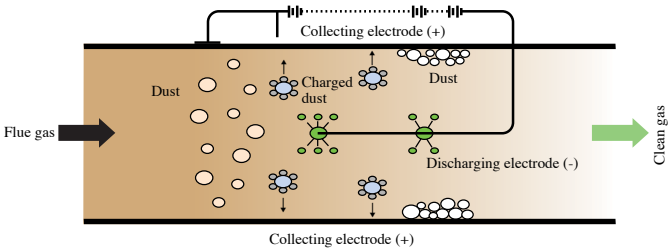
Measures to Control of Soot and Dust Emissions

Electrostatic Precipitator

All of our thermal power stations, except for those fueled solely by soot-and-dust-free gas, are equipped with high-performance electrostatic precipitators.

■Process of Electrostatic Precipitation

Electrostatic precipitator



Treatment of Radioactive Waste

Management of Gaseous Radioactive Waste

Air which has circulated through nuclear power station buildings is passed through filters before being released into the atmosphere. Likewise, extraction steam from condensers is processed to attenuate its radioactivity, and then passed through filters before being released through a stack into the air. The radioactivity of this gaseous nuclear waste is continuously measured and monitored.

Management of Liquid Radioactive Waste

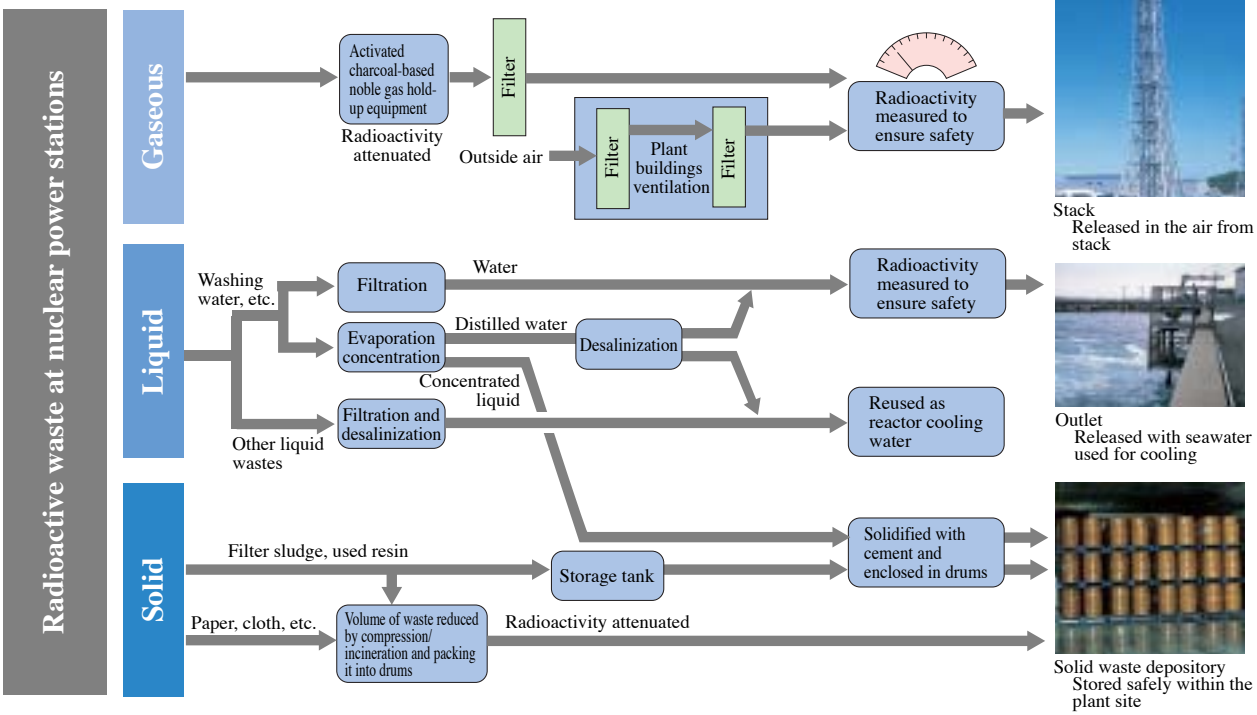
Most water used in the stations is recycled after being purified through filtration, ion exchange and distillation. Washing water and other liquid waste with very low levels of radioactivity are released through the discharge channel after we have carried out treatment, quality checks and radioactivity measurements to ensure safety.

Management of Solid Radioactive Waste

Most of the ion-exchange resins and filter scraps used for water purification in the station are stored in tanks, etc., and then solidified in drums. Part of the ion-exchange resins and filter scraps, and paper, cloth, metals and other miscellaneous solid wastes for cleaning are packed in drums after being condensed through incineration and compression. These drums are kept in the solid waste depositories within the sites of our nuclear power stations.

Because on-site storage capacity is limited, solid waste stored in the depositories is transported in sequence to the Low-Level Radioactive Waste Underground Disposal Center, operated by Japan Nuclear Fuel, Ltd., in the Rokkashomura village, Aomori Prefecture as a project to dispose of solid waste safely and efficiently in landfills.

■**Radioactive Waste Treatment Procedure**



Environmental Protection Forest Growing and Follow-up Surveys

Growing of Environmental Protection Forests

Afforestation of a power station site involves efforts to conduct a preliminary survey on the species of plants growing mainly in the natural forests in a 1 - 5 km radius around the site and, based on the survey findings, decide on the species of trees to be planted.

Seedlings of the selected species are planted at a high density of 1 - 3 trees/m^2. When they grow to somewhere between 2m - 3m in height by supporting one another under severe seashore conditions, the planted trees are left to natural selection, as they no longer need weeding or any other special management.

Seedlings right after planting

Trees growing to 2 - 3m four years after planting

Follow-up Surveys on Environmental Protection Forests

Follow-up surveys are conducted continually on environmental protection forests, artificial forests grown on the model of local nature, to see how closely they have come to resemble surrounding natural forests in quality.

①Tree Growth Grasping Survey

With a survey space of 10 m × 10 m - 20 m × 20 m set in three or four places in each environmental protection forest, the height of trees and the thickness of their trunks are measured in winter, which serves as an annual growth checking time, in order to grasp changes over time in the growth of trees.

②Vegetation Survey

With a survey space set in five or six places in each environmental protection forest, a survey is conducted on all species of plants and their distribution to compare the current state of plants in the artificial forest with those in natural forests in its vicinity.

Measurement of tree height and trunk thickness (tree growth grasping survey)

③Soil Fauna Survey

A wider variety of cryptostigmata, which decompose fallen leaves and other organic substances, are found in forests that have a more natural environment. With samples of 5 - 10 cm-deep surface soil collected, a soil fauna survey is conducted on environmental protection forests and natural forests to compare them in terms of soil composition.

At the Higashi-Ohgishima Thermal Power Station (in Kawasaki City, Kanagawa Prefecture), nine varieties of cryptostigmata were found in the reclaimed land lot before the power plants were built there. The varieties of the acarus inhabiting the power station site increased to 47 some 20 years after it was afforested. More than 80 varieties of cryptostigmata have been found in nature-abounding forests in Yokohama City, which borders on Kawasaki City. This implies that the environmental protection forest at the Higashi-Ohgishima Thermal Power Station is steadily coming to resemble natural forests in its vicinity in terms of soil fauna.

④Bird Monitoring

TEPCO also carries out surveys on birds visiting or resorting to power station sites to find how well environmental protection forests are used by wild birds, compared with natural forests.

As wild birds visiting the forests are subject to seasonal variations, four or five surveys are conducted yearly on these birds, with their chirps and appearances used as clues and with some routes and points of observation fixed. Where these surveys are continued for several years, we can determine changes in the surrounding environment from the species and numbers of wild birds observed.

A bird survey

History of Nature Conservation in the Oze Marshland

Oze is a boggy area that stretches over the three prefectures of Gunma, Fukushima and Niigata. It is known as home to many valuable natural species in Japan. TEPCO owns land that occupies about seventy percent of the entire Oze area – land lying on the Gunma Prefecture side of this district, and the Tokura mountain forest adjacent to Oze area. In the Taisho era (1912-1926), the vast tract of land and the right to use water, were acquired by an electric power company operating at that time for hydroelectric power generation. In 1951, when Tokyo Electric Power Company was founded, the rights were handed over to us. Today, electric power development projects in the Oze Marsh are a thing of the past. Water rights in this district are null and void. Still, the marshland serves as an essential green dam or headwaters protection forest. Thus, TEPCO has been engaged in diverse nature conservation activities, including constructing wooden walkways and restoring marshland fauna and flora, in the Oze district for over 30 years.

The history of the main nature conservation activities in the Oze district is as follows.

Decade	Main activities in the Oze district	Activities related to TEPCO
	Taisho era: An electric power company operating at that time acquired land and water rights in the Oze district.	
1950s	1951: Tokyo Electric Power Company was founded and acquired Oze land and water rights. 1952: The construction of wooden walkways began. 1953: Designated as a special reserved district of Nikko National Park. 1956: The Oze marshland area was designated as a national natural monument.	 Abundant nature retained in the Oze area 1958: The construction, repair and maintenance of wooden walkways began. 1969: Work to restore the Ayame Daira marshland began.
1960s	1960: The Oze marshland area was designated as a national special natural monument. Late in the 1960s: Marshlands in the Ayame Daira marshland were stripped of vegetation because of hordes of hikers. 1966: Gunma Prefecture initiated a project to restore the Ayame Daira marshland. Ayama Daira plain in a state of devastation	 Restoration work of the marshland 1970: Beautification patrol officers were posted. 1992: A 9.4 kW photovoltaic power generation system was installed at the TEPCO Oze Cottage.
1970s	1972: A take-your-litter-home campaign began.	
1990s	1992: The First Oze Summit took place. 1995: The Oze Preservation Foundation was established. 1996: Approximately 650,000 hikers visited Oze. Ayame Daira plain restored with greenery	 Photovoltaic power generation facility installed at the TEPCO Oze Cottage 1995: TEPCO, as a landowner, participated in the Oze Preservation Foundation (since its establishment). 1996: Extension of water rights was deferred. 1997: Volunteers started Japanese beech planting activities (in Tokura mountain forest). 1998: A 4.9 kW photovoltaic power generation facility was installed at the public lavatory in the Fujimi pass. 1999: Environmental protection staff were assigned to Oze, giving hikers explanations about the nature of Oze and observation etiquette. 2000: Some of the wooden walkways over the Ohshimizu marsh were replaced with wider wooden walkways. A trash collection volunteer (green volunteer) campaign began.
2000s	2001: Approximately 440,000 hikers visited Oze.	

TEPCO Pair Watching Program

The TEPCO Pair Watching Program is a drive designed to provide participants with an opportunity to come in contact with and learn about nature. The program aims at helping participants appreciate the importance of environmental protection and gain a better understanding of the natural environment that must be preserved. We have been carrying out this environmental education supporting activity since 1993.

Our concept is that if one experiences nature with someone else, such as a parent, a child or friend, the two of them will have a better chance of learning and wondering than if he or she goes alone. We call it the Pair Watching Program, and encourage our customers to take part in pairs in the program.

Observing nature in pairs at the Fukushima Daini Nuclear Power Station

Nature Observation Tours under the Pair Watching Program

This unique program offers participants an opportunity to have pleasant experiences in observing nature while learning how to make observations of nature in rich green tracts on the premises of TEPCO's power stations. The number of participants in nature observation tours so far totals 4,600 in 2,300 pairs, including parent-child pairs.

We also hold environment education workshops for teachers in order to encourage them to use the nature observation techniques they learn under the program at institutions of school education.

TEPCO Pair Watching Tours Offered by TEPCO (FY2001)

Venues	Sponsorship	Date	No. of participants
Yokohama Thermal Power Station	TEPCO	Sun, Jun. 10	90 pairs (180 participants)
Kashiwazaki-Kariwa Nuclear Power Station	TEPCO	Sat, Jul. 28	45 pairs (90 participants)
Sodegaura Thermal Power Station	TEPCO	Tue, Aug. 7	90 pairs (180 participants)
Total			225 pairs (450 participants)

Environment Education Workshops for Teachers

Venues	Sponsorship /cooperation	Date	No. of participants
International Christian University High School	TEPCO	Sat, Jun. 23	40
Tachikawa Branch of Tokyo Metropolitan School Personnel In-Service Training Center	Tokyo Metropolitan School Personnel In-Service Training Center/TEPCO	Thu, Jul. 12	30
Akatsuka Botanical Garden in Itabashi Ward	Itabashi Ward Eco PoliceCenter/TEPCO	Mon, Jul. 23	30
Sodegaura Thermal Power Station	TEPCO	Thu, Aug. 23	30
Kashiwazaki-Kariwa Nuclear Power Station /Atema Highland	National Elementary and Middle Schoolteachers' Association for the Study of Environmental Education /TEPCO	Sat, Sep. 8 and Sun, Sep. 9	40
Institute for Nature Study Attached to the National Science Museum	Tokyo Metropolitan School Personnel In-Service Training Center/TEPCO	Tue, Sep. 11	30
Tachikawa Branch of Tokyo Metropolitan School Personnel In-Service Training Center	Tokyo Metropolitan School Personnel In-Service Training Center/TEPCO	Fri, Sep. 21	20
Itabashi Ward Art Museum	Itabashi Ward Eco PoliceCenter/TEPCO	Sat, Oct. 27	30
Total			250

Pair Watching Meetings

This program comprises a contest for nature observation reports and the TEPCO Nature School, a lecture meeting on the environment (see page 62 in Part 1. Text). The reports are examined by checking how well participants have described what they observed in pairs and whether they have described new discoveries, wonders and impressions they feel. Thus far, participants in the contest submitted about 1,900 reports, of which 160 reports won prizes. (The prize-winning reports are published on the TEPCO Internet web site: www.tepco.co.jp/). Reports have also been submitted by schoolchildren at elementary and lower secondary schools that consider the program as one to provide good teaching materials in a lesson on "Period for Integrated Study."

"An exploration of the power station surrounded by greenery," a report winning a prize for fiscal year 2001

Reducing the Internal Consumption of Energy and Resources

Setting Challenging Medium-Term Targets

In order to entrench environmental protection efforts in the corporate culture and ensure the practice is continued, we consider it necessary to reduce the environmental load in our immediate surroundings by promoting the conservation of energy and resources in day-to-day activities and, through these activities, to raise the consciousness of each and every employee regarding environmental protection.

From this perspective, we have newly set the following challenging medium-term targets for reductions in the internal consumption of the four energy and resource items. We have undertaken a company-wide effort to accomplish these targets (see pages 22-23 "Environmental Indicators (Actual Values and Targets)" in Part 1. Text).

	Electricity	Water	Specific fuel consumption	Paper
Targets for FY 2005 (from the FY 2000 level)	15% reduction	15% reduction	20% improvement	50% reduction

Activities to Achieve the Targets

Our branch offices, power stations and head office departments have set their own target values based on the company-wide targets mentioned above, and are promoting activities to achieve their targets. These targets and results are checked and reviewed every year by the Comprehensive Environment Committee, and also discussed at performance evaluation meetings of our offices and stations.

Specific measures for reduction are discussed and promoted on a company-wide basis by a cross-sectional organ formed by the departments concerned, and efforts are made to help our employees develop awareness of environment protection and share information with one another on the intranet home page, etc.

■Internal Cross-sectional Organs

	Electricity and water	Paper
Promoting organ	"The E Management Working Group" (Energy Marketing Dept. and Construction Dept.)	"The Paperless Promotion Secretariats" Corporate Systems Dept., Corporate Affairs Dept., and Environment Dept.
Action	To promote energy consumption and environmental load reduction measures at our buildings and use the results in strategic marketing.	To consider specific measures based on a survey and analysis of paper consumption within the company.

■Development of Awareness of Employees through Intranet (Examples of Screens)

■Major Rate Options Available to Customers

Rate options	Customer category	Description
Time-of-Day Lighting Service [Nighttime 8-hour type] (Otokuna-Night 8) [Nighttime 10-hour type] (Otokuna-Night 10)	General customers	Different energy charges are set for the daytime and the nighttime periods, and the nighttime period, to which lower rates apply, is further divided into an 8-hour service and a 10-hour service.
Time-of-Use Lighting Service (Denka-Jozu)		This service option applies different energy charges in "2-season and 3-hour periods," and offers lower electricity rates to those customers who can shift their loads from the daytime to the morning, evening or nighttime. This menu benefits customers living in electrified houses. (Discounts are available to fully electrified houses.)
Night-Only Service ・Night-Only Service ・Second Night-Only Service		The contracts are available for electric water heaters and other nighttime thermal storage equipment, offering lower electricity rates with the service hours limited to late at night.
Load Shift Contract - Heat Storage Type for Low Voltage Power Service Users		The menu allows for a discount on electricity rates in exchange for a shift of heating/cooling and other loads from day to night by thermal storage operation.
Light & Power Service Type 2 High Voltage Power Service Type 2	Commercial and industrial	A menu to encourage customers to efficiently use power and load equipment throughout the year, and heighten their load factors by setting the demand charge higher and the energy charge lower.
Time-of-Use Power Service ・Time-of-Use Light & Power Service ・Time-of-Use High-Voltage Power Service		The contract offers TOU-differentiated energy rates for "2-season and 3-hour periods" to encourage a load shift from the summer peak period or the daytime to the nighttime, Sundays or national holidays.
・Time-of-Use Light & Power Service Type 2 ・Time-of-Use High-Voltage Power Service Type 2		These service options offer lower electricity rates to those customers who can shift their loads from the summer peak period or the daytime to the nighttime, Sundays or national holidays and also efficiently use their power and load equipment throughout the year.
Holiday High-Load Power Service ・Holiday High-Load Light & Power Service ・Holiday High-Load High-Voltage Power Service		A menu to encourage customers to shift their loads from weekdays to holidays by setting the energy charge on weekdays higher and that on holidays lower.
・Holiday High-Load Light & Power Service Type 2 ・Holiday High-Load High-Voltage Power Service Type 2		These options offer lower electricity rates to those customers who can shift their loads from weekdays to holidays and also efficiently use their power and load equipment throughout the year.
Load Shift Contract - Heat Storage Type ・Load Shift Contract - Heat Storage Type for Commercial Customers ・Load Shift Contract - Heat Storage Type for Industrial Customers		The menus allow for a discount on electricity rates in exchange for customers possessing thermal storage tanks to shift loads from daytime to nighttime through the thermal storage operations of equipment.
Rate Incentive for the Ice Storage Air-Conditioning System		This measure offers a greater discount rate when the system is newly installed than under ordinary load shift contracts. After a certain period of time, the discount rate is reduced.

Official Diffusion Support Programs

As a result of TEPCO's efforts to persuade regulatory authorities, the following official support programs have been established to promote the diffusion of equipment and systems conducive to energy conservation and the efficient use of energy.

○Financing Program to Promote the Widespread Use of Ice Storage Air-Conditioning Systems

This program provides a government subsidy covering the installation cost of the Eco Ice system. The subsidy is available for ① those one-on-one dispersed ice storage air-conditioning systems which are below 10 h.p. in capacity, and ② those systems which are over 10 h.p. in capacity and have a peak-shift-rate of not less than 40%. The amount of the subsidy to be granted is ① one third of the difference between the installation cost (including work expenses) of an ice storage system and that of a non-thermal storage system and ② 30% of the difference, respectively.

○Tax Incentive for the Promotion of Investment in Reforms of Energy Supply-Demand Structure (Energy Reform Tax Credit Program)

Under this program, businesses who install equipment conducive to energy conservation and load leveling are allowed to deduct 7% of 50% of the equipment acquisition cost from their corporation tax or income tax (this deduction being applicable only to small- and medium-sized enterprises) or to add 30% of the acquisition cost to initial-year depreciations as a special depreciation.

○Low-Interest Financing Program by Government Financial Institutions

This is a program that enables those who install equipment conducive to energy conservation and load leveling to obtain a loan at a low interest rate from the Development Bank of Japan, Japan Finance Corporation for Small Business, or the National Life Finance Corporation. (Qualifications for eligible borrowers, qualified equipment, and terms and conditions of loans differ from institution to institution.)

○A Program for Promotion of the Introduction of High-Efficiency Water Heater (to be launched in fiscal year 2002)

TEPCO plans to start a new system to assist the introduction of CO_2 refrigerant heat pump water heaters that are much more efficient than the conventional water heaters, in order to accelerate energy conservation in the hot water supply field that accounts for 30% of household energy consumption.

Environmental Action Plan for Electric Power Industry

Japanese electric power companies make it a basic policy to voluntarily and positively promote measures against global warming.

In November 1996, before the adoption of the Kyoto Protocol, the Japan Federation of Electric Power Companies formulated the Environmental Action Plan by the Japanese Electric Power Industry, setting forth a target of "reducing the CO_2 emission intensity in fiscal year 2010 by 20% from the 1990 level" through the promotion of nuclear power development and further improvements in the efficiency of thermal power plants in its commitment against global warming.

The action plan has been periodically reviewed to check its transparency and steady progress of measures. The fourth review in September 2001 confirmed that the CO_2 emission intensity in fiscal year 2000 decreased (by 12%) from the benchmark year level of fiscal year 1990 because of newly constructed nuclear power stations, improvements in capacity factors of nuclear power plants and in thermal efficiency of thermal power generation, and increase in the percentage composition of LNG for electricity generated. Although the climate surrounding the positioning of nuclear power plants as a pillar of measures to reduce CO_2 emissions is very uncomfortable, Japanese electric power companies are working to achieve the target by making further efforts, including improving the capacity factor of nuclear power plants, considering thermal power plant operating methods, and utilizing the Kyoto Mechanisms.

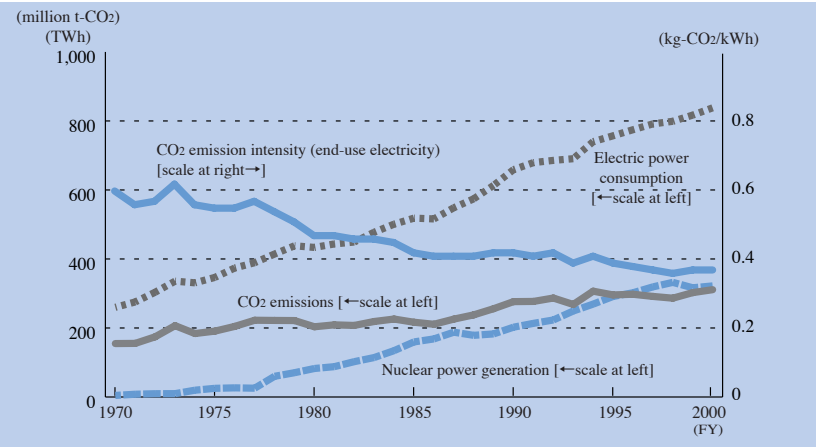
In June 1997, meanwhile, the Keidanren Voluntary Action Plan on the Environment was established, with the electric power industry and 35 other industries (now 48 industries) taking part. In the Guideline of Measures to Prevent Global Warming, the Japanese government positions this voluntary action plan as a core element of measures by industries to combat global warming.

■Electric Power Industry's CO_2 Reduction Targets and Results

Item	FY1990 (actual)	FY1998 (actual)	FY1999 (actual)	FY2000 (actual)	FY2005 (forecast)	FY2010
CO_2 Emission Intensity (end-use electricity) (kg-CO_2/kWh)	0.42	0.36	0.37	0.37	0.38	Approximately 20% reduction from the FY1990 level; about 0.3 kg-CO_2/kWh (target)
Electric Power Consumption (TWh)	659	799	817	838	894	Approximately 1.5 times the baseline figure for FY1990; 964 TWh (forecast)
CO_2 Emissions (million t-CO_2)	276	286	302	311	340	Approximately 1.2 times the baseline figure for FY1990; 330 million t-CO_2 (forecast)

*CO_2 Emission Intensity (end-use electricity) = CO_2 emissions ÷ Electric power consumption
*Fugures contain electric power purchased from joint thermal power generation companies and independent power producers and sold to customers, and amount of CO_2 when purchased power was generated.
*Compared with fiscal year 1999, the CO_2 emission intensity of electricity consumed in fiscal year 2000 remained almost unchanged because the share of thermal power in the electricity generated increased slightly, while the capacity factor of nuclear power plants rose from 80.1% in fiscal year 1999 to 81.7% in fiscal year 2000.
*CO_2 emissions will increase in fiscal year 2005 but decrease in 2010 because, according to plans, in fiscal year 2005 new coal-fired thermal power plants will go into service and from that time until fiscal year 2010, new nuclear power plants will go into operation.

■Electric Power Industry's CO_2 Emissions, etc.



Domestic and Overseas Developments in Global Warming Mitigation Measures

International Trends

Adoption of the Kyoto Protocol at the COP3

At the Third Conference of the Parties to the U.N. Framework Convention on Climate Change (COP3), held in Kyoto in 1997, the Kyoto Protocol was adopted, establishing greenhouse gas reduction targets for advanced countries.

Industrialized Countries' Reduction Targets (on the average between 2008 and 2012 compared with the 1990 level)

Japan: 6%
USA: 7%
EU: 8%
(Industrialized countries together are to achieve a reduction of approximately 5%).

The protocol proposes using CO_2 absorption sources, such as forests, and sets forth the Kyoto mechanisms, such as Joint Implementation (JI), Clean Development Mechanism (CDM) and emissions trading, as supplementary measures to domestic efforts to achieve greenhouse gas reduction targets.

International Negotiations for the Kyoto Mechanism

After years of heated international negotiations since the COP3, the COP7, held in Marrakesh, Morocco in October to November 2001, reached a basic agreement on the rules of sinks such as forests and other absorption sources as well as the Kyoto mechanisms.

Moves toward Ratification of the Protocol

Following COP7, some of the parties, including Czech Republic, the European Union and Japan, ratified the Kyoto Protocol.

The United States, on the other hand, announced in March 2001 its intention of not participating in the Kyoto Protocol. In February 2002, the country announced its own global warming control measures with emphasis on technology development, economic growth, voluntary initiatives, and nuclear power. It established a target of reducing greenhouse gas emissions per GDP by 18% over a 10-year period until 2012.

As of July 2002, therefore, the requirements for the enforcement of the protocol have not been fully met yet. More specifically, the protocol will have to be ratified by Russia and some other countries before it becomes effective.

Trends in Japan

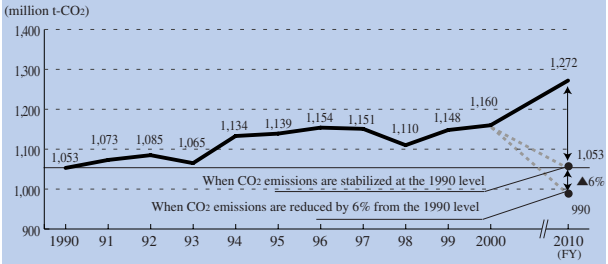
Enactment of Laws for Promotion of Global Warming Mitigation Measures

Japan enacted the following laws in 1998:

- The Guideline of Measures to Prevent Global Warming was enacted.
- The Law Concerning the Promotion of the Measures to Cope with Global Warming was enacted.
- The Law Concerning the Rational Use of Energy (Energy Conservation Law) was revised.

However, if no measures are taken, Japan's CO_2 emissions in 2010 are predicted to increase 20% over the 1990 level, indicating that the nation will have to attain a 26% reduction in real terms. This makes it very difficult for Japan to achieve the target set for reducing CO_2 emissions.

■Energy-Oriented CO_2 Emission Reduction in Japan



Source: Ministry of the Environment, etc.

Basic Policy Aiming to Ratify the Protocol

In February 2002, as the COP7 agreed on the operating rules, the Headquarters for Promotion of Measures Designed to Arrest Global Warming, headed by Prime Minister Junichiro Koizumi, came up with a basic policy aimed at:

- Achieving environmental protection and economic growth at the same time;
- Using technical innovations and ingenuities of business circles;
- Promoting energy conservation, the use of new energy sources, and nuclear power development; and
- Establishing international rules involving the United States and developing countries.

Thus the headquarters made preparations for approval to ratify the protocol by the end of 2002 and for establishment of related domestic systems.

In March 2002, the Japanese government reviewed the Guideline of Measures to Prevent Global Warming and, on June 4 the same year, Japan ratified the Kyoto Protocol. In addition, action was taken to amend the Law Concerning the Promotion of Measures to Cope with Global Warming and the Energy Conservation Law. The government also enacted the Law Concerning Special Measures for the Use of New Energy Sources, Etc. by Electric Power Companies and officially promulgated it on June 7 (for an outline of these national systems, see page 100).

When the Kyoto Protocol becomes effective, the Japanese government will formulate a program for achieving the target set forth in the Kyoto Protocol, as specified in the Law Concerning the Promotion of the Measures to Cope with Global Warming, in accordance with the Guideline of Measures to Prevent Global Warming.

National Systems Related to Measures against Global Warming

In an effort to ratify the Kyoto Protocol by the end of 2002, action was taken to consider and enhance related national systems. The following is a summary of these national systems (as for domestic and overseas developments in global warming mitigation measures, see page 99).

	Outline of the old systems	Focal points of revisions
① The Guideline of Measures to Prevent Global Warming	[A decision by the Headquarters for Promotion of Measures Designed to Arrest Global Warming in June 1998] The headquarters presented measures to be urgently carried out by 2010 to attain the target of reducing GHG emissions as stated in the Kyoto Protocol: ○Energy conservation, the introduction of new energy sources, and the promotion of nuclear power plant siting with all necessary measures taken for safety ○Introduction of a "top-runner" approach under the revised Energy Conservation Law ○Post-checkups on voluntary action plans of industrial circles ○A review of people's lifestyles, the improvement of urban infrastructure, improved maintenance of forests, etc. ○A breakdown of the 6% reduction target: ・Emission of CO_2, CH_4 and N_2O: -2.5% (Of these GHGs, the CO_2 emission target is set at ±0% in net variation for all sectors, including -7% in the industrial sector, ±0% in the residential/commercial sector, +17% in the transport sector and +5% in the energy conversion sector.) ・Emission of HFC, PFC and SF_6: approx. +2% ・Sinks such as forests: -3.7% ・Others: -1.8%	[A decision by the Headquarters for Promotion of Measures Designed to Arrest Global Warming on March 19, 2002] In a bid to attain the GHG reduction target stated in the Kyoto Protocol, the headquarters came up with a basic policy for domestic measures and also specific measures formulated under such policy. ○To build up and improve a mechanism conducive to achieving environmental protection and economic growth at the same time, effectively using technical innovations and ingenuities of business circles. ○To divide the period from 2002 to 2012 into three phases, assess and review the progress of measures at each of the milestones (2004 and 2007), and introduce necessary measures by stages. ○A breakdown of the 6% reduction target: ・Energy-originated CO_2 emissions: ±0% Industrial sector: -7% (including ±0% mentioned in Keidanren Voluntary Action Plan on the Environment) Residential/commercial sector: -2% Transport sector: +17% ・Emission of CH_4 and N_2O: -0.5% ・Emission of HFC, PFC and SF_6: +2% ・Promotion of activities by the general public and organization in various fields: -2% ・Securing absorption capacity through the sound maintenance of forests: -3.9%
② Law Concerning the Promotion of the Measures to Cope with Global Warming	[Enacted in October 1998] The law provides for a basic policy of measures to cope with global warming and responsibilities of implementing entities. [Central government] ・Formulation and announcement of GHG reduction plans (responsibility) ・Announcement of the progress of measures (responsibility) ・Decision of a basic policy and support for implementing entities [Local governments] ・Formulation and announcement of GHG reduction plans (responsibility) ・Announcement of the progress of measures (responsibility) ・Provision of information [Business enterprises] ・Formulation and announcement of GHG reduction plans (under the requirement for utmost efforts) ・Announcement of the progress of measures (under the requirement for utmost efforts) [General public] ・Emission control in daily life (under the requirement for utmost efforts)	[Revised on June 7, 2002] The law was revised to step up efforts (by adding the following measures) as a means of insuring ratifying the protocol. ○Formulating a Plan to Achieve the Target Set Forth in the Kyoto Protocol (later on under new guidelines) ○Establishing the Headquarters for Promotion of Measures Designed to Control Global Warming ○Stepping up the general public's efforts (diagnosis of measures against global warming) ○Preserving sinks mainly through improved maintenance of forests ○Examining a domestic system designed to apply the Kyoto mechanisms
③ Law Concerning the Rational Use of Energy	[Enacted in 1979; Revised in June 1998] The law provides for energy-saving measures for factories, buildings, and machinery, equipment and appliances. ○Application of the top-runner approach-based energy conservation standards ・Automobiles, electrical appliances (11 items designated by the government ordinance), and others ○Specification of Type 1 energy management designated factories ・Application: Factories consuming not less than 3,000 kℓ / year of fuel, etc. in crude oil equivalent or not less than 12 GWh/year of electricity Five designated industries (manufacturing, mining, electric power, gas, and heat supply) ・Medium and long-term plans (emission intensity reduction target: -1%/year), and submission of a periodic report ○Specification of Type 2 energy management designated factories ・Application: Factories consuming not less than 1,500 kℓ / year of fuel, etc. in crude oil equivalent or not less than 6 GWh/year of electricity ・Recording of energy consumption	[Revised on June 7, 2002] Based on actual energy demand, measures by the residential and commercial sectors were stepped up. ○Expanding the scope of type 1 energy management designated factories ・Applicable to all industries (including large office buildings, etc.) ○Imposing additional obligation to type 2 energy management designated factories ・Submission of a periodic report (instead of a record of energy consumption) ○Requiring the owners of specified buildings (buildings, other than houses, with a total floor space of not less than 2,000 m^2) to notify the authorities of their energy-saving measures.
④ Law Concerning Special Measures for the Use of New Energy Sources, Etc. by Electric Power Companies	———	[Enacted on June 7, 2002] The law requires electric power companies to supply electricity generated by new energy for at least a certain percentage of their electricity sales. ○Electricity generated by new energy: Electric power from such facilities as wind power, photovoltaic power, and those smaller hydroelectric power, waste-to-energy and biomass-fueled power plants which are designated under the applicable government ordinance ○The government sets a target for the use of new energy and requires electric power companies to use it for at least a certain percentage of their electricity sales every year. ○Electric power companies are allowed three options to discharge this obligation: ①producing electricity at their own facilities using new energy, ②purchasing electricity generated with new energy from outside supply sources, or ③transferring the obligation to other electric power companies.

Environmental Impact Assessment System for Power Stations

In Japan, environmental impact assessments for power station projects have been conducted based on a ministerial decision by the Ministry of International Trade and Industry (in 1977), while those for other projects have been based on a decision by the Cabinet council (in 1984).

Concerning environmental protection measures by the central government, however, another impetus was given to the movement toward the legalization of environmental impact assessments in the Basic Environment Law (enacted in 1993), which expressly stated "the necessity of taking measures for the promotion of environmental impact assessments." As a result, an Environmental Impact Assessment Law was enacted in June 1997 and fully enforced in June 1999.

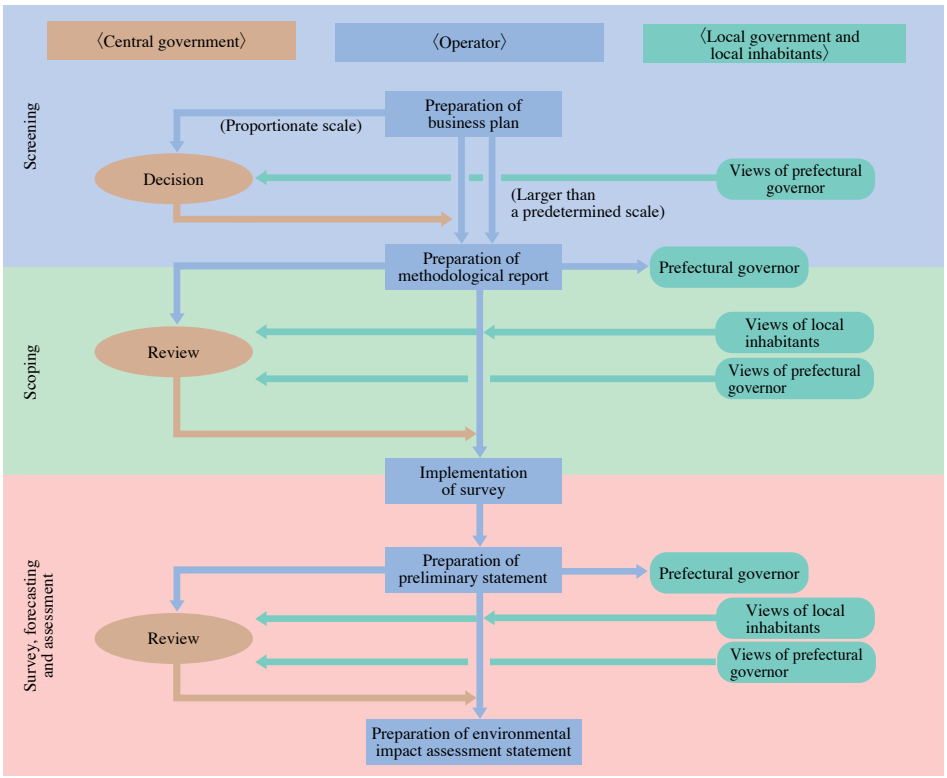
Power stations are included among the projects which are subject to the Environmental Impact Assessment Law and to the assessment procedures prescribed under the law. As for electric utilities' business plans, the Electricity Utilities Industry Law was partially amended (in June 1997) in connection with the enactment of the Environmental Impact Assessment Law to include some additional procedures, specifically METI (Ministry of Economy, Trade and Industry) reviewal of methodological reports and preliminary statements to be submitted by any of the utility operators.

A notable difference between the new environmental impact assessment system prescribed under the two laws for power plant projects and its predecessor is that the new system calls for the introduction of two mechanisms (screening and scoping procedures) which require the utility operators to hear the views of local inhabitants and local public bodies from an early stage in each project.

The previous environmental impact assessment procedure based on the then MITI (Ministry of International Trade and Industry) decision specified the size of projects that were subject to the assessment. Under the new legalized system, meanwhile, the central government decides (by screening) on a case-by-case basis whether to require an environmental impact assessment on those projects which are smaller than a certain size category (type 1 project scale(*1)) - a size subject to the environmental impact assessment procedure - but come under a similar size category (type 2 project scale(*2)), after hearing the opinions of the prefectural governors involved.

Before carrying out an environmental survey, the operator is required to prepare a methodological report stating the items and methods of the proposed survey and forecast and, after leaving the report open to public inspection, receive opinions from local inhabitants and public bodies and submit the report to the central government for reviewal, decide on the methods to be employed for the survey, forecast and assessment (a process called "scoping") and then start the assessment based on the results of the scoping.

■**Environmental Impact Assessment System for Power Stations**



		Thermal power	Hydroelectric power	Geothermal power	Nuclear power
(*1)	Type 1 project scale	150MW or more	30MW or more	10MW or more	Projects of all scales
(*2)	Type 2 project scale	112.5MW — below 150MW	22.5MW — below 30MW	7.5MW — below 10MW	————

Environmental Impact Assessment of a Construction Project for Units 1 and 2 of the Higashidori Nuclear Power Station

Submission of an Environmental Impact Assessment Process Statement and the hearing of comments
(August through October 2000)

・TEPCO prepared a document describing the items of environmental impact assessment, relevant surveys and forecasts, and the process of the assessment (an Environmental Impact Assessment Process Statement), submitted it to the Minister of Economy, Trade and Industry, and also sent a copy of the document to the Governor of Aomori Prefecture and the heads of the municipalities involved. In addition, the Company publicly announced the assessment process, opened the statement to public inspection and heard the opinions and comments of local residents.
・We compiled a report summarizing the residents' opinions and comments and our views thereof, submitted it to the Minister and sent a copy of the report to the Governor and the heads of the local public bodies involved.
(The Governor was to submit his opinion on the Environmental Impact Assessment Process Statement to the Minister within 90 days from the day on which we submitted the statement to the Minister.)

Examination of the Environmental Impact Assessment Process Statement
(August 2000 through February 2001)

・The Minister heard opinions of the Advisory Committee on Environmental Reviews whose membership consists of persons of learning and experience in various fields. After considering the Governor's opinions as well, the Minister examined the Environmental Impact Assessment Process Statement and then issued his recommendations, known as the "Minister of Economy, Trade and Industry Recommendations" (within 180 days from the day on which he received the statement).

Surveys of the Current Environmental Status
(April 2001 through March 2002)

●Surveys for preserving the natural components of the environment in a desirable condition
・Surveys on the atmospheric environment, water environment and the coastal topography
●Surveys for securing bio-diversity and systematically preserving the natural environment
・Surveys on the fauna, flora and ecosystem
●Surveys for securing good relations between humans and nature
・Surveys on landscapes and on the fields of activities to promote relations between humans and nature

Submission of an Environmental Impact Assessment Preparatory Statement and the hearing of comments
(scheduled for FY2002)

・Based on data obtained from the Surveys of the Current Environmental Status which were carried out with consideration given to the opinions and comments of local residents on the Environmental Impact Assessment Process Statement, those of the Prefectural Governor, and the Minister of Economy, Trade and Industry recommendations, we have decided to study environmental preservation measures and predict and assess the impact of the planned power plant construction and operation on the surrounding environment.
We will compile the details of the surveys, predictions and assessment mentioned above into an Environmental Impact Assessment Preparatory Statement and publicly announce the statement, open it to public inspection and hold explanation meetings on it in the local community.
・We will also compile a report summarizing the residents' opinions and comments and our views thereof, submit the report to the Minister and send a copy of the report to the Prefectural Governor and the heads of the local public bodies involved.
(The Governor should submit his opinion on the preparatory statement to the Minister within 120 days from the day on which we submit the statement to the Minister.)
・The Minister will hear opinions of the Advisory Committee on Environmental Reviews which consists of persons of learning and experience in various fields. After considering the opinions of the Governor and the Minister of Environment as well, he will examine the statement and issue the Minister of Economy, Trade and Industry recommendations (within 270 days from the day on which he received the statement).

Preparation of an Environmental Impact Assessment Statement and the hearing of comments
(scheduled for FY2002)

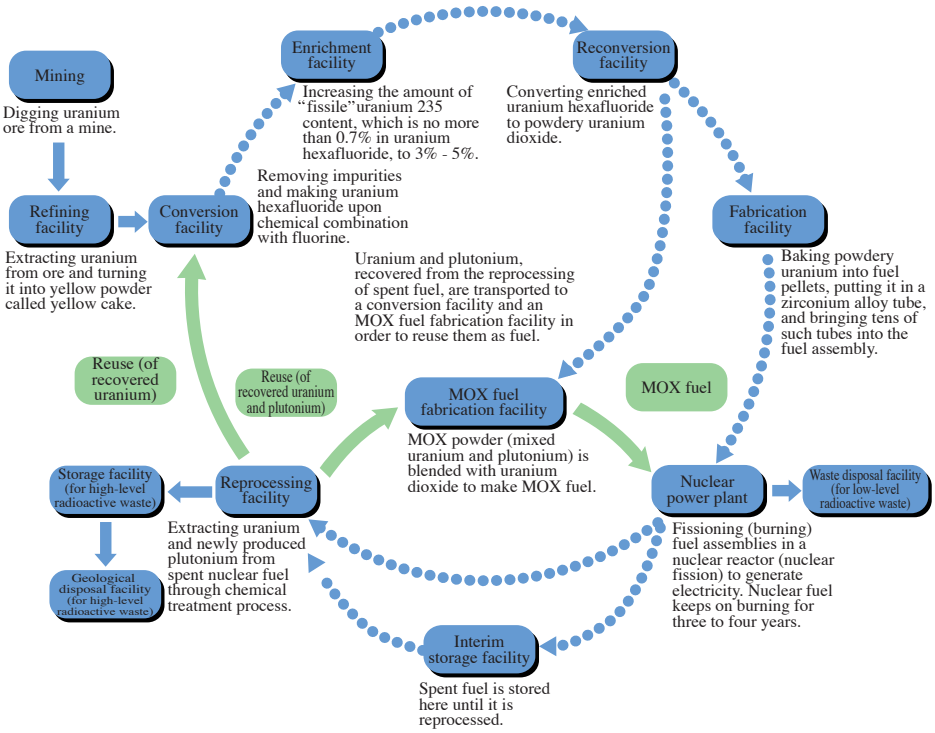
・Based on the opinions and comments of local residents, those of the Prefectural Governor and the Minister of Economy, Trade and Industry recommendations, we will review the contents of the preparatory statement, compile the results into an Environmental Impact Assessment Statement and submit it to the Minister.
・The Minister will examine the Environmental Impact Assessment Statement. If and when the statement is finalized, we will publicly announce it and open it to public inspection. With the foregoing steps, the environmental impact assessment procedure will be completed.

Completion of the environmental impact assessment procedure

Nuclear Fuel Cycle

Uranium ore extracted from mines is turned into fuel for nuclear power generation through such processes as refining, conversion, enrichment and fabrication. The nuclear fuel, after burning for three to four years at a nuclear power station, is removed as spent fuel.

Recyclable plutonium and unburned uranium are extracted from spent fuel by chemical treatment (called reprocessing) and reused as nuclear power station fuel. This series of operations is called the nuclear fuel cycle.

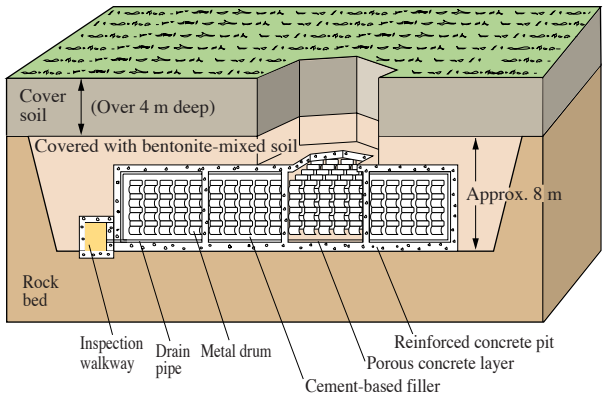


Disposal of Low-Level Radioactive Waste

Low-level radioactive waste, such as concentrated liquid waste, is solidified with cement or other materials and then filled into drums and hermetically sealed for storage. The Low-Level Radioactive Waste Underground Disposal Center, built in the village of Rokkasho-mura, Aomori Prefecture, by Japan Nuclear Fuel, Ltd., started operation in fiscal year 1992 to house these drums in underground reinforced concrete pits, with cement-based fillers placed between the drums and pits to combine them into solid assemblies.

Up until the end of fiscal year 2001, TEPCO transported approximately 60,000 solidified concentrated liquid waste drums. Moreover, we have since fiscal year 2000 been disposing of solid waste such as metal scraps and destruction rubbish. Already we have transported about 4,500 such solid waste drums.

■An Example of Low-Level Radioactive Waste Disposed of by Underground Reclamation



Note: Bentonite is a kind of clay nearly impervious to water penetration.

Disposal of High-Level Radioactive Waste

High-level radioactive liquid waste, produced in the process of spent fuel reprocessing, is mixed with glass and filled in stainless steel containers to form steady vitrified waste assemblies, which are stored and managed for cooling in dedicated repositories at reprocessing plants for 30 to 50 years. By the end of fiscal year 2001, a total of 616 vitrified waste assemblies of high-level radioactive waste (inclusive of 153 vitrified assemblies for TEPCO) produced in spent fuel reprocessing on commission in the U.K. and France, were returned, and they are now stored in the Vitrified Waste Storage Center, operated by Japan Nuclear Fuel, Ltd., in the Rokkashomura village, Aomori Prefecture.

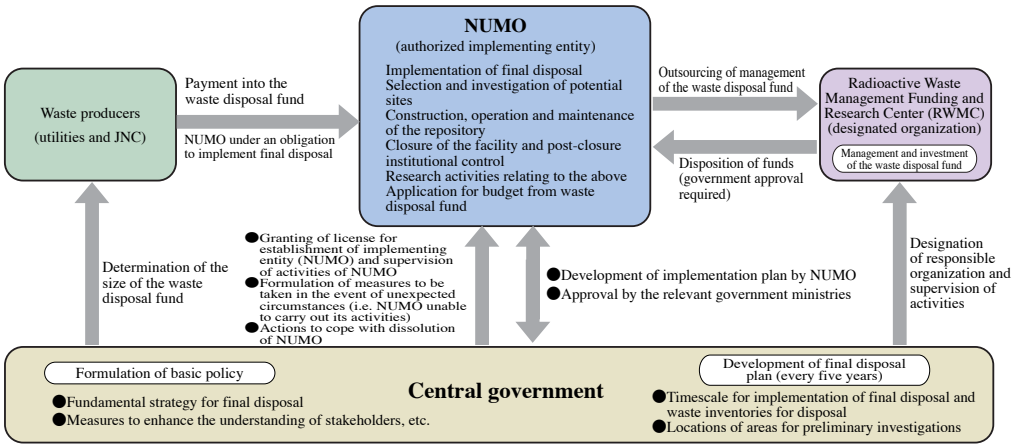
The Japanese government pursues a basic policy on the final disposal of high-level radioactive waste, which dictates that vitrified waste assemblies will be "deposited in deep, stable geological formations at least several hundred meters below the surface."

With regard to the radioactive waste disposal implementing entity, the Nuclear Waste Management Organization of Japan (NUMO) was established as an authorized corporation in October 2000 under the Law Concerning the Final Disposal of Specific Radioactive Waste that was enacted in May 2000 and promulgated in June the same year. NUMO is now in the process of selecting the final disposal site for high-level radioactive waste.

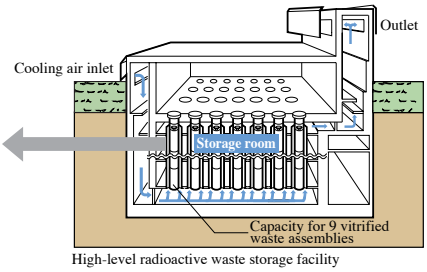
■Project Schedule for Final Disposal

	Literature survey
Following years	Selection of preliminary investigation areas
	Borehole programs, etc.
2008 - 2012	Selection of areas for detailed investigation
	Test programs in underground exploration facilities
2023 - 2027	Selection of the site for repository construction
Around 2025	Design of the repository and licensing by the government; start of construction
2033 - 2037	Start of operation

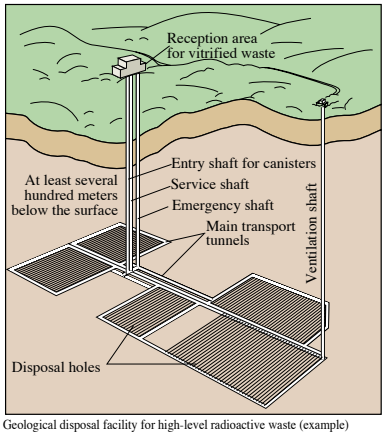
■Organizational Setup for Final Disposal



■Storage and Disposal of High-Level Radioactive Waste



High-level radioactive waste storage facility



Geological disposal facility for high-level radioactive waste (example)

Effects of Electromagnetic Fields

An electromagnetic field develops around a conductor through which electric current flows. Some magnetic fields that exist close to us are produced from electric service facilities such as transmission and distribution lines or from household electrical appliances. The magnetic fields produced around electric service facilities usually range from several milligausses to several tens of milligausses – around 200 milligausses at the most. This is the same level as the magnetic field arising from household electrical appliances.

In Japan, the impact on human health of magnetic fields from electric service facilities (50/60 Hz) is studied by interested parties led by the Central Research Institute of Electric Power Industry (CRIEPI). Since 1989, TEPCO has been conducting a similar study with experiments on animals, such as vinegar flies and rats, to accumulate scientific knowledge and gain a better understanding of this topic. So far, no health hazards have been observed with a magnetic field of up to 50,000 milligausses.

The impact of electromagnetic fields has also been comprehensively assessed by interested organizations both in Japan and abroad, including such international bodies as the World Health Organization (WHO) and the International Commission on Non-Ionizing Radiation Protection (ICNIRP), national institutions in other countries such as the National Radiological Protection Board (NRPB) of the United Kingdom, the National Research Council (NRC) – a unit of the National Academy of Science (NAS) in the United States, and some Japanese organizations including the Ministry of Environment, the Agency of Natural Resources and Energy – a unit of the Ministry of Economy, Trade and Industry, the Institute of Electrical Engineers of Japan, and the Japan Health Physics Society (JHPS). These organizations, consisting of experts well-versed in topics of electromagnetic fields, have conducted assessments based on many papers and other relevant materials. Their assessments state that, "Human health is not adversely affected by electromagnetic fields resulting from power transmission lines or household electric appliances."

Recently, in June 1999, the final report was presented on the EMF-RAPID (Electric and Magnetic Fields Research and Public Information Dissemination) Program in the United States. The report concludes that "the scientific evidence suggesting that ELFEMF (extremely low frequency electric and magnetic fields) exposures pose any health risk is weak."

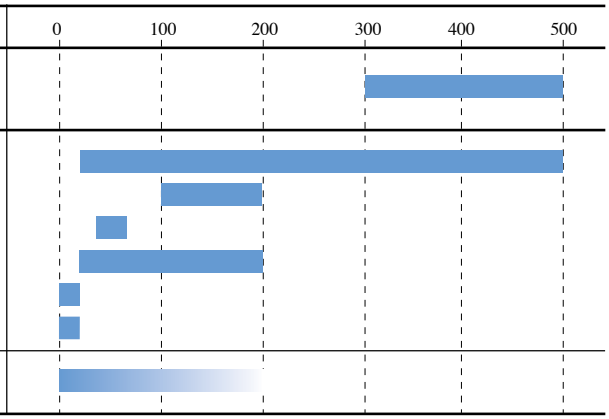
In June 2001, the International Agency for Research on Cancer (IARC), a unit of WHO, published a report putting electromagnetic fields into a class that may have carcinogenic effects on humans. However, the evidence of carcinogenic risk given in the report is considered very weak as IARC itself publicly admitted its failure to scientifically explain the relationship between electromagnetic fields and infantile leukemia in an epidemiological study, the sole scientific evidence shown in the report concerning health risks involved in electromagnetic fields. Previous assessments by interested organizations also gave attention to the relationship between electromagnetic fields and cancer or some other diseases as indicated in some epidemiological studies but presented a view that scientific evidence of the relationship was weak. Accordingly the IARC report is considered to include no appreciable difference from the previous opinions of other interested organizations.

Based on WHO's criteria, the ICNIRP recommends an allowable limit of "1,000 milligausses for the general public" as a guideline. Electromagnetic fields from such electric service facilities as transmission and distribution systems are well below the guideline.

From the foregoing data and materials, TEPCO believes that human health is not adversely affected by electromagnetic fields from electric service facilities. We will continue research to accumulate further scientific knowledge and provide correct information on this topic. In order to deepen public understanding of electromagnetic fields, we publish pamphlets, brochures and other materials, including a book entitled "Health Hazards of Electromagnetic Fields" which contains the results of studies and experiments conducted by TEPCO over the last 10 years.

■Example of Magnetic Fields

			Magnetic field intensity (milligauss)
Natural magnetic field		Geomagnetic field (static magnetic field)	approx. 300 - 500 (ground surface)
Magnetic fields from electrical facilities, etc.	Electrical appliances (alternating-current magnetic field)	Hair dryer	20 - 500 (3.0 cm)
		Electric carpet	100 - 200 (2.5 cm)
		Electric blanket	approx. 50 (2.5 cm)
		Vacuum cleaner	20 - 200 (30.0 cm)
		TV	1 - 20 (30.0 cm)
		Fluorescent table lamp	5 - 20 (30.0 cm)
	Transmission lines, substations and other electric service facilities (alternating-current magnetic field)		1 - 200 (1 m above ground surface)



Notes: ・ Figures in parentheses for electrical appliances indicate the distance from the equipment.
・ Sources: For the geomagnetic field: Chronological Table of Science, the National Astronomical Observatory.
For electrical appliances: Report on the Survey and Study of Electromagnetic Field Effects, the Agency of Natural Resources and Energy, December 1993.

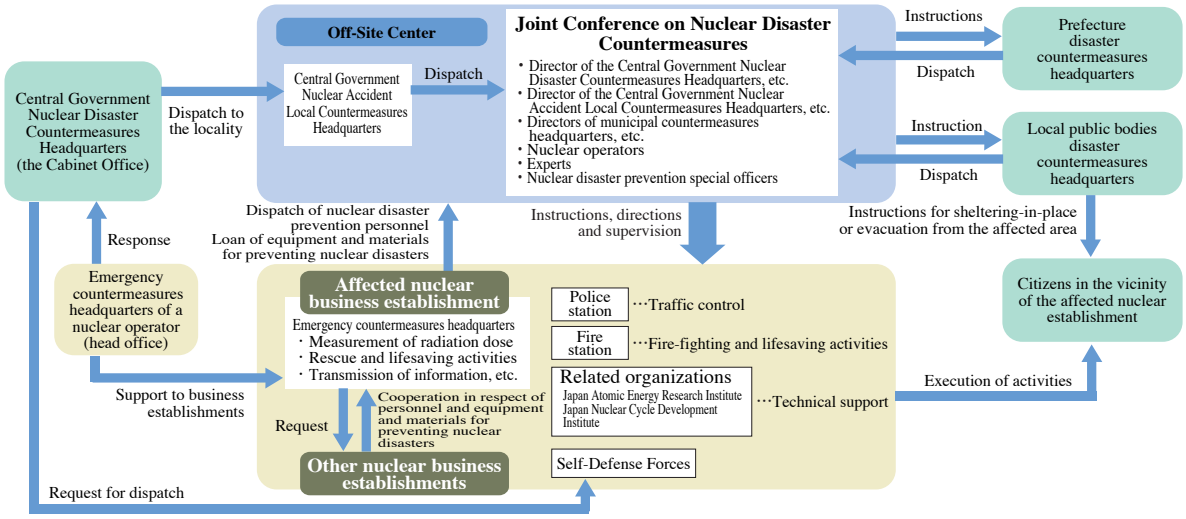
Organizational Setup for Nuclear Disaster Prevention

For decades, measures for nuclear disaster prevention have been taken under the Basic Law for Countermeasures against Disasters. Electric utilities and the central and local governments have implemented disaster prevention measures based on their respective plans, comprising disaster prevention activity plans by the utilities, a basic disaster prevention plan by the central government and regional disaster prevention plans by the local governments.

Following the September 1999 criticality accident at JCO Tokai Facility, however, the Special Law for Nuclear Disaster Prevention was enacted (enforced in June 2000) to strengthen nuclear disaster countermeasures. Under the new law, an off-site center was established in the vicinity of each area where a nuclear power station is located, so that the central and local governments and nuclear operators could jointly take necessary measures in emergencies, specifically the release of radioactive substances in large quantities. Arrangements were also made for permanently stationing the government's nuclear disaster prevention special officers in all areas hosting nuclear power stations.

Among the host communities of our nuclear power stations, a new off-site center was established in Ohkuma Town, Fukushima prefecture, and in Kashiwazaki Town, Niigata Prefecture, in March 2002.

■New Organizational Setup for Nuclear Disaster Prevention



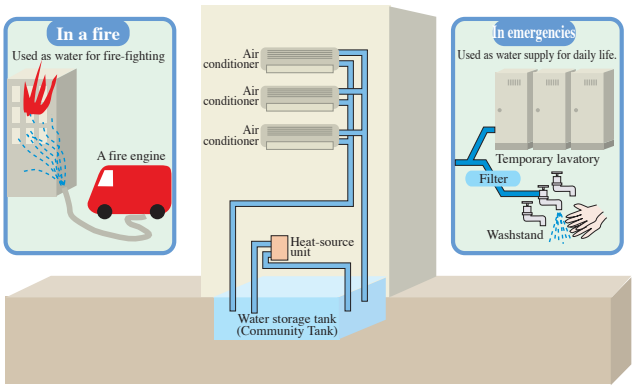
Community Tank

TEPCO has been encouraging the use of its Thermal Storage Air-Conditioning System, which is superior in economic efficiency, energy conservation and environmental protection.

The water stored in a thermal storage tank can be used not only for air-conditioning but also help in the disaster prevention of local communities as the water for fire-fighting and for domestic use such as the cleaning of toilets and hand washing. Therefore, we call this type of multifunctional thermal storage tank a community tank, and we are promoting activities to help the general public understand the benefits of the system.

TEPCO's thermal storage tanks installed at 19 of its establishments, such as the Ohta and Katsushika Service Centers under Tokyo Branch Office, have been officially designated as a fire-fighting water supply for use in case of emergencies such as fires.

■Functions of Community Tank



Effects of Thermal Storage System

Energy-Saving Effects

A thermal storage air-conditioning system stocks the thermal storage tank with cool thermal heat in summer and hot thermal heat in winter by operating a heat-source unit in the nighttime and uses the stored heat for air conditioning in the daytime. It is an environment-friendly air-conditioning system saving energy by some 10% and reducing CO_2 emissions by about 16%, compared with a non-thermal storage system. Greater energy-saving effects can be provided by effectively using sewage, river water, waste heat from substations, and other energy sources that have been left unused in the past. The Guideline of Measures to Prevent Global Warming as reviewed in March 2002 calls for further diffusion of thermal storage systems as an effective tool of load leveling that leads to the reduction of CO_2 emissions. Particularly notable is a government subsidy provided to support the installation of Eco Ice, a one-on-one dispersed air-conditioning system (excluding some types of the system) (see page 97 for an outline of the subsidy program).

Projects are also under way to develop new air-conditioning systems and their application technologies, including a cold air distribution system which, when combined with an ice storage air-conditioning system, can reduce air-conditioning fan power by more than 40%, an ice storage freezing and refrigeration showcase using a cascade of heat introduced in some food stores, and a structural thermal storage technology that can store heat in the main structure of buildings.

CO_2 Reducing Effects

The CO_2 emission intensity per kWh of electricity generated in the nighttime declines to about 82% of the daytime level because thermal power generation using oil, LNG or other fossil fuels decreases as a percentage of the total at night. In addition, electric service facilities can be efficiently operated at night. Thermal storage systems which use nighttime power service can reduce CO_2 emissions by some 16% compared with non-thermal storage systems.

Under the Law Concerning the Rational Use of Energy (also called the Energy Conservation Law) as amended in April 1999, these characteristics of nighttime power service are highly rated and, in terms of primary energy equivalents, nighttime power service is considered to save energy by some 6% compared with daytime power service (with daytime power converted at 10,250 kJ/kWh, equivalent to 2,450 kcal/kWh, and nighttime power converted at 9,620 kJ/kWh, equivalent to 2,300 kcal/kWh). These conversions are based on the average efficiency of thermal power generation.

The amount of fossil fuel actually consumed to generate 1 kWh of electricity decreases to about 5,500 kJ/kWh (equivalent to about 1,300 kcal/kWh) because some 44% of electricity produced by general electric utilities comes from nuclear power and hydroelectric power, both non-fossil fuel power sources. This is approximately half the level specified under the Energy Conservation Law.

■CO_2, NOx and SOx Emission Intensities (Per Unit of Electricity Sales) (Actual Values in FY2001)

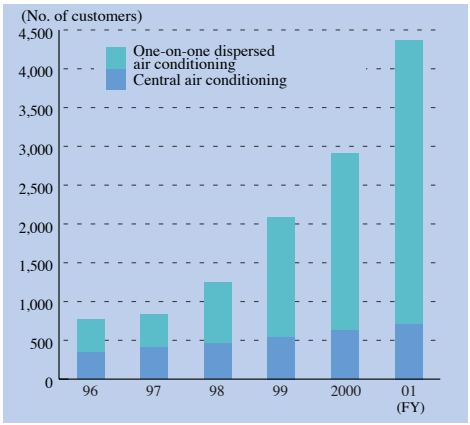
	CO_2 (kg-CO_2/kWh)	NOx (g/kWh)	SOx (g/kWh)
Annual average	0.32	0.09	0.05
Daytime (8:00-22:00 hrs)	0.34	0.10	0.06
Nighttime (22:00-8:00 hrs)	0.28	0.07	0.04
Day:Night	100 : 82	100 : 70	100 : 67

Note: Day or night emission intensity = $\frac{\text{Total hourly emissions in the daytime (or nighttime)}}{\text{Hourly electricity sales in the daytime (or nighttime)}}$

Ice Storage Air-Conditioning System (Eco Ice)

Compared with conventional thermal storage systems, our ice storage air-conditioning system (Eco Ice) has a smaller, space-saving ice thermal storage tank which stores ice instead of water, so that it can be introduced in such buildings where it would be difficult to obtain the space large enough to install a water thermal storage tank. We have also developed and commercialized the Eco Ice mini, another ice storage system intended for small package air conditioners with a cooling capacity of less than 28 kW (equivalent to an air-conditioning area of 80 m^2 to 200 m^2) in order to expand the scope of applications for the ice storage technology.

■Progress in Diffusion of Eco Ice



Eco Ice mini

Commitment to DHC Service with Thermal Storage Systems

On April 1, 2001, TEPCO started up a district heating and cooling service in Harumi Island Triton Square, a mixed urban district redeveloped under the new concept of a town with offices and houses close together as the marine gateway to Tokyo. The DHC system supplies hot and cold water, mainly for heating and cooling purposes, to customers in five office and other buildings (with a combined total floor space of about 410,000 m^2). Compared with the instance in which no thermal storage system is used, the DHC system in the Harumi Island area saves energy by 30% and significantly reduces environmental loads (some 40% decrease in CO_2 emissions and some 42% decrease in NOx emissions), making the most of low-environmental-load nighttime power service and high-efficiency refrigerating machines and heat pumps.

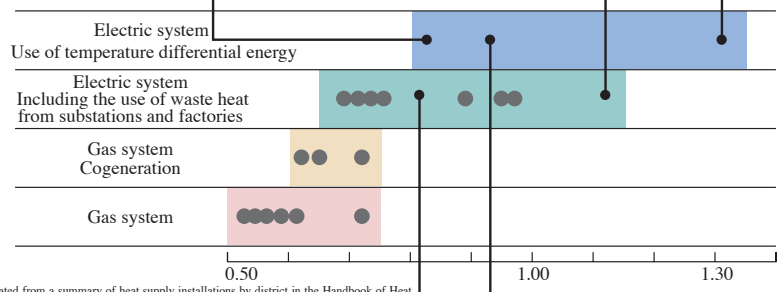
Another feature of the DHC system is the use of a large thermal storage tank (with a capacity of about 19,000 m^3, i.e., 10 times the size of a 50-meter-long swimming pool), the largest of its kind in Japan, which provides the function of a "community tank" (a multi-function thermal storage tank) that is useful for local disaster prevention, supplying water for fire fighting or people's daily lives in the event of an emergency.

Harumi Island Triton Square

■Current Overall Energy Efficiency of District Heating and Cooling Systems (in TEPCO's Service Area)

Takasaki Chuo district (using ground water)
- Size of service area: 18.1 ha
- Main heat-source equipment:
  - Heat pump (of heat recovery type) using ground water
  - Heat pump using ground water
  - Heat pump (of heat recovery type with a heating tower) using an air-carried heat source
- Thermal storage tank: 1,290 m^3
- Startup of commercial operation: December 1993

High-tech business district in Makuhari Shin-toshin (using sewage treatment water)
- Size of service area: 48.9 ha
- Main heat-source equipment:
  - Heat pump (of heat recovery type) using sewage treatment water
  - Heat pump (of heat recovery type) using an air-carried heat source
  - Refrigerating machine
  - Electric steam boiler
- Thermal storage tank: 4,460m^3
- Startup of commercial operation: April 1990



Source: Calculated from a summary of heat supply installations by district in the Handbook of Heat Supply Business (2000) and an Outline of Heat Supply by District
Systems surveyed: Points of DHC systems supplying both cold water and hot water (including steam and hot water supply) mainly for commercial and other business facilities.

Utsunomiya Chuo district (substation waste heat)
- Size of service area: 10.7 ha
- Main heat-source equipment:
  - Heat pump (of heat recovery type with a heating tower) using an air-carried heat source
  - Refrigerating machine
- Thermal storage tank: 3,023 m^3
- Startup of commercial operation: February 1991

Hakozaki district (river water)
- Size of service area: 25.4 ha
- Main heat-source equipment:
  - Heat pump (of heat recovery type) using river water
  - Refrigerating machine using river water
  - Heat pump for hot-water supply
- Thermal storage tank: 43,980 m^3
- Startup of commercial operation: April 1989

Working Mechanism of Heat Pump

- The heat pump is a device for "pumping up" heat from a low level to a high level. The smaller the temperature differential covered by pumping is, the less power does the pump require.
- Sewage and river water have such characteristics that their temperatures are higher than the ambient air in winter and lower than the latter in summer. Accordingly, air conditioning can be made more efficiently with these water-carried heat sources than with air-carried heat sources.

Basic Concept of Total Energy Efficiency

- An electric heat pump system utilizing an unused energy source can make a larger quantity of heat available than the primary energy input because the heat pump draws a large quantity of heat with very low power.
- Meanwhile, a combustion-type heat pump system has a low thermal utilization rate of 0.5 to 0.8 due to combustion and auxiliary power losses because fuel is consumed for direct use of heat.

Unused Energy Sources and Thermal Storage System

- The available quantity of unused energy sources does not always meet heat demand as it is subject to seasonal and hourly changes. Accordingly the installation of a thermal storage tank is essential to raising the recovery rate of unused energy sources by absorbing the gap between supply and demand.

Energy-Saving Appliances for General Households and Commercial Establishments

Induction Heater (IH Cooking Heater)

The IH cooking heater has great heating power and much higher energy efficiency than other heat sources, as it directly heats pots and pans with magnetic lines of force. Since its heat-source unit does not use fire, the cooking heater is free from the danger of causing fire, incomplete combustion or air pollution and requires little ventilation. Additionally, less energy is required for cooling the kitchen, as the IH heater releases little heat into the ambient air. With various other advantages, including diverse cooking functions, easy cleaning and simple maintenance, the IH cooking heater has rapidly come into wide use in recent years.

Induction heater (IH Cooking Heater)

Electrified Kitchen for Business Use

Three-C (clean, cool and controlled) operation of a kitchen can be realized by using electricity for the cooking heat source. An electric heat-source unit offers a clean, cool and comfortable kitchen environment as it ensures easy control of temperature, humidity and time in the cooking process and has excellent hygienic control capabilities. In addition, it appreciably reduces the rise in room temperature and is free from any combustion gas or soot. Productivity is also improved significantly with an electrified kitchen because of its high controllability and great safety which can be expected only from the use of electricity. Besides, the electrified kitchen can significantly cut back the air-conditioning load and the required ventilation rate, offering a total energy-saving effect for the cooking equipment.

The advantages of electrified kitchens will be further enhanced by the implementation in fiscal year 2002 of a rate option that reduces the charge for electric energy used for electrified cooking equipment, whenever it meets certain conditions.

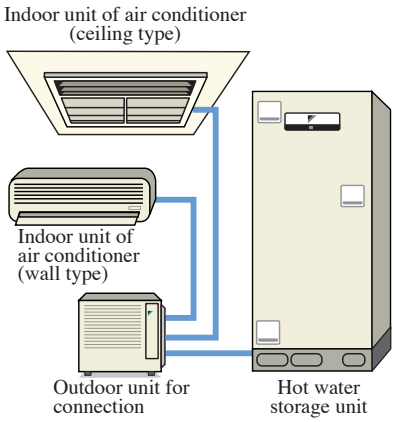
Power Supply Cutoff Timer ("Komameni Cut")

This timer is used as a retrofit for electric outlets to save energy in those households where occupants are frequently away from home in the daytime. It automatically cuts off power supply at 1:00 p.m. every day when electricity consumption reaches its peak but, thereafter, it automatically switches on power supply at the hour preset by the customer. The timer is effective in reducing the required standby power for electric hot water pots and warm water bidet-type toilet seats.

Multi-Function Heat Pump System with Heat Storage

This is a residential energy supply system with cooling, heating and hot-water supply functions. The system boasts high economic efficiency and energy-saving performance, as it uses the exhaust heat released outdoors during cooling as the heat source for hot-water supply, and uses the cool water stored by night-only power service for air conditioning in the daytime.

■System Configuration



Energy-Saving Electric Thermos

This is a new electric thermos with improved energy-saving performance in keeping water hot. Compared with conventional products, the new thermos reduces electricity consumption by about 50% through a set of improvements, including the enhanced heat-insulating performance of the side and the cap, a selector function to set the water temperature at a slightly lower level (85℃) or at the normal level (98℃), and a function to lower the water temperature to around 60℃ while the user is asleep or away from home and to automatically bring water to a boil six hours later.

Energy-Saving Warm Water Bidet-Type Toilet Seat

The warm water bidet-type toilet seat is powered around the clock to keep the washing water and toilet seat warm. Therefore, its energy consumption can be reduced by a wide margin if its electricity is turned off when it is not being used.

The energy-saving hot water bidet-type toilet seat (called Shower Toilet New J) developed jointly by TEPCO and INAX Corp. has a function to automatically lower the temperature of the washing water and seat when they are not being used. This function can reduce energy consumption by about 50% in winter. Moreover, energy savings of 100 kWh or so (about 30%) per unit can be expected on an annual basis.

Energy-Conservation Vending Machine (Eco Vender)

This energy-conservation vending machine capable of peak cutting was developed jointly by TEPCO, Fuji Electric Co., Ltd. and Coca-Cola (Japan) Co., Ltd. It has been designed to reduce energy consumption by about 90% during peak hours by cooling the temperature of the soft drinks it contains to a level 3℃ to 5℃ lower than usual from 10:00 a.m. through 1:00 p.m. on summer weekdays, and by stopping the operation of its cooling system from 1:00 p.m. through 4:00 p.m. Through improvements in its thermal insulation performance, the Eco Vender can save about 5% more energy than conventional vending machines. Information about this technology is also provided free of charge to other vending machine manufacturers. About 530,000 units of the Eco Vender have been introduced in TEPCO's service areas as of March 2002.

Energy-Saving Freezer and Cold Storage Showcases (Eco Showcase)

This system was developed jointly by TEPCO and SANYO Electric Co., Ltd. to promote the peak cutting and energy conservation aspects of the freezer and cold storage showcases which are widely used by supermarkets.

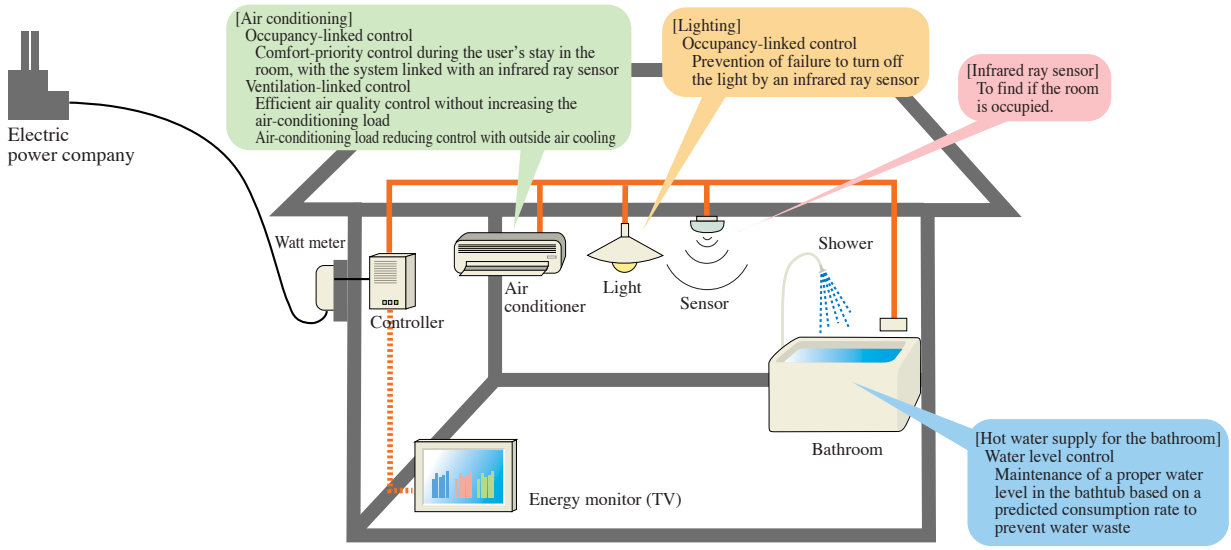
The system can reduce the power consumption of a showcase by about 10-12% by dimming the light in the showcase by 20% during the period from 1:00 p.m. to 4:00 p.m., and increasing the temperature by 1℃ in correspondence with the decrease in the radiant heat therein. Other new systems combined with thermal storage tanks to heighten their peak-shift effects are also being sold by various manufacturers.

Home Energy Management System (HEMS)

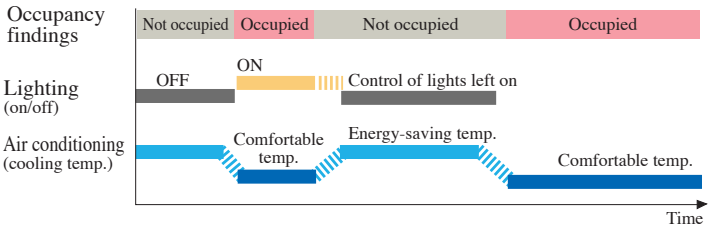
The home energy management system (HEMS) is intended to support the management of energy requirements (i.e., energy-saving efforts) at home with its functions to maintain optimal operation of air conditioners and other household electric appliances, turn on and off lights, and display the current state of energy consumption.

Under a joint project with Mitsubishi Electric Corporation and Jyukankyo Research Institute Inc., TEPCO is conducting a series of demonstration tests on HEMS from September 2001 through the end of February 2004 as part of a Program to Promote Optimal Management of Energy Requirements sponsored by the New Energy and Industrial Technology Development Organization (NEDO).

■An Example of HEMS Configurations



■Occupancy-Linked Air-Conditioning and Lighting Control



Reference Data: Materials presented at the second meeting of the Committee on Optimal Management of Energy Requirements

Ⅲ. Data

TEPCO Data

Data	Unit	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
■Supply/Demand and Power Generation Facilities Data													
(1) Electricity sales	TWh	219.9	227.6	230.1	231.7	248.9	254.4	257.4	265.4	267.0	274.2	280.7	275.5
Lighting	TWh	60.2	63.5	66.1	67.4	73.5	76.5	76.5	78.9	81.0	84.0	86.0	85.1
Power	TWh	159.7	164.2	164.0	164.3	175.4	177.9	180.9	186.5	186.1	190.3	117.1	115.3
Deregulated demand	TWh	—	—	—	—	—	—	—	—	—	—	77.6	75.1
(2) No. of customers (contracts)	GW	117.84	123.90	128.13	130.86	134.26	137.35	139.95	142.79	144.68	146.26	128.56	130.53
Lighting	GW	52.08	55.11	57.77	60.11	62.82	65.44	67.95	70.24	72.18	74.01	76.00	77.98
Power	GW	65.76	68.79	70.36	70.75	71.44	71.91	72.01	72.55	72.50	72.25	52.56	52.55
<No. of customers>	million contracts	22.68	23.22	23.66	24.01	24.39	24.83	25.29	25.70	26.03	26.33	26.71	27.02
Lighting	million contracts	19.92	20.42	20.84	21.18	21.55	21.99	22.45	22.87	23.21	23.52	23.92	24.26
Power	million contracts	2.76	2.80	2.82	2.83	2.84	2.84	2.84	2.83	2.82	2.81	2.79	2.76
(3) System Peak Load (daily peak at generation end)	GW	49.30	51.90	54.10	50.20	57.60	58.65	59.40	57.96	59.20	59.25	59.24	64.30
(4) Power generating capacity (of TEPCO)	GW	46.55	46.91	48.39	49.50	51.32	51.21	53.98	56.76	56.87	57.85	58.84	60.38
Hydroelectric	GW	6.03	6.74	6.74	6.74	7.34	7.63	7.64	7.66	7.70	8.10	8.51	8.52
Thermal	GW	28.12	27.77	29.25	29.25	29.38	28.98	30.38	31.78	31.87	32.43	33.03	34.55
Coal	GW	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0	0	0	0	0
Oil	GW	9.59	9.24	9.24	9.24	9.24	8.83	8.66	9.19	8.76	8.76	8.76	8.76
LNG/LPG	GW	18.01	18.01	19.13	19.13	19.26	19.26	21.19	22.59	23.11	23.67	24.27	25.79
Other gases (including geothermal)	GW	0	0	0.35	0.35	0.35	0.35	0	0	0.003	0.003	0.003	0.003
Nuclear	GW	12.40	12.40	12.40	13.50	14.60	14.60	15.95	17.31	17.31	17.31	17.31	17.31
Wind	GW	0	0	0	0	0	0	0	0	0	0.0005	0.0005	0.0005
(5) Electricity generated and purchased	TWh	242.1	251.0	253.4	255.2	273.9	279.2	282.1	291.3	292.4	299.5	305.7	299.5
Total generated	TWh	221.5	231.6	234.5	232.2	248.8	249.2	251.9	256.9	255.0	264.3	265.6	257.0
Hydroelectric	TWh	12.6	13.7	12.5	14.5	12.0	12.7	12.7	13.7	13.8	13.0	13.7	13.7
Thermal	TWh	131.8	137.2	139.1	127.5	139.6	129.6	122.6	123.8	115.1	123.0	131.5	121.8
Nuclear	TWh	77.1	80.7	82.9	90.2	97.2	106.9	116.6	119.4	126.1	128.3	120.4	121.5
Total, purchased	TWh	27.3	27.2	25.8	27.2	30.1	33.7	35.0	35.6	35.3	29.0	36.2	32.9
Exchange	TWh	- 0.7	- 0.2	- 0.4	4.0	2.8	4.4	4.1	8.6	11.3	13.4	11.6	17.2
Used at pumped storage	TWh	- 6.0	- 7.6	- 6.5	- 8.2	- 7.8	- 8.1	- 8.9	- 9.8	- 9.2	- 7.2	- 7.7	- 7.6
(6) Used in power stations	TWh	9.1	9.4	9.7	9.6	10.2	10.3	10.5	10.5	10.3	10.4	10.2	9.8
<Station service power rate, %>	%	4.1	4.1	4.1	4.1	4.1	4.1	4.2	4.1	4.0	3.9	3.9	3.8
(7) Transmission-end supply capacity	TWh	233.0	241.6	243.7	245.6	263.7	268.9	271.6	280.8	282.1	289.1	295.5	289.7
(8) Used in substations	TWh	0.33	0.35	0.36	0.38	0.39	0.41	0.42	0.41	0.43	0.45	0.45	0.45
(9) Transmission and distribution loss rate	%	5.4	5.6	5.5	5.5	5.5	5.2	5.1	5.3	5.2	5.0	4.9	4.7

* Figures do not necessarily add up to the totals because of rounding.

Data	Unit	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
(10) Thermal power fuel consumption	Fuel oil equivalent, million kℓ	29.81	30.98	31.45	28.89	31.61	29.35	27.63	27.55	25.48	26.80	28.28	25.76
Items: Coal	million t	0.38	0.32	0.36	0.29	0.31	0.36	0.25	0	0	0	0	0
Items: Fuel oil	million kℓ	7.09	7.35	7.40	5.84	6.38	5.70	4.13	3.89	2.89	2.77	2.83	1.98
Items: Crude oil	million kℓ	5.00	4.79	5.11	3.97	5.18	3.64	3.01	2.88	2.09	2.44	2.74	1.73
Items: NGL	million kℓ	0.10	0.14	0.23	0.17	0.19	0.16	0.11	0.05	0.02	0.02	0.04	0.04
Items: Gas oil	million kℓ	0.02	0.02	0.05	0.04	0.04	0.04	0.04	0.03	0.03	0.02	0.02	0.01
Items: LNG/LPG	million t	12.99	13.80	13.73	13.87	14.56	14.59	15.02	15.40	15.19	16.01	16.86	16.18
Items: Natural gas	billion Nm^3	0.23	0.25	0.26	0.23	0.25	0.21	0.21	0.21	0.20	0.20	0.21	0.18
Items: Town gas	billion Nm^3	0.00	0.00	0.03	0.05	0.04	0.04	0.03	0.03	0.03	0.02	0.01	0.36
(11) Capacity factor of nuclear power plants	%	71.3	74.1	75.3	76.3	76.6	83.2	84.1	79.5	83.1	84.4	79.4	80.1
(12) Thermal efficiency of thermal power plants	%	39.1	39.2	39.2	39.1	39.2	39.0	39.2	39.7	40.0	40.6	41.1	41.6

■Accounting Data

(13) Revenue from electricity sales	billion yen	4,251.1	4,442.8	4,544.9	4,565.5	4,824.2	4,900.6	4,882.8	5,113.6	4,920.0	4,942.5	5,086.1	4,988.9
Lighting	billion yen	1,495.0	1,581.7	1,652.1	1,675.1	1,818.6	1,881.1	1,863.0	1,952.7	1,920.4	1,965.1	2,024.1	1,987.4
Power	billion yen	2,756.0	2,861.0	2,892.7	2,890.3	3,005.6	3,019.4	3,019.7	3,160.8	2,999.5	2,977.4	3,061.9	3,001.5
(14) Electric utility operating revenues	billion yen	4,383.6	4,597.1	4,699.9	4,721.0	4,975.4	5,031.8	5,012.6	5,252.2	5,060.1	5,059.6	5,225.1	5,129.6
(15) Ordinary revenues	billion yen	4,402.3	4,613.9	4,715.3	4,732.8	4,988.6	5,042.7	5,027.3	5,269.9	5,079.6	5,087.4	5,249.3	5,156.0
(16) Ordinary expenses	billion yen	4,274.1	4,467.0	4,557.0	4,572.8	4,779.7	4,875.1	4,884.7	5,052.6	4,871.7	4,741.5	4,929.2	4,836.4
(17) Ordinary profit	billion yen	128.2	146.8	158.3	159.9	208.9	167.5	142.5	217.3	207.9	345.9	320.0	319.5

■Plant & Equipment Investment Data

(18) Total amount of plant & equipment investment	billion yen	1,353.4	1,509.4	1,541.0	1,680.0	1,567.2	1,399.2	1,436.5	1,279.8	1,131.6	1,006.4	905.9	932.2
<Excluding nuclear fuels>	billion yen	1,260.4	1,413.1	1,453.0	1,582.4	1,468.5	1,294.9	1,326.9	1,104.7	965.5	845.4	757.3	733.9

■CO_2 Data

(19) CO_2 emissions (from all power stations)	million t-CO_2	84.10	87.60	89.80	85.00	94.00	91.00	86.60	88.80	84.10	89.40	92.20	87.40
<Emissions from TEPCO's power stations>	million t-CO_2	71.00	73.30	74.70	66.90	73.50	67.60	62.10	61.30	55.60	58.40	61.80	55.40
(20) CO_2 emission intensity (per unit of electricity sales)	kg-CO_2/kWh sales	0.382	0.385	0.390	0.367	0.378	0.358	0.336	0.335	0.315	0.326	0.328	0.317
(21) CO_2 emission intensity (per kWh electricity generated by all operational power stations)	kg-CO_2/kWh generated	0.337	0.337	0.344	0.321	0.332	0.315	0.296	0.293	0.277	0.290	0.293	0.283
<Emissions from TEPCO's power stations>	kg-CO_2/kWh generated	0.321	0.317	0.318	0.288	0.295	0.271	0.247	0.239	0.218	0.221	0.233	0.216
(22) Electricity generated (total, generated, purchased and exchanged)	TWh	249.4	259.8	261.0	264.5	283.1	288.7	292.5	302.6	303.0	308.2	315.0	308.7

Data	Unit	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
■SOx and NOx Data													
(23) SOx emissions (from TEPCO's power stations)	thousand t	37	37	37	30	36	30	22	21	16	17	19	12
(24) SOx emission intensity (average of TEPCO's power stations)	g/kWh	0.17	0.16	0.16	0.13	0.14	0.12	0.09	0.08	0.06	0.07	0.07	0.05
<Average of TEPCO's thermal power stations>		0.28	0.27	0.27	0.23	0.26	0.23	0.18	0.17	0.14	0.14	0.14	0.10
(25) NOx emissions (from TEPCO's power stations)	thousand t	47	47	45	40	43	38	33	31	27	27	27	21
(26) NOx emission intensity (average of TEPCO's power stations)	g/kWh	0.22	0.20	0.19	0.17	0.17	0.15	0.13	0.12	0.11	0.10	0.10	0.08
<Average of TEPCO's thermal power stations>		0.36	0.34	0.33	0.32	0.31	0.29	0.27	0.25	0.24	0.22	0.20	0.18
(27) No. of electric vehicles introduced (cumulative total)	No. of units	45	65	104	130	130	130	130	130	130	130	132	137
■Radioactive Substances and Radioactive Waste Data													
(28) Evaluated value of radiation exposure doses of the people living around nuclear power stations	mSv/yr	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001	Below 0.001
(29) Amount of solid radioactive waste produced (No. of 200 L-drums)	drums	8,035	9,315	8,512	11,219	12,354	4,988	7,317	9,203	7,786	8,148	11,926	16,803
	drums/GW	913	1,011	899	1,090	1,113	409	550	675	541	556	868	1,211
Nuclear Power Stations: Fukushima Daiichi	drums	5,272	6,113	5,696	8,647	5,493	3,429	5,357	6,369	5,924	6,819	10,388	14,588
Nuclear Power Stations: Fukushima Daini	drums	2,276	2,546	2,096	1,698	5,936	914	1,046	1,510	867	660	730	1,353
Nuclear Power Stations: Kashiwazaki-Kariwa	drums	487	656	720	874	925	645	914	1,324	995	669	808	862
(30) Amount of solid radioactive waste reduced	drums	8,215	8,195	12,490	16,080	24,170	15,704	17,568	20,111	15,153	10,751	9,220	18,870
Nuclear Power Stations: Fukushima Daiichi	drums	7,105	7,573	11,689	15,752	16,997	15,704	17,510	19,517	14,990	10,423	9,078	15,556
Nuclear Power Stations: Fukushima Daini	drums	312	144	252	328	7,173	0	58	594	163	221	18	3,174
Nuclear Power Stations: Kashiwazaki-Kariwa	drums	798	478	549	0	0	0	0	0	0	107	124	140
(31) Cumulative amount of solid radioactive waste stored	drums	261,951	263,071	259,093	254,232	242,416	231,700	221,449	210,541	203,174	200,569	203,277	201,210
Nuclear Power Stations: Fukushima Daiichi	drums	246,242	244,782	238,789	231,684	220,180	207,905	195,752	182,604	173,538	169,932	171,244	170,276
Nuclear Power Stations: Fukushima Daini	drums	13,340	15,742	17,586	18,956	17,719	18,633	19,621	20,537	21,241	21,680	22,392	20,571
Nuclear Power Stations: Kashiwazaki-Kariwa	drums	2,369	2,547	2,718	3,592	4,517	5,162	6,076	7,400	8,395	8,957	9,641	10,363
■Industrial Waste and Resource Recycling Data													
(32) Amount of industrial waste produced	thousand t	365.4	345.5	326.8	297.6	292.8	291.8	275.1	236.6	242.4	245.0	209.8	191.1
(33) Amount of industrial waste disposed of by landfill	thousand t	38.8	30.2	29.7	26.3	25.8	18.2	16.4	16.4	10.3	9.0	9.4	6.7
Shellfish	thousand t	14.3	13.0	9.1	11.6	9.6	3.6	4.8	4.8	0.9	1.9	1.8	0.9
Thermal insulating material scraps	thousand t	3.8	3.3	3.6	3.2	3.3	3.5	3.0	2.5	1.2	1.4	1.3	0.8
Insulator scraps	thousand t	2.1	0.8	0.8	0.7	0.8	0.4	0.0	0.0	0.0	0.0	0.1	0
Concrete scraps	thousand t	4.3	0.6	4.3	1.9	4.0	2.6	2.8	2.5	0.7	0.6	0.7	1.6
Sludge from treatment of effluent	thousand t	3.0	3.3	2.9	2.4	1.6	1.5	0.4	0.2	0.2	0	0	0
Others	thousand t	11.3	9.4	9.0	6.5	6.6	6.7	5.3	6.4	7.3	5.1	5.5	3.3
(34) Recycling rate of industrial waste	%	86	89	89	89	89	92	93	91	93	94	94	95
(35) Amount of waste paper collected	thousand t	0.5	1.3	2.4	2.8	2.7	3.0	3.0	2.9	3.0	3.7	3.7	4.0

Data	Unit	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
■Regulated Chlorofluorocarbons Data													
(36) Consumption of regulated chlorofluorocarbons	ODP-t	37.3	46.0	24.9	25.7	23.7	24.3	12.7	6.8	5.7	7.7	4.3	9.6
For refrigerants (excluding district heating and cooling service)		8.6	13.4	9.9	9.1	8.5	7.9	6.0	4.3	4.2	3.2	2.7	1.8
For refrigerants (for district heating and cooling service)		1.6	1.8	4.1	2.1	3.2	6.0	1.2	0.1	0.1	1.7	0.8	0.9
For clothes cleaning		5.8	5.8	2.4	2.8	4.6	5.4	2.6	1.7	0.7	0.4	0.7	0
For cable and equipment cleaning		4.2	21.1	3.6	4.5	1.6	0.5	0.1	0	0	0	0	0
For fire extinguishing		0	0	0	0.6	1.0	0	0	0	0.6	2.3	0	6.9
Other (for flaw detection, etc.)		17.1	3.9	4.9	6.6	4.8	4.5	2.8	0.7	0.1	0.1	0.1	0
(37) Actual consumption	t	54.4	65.8	44.8	44.2	40.0	49.3	33.9	21.3	26.5	24.2	25.7	12.3
■Natural Energies Data													
(38) Development and introduction of natural energies (cumulative total)	kW	0	25	76	515	632	779	871	952	4,267	4,789	4,809	4,509
	(No. of locations)	0	11	9	23	30	41	45	50	54	57	60	60
Photovoltaic power generation	kW	0	25	76	215	332	479	571	652	667	689	709	709
	(No. of locations)	0	11	9	22	29	40	44	49	52	54	57	57
Wind power generation	kW	0	0	0	300	300	300	300	300	300	800	800	500
	(No. of locations)	0	0	0	1	1	1	1	1	1	2	2	2
<For business-use>	kW	0	0	0	0	0	0	0	0	0	500	500	500
	(No. of locations)	0	0	0	0	0	0	0	0	0	1	1	1
Geothermal power generation	kW	0	0	0	0	0	0	0	0	3,300	3,300	3,300	3,300
	(No. of locations)	0	0	0	0	0	0	0	0	1	1	1	1
(39) Electricity purchased from natural energies	MWh	—	—	1	6	232	3,755	3,628	6,550	7,042	14,210	23,190	37,734
	(contracted kW)	—	—	37	185	2,967	4,989	7,323	14,103	21,996	37,841	65,414	102,014
Photovoltaic power generation	MWh	—	—	1	6	63	447	1,068	2,688	4,855	9,665	18,487	30,892
	(contracted kW)	—	—	37	185	702	1,944	4,278	10,438	17,131	33,891	62,064	96,519
Wind power generation	MWh	—	—	0	0	55	122	136	1,300	1,962	4,499	4,398	6,043
	(contracted kW)	—	—	0	0	250	250	250	1,050	2,250	2,550	2,550	4,693
Fuel cells	MWh	—	—	0	0	114	3,186	2,424	2,562	225	46	305	799
	(contracted kW)	—	—	0	0	2,015	2,795	2,795	2,615	2,615	1,400	800	802
■Afforestation, Nature Conservation and Harmony with the Environment Data													
(40) Greenery rates of power stations (thermal and nuclear power)	%	—	47	42	42	45	45	46	46	46	46	46	46
Thermal power stations		—	28	27	27	27	27	28	29	28	28	27	28
Nuclear power stations		—	65	55	55	62	62	62	64	64	65	65	66
(41) Underground installation rate of distribution lines (TEPCO as a whole)	%	6.7	6.9	7.3	7.5	7.8	8.0	8.1	8.3	8.5	8.7	8.8	8.9
In Tokyo's 23 wards		35.3	36.5	38.3	39.0	39.8	40.4	40.9	41.5	42.0	42.5	43.0	43.4

Data	Unit	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
■Other Data													
(42) Total no. of persons holding certificates or licenses in the environmental field	No. of persons	—	—	1,918	1,892	1,867	1,784	1,702	1,610	1,574	1,557	1,691	1,875
Pollution control managers		—	—	1,298	1,281	1,270	1,209	1,140	1,058	1,001	962	1,002	1,034
Energy supervisors		—	—	620	611	597	575	562	552	573	595	689	841

<Calculation Methods and Scope of Application>

(7) Transmission-end supply capacity = (5) Total, generated and purchased − (6) Used in power stations

$$\text{(9) Transmission and distribution loss rate} = \frac{\text{(7) Transmission-end supply capacity} - \text{(1) Electricity sales} - \text{(8) Used in substations}}{\text{(7) Transmission-end supply capacity}} \times 100$$

$$\text{(11) Capacity factor of nuclear power plants} = \frac{\text{Electricity generated}}{\text{Authorized capacity} \times \text{calendar hours}} \times 100$$

$$\text{(12) Thermal efficiency of thermal power plants} = \frac{\text{Electricity generated} \times \text{Calorific value equivalent of kWh (3.60 MJ/kWh)}}{\text{Total heat input of fuel}} \times 100$$

(18) The amount of plant & equipment investment does not include incidental construction costs.

(19) CO_2 emissions (from all power stations): Calculated by the amount of fuel consumed and the conversion factors mentioned in the "Guidelines to Calculate Total Emissions of Greenhouse Effect Gasses in Respect of Works and Projects of Local Public Entities Based on the Law Concerning Promotion of Measures against Global Warming" (issued by the Environment Agency in July 1999).
(Major conversion factors: 2.3515 kg-CO_2/kg for steaming coal,
2.9393 kg-CO_2/L for C fuel oil, and
2.6879 kg-CO_2/kg for LNG.)
All power stations denote the total of electricity generated, purchased and exchanged.

$$\text{(20) } CO_2 \text{ emission intensity (per unit of electricity sales)} = \frac{\text{(19) } CO_2 \text{ emissions (from all power stations)}}{\text{(1) Electricity sales}}$$

$$\text{(21) } CO_2 \text{ emission intensity (per kWh electricity generated by all power stations)} = \frac{\text{(19) } CO_2 \text{ emissions (from all power stations)}}{\text{(22) Electricity generated (total, generated, purchased and exchanged)}}$$

$$<CO_2 \text{ emission intensity of TEPCO's power stations only}> = \frac{\text{(19) } CO_2 \text{ emissions (from TEPCO's power stations)}}{\text{(5) Electricity generated by TEPCO}}$$

$$\text{(24) SOx emission intensity (average of TEPCO's power stations)} = \frac{\text{(23) SOx emissions (from TEPCO's power stations)}}{\text{(5) Electricity generated by TEPCO}}$$

$$\text{SOx emission intensity (average of TEPCO's thermal power stations)} = \frac{\text{(23) SOx emissions (from TEPCO's power stations)}}{\text{(5) Electricity generated by TEPCO's thermal power stations}}$$

$$\text{(26) NOx emission intensity (average of TEPCO's power stations)} = \frac{\text{(25) NOx emissions (from TEPCO's power stations)}}{\text{(5) Electricity generated by TEPCO}}$$

$$\text{NOx emission intensity (average of TEPCO's thermal power stations)} = \frac{\text{(25) NOx emissions (from TEPCO's power stations)}}{\text{(5) Electricity generated by TEPCO's thermal power stations}}$$

(32) Amount of industrial waste produced = Amount of valued items + Amount of materials internally recycled + Amount of industrial waste

$$\text{(34) Recycling rate of industrial waste} = \frac{\text{Amount recycled (including amount of valued items and materials internally recycled)}}{\text{Amount of industrial waste produced}} \times 100$$

(36) Consumption of regulated chlorofluorocarbons = Ozone Depletion Potential (ODP) + (37) Actual consumption (calculated for each substance)

$$\text{(40) Greenery rates of power stations} = \frac{\text{Green tracts of power stations}}{\text{Site areas of power stations}} \times 100$$

$$\text{(41) Underground installation rate of distribution lines} = \frac{\text{Total length of underground cables}}{\text{Total route length of overhead lines + Total length of underground cables}} \times 100$$

(42) The licensed managers for environmental management include those who have the following licenses:

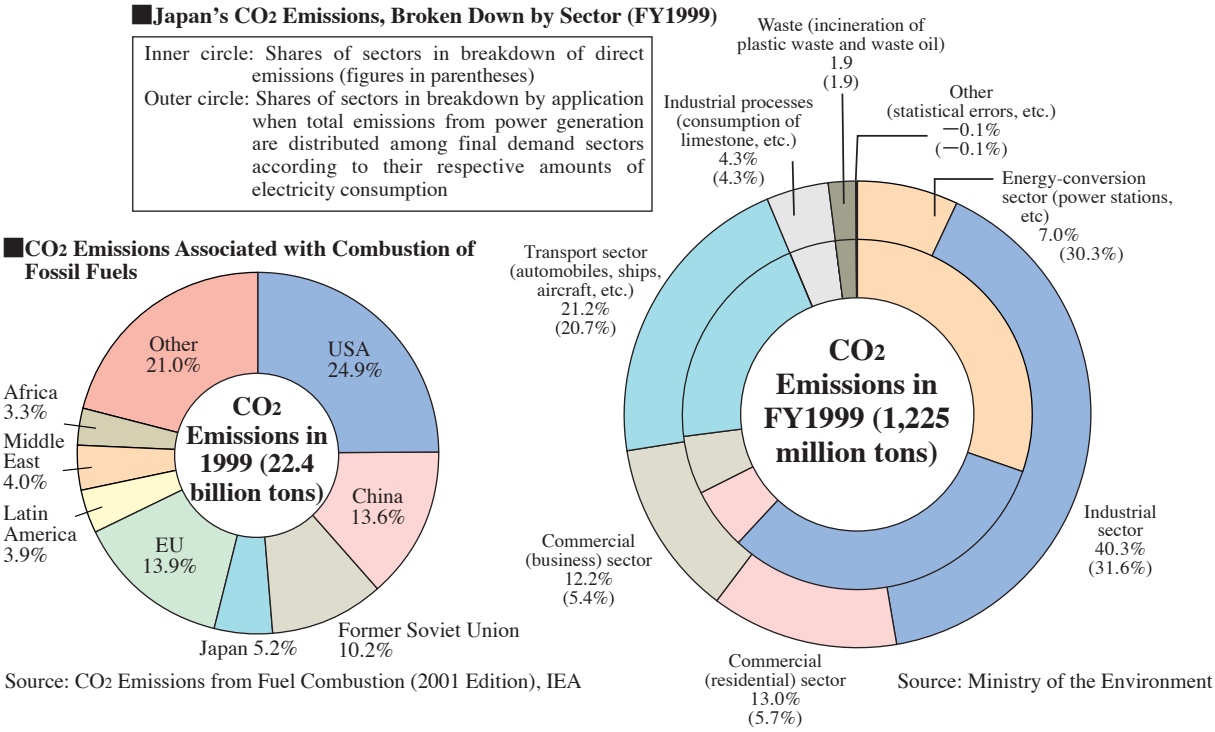
- Pollution Control Managers: Chief Managers of Pollution Control, Air Pollution Control Managers (1st - 4th grade), Water Pollution Control Managers (1st - 4th grade), Noise Abatement Managers, Dust Pollution Control Managers, Vibration Abatement Managers, and Dioxins Pollution Control Managers.
- Energy Supervisors: Thermal Energy Supervisors and Electric Energy Supervisors.

Reference Data

Data	Unit	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Source
■Energy Data													* Figures do not necessarily add up to the totals because of rounding.
(1) Total primary energy supply (worldwide)	PJ	365,580	370,229	372,066	376,504	378,917	388,473	400,519	403,973	405,508	411,814	—	IEA: CO_2 EMISSIONS FROM FUEL COMBUSTION (2001 Edition)
(2) Total primary energy supply (in Japan)	PJ	20,357	20,552	20,963	21,213	22,353	22,768	23,118	23,392	22,810	23,001	23,385	General Energy Statistics, 2000
Hydroelectric		859	938	793	921	645	791	774	877	898	832	806	
Coal		3,380	3,482	3,382	3,414	3,662	3,763	3,794	3,949	3,737	3,990	4,195	
Oil		11,870	11,659	12,192	11,996	12,833	12,708	12,758	12,535	11,942	11,973	12,107	
Natural gas		2,063	2,180	2,216	2,267	2,406	2,467	2,638	2,706	2,804	2,920	3,072	
Geothermal		19	21	21	21	25	39	45	46	43	42	40	
Nuclear		1,905	2,010	2,103	2,348	2,535	2,743	2,846	3,006	3,130	2,982	2,898	
New energy, etc.		261	261	255	246	247	258	262	273	256	262	267	
(3) Primary energy supply per capita (worldwide)	GJ/ person	69.9	69.7	69.0	68.8	68.2	69.0	70.2	69.8	69.1	69.3	—	IEA: CO_2 EMISSIONS FROM FUEL COMBUSTION (2001 Edition)
<Reference: population>	million persons	5,228	5,315	5,396	5,474	5,552	5,629	5,707	5,788	5,866	5,945	—	
(4) Primary energy supply per capita (in Japan)	GJ/ person	164.7	165.6	168.3	169.8	178.4	181.3	183.7	185.4	180.3	181.6	184.2	General Energy Statistics, 2001
<Reference: population>	million persons	123.61	124.10	124.57	124.94	125.27	125.57	125.86	126.17	126.49	126.69	126.93	Statistics of Management and Coordination Agency
(5) Energy supplied for electric power (in Japan)	PJ	7,872	8,129	8,182	8,267	8,765	8,992	9,145	9,359	9,394	9,479	9,489	General Energy Statistics, 2001
<Electrification rate>	%	38.7	39.6	39.0	39.0	39.2	39.5	39.6	40.0	41.2	41.2	42.4	
(6) Self-sufficiency ratio of energy supply (in Japan)	%	17.2	17.7	17.6	19.1	18.8	19.9	20.1	20.7	21.3	20.2	—	ENERGY BALANCES OF OECD COUNTRIES
■Electric Power Data													* Figures do not necessarily add up to the totals because of rounding.
(7) Electricity consumed (in Japan)	TWh	765.6	789.9	797.8	804.7	858.8	881.6	903.5	926.7	934.7	957.4	978.3	Electric Power Industry Handbook
(8) Electricity generated (in Japan)	TWh	857.3	888.1	895.3	906.7	964.3	989.9	1,009.3	1,037.9	1,046.3	1,066.1	1,091.5	
Hydroelectric		95.8	105.6	89.6	105.5	75.7	91.2	89.4	100.4	102.6	95.6	96.8	
Thermal		557.4	567.3	580.6	550.2	617.5	604.2	614.0	614.6	607.8	650.4	669.2	
Nuclear		202.3	213.5	223.3	249.3	269.1	291.3	302.2	319.2	332.3	316.6	322.1	
Geothermal		1.7	1.8	1.8	1.8	2.1	3.2	3.7	3.8	3.5	3.5	3.3	
(9) Power generation system (in Japan)	GW	194.73	199.99	205.13	212.91	220.90	226.99	233.74	242.45	250.29	253.54	258.84	
Hydroelectric		37.83	39.12	39.52	39.97	41.93	43.46	44.41	44.46	45.38	45.86	46.32	
Thermal		124.98	127.18	130.75	134.10	138.05	141.67	146.07	152.20	159.05	161.87	166.65	
Nuclear		31.65	33.40	34.58	38.54	40.53	41.36	42.71	45.25	45.25	45.25	45.25	
Geothermal		0.27	0.27	0.27	0.30	0.38	0.50	0.53	0.53	0.53	0.53	0.53	
■CO_2 Data													
(10) CO_2 emissions associated with the combustion of fossil fuels (worldwide)	million t	21,279	21,403	21,367	21,612	21,688	22,184	22,903	23,059	22,982	23,172	—	IEA: CO_2 EMISSIONS FROM FUEL COMBUSTION (2001 Edition)
(11) CO_2 emissions per capita (worldwide)	t/person	4.07	4.05	3.98	3.95	3.90	3.93	4.00	3.99	3.92	3.90	—	
(12) CO_2 emissions (in Japan)	million t	1,124.4	1,147.8	1,162.2	1,144.0	1,214.1	1,217.8	1,236.2	1,233.5	1,187.0	1,225.0	—	Ministry of Environment
(13) CO_2 emissions per capita (in Japan)	t/person	9.10	9.25	9.34	9.17	9.71	9.70	9.82	9.78	9.38	9.67	—	
(14) CO_2 emissions from the electric power industry	million t	276	277	287	268	307	296	298	291	286	302	311	The Federation of Electric Power Companies Japan
(15) CO_2 emission intensity of electric power industry (user end)	kg/kWh	0.42	0.41	0.42	0.39	0.41	0.39	0.38	0.37	0.36	0.37	0.37	

■Japan's CO_2 Emissions, Broken Down by Sector (FY1999)

Inner circle: Shares of sectors in breakdown of direct emissions (figures in parentheses)
Outer circle: Shares of sectors in breakdown by application when total emissions from power generation are distributed among final demand sectors according to their respective amounts of electricity consumption

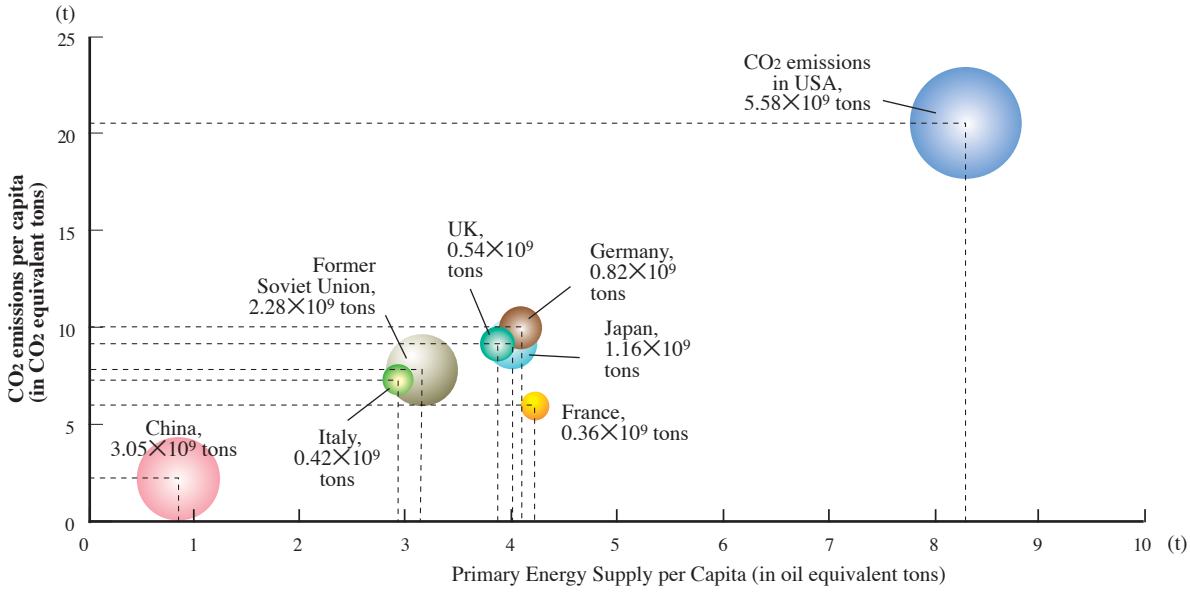


Source: Ministry of the Environment

■CO_2 Emissions Associated with Combustion of Fossil Fuels

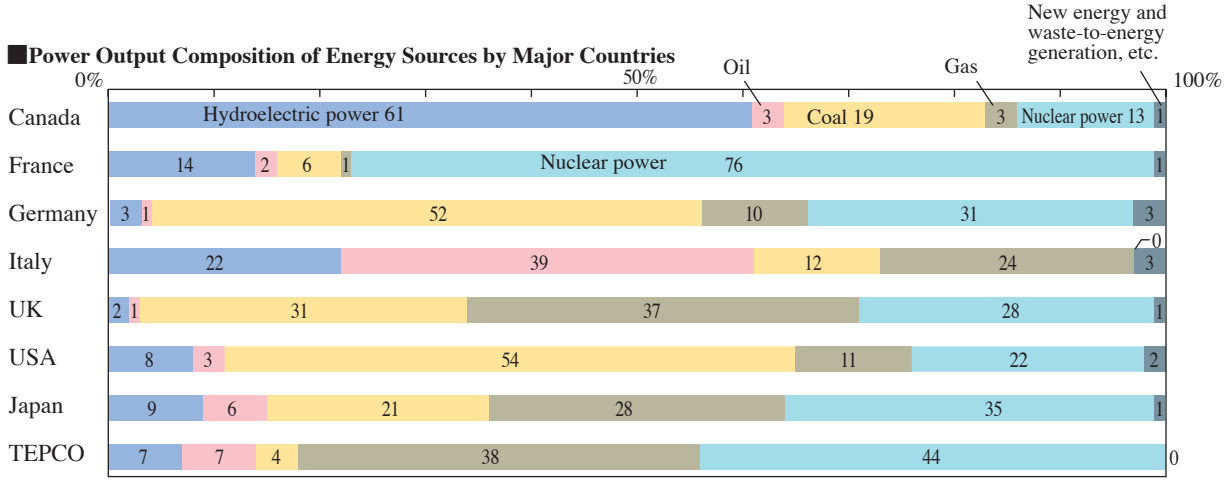
Source: CO_2 Emissions from Fuel Combustion (2001 Edition), IEA

■Primary Energy Supply and CO_2 Emissions per Capita (FY1999)



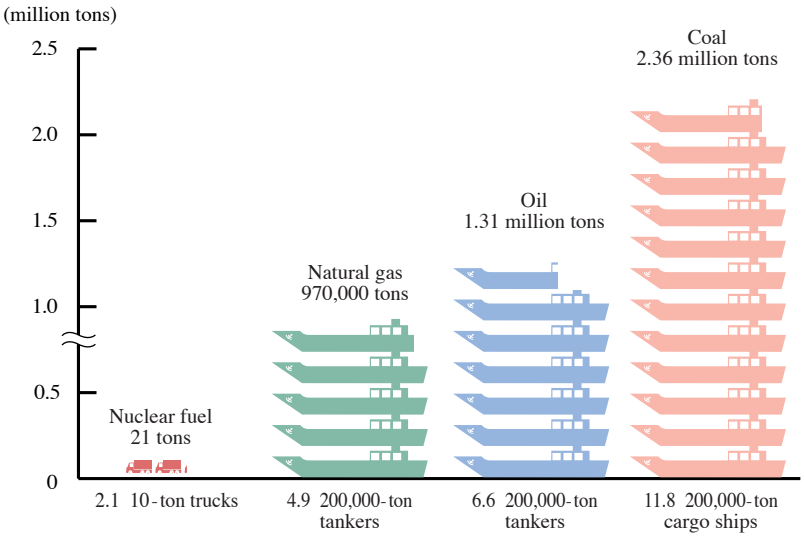
Source:CO_2 Emissions from Fuel Combustion (2001 Edition), IEA

■Power Output Composition of Energy Sources by Major Countries



Note: Emissions for the four European countries, Canada and the USA are based on 1999 data, those for Japan on FY2001 data, and those for TEPCO on FY2001 data.
Source: Estimates from ENERGY BALANCES OF OECD COUNTRIES, 1998-1999 for the USA and the five European countries, and estimates for Japan based on a survey of Federation of Electric Power Companies.

■Fuel Required to Operate a Million kW Plant for One Year



■Reserves of Energy Resources in the World (in 2000)

	Confirmed exploitable reserves	Reserves/ Production ratio
Uranium	3.95 million tons	64.2 (Note 1)
Natural gas	150 trillion m^3	61.0
Oil	1.0460 trillion barrels (Note 2)	39.9
Coal	984.2 billion tons	227

Source: General Energy Statistics, 2001

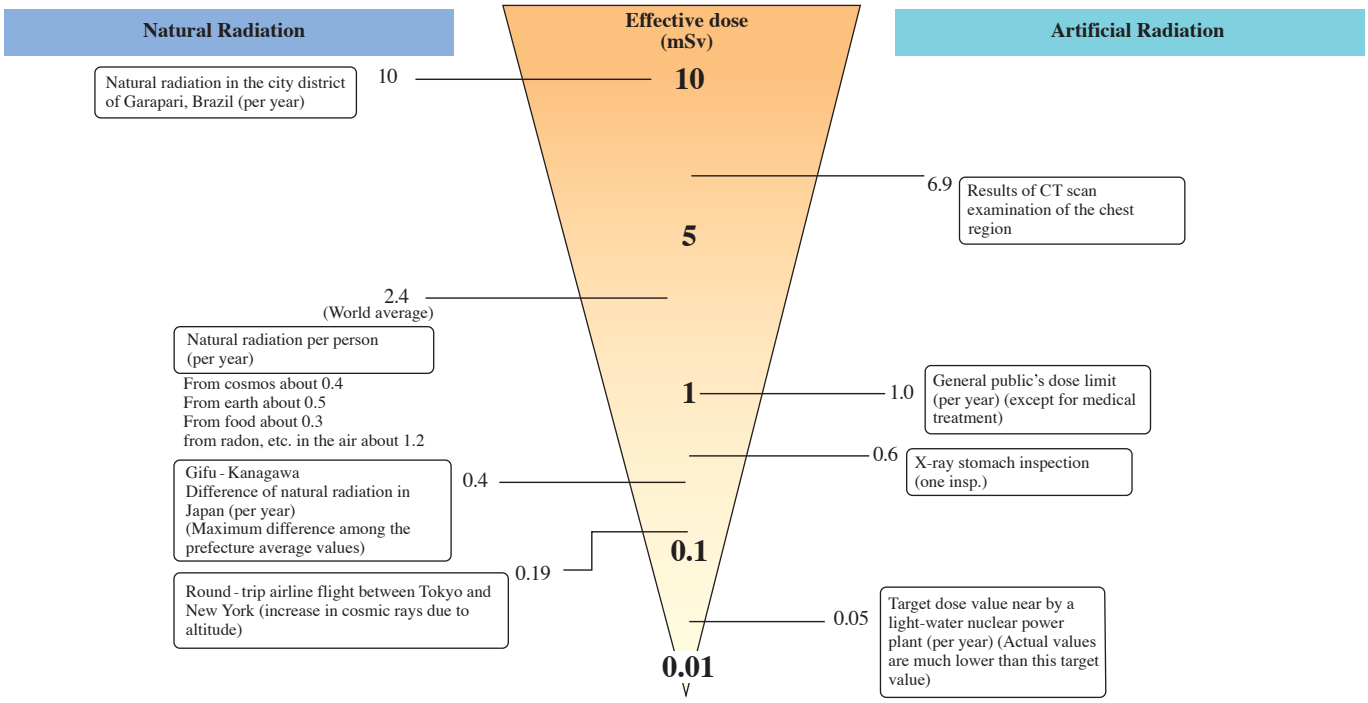
Note 1: The amount of uranium mined a year is smaller than its annual demand (62,000 tons) because of adequate inventory. Therefore, its R/P is set at the value of the proven reserve divided by the annual demand.

Note 2: 1 barrel = 0.159 kℓ

■Units of Radioactivity and Radiation

		New units	Definition	Former units	Conversion formula
Unit of radioactivity		Becquerel, Bq	Radioactive material in which one atom decays per second.	Curie, Ci	$1Ci = 3.7\times10^{10}Bq$
Units concerning radiation dose	Exposure	Coulomb per kilogram, C/kg	Dose of X- and gamma-rays irradiating 1 kg of air and thereby producing 1 coulomb of ion.	Roentgen, R	$1R = 2.58\times10^{-4}C/kg$
	Absorbed dose	Gray, Gy	Radiation dose when one joule of energy is absorbed per 1 kg	Roentgen absorbed dose, rad	1rad = 0.01Gy
	Dose equivalent	Sievert, Sv	Unit of gray multiplied by the relative biological effectiveness.	Roentgen equivalent man, rem	1rem = 0.01Sv

■Radiation in Daily Life



Ⅳ. Glossary and Index

Page numbers indicate only key passages in this report.

In alphabetical order

A

Advanced Combined Cycle (ACC) Power Generation (p.4,7,23,30,35,67,88)

Combined cycle power generation is a power generation system with higher thermal efficiency attained by combining the advantages of steam power generation and gas-turbine power generation. This system first generates electricity by burning fuel in a gas turbine unit and then recovers heat from the exhaust gas of the turbine to produce steam for a steam power generation unit. Advanced combined cycle (ACC) power generation offers an improved version of the LNG-fired gas turbine combined cycle power generation system, with the gas temperature at the turbine inlet raised to 1,300℃ or more to further upgrade the thermal efficiency.

B

Biomass (p.31,100)

Organic substances which derive from the fauna and flora and which can be used as an energy source. These substances do not include any fossil fuel (crude oil, petroleum gas, combustible natural gas or coal) or any product thereof.

C

Chemical Extraction/Decomposition Method (p.46,78,79)

Technology for the chemical decomposition of PCB, jointly developed by the Tokyo Electric Power Company, Mitsui & Co., Ltd. and Neos Co., Ltd. under the direction of the Research Institute for Production and Development, Inc. The method adds alkali and a solvent to insulating oil containing PCB and heats it to a temperature of about 200℃ under normal pressure. The method attains excellent PCB decomposition by the dechlorination of PCBs, which change into harmless oil and salt.

Clean Development Mechanism (CDM) (p.30,99)

One of the Kyoto mechanisms set forth in the Kyoto Protocol. Industrialized countries jointly implement a project to reduce greenhouse gas emissions in a developing country, and reductions attained are distributed among the participating countries.

Coagulating Sedimentation Method (p.35)

A waste water treatment method whereby a particulate substance dispersed in water is chemically turned into larger particles, which will then coagulate, settle and be separated. This method has been adopted because those particles dispersed in water which are less than 1mm in size cannot be separated by mechanical means such as filtering.

Community Tank (p.106,108)

(See page 106)

Consulting Engineer (p.16)

Persons who have obtained any of the national qualifications specified under the Consulting Engineers Law. The registered engineers carry out, or provide guidance in, the task of planning, studies, designs, analyses, tests and assessment for those matters which require the capability of making advanced technical applications of science and technology. The subjects of engineering specified under the law are grouped into 20 technical fields including, among others, mechanical engineering, chemistry, civil engineering and the environment.

D

Deep Seawater Intake System (p.35,36)

(See page 36)

Dioxins (p.16,39,51,78,115)

A general term, as defined in the Law Concerning Special Measures against Dioxins, for polychlorinated dibenzo-para-dioxin (PCDD), polychlorinated dibenzofuran (PCDF) and coplanar polychlorinated biphenyl (coplanar PCB). PCDD has 75 isomers, PCDF has 135 and coplanar PCB has 14, of which 29 are considered toxic. Animal and other tests show that dioxins, unintended products of combustion processes, have intensely acute toxicity, carcinogenicity and teratogenicity.

District Heating and Cooling (DHC) Service (p.32,72,108)

A system that provides heating and cooling by feeding cold water, hot water and steam from a heat supply plant to buildings in the specified service district through piping. The district heating and cooling system achieves high energy efficiency, as it can effectively use waste heat from waste incineration plants, substations, subways, etc., and also such unused energy sources as heat from river water and sewage.

E

E7 (p.31,66)

An environment-related international NPO of the nine major electric power companies from seven countries: Japan, Germany, France, Italy, Canada, the United Kingdom and the United States. In order to contribute to solving global environmental problems through a set of measures, such as technical support to developing countries, the E7 holds a conference for the leaders of member electric utilities (E7 Summit), implements specific projects, and issues various statements.

Eco Vender (p.71,110)

(See page 110)

Eco-Efficiency (p.8,68)

The idea of seeking efficiency both in the environmental and economic aspects of business activities. In other words, it aims to reduce environmental loads through the improvement of technical capabilities and economic efficiency. Eco-efficiency was first proposed in "Changing Course," a book published by the Business Council for Sustainable Development (BCSD), as a basic principle for industrial circles in taking measures to realize sustainable development.

Eco-Efficiency Ratio (p.7,68)

(See page 68)

Eco Ice, Eco Ice Mini (p.71,73,97 107)

(See page 107)

Effective Dose (p.38)

A radiation dose used to express the effects of various types of radiation on part of the human body by the same measure as that used for indicating those effects on the whole body. This indicator is used with due consideration to the radiation sensitivity of the internal organs and tissues of the human body. The effective dose is expressed in units of Sievert (Sv).

Electromagnetic Field (p.105)

A general term for electric and magnetic fields. The electric field can be explained as follows. When you rub a celluloid board and hold it up over your head, your hair will bristle up. The "field" causing this force is called the electric field. An electric field is produced around an object to which voltage is applied. When you scatter iron powder on a celluloid board and

put a magnet to the back of the board, a pattern connecting the N pole and the S pole will appear on the board. The "field" causing this force is referred to as the magnetic field. A magnetic field is generated around an object through which an electric current is flowing or around a magnet.

Electrostatic Precipitator (p.33,34,91)

A device which, when voltage is applied to a dust-collecting electrode and a discharge electrode, passes flue gas between the two electrodes to charge soot and dust contained in the gas with electricity by the action of an electric field and then gathers charged soot and dust onto the dust-collecting electrode.

Emission Intensity (p.4,5,20,21,24,33,35,98,107,112, 113,115)

The amount of CO_2, SOx, NOx, etc. emitted per kWh of electric energy produced (or consumed).

Emissions Trading (p.30,99)

One of the Kyoto mechanisms that allows industrialized countries to trade part of the greenhouse gas emissions allocation under the Kyoto Protocol. When one country has emitted a greater amount of greenhouse gases than its reduction target, it may purchase emissions allocations from another nation and subtract them from its own emissions to fulfill the target. When one country emits a lower amount of greenhouse gases compared with its target, the country may sell the difference to another country.

Energy Supervisor (p.16,22,115)

A person who holds an energy supervisor's license upon passing examinations conducted in accordance with the Law Concerning the Rational Use of Energy. The law stipulates that at each factory or business establishment exceeding a certain scale, an energy supervisor will be appointed to take charge of maintaining energy-consuming equipment, improving patterns of energy usage, and overseeing energy use.

Environment Day (p.64)

June 5 has been designated as Environment Day under Article 10 of the Basic Environment Law. Environment Day is observed to raise the consciousness of industries and citizens and to deepen their understanding of environmental protection, as well as to encourage them to promote activities for environmental preservation. The designation of Environment Day was made in commemoration of the UN Conference on the Human Environment held in Stockholm, Sweden, from June 5, 1972. Following a proposal by the Japanese delegation at the conference, the United Nations designated June 5 as World Environment Day.

Environment Month (p.15,64)

In 1973, the week beginning on June 5 every year was designated as Environment Week in accordance with a proposal by the Ministry of Environment. In 1991, another proposal by the ministry was adopted to designate June as Environment Month, during which various events are to be held across the country to promote people's understanding of environmental preservation and encourage them to act for this purpose. In addition, June 5 was designated in 1993 as Environment Day under Article 10 of the Basic Environment Law.

Environmental Accounting (p.7,68-70,88,89)

An accounting system to determine and assess the costs and benefits of corporate activities pertaining to the environment based on information about the units of money and materials involved. Interested parties, specifically the government and private corporations, are studying the uses of this system, which is expected to provide an effective tool to obtain business data and information for determining the cost effectiveness of environmental measures and to improve information disclosure practices for environmental protection.

Environmental Action Plan by the Japanese Electric Utility Industry (p.98)

A voluntary action plan formulated by the Japanese electric utility industry in November 1996 to further promote the environmental preservation measures it had been promoting voluntarily and actively. The environmental action plan is checked and reviewed annually and the results are announced publicly. Concerning the implementation of measures to mitigate global warming and the creation of a recycling-oriented society, the plan sets forth two numerical targets; one aims to lower the electric power industry's CO_2 emission intensity per kWh of electricity generated in fiscal year 2010 to approximately 20% (about 0.3 kg-CO_2/kWh) below the FY1990 level and the other calls for reducing the total amount of final waste disposal by the industry in FY2010 to around 2 million tons from the approximately 2.4 million tons actually recorded in FY1990.

Environmental Aspect (p.9,11,19)

Environmental aspects are defined in ISO14001 as "elements of an organization's activities, products or services that can interact with the environment."

Environmental Audit (p.9,11,16)

The act of examining the environmental protection activities and environmental management systems of a certain organization to see if they are in proper condition or properly operated in accordance with the law or environmental protection manuals, and making a report of the results to the client of an audit. The examination is conducted by interviews, observation of work places, and by a review of documents to collect evidence. Based on this evidence, an objective evaluation is made. The environmental audit consists of an environmental management system audit, which examines if the system is arranged and operated properly; a compliance audit, which examines compliance with laws and ordinances; and a performance audit, which examines environmental performance, such as how waste is being disposed of and recycled.

Environmental Education (p.62,95)

Education concerning the environment. It is aimed to promote people's environmental consciousness by providing them with knowledge about the environment and lead them to put environment-conscious lifestyles and activities into practice.

Environmental Impact Assessment (p.33,79,101,102)

A system under which the entity implementing a development project is required to survey, predict and assess the possible impact of the project on the environment, publish the results of the assessment and hear the opinions of local inhabitants and other interested parties on the results. The system aims to enhance environmental safeguards. It is one important means of preventing environmental disruption.

Environmental Management System (p.8,9,11,12,14,16,51,52,69,85)

A system whereby the environmental management of an organization is conducted through the PDCA cycle of establishing, implementing, operating, checking and reviewing environmental policies and programs.

Environmental Review (p.33,102)

A review conducted by the regulatory authorities in accordance with the assessment standards specified in the applicable laws and ordinances to examine projects that are subject to environmental impact assessment, in respect to those items which can affect the environment.

Equal Employment Opportunity Law (p.59)

The common name of the law enacted in May 1985 through the renaming of and major amendments to the Law for Welfare of Working Women in a bid to realize sexual equality in employment. Action was taken later to strengthen the provisions of the law concerning the equal treatment of both sexes in employment. More specifically, the provisions requiring business operators, or employers, to make efforts for equal treatment of both sexes in recruitment, employment, assignment and promotion were replaced by new provisions banning any sexual discrimination in these respects. The action also called for other amendments, including the provision that the official name of the law be changed to the Law for Securing Equal Opportunity and

Treatment for Both Sexes in the Area of Employment, etc. The amended law was enacted in June 1997.

Evaluated Value of Radiation Exposure Doses (p.20,38)

A value that indicates the results of an evaluation of the dose which the public is exposed to radioactive substances released into the environment near a nuclear power station. Nuclear power stations in operation in Japan are under strict control not only to satisfy the regulatory value (1 mSv/year), but to attain a level substantially lower than the target dose (0.05 mSv/year) specified in accordance with the guidelines of the Nuclear Safety Commission.

F

Factory Location Law (p.13,23)

A law enacted in 1959 to ensure that factories are properly located with consideration given to environmental preservation. The law provides that the greenery rate of any factory larger than a certain size be not lower than 20%. (The greenery rate may be somewhere between 15% and 25%, as set by local public entities on their own under the applicable ordinance according to the actual conditions of the locality.)

Flue Gas Denitrification Facility (p.4,33,34,88,91)

Equipment intended to remove nitrogen oxides (NOx) from flue gas produced when fossil fuel burns in the boiler of a thermal power station.

Flue Gas Desulfurization Facility (p.33,34,91)

Equipment intended to remove sulfur oxides (SOx) from flue gas produced when fossil fuel burns in the boiler of a thermal power station.

Framework Convention on Climate Change (p.31,99)

A UN convention specifying a basic framework of efforts by the international community toward the mitigation of global warming, with the ultimate goal of stabilizing the atmospheric concentration of greenhouse gases. The convention was adopted in May 1992 and put into effect in March 1994.

G

Geological Disposal (p.104)

Disposal of high-level radioactive waste in appropriate deep geological formations after being stored for cooling for a certain period of time.

Geothermal Power (p.22,28,114)

Production of electricity by operating a turbine by means of hot water underground or the thermal energy of hot dry rock. Geothermal power generation is conducted near volcanoes.

GIAC (Greater-Kanto Industrial Advancement Center) (p.28,29)

An acronym for the Greater-Kanto Industrial Advancement Center, a public organization established in September 1987 mainly for the purpose of revitalizing industries in Tokyo and 10 other prefectures of the Greater-Kanto region (which consists of the Kanto region plus Yamanashi, Nagano, Niigata and Shizuoka prefectures). GIAC has a fine track record of successfully carrying on extensive activities, including projects for the creation of new industries and surveys and studies on the revitalization of existing industries. Making effective use of these experiences, it takes charge of managing the Green Power Fund.

Global Warming (p.12,18,26,48,69,86,98,99,100)

A phenomenon in which the temperature of the ground surface rises more than the natural changes as the greenhouse effect is intensified by a rise in the atmospheric concentration of greenhouse gases due to increased emissions of those gases (i.e. carbon dioxide, methane and nitrous oxide) associated with expanded human activities.

Global Warming Potential (p.32)

A coefficient indicating the extent to which each greenhouse gas contributes to global warming. It is expressed as a relative value with the global warming effect of carbon dioxide of the same mass given as one (1). Usually the GWP of a gas is represented by the result of comparing it with CO_2 in terms of its global warming effect over a period of 100 years.

Green Power Program (p.23,28)

Natural energy sources, such as photovoltaic power and wind power, involve a lighter environmental load but tend to be costlier than other power sources. The green power program is intended to promote the diffusion of these natural energy sources with voluntary cooperation from general customers and businesses. The specific programs introduced by TEPCO are described on pages 28-29.

Green Procurement (p.8,13)

Purchasing and/or using those commodities, materials and equipment which have been produced with consideration to the environment, e.g., commodities effectively utilizing recycled resources and equipment having great energy-saving effects.

Greenery Rate (p.22,40,114,115)

The percentage of the greenery area to the total area of the site. Specific factories are required to fulfill the greenery rate regulations under the Factory Location Law and prefectural ordinances.

Greenhouse Gas (p.4,8,9,24,26,32,99,115)

Carbon dioxide (CO_2) and other gases absorb infrared rays released from the ground surface and re-emit some of them back onto the ground; as a result, the ground surface and lower atmosphere are heated. This phenomenon is referred to as the greenhouse effect. Gases that have the greenhouse effect are referred to as greenhouse gases. The Kyoto Protocol specifies carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulfur hexafluoride (SF_6) as greenhouse gases, and requires parties to reduce anthropogenic emissions of these greenhouse gases. In addition to these gases, water vapor in the atmosphere, CFCs, and ozone also have a greenhouse effect.

Guideline of Measures to Prevent Global Warming (p.98-100,107)

(See page 100)

H

Headwaters Protection Forest (p.40,94)

Forests have the function of alleviating floods and water shortages by storing rainwater and retarding water influx into rivers. Water quality conservation is another function of forests to produce water of good quality that has little variation in composition and temperature. These functions are referred to as headwaters protecting functions, and the forests with such functions are called headwaters protection forests.

Heat Pump (p.71-73,97,108-109)

A device that generates cool or warm heat by exchanging heat between a refrigerant and the outside, such as the ambient air, while keeping the refrigerant going through a cycle of compression and expansion strokes. The heat pump is widely used as a heat source for room air conditioners, air-conditioning systems in large buildings, and district heating and cooling services.

Higher Heating Value (HHV) (p.30)

The heating value of fuel represented in its gross heating value during combustion. This term is used in comparison with the lower heating value of the fuel, the balance after the deduction of the latent heat of steam generated during combustion from the gross heating value. In calculating the thermal efficiency of power generation (see page 125), use of the lower heating value as a unit heating value of the fuel results in higher apparent thermal efficiency than when the higher heating value is used.

High-Level Radioactive Waste (p.26,27,104)

Vitrified waste assemblies produced from the treatment of waste liquid containing high-concentration radioactive substances separated in the reprocessing process at a reprocessing facility, which is designed for the recovery of uranium and plutonium from spent fuel.

Home Energy Management System (HEMS) (p.7,72,110)

(See page 110)

Hydrofluorocarbon (HFCs) (p.32)

Substances used as refrigerants for air conditioners and refrigerators and as aerosol sprayers. HFCs are supposed to have a global warming potential 140 to 11,700 times higher than that of carbon dioxide.

I

Induction Heater (IH Cooking Heater) (p.73,109)

(See page 109)

Inert Gas Series (p.32)

Noble gases (see page 124) are called inert gases because they are generally inert. In addition, nitrogen and some other gases are sometimes referred to as inert gases. In the past, gases such as CO_2, halon and nitrogen were used separately as extinguishants, but recently, nitrogen, in the form of a simple substance or a mixture with argon or other gases, has come into wider use from the viewpoint of protecting the global environment. These gases are generically called the new gases, or inert gas series.

Insulator (p.43,79,113)

Any of the porcelain devices installed mainly on power transmission steel towers or utility poles to support electric wires while preventing the conduction of an electric current from the wires to the ground.

Integrated Coal Gasification Combined Cycle (IGCC) Power Generation (p.26, 87)

(See page 87)

Intergovernmental Panel on Climate Change (IPCC) (p.40,48)

IPCC was established jointly by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) in 1988 as a place for experts selected by the governments of world nations to meet and discuss global warming problems. The panel gathers and categorizes basic data and views on global warming, particularly a scientific assessment of this phenomenon, its social and economic impacts, and strategies to mitigate it.

International Chamber of Commerce (ICC) (p.66)

A non-governmental international association established in 1919 with a view to promoting international trade and investment and building a global framework for economic exchanges. The International Chamber of Commerce has members in about 130 countries. The ICC is engaged in activities in various fields, including energy, the environment, trade and international arbitration.

International Energy Agency (IEA) (p.116,117)

An agency established in 1974 within the Organization for Economic Cooperation and Development (OECD) by oil-consuming countries to work together to meet international energy needs after the first oil crisis. The IEA formulates measures to be taken in emergencies (such as the suspension of oil supply), conducts surveys on trends in the international oil market, and makes various recommendations.

Iodine (p.37)

A halogen with the symbol I and the atomic number 53. Iodine does not exist naturally as a separate element, but is found mainly as an organic compound in seaweeds and marine animals. At nuclear power plants, it occurs as radioactive iodine (e.g., iodine 131 and 133), one of the fission products resulting from the nuclear fission of uranium 235.

ISO14001 (p.11,12,14,51,52)

One of the ISO14000 series of international standards on environmental management, formulated by the International Organization for Standardization (ISO). The ISO14001 specifies the requirements for environmental management systems. The aim is to encourage private enterprises and organizations to voluntarily conduct environmental management and thereby continually improve their environmental performance.

J

Japan International Cooperation Agency (JICA) (p.66)

A special corporation established in 1974 to promote technical and financial cooperation with developing nations. Among the major functions of JICA are receiving trainees from and sending experts to developing countries, sending Japan Overseas Cooperation Volunteers to foreign countries, conducting preliminary surveys for free financial cooperation, and facilitating the implementation of such cooperation projects.

Joint Implementation (p.4,30,99)

One of the Kyoto mechanisms identified under the Kyoto Protocol. Industrialized countries jointly implement a project to reduce greenhouse gas emissions, and reductions attained are distributed among the participating countries.

K

Keidanren Voluntary Action Plan on the Environment (p.98)

A voluntary action plan that prescribes measures to control global warming and environmental safeguards, including recycling, formulated by the Japanese business community in response to the Keidanren (Japan Federation of Economic Organizations) Appeal. At present, 43 different industrial sectors are taking part in the Voluntary Action Plan. In order to mitigate global warming, the Action Plan sets the goal of "reducing CO_2 emissions from the industrial and energy conversion sectors below the 1990 level by the year 2010."

Kyoto Mechanism (Flexibility Mechanism) (p.4,26,30,31,99,100)

Mechanisms introduced in the Kyoto Protocol as supplementary measures to the domestic efforts of industrialized countries to meet their greenhouse gas reduction targets by working together to reduce greenhouse gas emissions on a global scale. The Mechanisms include the clean development mechanism, emission trading, and joint implementation.

Kyoto Protocol (p.24,98,99,100)

A protocol adopted by the third Conference of the Parties to the United Nations Framework Convention on Climate Change (COP3), held in Kyoto, Japan, in December 1997. The Kyoto Protocol designates six greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Under the Kyoto Protocol, the overall emissions of these greenhouse gases from the industrialized countries, including the former Soviet Union and Eastern European nations, are to be reduced by at least 5% below the 1990 level (or the 1995 level for HFCs, PFCs, and SF_6), on average during the five-year period from 2008 to 2012. Legally binding greenhouse gas reduction targets designated by the protocol are differentiated by countries: 6% for Japan, 7% for the United States, 8% for the European Union. For other countries, targets range from an 8% reduction in greenhouse gases to a 10% increase in emissions.

L

Law Concerning Special Measures for Promoting Proper Disposal of Polychlorinated Biphenyl Waste (p.80)

A law (enacted on June 15 and enforced on July 15, 2001) for the purpose of protecting people's health and preserving their living environment by promoting the reliable, proper disposal of polychlorinated biphenyl (PCB) waste. The law requires that the central and local governments endeavor to formulate their respective plans for disposing of PCB waste and take necessary measures, including the establishment of organizations for disposal of the waste, that business operators producing PCB waste dispose of such waste within 15 years from the date of enforcement of the law, and that the operators of PCB waste storage and disposal facilities report yearly the current state of PCB waste storage and disposal to the prefectural governors involved (or the mayors of the affected cities that have public health centers).

Law Concerning Special Measures for the Use of New Energy Sources, Etc. by Electric Power Companies (p.99,100)

(See page 100)

Law Concerning the Final Disposal of Specific Radioactive Waste (p.104)

A law enacted in May 2000 to provide for necessary measures, including the establishment of an implementing entity, financing for disposal costs, and the selection process for final disposal facility sites, in a bid to steadily and systematically carry out the final disposal of high-level radioactive waste.

Law Concerning the Promotion of the Measures to Cope with Global Warming (p.99,100)

(See page 100)

Law Concerning the Rational Use of Energy (Energy Conservation Law) (p.13,99,100,107)

(See page 100)

Light Water Reactor (LWR) (p.118)

A nuclear reactor that uses common water (light water) as a moderator, which is used to slow down the speed of neutrons so they can easily be absorbed by uranium fuel, and as a coolant, which is used to extract heat produced by nuclear fission.

LNG (Liquefied Natural Gas) (p.2,4,13,19,21,26,33,34,111,112)

Natural gas that has methane (CH_4) and ethane (C_2H_6) as its main ingredients and which has been cooled down to minus 162℃ to form a liquid. LNG is carried on a special ship called an LNG tanker and, after unloading, gasified again as fuel for power generation and other purposes.

Load Leveling (p.97,107)

Arrangements for promoting energy conservation, environmental protection and cost reductions through more efficient use of electrical facilities by narrowing differences in electricity demand among seasons as well as between day and night.

Lower Heating Value (LHV) (p.30)

(See page 121 "Higher Heating Value")

Low-Level Radioactive Waste (p.37,92,103)

Waste with a low concentration of radioactive substance produced from a nuclear power station or other similar facilities. Such waste includes used paper towels, discarded working clothes and gloves.

Low-Pollution Vehicles Designated by the Ministry of Land, Infrastructure and Transport (p.5,35)

Motor vehicles with little CO_2 or NOx emissions designated by the Ministry of Land, Infrastructure and Transport. The designated automobiles include ultra-low-emission vehicles, hybrid vehicles, natural gas-fueled vehicles, electric vehicles, and methanol-fueled vehicles.

M

Methane (CH_4) (p.31,32)

Methane is one of the hydrocarbons, which is supposed to have a global warming potential 21 times higher than that of carbon dioxide. The following sources of methane emissions have particularly become an issue: rice cultivation, reclamation of waste and intestinal fermentation of cattle.

Middle-Term Profit-Sharing Silviculture Program (p.41)

A program under which participants pay a certain amount to own trees being reared, in part, in a national forest in conjunction with the government (Forestry Agency). Participants are to receive proceeds from the sale of trees in proportion to their own shares at a date specified in the contract.

MOX Fuel (Mixed Oxide Fuel) (p.47,103)

A nuclear fuel prepared by mixing plutonium extracted by spent fuel reprocessing with uranium.

MOX Fuel Utilization in Light Water Reactors (p.47)

(See page 47)

N

NAS Battery (Sodium-Sulfur Battery) (p.74)

A chargeable and dischargeable battery that has sodium on the negative side and sulfur on the positive side and which uses beta alumina ceramics with sodium ion conductivity as the solid electrolyte. The NAS battery has a number of advantages in that it involves no self-discharge, thereby resulting in high charging and discharging efficiency, it can be installed in small spaces due to its high energy density, and it is durable for a long time.

Natural Energy (p.4,22,26,28,29,55,69,90,114)

In general, natural energy means renewable energy sources available from nature, such as solar, wind, hydraulic and geothermal energy, which feature low environmental loads and few quantitative limitations on resources.

Natural Refrigerant CO_2 Heat Pump Water Heater (p.7,71,72)

(See page 72)

NGL (Natural Gas Liquid) (p.19,34,112)

Hydrocarbon produced as a natural gas and liquefied at a normal temperature and pressure. NGL is a good fuel with a low sulfur and nitrogen content. It is used as one of the fuels for power generation.

Nitrogen Oxide (NOx) (p.4,5,19-21,26,33-35, 91,107,108)

A general term for nitrogen monoxide (NO), nitrogen dioxide (NO_2) and other similar substances. Nitrogen oxides are produced when a fossil fuel burns and nitrogen contained in the fuel is oxidized, or when nitrogen in the air is oxidized at high temperatures. NOx is contributing to the formation of photochemical smog and acid rain, and is designated as a regulated substance under the Air Pollution Control Law.

Nitrous Oxide (N_2O) (p.32)

Nitrous oxide is produced from the combustion of fuels, industrial processes (e.g., the manufacture of adipic acid and nitric acid), etc. This substance is considered to have a global warming potential some 310 times higher than that of carbon dioxide.

Noble Gas (p.37,92)

A generic term for Group 0 elements in the periodic table, comprising helium (He), neon (Ne), argon (Ar), krypton (Kr), xenon (Xe) and radon (Rn). As they exist only in a very small quantity in the earth's crust or the air, these elements are called "rare gases" or "noble gases." Radioactive substances produced at nuclear power plants include such rare gases as radioactive krypton, xenon and argon.

Nuclear Fission (p.47,103)

One of the nuclear reactions denoting the splitting of a heavy atomic nucleus into two or more atomic nuclei. Nuclear power generation utilizes energy freed by uranium 235 when it absorbs neutrons and undergoes nuclear fission.

Nuclear Fuel (p.47,103)

Fuels used in a nuclear reactor. Nuclear fuels include uranium and plutonium.

Nuclear Safety Commission (p.21,37,38)

A commission newly established in the Prime Minister's Office in 1978 under a reorganization program of the Atomic Energy Commission to reinforce the nuclear safety structure. (The commissions were transferred to the Cabinet Office, successor to the Prime Minister's Office, early in 2001 when the Japanese government reorganized its main office and ministries and agencies.) Among the essential matters related to the research, development and utilization of nuclear energy, the Nuclear Safety Commission is authorized to plan for, deliberate and decide on matters involved in securing nuclear safety.

Nuclear Safety network (NSnet) (p.57)

An organization established in December 1999, following the criticality accident (of September 1999) at a fuel processing facility in Tokai-mura Village, Ibaraki Prefecture, with the objective of promoting a safety culture throughout the entire nuclear power industry. NSnet carries on such activities as the diffusion of the nuclear safety culture, a peer review among members, and exchanges and the provision of information on nuclear safety. Currently its membership comprises 36 enterprises and research institutes in Japan, including not only electric utilities but also other businesses that play a role in the nuclear fuel cycle, from brand-new fuel fabrication to spent fuel reprocessing.

Nuclear Waste Management Organization of Japan (NUMO) (p.104)

An organization established in October 2000 as an implementing entity for high-level radioactive waste disposal under the Law Concerning the Final Disposal of Specific Radioactive Waste (enacted in May 2000). The institute promotes the implementation for selecting final disposal facility sites, building and managing the final disposal facility, carrying out the final disposal of the specified radioactive waste, closing the final disposal facility, etc.

O

Office Neighborhood Association (ONA) (p.52,90)

A network started in August 1991, with TEPCO playing a central role, with a view to efficiently collecting and recycling waste paper from offices in cooperation with waste paper collectors. The network of office neighborhood associations contributes to promoting the collection of separated waste paper from offices. The office neighborhood association conducts drives for the expanded use of recycled paper, thereby contributing to a decrease in the amount of waste paper, and to the use of waste paper as a resource. In so doing, the association aims to contribute to the creation of a resource-recycling society.

Ozone Depletion Potential (ODP) (p.20,21,32,115)

An indicator of the potential of chlorofluorocarbons (CFCs) and other chemical substances to deplete the ozone layer. It is expressed in terms of the relative value obtained when the potential of CFC-11 (trichlorofluoromethane), a specified CFC, is given as one.

Ozone Layer (p.32,72)

An atmospheric layer which has a high ozone concentration. The ozone layer has a thickness of about 20 km and is found chiefly at an altitude of about 20-25 km. The ozone layer absorbs a great portion of damaging ultraviolet rays from the sun.

P

PCB (Polychlorinated Biphenyl) (p.5,20,39,46,77-80)

A general term for organic chlorine compounds that consist of carbon, hydrogen and chlorine and in which hydrogen (H) in two benzene rings connected to each other is substituted by chlorine. PCB is not decomposable in the environment and easily accumulates in the adipose tissues of living things. Following the Kanemi rice-bran cooking oil poisoning in 1968, PCB was determined to be harmful. In 1972, the production of PCB was discontinued.

Perfluorocarbon (PFC) (p.32)

Substances used in etching gas for the production of semiconductors and in cleaning gas for semiconductor manufacturing machines. PFCs are supposed to have a global warming potential 6,500 to 9,200 times higher than that of carbon dioxide.

Period for Integrated Study (p.62)

Periods set at elementary schools, lower and upper secondary schools, etc. to develop students' capacity to live, including their abilities to learn and think on their own. The periods for integrated study, introduced in earnest in fiscal year 2002, are intended to provide empirical and problem-solving courses of study on interdisciplinary, general subjects such as international understanding, environmental problems and welfare affairs. These courses consist of experiences with nature, social experiences, observations, experiments, visits to related places, surveys, etc. In the prescribed periods, the schools carry on ingenious educational activities characteristic of their specialties.

Plutonium (p.47,103)

A radioactive element that has the atomic number of 94 and scarcely occurs naturally. In nuclear power generation, plutonium is newly produced in fuel. Like uranium 235, plutonium produces energy by fission.

Pollution Control Manager (p.16,22,115)

A qualified person appointed to manage technical affairs involved in pollution control at any of the factories which belong to the manufacturing, electric utility, gas utility or heat supply industry and have facilities causing such environmental pollution as smoke and soot, waste water, vibration, noise, etc.

Prototype Carbon Fund (PCF) (p.30,31)

A financing arrangement established in January 2000 under which the World Bank raises funds with contributions from governments and business enterprises, invests such funds in greenhouse gas reducing projects, especially in developing countries or economy-in-transition nations, and distributes the emission credits thus earned to the participating governments and enterprises according to the amounts of their respective contributions.

PRTR (Pollutant Release and Transfer Register) System (p.39)

A system that calls on business operators to determine on their own the amount of each of the specified environmental pollutants released from their factories or similar corporate establishments into the environment and the quantity of such substance transferred as waste, and to total and report the results to the regulatory authorities, who publicize them.

Pumped Storage (Pumped Storage Hydropower) (p.111)

One form of hydroelectric power generation that pumps up water from a lower regulating reservoir to an upper one at night when power demand is small, and releases water and produces electricity in the daytime when demand is large.

R

Radioactivity (p.37,38,92,118)

The property of some nuclei in an unstable state to emit radiation such as α (alpha), β (beta) and γ (gamma) rays when they are returning to a stable state. Radioactivity is expressed in units of becquerel (Bq). Substances that have radioactivity are called radioactive substances.

Regulated Chlorofluorocarbons (CFCs) (p.20,32,69,115)

Chlorofluorocarbons (CFCs) and other substances which were designated in the Montreal Protocol on Substances that Deplete the Ozone Layer, adopted in 1987, as ozone-depleting substances whose production should be stopped or whose use should be restricted. Regulated CFCs include CFC-11 (trichlorofluoro-methane) and HCFC-22 (chlorodifluoromethane).

Regulating Reservoir (p.52,83)

A reservoir at a hydroelectric power station to store river water so that the output of the station can be adjusted to electricity demand.

Regulatory Approach (p.25)

A policy approach for the central and local governments to attain their respective targets of environmental preservation, etc., through direct regulations under the applicable laws and ordinances. Among typical examples of these regulations are standards set to limit the concentration and amount of emissions of pollution-causing substances, and requirements for mandatory installation of pollution control facilities and equipment. Sanctions, such as remonstrances, orders and other administrative measures or penalties, are often provided for those who contravene any of these regulations or standards.

Reprocessing (p.26,47,103,104)

Chemical processing of spent fuel from nuclear power generation to separate it into plutonium and uranium, which can be reused as fuel, and other fission products.

S

Scoping (p.101)

(See page 101)

Screening (p.101)

(See page 101)

Sink (p.99,100)

Forests, seawater, soil, coral and other substances that absorb and sequester greenhouse gases, such as CO_2, from the atmosphere. Sequestrant is used in almost the same sense. Under the Kyoto Protocol, the quantities of CO_2 absorbed by tree planting or other projects in and after 1990 may be allotted by the parties involved to the achievement of their respective emission-reducing targets.

Soot and Dust (p.4,33,34,91)

A general term for soot and ash released into the air by burning, etc. The Air Pollution Control Law specifies the permissible limits on soot and dust emissions from the outlet of smoke and soot generating facilities according to the types and size of these facilities.

Special Law for Nuclear Disaster Prevention (p.57,106)

A law enacted in December 1999 to strengthen measures to deal with nuclear disasters, including arrangements for securing a rapid initial response and well-organized cooperation between the central and local governments in the event of a nuclear disaster, the reinforcement of the central government's emergency setup suited to the peculiarities of nuclear disasters, and the clarification of the roles to be played by nuclear operators in the event of a nuclear disaster, based on what was learned from the criticality accident (of September 1999) at a fuel processing facility in Tokai-mura Village, Ibaraki Prefecture.

Standby Power (p.109)

Electric power consumed by equipment such as household appliances to maintain a standby state waiting for instructions from the remote-control system, or to retain the functions of their timer or memory units when they are not being operated.

Steam Power Plant (p.35)

A power generation system that produces steam by burning fuel in a boiler, turns a steam turbine by the expansion force of the steam and operates a power generator directly connected with the turbine to generate electricity.

Sulfur Hexafluoride (SF_6) (p.32)

A compound of fluorine and sulfur that does not occur naturally but is produced industrially. Because it is chemically stable and possesses good qualities as insulation, SF_6 is used as an insulation gas in circuit breakers and other equipment in the electric utility industry. SF_6 is considered to have a global warming potential 23,900 times higher than that of carbon dioxide.

Sulfur Oxide (SOx) (p.4,5,19-21,33,34,68,91,107)

A general term for sulfur dioxide (SO_2), anhydrous sulfuric acid (SO_3) and other similar substances. Sulfur oxides are produced from the oxidization of the sulfur content of fossil fuels during their combustion. Because sulfur oxides have adverse effects on human health and damage the living environment, SOx is designated as a regulated substance under the Air Pollution Control Law.

Survey of the Current Environmental Status (p.33,102)

A survey, conducted as part of an environmental impact assessment, to examine the current state of air and water quality, marine weather, meteorological conditions, flora and fauna, etc. The aim of the survey is to accurately predict and assess the probable impacts of each new project on the environment.

Sustainable Development (p.1,2,8,9,18,67)

A concept advocated by the World Committee on the Environment and Development in its report published in 1987. It denotes development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

T

Thermal Efficiency of Thermal Power Generation (p.2,7,9,22,24,30,67-69,87,112,115)

A numerical value to indicate the performance of thermal power generators. It is used to express the percentage of electricity to heat energy obtained by the combustion of fuel. Thermal efficiency = Electric energy generated (kWh) × 3.60 (MJ/kWh)/Fuel consumption (kℓ, t) ×Unit heating value of fuel (MJ/kℓ, t)

Thermal Effluent (p.35,36)

In thermal power and nuclear power generation, steam used to turn turbines is cooled into water by seawater or river water. The water used as a coolant and then discharged back into the sea or the river is warmer by several degrees centigrade than when it was taken in through the inlet. Warm water thus returned to the sea or the river is called thermal effluent.

Thermal Insulating Materials (p.43,44)

Materials that are attached around boilers, turbines and the piping facilities connecting such equipment to keep them from radiating heat into the surroundings. This ensures that steam used for power generation is maintained at a high temperature.

Thermal (or Ice) Storage (Air-Conditioning) System (p.71,72,97,106,107,108)

A system that stores cool or warm thermal heat produced at night in a thermal storage tank and uses it for air conditioning in the daytime. There are two types of thermal storage systems, a water-carried thermal storage system and an ice storage system (Eco Ice and Eco Ice mini systems).

Third Conference of the Parties to the United Nations Framework Convention on Climate Change (COP3) (p.99)

An international conference held in Kyoto, Japan, in December 1997 under the UN Framework Convention on Climate Change. The conference adopted a Kyoto Protocol setting forth an international framework for mitigating global warming from the year 2000 onward.

Transmission and Distribution Loss Rate (p.22,23,26,30,111,115)

Electric power lost in transmission and distribution lines as a percentage of electric power transmitted from a power station.

Triple Bottom Line (p.2,3)

A principle of business operations comprising three aspects - economic development, environmental preservation and social ethics. The Triple Bottom Line is considered to serve as a basic axis of assessment in evaluating the activities and efforts which aim to realize the sustainable development of society as a whole.

Tritium (p.37)

A radioactive isotope of hydrogen whose nucleus consists of one proton and two neutrons. Tritium is produced through the fission of nuclear fuel, specifically uranium, in light water reactors or through neutron irradiation of heavy water. This element has a half-life of 12.3 years.

U

Unused Energy Sources (p.108)

Energy sources that have heretofore not be used effectively. Unused energy sources include waste heat from waste incineration plants, substations, etc., and energy derived from the difference in temperature between river water or sewage and the outside air.

Uranium (p.19,47,103)

A metal element that is denoted by the chemical symbol U, has the atomic number of 92, and occurs naturally. Uranium 235, used in nuclear power generation, is one of the isotopes of uranium and is fissile. A greater portion of natural uranium is uranium 238, which is fertile. Natural uranium contains no more than 0.7% of uranium 235, so natural uranium is enriched to increase its uranium 235 content to 3-5% to make uranium fuel.

V

VDT Work (p.61)

(See page 61)

Voluntary Agreement for Environmental Pollution Control (p.13)

(See page 13)

Voluntary Commitment (p.25)

(See page 25)

W

Whiteness (p.90)

An indicator of the whiteness of paper. Copying paper made of 100% natural pulp has a whiteness of 80, while the whiteness of newsprint is about 55. Though somewhat poor in terms of whiteness, recycled paper with a whiteness of 70 is expected to facilitate the effective use of waste if it comes into wider use.

World Association of Nuclear Operators (WANO) (p.66)

An organization established in May 1989 in response to the appeal of Lord Marshall, at that time the President of the Central Electricity Generating Board of Great Britain (CEGB), with the 1986 Chernobyl nuclear plant disaster as the driving force. The aim was to reinforce relations and cooperation among nuclear operators. The World Association of Nuclear Operators has a membership of about 132 nuclear operators as of 2001, providing a place for the exchange of operational experiences among them.

World Business Council for Sustainable Development (WBCSD) (p.66)

A council established in January 1995 through a merger between the Business Council for Sustainable Development (BCSD) and the World Industry Council for the Environment (WICE) as an organization to lead industrial circles in their efforts toward sustainable development. The council focuses its activities on bringing the concept of eco-efficiency into practice in industrial circles and presenting its opinions on the formulation of relevant policies.

UNITS

Bq (becquerel)

A unit to indicate the intensity of radioactivity. It is expressed by the number of radioactive substances decayed per second. One becquerel denotes the intensity of radioactivity causing one decay per second.

Gauss (G)

A unit showing the intensity of a magnetic field. One gauss indicates the intensity of a magnetic field at a place one meter away from an electric wire through which an electric current of 500 A flows. In the international unit system, tesla (T) is used.

1 T = 10,000 G

ha (hectare)

A unit of surface area, equal to 100 meters square.

ha = 10,000 m^2 (square meters)

100 ha = 1 km^2 (square kilometers)

kW, MW, GW (kilowatt, megawatt, gigawatt)

A unit indicating power output, contract power and power consumption.

kW = 10^3 W (watts)

MW = 10^6 W

GW = 10^9 W

W (watt) = V (volt) × A (ampere)

kWh, MWh, GWh, TWh (kilowatthour, megawatthour, gigawatthour, terawatthour)

A unit indicating electric energy consumed.

kWh = 10^3 Wh (watthours)

MWh = 10^6 Wh

GWh = 10^9 Wh

TWh = 10^{12} Wh

Wh (watthour) = W (watt) × h (hour)

Nm^3 (normal cubic meter)

A unit indicating the volume of gas at a temperature of 0℃ under one unit of atmospheric pressure.

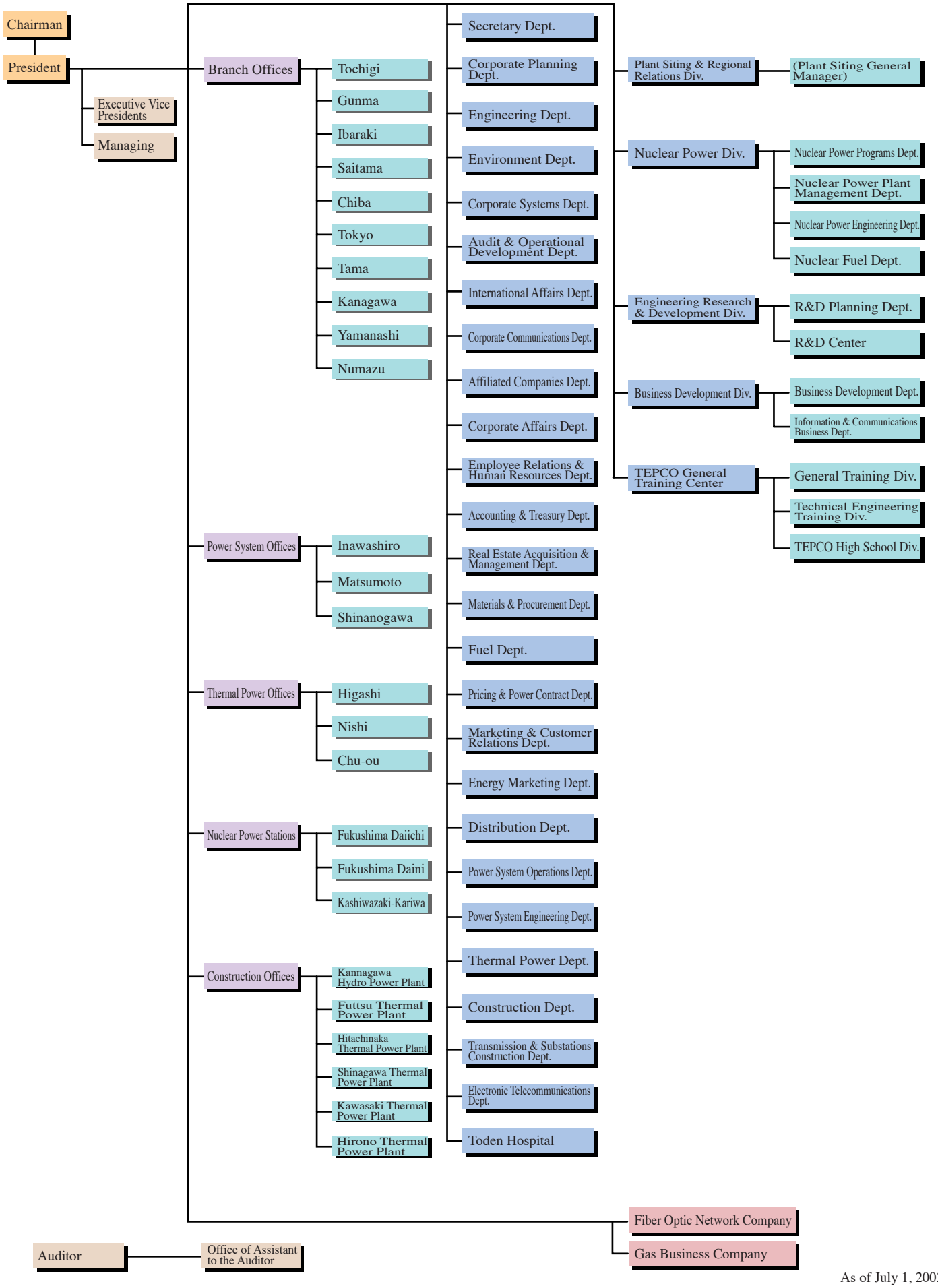
Sv (sievert)

A unit used as a measure of radiation impact on the human body. It indicates the impact of radiation on the human body with consideration given to differences due to the types and amounts of radiation.

Chronology (Events Related to Energy and Environmental Protection)

Year	Worldwide	Japan	Tokyo Electric Power Company
1950s	1952 London smog		1951 Operations commenced at Tokyo Electric Power
1960s	1967 National Environment Protection Agency created in Sweden 1969 National Environmental Policy Act enacted in USA	1962 Law Concerning Control on the Emissions of Soot and Smoke enacted for the first time 1967 Basic Law for Environmental Pollution Control promulgated 1968 Ambient Air Quality Standards for SO_2 enacted 1968 Air Pollution Control Law and Noise Regulation Law enacted 1969 White Paper on the Environment first submitted to the Diet	1963 Tree planting at thermal power stations started 1964 Noise control systems installed at thermal power stations 1965 Use of low-sulfur fuel oil and installation of tall, concentrated stacks begun 1966 Total effluents treatment systems installed at all thermal power stations 1966 Study on flue gas desulfurization started at the Goi Thermal Power Station 1966 Installation of electrostatic precipitators at fuel oil thermal power stations started 1968 Memorandum signed with the Tokyo Metropolitan Government on the prevention of pollution at thermal power stations (the first pollution control agreement between an electric utility and local authorities in Japan) 1968 Use of Minas fuel oil started
1970s	1970 OECD Environment Committee established 1970 US Environmental Protection Agency created 1971 Ministry of the Environment created in France 1972 UN Conference on Human Environment held in Stockholm UNEP (United Nations Environment Programme) established 1973 The first OPEC oil crisis affects oil supplies 1979 The second OPEC oil crisis becomes an issue 1979 Expanded use of coal agreed on by the IEA	1970 Environmental Water Quality Standards enacted 1971 Environment Agency created 1972 Verdict reached on the Yokkaichi City air pollution lawsuits 1973 Ambient Air Quality Standards for NO_2 and other atmospheric pollutants enacted 1973 Pollution-Related Health Damage Compensation Law promulgated 1974 Area-wide total pollutant load control for SOx introduced 1977 Environmental impact assessment reviews for power stations tightened by MITI 1978 Ambient Air Quality Standards for NO_2 amended	1970 World first LNG-fired thermal power unit built (at the Minami Yokohama Thermal Power Station) 1971 Environmental assessments begun under MITI's administrative guidance 1972 Naphtha used for the first time 1973 Denitrification R&D project launched 1974 Afforestation ecology activities commenced at the Sodegaura Thermal Power Station 1979 Field tests started on a total flue gas treatment system 1979 Environment Week campaign inaugurated 1970s Progressive introduction of NOx emission-reduction technology
1980s	1985 Vienna Convention for Protection of the Ozone Layer adopted 1987 Montreal Protocol adopted 1988 Intergovernmental Panel on Climate Change (IPCC) established	1981 Area-wide total pollutant load control for NOx put in force 1988 Law Concerning the Protection of the Ozone Layer through the Control of Specified Substances and other Measures enacted	1982 MITI prize awarded to the Chiba Thermal Power Station for in-site afforestation development efforts 1985 Yokosuka Thermal Power Station Units 1 and 2 converted from oil to COM 1985 Combined-cycle plant (Futtsu Thermal Power Station Unit 1) put into operation
1990s	1992 United Nations Conference on the Environment and Development (UNCED) (held in Rio de Janeiro) 1993 Environmental management technological committee (TC-207) established in the International Standardization Organization (ISO) 1993 UN Commission on Sustainable Development (CSD) established 1994 United Nations Framework Convention on Climate Change put in force 1995 The 1st Conference of the Parties to United Nations Framework Convention on Climate Change (COP1) held 1996 ISO's International Standards on Environmental Management Systems and Environmental Audit put in force 1997 Kyoto Protocol agreed upon at COP3 (in Kyoto)	1990 Action Program to mitigate Global Warming worked out 1991 Global Environment Charter issued by Keidanren (Japan Federation of Economic Organizations) 1993 Basic Environment Law enacted 1994 Basic Environmental Plan decided on by the Cabinet 1997 Environmental Impact Assessment Law enacted 1997 Electricity Utilities Industry Law amended 1997 Keidanren Voluntary Action Plan on the Environment issued 1998 Law Concerning Rational Use of Energy amended 1998 Guideline of Measures to Prevent Global Warming issued 1998 Law Concerning the Promotion of the Measures to Cope with Global Warming enacted 1999 Law for Pollutant Release and Transfer Register (PRTR Law) enacted 1999 Law Concerning Special Measures against Dioxins enacted	1991 Office Neighborhood Association scheme implemented on a full scale 1992 Commencement of purchase of surplus electricity from power plants using new energy, etc. by contract options 1992 First edition of Environmental Action Report published 1993 Comprehensive Environment Committee established 1993 TEPCO Advisory Committee on Environmental Affairs organized 1993 TEPCO Pair Watching Program commenced 1995 Prime Minister's Prize awarded to the Sodegaura Thermal Power Station for afforestation promotion activity 1996 Environmental Management Regulations put in force 1996 Advanced combined cycle power plants (Yokohama Thermal Power Station Units 7 and 8) put into operation 1997 TEPCO's Environmental Action Report ranked 9th in the world and 1st in Japan in a survey of environmental reports by the United Nations Environment Programme (UNEP) 1999 Hachijojima Geothermal Power Plant put into operation 1999 ISO 14001 certification for the Kannagawa Hydro Power Plant Construction Office acquired
2000s	2000-2001 IPCC Third Assessment Report adopted 2001 Bonn Accord reached at COP6 reopened (in Bonn) 2001 Marrakesh Accord adopted at COP7 (in Marrakesh, Morocco)	2000 Basic Law for Promoting the Creation of Recycle-Oriented Society and related recycling laws enacted/amended 2000 Toward the Establishment of Environmental Accounting System (2000 Report) published by the Environment Agency 2001 Ministry of the Environment created through reorganization of the government ministries and agencies 2001 Law Concerning Special Measures for Promotion of Proper Treatment of PCB Waste enacted 2001 Law for Recovery and Decomposition of CFCs enacted 2002 Guideline of Measures to Prevent Global Warming amended 2002 Law Concerning Measures to Cope with Soil Contamination enacted 2002 The Kyoto Protocol ratified 2002 Law Concerning the Promotion of Measures to Cope with Global Warming amended 2002 Energy Conservation Law amended 2002 Law Concerning Special Measures for the Use of New Energy, etc. by Electric Utilities enacted 2002 Basic Environment Law enacted 2002 Automotive NOx and Particulate Matters Law enacted	2000 The World Bank's Prototype Carbon Fund started (TEPCO included among the contributors) 2000 Tree planting in Australia started 2000 Hachijojima Wind Power Plant put into commercial operation 2000 Standards for calculation of internal environmental costs formulated 2000 Green Power Fund and Green Power Certification System inaugurated 2001 Plan to commence operation of recycling facilities for insulating oil containing PCB, transformers, etc. announced 2002 TEPCO's environmental advertisement won the grand prize in the readers' choices category of advertisements for Yomiuri Shimbun Awards.

Corporate Organization Chart of Tokyo Electric Power Company, Incorporated



As of July 1, 2002

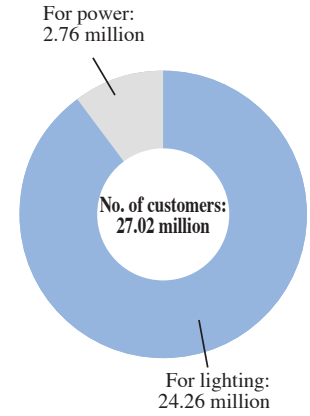
TEPCO Overview (As of the end of March, 2002. Items with * represent data for FY 2001)

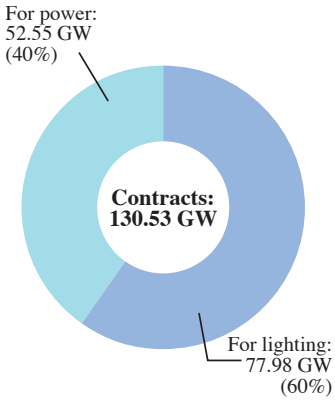
Trade name:	The Tokyo Electric Power Company, Incorporated
Date of establishment:	May 1, 1951
Equity capital (billion yen):	676.4
Total number of shares issued:	1,352,867,531
Number of shareholders:	828,253
Total assets (billion yen):	14,174.8
Service area:	Tochigi, Gunma, Ibaraki, Saitama, Chiba, Tokyo, Kanagawa, Yamanashi and Shizuoka (east of the Fuji-gawa River)
Size of service area:	39,496km^2
Population of service area:	43.16 million
Number of employees:	40,725
Amount of electricity sales*:	275.5 TWh (85.1 TWh for lighting , 115.3 TWh for power and 75.1 TWh for deregulated demand)
Sales (billion yen)*:	5,129.6 (total ordinary revenue: 5,156.0)
System peak load:	64.3 GW (July 24, 2001)

Number of power stations	Hydroelectric power: 160	Thermal power: 25	Nuclear power: 3	Wind power: 1
Transmission facilities	Route length: 20,837 km	Circuit length: 39,679 km	Number of supports: 52,625 units	
Substations	Number installed: 1,558	Total capacity: 256.70 GVA		
Distribution facilities	Route length: 333,716 km	Circuit length: 1,007,162 km	Number of supports: 5,510,000 units	

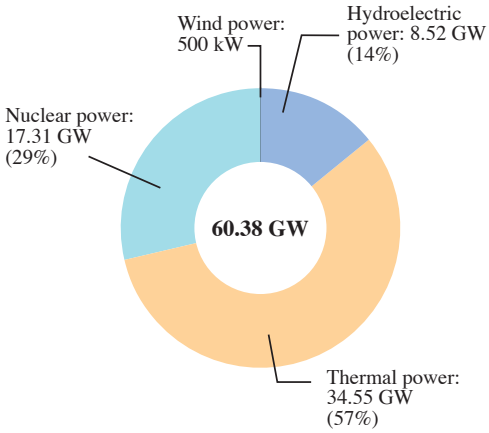
* Figures do not necessarily add up to the totals because of rounding.

Number of Customers



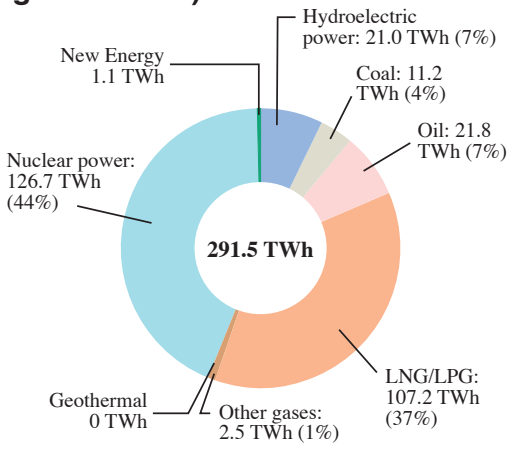


Authorized Capacity of Power Stations



Service Area

Amount of Electricity Generated (Including Purchases)*



Forward into the future. All for you.

SMILE ∞ ENERGY

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